

33 Cross St
DA Report
29/01/2009
ADV0807900

Client

Ashington

Advanced Environmental

Lincolne Scott Australia Pty Ltd
ABN 47 005 113 468
Level 1 41 McLaren Street
PO Box 6245 North Sydney
New South Wales 2060 Australia
Telephone 61 2 8907 0900
Facsimile 61 2 9957 4127
sydney@lincolnescott.com
lincolnescott.com

Authorised for Issue

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RNP
.....
Project Leader

.....
29/01/2009
.....
Date

EXECUTIVE SUMMARY

The objective of this report is to provide a summary of the sustainable design process to date on the combined hotel and residential development at 33 Cross St, Double Bay and demonstrate how the Building Code of Australia sustainability requirements have been achieved.

Specifically, this report addresses:

- ESD Opportunities considered
- Initiatives which demonstrate compliance with NatHERS and BASIX requirements for the residential component (BCA class 2)
- Approach to BCA Section J for the hotel and retail components (BCA class 3 and class 6)

Design Approach

A holistic environmental design approach has been adopted for the development which balances performance across a range of areas. The sustainable design approach for the development has focused on balancing performance over the following areas:

- Energy Efficiency
- Water Efficiency
- Internal and External Environment Quality
- Materials Selections
- Sustainable Infrastructure

Compliance Requirements

The holistic design approach discussed above is aimed at providing a best practice level of sustainability. As part of such an approach, the legislative compliance requirements have been met for the BCA Section J (for classes 3 and 6) and BASIX (for class 2). The detailed strategy for achieving compliance is provided in the following sections of this report. The compliance requirements are as follows:

- Class 2 (residential)
 - NatHERS Thermal Comfort Analysis
 - BASIX Energy, Water and Thermal Comfort Assessment
- Class 3 and 6 (hotel, retail and restaurant)
 - Deemed-to-Satisfy provision of the BCA Section J
 - J1 Building Fabric
 - J2 Glazing
 - J3 Building Sealing
 - J4 Air movement

- J5 Air-conditioning and ventilation Systems
- J6 Artificial Lighting and power
- J7 Hot Water Supply
- J8 Access for maintenance

Results

The BCA Section J requirements are being demonstrated through design statement by Lincolne Scott and Architectus. The BASIX and NatHERS compliance is noted in the appended certificates, with resulting scores of:

- **Energy – 36% (exceeding the target by 16%)**
- **Water – 48% (exceeding the target by 8%)**
- **Thermal Comfort – Pass (no targets)**

Conclusion

The holistic strategies noted in this report would combine to produce a building solution that minimises its energy and water footprint, and optimises visual and thermal occupant comfort.

This is demonstrated by the substantial improvement on the minimum regulatory requirements for sustainability.

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Issue/Status	Revision	Date Issued	Author	Checked	Approved	Comment
Draft		29/01/2009	RNP	ATK	RNP	
Final		30/01/2009	RNP	ATK	RNP	Amendment to Section 6.1

1 Introduction

1.1 Report Approach

The objective of this report is to provide a summary of the sustainable design process to date on the combined hotel and residential development at 33 Cross St, Double Bay and demonstrate how the Building Code of Australia sustainability requirements have been achieved.

Specifically, this report addresses:

- ESD Opportunities considered
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- Approach to BCA Section J for the hotel and retail components (BCA class 3 and class 6)

1.2 Sources of information

Sources of information for this report include:

- Architectural Drawings provided by Architectus (27/01/2009)
- Façade schedule provided by Architectus (23/01/2009)
- ESD Opportunities Report by AE (17/07/2008)
- BASIX Building Sustainability Report by AE (17/07/2008)
- Preliminary BCA Section J Glazing Analysis by AE (memo issued 28/01/2009)

1.3 Limitations

All strategies and initiatives presented are based on the concept design completed to date. Actual performance of the systems will depend on the final implementation of the design.

2 Methodology

2.1 Design Approach

A holistic environmental design approach has been adopted for the development which balances performance across a range of areas. Energy and water efficiency are most commonly thought of with regard to sustainable design; however, the sustainable design approach for the development has focused on balancing performance over the following areas:

- Energy Efficiency
- Water Efficiency
- Internal and External Environment Quality
- Materials Selections
- Sustainable Infrastructure

Due to the nature of the development at 33 Cross St and the diversity of use incorporated; addressing the services across the development can result in significant spatial and financial savings. The design approach has been to focus on the optimal mix of passive design, specialist building services and renewable energy generation to provide a strong ESD outcome that is commercially viable.

2.2 Compliance Requirements

The holistic design approach discussed above is aimed at providing a best practice level of sustainability. As part of such an approach, the legislative compliance requirements have been met for the BCA Section J (for classes 3 and 6) and BASIX (for class 2). The detailed strategy for achieving compliance is provided in the following sections of this report. The compliance requirements are as follows:

- Class 2 (residential)
 - NatHERS Thermal Comfort Analysis
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 - J5 Air-conditioning and ventilation Systems
 - J6 Artificial Lighting and power
 - J7 Hot Water Supply
 - J8 Access for maintenance

2.3 NABERS for Hotels

In response to the DG query regarding consideration of the NABERS tool for hotels, the design is currently progressed to insufficient detail to accurately predict the NABERS hotel performance.

NABERS for hotels is a rating tool which assesses the energy and water performance of operational hotels; however there are no assessment methodology guidelines currently available for assessing a potential NABERS rating during design stages. As an operational tool, it depends significantly on the guest usage of water and energy, the design of the building can only have a limited impact on water and energy savings. This is especially the case in hotels, where guest usage cannot be restricted nor managed.

The final performance of any hotel is largely dependent on design decisions made by the operator; and as an operator has not yet been appointed it is not currently possible to predict the operational energy performance in line with the NABERS Hotel requirements accurately.

The hotel design has only progressed to a broad conceptual level, at which accurate energy predictions are not possible. In the interest of achieving a sustainable solution, preliminary services concepts have focused on reducing the energy and water footprint of both the hotel and residential components and these concepts will be developed in conjunction with operator when they are appointed. However at this stage, this does not inform the potential NABERS energy and water operational ratings.

As noted above, we have addressed the regulatory requirements for environmental performance through the Building Code of Australia which stipulates the minimum mandatory level of compliance.

3 Opportunities Consideration

The intent of this section is to provide a summary list of the ESD opportunities that have been considered redevelopment at 33 Cross Street, Double Bay.

ESD opportunities for site-wide infrastructure and for the individual components of the development are discussed within the ESD Opportunities Report (issued 17 July 2008). The feasibility of the key ESD opportunities identified for the residential, hotel and retail components will be assessed in further detail during subsequent design stages.

The following table is a summary of the recommended ESD opportunities for the site development.

SITE-WIDE INFRASTRUCTURE	Status
<ul style="list-style-type: none"> • Centralised HVAC and water systems. • Efficient landscaping and irrigation. • Energy and water metering. • Master electrical switches. 	<ul style="list-style-type: none"> • Included in current design • Included in current design • Included in current design • Included in current design
ENERGY	
<ul style="list-style-type: none"> • Energy efficient HVAC systems. • Mixed mode air-conditioning systems. • Controls on windows to prevent simultaneous use of air conditioning and natural ventilation. • Cogeneration or solar hot water. • Efficient lighting systems. • Time controlled HVAC and lighting for common areas. • Interactive energy and water metering systems. 	<ul style="list-style-type: none"> • Included in current design • Included in current design • Included in current design, control details to be confirmed • Solar hot water included • Included in current design • To be confirmed • To be confirmed during design development
WATER	
<ul style="list-style-type: none"> • Low flow water fittings. • Rainwater capture. • Potential for on-site stormwater detention. • Potential for on-site blackwater treatment. • Swimming pool covers to reduce evaporative water loss. • Water efficient heat rejection. 	<ul style="list-style-type: none"> • Included in current design • Included in current design • Not included in current design • Not included in current design • TBC • TBC

INTERNAL ENVIRONMENT QUALITY	
<ul style="list-style-type: none"> • Natural Ventilation. • Natural Lighting. • Appropriate shading to enhance occupant thermal and visual comfort. 	<ul style="list-style-type: none"> • Mixed mode ventilation included • Included in current design • Included in current design
MATERIALS	
<ul style="list-style-type: none"> • Use of recycled concrete, steel and aggregate. • Use of recycled or FSC certified timber. • Low or no VOC paints, varnishes, adhesives and sealants. • Reduction in PVC use and replacement with alternative, less toxic materials. 	<ul style="list-style-type: none"> • All material selections to be considered during future design stages
EXTERNAL AMENITIES	
<ul style="list-style-type: none"> • Incorporation of appropriate shading for occupant thermal comfort. • Incorporation of Building Integrated Photovoltaics in feature shading in public areas. • Use of recycled water in any water features incorporated. 	<ul style="list-style-type: none"> • TBC during subsequent design stages • TBC during subsequent design stages • Not included

4 BCA Section J

4.1 Approach

The hotel, retail and restaurant (class 3 and 6) parts of development at 33 Cross St must demonstrate compliance with section J of the BCA. Section J for the residential component is covered by BASIX in NSW.

