Appendix K

Green star report

Waterman AHW
Consulting Engineers

Green Star Report

Belmore Park Commercial Building

For:

Kann Finch

Job No: 22371

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1. INTRODUCTION

The new commercial office building that is proposed to be integrated with the new Zone Substation for Energy Australia, is proposed to follow best practice principles of Ecologically Sustainable Design (ESD).

In order to achieve ESD best practice, the office building is proposed to follow the principles of a 5 star base building office under the Green Star rating scheme (Green Building Council of Australia) and a 4.5 or 5 star base building ABGR rating (administered by DECC). Note that a 5 Green Star rating provides an outcome considered “Australian Excellence” and a 5 Star ABGR is considered “Exceptional”.

This report specifically addresses the Green Star rating scheme. Green Star is a holistic ESD rating tool covering most aspects of building sustainability including energy, water and several others is indicated below.

ABGR is addressed in a separate report. ABGR is the Australian Building Greenhouse Rating scheme, which addresses only the greenhouse gas emissions attributed to the operation of the completed building.

The approach to ESD will be iterative, involving sustainability principles from concept design (inception) right through construction then to building operation. Credits within the following Green Star categories will be weighed up in terms of sustainable outcomes, build-ability, budget, maintenance, ongoing operation and asset value:

- Management
- Indoor Environment Quality
- Energy
- Transport
- Water
- Materials
- Land Use & Ecology
- Emissions
- Innovation

The relevant Green Star tool for the project at the time of writing this report is:

- **Green Star Office Design & As Built Version 3, 2008**

2. EXECTUTIVE SUMMARY

The building is currently heading towards a 4 Green Star rating with the potential to reach 5 stars. In order to reach the 5 star target, there may be cost and space implications.

3. PRELIMINARY ASSESSMENT

Refer to the attached points schedules. A summary schedule is at the end.

The results indicate that a 4 Green Star rating is readily achievable and that an upgrade to a 5 Green Star rating is viable. The upgrade would however require further design work.

4. DISSCUSSION

4.1. General

It is noted that the current version of Green Star (Version 3), which has been in use since May 2008, is more stringent on some key items than the previous version (v2). The effect on this project is that achieving a 5 Green Star rating will require that additional points are targeted than originally expected. This will impose additional spatial and cost implications on the project.

Previous advice was that a five star building is likely to cost an additional 5 to 8% on top of the total building works cost of the commercial building. We believe that this range has now increased to 6 to 10%.

4.2. Management

Management credits cover issues relating to ongoing operation of the building. This is done by designing the building to operate in an efficient and sustainable way and by putting management plans, measures and procedures in place to ensure that the design intent can be effectively met in operation.

The Management category accounts for 9% of the Green Star rating in NSW.

4.3. Indoor Environment Quality

Indoor Environment Quality credits cover issues relating to providing an enhanced working environment with respect to the health, comfort and well being of building occupants. The aim is to reduce occupant sickness and absenteeism whilst improving mental awareness and productivity. The main issue, covered by several credits is indoor air quality. Other credits cover thermal comfort, natural light, lighting, glare, acoustics and external views.

The Management category has the highest number of credits of any category in Green Star and accounts for 20% of the Green Star rating in NSW.

4.4. Energy

The Energy credits cover energy efficient design, reducing greenhouse gas emissions and reducing peak demand.

Whilst there are only six credits in this category, the number of points and weightings of these points are high – accounting for 25% of Green Star in NSW, which is the highest of all of the categories.

4.5. Transport

Transport credits relate to how well a building is served by public transport, promoting fuel efficient transport, inclusion of bicycle racks (with showers and lockers) and minimising carpark provisions.

The Transport category accounts for 8% of the Green Star rating in NSW.

4.6. Water

Water credits relate to minimising the use of potable (town supply) water by the building in operation. The credits for Water covers the efficiency of water fittings and fixtures including tapware, shower heads, WC's and urinals), the use of harvesting and recycling such as rainwater, grey water, black water and fire system testing/draining recycling, the water efficiency of building cooling systems, plus irrigation system efficiency.

The Water category accounts for 12% of the Green Star rating in NSW.

4.7. Materials

The Materials category encourages re-use, recycling and sustainable materials in building construction and operation. It also encourages minimising churn related waste by promoting shell and core or integrated fitout instead of the traditional separate base building and fitout where a lot of waste occurs in the fitout to modify the base building.

The Materials category accounts for 14% of the Green Star rating in NSW.

4.8. Land Use & Ecology

The Ecology category relates to various items that the construction and/or operation of the building may have on the ecosystem. Included are credits that cover building location relative to sensitive ecosystems, the re-use of formerly built upon land, topsoil conservation, land decontamination and change in ecological value.

The Ecology category accounts for 6% of the Green Star rating in NSW.

4.9. Emissions

Emissions credits relate to minimising items commonly considered as pollutants and contaminants. These credits include refrigerant selection and monitoring, ozone depletion, stormwater and sewer discharge, Legionella risk and light pollution.

The Emissions category accounts for 6% of the Green Star rating in NSW.

4.10. Innovation

The Innovation category does not count in the base credits for Green Star. Credits in this category are considered "bonus" points. There are credits promoting innovative strategies and technologies, for exceeding the credit criteria in the proceeding eight categories and for designing "other" environmental initiatives that are not covered in the Green Star scheme.

Belmore Park Commercial Development
Preliminary Green Star Analysis

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Man - 1	Green Star Accredited Professional	To encourage and recognise the engagement of professionals who can assist the project team with the integration of Green Star aims and processes throughout design and construction phases.	Two points are awarded where: A principal participant in the design team is a Green Star Accredited Professional and has been engaged by the building owner to provide sustainability advice from the schematic design phase through to construction completion.	2	**2**		Waterman AHW - Scott Brown
Man - 2	Commissioning Clauses	To encourage and recognise commissioning and handover initiatives that ensure that all building services can operate to optimal design potential.	Up to two points are awarded as follows: One point is awarded where it is demonstrated that: Comprehensive pre-commissioning, commissioning, and quality monitoring are contractually required to be performed for all building services (BMS, mechanical, electrical and hydraulic); and The works outlined above are done in exact accordance with CIBSE Commissioning Codes or ASHRAE Commissioning Guideline 1-1996 (for mechanical services only).	1	**1**		This is an easy credit to achieve, it will add cost (probably under $50K). Commissioning requirements must be added to services specifications and drawings.
			An additional point is awarded where it is demonstrated that: - The point above is achieved; and - The design team and contractor are required to transfer project knowledge to the building owner/manager through all of the following: o Documented design intent; o As-built drawings; o Operations and Maintenance Manual; o Commissioning Report; and o Training of building management staff.	1	**1**		
Man - 3	Building Tuning	To encourage and recognise commissioning initiatives that ensure optimum occupant comfort and energy efficient services performance throughout the year.	Two points are awarded where: After handover, the building owner implements tuning of all building systems; A relevant member of the design team is involved in the tuning process; Monthly monitoring is undertaken and the outcomes are reported to the building owner quarterly; Full re-commissioning is undertaken 12 months after practical completion; and A Building Tuning Report on the outcomes of the tuning process will be provided to the building owner and made available to the design team.	2	**2**		This is an easy credit to achieve but it will add cost (probably under $50K). Additional commissioning requirements must be added to services specifications.
Man - 4	Independent Commissioning Agent	To encourage and recognise the appointment of an independent commissioning agent from project design through to handover.	One point is awarded where an independent commissioning agent has been appointed to: Provide commissioning advice to the building owner and the design team; and Monitor and verify the commissioning of all building systems.	1	**1**		Theoretically needs a Commissioning Agent appointed now. Cost unsure - possibly circa $50K.
Man - 5	Building Users' Guide	To encourage and recognise information management that enables building users to optimise the building's environmental performance.	One point is awarded where: A simple and easy-to-use Building Users' Guide, which includes information relevant for the building users, occupants and tenants' representatives, is developed and made available to the building owner.	1	**1**		This is an easy credit to achieve. Will require input from all design consultants. Cost circa $20K

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Man - 6	Environmental Management	To encourage and recognise the adoption of a formal environmental management system in line with established guidelines during construction.	Up to two points are awarded independently of each other and as follows: One point is awarded where it is demonstrated that: The contractor implements a comprehensive, project-specific Environmental Management Plan (EMP) for the works in accordance with Section 4 of the NSW Environmental Management System guidelines 1998 or 2007. One point is awarded where it is demonstrated that: □ The Contractor has valid ISO14001 Environmental Management System (EMS) accreditation prior to and throughout the project.	2	**2**		This relates to the builder. The builder must provide the EMP and must have relevant ISO accreditation. Cost for EMP circa $15K.
Man - 7	Waste Management	To encourage and recognise management practices that minimise the amount of construction waste going to disposal.	Up to two points are awarded where: The contractor implements a Waste Management Plan (WMP), retains waste records and quarterly reports to the building owner; and A percentage (by mass) of all demolition and construction waste is reused or recycled as follows: One point for 60% of the waste; and Two points for 80% of waste.	2	**2**		This relates to the builder. The builder must provide and implement a WMP.
			Total Points =	**12**	**12**	**0**	

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Ieq - 1	Ventilation Rates	To encourage and recognise designs that provide ample amounts of outside air to counteract build-up of indoor pollutants.	Three points are available as follows: **Mechanically Air-conditioned Spaces** Up to three points are awarded where for 95% of the NLA, outside air is provided at rates greater than the requirements of AS1668.2-1991, as follows: One point for 50% improvement; Two points for 100% improvement; and Three points for 150% improvement.	3	**1**		This is an easy credit to achieve. It will add some cost (circa $50K) and will have slight a negative effect on ABGR (Ene-1, 2)
Ieq - 2	Air Change Effectiveness	To encourage and recognise systems that effectively delivers optimum air quality to any occupant throughout the occupied area.	Two points are awarded where the Air Change Effectiveness (ACE) for at least 95% of the NLA meets the following criteria: **Mechanically Air-conditioned Spaces** The ventilation systems are designed to achieve an Air Change Effectiveness (ACE) of >0.95 for at least 95% of the NLA when measured in accordance with ASHRAE 129-1997: 'Measuring Air Change Effectiveness'; and ACE is measured in the breathing zone (nominally 1m from finished floor level).	2	**2**		Requires CFD Modelling to confirm. May require alteration to air diffuser locations and dictate diffuser types. The CFD modelling will be very expensive (possibly over $100K) because there are a lot of unique floors to do.
Ieq - 3	Carbon Dioxide Monitoring and Control	To encourage and recognise the provision of response monitoring of carbon dioxide levels to ensure delivery of optimum quantities of outside air.	One point is awarded where: **Mechanically Air-conditioned Spaces** A carbon dioxide (CO_2) monitoring and control system with a minimum of one CO_2 sensor at all return points on each floor, is provided to facilitate continuous monitoring and adjustment of outside air ventilation rates to each level, to ensure independent control of ventilation rates to achieve outside air requirements; OR HVAC systems provide 100% outside air with no recirculated component.	1	**1**		This is an easy credit. Cost likely $75K
Ieq - 4	Daylight	To encourage and recognise designs that provides good levels of daylight for building users.	Up to three points are available in his credit; there are two alternative credit criteria: The percentage of the NLA that has a measured Daylight Factor (DF) of not less than 2.0%, at desk-height level (720mm AFFL) under a uniform design sky; OR The percentage of the NLA that has a Daylight Illuminance (DI) of at least 250 Lux. In both cases are the points awarded based on percentage of NLA as per below. One point is awarded for 30% of NLA; Two points are awarded for 60% of NLA; and Three points are awarded for 90% of NLA.	3	**0**	**1**	Requires Daylight Model to check. Façade glazing must have high visible light transmittance (VLT). This can be in conflict with shading factor needs for air conditioning and ABGR. If it is possible, it is a "free" credit.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Ieq - 5	Daylight Glare Control	To encourage and recognise buildings that are designed to reduce the discomfort of glare from natural light.	One point is awarded where it is demonstrated that glare from daylight is reduced through any combination of the below: Where, for each typical glazing configuration or atrium, fixed shading devices shade the working plane 1.5m in from the centre of the glazing of direct sun at desk height (720mm AFFL) for 80% of standard working hours; OR Where blinds or screens are fitted on all glazing and atriums as a base building provision and meet to following criteria; - Eliminate all direct sun penetration; - Are control with an automatic monitoring system; - Are equipped with a manual override function accessible by occupants; and - Have a visual light transmittance (VLT) of <10%.	1	**0**	**1**	Expensive and difficult to achieve unless the fixed shading provides compliance. Further investigation required.
Ieq - 6	High Frequency Ballasts	To encourage and recognise the increase in workplace amenity by avoiding low frequency flicker that may be associated with fluorescent lighting.	One point is awarded where: High frequency ballasts are installed in fluorescent luminaries over a minimum of 95% of the Class 5 Commercial Office NLA.	1	**1**		This is an easy credit. The cost is negligible as we would normally specify these anyway.
Ieq - 7	Electric Lighting Levels	To encourage and recognise base building provided office lighting that is not over designed.	One point is awarded where: The office lighting design has a maintained illuminance level of no more than 400 Lux for 95% of the Class 5 Commercial Office NLA as measured at the working plane (720mm AFFL).	1	**1**		This is an easy credit using an array of single tube T5 light fittings at a particular spacing. Target would be 320 Lux according to Standards Asutralia. Single tube fittings cost more than double because more fittings are required.
Ieq - 8	External Views	To encourage and recognise designs that provide occupants with a visual connection to the external environment.	Up to two points are awarded where: A significant portion of the Class 5 Commercial Office NLA has a direct line of sight to the outdoors or into an adequately sized and day-lit atrium is: - One point for 60% of the NLA; and - Two points for 80% of the NLA.	2	**1**	**1**	Requires to be confirmed by measurement and calculation. If it is possible, it is a "free" credit.
Ieq - 9	Thermal Comfort	To encourage and recognise buildings that achieve a high level of thermal comfort.	Up to two points are awarded where high level of thermal comfort is achieved for all of the Class 5 Commercial NLA through any combination of the below: **Mechanically Air-Conditioned Spaces:** Where Predicted Mean Vote (PMV) levels, calculated in accordance with ISO7730, are achieved during Standard Operating Hours of Occupancy for 98% of the year using standard clothing and metabolic rate value: - One point for PMV levels between -1 and +1, inclusive; and - Two points for PMV levels are between -0.5 and +0.5, inclusive.	2	**1**	**1**	Requires PMV modelling to confirm. Cost is for modelling of a lot of unique floors (circa $50K).

