Urban design testing

46 Nicolson Street, St Leonards

DRAFT

Architectus Australia Holdings Pty Ltd.
ABN 90 131 245 684

Nominated Architect
Managing Director
Ray Brown
NSWARB 6359

Adelaide
Lower Ground Floor
57 Wyatt Street
Adelaide SA 5000
Australia
T +61 8 8427 7300
adelaide@architectus.com.au

Melbourne
Level 25, 385 Bourke Street
Melbourne VIC 3000
Australia
T +61 3 9429 5733
F +61 3 9429 8480
melbourne@architectus.com.au

Perth
QV1 Upper Plaza West
250 St. Georges Terrace
Perth WA 6000
Australia
T +61 8 9412 8355
perth@architectus.com.au

Sydney
Level 18, MLC Centre
19 Martin Place
Sydney NSW 2000
Australia
T +61 2 8252 8400
F +61 2 8252 8600
sydney@architectus.com.au

architectus.com.au

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01 Introduction

1.1 Purpose of this report

In June 2020, Lane Cove Council received a Planning Proposal for a commercial office development of 32 storeys for the site at 46 Nicholson street, the corner of Nicholson and Christie streets in St Leonards. Architectus has been engaged by Council to provide an urban design review of the site.

The purpose of this report is to develop a suitable building envelope that works with the local urban context and yields a high-quality public domain and enables some view sharing while achieving the maximum FSR of 15:1 under the 2036 Final Plan. Four options are included in this report: Applicant's proposal; Development under 2036 Final Plan at 15:1 FSR, Lowest height for 15:1 FSR, and a balanced option to achieve 15:1 FSR (preferred).

1.2 The site and local context

The site is strategically located within the Lane Cove Local Government Area (LGA). It is within five kilometres of Central Sydney, three kilometres of North Sydney CBD and is centrally located in St Leonards Town Centre.

The site is well supported by public transport, located within 300m of the existing St Leonards Train Station and proposed new Crows Nest Metro Station. The site is also well serviced by existing bus services, providing connections to key centres including Epping, Lane Cove, Chatswood and Sydney CBD. The site also has excellent road access, being located near the Pacific Highway at the south side of the intersection of Christie and Nicholson Streets.

The Gore Hill Park, west to the site, provides a significant local open space, which will contain excellent sporting and recreational facilities, barbecue and seating facilities. The Newlands Park is also in close proximity across the rail line.

The site is 2,301sqm.

Local context plan

1.3 DPIE St Leonards and Crows Nest 2036 Final Plan

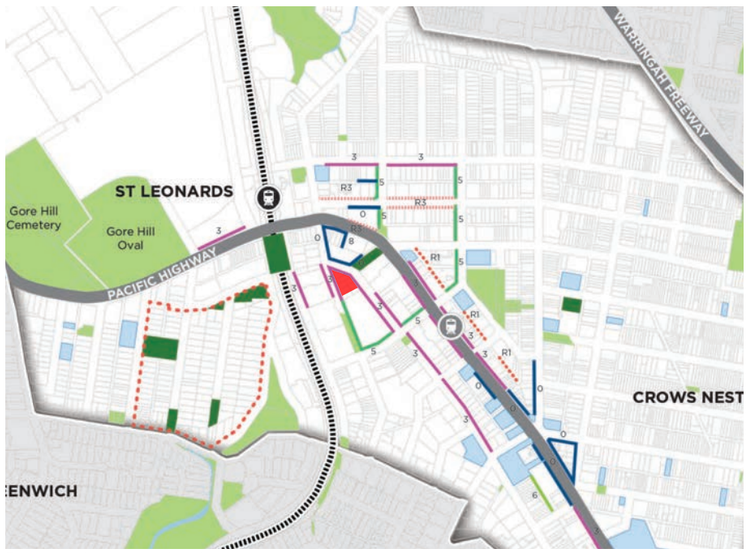
The following maps show the proposed planning control changes under the DPIE St Leonards and Crows Nest 2036 Final Plan (referred to in this report as 2036 Final Plan).

Key Planning control changes for the subject site include:

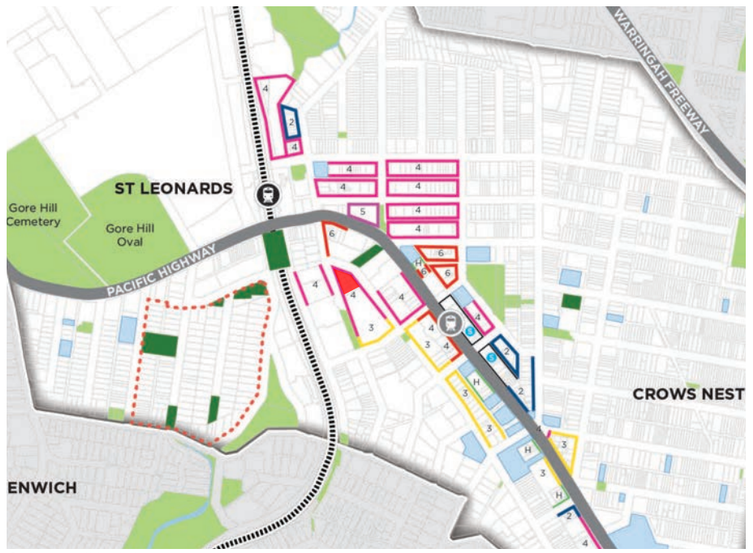
- Increase the maximum building height to 30 storeys commercial use.
- Introduce a new maximum floor space ratio (FSR) of 15:1.
- 4 Storey street wall height
- Street setbacks:
  - 3m along Nicolson Street
  - 3m along Christie Street
- Newland Park (item 2 of the bottom right diagram) should not be further overshadowed from 10am to 3pm.
- There are no changes proposed to the site's existing B2 Local centre zoning.

Proposed Height of Buildings

Proposed overall FSR changes plan



Proposed street setbacks



Street wall heights

Solar access plane

02 Site testing

2.1 Urban design principles

Six key design principles were identified to provide a consistent framework for testing.

These principles have been established to guide options testing and inform our recommended built from outcome and planning controls for the site.

1

“A” grade office space

- Min 1,000sqm NLA, preferably 1,200-1,400sqm NLA
- Floor to floor heights 3.6-3.8m (the lowest practicable storey height is 3.6m for an A-grade office building)
- Plant location (floor by floor or centralised)

Note - The above points summarise Architectus’ experience in working with the Property Council’s definition of ‘A’ grade office space and our experience of the commercial office market. Appended is the Property Council’s Guide to Office development with definitions on grades of office space.

2

Public domain amenity

- Wind mitigation for pedestrians at street level (by podium/tower built form)
- Sky view from streets – avoiding street canyon effects
- View from Friedlander Place open space
- Pedestrian amenity – especially along Nicholson St as it is a pedestrian desire line to the new Metro station at Crows Nest
- No further overshadowing of Newlands Park from 10am to 3pm.

3

Tower adjacencies and setbacks

- Good building relationship to the southern neighbour.
- Above podium setback to improve building separation.

4

Transition to Pacific Highway

It is important to provide a good transition between development along Pacific Highway and the nearby residential area.

Future built form should consider the prevailing scale of development surrounding residential of the site, to ensure an appropriate transition between the highest densities in St Leonards and the lower scale development in the surrounding area.

5

View sharing

A key objective is to consider cumulative impacts of new development on existing areas including view loss.

The future proposed tower form will be designed to capture views towards the city and Newlands park, and allow view sharing for existing buildings

6

Podium alignment and scale

Future development should respond to streetscape enhancement by providing a street wall, continuous street frontages and increased activation at the street level.

2.2 Property Council definition of “A” grade office space

This table is a ummary of the appended Property Council document.

Code	Parameter	Unit	Grade A buildings
Overview			
	Desciptor	Presentation	High-quality office building including high-quality views, outlook and natural light, high-quality access from an attractive street setting, high-quality lobby and lift finishes, high-quality amenities, high-quality presentation and maintenance.
Environmental			
A1	Environmental rating	Green Star - Design & As Built v1.2	5 Star
A2	Energy (without green power)	NABERS Office Energy (Commitment)	5.5 Star
A3	Water	Number of water points under Green Star - Design & As Built v1.2	3
A4	Waste	Green Star - Design & As Built v1.2 Operational Waste credit	Yes
A5	Indoor environment quality	Percentage of minimum Indoor Environmental Quality points under Green Star - Design & As Built v1.2	Min 60%Including credits for thermal comfort
A6	Climate change adaptations and resilience	Green Star - Design & As Build v1.2 'Adaptation and Resilience' credit	Yes
Environmental			
B1	Building size	sqm NLA	Sydney/Melbourne CBDs > 10,000Brisbane/Perth CBDs > 10,000Other CBDs > 5,000
B2	Floor plate	sqm NLA	Sydney/Melbourne/ Brisbane/Perth CBDs > 1,000, Other CBDs > 800
B3	Tenant service zone	mm	>= 125
B4	High loading	% of NLA	5% > 7.5kPa
Mechanical			
C1	Air conditioning - maximum zone size	sqm (perimeter / centre zone)	<= 85/100
C2	Chilled beam density - maximum area served per chilled beam	Watts per m2(perimeter/zone)	<= 20/35
C3	Tenant equipment	Watts per m2	>= 12
C4	Tenant supplementary loop	Watts per m2	>= 20
C5	After-hours operation	Minimum zones per floor and Maximum zone size (sqm)	2 and 600
C6	Cooling/heating plant redundancy	% peak cooling / heating load	> 50%
Tenant Risers			
D1	General exhaust	L/s/m2 (m2 capped to minimum floor plater size)	0.15
D2	Commercial kitchen exhaust and commercial kitchen make up air	L/s Number	>= 3,000 Minimum of 1
D3	Supplementary toilet exhaust	L/s/m2 (m2 capped to minimum floor plater size)	0.1
D4	Supplementary outside air	L/s/m2	0.3
Lifts			
E1	Car capacity	Number of persons	>= 16
E2	Lateral vibration	mg	<= 20
E3	Waiting time	Seconds during any five-minute period	Up peak <= 30 Lunch peak <= 40
E4	Handling capacity	%	Up peak >= 13 Lunch peak >= 11
E5	Goods lift	Number	>= 1
E6	Goods lift	Capacity (kg)	>= 1,400
See “Electirical, Standby Power - Base building, Communications, Hydraulics, Security, Amenities, and Parking” section in the Appendix A.			