A *deemed-to-satisfy* (DTS) approach to demonstrating compliance has been selected. The DTS requirements are demonstrated as follows:

- J1 Building Fabric – Design Statement by Architectus
- J2 Glazing – Design Statement by Architectus referencing the performance requirements noted in this report
- J3 Building Sealing – Design Statement by Architectus
- J4 Air Movement – Design Statement by Architectus
- J5 Air-Conditioning and Ventilation Systems – Design Statement by Lincolne Scott
- J6 Artificial Lighting and Power – Design Statement by Lincolne Scott
- J7 Hot Water Supply – Design Statement by Lincolne Scott
- J8 Access for Maintenance – Design Statement by both Lincolne Scott and Architectus

4.2 Section J-2 Glazing

4.2.1 Methodology

This section of the report provides performance requirements for the facade to achieve compliance with J2 - glazing according to the deemed-to-satisfy conditions for the hotel, retail and restaurant portions of the development.

Glazing performance has been based on the façade schedule provided by Architectus (23 January 2009) nominating the glazed areas, shading details, floor areas and façade areas for each building class.

Glazing calculators have been prepared (and are attached) in accordance with the requirements for section J2 as follows:

- Hotel L1 (class 3): Glazing method 1 (J2.3)
- Hotel L2 (class 3): Glazing method 1 (J2.3)
- Hotel L3 (class 3): Glazing method 1 (J2.3)
- Retail/Restaurant G (class 6): Glazing method 2 (J2.4)
- Retail/Restaurant L4 (class 6): Glazing method 2 (J2.4)

4.2.2 Performance requirement

The performance requirements to achieve deemed to satisfy compliance with section J2 are:

Hotel:

- U-value must be no greater than 7
- Solar Heat Gain Co-efficient (SHGC) must be no greater than 0.8

Retail/Restaurant (G):

- U-value must be no greater than 3.5
- Solar Heat Gain Co-efficient (SHGC) must be no greater than 0.25 on the north, 0.35 on the east, 0.5 on the west and 0.9 on the south

Retail/Restaurant (L4):

- U-value must be no greater than 3.5
- Solar Heat Gain Co-efficient (SHGC) must be no greater than 0.23 on the north, 0.27 on the west

The glazing calculators for each level and the façade schedule are provided in Appendix A. Design statements are provided in Appendix B.

5 BASIX

The residential component of the proposed development at 33 Cross Street is categorised as Class 2 as per the Building Code of Australia, and is consequently required to meet BASIX Building Sustainability targets as part of the New South Wales building approval process.

BASIX is a Building Sustainability Index produced by the New South Wales Government that sets benchmarks for thermal comfort, reduction in potable water use and reduction in greenhouse gas emissions for all residential developments within New South Wales. The benchmarks set out under BASIX vary according to location and building type, and are intended to ensure that all new residential developments constructed in New South Wales are aligned with the Government's sustainability requirements.

It is compulsory that all new residential dwellings in NSW conform to the BASIX benchmarks. Each development application for a residential dwelling must be submitted with a BASIX Certificate, and such a Certificate can be obtained if and only if the development complies with or exceeds the thermal comfort, water and energy benchmarks set out in BASIX.

The reduction targets for this development are as shown below:

- Energy – 20% reduction
- Water – 40% reduction

Using the BASIX on-line software, all of the dwellings proposed as part of the redevelopment at Cross Street were modelled to determine the system configuration required for compliance with the water and energy benchmarks set out in BASIX. NatHERS modelling has been completed to determine the thermal comfort and HVAC loads for the BASIX certificates.

The key energy and water efficiency initiatives currently included in the development are:

- Water efficient fittings and appliances
 - Rainwater collection for re-use
 - 3 star WELS showers
 - 4 star WELS toilets
 - 6 star WELS kitchen and bathroom taps
 - 5 star WELS clothes and dishwashers
- Energy efficient appliances
 - Gas-boosted solar hot water heaters
 - Central ventilation systems
 - Efficient lighting and good natural lighting
 - Gas ovens and cook tops
 - 6 star refrigerators
 - 4 star dish washers

- 4.5 star clothes washers
- Gas heated clothes dryers
- Central Renewable energy Capacity
 - 200 m² Solar collector

The resulting BASIX scores are:

- **Energy – 36% (exceeding the target by 16%)**
- **Water – 48% (exceeding the target by 8%)**
- **Thermal Comfort – Pass (no targets)**

The full set of minimum compliance requirements are provided in the BASIX certificates in Appendix C. The associated drawings, assessor's certificates and thermal specification are provided in Appendix D.

6 Conclusion

A number of design initiatives; both passive and active are proposed to reduce the overall environmental footprint of the proposed development at 33 Cross Street and demonstrate compliance with the regulatory tools of the BCA section J and BASIX.

6.1 Holistic Sustainable Design

A range of ESD initiatives have been considered for the development at 33 Cross St. A number have been included in the current design, while other have been noted for further investigation during design development.

Included in the current design are:

- All the spaces are intended to be mixed mode; the use of natural ventilation as often as possible can reduce energy consumption for air-conditioning by up to 25%.
- Most of the spaces within the residential and retail areas have access to daylight. External shading shall be incorporated to optimise daylight availability and reduce lighting energy consumption during the day.
- In order to reduce energy consumption for lighting, it is recommended that compact fluorescents are used for all primary light fittings incorporated in the retail and hotel components. This could reduce lighting energy consumption by more than 50%.
- It is recommended that all services for common areas such as lighting, HVAC, and mechanical ventilation be operated through time switches or be linked to motion sensors to reduce energy consumption when the space is unoccupied.
- Incorporating low-flow water fittings with a 4 – 5 star WELS rating would lead to a reduction of up to 50% in overall water consumption.
- Rainwater harvest alone can provide up to 35% of total non-potable water demand (excluding cooling towers).

Items which are being further investigated include:

- Renewable energy may be incorporated in the form of Building Integrated Photovoltaics that could form a visible aesthetic component of the development.
- Interactive metering would help increase awareness among occupants regarding impacts of their actions on energy and water use, and consequently promote effective patterns of use.
- Measures such as the use of low VOC materials, incorporation of appropriate internal and external shading, providing manual over-rides to all end use applications can aid in improving occupant comfort levels throughout the development.

All of the strategies listed above would combine to produce a building solution that minimises its energy and water footprint, and optimises visual and thermal occupant comfort

6.2 Compliance

Compliance with the regulatory tools is demonstrated by the design statements and BASIX Certificates in the appendices.

APPENDIX A – DESIGN STATEMENTS

29th January 2009

Advanced Environmental
Level 1
41 McLaren St
NORTH SYDNEY NSW 2060

Dear Sir

**33 Cross Street, Double Bay
Proposed mixed use development**

Architecture
Urban Design
Planning
Interior Architecture

Pursuant to the provisions of **Section J of the Building Code of Australia**, I hereby certify that the above design will be in accordance with the following sections:

- Section J1 - Building Fabric
- Section J2 – Glazing
Glazing selections will be in accordance with the glazing performance requirements specified in the BASIX report prepared by Advanced Environmental
- Section J3 – Building Sealing
- Section J4 – Air Movement
- Section J8 – Access for maintenance

Architectus Sydney Pty Ltd
ABN 11 098 489 448
41 McLaren Street
North Sydney
NSW 2060 Australia
T 61 2 9929 0522
F 61 2 9959 5765
sydney@architectus.com.au
www.architectus.com.au

I am an appropriately qualified and competent person in this area and as such can certify that the design and performance of the design systems will comply with the above.

I possess Indemnity Insurance to the satisfaction of the building owner or my principal.

Full Name of Designer: Raymond Geoffrey Brown
Qualifications: B. Arch (Hons 1) Registered Architect NSW 6359
Address of Designer: Level 3 341 George St, Sydney
Business Telephone No: 02 8252 8400 Fax No: 02 8252 8600
Name of Employer: Architectus Sydney Pty Ltd

Auckland
Brisbane
Christchurch
Melbourne
Shanghai
Sydney

Signature:.....

Mechanical Design Certificate

To **Ashington Ltd**

Attention **Nick Wyeth**

Date **30/1/2009**

Address

Facsimile

Project No **SYD0811800**

Project **33 Cross Street , Double Bay**

No of Pages **1**

Copies

The Mechanical Ventilation and Air Conditioning systems for the building works described below have been designed in accordance with:

- General BCA 2008 (DTS Sections J5 & J8)
- Mechanical Air Handling Systems AS/NZS 1668.1 - 1998 , AS 1668.2 - 1991 & BCA 2008 Clause E2.2
- Mechanical Ventilation Systems AS1668.2 – 1991 & BCA 2008 Clauses F4.5, F4.11, F4.12
- Mechanical Plant AS 3666.1 – 2002 & BCA 2008 Clause F4.5

It shall be noted that the project has yet to be given planning permission and works to date are restricted to the submission of conceptual design sketches and models with associated reports highlighting future services concepts. The design has not commenced and and and works to date are not detailed for tender documentation.

The regulations and clauses listed above are adhered to where applicable at this stage and shall form the basis of our full design once DA approval has been received.

Building Description and Location

The project involves the construction of a new podium and tower mixed use development with both retail and hotel at ground/first floor levels. The proposed towers shall contain high specification residential development with dedicated access at ground floor. The development shall also contain a two storey sub-basement car park. The project is located in Double Bay on the outskirts of the Sydney CBD.