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Ieq - 10	Individual Comfort Control	To encourage and recognise designs that facilitate individual control of thermal comfort.	Up to two points are awarded where it is demonstrated that the base building provides for individual user control of air supply rates, air temperature, or mean radiant temperature to each workspace, through any combination of the below: **Mechanically Air-Conditioned Spaces** The base building HVAC system allows for tenant installation of individual user control of thermal comfort to each workspace for each 15m2 or part thereof (including enclosed spaces), as follows: - One point for 60% of NLA; and - Two points for 90% of NLA.	2	**0**	**1**	Possible but costly and not practicle. Cost circa $500K + for additional AC zones
Ieq - 11	Hazardous Materials	To encourage and recognise actions taken to reduce health risks to occupants from the presence of hazardous materials.	One point is awarded where: A comprehensive hazardous material survey has been carried out on the project site, as defined by the relevant Environmental and Occupational Health and Safety (OH&S) legislation; and Whenever asbestos, lead or Polychlorinated Biphenyls (PCBs) were found, they have been removed in accordance with the standards listed under Table IEQ-11.1. For new developments or developments in which none of the above hazardous materials were found, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Indoor Environment Quality category score. Type 'na' in the No. of points Achieved column	0	**na**		Requires survey and report by a suitably qualified professional. Cost unknown - (circa $10k?)
Ieq - 12	Internal Noise Levels	To encourage and recognise buildings that are designed to maintain internal noise levels at an appropriate level.	Up to two points are awarded where 95% of the project's NLA does not exceed the 'Satisfactory' ambient internal noise levels in accordance with AS/NZS 2107:2000, as follows: Building Services Design - One point is awarded where, within the entire base building general office space, noise from the building services does not exceed 40dBAeq. Overall Building - One point is awarded where within the base building office space, the sound level does not exceed 40dBAeq (assuming open plan offices).	2	**1**	**1**	This is an easy credit. Requires specific acoustic advice. Additional cost of acoustic consultant unknown (possibly $10K)
Ieq - 13	Volatile Organic Compounds	To encourage and recognise specification of interior finishes that minimise the contribution and levels of Volatile Organic Compounds in buildings.	Up to three points are awarded where the various finishes used in the project meet the benchmarks outlined below as follows: **Paints** One point where at least 95% of all painted surfaces meet the TVOC Content Limits outlined in Table IEQ-13.1 (low-VOC) or where no paint is used in the project.	1	**1**		Requires specifications to clearly outline requirements and specify products. Relatively cheap credit. Costs vary (circa 0 to 20% of product cost).

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
			Carpets and Flooring One point where all carpets meet the TVOC emissions limits outlined in Table IEQ-13.2 (low-VOC); OR Where no carpet has been installed in the project and projects wish to use low-VOC flooring, one point is awarded where all the flooring installed in the project meet the emissions limits outlined in Table IEQ-13.2. Where no carpet has been installed in the project, the carpet point is 'Not Applicable' and is removed from the total number of points available for the category; type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	1	**1**		Requires specifications to clearly outline requirements and specify products. Relatively cheap credit. Costs vary (circa 0 to 20% of product cost).
			Adhesives and Sealants One point where 95% of all adhesives and sealants meet the TVOC Content Limits outlined in Table IEQ-13.3 (low-VOC) or where no adhesives or sealants are used.	1	**1**		Requires specifications to clearly outline requirements and specify products. Relatively cheap credit. Costs vary (circa 0 to 20% of product cost).
Ieq - 14	Formaldehyde Minimisation	To encourage and recognise the specification of products with low formaldehyde emission levels.	One point is awarded where all composite wood products (including exposed and concealed applications) either: Contain low-emission formaldehyde. OR Contain no formaldehyde. If no engineered wood products are used within the project, this credit is 'Not Applicable' and is removed from the total number of points available for the category; type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	1	**1**		Requires specifications to clearly outline requirements and specify products. Relatively cheap credit (little or no cost implication). Requires
Ieq - 15	Mould Prevention	To encourage and recognise the design of services that eliminate the risk of mould growth and its associated detrimental impact on occupant health.	One point is awarded where it is demonstrated that: The mechanically air-conditioned ventilation system actively controls humidity to be no more than 60% relative humidity in the space and no more than 80% relative humidity in the supply ductwork; OR The building is fully naturally ventilated.	1	**0**	**1**	Possible - but not good for energy consumption Ene1, 2 and ABGR. Cost minimal.
Ieq - 16	Tenant Exhaust Riser	To encourage and recognise the design of buildings with a general exhaust riser that can be used by tenants to remove indoor pollutants from printing and photocopy areas.	One point is awarded where the building includes a dedicated tenant's exhaust riser with the following characteristics: - Complies with section 5.7 of AS1668.2-2002; - Provides no less than 0.2 L/s/m² for 100% of the NLA; - Has a capacity of 0.35 L/s/ m² for 100% of NLA on any individual floor; and - The exhaust system is not recycled to other enclosures of different use.	1	**1**		This is an easy credit. Space is allowed for riser.
			Total Points =	**26**	**14**	**7**	

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Ene -	Conditional Requirement	To encourage and recognise designs that minimise the greenhouse gas emissions associated with operational energy consumption, and maximise potential operational energy efficiency of the base building.	To meet the conditional requirement: The project's predicted greenhouse gas emissions must not exceed 110 kgCO2/m2/annum as determined using energy modelling in accordance with: The Australian Building Greenhouse Rating (ABGR) Validation Protocol for Computer Simulations. OR The final and current version of the Green Star Energy Calculator Guide.	na	**na**		Design will Comply. Requires ABGR model as proof. Cost for modelling circa $40K
Ene - 1	Greenhouse Gas Emissions	To encourage and recognise designs that minimise greenhouse gas emissions associated with operational energy consumption.	Up to twenty points are awarded where it is demonstrated that the building's predicted greenhouse gas emissions have been further reduced below the Conditional Requirement. No evidence is required in addition to that submitted for Ene – Conditional Requirement.	20	**6**	**2**	6 points = 5 star ABGR which the current proposed services should be capable of. It is possible that they may be further. Cost included in Ene- above)
Ene - 2	Energy Sub-metering	To encourage and recognise the installation of energy sub-metering to facilitate ongoing management of energy consumption.	Up to two points are awarded as follows: One point is awarded where: It is demonstrated that sub-metering is provided for substantive energy uses within the building (i.e. all energy uses of 100kVa or greater); and There is an effective mechanism for monitoring energy consumption data.	1	**1**		This is an easy point. Cost circa $50K
			An additional point is awarded where: - The point above is achieved; - It is demonstrated that sub-metering is provided separately for lighting and separately for power for each floor or tenancy, whichever is smaller; and - There is an effective mechanism for monitoring water consumption data.	1	**1**		This is an easy point. Cost circa $100K
Ene - 3	Lighting Power Density	To encourage and recognise designs that provide artificial lighting with minimal energy consumption.	Up to three points are awarded where it is demonstrated that the lighting power densities for 95% of the NLA meets the following criteria at 720mm AFFL with the default maintenance factor of 0.8: One point for energy use of 2.5 W/m² per 100 Lux; Two points for energy use of 2.0 W/m² per 100 Lux; and Three points for energy use of 1.5 W/m² per 100 Lux.	3	**2**		This is an easy point. Cost circa $10K for calculations and report
Ene - 4	Lighting Zoning	To encourage and recognise lighting design practices that offer greater flexibility for light switching, making it easier to light only occupied areas.	Up to two points are awarded as follows: One point is awarded where it is demonstrated that: All individual or enclosed spaces are individually switched; The size of individually switched lighting zones does not exceed 100m² for 95% of the NLA; and Switching is clearly labelled and easily accessible by building occupants.	1	**1**		This is an easy and low cost point. We would provide similar lighting zone sizes in a standard design for an energy efficient building.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
			An additional point is awarded where: - The point above is achieved; and - It is demonstrated that an individually addressable lighting system is provided for 90% of the NLA.	1	**1**		This is an easy and low cost point. We would provide a lighting system in a standard design for an energy efficient building.
Ene - 5	Peak Energy Demand Reduction	To encourage and recognise designs that reduce peak demand on energy supply infrastructure.	Up to two points are awarded where it is demonstrated that the building has reduced its peak electrical demand load on electricity infrastructure as follows: One point where: Peak electrical demand is actively reduced by 15%; OR The difference between the peak and average demand does not exceed 40%. Two points where: Peak electrical demand is actively reduced by 30%; OR The difference between the peak and average demand does not exceed 20%.	2	**0**	**1**	This is not easily targeted. Three options include a)large absorption chillers (requiring much larger plant space plus high cost circa $400K), b) cogeneration (as per option a but more space and cost circa $800K), c) Thermal storage which requires a very large amount of space and added cost (also several $100K's). Other options, also very costly, include wind and solar power generation. If this was targeted then Ene2 will also improve (likely in the vicinity of 1 or 2 points), providing more points.
			Total Points =	**29**	**12**	**3**	

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Tra - 1	Provision of Car Parking	To encourage and recognise developments that facilitate the use of alternative modes of transportation for commuting to work.	Up to two points are awarded as follows: One point is awarded where the number of car parking spaces is: - At least 25% less than the maximum local planning allowances applicable to the project. OR - Not to exceed the minimum planning allowance by more than 10% Two points are awarded where the number of car parking spaces is: - At least 50% less than the maximum local planning allowances applicable to the project. OR - No more than the minimum local planning allowances. Where car parking is not permitted in the local planning scheme, this credit is 'Not Applicable' and is excluded from the points available to calculate the Transport Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	2	**0**	**2**	Architect to check council parking guidelines to and advise (DCP?) how many car spaces could theoretically be included. Waterman then to check if we can get points. Having less car spaces will save money.
Tra - 2	Fuel-Efficient Transport	To encourage and recognise developments that facilitate the use of more fuel efficient vehicles for work commuting.	One point is awarded where: - A minimum of 80% of all preferred parking spaces is dedicated solely for use by car-pool participants, small cars, hybrid or other alternative fuel vehicles; **and** Of the total parking spaces on the site: - A minimum of 10% or 10 parking spaces (whichever is the greater) are designed and labelled for small vehicles, in accordance with AS/NZS2890.1:2004; and - A minimum of 5% or 5 parking spaces (whichever is the greater) are designed and labelled for mopeds and/or motorbikes, in accordance with AS/NZS2890.1:2004. If no parking spaces are to be provided this credit is 'Not Applicable' and is excluded from the points available used to calculate the Transport Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	1	**0**	**1**	Architect to confirm if any allowance is possible. Having less full sized car spaces might save space and hence money.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Tra - 3	Cyclist Facilities	To encourage and recognise developments that facilitate the use of bicycles by occupants and visitors.	Up to three points are awarded as follows: One point is awarded where the following are provided: - Secure bicycle storage for 5% of building staff (based on one person per 15m2 of NLA); - Accessible showers (based on one per 10 bicycle spaces provided or part thereof); - Changing facilities adjacent to showers; and - One secure locker per bicycle space in the changing facilities. Two points are awarded where the following are provided: - Secure bicycle storage for 10% of building staff (based on one person per 15m2 of NLA); - Accessible showers (based on one per 10 bicycle spaces provided or part thereof); - Changing facilities adjacent to showers; and - One secure locker per bicycle space in the changing facilities.	2	**0**	**2**	This would require a large number of secure bicycle racks, showers and lockers as per email to Kann Finch dated 8.04.08. · 1 point for 65 cycle racks, 65 lockers and 7 showers (approx – to be confirmed with final NLA). · 2 points for 130 cycle racks, 130 lockers and 14 showers (approx – to be confirmed with final NLA). It is noted that there will be cycle racks installed in the basement and that there is a shower at each office floor but it is unclear if this will comply with the Green Star requirements. The location of lockers is also in question with this arrangement (one per cycle space). We believe that this will require a credit interpretation from the Green Building Council. Note that credit interpretations can only be done for a registered project.
			An additional point is awarded where: - The requirements for either one or two points have been met; and - Visitor bicycle parking is provided and meets the following criteria: One space per 750m2 NLA or part thereof; and Provided in an accessible location, signposted and close to, or adjacent to, a major public entrance to the building.	1	**0**		
Tra - 4	Commuting Mass Transport	To encourage and recognise developments that facilitate the use of mass transport for work commuting.	Up to five points are awarded for the quality of mass transport options available to building occupants. The points are determined using the Green Star Mass Transport Calculator based on: - The type of mass transport services available within 1000m of the site; - The number of routes served; and - The average interval between services during weekday peak hours. The points are determined using the Green Star Public Transport Calculator.	5	**5**		Easy and free credit because the building is within 500m walking distance of Central Station.
			Total Points =	**11**	**5**	**5**	

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Wat - 1	Occupant Amenity Water	To encourage and recognise designs that reduce potable water consumption by building occupants.	Up to five points are awarded where the predicted potable water consumption for sanitary use within the building has been reduced against a 'best practice' benchmark. The points are determined by the Green Star Potable Water Calculator.	5	**2**	**2**	Cheap and easy credit (2 points). Requires 5A rated WC's and taps plus waterless urinals. Additional points are difficult. Check how we would drain the sloped roof - can this water be collected?
Wat - 2	Water Meters	To encourage and recognise the design of systems that both monitor and manage water consumption.	One point is awarded where: - Water meters are installed for all major water uses in the project; and - There is an effective mechanism for monitoring water consumption data.	1	**1**		Water meters are a cheap credit (circa $20K).
Wat - 3	Landscape Irrigation	To encourage and recognise the design of systems that aim to reduce the consumption of potable water for landscape irrigation	One point is awarded where: - Potable water consumption for landscape irrigation has been reduced by 90% OR - A xeriscape garden has been installed. If there is no landscaping, or landscaping represents less than 1% of the site area, this point is 'Not Applicable' and is excluded from the points available used to calculate the Water Category Score. Type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	0	**na**		Will there be landscaping? Xeriscape refers to landscaping that does not require supplemental irrigation.
Wat - 4	Heat Rejection Water	To encourage and recognise design that reduces potable water consumption from heat rejection systems.	Up to four points are awarded as follows: Two points are awarded where: - Potable water consumption of water-based heat rejection systems is reduced by 50%; and Four points are awarded where: - Potable water consumption of water-based heat rejection systems is reduced by 90%; OR - No water-based heat rejection systems are provided.	4	**0**		Difficult and expensive credit. This would require major water recycling plant (circa $1M)
Wat - 5	Fire System Water Consumption	To encourage and recognise building design which reduces consumption of potable water for the building's fire protection and essential water storage systems.	One point is awarded where: - There is sufficient temporary storage for a minimum of 80% of the routine fire protection system test water and maintenance drain-downs, for reuse on-site; and - Each floor fitted with a sprinkler system has isolation valves or shut-off points for floor-by-floor testing; OR - The fire protection system does not expel water for testing. If the building does not have a sprinkler system, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Water Category Score. Type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	1	**1**	**0**	Easy and cheap credit (circa $25K)
			Total Points =	**11**	**4**	**2**	