2.3 Options introduction

2.3.1 Three tested options

All tested options comprise the following:

- 3.6m floor to floor consistent with 'A' Grade office building.
- 85% efficiency GFA to Building Envelope Area and 90% efficiency NLA to GFA for typical floors.
- A full storey needs to comprise a plant (for every 20-25 storeys) plus some rooftop plant. This amounts to 2 storeys which are included in the below building heights

Three options from different aspects have been tested to analyze a suitable building envelope for the site.

Option 1 – Development under the 2036 Final Plan. The assumption of this envelope is that the future building will be developed under the DPIE St Leonards and Crows Nest 2036 (August 2020). Street wall height, street setbacks, and above podium setbacks are consistent with the 2036 Final Plan and DCP.

Option 2 – Lowest building height to achieve the same FSR. This option shows that to maintain 15:1 FSR, what the lowest building height should be. No street setbacks and above podium setbacks will be provided in this option, which maximizes building footprint per level for reducing building height. A setback only at ground level to each street frontage to provide street level amenity for Nicholson street and Christie street.

Option 3 – Balanced option (preferred option). This option comes up with a balanced outcome with reduced height, allowing good street amenity. An 8-storey podium has been provided with above podium setbacks for the tower. A less bulky tower has been provided to achieve 15:1 FSR in a mediated building height to provide view sharing.

2.3.2 Applicants proposal

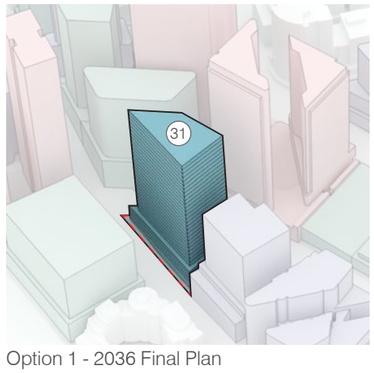
The applicant's building has been remodelled in the sketch up for comparison to the options.

2.3.3 Surrounding buildings

The surrounding properties have been modelled based on three categories: under construction, approved/lodged planning proposal or DA, and potential future development under the 2036 Final Plan.

The first two categories of buildings are modelled based on the available PP/DA drawings. The third category of buildings has followed the controls in the 2036 Final Plan. However, the street wall height was increased from 6-storey to 8-storey for the development at 530-542 Pacific Highway and 69 Christie street to achieve a more consistent street frontage with Pacific Highway.

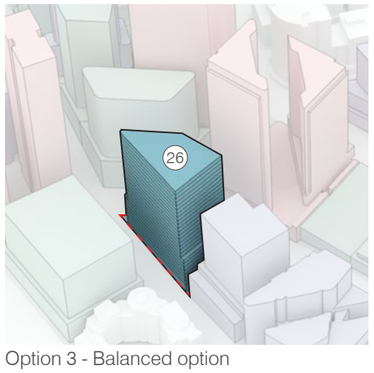
The development envelopes for the land to the south of the site (29-57 Christie street) in the same street block are shown consistent with the DA submitted form that site.



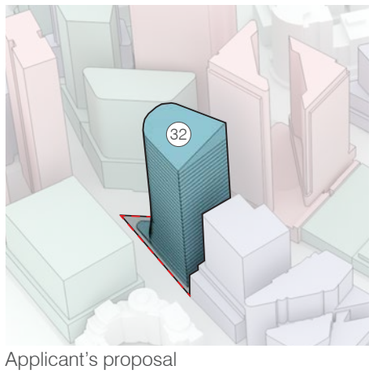
Option 1 - 2036 Final Plan

Note: An additional storey is added to accmmodat plant

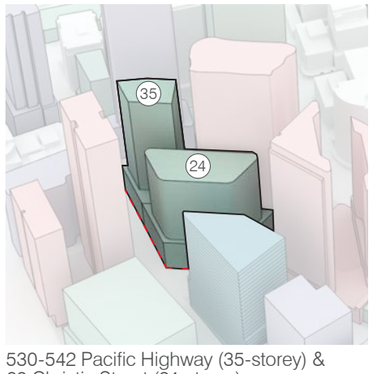
Option 2 - Lowest building height



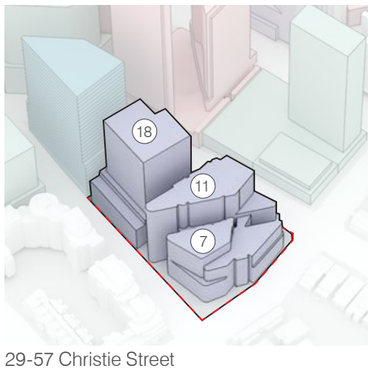
Option 3 - Balanced option



Applicant's proposal



530-542 Pacific Highway (35-storey) & 69 Christie Street (24-storey)



29-57 Christie Street

2.4 Applicant's proposal

Elements	
Land Use	B3 Commercial Core
Building Height	32 storeys (Incl. plant/roof level)
FSR	16.45:1
Street wall height	N/A
Setback at ground level only	N/A
Street setback - Nicholson Street	3m
Street setback - Christie Street	3m
Street setback - South boundary	0m
Setback above podium	3m to south side
No additional overshadowing to Newlands Park	Yes

Building	**GBA(m²)**	**Storey**	**Efficiency**	**GFA(m²)**
Retail+Medical	7,242	5	0.9**	6,518
Commercial tower	34,805	25	0.9**	31,325
Sum		30*		37,842

Total NLA (85% efficiency NLA-GBA)	35,740
Total GFA (m²)	37,842
Site area (m²)	2,301
FSR	16.45

**Note: Excl. plant/roof level*

***Note: Please note that applicants have applied a higher efficiency rate (GFA-GBA 90%) in this proposal. It may be hard to achieve this high rate in future design. The tested options in the following pages have used an 85% efficiency rate from GFA to GBA.*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Pacific Highway
Nicholson Street
Christie Street
Legend
Buildings under construction
Approved building/Pending approval
Likely development (under LUIIP)
Commercial use for subject site

2.5 Option 1 - 31 storeys, 15:1 FSR (Development under the 2036 Final Plan)

Elements	
Land Use	B3 Commercial Core
Building Height	31 storeys (Incl. plant/roof level)
FSR	15:1
Street wall height	4 storeys
Setback at ground level only	N/A
Street setback - Nicholson Street	3m
Street setback - Christie Street	3m
Street setback - South boundary	0m
Setback above podium	3m to all sides
No additional overshadowing to Newlands Park	Yes

Building	**GBA(m²)**	**Storey**	**Efficiency**	**GFA(m²)**
Podium	1,836	4	0.85	6,241
Tower	1,311	25	0.85	27,863
Sum		29*		34,104

Total NLA (90% efficiency NLA-GFA)	30,694
Total GFA (m²)	34,104
Site area (m²)	2,301
FSR	15:1

**Note: Excl. plant/roof level*


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Pacific Highway
Nicholson Street
Christie Street
Legend
Buildings under construction
Approved building/Pending approval
Likely development (under LUIIP)
Commercial use for subject site

2.6 Option 2 - 20 storeys, 15:1 FSR (Lowest buidling height)

Elements	
Land Use	B3 Commercial Core
Building Height	20 storeys (Incl. plant/roof level)
FSR	15:1
Street wall height	N/A
Setback at ground level only	3m to both streets
Street setback - Nicholson Street	N/A
Street setback - Christie Street	N/A
Street setback - South boundary	N/A
Setback above podium	N/A
No additional overshadowing to Newlands Park	Yes

Building	**GBA(m²)**	**Storey**	**Efficiency**	**GFA(m²)**
Ground level	1,836	1	0.85	1,560
Tower	2,301	17	0.85	33,253
Sum		18		34,814

Total NLA (90% efficiency NLA-GFA)	31,332
Total GFA (m²)	34,814
Site area (m²)	2,301
FSR	15:1

**Note: Excl. plant/roof level*


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Pacific Highway
Nicholson Street
Christie Street
Legend
Buildings under construction
Approved building/Pending approval
Likely development (under LUIIP)
Commercial use for subject site

2.7 Option 3 - 26 storeys, 15:1 FSR (Balanced option)

Elements	
Land Use	B3 Commercial Core
Building Height	26 storeys (Incl. plant/roof level)
FSR	15:1
Street wall height	8 storeys
Setback at ground level only	N/A
Street setback - Nicholson Street	3m
Street setback - Christie Street	0m
Street setback - South boundary	0m
Setback above podium	3m to Nicholson street side and south boundary
No additional overshadowing to Newlands Park	Yes

Building	GBA(m²)	Storey	Efficiency	GFA(m²)
Podium	1,966	8	0.85	13,370
Tower	1,610	16	0.85	21,893
Sum		24*		35,264

Total NLA (90% efficiency NLA-GFA)	31,737
Total GFA (m²)	35,264
Site area (m²)	2,301
FSR	15:1

**Note: Excl. plant/roof level*


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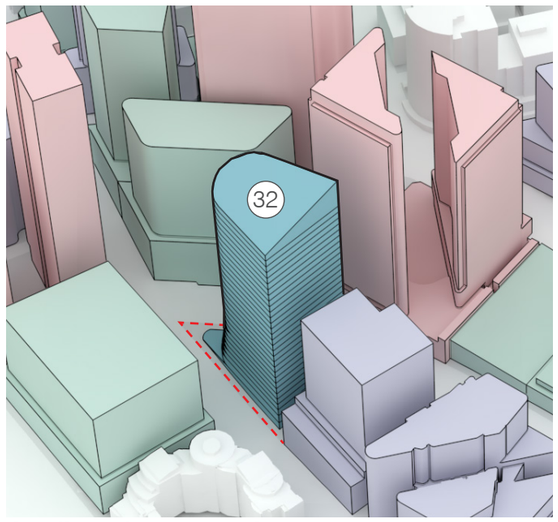
Pacific Highway
Nicholson Street
Christie Street
Legend
Buildings under construction
Approved building/Pending approval
Likely development (under LUIIP)
Commercial use for subject site