Owner

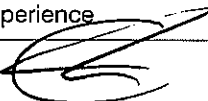
Ashington Ltd

Details of Person Signing

Position in Company Director

Qualifications and Experience MSc, BSc (Hons), 12 years industry experience

Name Gus Nainu



Signature

Date 30/1/09

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Electrical Inspection Statement

To **Ashington Ltd**

Attention **Nick Wyeth**

Date **30/01/2009**

Address

Facsimile

Project No **SYD0811800**

Project **33 Cross Street , Double Bay**

No of Pages **1**

Copies

The Electrical systems for the building works described below have been designed in accordance with:

- General **BCA 2008 (DTS Sections J6 & J8)**
- General electrical wiring & installation **AS/NZS 3000 - 2007**

It shall be noted that the project has yet to be given planning permission and works to date are restricted to the submission of conceptual design sketches and models with associated reports highlighting future services concepts. The design has not commenced and and and works to date are not detailed for tender documentation.

The regulations and clauses listed above are adhered to where applicable at this stage and shall form the basis of our full design once DA approval has been received.

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Owner


Ashington Ltd

Details of Person Signing

Position in Company **Director**

Qualifications and Experience **MSc, BSc (Hons), 12 years industry experience**

Name **Gus Nainu**



Signature

Date **30/1/09.**

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Hydraulic Design Statement

To	Ashington Ltd		
Attention	Nick Wyeth	Date	30/1/2009
Address		Facsimile	
		Project No	SYD0811800
Project	33 Cross Street , Double Bay	No of Pages	1
Copies			

The Hydraulic systems for the building works described below shall be designed in accordance with::

- General BCA 2008 (DTS Sections J7 & J8)
- Water Supply AS/NZS 3500.1 – 2003
- Plumbing and Drainage AS/NZS 3500.2 – 2003
- Gas supply AS 5601/AG601
- Stormwater Drainage AS/NZS 3500.3 – 2003 & BCA 2008 Clause F1.1
- Heated Water Services AS 3500.4 – 2003 & BCA 2008 Clause J7.2
- Fire Hydrant System AS 2419.1 – 2005 -Amdt 1/ 2005 & BCA 2008 Clause E1.3
- Fire Hose Reel System AS 2441 – 2005 & BCA 2008 Clause E1.4

It shall be noted that the project has yet to be given planning permission and works to date are restricted to the submission of conceptual design sketches and models with associated reports highlighting future services concepts. The design has not commenced and and and works to date are not detailed for tender documentation.

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Building Description and Location

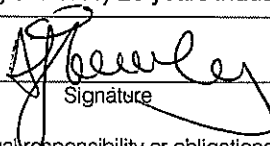
The project involves the construction of a new podium and tower mixed use development with both retail and hotel at ground/first floor levels. The proposed towers shall contain high specification residential development with dedicated access at ground floor. The development shall also contain a two storey sub-basement car park. The project is located in Double Bay on the outskirts of the Sydney CBD.

Documents

Owner

Ashington Ltd

Details of Person Signing

Position in Company	Director			
Qualifications and Experience	Master of Design Science (Building Services) 20 years industry experience			
Name	Andrew Cowley	 Signature	Date	30/1/2009

This document shall in no way relieve the Builder and or Contractors of any legal responsibility or obligations with respect to the manufacture, installation, operation and respective certifications.

APPENDIX B – GLAZING CALCULATORS AND FAÇADE SCHEDULE

HOTEL (residential areas)
Class 3

Level 1
Floor area 1606sqm

	Area of glazing	Overhang		
North façade 1	2.75 x 9.9	2.75 x 1.5		
North façade 2	2.75 x 8.7	2.75 x 1.5		
East façade 1	2.75 x 24	2.75 x 1.5		
East façade 2	2.75 x 9.9	0		
West façade 1	2.75 x 28.7	2.75 x 0.6		
West façade 2	2.75 x 23.5	2.75 x 1.5		
South façade 1	2.75 x 45.8	2.75 x 0.6		

Level 2
Floor area 1606sqm

	Area of glazing	Overhang		
North façade 1	2.75 x 9.9	2.75 x 1.5		
North façade 2	2.75 x 8.7	2.75 x 1.5		
East façade 1	2.75 x 24	2.75 x 1.5		
East façade 2	2.75 x 9.9	0		
West façade 1	2.75 x 28.7	2.75 x 0.6		
West façade 2	2.75 x 23.5	2.75 x 1.5		
South façade 1	2.75 x 45.8	2.75 x 0.6		

Level 3
Floor area 1606sqm

	Area of glazing	Overhang		
North façade 1	2.75 x 9.9	2.75 x 1.5		
North façade 2	2.75 x 8.7	2.75 x 1.5		
East façade 1	2.75 x 24	2.75 x 1.5		
East façade 2	2.75 x 9.9	0		
West façade 1	2.75 x 28.7	2.75 x 0.6		
West façade 2	2.75 x 23.5	2.75 x 1.5		
South façade 1	2.75 x 45.8	2.75 x 0.6		

RETAIL & HOTEL FOYER/RESTAURANT
Class 6

Ground floor

	Area of facade	Area of glazing		
North façade 1	4.25 x 7.6	4.25 x 32.2		
North façade 2	0	4.25 x 10.5		
North façade 3	0	4.45 x 9.6		
East façade 1	4.2 x 36.4	0		
East façade 2	4.5 x 17.3	0		
East façade 3	0	4.5 x 22.9		
East façade 4	0	4.3 x 10.6		
East façade 5	0	4.85 x 23.4		
East façade 6	0	4.85 x 14.6		
West façade 1	5.5 x 4.8 , 3.45 x 10.2	4.2 x 32.4 , 1.4 x 12.8		
West façade 2	0	4.3 x 23.9		
West façade 3	0	4.45 x 12.2		
West façade 4	0	4.30 x 15.5		
South façade 1	0	4.85 x 34.3		
South façade 2	0	0		
South façade 3	0	4.25 x 15.5		
South façade 4	0	4.25 x 8.7		

Level 4

	Area of facade	Area of glazing		
North façade 1	0	3.1 x 12.3		
West façade 1	3.1 x 5.5	3.1 x 32.4		

GLAZING CALCULATOR FOR USE WITH CLAUSE J2.3, BCA VOLUME ONE (METHOD 1)

Climate zone: Building name/description:

Unit no.: Storey:

Area of floor: Glazing area: ##### (26% of area of floor - Storey: 1)

CONSTANTS and ALLOWANCES (per storey)	
	1 not used
C _U / C _{SHGC}	1.9 / 0.14
C _U x Area	3051.4
C _{SHGC} x Area	224.8

Number of rows preferred in table below: (as currently displayed)

GLAZING ELEMENTS, ORIENTATION, SIZE and PERFORMANCE CHARACTERISTICS							SHADING		CALCULATION DATA			CALCULATED OUTCOMES - OK (if inputs are valid)					
Glazing element		Sector faced		Size			Performance		P&H or device		Exposure		Size	Conductance - PASSED		Solar heat gain - PASSED	
ID	Description (optional)	Storey: 1	Storey: not used	Height (m)	Width (m)	Area (m ²)	Total U-Value (NFRC)	SHGC (NFRC)	P (m)	H (m)	P/H	E factor	Area used (m ²)	U x area	Element share of % of allowance used	SHGC x E x area	Element share of % of allowance used
1	North fascade 1	N		2.75	9.90		7.0	0.80	1.50	2.75	0.55	0.36	27.23	190.6	7% of 95%	7.9	4% of 97%
2	North fascade 2	N		2.75	8.70		7.0	0.80	1.50	2.75	0.55	0.36	23.93	167.5	6% of 95%	6.9	3% of 97%
3	East fascade 1	E		2.75	24.00		7.0	0.80	1.50	2.75	0.55	0.62	66.00	462.0	16% of 95%	32.6	15% of 97%
4	East fascade 2	E		2.75	9.90		7.0	0.80				1.19	27.23	190.6	7% of 95%	25.9	12% of 97%
5	West fascade 1	W		2.75	28.70		7.0	0.80	0.60	2.75	0.22	0.98	78.93	552.5	19% of 95%	61.6	28% of 97%
6	West fascade 2	W		2.75	23.50		7.0	0.80	1.50	2.75	0.55	0.69	64.63	452.4	16% of 95%	35.9	16% of 97%
7	South fascade 1	S		2.75	45.80		7.0	0.80	0.60	2.75	0.22	0.47	#####	881.7	30% of 95%	47.6	22% of 97%
8																	
9																	
10																	
11																	
12																	

IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR

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if inputs are valid



GLAZING CALCULATOR FOR USE WITH CLAUSE J2.3, BCA VOLUME ONE (METHOD 1)

Climate zone: Building name/description:

Unit no.: Storey:

Area of floor: Glazing area: ##### (26% of area of floor - Storey: 2)

CONSTANTS and ALLOWANCES (per storey)	
	2 not used
C _U / C _{SHGC}	1.9 / 0.14
C _U x Area	3051.4
C _{SHGC} x Area	224.8

Number of rows preferred in table below: (as currently displayed)