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Mat - 1	Recycling Waste Storage	To encourage and recognise the inclusion of storage space that facilitates the recycling of resources used within buildings to reduce waste going to landfill.	Two points are awarded where a dedicated storage area for the separation and collection of office recyclables is provided and it: - Is adequately sized in accordance with 'Sizing the Waste Storage Area' table (Table Mat-1.1); - Meets the access requirements of 'Policy for Waste Minimisation in New Developments' (NSW, 2004): Section A, points A-12 through A-17, and Section C, points C6 and C7; and - Is located in the same level as the loading dock with clearly marked, sign-posted, convenient, guaranteed access route within one of the following walking distances: - 20m of the exit used for recycling pick-up; OR - 20m of the lift core serving all floors; OR - 3m of the shortest route connecting the lift core serving all floors and the exit used for recycling pick-up.	2	**2**	**0**	Refer report by The Mack Group.
Mat - 2	Building Reuse	To encourage and recognise developments that reuse existing buildings to minimise materials consumption.	Six points are available as follows: Up to two points are awarded where a proportion of the total existing façade of the building, by vertical area, is reused: - One point for reuse of 60%; or - Two points for reuse of 90%. Up to four points are awarded where a proportion of the existing major structure, by gross building volume, is reused: - Two points for 30% reuse; - Three points for 60% reuse; or - Four points for 90%. Where the site contained no buildings at the time of purchase or the total GFA of the original building(s) is less than 20% of the GFA of the new building that replaces it, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	na	**na**		Not applicable because existing site is only a carpark on grade.
Mat - 3	Reused Materials	To encourage and recognise designs that prolong the useful life of existing products and materials.	One point is awarded where: At least 2% of the project's total contract value is represented by reused products/materials. This credit excludes materials specifically addressed by other credits (i.e. steel, concrete, PVC and timber); neither does it address the reuse of the original building(s) on the site (addressed in Mat-2 'Building Reuse').	1	**0**	**1**	Difficult to achieve on a new building.
Mat - 4	Shell and Core or Integrated Fit-out	To encourage and recognise base building delivery mechanisms that eliminate the need for immediate tenant refits.	Two points are available as follows: Up to two points are awarded where a percentage of the (NLA) of the project is delivered as any combination of shell and core or integrated fitout. - One point for 60% of NLA; or - Two points for 90% of NLA.	2	**0**	**2**	Unlikely unless tenant is known and integrated into base building. Shell and core option can be done but requires a different direction in thinking from developer. Issues with commissioning are also unresolved for shelll and core

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Mat - 5	Concrete	To encourage and recognise the reduction of embodied energy and resource depletion occurring through use of concrete.	Three points are available as follows: Up to three points are available where the project has reduced the absolute quantity of Portland cement, as an average across all concrete mixes, by substituting it with industrial waste product(s) or oversized aggregate as follows: - For 1 point, 30% for in-situ concrete, 20% for pre-cast concrete and 15% for stressed concrete; or - For 2 points, 60% for in-situ concrete, 40% for pre-cast concrete and 30% for stressed concrete.	2	**1**	**1**	We assume readily acheivable - costs TBA - by Structural Engineer.
			An additional point is awarded where: - At least one of the above points is achieved; - 20% of all aggregate used for structural purposes is recycled (Class 1 RCA in accordance with HB155-2002) or slag aggregate; and - No natural aggregates are used in non-structural uses (e.g. building base course, sub-grade to any car parks and footpaths, backfilling to service trenches, kerb and gutter). If the material cost of new concrete represents less than 1% of the project's contract value, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	1	**1**	**0**	We assume readily acheivable - costs TBA - by Structural Engineer.
Mat - 6	Steel	To encourage and recognise the reduction in embodied energy and resource depletion associated with reduced use of virgin steel.	Up to two points are awarded as follows: One point is awarded where: 60% of all steel, by mass, in the project either has a post-consumer recycled content greater than 50%, or is reused. Two points are awarded where: 90% of all steel, by mass, in the project either has a post-consumer recycled content greater than 50%, or is reused. If the material cost of steel represents less than 1% of the project's total contract value, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	2	**0**	**2**	Difficult to get certified recycled steel. Structural Engineer to check.
Mat - 7	PVC Minimisation	To encourage and recognise the reduction in use of Poly Vinyl Chloride (PVC) products in Australian buildings.	Up to two points are awarded as follows: One point is awarded where: - 30% of the total cost of PVC content was reduced through replacement with alternative materials. Two points are awarded where: - 60% of the total cost of PVC content was reduced through replacement with alternative materials.	2	**1**	**1**	1 point is easily achieved at negligible cost. 2 points possible but costly (TBA).

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Mat - 8	Sustainable Timber	To encourage and recognise the specification of reused timber products or timber that has certified environmentally-responsible forest management practices.	Two points are awarded where 95% (by cost) of all timber products used in the building and construction works have been sourced from any combination of the following: - Reused timber; - Post-consumer recycled timber; or - Forest Stewardship Council (FSC) Certified Timber. If the material cost of timber represents less than 0.1% of the project's total contract value then this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	2	**0**	**2**	This is possible but the main item is typically formwork. To be discussed.
Mat - 9	Design for Disassembly	To encourage and recognise designs that minimise the embodied energy and resources associated with demolition.	One point is awarded where: - 50% (by area) of the structural framing, roofing, and façade cladding systems are designed for disassembly. OR - 95% of the total façade is designed for disassembly. If the material cost of the structural framing, roofing, and façade cladding systems represent less than 1% of the project's total contract value, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	1	**0**		Unlikely

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Mat - 10	Dematerialisation	To encourage and recognise designs that produce a net reduction in the total amount of material used.	One point is available where a substantial reduction in materials consumption occurs as follows: Where within projects where at least 50% of the GFA is framed in structural steel, and where it is demonstrated that the building's structural requirements and integrity have been achieved using 20% less steel (by mass) than in a structure with conventional steel framing, without changing the load path to other structural components. OR Where any two of the initiatives below are demonstrated: Structure Within projects where at least 50% of the GFA is framed in structural steel, and where it is demonstrated that the building's structural requirements and integrity have been achieved using 10% less steel (by mass) than in a structure with conventional steel framing, without changing the load path to other structural components. Ductwork The building is fully naturally ventilated; OR The requirement for ductwork has been reduced by 95%. Building Efficiency For new buildings, where it is demonstrated that Building Efficiency, defined as the ratio of the total NLA over the total GFA, is at least 85%. Finishes As-installed final design must require no finish. 95% of all base building floor material is exposed structure with no covering (e.g. exposed sealed concrete floor); OR 95% of all base building ceiling is exposed structure (and services, where relevant) with no cladding (e.g. exposed concrete ceiling). Cladding 25% of the roof cladding area has a dual function (e.g. roof garden substrate or photovoltaic shingles serve as cladding); OR 25% of the façade cladding area has a dual function (e.g. photovoltaic panels serve as cladding). Piping No piping is used for urinals (i.e. all urinals are waterfree); OR No piping is used for toilets (i.e. all toilets are waterfree); OR Mass of underground piping is reduced by 25% for the same functional requirem	1	**0**	**1**	Unlikely
			Total Points =	**16**	**5**	**10**	

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Eco - 1	Conditional Requirement	To encourage and recognise development on land that has limited ecological value and to discourage the development of ecologically valuable sites.	It is a conditional requirement for obtaining a Green Star – Office v3 Certified Rating that unless the building is a refurbishment/redevelopment, it is not on land of high ecological value, which is defined as any of the following: - Prime agricultural land; - Old-growth forest; - Site within 100m of a wetland; or - Site containing a State or Federally-listed Threatened Ecological Community. The GBCA reserves the right to provide the final ruling on a project's compliance with this Conditional Requirement.				Complies
Eco - 2	Topsoil	To encourage and recognise construction practices that preserve the ecological integrity of topsoil.	One point is awarded where: - All topsoil impacted by the construction works is separated and protected from degradation, erosion or mixing with fill or waste; - There is no net change in the volume of topsoil on the site; and - 95% of all topsoil (by volume) retains its productivity. Where no topsoil was impacted by the construction works, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Land Use & Ecology Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	0	**na**		Check definition of topsoil compared to what is on site.
Eco - 3	Reuse of Land	To encourage and recognise the reuse of land that has previously been developed.	One point is awarded as follows: If the project is a refurbishment or a building extension; OR If at the time of the site purchase, 75% of the site had been previously built on.	1	**1**		Complies? Need to check buildings previous to car park.
Eco - 4	Reclaimed Contaminated Land	To encourage and recognise developments that reclaim contaminated land that otherwise would not have been developed.	Two points are awarded where: - The site was contaminated at the time of purchase; and - The developer has undertaken full remedial steps to decontaminate the site prior to construction. This credit is 'Not Applicable' for projects that are refurbishments or building extensions, and is excluded from the points available used to calculate the Land Use & Ecology Category Score; type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	0	**na**		A report will be required to check contamination.
Eco - 5	Change of Ecological Value	To encourage and recognise developments that maintain or enhance the ecological value of their sites.	Up to four points are awarded where: - For Greenfield sites, the site has no threatened or vulnerable species and for reused sites (e.g. refurbishments), such species are adequately protected if present; - There is no net reduction of native vegetation; and - The ecological value of the site is either not diminished, or is enhanced beyond its previously existing state. The points are determined by the Green Star Change in Ecology Calculator on the basis of comparison between the 'before' and the 'after' ecological value of the site.	4	**1**	**1**	One point is easy (1 point = zero change)
			Total Points =	**5**	**2**	**1**	

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Emi - 1	Refrigerant ODP	To encourage and recognise the selection of refrigerants that do not contribute to long-term damage to the Earth's stratospheric ozone layer.	One point is awarded where - All HVAC refrigerants have an Ozone Depletion Potential (ODP) of zero OR - No refrigerants are used.	1	**1**		Easy using standard equipment. Zero cost
Emi - 2	Refrigerant GWP	To encourage and recognise the selection of refrigerants that reduce the potential for increased global warming from the emission of refrigerants to the atmosphere.	Up to two points are awarded as follows: - One point where 50% of the fluorocarbon refrigerant charge has been replaced with refrigerant(s) that have a Global Warming Potential (GWP) of 10 or less; and - Two points where all refrigerants have a GWP of 10 or less OR where no refrigerants are used at all.	2	**0**		Not achievable using standard chiller systems
Emi - 3	Refrigerant Leaks	To encourage and recognise building systems design that minimises environmental damage from refrigerant leaks.	Up to two points are awarded as follows: One point is awarded where: - HVAC Systems containing refrigerants are contained in a moderately air tight enclosure; and - A refrigerant leak detection system is installed to cover high-risk parts of the plant.	1	**1**		Easy and cheap - circa $20K
			An additional point is awarded where: - The point above is achieved; and - The project has installed a refrigerant recovery system that is: - Equipped with an automated pump-down system; and - Sized to effectively and safely capture, isolate, and store 95% (by weight) of the maximum refrigerant charge. Where the project is fully naturally ventilated or is fully mechanically assisted naturally ventilated OR if all points in Emi-1 'Refrigerant ODP' and Emi-2 'Refrigerant GWP' are achieved, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Emissions Category Score; type "NA" in the appropriate 'No. of Points Achieved' column of the rating tool.	1	**1**		Possible using correct chillers. Cost additional $30K
Emi - 4	Insulant ODP	To encourage and recognise the selection of insulants that do not contribute to long-term damage to the Earth's stratospheric ozone layer.	One point is awarded where no ozone-depleting substances are associated with either the manufacture or the composition of all thermal insulants in the project.	1	**1**		Easy and cost negligable
Emi - 5	Watercourse Pollution	To encourage and recognise developments that minimise stormwater run-off to, and the pollution of, the natural watercourses.	Up to three points are awarded as follows: Two points are awarded where: - The development does not increase peak stormwater flows for rainfall events of up to a 1-in 2 year storm; and - All stormwater leaving the site, at any time up to a 1-in-20 year storm event, is treated or filtered in accordance with either: - CSIRO Urban Stormwater: Best Practice Environmental Management Guidelines. OR - Australian and New Zealand Environment Conservation Council (ANZECC)'s Guidelines for Urban Stormwater Management.	2	**2**		Can be achieved using a "Humeceptor" or similar gross pollutant trap. Cost circa $100K

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
			An additional point is awarded where: - The point above is achieved; and - A riparian buffer zone that has three separate zones of pollution buffering is installed within 9 meters of a waterway or natural watercourse and the development. Where the project site does not contain or is not immediately adjacent to a waterway, the additional point is 'Not Applicable' and is excluded from the points available used to calculate the Emissions Category Score, type "NA" in the appropriate 'No. of Points Achieved' column of the rating tool.	1	**0**	**1**	
Emi - 6	Discharge to Sewer	To encourage and recognise developments that minimise discharge to the municipal sewerage system.	Up to five points are available as follows: Up to four points are awarded where the building outflows to the sewerage system due to building occupants' usage have been reduced against an average-practice benchmark as follows: - One point for a 30% reduction; - Two points for a 50% reduction; - Three points for a 70% reduction; and - Four points for a 90% reduction.	4	**0**		This would require on site recycling - expensive
			An additional point is awarded where: - At least one point above was achieved; - There is a Blackwater Treatment Maintenance Plan; and - There is a maintenance contract for a minimum of five year to ensure that the blackwater treatment system operates as intended by the design. Where no blackwater treatment system is installed, the additional point is 'Not Applicable' and is excluded from the points available used to calculate the Emissions Category Score: type "NA" in the appropriate 'No. of Points Achieved' column of the rating tool.	0	**na**		
Emi - 7	Light Pollution	To encourage and recognise developments that minimise light pollution into the night sky.	One point is awarded where: - No light beam, generated from within the building or outside of the building boundary, is directed at any point in the sky hemisphere without falling directly onto a non-transparent surface; - The lighting design complies with AS4282 "Control of the Obtrusive Effects of Outdoor Lighting"; and - 95% of outdoor spaces do not exceed the minimum requirements of AS1158 for illuminance levels.	1	**1**		Easily achieved
Emi - 8	Legionella	To encourage and recognise building systems design that eliminates the risk of Legionnaires' disease (Legionellosis).	One point is awarded where there are no water-based cooling systems serving the building.	1	**0**		
			Total Points =	**15**	**7**	**1**	

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Comments
Inn - 1	Innovative Strategies & Technologies	To encourage and recognise pioneering initiatives in sustainable design, process or advocacy.	Up to two points can be awarded for an innovation initiative where: - The initiative is a technology or process that is considered a 'first' in Australia or in the World; OR - The project substantially contributes to the broader market transformation towards sustainable development in Australia or in the World. Points for this credit are allocated as: - One point is awarded when either of the above is true for the Australian market; and - Two points are awarded when either of the above is true for the Global market No individual initiative can achieve more than two points in this credit. Qualifying initiatives may achieve additional points in other Innovation credits, for the maximum of the five points available in total within the Innovation Category.	2	**0**		
Inn - 2	Exceeding Green Star Benchmarks	To encourage and recognise projects that achieve environmental benefits in excess of the current Green Star benchmarks.	Up to two points can be awarded for an innovation initiative where there has been a substantial improvement on an existing Green Star credit, as follows: - One point for a solution that results in the elimination of the specific negative environmental impact of the project targeted by an existing credit; and - Two points for a solution that results in a substantial (e.g. 5% or greater above 'neutral') restorative environmental impact targeted by an existing credit. No individual initiative can achieve more than two points in this credit. Qualifying initiatives may achieve additional points in other Innovation credits, for the maximum of the five points available in total within the Innovation Category.	2	**0**		
Inn - 3	Environmental Design Initiatives	To encourage and recognise sustainable building initiatives that are currently outside of the scope of this Green Star rating tool but which have a substantial or significant environmental benefit.	One point can be awarded where: - An initiative in the project viably addresses a valid environmental concern outside of the current scope of this Green Star tool. No individual initiative can achieve more than one point in this credit. Qualifying initiatives may achieve additional points in other Innovation credits, for the maximum of the five points available in total within the Innovation Category.	1	**0**		
			Total Points =	**5**	**0**	**0**	