2.8 Evaluation of options



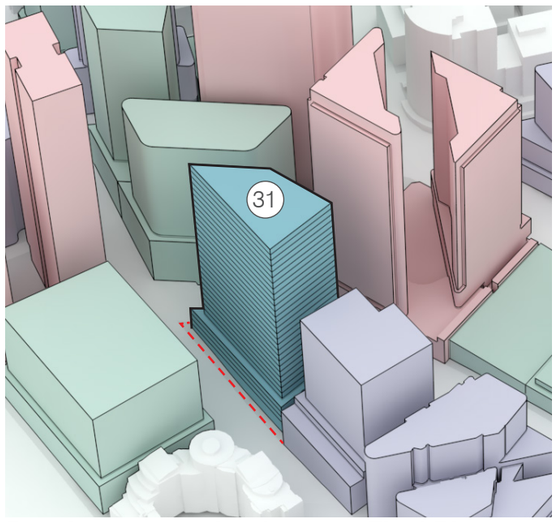
Applicant's proposal
Tower GFA per level 1,292m^2
Tower NLA per level 1,221m^2

Pros

- ✓ Maximises commercial opportunity
- ✓ Good amenity at the lower levels to both streets

Cons

- ✗ Exceed the maximum FSR control
- ✗ Exceed the maximum Height control
- ✗ Highest impacts on views from the neighbouring residential buildings at 486 Pacific Highway



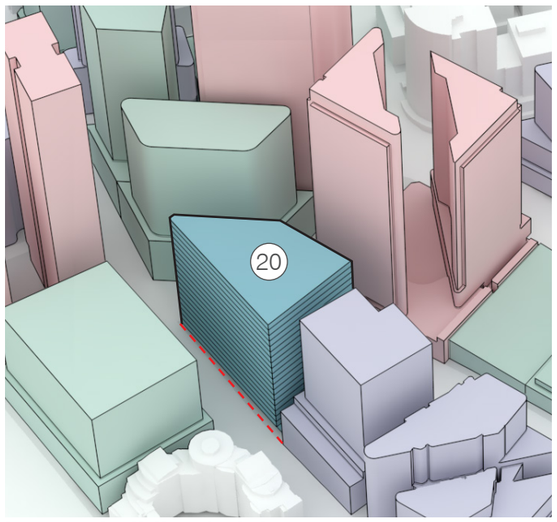
Development under the 2036 Final Plan
Tower GFA per level 1,115m^2
Tower NLA per level 1,003m^2

Pros

- ✓ Consistent with 2036 final plan controls
- ✓ Good amenity at the lower levels to both streets

Cons

- ✗ The roof level for plant may exceed the height limitation for achieving 15:1 FSR
- ✗ Smallest commercial floorplate in three tested options but consistent with 'A' grade office space
- ✗ Highest impacts on views from the neighbouring residential buildings at 486 Pacific Highway



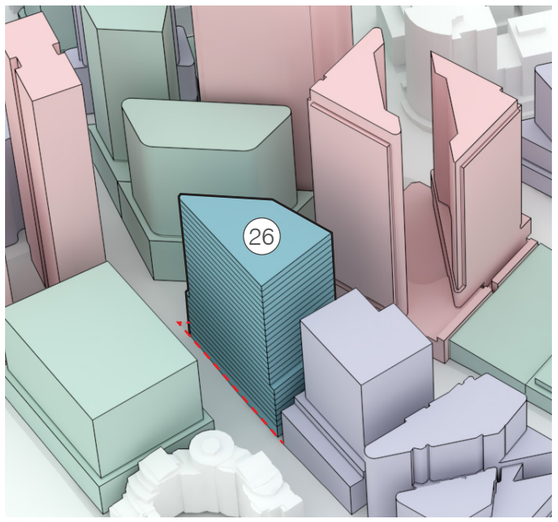
Lowest building height
Tower GFA per level 1,956m^2
Tower NLA per level 1,760m^2

Pros

- ✓ Lowest building height in all options
- ✓ Lowest impacts on views from the neighbouring residential buildings at 486 Pacific Highway
- ✓ Largest office floorplate in line with contemporary offices than option 1

Cons

- ✗ Smallest building separation to the site on the southern side
- ✗ No street wall with tower setback to podium has been provided in this option
- ✗ No setbacks have been provided in this option



Balanced option
Tower GFA per level 1,368m^2
Tower NLA per level 1,232m^2

Pros

- ✓ A balanced outcome compares to all options
- ✓ Good amenity to Nicholson street
- ✓ An appropriate size of the commercial office floorplate

Cons

- ✗ No setbacks to Christie street. However, it is considered that this can be appropriate in the urban context as Christie St has a more open quality than Nicholson St where setback above a podium is needed fir amenity.

2.9 Preferred option commentary

2.9.1 Shadowing

An important built form objective of the 2036 Final Plan is to minimise overshadowing of key open spaces, public places and adjoining residential areas. Solar height planes outlined in the strategy require no additional overshadowing to Newlands Park between 10:00am-3:00pm.

None of the options overshadow Newlands Park.

Shadow plan 10.00am

Shadow plan 11.00am

Shadow plan 12.00pm

Please note that the shadows on the north corner of Newlands Park in the diagram are cast by the new proposed building at 500 Pacific Highway.

Shadow plan 1.00pm

Shadow plan 2.00pm

Shadow plan 3.00pm

2.9.2 Public domain amenity

View 1 looks northwards along Christie St showing no setbacks for the subject site. It is considered acceptable given this is a long closed end view.

View 2 looks south-eastwards along Nicholson St. It is important to setback the tower above a podium to provide a better low angle sky view of this open ended street view. Nicholson St will be an important pedestrian connection in the future particularly with the advent of the Metro station at Crows Nest.

View 3 is from Friedlander Place towards the site. Some architectural tapering of the subject tower at the corner would increase the low angle sky view. It is considered unnecessary to have a significant setback to the street corner for the tower as Friedlander Place is characterised by being a public space edged by tall buildings.

View 4 looks north-westwards along Nicholson St and shows a very contained view. It is of most benefit to pedestrian amenity to have a tower setback above a podium to reduce the canyon effect.

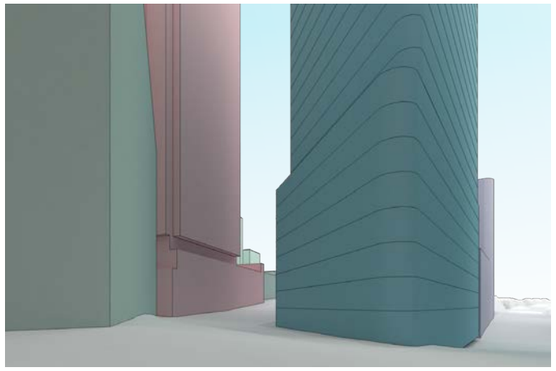
View 5 looks northwards along Nicholson St from Oxley St and shows the subject site behind the recently lodged DA in the left foreground.

View 6 is a view from the middle of Newlands Park and shows the subject site as part of a transition of stepped heights up to the highest buildings on Pacific Highway.

Wind

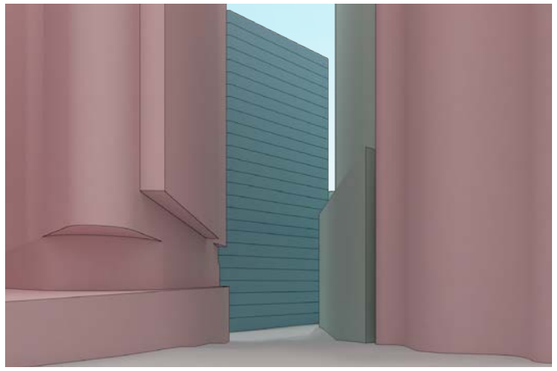
An aspect of public domain amenity is wind. The prevailing winds are north-easterlies which are largely likely to be moderated by the built forms to the north east of the site. The podium tower configuration to Nicholson St Is a good response to this situation. An awning along Christie St should be sufficient wind amelioration for pedestrian amenity.