GLAZING ELEMENTS, ORIENTATION, SIZE and PERFORMANCE CHARACTERISTICS							SHADING		CALCULATION DATA			CALCULATED OUTCOMES - OK (if inputs are valid)						
Glazing element		Sector faced		Size			Performance		P&H or device		Exposure		Size		Conductance - PASSED		Solar heat gain - PASSED	
ID	Description (optional)	Storey: 2	Storey: not used	Height (m)	Width (m)	Area (m ²)	Total U-Value (NFRC)	SHGC (NFRC)	P (m)	H (m)	P/H	E factor	Area used (m ²)	U x area	Element share of % of allowance used	SHGC x E x area	Element share of % of allowance used	
1	North fascade 1	N		2.75	9.90		7.0	0.80	1.50	2.75	0.55	0.36	27.23	190.6	7% of 95%	7.9	4% of 97%	
2	North fascade 2	N		2.75	8.70		7.0	0.80	1.50	2.75	0.55	0.36	23.93	167.5	6% of 95%	6.9	3% of 97%	
3	East fascade 1	E		2.75	24.00		7.0	0.80	1.50	2.75	0.55	0.62	66.00	462.0	16% of 95%	32.6	15% of 97%	
4	East fascade 2	E		2.75	9.90		7.0	0.80				1.19	27.23	190.6	7% of 95%	25.9	12% of 97%	
5	West fascade 1	W		2.75	28.70		7.0	0.80	0.60	2.75	0.22	0.98	78.93	552.5	19% of 95%	61.6	28% of 97%	
6	West fascade 2	W		2.75	23.50		7.0	0.80	1.50	2.75	0.55	0.69	64.63	452.4	16% of 95%	35.9	16% of 97%	
7	South fascade 1	S		2.75	45.80		7.0	0.80	0.60	2.75	0.22	0.47	#####	881.7	30% of 95%	47.6	22% of 97%	
8																		
9																		
10																		
11																		
12																		

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if inputs are valid



GLAZING CALCULATOR FOR USE WITH CLAUSE J2.3, BCA VOLUME ONE (METHOD 1)

Climate zone: **5** Building name/description: **33 Corrss St - hotel L3**

Unit no.: **1** Storey: **3**

Area of floor: **1606m²**

Glazing area: ##### (26% of area of floor - Storey: 3)

CONSTANTS and ALLOWANCES (per storey)	
	3 not used
C _U / C _{SHGC}	1.9 / 0.14
C _U x Area	3051.4
C _{SHGC} x Area	224.8

Number of rows preferred in table below **12** (as currently displayed)

GLAZING ELEMENTS, ORIENTATION, SIZE and PERFORMANCE CHARACTERISTICS								SHADING		CALCULATION DATA			CALCULATED OUTCOMES - OK (if inputs are valid)				
Glazing element		Sector faced		Size			Performance		P&H or device		Exposure		Size	Conductance - PASSED		Solar heat gain - PASSED	
ID	Description (optional)	Storey: 3	Storey: not used	Height (m)	Width (m)	Area (m ²)	Total U-Value (NFRC)	SHGC (NFRC)	P (m)	H (m)	P/H	E factor	Area used (m ²)	U x area	Element share of % of allowance used	SHGC x E x area	Element share of % of allowance used
1	North fascade 1	N		2.75	9.90		7.0	0.80	1.50	2.75	0.55	0.36	27.23	190.6	7% of 95%	7.9	4% of 97%
2	North fascade 2	N		2.75	8.70		7.0	0.80	1.50	2.75	0.55	0.36	23.93	167.5	6% of 95%	6.9	3% of 97%
3	East fascade 1	E		2.75	24.00		7.0	0.80	1.50	2.75	0.55	0.62	66.00	462.0	16% of 95%	32.6	15% of 97%
4	East fascade 2	E		2.75	9.90		7.0	0.80				1.19	27.23	190.6	7% of 95%	25.9	12% of 97%
5	West fascade 1	W		2.75	28.70		7.0	0.80	0.60	2.75	0.22	0.98	78.93	552.5	19% of 95%	61.6	28% of 97%
6	West fascade 2	W		2.75	23.50		7.0	0.80	1.50	2.75	0.55	0.69	64.63	452.4	16% of 95%	35.9	16% of 97%
7	South fascade 1	S		2.75	45.80		7.0	0.80	0.60	2.75	0.22	0.47	#####	881.7	30% of 95%	47.6	22% of 97%
8																	
9																	
10																	
11																	
12																	

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if inputs are valid



GLAZING CALCULATOR FOR USE WITH CLAUSE J2.4, BCA VOLUME ONE (METHOD 2)

Building name/description

33 Cross St - Retail G

Climate zone

5

Storey

1

Facade areas

	N	NE	E	SE	S	SW	W	NW
Option A	256m²		564m²		269m²		439m²	
Option B								
Glazing area (A)	224m ²		333m ²		269m ²		224m ²	

Number of rows preferred in table below

10 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION, SIZE and PERFORMANCE CHARACTERISTICS								SHADING		CALCULATED OUTCOMES, SUMMARY						
Glazing element		Sector faced		Size			Performance		P&H or device		Shading		Multipliers		Size	Element share of % of allowance used
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total U-Value (NFRC)	SHGC (NFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	
1	North facade	N				224.20	3.5	0.25				0.00	1.00	1.00	224.20	100% of 96%
2	East facade	E				332.93	3.5	0.35				0.00	1.00	1.00	332.93	100% of 92%
3	West facade	W				223.71	3.5	0.50				0.00	1.00	1.00	223.71	100% of 99%
4	South facade	S				269.21	3.5	0.90				0.00	1.00	1.00	269.21	100% of 75%
5																
6																
7																
8																
9																
10																

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if inputs are valid



GLAZING CALCULATOR FOR USE WITH CLAUSE J2.4, BCA VOLUME ONE (METHOD 2)

Building name/description

33 Cross St - Retail L4

Climate zone

5

Storey

4

Facade areas

	N	NE	E	SE	S	SW	W	NW
Option A	38.1m²						117m²	
Option B								

Glazing area (A) **38.1m²**

100m²

Number of rows preferred in table below

10 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION, SIZE and PERFORMANCE CHARACTERISTICS								SHADING		CALCULATED OUTCOMES (METH 2)						
Glazing element		Sector faced		Size			Performance		P&H or device		Shading		Multipliers		Size	Element share of % of allowance used
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total U-Value (NFRC)	SHGC (NFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	
1	North facade	N				38.13	3.5	0.23				0.00	1.00	1.00	38.13	100% of 99%
2	West facade	W				100.44	3.5	0.27				0.00	1.00	1.00	100.44	100% of 100%
3																
4																
5																
6																
7																
8																
9																
10																

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if inputs are valid



APPENDIX C – BASIX CERTIFICATES

BASIX Certificate

Building Sustainability Index www.basix.nsw.gov.au

Certificate number: 234806M

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 29/06/2006, published by the Department of Planning. This document is available at www.basix.nsw.gov.au

Director-General
Date of issue: Friday, 20 February 2009



NSW GOVERNMENT
Department of Planning

Score

- ✓ Water: 48 (Target 40)
- ✓ Thermal comfort: pass (Target pass)
- ✓ Energy: 36 (Target 20)

Description of project

Project address	
Project name	33 Cross St, Double Bay NSW 2028 (copy of)
Street address	33 Cross Street Double Bay 2028
Local Government Area	Woollahra Municipal Council
Plan type and plan number	deposited 793525
Lot no.	1
Section no.	-
Project type	
No. of unit buildings	1
No. of units in unit buildings	37
No. of attached dwelling houses	0
No. of separate dwelling houses	0
Site details	
Site area (m ²)	9674
Roof area (m ²)	769
Non-residential floor area (m ²)	-
Residential car spaces	58
Non-residential car spaces	-
Common area landscape	
Common area lawn (m ²)	50
Common area garden (m ²)	100
Area of indigenous or low water use species (m ²)	50
Assessor details	
Assessor number	20848
Certificate number	67422177

Description of project

The tables below describe the dwellings and common areas within the project

Unit building - 33 Cross St, 37 dwellings, 15 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species: (min area m2)
101	2	106.0	34.0	0	0
201	2	106.0	34.0	0	0
302	2	140.0	7.0	0	0
402	1	69.0	12.0	0	0
406	1	53.0	7.0	0	0
E 9	3	236.0	31.0	0	0
W 8	3	257.0	35.0	0	0
E 12	3	236.0	31.0	0	0
NE 3	2	158.0	21.0	0	0
W 13	3	315.0	41.0	47	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species: (min area m2)
102	1	60.0	1.0	0	0
202	1	60.0	1.0	0	0
303	2	123.0	0.0	0	0
403	1	91.0	19.0	0	0
E 6	3	236.0	31.0	0	0
P/H	3	220.0	16.0	0	0
W 9	3	257.0	35.0	0	0
E 13	3	248.0	54.0	33	0
W 10	3	257.0	35.0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species: (min area m2)
103	1	58.0	2.0	0	0
203	1	58.0	2.0	0	0
304	2	96.0	8.0	0	0
404	2	101.0	6.0	0	0
E 7	3	236.0	31.0	0	0
W 6	3	257.0	35.0	0	0
E 10	3	236.0	31.0	0	0
NE 1	2	158.0	21.0	0	0
W 11	3	257.0	35.0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species: (min area m2)
104	2	120.0	14.0	0	0
204	2	120.0	14.0	0	0
401	1	81.0	19.0	0	0
405	1	63.0	0.0	0	0
E 8	3	236.0	31.0	0	0
W 7	3	257.0	35.0	0	0
E 11	3	236.0	31.0	0	0
NE 2	2	158.0	21.0	0	0
W 12	3	257.0	35.0	0	0

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of unit building - 33 Cross St