Category	Title		No. of Points Available	No. of Points Achieved	Points to be Confirmed
Management					
	Green Star Accredited Professional	Man-1	2	2	0
	Commissioning Clauses	Man-2	2	1	0
	Building Tuning	Man-3	2	2	0
	Independent Commissioning Agent	Man-4	1	1	0
	Building Users' Guide	Man-5	1	1	0
	Environmental Management	Man-6	2	2	0
	Waste Management	Man-7	2	2	0
		TOTAL	12	12	0
Indoor Environment Quality					
	Ventilation Rates	IEQ - 1	3	1	0
	Air Change Effectiveness	IEQ - 2	2	2	0
	Carbon Dioxide Monitoring and Control	IEQ - 3	1	1	0
	Daylight	IEQ - 4	3	0	1
	Daylight Glare Control	IEQ - 5	1	0	1
	High Frequency Ballasts	IEQ - 6	1	1	0
	Electric Lighting Levels	IEQ - 7	1	1	0
	External Views	IEQ - 8	2	1	1
	Thermal Comfort	IEQ - 9	2	1	1
	Individual Comfort Control	IEQ - 10	2	0	1
	Hazardous Materials	IEQ - 11	0	na	0
	Internal Noise Levels	IEQ - 12	2	1	1
	Volatile Organic Compounds	IEQ - 13	3	1	0
	Formaldehyde Minimisation	IEQ - 14	1	1	0
	Mould Prevention	IEQ - 15	1	0	1
	Tenant Exhaust Riser	IEQ - 16	1	1	0
		TOTAL	26	14	7
Energy					
	Conditional Requirement	Ene -	0	0	0
	Greenhouse Gas Emissions	Ene - 1	20	6	2
	Energy Sub-metering	Ene - 2	2	1	0
	Lighting Power Density	Ene - 3	3	2	0
	Lighting Zoning	Ene - 4	1	1	0
	Peak Energy Demand Reduction	Ene - 5	2	0	1
		TOTAL	29	12	3
Transport					
	Provision of Car Parking	Tra - 1	2	0	2
	Fuel-Efficient Transport	Tra - 2	1	0	1
	Cyclist Facilities	Tra - 3	3	0	2
	Commuting Mass Transport	Tra - 4	5	5	0
		TOTAL	11	5	5
Water					
	Occupant Amenity Water	Wat - 1	5	2	2
	Water Meters	Wat - 2	1	1	0
	Landscape Irrigation	Wat - 3	0	na	0
	Heat Rejection Water	Wat - 4	4	0	0
	Fire System Water Consumption	Wat - 5	1	1	0
		TOTAL	11	4	2
Materials					
	Recycling Waste Storage	Mat - 1	2	2	0
	Building Reuse	Mat - 2	0	na	0
	Reused Materials	Mat - 3	1	0	1
	Shell and Core or Integrated Fit-out	Mat - 4	2	0	2
	Concrete	Mat - 5	3	1	1
	Steel	Mat - 6	2	0	2
	PVC Minimisation	Mat - 7	2	1	1
	Sustainable Timber	Mat - 8	2	0	2
	Design for Disassembly	Mat - 9	1	0	0
	Dematerialisation	Mat - 10	1	0	1
		TOTAL	16	5	10
Land Use & Ecology					
	Conditional Requirement	Eco -	0	0	0
	Topsoil	Eco - 1	0	na	0
	Reuse of Land	Eco - 2	1	1	0
	Reclaimed Contaminated Land	Eco - 3	0	na	0
	Change of Ecological Value	Eco - 4	4	1	1
		TOTAL	5	2	1

Belmore Park Commercial Development

Preliminary Green Star Analysis

Job No: 22371

Category	Title		No. of Points Available	No. of Points Achieved	Points to be Confirmed
Emissions					
	Refrigerant ODP	Emi - 1	1	1	0
	Refrigerant GWP	Emi - 2	2	0	0
	Refrigerant Leaks	Emi - 3	1	1	0
	Watercourse Pollution	Emi - 5	2	2	0
	Discharge to Sewer	Emi - 6	4	0	0
	Light Pollution	Emi - 7	1	1	0
	Legionella	Emi - 8	1	0	0
	Insulant ODP	Emi - 4	1	1	0
		TOTAL	15	7	1
	Sub-total weighted points:			**48**	**24**
Innovation					
	Innovative Strategies & Technologies	Inn-1	2	0	0
	Exceeding Green Star Benchmarks	Inn-2	2	0	0
	Environmental Design Initiatives	Inn-3	1	0	0
		TOTAL	5	0	0

Total weighted points:	**48**
Predicted RATING	**4 Stars**

Including To Be Confirmed	72
Potential RATING	5 Stars

Notes: **Points and ratings indicated are indicative only and are NOT official or gauranteed.**

Analysis is based on Green Star Office Design and As Built VERSION 3

4 Stars = 45 points
5 Stars = 60 points
6 Stars = 75 points

Appendix L

ABGR report

Waterman AHW
Consulting Engineers

ABGR Report

Belmore Park Commercial Building

For:

Kann Finch

Job No: 22371

15 July 2008

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CONTENTS

1. INTRODUCTION

The new commercial office building that is proposed to be integrated with the new Zone Substation for Energy Australia is proposed to follow best practice principles of Ecologically Sustainable Design (ESD).

In order to achieve ESD best practice, the office building is proposed to follow the principles of a 5 star base building office under the Green Star rating scheme (Green Building Council of Australia) and a 4.5 or 5 star base building ABGR rating (administered by DECC). Note that a 5 Green Star rating provides an outcome considered “Australian Excellence” and a 5 Star ABGR is considered “Exceptional”.

This report specifically addresses the ABGR scheme. ABGR is the Australian Building Greenhouse Rating scheme, which addresses only the greenhouse gas emissions attributed to the operation of the completed building.

This report is produced pre-design during the Concept Design Period and does **not** include results from energy modelling. The building and systems described herein will require to have energy modelling carried out if an ABGR Commitment Agreement and/or Green Star Submission is required to prove predicted performance. It is anticipated that this modelling would be carried out in the following design phase of the commercial building.

The Green Star rating scheme is addressed in a separate report. Green Star is a holistic ESD rating tool covering most aspects of building sustainability including energy, water and several others (refer to the Green Star Report).

1.1. ABGR Background Information

The ABGR star rating scheme (0 to 5 stars) is a national program for office buildings The focus of the ABGR is solely based on the amount of greenhouse gases that an office building directly or indirectly produces during the normal operation of the building. Hence it includes electrical supply into the building, which is mainly from coal-fuelled power stations. In addition it includes natural gas into the building and all bulk fuels (stored fuel such as diesel for diesel generators) used.

When designing a new building to achieve a predicted ABGR star rating, energy modelling is required. Hence everything comes into account that is both passive and active that will effect the energy use and greenhouse gas emissions. The passive items include the building form, materials, orientation, facade systems, glazing systems, thermal mass, shading and related items. The active systems include lighting type and control, air conditioning plant, BMCS (building controls), hot water service, general power and other building services.

When carrying out ABGR predictions and modelling, the use of certified “Green Power” is not permitted to be taken into account. The intent of this is to ensure that a building is energy efficient due to it’s own virtues, rather than allowing a building to be poorly designed and simply purchase Green Power.

2. EXECTUTIVE SUMMARY

We believe that the building is currently heading towards a 5 Star ABGR base building rating with the potential to reach 5 stars plus 20% improvement.

The proposed building is energy efficient in terms of the building itself and the building services.

3. VARIABLES AND TARGETS

3.1. Variables

The three major factors (variables) which will combine to result in the overall energy use and hence greenhouse gas emissions of the completed operating building are as follows:

1. Passive Design Elements
2. Active Design Elements
3. Commissioning, tuning and operation

3.2. ABGR Target

Following is a summary of the energy target for the base building:

5 Star ABGR

Greenhouse Gas Emissions* = 71 kg CO_2/m^2/annum

Electricity** = 298 MJ/m^2/annum

Natural Gas** = 52 MJ/m^2/annum

5 Star ABGR + 20% improvement

Greenhouse Gas Emissions* = 56 kg CO_2/m^2/annum

Electricity** = 238 MJ/m^2/annum

Natural Gas** = 41 MJ/m^2/annum

Notes:

*Greenhouse Gas Emissions indicated are based on “normalised” emissions using the ABGR calculator.

**Assumes 85% of energy consumed is electricity and 15% is natural gas. Actual % breakdown may vary.

4. PASSIVE DESIGN ELEMENTS

Passive systems are those in which internal conditions are modified as a result of the behaviour of the building form and fabric. The effect of applying passive systems in a well planned manner results in reduced energy consumption required for heating, cooling and lighting. The degree of emphasis shall be placed on each of the following elements in the design of the buildings. To any passive design issue there is no single correct design solution: therefore appropriate solutions will need to be investigated by the architects, façade engineers and the design team during the design phase.

4.1. Orientation and Location

The building site is located in the Sydney CBD adjacent to Belmore Park, with frontages on Pitt Street, Hay Street and Campbell Street.

The site is proposed to have a Zone Substation constructed on it. In addition, the commercial (office) building discussed in this report will be built next to and on top of the Zone Substation. Refer to architectural drawings.

The building roof is tapered, with the high point at approximately north and the low point at approximately south. This will reduce the effective area of the roof that is in direct sunlight and hence minimise cooling.

4.2. Façade Systems

The proposed office level facades comprise a combination of glazing and external shading/light shelves. The building has façade systems designed for an optimum balance of each of the following performance criteria:

- Maximise internal views.
- Low U-value to minimise direct heat gain and loss.
- Low shading factor to reduce cooling load.
- High visible light transmission (VLT) to optimise natural lighting levels
- Low reflectance to minimise nuisance.

The proposed office level facades are as follows:

- Double glazing – providing approximate U = 2.5W/m^2/K
- Shading factor of approximately 0.29 to 0.40
- External shading/light shelves as and where indicated on architectural drawings and details.

The external shading/light shelves proposed are horizontal elements as follows:

- There are four of these horizontal external elements per typical office floor, spaced evenly with each approximately 1000mm above the one under.
- Each element is approximately 450mm deep.
- The depth and spacing of these elements will be optimised for a balance of:-
    - Shading in summer – reducing sun penetration at times when the building is in cooling mode.
    - Increased sun penetration in winter due to the lower angle of the sun. This will maximise heating benefit from the sun in winter.
    - Providing daylight reflection into the building to maximise natural daylight penetration.

The tapered building roof is proposed to be glazed. This will allow additional daylight penetration into the building.

An atrium is proposed to provide natural light to the central area of the building.

4.3. Insulation and building materials

The building will be provided with insulation in accordance with BCA Section J. This will provide the required degree of insulation to cost-effectively reduce the cooling and heating requirements of the building services systems.

5. ACTIVE DESIGN ELEMENTS

The active design elements, otherwise known as the building services, will be designed to be energy efficient. This in turn reduces the quantity of incoming electrical and gas supply, hence minimising greenhouse gas emissions.

5.1. Mechanical Services

Main Plant

The proposed main air conditioning plant for the commercial building will be located in the roof level plantroom of the building:

- Including chillers, cooling towers, pumps and air handling units (AHU's).
- The chiller plant will consist of water cooled centrifugal or screw type machines. Energy efficient chillers will be selected, having a maximum efficiency rating of less than 0.25 kW/kWR with high efficiency at part load.
- These water cooled chillers will provide the highest possible energy efficiencies available for traditional cooling (with exception of co-generation systems).
- Primary chilled water will be circulated to the AHU's by chilled water pumps.

- Heating will be provided using high efficiency central gas heating plant. Hot water coils will be installed in the central AHU's.
- Chilled water heat exchangers will be provided for secondary chilled water. Secondary chilled water will be then distributed
- Condenser water will be circulated between the chillers and the cooling towers by condenser water pumps.
- A secondary condenser water system will be provided for tenant supplementary air conditioning.
- The central plant AHU's will supply air through vertical risers to each floor.
- Variable frequency drives may be provided at each VAV air handler to control fan speed and save on fan energy costs.
- An all outside air economy cycle may be included within each air handling system to minimise operating costs during times of favourable ambient conditions.
- Heat recovery systems may be incorporated to minimise energy consumption.
- Fans and pumps will be selected to operate efficiently at their design point.
- Variable speed drives may be installed on chilled water, hot water and condenser water pumps that are not always fully loaded.
- Variable speed drives shall be installed where fans are not always fully loaded.

Distribution

Air conditioning distribution systems are proposed as follows:

- Each perimeter zone will be provided with a separate AHU in the main plantroom that will supply primary air at a low temperature to each floor via risers.
- Ductwork from the risers on each floor will distribute primary air to active chilled beams located around the perimeter. These will use the primary air plus the secondary chilled water to provide cooling and heating.
- The centre zone will be provided with a separate AHU that will supply air at a temperature relevant to the internal loads.
- Variable air volume terminals will then adjust the centre zone air flow to individual areas to maintain control set point relative to the different loadings in each area from people and equipment.
- Individual floors and portions of a floor may be isolated by the BMCS for after hours air conditioning.

Carpark Ventilation

CO monitoring with variable speed drives shall be installed in the car park to control the operation of the exhaust fans. The CO monitoring shall start the fans on demand and control the speed of the fans and hours of operation.

BMCS

A building management and control system (BMCS) is proposed to primarily control, log and monitor the mechanical services systems. In addition there will be monitoring and/or control of other building services. Functions of the BMCS may include:

- Adaptive technology to optimise cooling and heating plant start, stop and sequencing for energy efficiency based on historical data and outdoor weather conditions.
- The BMCS will shut down equipment and systems when they are not required to operate.
- The system will log and monitor electrical sub-meter data:-
    - To compare with historical usage and plant operation for optimising energy efficiency.
    - To provide alarms when there is higher than expected electrical consumption. This enables quick response to any damaged or malfunctioning systems and helps to narrow down the “hunt” for the source of any problem.
- The system will log and monitor gas sub-meter data:-
    - To compare with historical usage and plant operation for optimising energy efficiency.
    - To provide alarms when there is higher than expected gas consumption. This enables quick response to any damaged or malfunctioning systems and helps to narrow down the “hunt” for the source of any problem.

5.2. Electrical Services

Energy efficient systems relating to the electrical services for the development of the building are proposed as follows:

Electrical

Cabling systems and busways will be adequately sized to minimise losses in the building.

Electrical sub-metering will be provided as follows, connected back to the BMCS:

- For all large individual loads and groups loads (100kVA and above).
- For each tenant lighting and each tenant power distribution board.

Lighting

Lighting is proposed primarily be a mixture of linear fluorescent luminaries and compact fluorescent:

- Office floors will utilise high efficiency T5 fittings with electronic ballasts.
- Incandescent and low voltage halogen lighting will be avoided.

Lighting Controls

Control devices such as local switches, time switches, light sensing devices or movement sensing devices, where appropriate, shall be utilised, thereby restricting the unnecessary use of lighting.