View 1 - Christie street

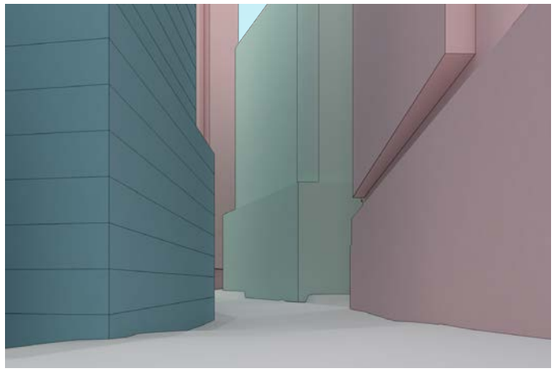


View 2 - Intersection of Christie street and Nicholson street

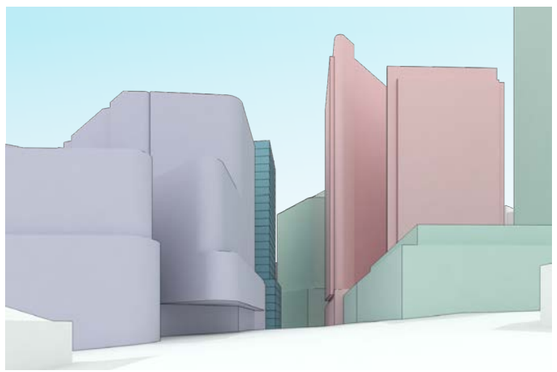
View location



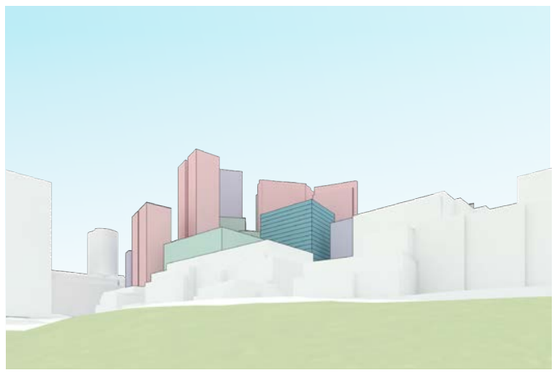
View 3 - Friedlander place



View 4 - Nicholson street



View 5 - Intersection of Oxley street and Nicholson street



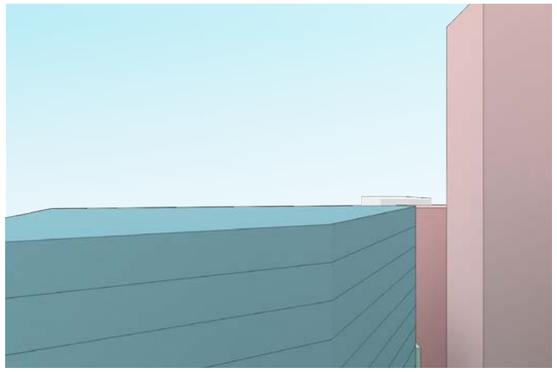
View 6 - Newlands Park

Legend

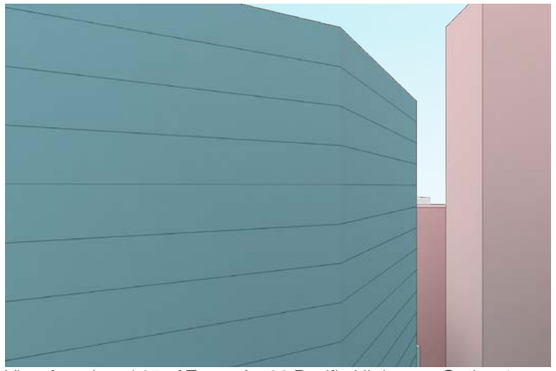
- Buildings under construction
- Approved building/Pending approval
- Likely development (under LUIIP)
- Commercial use for subject site
- Site boundary

2.9.3 View sharing

View sharing is considered from representative viewpoint at Level 27 in the middle apartment of Tower 2 of 486 Pacific Highway located opposite the site on Nicholson St. Tower 2 has 36 storeys. The views show that Option 1 allows views from only the top 4 storeys while Option 3 allows views from the top 10 storeys. Option 3 provides the best balance of development potential and view sharing.

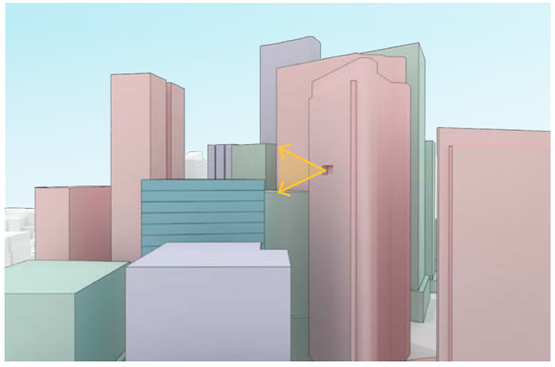


View from Level 27 of Tower A 486 Pacific Highway - Option 3

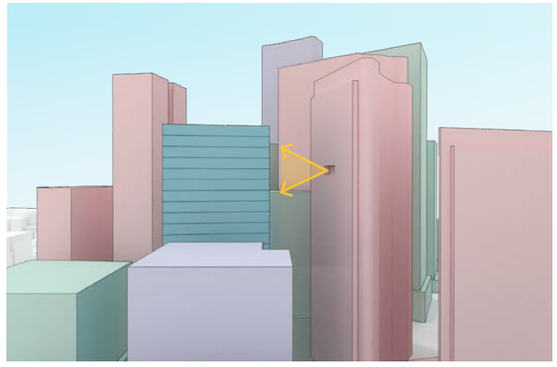


View from Level 27 of Tower A 486 Pacific Highway - Option 1

View location in plan



View location of apartment from Level 27 - Option 3

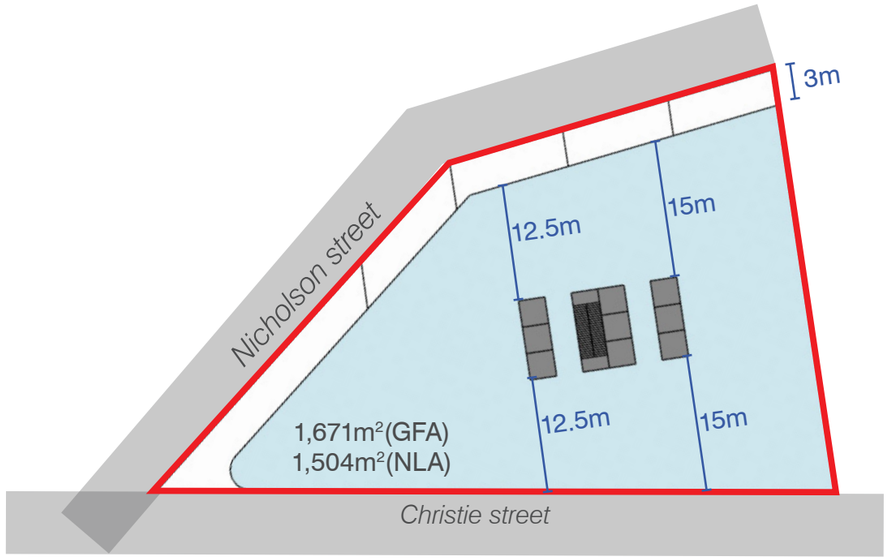


View location of apartment from Level 27 - Option 1

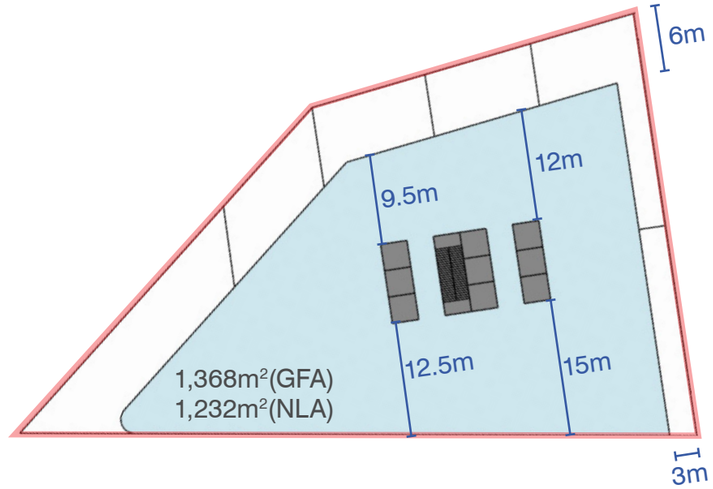
2.9.4 ‘A’ grade office space - Indicative floorplate

The indicative floorplate is showing a potential layout with a centre core.

Architectus considers the indicative floorplate accords with the Property Council criteria for ‘A’ grade office space



Typical podium level



Typical tower level

03 Recommendations

Recommendations

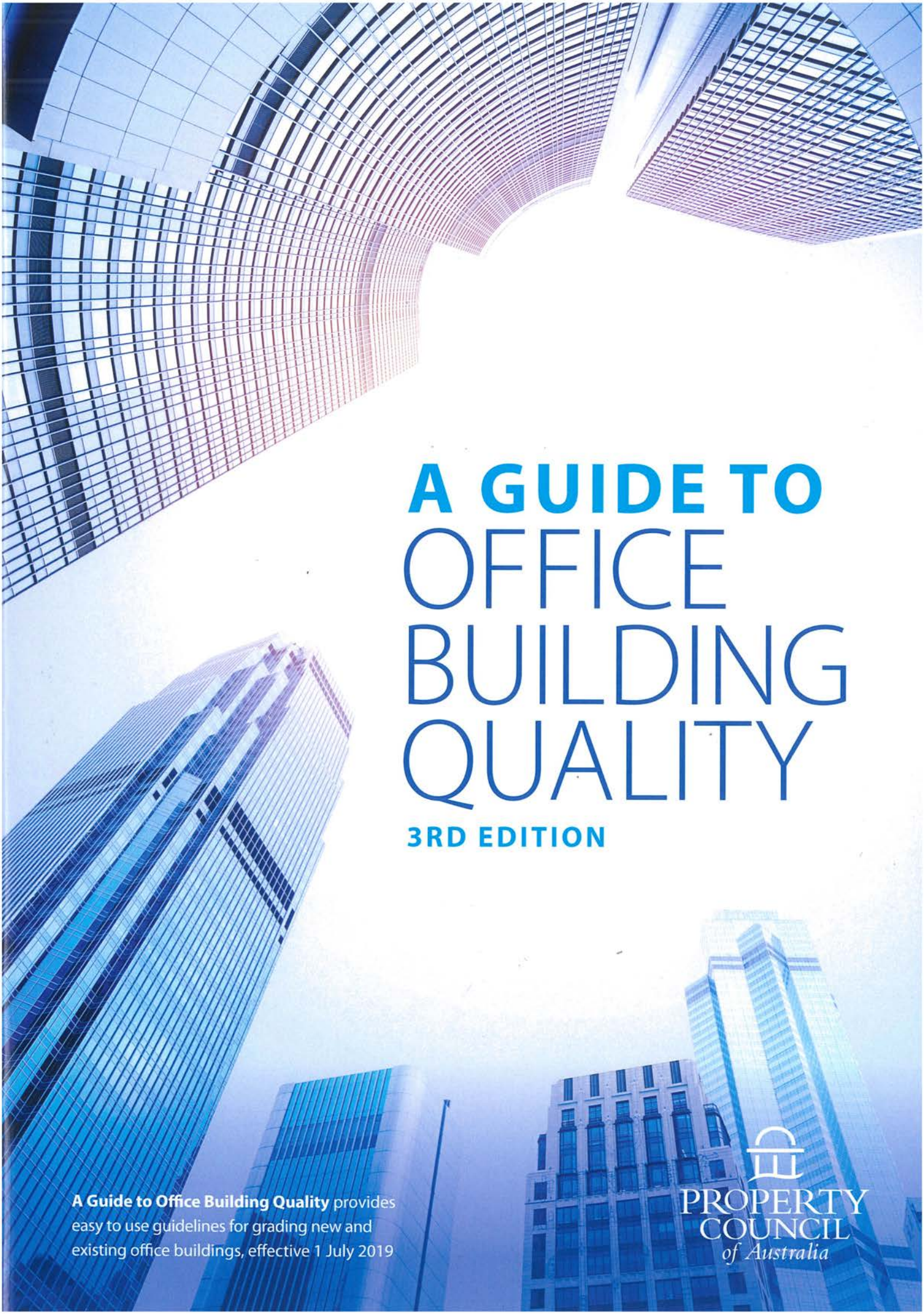
DRAFT

Architectus recommends the following:

1. Option 3 provides the best balanced outcome in achieving the urban design principles.

2. Option 3 achieves 15.0:1 FSR consistent with the 2036 Final Plan but at a lower height by 4 storeys which enables better view sharing with nearby residential neighbours and a better transition in building heights from surrounding lower scale residential areas to the highest buildings along Pacific Highway.