Common area	Floor area (m ²)	Common area	Floor area (m ²)	Common area	Floor area (m ²)
Indoor pool &/or spa area (No. 1)	50	Car park	1800	Lift car (No. 1)	-
Lift car (No. 2)	-	Lift car (No. 3)	-	Lift car (No. 4)	-
Garbage Rooms	69.5	Plant Room	20	Lifts (4 Nos)	10
Switch Room	10	East Tower Lobby Upper Basement	9	West Tower Lobby Upper Basement	9
North East Tower Lobby Upper Basement	12	North Podium Lobby (Upper Basement)	12	North East Tower Lobby GF	21
North Podium Lobby GF	14	East Tower Lobby GF	11	West Tower Lobby	22
North Podium Corridor L1	21	North Podium Corridor L2	21		

Schedule of BASIX commitments

1. Commitments for unit building - 33 Cross St

(a) Dwellings

- (i) Water
- (ii) Energy
- (iii) Thermal Comfort

(b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

2. Commitments for attached dwelling houses

3. Commitments for separate dwelling houses

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

- (i) Water
- (ii) Energy

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

1. Commitments for unit building - 33 Cross St

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✓	✓	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✓	✓
(d) The applicant must install an on-demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "Hot water recirculation" column of the table below.		✓	✓
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✓	✓	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✓	
(g) The pool or spa must be located as specified in the table.	✓	✓	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✓	✓	✓

Dwelling no.	Fixtures					Appliances		Individual pool				Individual spa		
	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	Hot water recirculation	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
E 13, W 13	3 star	4 star	6 star	6 star	yes	5 star	5 star	33	yes	outdoors	yes	-	-	-

Dwelling no.	Fixtures					Appliances		Individual pool				Individual spa		
	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	Hot water recirculation	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
101, 102, 103, 104, 201, 202, 203, 204, 302, 303, 304, 401, 402, 403, 404, 405, 406, E 6, E 7, E 8, E 9, P/H, W 6, W 7, W 8, W 9, E 10, E 11, E 12, NE 1, NE 2, NE 3, W 10, W 11, W 12	3 star	4 star	6 star	6 star	yes	5 star	5 star	-	-	-	-	-	-	-

Alternative water source								
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection	Laundry connection	Pool top-up	Spa top-up
All dwellings	reticulated alternative water supply	-	-	yes	yes	yes	yes	no

Alternative water source								
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection	Laundry connection	Pool top-up	Spa top-up
None	-	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✓	✓	✓
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✓	✓
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✓	✓
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✓	✓
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✓	✓	✓
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must: (aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and (bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✓ ✓	
(h) The applicant must install in the dwelling: (aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below; (bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and		✓ ✓	✓

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✓	
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✓	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	solar (gas boosted) 41 to 45 RECs	individual fan into central duct + VSD	interlocked to light	individual fan into central duct + VSD	interlocked to light	individual fan into central duct + VSD	interlocked to light

Dwelling no.	Cooling		Heating		Artificial lighting					Natural lighting		
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
302, 303, 304	central cooling system 1 (zoned)	central cooling system 1 (zoned)	central heating system 1 (zoned)	central heating system 1 (zoned)	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	1	yes
E 7, E 8, E 9, W 7, W 8, W 9, E 10, E 11, E 12, E 13, W 10, W 11, W 12, W 13	central cooling system 1 (zoned)	central cooling system 1 (zoned)	central heating system 1 (zoned)	central heating system 1 (zoned)	3 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	1	yes

Dwelling no.	Cooling		Heating		Artificial lighting						Natural lighting	
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
101, 102, 103, 104, 201, 202, 203, 204, 401, 402, 403, 404, 405, 406, E 6, P/H, W 6, NE 1, NE 2, NE 3	central cooling system 1 (zoned)	central cooling system 1 (zoned)	central heating system 1 (zoned)	central heating system 1 (zoned)	2	1	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	1	yes

Dwelling no.	Individual pool		Individual spa		Appliances & other efficiency measures							
	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
E 13, W 13	no heating	yes	-	-	gas cooktop & gas oven	6 star	no	4 star	4.5 star	gas heated	no	no

Dwelling no.	Individual pool		Individual spa		Appliances & other efficiency measures							
	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
101, 102, 103, 104, 201, 202, 203, 204, 302, 303, 304, 401, 402, 403, 404, 405, 406, E 6, E 7, E 8, E 9, P/H, W 6, W 7, W 8, W 9, E 10, E 11, E 12, NE 1, NE 2, NE 3, W 10, W 11, W 12	-	-	-	-	gas cooktop & gas oven	6 star	no	4 star	4.5 star	gas heated	no	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.			
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.			
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✓	✓
(g) Commitment (h) below, applies to the rooms or areas of a dwelling which are listed in the "Cross Ventilation" table below as comprising a breeze path for the dwelling.			
(h) The applicant must construct the dwelling so that at least one ventilation opening is provided in each such room or area. (If only one room or area of a dwelling is mentioned for a breeze path, then that room or area must have at least two ventilation openings).		✓	✓
(i) The two ventilation openings referred to in (h), must meet the following specifications: (aa) be located as specified for the breeze path in the table; (bb) not be more than 15 metres apart; (cc) if the dwelling is below the 10th storey of the building, be at least 1 square metre in size, or if the dwelling is on or above the 10th storey, be at least 0.5 square metres in size and be located above door head level in the room; and (dd) have only 1 doorway, or opening less than 2 square metres in size, located in the direct path between them.			

Thermal loads			
Dwelling no.	Heating load (in mJ/m²/yr)	Cooling load (in mJ/m²/yr)	Corrected Cooling load (in mJ/m²/yr)
302	97.9	29.7	29.7

Dwelling no.	Thermal loads		
	Heating load (in mJ/m ² /yr)	Cooling load (in mJ/m ² /yr)	Corrected Cooling load (in mJ/m ² /yr)
303	55.2	13.5	13.5
304	107.1	31	31.0
401	30	28	28.0
402	24.6	37.7	37.7
403	39.2	41.2	41.2
404	76	32.8	32.8
405	64.4	41.6	41.6
406	74.8	26.5	26.5
P/H	69.7	24.1	24.1
E 13	75.7	48.8	48.8
W 13	85	43.6	43.6
101, 201	13.7	64.1	64.1
102, 202	13.9	23.9	23.9
103, 203	10.4	30.3	30.3
104, 204	34.5	20.5	20.5
NE 1, NE 2, NE 3	33.7	19.4	19.4
E 6, E 7, E 8, E 9, E 10, E 11, E 12	30.7	64.3	64.3
All other dwellings	48.2	48.1	48.1

Dwelling no.	Cross ventilation			
	Breeze path 1	Breeze path 2	Breeze path 3	Breeze path 4
All dwellings	-	-	-	-

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	3 star	4 star	6 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Pool (No. 1)	Volume: 60 kLs	Location: Indoor pool &/or spa area (No. 1) Pool shaded: yes	-
Fire sprinkler system (No. 1)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-
Central cooling system (No. 1)	-	Private water meter on make-up line connected to building management system. Conductivity controller installed in the cooling tower.	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

	Common area ventilation system		Common area lighting		
Common area	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Indoor pool &/or spa area (No. 1)	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	manual on / manual off	Yes
Car park	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	fluorescent	time clocks	Yes
Lift car (No. 1)	-	-	compact fluorescent	connected to lift call button	Yes
Lift car (No. 2)	-	-	compact fluorescent	connected to lift call button	Yes
Lift car (No. 3)	-	-	compact fluorescent	connected to lift call button	Yes
Lift car (No. 4)	-	-	compact fluorescent	connected to lift call button	Yes
Garbage Rooms	ventilation (supply + exhaust)	thermostatically controlled	fluorescent	motion sensors	Yes
Plant Room	ventilation (supply + exhaust)	thermostatically controlled	fluorescent	motion sensors	Yes
Lifts (4 Nos)	ventilation (supply + exhaust)	thermostatically controlled	fluorescent	motion sensors	Yes
Switch Room	ventilation (supply + exhaust)	thermostatically controlled	fluorescent	motion sensors	Yes
East Tower Lobby Upper Basement	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes

Common area	Common area ventilation system		Common area lighting		
	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
West Tower Lobby Upper Basement	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes
North East Tower Lobby Upper Basement	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes
North Podium Lobby (Upper Basement)	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes
North East Tower Lobby GF	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes
North Podium Lobby GF	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes
East Tower Lobby GF	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes
West Tower Lobby	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes
North Podium Corridor L1	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes
North Podium Corridor L2	ventilation (supply + exhaust)	time clock or BMS controlled	fluorescent	daylight sensors	Yes

Central energy systems	Type	Specification
Central hot water system (No. 1)	solar - gas boosted	Solar collector area (minimum, in square metres): 200 Piping insulation (ringmain & supply risers): (b) Piping internal to building: R1.0 (~38 mm)
Central cooling system (No. 1)	chilled water fan coil units	Energy source: gas driven compressor Heat rejection method: evaporative fluid cooler Unit efficiency (min): high - COP > 1.8
Central heating system (No. 1)	fan coil + heated water	Energy source: gas boiler
Lift (No. 1)	geared traction with V V A C motor	Number of levels (including basement): 16
Lift (No. 2)	geared traction with V V A C motor	Number of levels (including basement): 16

Central energy systems	Type	Specification
Lift (No. 3)	geared traction with V V A C motor	Number of levels (including basement): 16
Lift (No. 4)	geared traction with V V A C motor	Number of levels (including basement): 16
Pool (No. 1)	Heating source: solar (gas boosted)	Solar collector area (minimum, in square metres): 200 Pump controlled by timer: yes

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	3 star	4 star	6 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✓" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✓" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✓" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

APPENDIX D - DRAWINGS, ASSESSOR'S CERTIFICATES AND THERMAL SPECIFICATION

Assessor Certificate

Multiple Dwellings

Certificate Version 6.1. Prior versions not valid after 1 March 2006

Issued in accordance with
BASIX Thermal Comfort Simulation Method.