A programmable lighting control system is proposed for office NLA (similar to Dynalite or Cbus). Some of the control and zoning strategies include:

- The perimeter lighting zones are proposed to incorporate daylight sensors.
- These daylight sensors will be used to automatically dim the perimeter lights when the natural lighting levels are adequate.
- This dimming system is optimised due to the external light shelves, as discussed in the building Passive Design Elements.
- Lighting zones will each be a maximum of 100m^2 each. This will enable areas to be turned off that are not in use without affecting a whole or half floor. This particularly useful after-hours and will reduce energy consumption.

5.3. Hydraulic Services

Hot Water

The following energy minimisation measures are proposed for domestic hot water:

- The building shall be fed from a central gas hot water plant to provide energy efficient and low greenhouse emission domestic hot water.
- Hot water pipework shall be lagged throughout the development to conserve energy (heat) loses via pipework.
- AAA rated or better water efficient (low flow) shower roses, taps and faucets shall be used throughout the development to restrict flow to the outlets and therefore conserve hot water consumption which in turn reduces energy and greenhouse gas emissions.
- Variable speed pumps shall be used on the domestic water supplies to each building
- Gas sub-metering of large appliances and groups of load back to the BMCS.

5.4. Lifts

Energy efficiency measures of the lifting systems may include:

- High efficiency motors.
- Regenerative drives.
- Intelligent “adaptive” control systems that enable the lifts to be sequenced and homed in the most energy efficient manner without adversely affecting the waiting intervals.
- LED’s for indication and/or lighting in lieu of incandescent or low voltage halogen.

6. COMMISSIONING, TUNING & OPERATION

The following measures are proposed to ensure that the building services are performing at their most effective and efficient:

- Commissioning is proposed to be in accordance with CIBSE codes. This will provide the best possible end result in terms of individual plant efficiency and overall system efficiency.
- Adequate balancing dampers and valves will be provided to enable proper commissioning of the system.
- Pipework flushing and cleaning will initially bypass equipment to ensure that the systems are clean prior to connection of equipment. This reduces the likelihood of partial or complete blockages occurring from “dirty water” that could have added to system resistance and hence energy consumption.
- Ongoing building fine-tuning and calibration for a period of 12 months after completion. This includes system balancing, energy optimisation and review of control strategies based on actual building operation.
- Clear and comprehensive operator’s guides to all building services. These will include the system details, maintenance requirements, commissioning data and a description of how and why these are appropriate from an ongoing energy efficiency perspective.
- Detailed records of items modified or updated during the fine-tuning period including records of why any balancing figures or control methods have been modified as applicable.

Appendix M

BCA report

PLANNING
BUILDING
HERITAGE
LANDSCAPE
URBAN DESIGN

CITY PLAN SERVICES

BCA Report

BUILDING CODE OF AUSTRALIA ASSESSMENT REPORT

Project: Belmore Park Substation, Sydney
Client: Energy Australia

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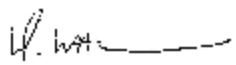
Table of Contents

Revision History:
Report: **RE280530.1**

Revision	Date	Comment
Draft	30/05/2008	80% Draft issued for client review
Final Draft Issue	27/06/08	Final Draft
Final Issue	2/07/08	Final

	NAME	SIGNATURE	DATE
Prepared by:	Ray Williams		02/07/08
Approved by:	Bill Nettleton		02/07/08

1.0 INTRODUCTION

1.1 General

The development, subject of this report, relates to 430-450 Pitt Street, Sydney located within the local government area of the City of Sydney Council.

We understand that development consent is being sought for the development consisting of:-

- *Erection of a 13 storey commercial office tower, with ground level retail, basement car parking and electrical substation.*
- *Four basement levels for 62 car spaces, ancillary and Loading Dock.*

1.2 1.2 Description

The development site is located at Pitt Street, Sydney. The site fronts Pitt, Campbell and Hay Streets, currently being used as an existing Haymarket carpark. The subject commercial office tower is a 13 storey building.

1.3 1.3 Purpose of the Report

This report has been prepared, on behalf of Energy Australia, to establish that compliance with the Building Code of Australia, relevant Acts and Regulations have been achieved with respect to the proposal.

1.4 1.4 Report Basis

This report is based on:

i. Architectural plans prepared by Kann Finch Architects as identified in the attached Appendix 1.
ii. The Building Code of Australia 2008, inclusive of NSW variations (See Note 1).
iii. Environmental Planning and Assessment Act 1979.
iv. Environmental Planning and Assessment Regulation 2000.
v. Fire Safety Strategy Report prepared to be developed by AE&D Consulting and Peer review by Dr Victor Shestapol.

Notes (1) Building Code of Australia (BCA) 2008 was adopted in NSW on 1 May 2007. The amendment of the BCA in force at the date of lodgement of a Crown 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 1.5 Exclusions

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

i. Structural design.
ii. The Disability Discrimination Act 1992.

2.0 BUILDING CODE OF AUSTRALIA DESCRIPTION

1.6 2.1 Classification (A3.2)

The subject buildings have the following classifications;

Class 5	Commercial office
Class 6	Retail
Class 7a	Basement Car park including loading dock and ancillary services
Class 8	Substation

1.7 2.2 Effective Height (A1.1)

The building has an effective height of more than 25m and less than 50m.

Level 13	RL 54.07
Pitt St Grd	RL 7.38

Effective Height 46.69m

1.8 2.3 Rise in Storeys (C1.2)

The building has a rise in storeys as defined by the BCA of thirteen (13).

1.9 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.

3.0 BUILDING CODE OF AUSTRALIA ASSESSMENT

1.10 3.1 Structure (BCA Section B)

BCA Clause	Title	Assessment and Comment	Status
B1.0	Deemed-to-satisfy conditions	Where a Building Solution is proposed to comply with the Deemed-to-Satisfy Provisions, Performance Requirement BP1.1 to BP1.3 are satisfied by complying with either- (i) B1.1, B1.2 and B1.4; or (ii) B1.3 and B1.4.	Note
B 1.1, B1.2 & B1.3	Resistance to actions, Determination of individual actions, & Loads	The building structure is required to be designed by a Structural Engineer in accordance with the standards required by this part. The structural engineer is to provide a design certificate prior to the commencement of works.	The proposed building is capable of complying
B1.4	Determination of structural resistance of materials and forms of construction. Materials & forms of construction	The proposed materials and forms of construction are to be designed/selected to comply with the required Australian Standards. The construction documentation is to demonstrate compliance with this requirement. The building structure is required to be designed by a Structural Engineer in accordance with the standards required by this part. The structural engineer is to provide a design certificate prior to the commencement of works. Primary structural elements, as defined by the BCA, of timber construction are to be termite resistant/preservative treated timber in accordance with AS3660.1. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying N/A

1.11 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. Type A construction is the highest of the fire resistant types of construction. (Refer to Item 3.2.2 of this report – Specification C1.1 Fire-resisting Construction).	Note
C1.8	Lightweight construction	Any proposed lightweight fire resisting wall construction is required to be designed to comply with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
C1.10	Fire hazard properties	Proposed materials are required to be selected to comply with the required fire hazard properties.	The proposed building is capable of complying

3.2.2 Fire-Resisting Construction (Specification C1.1)

BCA Clause	Title	Assessment and Comment	Status
2.1	Exposure to fire source features	The subject building is bounded by common boundaries and public roads and is exposed to fire source features as defined by this provision.	Note
2.2	Fire protection for support of another part	The building is required to be designed to comply with the application of fire resistance level provisions of this part. (Refer to Item 3.2.2 of this report – Specification C1.1 Fire-resisting Construction, Clause 3.1, below). External columns will be required to achieve the FRL of the structure that they support.	Refer to 3.1 below
2.3	Lintels	Certain lintels are required to have an appropriate fire resistance level in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
2.4	Attachment not to impair fire resistance	In general the proposed façade treatments are non-combustible elements and therefore would comply with this provision.	The building design compiles
2.5	General concessions	General concessions in respect to curtain walls may apply in this instance where the curtain wall is exposed to a fire source feature. An FRL is not required where it is fully protected by an automatic wall wetting sprinkler.	N/A
2.6	Mezzanine floors: concession	The building does not contain mezzanine's that are subject to this provision.	N/A
2.7	Enclosure of shafts	The bottom of fire rated shafts are required to be enclosed by fire rated construction. The top of fire isolated stair shafts are required to be enclosed by fire rated construction. The top of other fire rated shafts are to be enclosed by fire rated construction, except for shafts that pass beyond the roof covering. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
3.1	Fire resistance of building elements	Type A construction is the applicable form of fire resisting construction under this deemed-to-satisfy clause. This generally requires: Retail 180 mins Office 120 mins Carparking 120 mins Substation 240 mins External walls and the flooring and floor framing of lift pits are required to be non-combustible. A non-load bearing internal wall required to be fire resisting is required to be of non-combustible construction. The construction documentation is to demonstrate compliance with this requirement. Any load bearing internal walls will be of concrete or masonry construction. The construction documentation is to demonstrate compliance with this requirement. Refer to Appendix 2 for specific FRL requirements.	The building is capable of complying
3.5	Roof Concession	In buildings containing a sprinkler system throughout, the roof need not have an FRL if its covering is non-combustible.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
3.6	Roof lights	The roof light is not more than 20% of the roof surface and is setback greater than 3.0m as required under this provision.	N/A
3.7	Internal columns and wall concession	For a building with an *effective height* of not more than 25 m and having a roof without an FRL in accordance with Clause 3.5, in the *storey* immediately below that roof, internal columns other than those referred to in Clause 3.1(f) and *internal walls* other than *fire walls* and *shaft* walls may have— (a) in a Class 2 or 3 building: FRL 60/60/60; or (b) in a Class 5, 6, 7, 8 or 9 building— (i) with *rise in storeys* exceeding 3: FRL 60/60/60 (ii) with *rise in storeys* not exceeding 3: no FRL.	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 maximum permitted fire compartment size is: • Class 5 office - 8,000 m² and 48,000 m³ • Class 6 retail, 7a carpark & 8 Substation – 5,000 m² and 30,000 m³. Fire compartments have been assessed as follows; • Basements B1 to B4 – (entry at Campbell St) • Retail (Pitt St entry foyer separate compartments) • Level 1 to 13 Office (separate compartments) • Basements B1 to B4 Substation (separate compartments) the substation is to be separated from the 7a. • Ground floor Class 6 (separate compartments) from the substation. • Level 1 to 5 Class 5 (separate compartments) from the substation. • A stratum subdivision is proposed to delineate between lots (substation and car park, retail and office parts of the building). Construction documentation is to demonstrate compliance. The building is provided with an atrium that connects from Ground level to Level 13. The void is to have bounding construction that satisfies G3.4 and compartmentation (performance provisions) is to be maintained in accordance with C2.2 for the office levels. Construction documentation is to demonstrate compliance. No fire compartments exceed the maximum limitations imposed by C2.2.	The building is capable of complying
C2.6	Vertical separation of openings in external walls	Separation between the substation and the office building component is proposed by a 900mm spandrel in accordance with this Clause. The residual building is to be sprinkler protected therefore the vertical separation by spandrels is not required.	N/A
C2.7	Separation by firewalls	The subject building requires a number of fire walls that are to be constructed in accordance with this provision. Any openings in the fire wall are to be protected in accordance with Part C3. Building elements are not to pass through a fire wall unless the performance of the wall is maintained.	The proposed building is capable of complying
C2.8	Separation of classifications in the same storey	The Class 5, 6, and 7a are fire separated from the 8. The architectural plans have been amended to outline fire rating levels of 240/240/240.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
C2.9	Separation of classifications in different storeys	The floor that separates the Class 6 from the 7a is fire separated. The slabs are required to have an FRL of the fire compartment below. The architectural plans have been amended to outline fire rating levels of 120/120/120.	The proposed building is capable of complying
C2.10	Separation of lift shafts	All lift shafts within this building are required to have an FRL to be determined by the appropriate fire compartment requirements as specified in this provision. The Class 5 “Office” FRL120/120/120 and Class 8 “Substation” FRL240/120/120. The lift landing doors are to have an FRL of -/60/- fire doors.	The proposed building is capable of complying
C2.11	Stairways and lifts in one shaft	All lift & stair shafts are separated.	The building design complies
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 & doors with an FRL of -/120/30: • Lift motor rooms and lift control panels. • Emergency generators or central smoke control plant. • Boilers; • Batteries • Switch rooms The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
C2.13	Electricity supply system	The main switch board, sustaining emergency equipment, is required to be fire separated from the remainder of the building by 120/120/120 construction. Electrical conductors located within the building and that supply the main switchboard, are required to comply with this clause. All 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 construction documentation is to demonstrate compliance with this requirement. The Electrical Engineer is to provide a design certificate prior to the commencement of works. The sub-station will be subject to specific fire resistant construction requirements from the relevant energy authority.	The proposed building is capable of complying

3.2.3 Protection of openings (Part C3)

BCA Clause	Title	Assessment and Comment	Status
NSW C3.2	Protection of openings in external walls	The building is bound by road on three sides and is not provided with openings within 3m of a fire source feature or 6m from the far boundary of a road adjoining the allotment.	N/A
C3.3	Separation of external walls and associated openings in different fire compartments	The building does not have fire compartments that are exposed to each other via the external walls.	N/A

BCA Clause	Title	Assessment and Comment	Status
C3.4	Acceptable method of protection	Protection of openings are not proposed.	N/A
C3.5	Doorways in fire walls	Doorways in fire walls are not proposed.	N/A
C3.6	Sliding fire doors	Sliding fire doors are not proposed.	N/A
C3.7	Protection of doorways in horizontal exits	Horizontal exits are not proposed.	N/A
C3.8	Openings in fire isolated exits	The internal doorways to fire isolated exits are required to be protected by self closing -/60/30 fire doors. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
C3.9	Service penetrations in fire isolated exits	Only services permitted by this clause are to penetrate through fire isolated exits. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
C3.10	Fire isolated lift shafts	Lift doors to lifts required to be in fire rated shafts (refer to comments under Clause C2.10) are required to be -/60/- fire doors that comply with AS1735.11 and are set to remain closed except when discharging or receiving passengers, goods or vehicles. Note: If the lift indicator panels exceeds 35000mm2 in area the fire-isolated lift shaft must be backed by construction having an FRL of not less than -/60/60.	The proposed building is capable of complying
C3.12	Openings in floors and ceilings for services	Fire separation between floors is required to be maintained where services penetrate though floors. This may be achieved by fire stopping at floor level or locating the services within complying fire rated shafts. The construction documentation is to demonstrate compliance with this requirement. Note: Fire stopping of floors within the same fire compartment is still required.	The proposed building is capable of complying
C3.13	Openings in shafts	Access panels, doors and hoppers to fire rated shafts are required to have a fire rating as required by this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
C3.15	Openings for service installations	Service penetrations through fire resisting construction are required to be protected. The construction documentation is to demonstrate compliance with this requirement. Where polybutyelene (plastic) pipes are proposed for water supply, or uPVC pipes and fire collars for mechanical ducts, they must be supported by the appropriate test data from a registered laboratory demonstrating compliance with C3.15 (a). Warning: latest technical advice is that not all fire rated collars in the market place adequately comply with AS4072, in particular parts 4.6.1-4.6.4. It is strongly advised that all services related contractors evidence the type of systems proposed during tender phases, prior to construction certificate stage and prior to installation including proving compliance with AS4072.1 and specifically the parts mentioned above. CPS will seek full test reports that demonstrate that the fire collars and systems proposed to fire stop services penetrations are fully compliant with the requirements of the relevant Australian Standards and the requirements of Specification C3.15.	The proposed building is capable of complying
C3.16	Construction joints	Construction joints in building elements required to have an FRL must be protected in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement.	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