04 Appendix A - A guide to office building quality by the Property Council



A GUIDE TO OFFICE BUILDING QUALITY

3RD EDITION

A Guide to Office Building Quality provides easy to use guidelines for grading new and existing office buildings, effective 1 July 2019

PROPERTY COUNCIL *of Australia*

A GUIDE TO OFFICE BUILDING QUALITY

Property Council of Australia Limited
ABN 13008 474 422
ISBN 978-1-876748-00-5

Level 1
Property Council of Australia House
11 Barrack Street
Sydney NSW 2000

Telephone: +612 9033 1900
Email: info@propertycouncil.com.au
Web: www.propertycouncil.com.au

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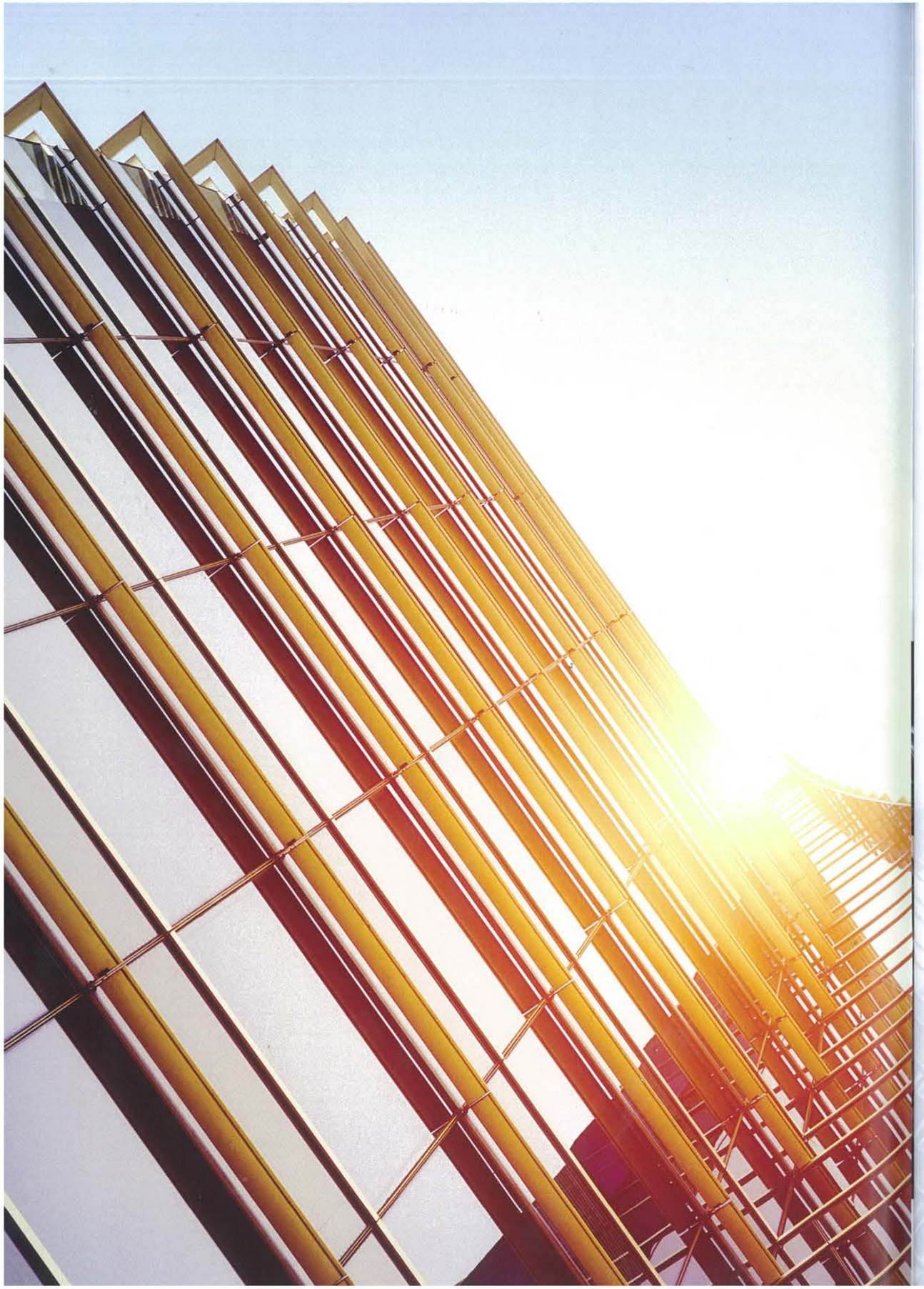

INTRODUCTION

This Guide provides separate tools for assessing office building quality in:

1. **New Buildings**; and

2. **Existing Buildings**.

These tools provide a **Guide** to parameters and criteria that typically influence perceptions of building quality.

These tools belong to the industry and offer a voluntary, market-based approach to classify building characteristics and performances.

This third edition of the Guide builds on previous versions, current expertise, expert consultation and international research identifying the elements of building quality from an occupant's or investor's perspective.

This third edition of the Guide comes into effect on 1 July 2019.

USING THESE BUILDING QUALITY GUIDELINES

1 This Guide applies to office buildings and office space.

2 This Guide is voluntary.

3 This Guide is not a rating tool and the Property Council of Australia does not publicly classify building quality or provide advice on the use of the tool in individual circumstances.

4 The New Buildings matrix applies to buildings for which a development application is submitted after 1 July 2019.

5 The Existing Building matrix relates to all other office buildings.

6 The quality matrices should only be used in conjunction with their relevant explanatory notes.

7 Compliance with statutory requirements is assumed throughout.

8 The quality matrices provide a guide to the typical features of different quality grades of office space. It is not necessary to achieve every parameter nominated in this Guide, however, to qualify for a quality grade, it is anticipated a building will **overwhelmingly meet** the stated criteria of that grade.

9 This Guide describes the optimal mix of features that differentiate building performance. It is an integrated package. Users of this Guide are cautioned against ramping up the standards recommended in this Guide. Higher, bigger and larger is not necessarily better.

10 Users of this Guide are encouraged to exercise their judgement rather than rely on absolute rules or a 'tick the box' approach. Should criteria not be included against a specific parameter this does not preclude its inclusion in a building of that quality.

11 The ultimate measure of office quality is the rent or financial value an occupant is willing to pay or attribute in return for the amenity and services delivered by the building.

12 Perceptions of quality change over time. Acknowledging this, the Guide will be reviewed not less than every three years.

> It is anticipated a building will **overwhelmingly meet** the stated criteria.

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OFFICE QUALITY GRADE MATRIX – OVERVIEW

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
	Descriptor	Presentation	A landmark office building located in major CBD office markets which is a trendsetter in establishing rents. Includes expansive views and outlook, ample natural light, prestige quality access from an attractive street setting, prestige lobby and lift finishes, premium quality lift ride, premium quality amenities, premium presentation and maintenance.	High-quality office building including high-quality views, outlook and natural light, high-quality access from an attractive street setting, high-quality lobby and lift finishes, high-quality lift ride, high-quality amenities, high-quality presentation and maintenance.	Good quality office building with a good standard of finish and maintenance.

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
	Descriptor	Presentation	A landmark office building located in major CBD office markets which is a trendsetter in establishing rents. Includes expansive views and outlook, ample natural light, prestige quality access from an attractive street setting, prestige lobby and lift finishes, premium quality lift ride, premium quality amenities, premium presentation and maintenance.	High-quality office building including high-quality views, outlook and natural light, high-quality access from an attractive street setting, high-quality lobby and lift finishes, high-quality lift ride, high-quality amenities, high-quality presentation and maintenance.	Good quality office building with a good standard of finish and maintenance.	Adequate quality office space.

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EXPLANATORY NOTES – OVERVIEW

A Guide for Office Building Quality third edition reflects current market perceptions of quality and identifies quality metrics which define:

- Premium, Grade A and Grade B standards for new office buildings approved for development from 1 July 2019, and
- Premium, Grade A, Grade B and Grade C standards for existing office buildings.

These metrics have been identified alphanumerically A1 to M3.

Compliance with statutory requirements is assumed throughout. Should this Guide conflict with any statutory requirements, the relevant code or standard will prevail. This Guide provides a basic guidance on office building grade aspirations only.

Gross Floor Areas (GFAs) and Net Lettable Areas (NLAs) referenced in this Guide should be measured in accordance with the Method of Measurement 1997, published by the Property Council of Australia.

Unless otherwise specified, metrics relate to all office floors and all of the office NLA. Metrics are based on one (1) person per 10 sqm.

THE DRIVE TO IMPROVE PERFORMANCE

The Guide recognises energy demand and intensity are decreasing within the property sector, with new implications for building performance. However, this trend is not always reflected in tenant demands. As performance-benchmarking data becomes available, industry practitioners become more skilled, and tenants more knowledgeable, there will inevitably be a closer alignment of infrastructure with the intended use of a building.

This will reduce energy consumption and waste within the property sector without compromising services, resulting in an overall improvement in the built environment's eco-efficiency profile.

OCCUPANCY DENSITY

The parameters and metrics used in this Guide are based on population densities and are assumed to be one (1) person per 10 sqm (for new buildings) and one (1) in 12 sqm (for existing buildings) for 100 per cent of the building's NLA*.

Where densities are less than one (1) person per 10 sqm (or one (1) person per 12 sqm in an existing building), a number of operational parameters may be affected and could create a perception of a poorer building quality from an occupant's perspective. These parameters include mechanical, electrical, communication, amenities, lifts, safety and egress, and health and wellness.