Assessor							
Name:	Martin Carlin	Company:	Build Sustainable Pty Ltd	ABSA #:	20848		
Address:	Studio 1, Level 1, 2-12 Foveaux St, Surry Hills NSW 2010						
Phone:	0434 284441	Fax:		Email:	martin@bsustainable.com.au		
Declaration of interest:	None						
Client							
Name:	Richard Palmer	Company:	Lincolne Scott				
Address:							
Phone:		Fax:		Email:	richard.palmer@lincolnescott.com		
Project							
Address:	33 Cross St, Double Bay NSW 2028						
Applicant:	Ashington	LGA:	Woollahra Municipal Council				
Assessment							
Date:	27 Jan. 09	File ref:	0902	Software:	BERS	Version:	4.1
Documentation							

All details, upon which this assessment has been based, are included in the project documentation that has been stamped and signed by the Assessor issuing this certificate, as identified below:

Thermal Performance Spec:

Attached, Affixed to drawings Page#: 1

Drawings:

Podium North Typical Levels 1 & 2, DA04-50, Issued 27/1/09;
Podium South Level 4, DA04-51, Issued 12/01/09
North East Tower, DA04-52, Issued 12/01/09
High Rise West, DA04-3, Issued 12/01/09
High Rise East DA04-53, Issued 12/01/09



Building Specifications: Only specifications, detailed on the drawings above, have been referenced.

ABSA Assessor Certificate		Assessor# 20848		Certificate # 67422177		Issued: 27 Jan. 09	
Thermal performance specifications						Page 1 of 2	
Unit number(s)	Certificate number	Floor area (M ²)		Predict. loads (MJ/M ² /y)		Concessions	Qualify for ventilation bonus
		Cond.	Uncond.	Heat	Cool (Sens & Lat)		
101 & 201	67422177	106.7	34.1	23.8	30.6	None	N/A
102 & 202	29603528	60.2	1.9	13.9	23.9	None	N/A
103 & 203	68373317	58.6	2	10.4	30.3	None	N/A
104 & 204	45382668	120.4	14	34.5	20.5	None	N/A
401	78616860	81.9	19	30	28	None	N/A
402	15855342	69.5	12.5	24.6	37.7	None	N/A
403	95687643	91.8	0	39.2	41.2	None	N/A

Thermal performance specifications							Page 2 of 2
Unit number(s)	Certificate number	Floor area (M ²)		Predict. loads (MJ/M ² /y)		Concessions	Qualify for ventilation bonus
		Cond.	Uncond.	Heat	Cool (Sens & Lat)		
404	60177379	101.9	6	76	32.8	None	N/A
405	23305508	63.8	0	64.4	41.6	None	N/A
406	98337949	53.5	7.1	74.8	26.5	None	N/A
NE Apt Levels 1-3	61570283	158.8	21.3	33.7	19.4	None	N/A
N.E Penthouse	27641580	220.9	16.8	69.7	24.1	None	N/A
High Rise West	53746486	257.8	35.5	34.9	41.7	None	N/A
High Rise East	55414131	236.3	31.4	37.2	36.6	None	N/A



Assessor # 20848

Certificate # 67422177

Issued: 27 Jan. 09

Thermal Performance Specifications

These are the Specifications upon which the Certified Assessment is based. If details included in these Specifications vary from other drawings or written specifications, these Specifications shall take precedence. If only one specification option is detailed for a building element, that specification must apply to all instances of that element for the project. If alternate specifications are detailed for a building element, the location and extent of alternate specifications must be detailed below and / or clearly indicated on referenced documents

Windows	Product ID	Glass	Frame	U value	SHGC	Area M ²	Detail
		Single Clear Low E	Aluminium	4.54	0.64	762	As per detail on plans
		Single Clear Low E	Timber	3.67	0.63	137	As per detail on plans
		D/G Low E	Aluminium	3.56	0.63	109	As per detail on plans
		D/G Low E Heavy Tint	Aluminium	3.52	0.26	139	As per detail on plans

Skylights	Product ID	Glass	Frame	U value	SHGC	Area M ²	Detail
N/A							

Any U and SHGC values specified on Certificates Issued after 1 May 2007 are according to NFRC 100. All values prior to this date are ANAC. Alternate products may be used if their U value is lower, and the SHGC value is less than 10% higher or lower.

External walls	Construction	Insulation	Colour – solar abs.	Detail
AAC Block 100mm		Externally Insulated	Light SA<0.475	Throughout

Internal walls	Construction	Insulation	Detail
AAC Block 100mm		None	Throughout

Floors	Construction	Insulation	Covering	Detail
Concrete		None	Carpet	As per plans
Concrete		None	Ceramic Tile	As per plans
Concrete		None	Cork 10mm	As per plans

Ceilings	Construction	Insulation	Detail
Plasterboard		None	As per plans

Roof	Construction	Insulation	Colour – solar abs.	Detail
Metal Deck		R1.5	Dark SA > 0.7	As per plan

Window cover	Internal (curtains)	External (awnings, shutters, etc)
Holland Blinds Throughout		Louvres As per plans

Fixed shading	Eaves (width - inc. gutters, h't above windows)	Verandahs, Pergolas (type, description)
	As per detail on plans (Drwg DA04-50)	Balcony As per detail on plans

Overshadowing	Overshadowing structures	Overshadowing trees
None		None

Orientation, Exposure, Ventilation and Infiltration

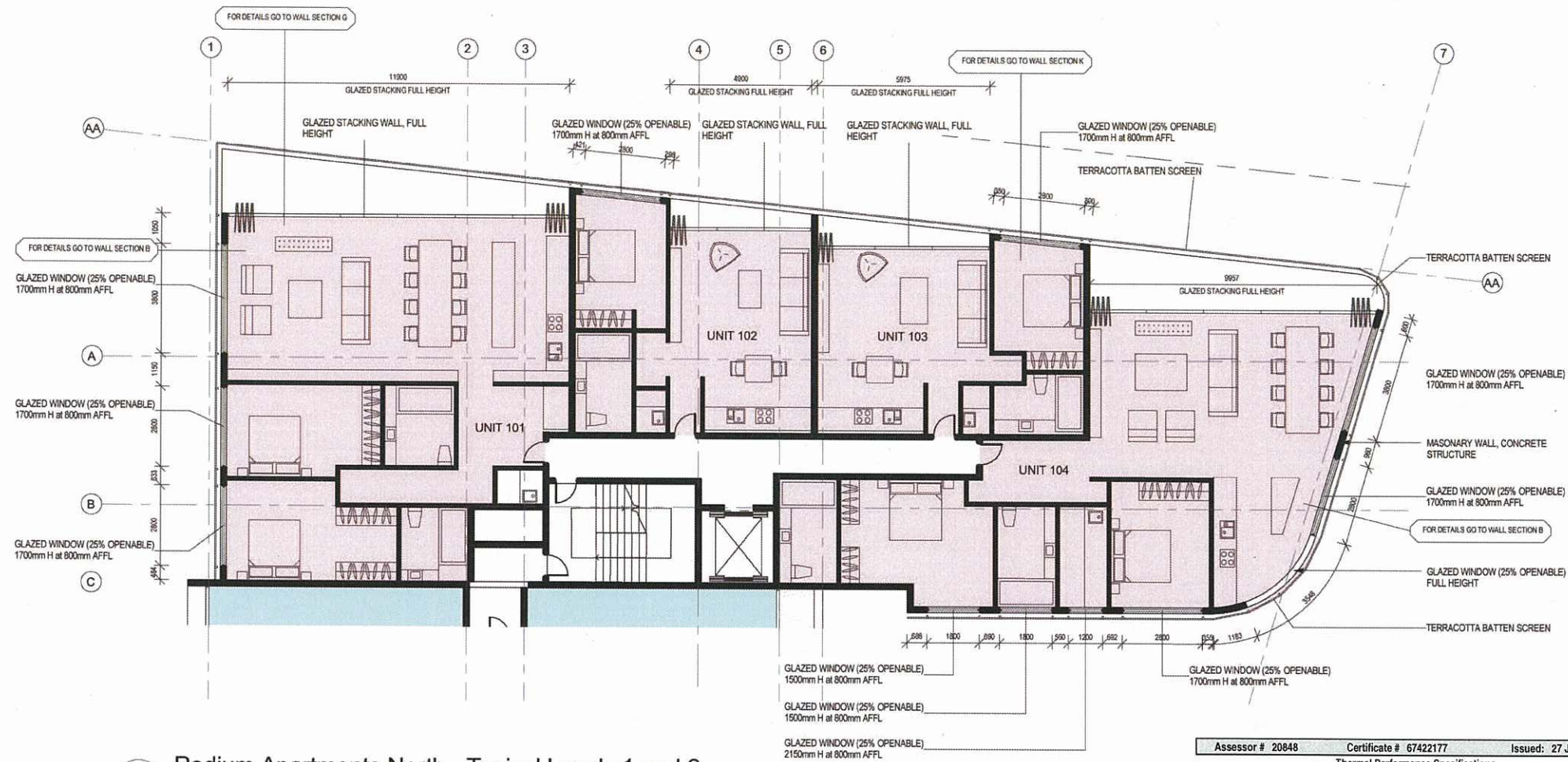
Orientation of nominal north:	5-30 degrees
Terrain category:	Suburban
Roof ventilation:	Unventilated
Cross ventilation:	None
Subfloor:	Elevated > 1m
Living area open to entry:	Some areas
Doors separate living areas:	No
Stair open to heated areas:	Some Areas
Seals to windows and doors:	Yes
Exhaust fans without dampers:	No
Ventilated skylights:	No
Open fire, unflued gas heat:	No
Vented downlights:	No
Wall and ceiling vents:	No