1.12 3.3 Access & Egress (BCA Section D)

3.3.1 Provision for escape (Part D1)

BCA Clause	Title	Assessment and Comment	Status
NSW D1.2	Number of exits required	Class 5 - Not less than two exits must be provided from each storey if the building has an effective height of more than 25m. Levels 12 and 13 are serviced by a scissor fire-isolated stair arrangement that open into a single fire-isolated stairway on level 11. D1.7(b) – States that “Each fire-isolated stairway must provide independent egress from each storey serviced and discharge directly, or by way of its own fire-isolated passageway – to a road or open space.” Refer to Clause D1.7 of the report for comments. Class 6 – Two exits required for the tenancy that fronts both Pitt and Hay Streets Class 7a – Two exits Class 8 – Three (3) provided Performance compliance is proposed by providing a single exit to the Cable Tunnel.	The proposed building is capable of complying Alternate Building Solution. See attached Fire Engineering Brief

BCA Clause	Title	Assessment and Comment	Status
D1.3	When fire isolated exits are required	All stairways serving as exits to basement levels & tower levels are required to be fire isolated in accordance with this provision.	The proposed building is capable of complying
D1.4	Exit travel distances	The exit travel distance within the tower floor plates to the office part of the building can generally be achieved in accordance with this provision in an open plan configuration. However, limitations will apply to office partition fitouts & separation into multiple tenancies. Class 6 – An additional exit is proposed from the retail tenancy areas fronting Hay Street and Campbell Street frontage to Pitt Steet through the commercial foyer. Class 8 – Three (3) exits are proposed to satisfy maximum travel distances within the substation. .	The proposed building is capable of complying
D1.5	Distance between alternative exits	The distance between alternative exits within the tower floor plates office parts of the building generally can be achieved in accordance with this provision. However, limitations will apply to office partition fitouts & separation into tenancies. The distance between alternative exits to the retail levels can be achieved in accordance with this provision.	The proposed building is capable of complying
NSW D1.6	Dimensions of exits and paths of travel to exits	The tower office levels are provided with an aggregate egress of 2.0m. These levels will accommodate 200 persons. An alternate solution may be sought to increase populations. All other levels are provided with suitable exit widths.	The proposed building is capable of complying
D1.7	Travel via Fire-isolated exits	Travel via fire-isolated exits appear to comply. D1.7(b) – States that “Each fire-isolated stairway must provide independent egress from each storey serviced and discharge directly, or by way of its own fire-isolated passageway – to a road or open space.” Fire isolated exits discharge into a covered area adjacent to the Pitt Street entry and Campbell & Hay Streets. These areas can achieve compliance with this provision. Note: The fire-isolated stairway (exit) are pressurised complying with clause (d) (ii). The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
D1.8	External Stairs or ramps in lieu of Fire-isolated exits	No external open stairs are proposed in lieu of fire isolated exits.	N/A

BCA Clause	Title	Assessment and Comment	Status
D1.9	Travel via non-fire-isolated stairways or ramps	The stairs within the Class 8 portion of the building that form the walkways are considered as required non fire-isolated stairs. This stairs are able to achieve compliance with this provision.	The proposed building is capable of complying
NSW D1.10	Discharge from exits	The discharge and access points to exits are to be protected from vehicles blocking them. Particular attention is required to the basement stairs.	The proposed building is capable of complying
D1.11	Horizontal exits	No horizontal exits proposed. The exit through the commercial foyer is not deemed as a "horizontal" exit, rather an alternate exit to satisfy travel distances. No separation is required due to the Class 5 & 6 portions FRL provisions for separation of classifications.	N/A
D1.12	Non required stairs	No non-required stairs are proposed.	N/A
D1.13	Number of persons accommodated	Populations have been assessed in accordance with Table D1.13 in accordance with the proposed uses. • Office levels – 200 people which are gradually reduced throughout each storey to 84 persons at the uppermost storey (LVL 13). A variation may be sought through an alternate solution, to the extent of 5% as deemed acceptable by the NSWFB • Retail levels are to be assessed in more detail at final design stage. • Substation levels - Review populations – nominal population	The proposed building is capable of complying
D1.16	Plant rooms and lift motor rooms: concessions	Egress from the plant rooms are by stairways and access ladders capable of complying with this clause. Ladders are to comply with AS1657 for plant rooms and AS1735.2 for lift motor rooms.	The proposed building is capable of complying
D1.17	Access to lift pits	Access to lift pits is to comply with this clause. Details are to be provided with the Construction documentation. Note – Lift pits with a depth of more than 3.0 m are to be provided with an access doorway and stairs in accordance with this provision.	The proposed building is capable of complying

3.3.2 Construction of exits

BCA Clause	Title	Assessment and Comment	Status
D2.2	Fire-isolated stairways and ramps	The proposed fire-isolated stairs are of non-combustible construction. The stairway is to be designed so that local failure will not result in structural damage to, or impair the fire resistance of the shaft. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
D2.3	Non-fire isolated stairs and ramps	Non fire-isolated stairs are to be constructed of materials complying with this requirement. If steel is used it must be not less than 6 mm thick. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
D2.4	Separation of rising and descending stair flights	The basement stairs are in separate shafts to the tower stairs.	N/A

BCA Clause	Title	Assessment and Comment	Status
D2.7	Installation in exits and paths of travel	Access to service shafts is not permitted from within the fire isolated stair. Gas or other fuel services are not permitted to be installed in a required exit. Electrical & telecom cupboards are required to be smoke sealed from public corridors/ lobbies and the like. The fire isolated stairway is not permitted to be penetrated by any service not permitted by this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
D2.8	Enclosure of space under stairs	No enclosures are permitted under fire isolated stair flights. Any enclosure under the non-fire isolated stairs is to be of 1 hr fire rated 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 main entry pedestrian ramp is to be designed to comply with this clause.	The proposed building is capable of complying
D2.11	Fire isolated passageways	Fire isolated passageways are required to have the required fire rating.	The proposed building is capable of complying
D2.12	Roof as Open Space	The exits do not discharge to the roof of the building.	The proposed building is capable of complying
NSW D2.13	Goings & risers	Goings and risers are required to be designed to comply with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
D2.14	Landings	Landings are required to be designed in accordance with this clause.	The proposed building is capable of complying
NSW D2.15	Thresholds	Thresholds are required to be designed to comply. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
NSW D2.16	Balustrades and other barriers	Balustrades are required to be designed to comply with this clause. The construction documentation is to demonstrate compliance with this requirement. Class 8 - Balustrade height is required to be 1.0m. Balustrade is to have spacings as specified i.e. rail required 150mmm above nosings of stairs and space between rails to be not more than 460mm.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
D2.17	Handrails	Handrails are required to be provided on at least one side of the stairs and ramps in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
D2.18	Fixed platforms, walkways, stairways & ladders	Fixed platforms etc within plant rooms are required to be designed to comply with AS1657. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
NSW D2.19	Doorways and doors	All required exit doors are swinging doors except that sliding doors may be provided to some retail tenancies opening to outside open space. It is intended that the Pitt Street entry be provided with a swing door to serve as a required exit.	The proposed building is capable of complying
D2.20	Swinging doors	Swinging exit doors are generally required to swing in the direction of egress and not impede the path of travel.	The proposed building is capable of complying
NSW D2.21	Operation of latch	Door hardware is required to be designed to comply with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
D2.22	Re-entry from fire isolated exits	Re-entry provisions are required to be provided from within fire isolated stairs as required by this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed buildings are capable of complying
D2.23	Signs on doors	Statutory signage is required to fire isolated exit doors. The construction documentation is to demonstrate compliance with this requirement.	The proposed buildings are capable of complying

3.3.3 Access for people with disabilities

BCA Clause	Title	Assessment and Comment	Status
D3.2	General building access requirements	Access for people with disabilities is required in accordance with this clause. Access is required to be provided throughout the building in accordance with AS1428.1. Access to the building is required to be provided from: • the main points of entry into the allotment; and • any associated accessible carspace, and • any adjacent and associated building on the allotment; and • through the principle public entrance. Handrails are required to both sides of the ramps used for access for people with disabilities. The construction documentation is to demonstrate compliance with this requirement. An Access Consultant Report prepared by Howard moutrie will also form part of the approval documentation.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
D3.3	Parts of building to be accessible	Access for people with disabilities is required in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement. Refer to Access Consultant report prepared by Howard Moutrie	The proposed building is capable of complying
D3.4	Concessions	It is not necessary to provide access for people with disabilities to any area if access would be inappropriate because of the particular purpose for which the area is used.	Note
D3.5	Car parking	Carparking spaces for people with disabilities are provided. The dimensions are required to comply with AS2890.1. Details of compliance are to be provided with the construction certificate application. • Class 5 – 1 space for every 100 carparking spaces • Class 6 – 1 space for every 50 carparking spaces	The proposed building is capable of complying
D3.6	Identification of accessible facilities, services, and features.	The sanitary facilities are required to be provided with the required signage in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
D3.7	Hearing augmentation	An inbuilt amplification system is not proposed for meeting rooms more than 100 m².	N/A
D3.8	Tactile indicators	Tactile ground surface indicators are required to be provided to the stairs (not being fire isolated stairs), ramps and escalators used by the public and to overhead obstructions as required by this clause. The construction documentation is to demonstrate compliance with this requirement. NB: The main foyer ramp/stair will require TGSI at the top and bottom of the stair in accordance with this provision.	The proposed building is capable of complying

1.13 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 building is required to be served by a fire hydrant system complying with this clause. A design certificate is required by the Hydraulic Engineer prior to the commencement of work. The fire hydrant booster connection location have been reviewed in a preliminary context by NSW Fire Brigades. Particular care is required to ensure that clearance is achieved to fire stair landing valves in accordance with AS2419.1-2005 (100mm clearance between hand wheel and wall).	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
E1.4	Fire hose reels	The building is required to be served by a fire hose reel system complying with this clause. Additional fire hose reels are to be provided as required to achieve the required coverage. A design certificate is required by the Hydraulic Engineer prior to the commencement of work. Class 8 - Alternate Solution proposed for omission of hose reels due to the nature of the part of building being an electrical substation.	The proposed building is capable of complying Refer Fire Engineered Alternate solution Brief
E1.5	Sprinklers	The building is required to be served by a sprinkler system complying with this clause. A design certificate is required by the Hydraulic Engineer prior to the issue of a Crown Certificate. The sprinkler booster connection location is to be detailed to determine visibility from the main entry of the building. Note: The substation building component will utilise the concession pursuant to AS 2118.4 due to the nature of the use.	The proposed building is capable of complying
E1.6	Portable fire extinguishers	The building is required to be served by portable fire extinguishers in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
E1.8	Fire control centres	The fire control centre is located at ground level with direct access to Campbell Street. The fire control centre is to be designed to ensure that egress from any part of its floor to a public road or open space does not involve changes in level which in aggregate does not exceed 300mm. In accordance with the requirements of BCA E1.8 & Spec E1.8, Clause 2 to 5. The ambient sound level within the fire control room measured when all fire safety equipment is operating in the manner in which it operates in an emergency must not exceed 60dB(A), in accordance with this clause. Design certification is to be provided by an acoustic consultant.	The proposed building is capable of complying The acoustic performance of the room is capable of complying
E1.9	Fire precautions during construction	Portable fire extinguishers are to be provided and fire hydrants and fire hose reels are to be operational during construction of the building, as required by this clause.	The proposed building is capable of complying
E1.10	Provision for special hazards	Class 8 - VESDA System proposed – review proposed fire safety measures. Design certification is to be provided.	The proposed building is capable of complying

3.4.2 Smoke hazard management (Part E2)

BCA Clause	Title	Assessment and Comment	Status
E2.2	General Requirements	The provisions of Clause E2.2 & Table E2.2a & Table E2.2b are to be satisfied for each different use within this building. Generally the following main requirements apply: (a) Miscellaneous systems not used as part of the smoke handling system to comply with E2.2 (b) Pressurisation of fire isolated exits (c) Sprinkler system throughout (assumed no special hazards) (d) Zone smoke control (particular attention is required to interconnected levels) (e) Mechanical ventilation to car park in accordance with this clause.	The proposed building is capable of complying Refer Fire Engineered Alternate

BCA Clause	Title	Assessment and Comment	Status
		(f) Air handling systems not forming part of smoke hazard management systems and which recycle air from one fire compartment to another or operate in a manner that may unduly contribute to the spread of smoke from one fire compartment to another, are required to comply with Clause E2.2(b) (g) Atriums are required to be provided with smoke hazard management in accordance with Part G3. The proposed design for atrium smoke exhaust may be performance assesses against the relevant performance provisions of the BCA. Design certification is to be provided by the services designers prior to construction.	solution Brief
E2.3	Provision for special hazards	Class 8 - VESDA System proposed – review proposed fire safety measures. Design certification is to be provided.	The proposed building is capable of complying

3.4.3 Lift installations (Part E3)

BCA Clause	Title	Assessment and Comment	Status
E3.2	Stretcher facility in lifts	At least one emergency lift serving all levels served by lifts is to be of a size the can accommodate a stretcher in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
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 construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
E3.4	Emergency Lifts	At least two emergency lifts are required to be provided in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement (Lift A & D are proposed to be nominated as compliant).	The proposed building is capable of complying
E3.5	Landings	Access and egress from the lift landing complies with this provision.	Complies
E3.6	Facilities for people with disabilities	All passenger lifts are to be designed to comply with this provision. The construction documentation is to demonstrate compliance with the requirement of AS1735.12.	The proposed building is capable of complying
E3.7	Fire service controls	Lifts are to be provided with fire services controls in accordance with this provision. The construction documentation is required to demonstrate compliance with this requirement.	The proposed building is capable of complying

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. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
E4.5	Exit signs	Exit signs are required to be provided in accordance with this clause. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying
NSW E4.6	Directional exit signs	Directional exit signage system is required to be provided in accordance with this clause. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying
E4.8	Design and operation of exit signs	Exit signs are required to be designed in accordance with AS/NZS 2293.1. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying
E4.9	Sound systems and intercom systems for emergency purposes	SSISEP is required to be provided in accordance with this clause. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying

1.14 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	Deemed to satisfy provisions	A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause- (a) unhealthy or dangerous conditions, or loss of amenity for occupants; and (b) undue dampness or deterioration of building elements. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
F1.1	Stormwater drainage	Stormwater drainage must comply with AS/NZS 3500.3. A design certificate is required from the Hydraulic Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying
F1.5	Roof coverings	The roof covering is required to provide weatherproofing in accordance with this provision. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
F1.6	Sarking	Any sarking used for weatherproofing of roofs and walls must comply with AS/NZS 4200 Parts 1 and 2. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
F1.7	Waterproofing of wet areas in buildings	Wet areas are to be constructed in accordance with this provision. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
F1.9	Damp-proofing	Damp-proofing in the form of damp proof course must be provided in accordance with this provision. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
F1.10	Damp-proofing of floor on ground	Damp proofing of floors on ground must be provided in accordance with this provision. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying
F1.11	Provision of floor wastes	Floor wastes are not required under this clause.	N/A
F1.12	Sub floor ventilation	There is no sub floor space.	N/A
F1.13	Glazed Assemblies	Glazed assemblies are required to be designed/selected to comply with this clause. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying

3.5.2 Sanitary and other facilities (Part F2)

BCA Clause	Title	Assessment and Comment	Status
F2.1	Facilities in Class 4 buildings	No Class 2, 3, 9c and 4 proposed.	N/A
F2.3	Facilities in Class 3 to 9 buildings	Class 5 = Max 100 male and 100 female on levels which is gradually reduced throughout each storey to 44 male and 44 female persons at the uppermost storey (LVL 13) Class 8 = < 10 persons The proposed facility numbers will equate for the projected occupant numbers. Sanitary facilities are generally provided as required by this clause. The construction documentation demonstrates compliance with this requirement. Refer to Appendix 3 for specific sanitary facility numbers.	The proposed building is capable of complying
F2.4	Facilities for people with disabilities	Sanitary facilities for people with disabilities are provided as required by this clause. The construction documentation demonstrates compliance with this requirement with a uni-sex facility provided on each level.	The proposed building is capable of complying
F2.5	Construction of sanitary compartments	Sanitary compartments are to comply with this provision. Particular attention is required to bathrooms that have less than 1.2m clearance from the pan to the door opening. The construction documentation is to demonstrate compliance with this requirement.	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 minimum floor to ceiling heights required under the BCA to be achieved can be achieved. The construction documentation is to demonstrate compliance with this requirement.	The proposed building is capable of complying

3.5.4 Light & Ventilation (Part F4)

BCA Clause	Title	Assessment and Comment	Status
F4.1	Provisions for natural light	No requirement	N/A
F4.4	Artificial lighting	Artificial lighting is required to be provided in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying
F4.5	Ventilation of rooms	A habitable room, office, workroom, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose must have natural ventilation or mechanical ventilation complying with AS1668.2. The construction documentation is to demonstrate compliance with this requirement. A design certificate is required from the Mechanical Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying
F4.8	Restriction on the position of water closets and urinals	The sanitary compartments are capable of complying.	The proposed building is capable of complying
F4.9	Airlocks	Where required, airlocks are provided to sanitary compartments, or the entry door is adequately screened from view and the compartment is provided with mechanical ventilation.	The proposed building is capable of complying
F4.11	Car park exhaust	Carpark exhaust is required to be provided in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement. A design certificate is required from the Mechanical Engineer certifying compliance with this clause, prior to the commencement of building work.	The proposed building is capable of complying
F4.12	Kitchen local exhaust	No commercial kitchen is proposed as part of base building. Allowance may be provided for future tenant use.	N/A

1.15 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	No refrigerated chambers, strong rooms or vaults have been identified on the plans.	Note
G1.101	Provision for the cleaning of windows	Provision for cleaning of windows is to be provided in accordance with this clause. Compliance with this provision is to be detailed as part of the construction documentation.	The proposed building is capable of complying

3.6.2 Atrium Construction (Part G3)

BCA Clause	Title	Assessment and Comment	Status
G3.1	Atriums affected by this part	This part applies to atriums that connect more than three storeys in a sprinkler protected building. The building contains an entry foyer atrium that connects from Pitt St level to Level 13.	Note

BCA Clause	Title	Assessment and Comment	Status
G3.2	Dimensions of atrium well	The atrium well width is greater than a 6 m diameter cylinder in accordance with this provision.	The building design complies
G3.3	Separation of atriums by bounding walls	The preliminary design does not demonstrate that the proposed atrium will be provided with separating walls as required by this clause. Compliance with this provision is to be detailed as part of the construction documentation.	The proposed building is capable of complying
G3.4	Construction of bounding walls	The preliminary design does not demonstrate that the proposed atrium will be provided bounding walls as required by this clause. Compliance with this provision is to be detailed as part of the construction documentation.	The proposed building is capable of complying or Alternate solution proposed
G3.5	Construction at balconies	The preliminary atrium design does not demonstrate whether it will contain balconies. Compliance with this provision is to be detailed as part of the construction documentation.	The proposed building is capable of complying
G3.6	Separation at roof	This clause requires the roof of the atrium to be protected by a sprinkler system. The construction documentation is to demonstrate compliance with this requirement. A design certificate is required from the Hydraulic Engineer certifying compliance with this clause, prior to the commencement of building work.	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

BCA Clause	Title	Assessment and Comment	Status
G3.8	Fire & smoke control systems	Fire and smoke control system are required to be provided in accordance with Spec G3.8. The following comments are provided in this regard:	
		The atrium roof and floor is required to be protected by a sprinkler system in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement. A design certificate is required from the Hydraulic Engineer certifying compliance with this clause, prior to the commencement of building work.	The building is capable of complying
		Smoke control systems will be provided to meet Clause 3. A design certificate is required certifying compliance with this clause, prior to the commencement of building work.	The building is capable of complying
		The fire detection and alarm system is required to comply with Clause 4. The construction documentation is to demonstrate compliance with this requirement. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The building is capable of complying
		Sound systems and intercom systems for emergency purposes are to be provided in accordance with this clause. The construction documentation is to demonstrate compliance with this requirement. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The building is capable of complying
		A suitable alternative power supply, in accordance with this clause, is required to 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. The construction documentation is to demonstrate compliance with this requirement. A design certificate is required from the Electrical Engineer certifying compliance with this clause, prior to the commencement of building work.	The building is capable of complying

1.16 3.8 Energy Efficiency – (NSW Section J(B) – Class 3 and 5 to 9 buildings)

Zone 5

The Class 5, 6 & 7a parts of the building 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.

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 only apply to the Class 5, 6 and 7a part of a building.	Note

BCA Clause	Title	Assessment and Comment	Status
J1.2	Thermal Construction General	Insulation is required to be installed in accordance with AS/NZS 4859.1 and the requirements of this Clause. Details are to be provided with the construction documentation. In addition, roof, ceiling, wall and floor materials and associated surfaces are deemed to have the thermal properties as listed in Specification J1.2	The proposed building is capable of complying
J1.3	Roof and Ceiling Construction	The roof or ceiling forming part of the envelope must achieve a Total R-Value as specified in Table J1.3 for the direction of heat flow. Details demonstrating compliance must be submitted with the application. Note: An envelope is defined a part of the building's fabric that separates a conditioned space or a habitable room from the exterior of the building, or a non-conditioned space including rooftop plant, lift machines, carparking or the like, other that spaces where conditioned air is being exhausted or relieved such as a internal corridor, cleaners room, store or exhaust riser. The building would be located within the Climate Zone 5.	The proposed building is capable of complying
J1.4	Roof Lights	If the total area of roof lights is more than 1.5% but not more than 10% of the floor area of the room or space they serve, roof lights are required to comply with Table J1.4. Details demonstrating compliance must be submitted with the application. The total area of roof lights must not exceed 10% of the floor are of the room or space it serves. Assessment of more detailed plans is required	The proposed building is capable of complying Further assessment is required
J1.5	Walls	The external wall which is part of the envelope is required to satisfy one of the options in Table J1.5a or J1.5b. The requirements of this provision do not apply to opaque non-glazed openings, glazing or a storey complying with J1.5(b). Details demonstrating compliance must be submitted with the application. J1.5 (b), (c) & (d) – applies to buildings located within climate zones 4, 6, 7 & 8 only. J1.5 (e) Metal framed walls are required to achieve a minimum Total R-Value, with attached external cladding installed with a thermal break installed between the metal frame and the external cladding, and consist of a material with an R-Value of not less than 0.2. Details are to be provided with the construction documentation.	The proposed building is capable of complying
NSW J1.6	Floors	Suspended floors for Class 5 to 9 buildings forming part of an envelope with an enclosed perimeter are required to achieve a Total R-Value specified in Table J1.6. Where in-slab heating is installed additional details must be provided as outlined in this clause. A concession (reduced R0.5) is available in Climate zones 1 to 6, where an additional R0.75 is added to the roof and ceiling construction. Details are to be provided with the construction documentation.	The proposed building is capable of complying

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 the Class 5 and 6 part of a building. The requirements of this provision do not apply to Class 7, 8 or 9b buildings that don't contain a conditioned space.	Note
J2.2	Application of glazing provisions	Glazing must be design in accordance with J2.3 or J2.4 for the Class 6 portion of the building with a total floor area of not more than 500m2, or J2.4 for the Class 6 portion of the buildings with a total floor area more than 500m2, or any Class 5 portion of the building.	The proposed building is capable of complying
J2.3	Glazing – Method 1	A detailed glazing calculator or other method as appropriate demonstrating compliance must be submitted by a suitably qualified person with the Construction Documentation.	The proposed building is capable of complying
J2.4	Glazing – Method 2	A detailed glazing calculator or other methods as appropriate demonstrating compliance must be submitted by a suitably qualified person with the Construction Documentation.	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 5 to 9 components of the development.	Note
J3.2	Chimneys and flues	Where provided, must be provided with a damper or flap to seal the chimney of flue. Details are to be provided with the construction documentation.	The proposed building is capable of complying
J3.3	Roof Light	Roof lights are required to be sealed or capable of being sealed, where serving a conditioned space or a habitable room in climate zones 4, 6, 7 & 8. Details are to be provided with the construction documentation.	The proposed building is capable of complying
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 where external windows and doors are designed in accordance with AS2047, to fire doors, louvered windows or doors. Details are to be provided with the construction documentation.	The proposed building is capable of complying
J3.5	Exhaust Fans	N/A	N/A
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. Details are to be provided with the construction documentation.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
J3.7	Evaporative Coolers	Evaporative coolers are required to be fitted with a self-closing dampers or the like when serving heated space or habitable room or other public area in climate zones 4, 6, 7 and 8. Details are to be provided with the construction documentation.	The proposed building is capable of complying

3.7.4Air 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

3.7.5Air Conditioning and Ventilation Systems (Part J5)

BCA Clause	Title	Assessment and Comment	Status
J5.2	Air Conditioning and Ventilating system	The mechanical design would be required to be designed in accordance with the requirements of this provision. Details are to be provided with the construction documentation.	The proposed building is capable of complying
J5.3	Time Switch	The mechanical design would be required to be designed in accordance with the requirements of this provision. Details are to be provided with the construction documentation.	The proposed building is capable of complying
J5.4	Heating and chilling systems	The mechanical design would be required to be designed in accordance with the requirements of this provision. Details are to be provided with the construction documentation.	The proposed building is capable of complying
J5.5	Miscellaneous exhaust system	The mechanical design would be required to be designed in accordance with the requirements of this provision. Details are to be provided with the construction documentation.	The proposed building is capable of complying

3.7.6Artificial 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 Class 3 and 5 to 9 components of the development.	Note
J6.2	Internal Artificial lighting	The requirements of this provision relate to the illumination load and power of artificial lighting. Construction documentation should demonstrate compliance with J6.2(b).	The proposed building is capable of complying
J6.3	Interior artificial lighting power control	Class 3 lighting is required to be individually operated by a switch or other control device, and an occupant activation device is required to be provided in SOU to cut the power when the unit is not occupied. The subject development does not contain any Class 3 tenancies and the requirements of this provision are not applicable. Artificial lighting in a storey of more than 250m^2 is required to be controlled by a time switch in accordance with Spec J6, or an occupant sensing device. Artificial lighting adjacent to windows in a storey greater than 250m² (Class 5, 6 or 8) are required to be switched separately. Details are to be provided with the construction documentation.	N/A The proposed building is capable of complying
J6.4	Interior decorative and display lighting	Lighting is required to be controlled separately from other artificial lighting, by a manual switch, and a time switch where display lighting exceeds 7 kW in accordance with Spec J6. Details are to be provided with the construction documentation.	The proposed building is capable of complying
J6.5	Artificial lighting around the perimeter of a building	Artificial lighting is required to be controlled by either a daylight sensor or a time switch. Where lighting load exceeds 100 W lighting is required to have an average light source efficiency not less that 60 Lumens/W or controlled by a motion detector. Façade lighting or signage lighting (decorative) are required to be operated by separate time switches in accordance with Spec J6. Details are to be provided with the construction documentation.	The proposed building is capable of complying
J6.6	Boiling water and chilled water storage units	Required to be controlled by a time switch in accordance with Spec J6. Details are to be provided with the construction documentation.	The proposed building is capable of complying

3.7.7Hot Water Supply (Part J7)

BCA Clause	Title	Assessment and Comment	Status
J7.2	Hot Water Supply	A hot water system for preparation of food and sanitary purposes (excluding solar systems in climate areas 1, 2 & 3) are required to be designed and installed in accordance with Section 8 of AS/NZS 3500.4. Details are to be provided with the construction documentation.	The proposed building is capable of complying

3.7.8Access for Maintenance (NSW Part J8.2)

BCA Clause	Title	Assessment and Comment	Status
NSW 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 FIRE SAFETY SCHEDULE

The following table is a list of the existing fire safety measures for this development. This list is to be treated as a guide as to what the buildings are considered to require. The fire safety schedule provided by council does not include all of these items.

FIRE SAFETY MEASURES	STANDARD OF PERFORMANCE
Access Panels, doors and hoppers to fire resisting shaft	BCA C3.13 & AS1905.1-2005, AS1905.2-2005
Automatic fire detection and alarm system Note: Class 8 – Very early warning smoke detection and alarm equipment (VESDA) system	BCA E2.2, Spec E2.2a & Spec G3.8 AS1670.1-2004
Automatic fire suppression system (sprinkler)	BCA E1.5, Spec E1.5 & Spec G3.8 AS2118.1-1999, AS2118.4-1995, AS2118.6-1995
Emergency lighting	BCA E4.2, E4.4 & AS/NZS2293.1-2005
Emergency Lifts	BCA E3.4 & AS1735.2-2001
Sound systems and intercom systems for emergency purposes	BCA E4.9 & Spec G3.8 & AS1670.4-2004, AS4428.4-2004
Exit signs	BCA E4.5, E4.6, E4.8 & Spec G3.8 AS/NZS2293.1-2005
Fire Control Centres	BCA E1.8 & Spec E1.8, Clause 2 to 5
Fire dampers	BCA C3.12, C3.15 & AS/NZS1668.1-1998, AS1668.2-1991, AS1668.1-1998, AS1668.2-1991
Fire doors	BCA Spec C3.4 & AS1905.1-2005
Fire hydrant systems	BCA E1.3 & AS2419.1-2005
Fire seals protecting openings in fire resisting components of the building	BCA C3.12, C3.15 & Spec C3.15
Hose reel system	BCA E1.4 & AS2441-2005
Lightweight construction	BCA C1.8 & Spec C1.8
Mechanical air handling system	BCA E2.2, Spec E2.2b & AS/NZS1668.1-1998
Portable fire extinguishers	BCA E1.6 & AS2444-2001
Smoke detectors and heat detectors	BCA E2.2, Spec E2.2a & & Spec G3.8 AS1670.1-2004,
Smoke Control System	BCA E2.2, Spec E2.2b & & Spec G3.8 AS1668.1-1998
Smoke dampers	BCA E2.2
Standby power systems	BCA Spec G3.8
Warning and operational signs	EPA Regulation (reg 183), BCA E3.3 (lifts), D2.23 Signs on exit doors
Alternative solutions	See Fire Engineering brief prepared by AE&D Consulting

5.0 SUMMARY OF NON-COMPLIANCE ISSUES

The following is a summary table of non-compliance with the deemed-to-satisfy provisions of the BCA, identification of the Performance Requirements of the BCA and the appropriate justification method.