The design and operation of Premium and Grade A buildings should consider the market's expectation for a higher service level and flexibility of tenancy space. It should be recognised that some tenants might choose for offices to be designed explicitly for higher or lower density than what is described in this Guide.

MECHANICAL

Increased occupant density within buildings has two primary impacts on mechanical services systems:

- Increased air conditioning requirements; and
- Increased ventilation requirements.

Buildings expecting higher occupancy densities should allow for the increased air conditioning requirements by:

- Providing additional base building cooling; and/or
- Providing additional capacity provided via the tenant supplementary loop; and/or
- Providing provision for tenant air conditioning plant including the required risers.

Buildings expecting higher occupancy densities should allow for the increased ventilation requirements by:

- Providing additional outside air via base building systems; and/or
- Providing additional supplementary outside air; and/or
- Providing provision for tenant outside air plant including the required louvres and/or risers.

ELECTRICAL

The capacity of the building's power supply and connectivity should be considered during design to accommodate for potential higher density occupancy.

COMMUNICATION

The capacity of the building's connectivity should be considered when designing to accommodate for potential higher density occupancy.

AMENITIES

Amenities should be sized or have the flexibility to accommodate above average occupancy density.

LIFTS

Please refer to section E for more details on lifts in relation to occupancy density. It should be considered that buildings commenced prior to the publish date of this Guide may fall outside of New Building parameters and may be assessed as Existing Buildings as described in this Guide.

SAFETY AND EGRESS

The capacity of fire stairs and refuges typically dictates the maximum capacity of a building and individual floors. Egress requirements are typically based on the Building Code calculation of one (1) person per 10 sqm. Above average occupant density can affect egress, and a tenant requirement for increased density may not be achievable subject to travel distance and exit capacity.

Premium Grade buildings should consider a design and build with a higher density in mind to allow for increased floor densities and to have the flexibility to allow for potential high-density tenant occupation.

ENVIRONMENTAL AND WELLNESS

Above average tenant occupancy can impact on the occupants' health and wellness, including acoustic and visual privacy. Although this can be outside of the building's control, the design and build can assist in minimising the impacts on higher density occupants and will also benefit the lower density occupants.

** Buildings commenced prior to the release of the third edition Guide will be deemed to be assessed as Existing Buildings as described in this Guide.*

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OFFICE QUALITY GRADE MATRIX – ENVIRONMENTAL

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
A1	Environmental rating	Green Star – Design & As Built v1.2	6 Star	5 Star	4 Star
A2	Energy (without green power)	NABERS Office Energy (Commitment)	5.5 Star	5.5 Star	5.5 Star
A3	Water	Number of water points under Green Star – Design & As Built v1.2	4	3	2
A4	Waste	Green Star – Design & As Built v1.2 'Operational Waste' credit	Yes	Yes	Yes
A5	Indoor environment quality	Percentage of minimum Indoor Environmental Quality points under Green Star – Design & As Built v1.2	Min 70% Including credits for thermal comfort	Min 60% Including credits for thermal comfort	Min 50%
A6	Climate change adaptations and resilience	Green Star – Design & As Built v1.2 'Adaptation and Resilience' credit	Yes	Yes	–

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
A1	Environmental rating	Green Star – Performance v1.2	4 Star	3 Star	2 star	2 star
A2	Energy (without green power)	NABERS Office Energy	5 Star	4.5 Star	4 Star	3 Star
A3	Water	NABERS Office Water	4 Star	3.5 Star	3 Star	3 Star
A4	Waste	Green Star – Performance v1.2 'Operational Waste' credit	Yes	Yes	No	No
A5	Indoor environment quality	NABERS IE Score (base building)	5 Star	4 Star	3 Star	–
A6	Climate change adaption and resilience	Capacity to adapt	Yes	Yes	–	–

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EXPLANATORY NOTES – ENVIRONMENTAL

A1 ENVIRONMENTAL RATING

For new buildings: Identifies the minimum required rating in accordance with GBCA's Green Star – Design & As Built v1.2 rating tools.

For existing buildings: Identified the requirement to be rated using GBCA's Green Star – Performance v1.2.

A2 ENERGY (WITHOUT GREEN POWER)

For new buildings: The proposed rating required for a NABERS Energy Commitment Agreement when demonstrating compliance with the National Construction Code 2019 via the JV1 – NABERS Energy for Offices Verification Method. Other available verification methods in the new section J of the NCC 2019 can be used in place of NABERS Energy Commitment Agreements to satisfy this criterion.

For existing buildings: NABERS Energy rating achieved.

A3 WATER

This includes water usage by the end-of-trip facilities.

For new buildings: Identifies the minimum number of points available in the Water category under GBCA Green Star – Design & As Built v1.2 rating tools.

For existing buildings: Identifies the minimum required base building NABERS Water rating.

A4 WASTE

For new buildings: Identifies whether the GBCA's Green Star – Office Design v3 credit 'Mat-1 Waste Storage' or the Green Star – Design & As Built v1.2 'Operational Waste' credit has been achieved.

For existing buildings: Identifies the requirement to be rated using GBCA's Green Star – Performance v1.2 rating with the 'Operational Waste Management Plan' criteria achieved.

A5 INDOOR ENVIRONMENT QUALITY

For new buildings: Identifies the minimum percentage required of the number of points available in the Indoor Environment Quality category under the GBCA's Green Star – Design & As Built v1.2 rating tool with at least one point in the Thermal Comfort Category and additional Advanced Thermal Comfort point for a Premium Grade building awarded.

EXAMPLE: The following could be the points allocations for Premium Grade:
Thermal comfort – 2 (PMV = +/- 0.5 equivalent to occupant satisfaction of 90 per cent)
Indoor pollutants – 2 (Paints, adhesives and wood)
Visual comfort – 3 (Daylighting to 60 per cent of nominated areas and glare control)
Lighting comfort – 1 (General illuminance and glare reduction)
Acoustic comfort – 2 (Internal noise and cross talk addressed)
Indoor air quality – 2 (Good ventilation and outdoor air quantity)
Total = 12 points = 70 per cent of available 17 points for IEQ

For existing buildings: NABERS IE (Base Building) scores (as nominated) may be utilised.

A6 CLIMATE CHANGE ADAPTION AND RESILIENCE

For new buildings: Identifies whether the GBCA's Green Star – Design & As Built v1.2 credit 'Management – Adaptation and Resilience' full credit points have been achieved.

For existing buildings: Identifies the ability to implement fundamental aspects of climate change adaptation, and a mitigation plan has been developed including cost estimates to implement the mitigation measures.

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OFFICE QUALITY GRADE MATRIX – CONFIGURATION

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
B1	Building size	sqm NLA	Sydney/Melbourne CBDs > 30,000 Brisbane/Perth CBDs > 25,000 Other CBDs > 20,000	Sydney/Melbourne CBDs > 10,000 Brisbane/Perth CBDs > 10,000 Other CBDs > 5,000	Sydney/Melbourne CBDs > 5,000 Brisbane/Perth CBDs > 5,000 Other CBDs > 3,000
B2	Floor plate	sqm NLA	Sydney/Melbourne/ Brisbane/Perth CBDs > 1,500 Other CBDs > 1,200	Sydney/Melbourne/ Brisbane/Perth CBDs > 1,000 Other CBDs > 800	Sydney/Melbourne/ Brisbane/Perth CBDs > 700 Other CBDs > 600
B3	Tenant service zone	mm	>= 150	>= 125	>= 100
B4	High loading	% of NLA	5% > 7.5kPa	5% > 7.5kPa	–

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
B1	Building size	sqm NLA	Sydney/Melbourne CBDs > 30,000 Other CBDs > 20,000	Sydney/Melbourne CBDs > 10,000 Other CBDs > 5,000	Sydney/Melbourne CBDs > 5,000 Other CBDs > 2,500	–
B2	Floor plate	sqm NLA	Sydney/Melbourne CBDs > 1,200 Other CBDs > 1,000	Sydney/Melbourne CBDs > 900 Other CBDs > 800	–	–
B3	Tenant service zone	mm	>= 100	–	–	–
B4	High loading	% of NLA	5% > 7.5kPa	5% > 7.5kPa	–	–

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EXPLANATORY NOTES – CONFIGURATION

B1 BUILDING SIZE

Identifies the minimum overall office space NLA requirement for the building. A group of buildings co-located in an office park/complex owned by a single entity can be aggregated when calculating NLA.

B2 FLOOR PLATE

Identifies the minimum NLA for each office floor of the building – 75 per cent or more of the building's office floors must comply with the metric.

EXAMPLE: A new building located in the Perth central business district has 20 office floors. 15 office floors have floorplates of 1,100 sqm NLA or greater. The building meets Grade A floorplate requirements as 75 per cent or greater of the office floors have floorplates that exceed the minimum requirement of 1,000 sqm.

B3 TENANT SERVICE ZONE

Identifies the minimum clear depth (mm) of continuous ceiling void or sub-floor service zone to be made available for tenant reticulation throughout 80 per cent of the net lettable area of every floor.

EXAMPLE: A new Premium Grade building with 1,600 sqm NLA floorplates exceeds minimum requirements if it has a contiguous service zone of 160 mm covering 1,400 sqm of every office floor.

B4 HIGH LOADING

Identifies the minimum high loading capacity for every office floor of the building.

EXAMPLE: A Premium Grade building with 1,600 sqm NLA floorplates exceeds minimum requirements if 100 sqm of every office floor has a capacity of 8 kPa high loading.