ABSA Assessor stamp



Do not scale drawings. Verify all dimensions on site

issue	amendment	date
-	ISSUE FOR INFORMATION	12.07.09
-	ISSUE FOR INFORMATION	27.01.09



1 Podium Apartments North - Typical Levels 1 and 2

DA0301 Scale: 1:100

Door Types/Sizes	Internal doors - solid core timber doors (2100x900) External doors - glazed aluminium frame (size varies typical size 2100x900)
Typical Wall Heights Throughout	Level 1 and 2 floor to floor heights 3200mm
Floor Coverings	Carpet, Ceramic & Cork
Window Specifications	Aluminium framed windows - low e, single glazed (unless otherwise indicated) Units 403, 404, 406 & High Rise East Double glazing low E clear Double Glazing low E heavily tinted throughout
Insulation	External walls are externally insulated.
Walls	External & Internal Walls - Hebel
Ceiling	Ceiling to be plasterboard - nominal 150mm ceiling void
Shading	As detailed on plans except where indicated below
North East Penthouse	1500mm wide eave on top level surrounding glazed areas & vertical louvres to all windows to achieve 60% shading
Unit 403	1500mm wide eave to north wall of bedroom & study.
Unit 404	Vertical louvre giving 60% shading to south east window.
Unit 406	1500mm wide eave to all windows

Assessor # 20848 Certificate # 67422177 Issued: 27 Jan. 09

Thermal Performance Specifications

These are the Specifications upon which the Certified Assessment is based. If details included in these Specifications vary from other drawings or written specifications, these Specifications shall take precedence. If only one specification option is detailed for a building element, that specification must apply to all instances of that element for the project. If alternate specifications are detailed for a building element, the location and extent of alternate specifications must be detailed below and/or clearly indicated on referenced documents.

Windows	Product ID	Glass	Frame	U value	SHGC	Area M ²	Detail
Single Clear Low E			Aluminium	4.54	0.64	792	As per plans
Single Clear Low E			Timber	3.67	0.63	137	As per plans
DiG Low E			Aluminium	3.56	0.63	109	As per plans
DiG Low E Heavily Tinted			Aluminium	3.52	0.29	139	As per plans
Skylights	Product ID	Glass	Frame	U value	SHGC	Area M ²	Detail
NA							

Any U and SHGC values specified on Certificates issued after 1 May 2007 are according to NFRC 100. All values prior to this date are ANAC. Alternate products may be used if their U value is lower, and the SHGC value is less than 10% higher or lower.

External walls	Construction	Insulation	Colour - solar abs.	Detail
AAC Block 100mm	Externally Insulated		Light SA-0-475	Throughout

Internal walls	Construction	Insulation	Detail
AAC Block 100mm		None	Throughout

Floors	Construction	Insulation	Covering	Detail
Concrete		None	Carpet	As per plans
Concrete		None	Ceramic	As per plans
Concrete		None	Cork 10mm	As per plans

Ceilings	Construction	Insulation	Detail
Plasterboard		None	As per plans

Roof	Construction	Insulation	Colour - solar abs.	Detail
Metal Deck		R 1.5	Dark-SA 0.7	Throughout

Window cover	Internal (curtains)	External (awnings, shutters, etc)
Holland Blinds Throughout		Louvers As per plans

Fixed shading	Eaves (width - inc gutters, n1 above windows)	Verandahs, Pergolas (type, description)
As per plans		Balconies As per plans

Overshadowing	Overshadowing structures	Overshadowing trees
None		None

Orientation, Exposure, Ventilation and Infiltration		
Orientation of nominal north:	5-30	Living area open to entry: Some
Terrain category:	Suburban	Doors separate living areas: No
Roof ventilation:	Unventilated	Stair open to heated areas: Some
Cross ventilation:	None	Seals to windows and doors: Yes
Sub-floor:	Elevated-1m	Exhaust fans without dampers: No



Architectus Sydney
 Level 3 341 George Street
 Sydney NSW 2000
 T (61 2) 8252 8400
 F (61 2) 8252 8600
 sydney@architectus.com.au
 ABN 11 098 489 448

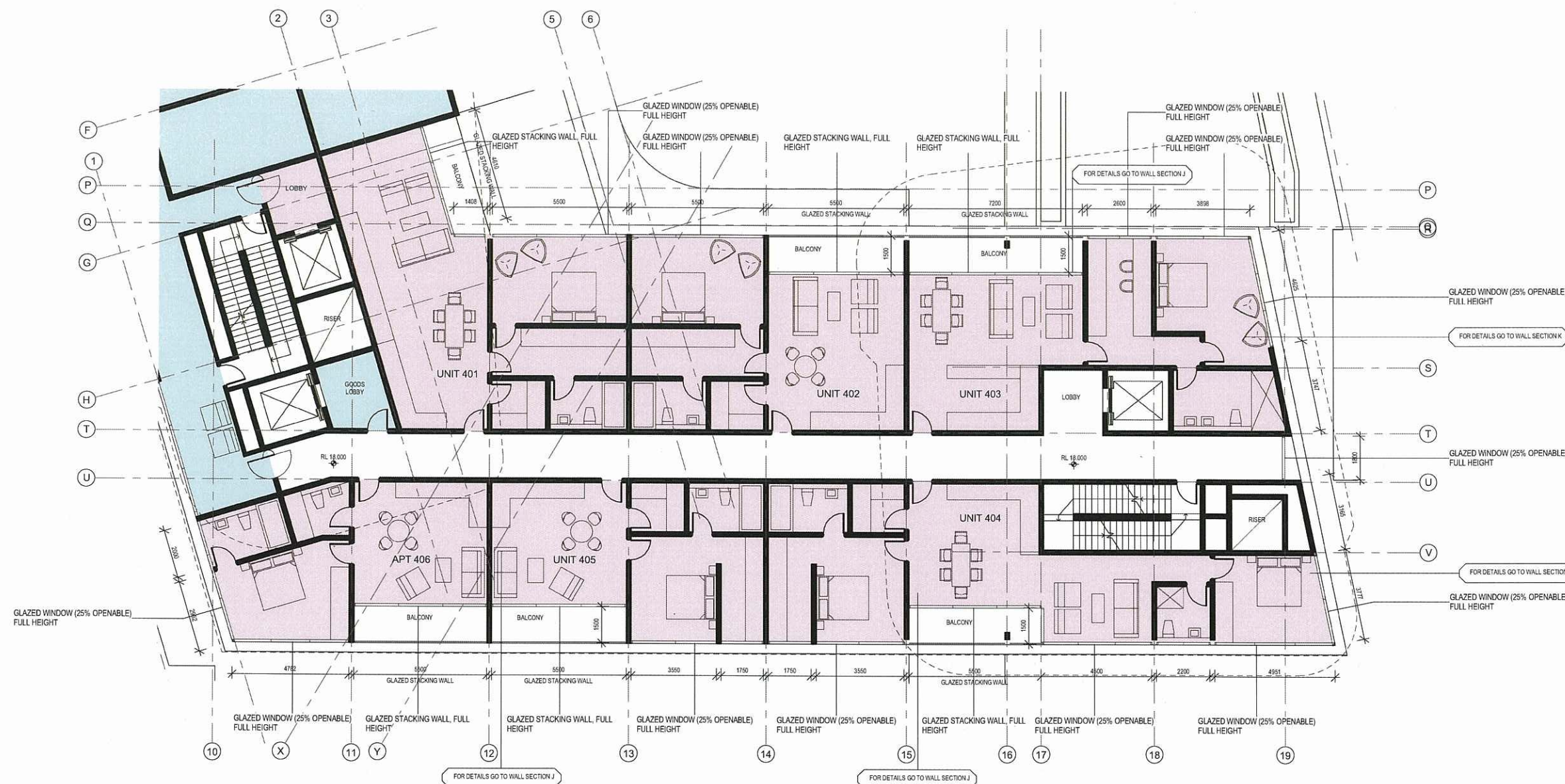
project 33 CROSS STREET, DOUBLE BAY

drawing APARTMENT TYPE - PODIUM NORTH - TYPICAL LEVELS 1 & 2

scale 1:100 drawing no. DA04-50
 drawn AD/TF issue
 checked CO
 project no 070068

Do not scale drawings. Verify all dimensions on site

Issue	amendment	date
	ISSUE FOR INFORMATION	12 01 09



1 Podium Apartments South - Level 4
 DA03-01 Scale: 1:100



architectus™
 Architectus Sydney
 Level 3 341 George Street
 Sydney NSW 2000
 T (61 2) 8252 8400
 F (61 2) 8252 8600
 Sydney Melbourne Auckland Brisbane Shanghai
 sydney@architectus.com.au
 ABRN 11 098 489 448