SUMMARY OF NON-COMPLIANCE ISSUES WITH
DEEMED-TO-SATISFY PROVISIONS OF BCA

BCA CLAUSE	Performance Requirements	ISSUE	JUSTIFICATION
C2.2		Fire separation/stratum subdivision	RD
D1.2 and D1.4		No. Exits to substation service shaft and Extended travel distances (Office)	PR
D1.5		Distance between alternative exits	PR
E1.5		Omission of hose reel system in Class 8	PR
G3.3		Separation of atriums	PR

JUSTIFICATION LEGEND

RD RE-DESIGN

Architect to re-design to meet the Deemed to Satisfy requirements of Building Code of Australia.

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.

Clause 94 COUNCIL DISCRETION

Clause 94 of the Environment Planning & Assessment Regulation 2000 - Council is required to determine if full or partial compliance with the BCA is to apply to the building. To be determined as part of DA process under Section 79C of the EPA Act.

Clause 188 NSW FIRE BRIGADE DISCRETION

Clause 188 of the Environment Planning & Assessment Regulation 2000 - NSW Fire Brigade may set aside BCA requirements in relation to Category 3 Fire Safety Provisions where compliance cannot be achieved.

Clause 144 CONCURRENCE 0F NSW FIRE BRIGADE

Clause 144 of the Environment Planning & Assessment Regulation 2000 - NSW Fire Brigades is to review any Alternative Building Solution Report prepared in relation to a Category 2 Fire Safety Provision and provide concurrence prior to the issue of a Construction Certificate.

6.0 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 and indicates the design intent to 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.

Ray Williams
For and on behalf of City Plan Services Pty Ltd

APPENDIX 1

Assessed plans prepared by Kann Finch Group

Plan Title	Drawing No	Revision	Date
Level B1 Basement/Substation Plan	DA/08		05/06/2008
Level B2 Basement/Substation Plan	DA/07		05/06/2008
Level B3 Basement/Substation Plan	DA/06		05/06/2008
Level B4 Basement/Substation Plan	DA/05		05/06/2008
Pitt Street/Foyer/Retail/Substation Plan	DA/09		05/06/2008
Level 1 Office/Substation Plan	DA/10		05/06/2008
Level 2 Office/Substation Plan	DA/11		05/06/2008
Level 3 Office/Substation Plan	DA/11-1		05/06/2008
Level 4 Office/Substation Plan	DA/11-2		05/06/2008
Level 5 Office/Substation Plan	DA/11-3		05/06/2008
Level 6 Office Plan	DA/12		05/06/2008
Level 7 Office Plan	DA/13		05/06/2008
Level 8 Office Plan	DA/14		05/06/2008
Level 9 Office Plan	DA/15		05/06/2008
Level 10 Office Plan	DA/16		05/06/2008
Level 11 Office Plan	DA/17		05/06/2008
Level 12 Office Plan	DA/18		05/06/2008
Level 13 Office Plan	DA/19		05/06/2008
Level 14 Plant/Roof Plan	DA/20		05/06/2008
Section Plan	DA/26		05/06/2008
Core Layout	SK01		05/06/2008

APPENDIX 2

Specification C1.1 Fire-Resisting Construction

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 1.5 m	**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 m 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**

APPENDIX 3

F2.3 Facilities in Class 3 to 9 Buildings

(a) Sanitary facilities must be provided for Class 3, 5, 6, 7, 8 and 9 buildings in accordance with Table F2.3.

(b) If not more than 10 people are employed, a unisex facility may be provided instead of separate facilities for each sex.

(c) If the majority of employees are of one sex, not more than 2 employees of the other sex may share toilet facilities if the facilities are separated by means of walls, partitions and doors to afford privacy.

(d) Employees and the public may share the same facilities in a Class 6 and 9b building (other than a *school* or *early childhood centre*) provided the number of facilities provided is not less than the total number of facilities *required* for employees plus those *required* for the public.

(e) Adequate means of disposal of sanitary towels must be provided in sanitary facilities for use by females.

(f) A Class 9a *health-care building* must be provided with—

(i) one kitchen or other adequate facility for the preparation and cooking or reheating of food including a kitchen sink and washbasin; and

(ii) laundry facilities for the cleansing and drying of linen and clothing or adequate facilities for holding and dispatch or treatment of soiled linen and clothing, sanitary towels and the like and the receipt and storage of clean linen; and

(iii) one shower for each 8 patients or part thereof; and

(iv) one island-type plunge bath in each *storey* containing a *ward area*.

(g) A Class 9b *early childhood centre* must be provided with—

(i) one kitchen with facilities for preparation and cooking of food for infants including a kitchen sink and space for a refrigerator; and

(ii) one bath or shower-bath; and

(iii) if the centre accommodates children younger than 3 years old—

(A) a laundry facility comprising a washtub and space in the same room for a washing machine; and

(B) a bench type baby bath.

(h) Class 9b theatres and sporting venues must be provided with one shower for each 10 participants or part thereof.

Table F2.3 Sanitary Facilities in Class 3, 5, 6, 7, 8 and 9 Buildings

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Class 3, 5, 6 and 9 other than *schools*						
Male employees	1 — 20	1	1 — 10	0	1 — 30	1
	> 20	Add 1 per 20	11 — 25	1	> 30	Add 1 per 30
			26 —50	2		

			>50	**Add 1 per 50**		
Female employees	**1 — 15**	**1**			**1 — 30**	**1**
	> 15	**Add 1 per 15**			**> 30**	**Add 1 per 30**
Class 7 and 8						
Male employees	**1 — 20**	**1**	**1 — 10**	**0**	**1 — 20**	**1**
	> 20	**Add 1 per 20**	**11 — 25**	**1**	**> 20**	**Add 1 per 20**
			26 —50	**2**		
			>50	**Add 1 per 50**		
Female employees	**1 — 15**	**1**			**1 — 20**	**1**
	> 15	**Add 1 per 15**			**> 20**	**Add 1 per 20**

Appendix N

Waste management report

MA
CK

BELMORE PARK ZONE SUBSTATION DEVELOPMENT

WASTE MANAGEMENT REPORT

GREEN SUBMISSION

Prepared by:

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Tel: 9550 0566
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Date: 26th June 2008

MA
CK

BELMORE PARK ZONE SUBSTATION
OFFICE COMPONENT

WASTE MANAGEMENT REPORT

1. EXECUTIVE SUMMARY
The proposed development sits between Pitt, Campbell and Hay Street. This report is for the office component of the project. The new commercial building consists of 4 levels of basement with parking and plant space, the ground floor has the entry foyer and some retail tenancies, which may include a café, and there are 13 levels of commercial space above. The central waste stores for the proposed commercial building will be housed in basement level B1. The vehicular access to the waste stores will be via a ramp from Campbell Street to basement level B1.

The central waste stores will consist of general waste and recyclable waste space and bin washing space. Waste staging stores will be located on each floor and will be incorporated into the floor design by the interior designers. The cleaners for each floor will be responsible for collecting, segregating and transporting the waste to the basement waste store. From there, the waste will be collected by private waste collection contractors. Based on the waste generation estimates, it is envisaged that a collection service three times per week will be required for the waste. During peak times this could increase to five times per week.

This report has been prepared based on Sydney City Council's "Code for Waste Handling in Buildings and the "Policy for Waste Minimisation in New Developments". All waste stores will be fitted out to meet council requirements. This report reviews the waste management system proposed for the project, including:

- Estimates of waste quantity
- Waste space allocation & equipment
- Management of waste
- Waste segregation and minimization procedures
- Access

2. ACCESS
Waste handling vehicles will enter and exit the site via the Campbell Street vehicle entry and exit ramp and proceed to the loading dock area on basement level B1. Entrances, exits, driveways, vehicle ramps and loading docks will be designed to enable the safe passage of waste collection vehicles. The driveway will be of adequate strength, width and design to carry collection vehicles and loads. Vehicles will enter and exit the premises in a forward direction. A level floor surface will be provided within the building envelope, adjacent to the waste store, for the loading operation to occur.

3. WASTE GENERATION SCHEDULE IN CUBIC METRES (cm) per week

Area	Size sqm	Day Rate	Total L/day	Total L/w
General Waste				
Commercial	20832	10L/100sqm	2083	10416
Retail / Cafe	407	80L/100sqm	325	2279
Retail/ non-food	168	50L/100sqm	84	588
Recyclable Waste				
Commercial	20832	10L/100sqm	2083	10416
Retail/ Cafe	407	25L/100sqm	101	712
Retail/ non-food	168	50L/100sqm	84	588

4. ESTIMATE OF WASTE VOLUME

The waste volumes have been estimated after discussion with private waste collection companies and also using the rates given by Sydney City Council. A summary of the estimated volumes has been tabulated below.

	Weekly Volume	Pick up Bins 240 L Weekly	Pick up Bins 240L Three times/ week
General Waste			
Commercial	10416	44	15
Retail/ Cafe	2279	10	4
Retail/ non-food	588	3	1
Recyclable Waste			
Commercial	10416	44	15
Retail/ Café	712	3	1
Retail/ non-food	588	3	1

Assumptions

- For "commercial" usage, a 5 x day week has been assumed. Weekends will likely be minimal waste generation periods.
- For "retail + cafe" usage, a 7 x day week has been assumed.
- This report is part of the application process. The final sizing of waste storage spaces and frequency of waste collection will be made after final designs are in place.

5. ESTIMATE OF REQUIRED STORAGE SPACE

The long term aim of the waste management strategy is to provide an ongoing and coordinated waste management service that satisfies mandatory authority requirements and is adaptable to changing operational needs. Either Council or private waste collection contractors, working with Management, will be responsible for providing a waste removal service, including the supply and maintenance of all equipment and the coordination of this service with the cleaning service.
Due to the various types of waste being generated, it is proposed to manage the waste collection as follows:

A. General Waste Store	
Parking space for 20 x 240 litre bins	14
Circulation space	10
Shared cleaners space	1
Shared bin wash space	1
Total space required	**26 sqm**
B. Recyclable waste store	
Parking space for 17 x 240 litre bins	12
Circulation space	20
Total space required	**32 sqm**

6. MAT 1 – RECYCLABLE WASTE STORAGE

A dedicated storage area will be provided for the separation, collection, and recycling of office consumables. The storage area has been adequately sized as follows:

Minimum area of recyclable storage space = Nett lettable area x 0.15%=
20832 x 0.15% = **31.3 sqm**
Area provided = 36.0 sqm

Further reference as required by Mat 1
COUNCIL OF THE CITY OF SYDNEY
POLICY FOR WASTE MINIMISATION IN NEW DEVELOPMENTS

Access		
A12	Convenient waste store location	refer plan
A13	Efficient collection vehicle access, minimum turning	via ramp
	Vehicles will enter and exit in a forward direction	
A14	If clearance less than 3.8 m then waste provider to nominate vehicle	3.8 clearance
A15	Collection point on level surface	refer plan
A16	Distance between collection vehicle and waste store must be level and free of steps	refer plan
	Maximum travel distance storage to collection = 10m for 240 litre bins	refer plan
A17	Adequate vehicle clearance	via ramp
Access		
C.6	Liquid waste from grease traps	by manager
C.7	If clearance less than 3.8 then waste provider to nominate vehicle	3.8 clearance

7. MANAGEMENT OF INTERNAL WASTE REMOVAL

Waste from the common areas will be collected in dedicated bins and moved to the central waste stores in basement B1, by the cleaning contractor. Waste from each floor will be collected, segregated and stored in dedicated bins by the cleaning contractor. This waste will then be taken to the central waste stores in basement B1 by the cleaning contractor.

8. WASTE REMOVAL AND VEHICLE MANOEUVRING

The various waste removal trucks will access the central waste stores docking area on basement B1 and will remove the general waste bins or the recyclable waste bins. It is proposed that the docking area is level with the truck parking space.

9. WASTE SEGREGATION AND MINIMISATION

The waste management strategy for the development will be continually evaluated by the building Management, to improve the service provided and to achieve the NSW Government's domestic and commercial waste reduction targets

a) General and Wet Waste

Putrescible wet waste will be placed in 240 litre bins. Non-organic waste will be separated from organic waste.

b) Recyclable Waste

Each floor will be responsible for separating recyclable waste from non-recyclable waste. Separate recycling bins for nominated waste categories will be provided at the waste store:

- Paper and cardboard
- Glass/ plastics/ aluminium cans/ metal
- Oils

c) Hazardous Waste

Should any of the retail tenancies produce hazardous waste (eg. chemist shop), it will be treated as follows:

- A colour coded plastic bag will be used to hold all hazardous waste.
- A rigid impenetrable container will be used to transport this waste.
- The container will have a securely fixed lid with a child proof catch.
- The container will be clearly marked with the words "contaminated waste"
- No radioactive substance is to be mixed with the contaminated waste
- The name of the collection company and the date of collection will be recorded and kept by the cleaning contractor.

10. WASTE STORES REQUIREMENTS

Based on the waste volume calculations, it is expected that a collection three times per week will be required. A more frequent pick service could be available on a contingency basis, all as coordinated by Management.

The waste stores will be designed to meet Sydney City Council's "Policy for Waste Minimisation in New Developments". Bin storage areas within each commercial and retail space will also be designed line with Council requirements.

A central waste bin washing area will be provided within the general waste store in basement B1, with hot and cold water and appropriate drainage.

The waste stores will be ventilated by a separate system. The ventilation system will comply with AS 1668 Parts 1 & 2 and Council's Ventilation Code 1983.

Suitable artificial lighting will be provided with a switch both inside and outside the room.

Floors will be of concrete slab construction, verified by the structural consultant to be of adequate strength for the waste management operation, graded and drained to an approved connection to the sewer. The finish will be sealed, non-slip and impervious to grease and water. It will be coved at all wall junctions.

The walls will be constructed of solid impervious material, cement rendered to a smooth even surface coved at all intersections. Doors will be vermin proof and must be kept closed at all times.

The ceiling will be finished with a rigid, smooth faced, non-absorbent material, capable of being easily cleaned.

Safety and warning signage will be provided

11. BASE DOCUMENTS

This report has been based on the following base documents:

Area Schedule dated - 00 June 2008
Drawings DA 05 – 19 Issue 01