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OFFICE QUALITY GRADE MATRIX – MECHANICAL

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
C1	Air conditioning – maximum zone size	sqm (perimeter / centre zone)	<= 75/100	<= 85/120	<= 100/150
C2	Chilled beam density – maximum area served per chilled beam	Watts per m^2 (perimeter / zone)	<= 15/25	<= 20/35	<= 25/50
C3	Tenant equipment	Watts per m^2	>= 15	>= 12	>= 10
C4	Tenant supplementary loop	Watts per m^2	>= 20	>= 20	>= 20
C5	After-hours operation	Minimum zones per floor Maximum zone size (sqm)	4 600	2 600	1 –
C6	Cooling / heating plant redundancy	% peak cooling / heating load	> 60%	> 50%	–

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
C1	Air conditioning – maximum zone size	sqm (perimeter / centre zone)	<= 75/100	<= 85/120	<= 100/150	One per face / <= 200
C2	Chilled beam density – maximum area served per chilled beam	Watts per m^2 (perimeter / zone)	<= 15/25	<= 20/35	<= 25/50	–
C3	Tenant equipment	Watts per m^2	>= 15	>= 12	>= 10	>= 5
C4	Tenant supplementary loop	Watts per m^2	>= 25	>= 20	–	–
C5	After-hours operation	Minimum zones per floor Maximum zone size (sqm)	4 600	2 600	– –	– –
C6	Cooling / heating plant redundancy	% peak cooling / heating load	> 50%	> 40%	–	–

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EXPLANATORY NOTES – MECHANICAL

C1 AIR CONDITIONING – MAXIMUM ZONE SIZE

Identifies the maximum size of perimeter and centre zone areas served by each VAV or equivalent device, with each VAV or equivalent device to be controlled by at least one thermostat to provide a control zone.

Zoning requirements for other systems (e.g. underfloor etc.) should meet a comparable standard in consideration of the building's configuration.

C2 CHILLED BEAM DENSITY – MAXIMUM AREA SERVED PER CHILLED BEAM

Identifies the maximum size of perimeter and centre zone areas served by each active or passive chilled beam. The control zone shall not exceed the criteria set for the maximum zone area in C1.

EXAMPLE: In a Premium Grade building, if the perimeter control zone area is 75 sqm it shall have a minimum five chilled beams controlled by at least one thermostat dedicated to that zone, and if the centre control zone area is 100 sqm it shall have a minimum of four chilled beams controlled by at least one thermostat dedicated to that zone.

C3 TENANT EQUIPMENT

Identifies the minimum capacity required to cool tenant equipment.

C4 TENANT SUPPLEMENTARY LOOP

Identifies the minimum useful cooling capacity required to be provided by a dedicated closed-loop supplementary base building mechanical system, i.e. condenser water-flow rate to allow for the minimum specified W/sqm of cooling load, plus a minimum NCC compliant compressor/package unit.

This provision is required on a 24/7 basis with 100 per cent standby capacity in case of mechanical failure.

To meet potential tenant requirements, the take-offs (valved connection points) for every floor shall be sized to cater for a minimum of 250 per cent of the base metric requirement.

EXAMPLE: A new Grade A building provides a tenant supplementary loop capable of providing 20 W/sqm x 130 per cent for 100 per cent of the building's net lettable area and take-offs for every office floor capable of providing 65 W/sqm.

C5 AFTER-HOURS OPERATION

Identifies the minimum number of zones required per office floor, and maximum zone size.

C6 COOLING / HEATING PLANT REDUNDANCY

Identifies the minimum amount of plant cooling capacity available if one chiller, cooling tower/heat-rejection system or pump fails expressed as a percentage of estimated peak building cooling load.

EXAMPLE: If a chiller, cooling tower/heat rejection system, or pump fails in a new Grade A building, the cooling plant will still continue to function at greater than 50 per cent capacity.

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OFFICE QUALITY GRADE MATRIX – TENANT RISERS

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
D1	General exhaust	L/s/m² (m² capped to minimum floor plate size)	0.25	0.15	–
D2	Commercial kitchen exhaust and commercial kitchen make up air	L/s Number	>= 3,000 1 per rise	>= 3,000 Minimum of 1	– –
D3	Supplementary toilet exhaust	L/s/m² (m² capped to minimum floor plate size)	0.2	0.1	–
D4	Supplementary outside air	L/s/m²	0.30	0.30	0.25

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
D1	General exhaust	L/s/m² (m² capped to minimum floor plate size)	0.2	0.1	–	–
D2	Commercial kitchen exhaust	Number	1 per rise	–	–	–
D3	Supplementary toilet exhaust	L/s/m² (m² capped to minimum floor plate size)	0.2	0.1	–	–
D4	Supplementary outside air	L/s/m²	0.3	0.3	–	–

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EXPLANATORY NOTES – TENANT RISERS

D1 GENERAL EXHAUST

Identifies the minimum general exhaust rate to be provided by a dedicated base building general exhaust system. To meet potential tenant requirements the exhaust take-offs (duct connection points) for every floor shall be sized to cater for a minimum of 250 per cent of the base metric requirement.

EXAMPLE: Premium Grade requirements for a new 42,000 sqm NLA building with 2,000 sqm NLA floorplates are calculated as follows:

1,500 (minimum Premium Grade floorplate) x 0.25 (minimum Premium Grade requirement) = 375 L/s

CALCULATIONS FOR TAKE-OFFS:

1,500 (minimum Premium Grade floorplate) x 0.25 (minimum Premium Grade requirement) = 375 L/s

250 per cent of the base metric requirement for Premium Grade buildings (300 L/s) = 937.5 L/s

Take-offs must be sized to cater for a minimum of 937.5 L/s

D2 COMMERCIAL KITCHEN EXHAUST

Identifies the requirement for commercial kitchen exhaust/s to be achieved by whatever approved means are deemed appropriate.

Premium and Grade A buildings should also provide provision for future tenant make-up air system.

D3 SUPPLEMENTARY TOILET EXHAUST

Identifies the minimum tenant toilet exhaust rate to be provided by the base building toilet exhaust system. To meet potential tenant requirements the exhaust take-offs (duct connection points) for every floor shall be sized to cater for a minimum of 250 per cent of the base metric requirement.

Refer to the example for D1.

D4 SUPPLEMENTARY OUTSIDE AIR

Identifies the minimum supplementary outside air rate to be provided by a dedicated base building system.

To meet potential tenant requirements the take-offs (duct connection points) for every floor shall be sized to cater for a minimum of 250 per cent of the base metric requirement.

EXAMPLE: Premium Grade requirements for a new 56,000 sqm NLA building with 2,000 sqm NLA floorplates are calculated as follows:

2,000 x 0.3 (minimum Premium Grade requirement) = 600 L/s

CALCULATION FOR TAKE-OFFS:

2,000 x 0.3 (minimum Premium Grade requirement) = 600 L/s

250 per cent of the base metric requirement for Premium Grade buildings (600 L/s) = 1,500 L/s

Take-offs must be sized to cater for a minimum of 1,500 L/s

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OFFICE QUALITY GRADE MATRIX – LIFTS

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
E1	Car capacity	Number of persons	>= 21	>= 16	>= 13
E2	Lateral vibration	mg	<= 15	<= 20	<= 20
E3	Waiting time	Seconds during any five-minute period	Up peak <= 25 Lunch peak <= 35	Up peak <= 30 Lunch peak <= 40	Up peak <= 35
E4	Handling capacity	%	Up peak >= 14 Lunch peak >= 12	Up peak >= 13 Lunch peak >= 11	Up peak >= 12 –
E5	Goods lift	Number	>= 1 per 50,000 sqm (or part thereof)	>= 1	–
E6	Goods lift	Capacity (kg)	>= 2,000	>= 1,400	–

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
E1	Car capacity	Number of persons	>= 21	>= 16	–	–
E2	Lateral vibration	mg	<= 20	<= 25	–	–
E3	Waiting time	Seconds during any five-minute period	Up peak <= 25 Lunch peak <= 35	Up peak <= 30 Lunch peak <= 40	Up peak <= 35 –	Up peak <= 40
E4	Handling capacity	%	Up peak >= 14 Lunch peak >= 12	Up peak >= 13 Lunch peak >= 11	Up peak >= 12 –	Up peak <= 10
E5	Goods lift	Number	>= 1 per 50,000 sqm (or part thereof)	>= 1	–	–
E6	Goods lift	Capacity (kg)	>= 1,600	>= 1,200	–	–

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EXPLANATORY NOTES – LIFTS

When calculating lift metrics, population densities are assumed to be one (1) person per 12 sqm for 100 per cent of the building's NLA and lift cars not being loaded to not more than 80 per cent of their rated capacity.

Passenger demand is defined as the rate at which people request service from the lift system (expressed as a percentage of the total building population based on the density for 100 per cent of the building's NLA) that a lift system can travel during a five-minute peak period, for each group or rise of lifts.

Lift system should serve all office levels.

E1 CAR CAPACITY

Identifies the minimum car capacity for each passenger lift serving all office floors.

For new buildings: The minimum car capacity is based on an average of 75kg per person.

For existing buildings: The minimum car capacity is based on an average of 68kg per person.

E2 LATERAL VIBRATION

Identifies the maximum level of lateral vibration measured in accordance with the relevant standard for measurement of lift-ride quality. Please refer to the ISO 18738 for further details.

E3 WAITING TIME

Waiting time is defined as the average time from when a passenger registers their call until the designated lift begins to open its doors at the main lobby during up peak or until the designated lift begins to open its doors at the boarding floor during lunch peak periods.

E4 HANDLING CAPACITY

Handling capacity for up peak traffic condition is defined as the total number of passengers (expressed as a percentage of the total building population) based on a density of one (1) person per 12 sqm for 100 per cent of the building's NLA that a lift system can transport from the main lobby level in the five-minute peak period, for each group of lifts.

In situations where tenants are likely to occupy developments where flexible workplace environments are anticipated, then a traffic profile of 85 per cent incoming, 10 per cent outgoing and 5 per cent inter-floor should be considered.

Handling capacity for the lunch peak two-way traffic condition is defined as the total number of passengers (expressed as a percentage of the total building population based on a density of one travel during a five-minute peak period) for each group of lifts.

In situations where tenants are likely to occupy developments where flexible workplace environments are anticipated, then a traffic profile of 45 per cent incoming, 45 per cent outgoing and 10 per cent inter-floor should be considered.

E5 GOODS LIFT

Identifies the minimum number of dedicated goods lifts. Goods lifts must serve every floor of the building, including loading docks and roof plant room floors, but may exclude sub-loading dock car parking floors. Goods lifts in Grade A buildings less than 30,000 sqm NLA may be a shared service/passenger lift.

E6 GOODS LIFT

Identifies the minimum capacity (kg) of each goods lift.