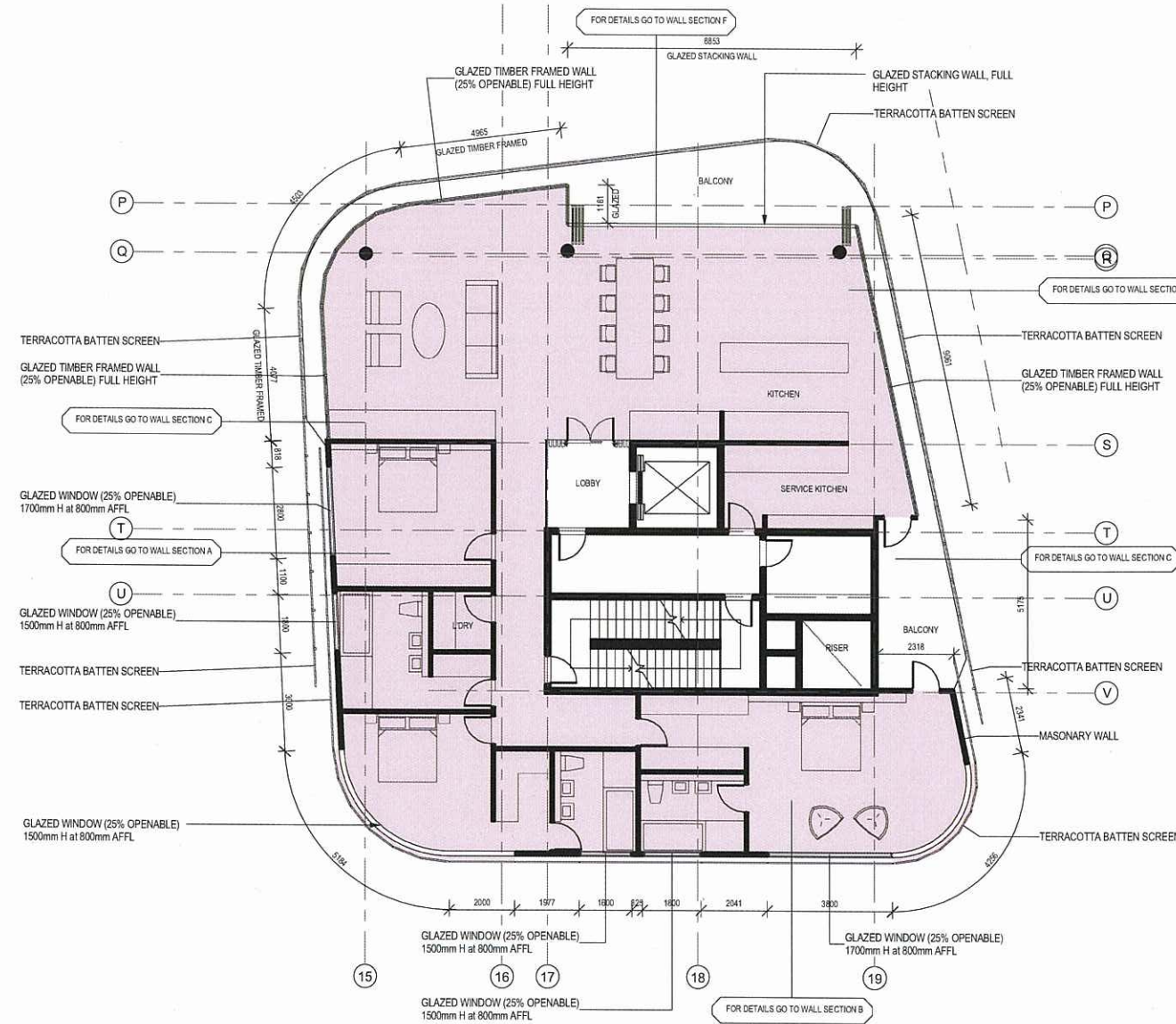
project 33 CROSS STREET, DOUBLE BAY

drawing APARTMENT TYPE - PODIUM SOUTH - LEVEL 4

scale	1:100	drawing no.
drawn	AD/TF	DA04-51
checked	CO	issue
project no	070068	

Do not scale drawings. Verify all dimensions on site

issue	amendment	date
-	ISSUE FOR INFORMATION	12.01.09



1 PLOT APT High Rise East (Level 6)
 DA03-01 Scale: 1:100



Architectus Sydney
 Level 3, 341 George Street
 Sydney NSW 2000
 T (61 2) 9252 8400
 F (61 2) 6252 8800
 sydney@architectus.com.au
 ABN 11 098 489 448

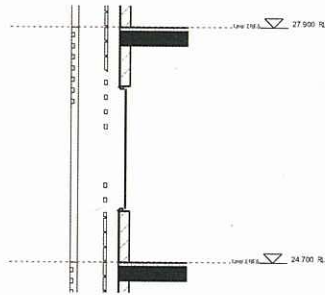
project
 33 CROSS STREET, DOUBLE BAY

drawing
 APARTMENT TYPE - HIGH RISE EAST

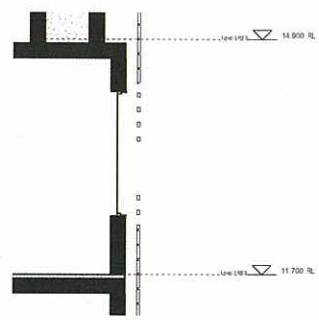
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 drawn AD/TF DA04-54
 checked CO issue
 project no 070068

Do not scale drawings. Verify all dimensions on site

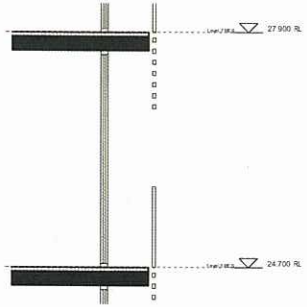
Issue	amendment	date
-	ISSUE FOR INFORMATION	12.01.09



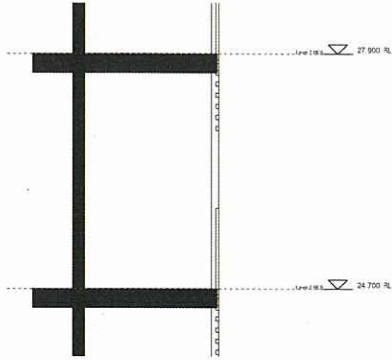
3 WALL SECTION A
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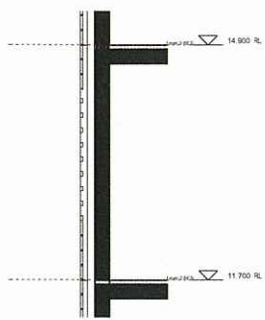
10 WALL SECTION B
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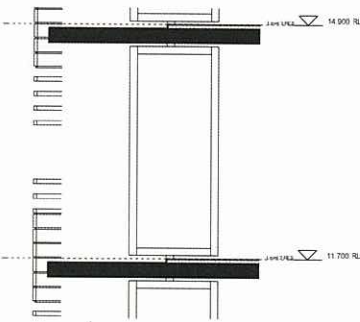
2 WALL SECTION C
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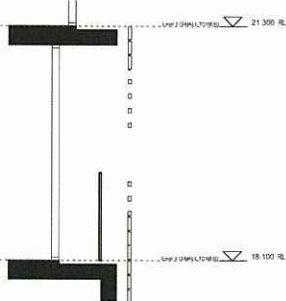
5 WALL SECTION D
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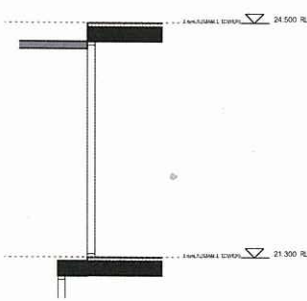
6 WALL SECTION E
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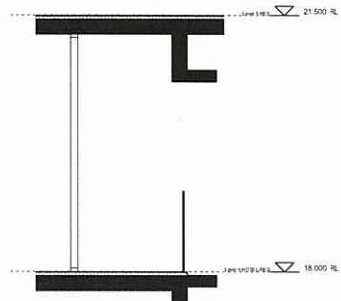
7 WALL SECTION F
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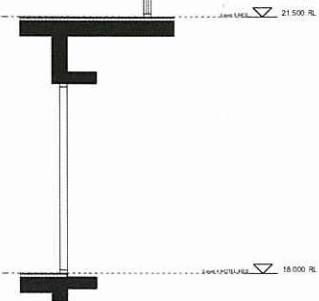
8 WALL SECTION G
 Scale: 1:50



9 WALL SECTION H
 Scale: 1:50



1 WALL SECTION J
 Scale: 1:50



4 WALL SECTION K
 Scale: 1:50



Architectus Sydney
 Level 3 341 George Street
 Sydney NSW 2000
 T (61 2) 8252 8400
 F (61 2) 8252 8600
 sydney@architectus.com.au
 ABN 11 098 489 448

Sydney
 Melbourne
 Auckland
 Brisbane
 Shanghai

project
 33 CROSS STREET, DOUBLE BAY

drawing
 APARTMENTS SECTION DETAILS

scale	1:50	drawing no.	
drawn	AD/TF	DA04-55	
checked	CO	issue	
project no.	070068		