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OFFICE QUALITY GRADE MATRIX – ELECTRICAL

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
F1	Power	VA / m² (risers)	>= 40	>= 40	>= 40
F2	Lighting	NCC compliance	Yes	Yes	Yes
F3	Lighting control	Programmable lighting control zones sqm	<= 100	<= 150	–
F4	Building management control systems (BMCS)	Type	Full BMCS including on floor control, energy management, comfort control, lift and mechanical metering systems, detailed diagnostics and reporting.	Full BMCS including on floor control, energy management, comfort control, lift and mechanical metering systems, diagnostics and reporting.	Full BMCS including on floor control, energy management, comfort control, basic diagnostics and reporting.

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
F1	Power	VA / m² (risers)	>= 60	>= 50	>= 40	>= 20
F2	Lighting	NCC compliance	Yes	Yes	Yes	Yes
F3	Lighting control	Programmable lighting control zones sqm	<= 150	<= 200	–	–
F4	Building management control systems (BMCS)	Type	Full BMCS including on floor control, energy management, comfort control, lift and mechanical metering systems, detailed diagnostics and reporting.	Full BMCS including on floor control, energy management, comfort control, lift and mechanical metering systems, diagnostics and reporting.	Full BMCS including on floor control, energy management, comfort control, lift and mechanical metering systems, basic diagnostics and reporting.	Electronic/pneumatic

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EXPLANATORY NOTES – ELECTRICAL

F1 POWER

Identifies the minimum power capacity available to tenanted space within the building.

Lighting power efficiency should comply with the supply authority requirements in each state/territory.

F2 LIGHTING

Identifies whether the requirements of the National Construction Code (NCC) Part J6 'Artificial lighting and power' have been met.

Part J6.2 (b) sets out the requirements for design illumination power load for office buildings, in addition to figures presented in Tables J6.2 (a) (Maximum illumination power density), J6.2 (b) (Illumination power density adjustment factor for a control device) and J6.2 (c) (Illumination power density adjustment factor for light colour).

Alignment to the requirements of the NCC is based on expected changes to be delivered in NCC 2019. Project proponents are expected to reference the version of the NCC that is current at the time of seeking DA approval.

For existing buildings: It would be expected that any refurbishment or upgrade will reference the requirements in Part J6 of the NCC that is current at the time of the upgrade.

F3 LIGHTING CONTROL

For new buildings: Identifies the requirement for programmable lighting zones.

For existing buildings: Identifies the requirement for switched or programmable lighting zones.

F4 BUILDING MANAGEMENT CONTROL SYSTEMS (BMCS)

Identifies the minimum level of base building control integrated into the building services of the building. All sensors and VAVs/induction/chilled beam units etc. must be monitored and controlled by the BMCS, and all output devices, i.e. valves, dampers, etc. to be actuated by the BMCS.

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OFFICE QUALITY GRADE MATRIX – STANDBY POWER – BASE BUILDING

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
G1	Lifts	Number of lifts / rise	50%	1 lift per rise	–
G2	Safety services (other than lifts)	Capacity	100%	100%	–
G3	House lights and power	Capacity	100%	50%	–
G4	Central plant	Capacity	50%	–	–
G5	Tenant supplementary loop	Capacity	100%	100%	–
G6	Tenant lights and power	Capacity	50% and space provision for tenant generator/s	Space provision for tenant generator/s	–
G7	Onsite fuel storage	Hours of operation	24	12	–

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
G1	Lifts	Number of lifts / rise	50%	1 lift per rise	–	–
G2	Safety services (other than lifts)	Capacity	100%	100%	–	–
G3	House light and power	Capacity	100%	100%	–	–
G4	Central plant	Capacity	50%	–	–	–
G5	Tenant supplementary loop	Capacity	100%	100%	–	–
G6	Tenant lights and power	Capacity	50% and space provision for tenant generator/s	Space provision for tenant generator/s	–	–
G7	Onsite fuel storage	Hours of operation	24	12	–	–

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EXPLANATORY NOTES – STANDBY POWER – BASE BUILDING

G1 LIFTS

Identifies the minimum base building standby power required for lifts.

G2 SAFETY SERVICES (OTHER THAN LIFTS)

Identifies the minimum base building standby power required for all essential services including base building ventilation systems.

G3 HOUSE LIGHT AND POWER

Identifies the minimum base building standby power required for house, (base building) lights and power.

G4 CENTRAL PLANT

Identifies the minimum base building standby power required to operate central plant including chillers.

G5 TENANT SUPPLEMENTARY LOOP

Identifies the minimum base building standby power provision required for the tenant supplementary loop.

G6 TENANT LIGHTS AND POWER

Identifies the minimum base building standby power provision required, and spatial provision for tenant generators capable of supporting 100 per cent of tenant light and power, with generator connection points at the main switchboard.

EXAMPLE: In the event of a power outage a new Premium Grade building will have standby power sufficient to operate all of the following:

- 50 per cent of lifts.
- 100 per cent of safety services other than lifts.
- 100 per cent of house lights and power.
- 50 per cent central plant operation.
- 100 per cent tenant supplementary loop capacity.
- 50 per cent of tenant lights and power.

G7 ONSITE FUEL STORAGE

Identifies the fuel storage onsite required to operate the base building standby powerplant at full capacity for the hours nominated.

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OFFICE QUALITY GRADE MATRIX – BUILDING MANAGEMENT

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
H1	Management personnel	Level of service	Full management and operational onsite team, regular building management committee meetings, active environmental education, adoption of software-based facility management systems, including integration with building information management (BIM), where utilised.	Full management and operational onsite team for buildings greater than 30,000 sqm. Regular building management committee meetings, online tenant service request system, active environmental education, building user guides and risk management systems.	Remote monitoring with daily site attendance.
H2	Courier coordination	Yes / No	Yes with space provided	Yes	Yes
H3	Life cycle maintenance	Years	>= 15	>= 10	>= 5
H4	Energy and water submetering	Yes / No	Yes	Yes	Yes
H5	IEQ monitoring	Yes / No	Yes – utilising IEQ monitors / loggers	Yes	No

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
H1	Management personnel	Level of service	Full management and operational onsite team, regular building management committee meetings, online tenant service request system, active environmental education, building user guides and risk management systems.	Full management and operational onsite team for buildings greater than 30,000 sqm. Regular building management committee meetings, online tenant service request system, active environmental education, building user guides and risk management systems.	Remote monitoring with daily site attendance.	–
H2	Courier coordination	Yes / No	Yes	Yes	No	No
H3	Life cycle maintenance	Years	>= 10	>= 5	–	–
H4	Energy and water submetering	Yes / No	Yes	Yes	Yes	–
H5	IEQ monitoring	Yes / No	Yes – utilising IEQ monitors / loggers	Yes	No	–

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EXPLANATORY NOTES – BUILDING MANAGEMENT

H1 MANAGEMENT PERSONNEL

Identifies the minimum base building management required.

H2 COURIER COORDINATION

Identifies the availability of a designated area for couriers to enter the building under the guidance of the management personnel; for buildings located in larger CBDs.

H3 LIFE CYCLE MAINTENANCE

Identifies the term of management plan that must be in place for the long-term maintenance of the building fabric and services to maintain its current quality grade.

H4 ENERGY AND WATER SUBMETERING

Identifies the requirement for energy and water demand sub-metering for all base building energy and water use in accordance with GBCA's Green Star – Design & As Built v1.2 'Metering and Monitoring' credit.

These meters must be integrated into the BMCS or a similar system to provide required reporting.

For New Buildings this should be available online.

H5 IEQ MONITORING

Real-time monitoring of IEQ vectors may be utilised in the compilation of required data under A5, via BMS with interface accessible to building users.

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OFFICE QUALITY GRADE MATRIX – COMMUNICATIONS

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
I1	Tenant data risers	Number	1/20,000 sqm (or part thereof), minimum of two, all physically separated	1/30,000 sqm (or part thereof), minimum of two, all physically separated	Minimum of 1
I2	MDF room	Number	>= 2, both to have at least two lead-ins from property boundary	>= 1, at least two lead-ins from property boundary	–
I3	Master antenna television	Yes / No	Yes, with space in riser for cable TV	Yes, with space in riser for cable TV	Yes
I4	Carriers	Number	2	2	1
I5	In-building mobile phone coverage	% of building area	100% GFA including lifts and car park	100% GFA	95% GFA

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
I1	Tenant data risers	Number	1 per 20,000 sqm (or part thereof)	1 per 30,000 sqm (or part thereof)	Minimum of 1	–
I2	MDF room	Number	>= 1, at least two lead-ins from property boundary	>= 1	–	–
I3	Master antenna television	Yes / No	Yes, with space in riser for cable TV	Yes, with space in riser for cable TV	Yes	–
I4	Carriers	Number	2	2	–	–
I5	In-building mobile phone coverage	% of building area	100% GFA	100% NLA	–	–

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EXPLANATORY NOTES – COMMUNICATIONS

I1 TENANT DATA RISERS

Identifies the minimum number of physically separated dedicated data risers running from the MDF room provided in the base building for use by tenants for their communications reticulation. These dedicated tenant data risers are in addition to the base building communications/data riser/s.

I2 MDF ROOM

Identifies the number of MDF room/s to be provided in the base building.

Lead-in refers to the provision of conduit/s from the street boundary connection pit to the MDF room for the respective communication carrier cabling.

I3 MASTER ANTENNA TELEVISION

Identifies the requirement for MATV and availability of cable television connection.

I4 CARRIERS

Identifies the minimum number of spatial provisions for communication carriers to be provided in the MDF room by the base building infrastructure.

I5 IN-BUILDING MOBILE PHONE COVERAGE

Identifies the minimum coverage for uninterrupted mobile phone communication within the building and Wi-Fi connectivity in the public foyer and lobby areas. This may be achieved through a distributed antenna system (DAS) for enhanced mobile coverage. It would be anticipated that further details could be found in a buildings MCF DAS Design Specification.

EXAMPLE: New Premium Grade buildings should provide 100 per cent uninterrupted mobile phone coverage within the building, including lifts and car park, and Wi-Fi access in common lobby areas.

New Grade A buildings provide 100 per cent uninterrupted mobile phone coverage within the building excluding lifts and car park.

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OFFICE QUALITY GRADE MATRIX – HYDRAULICS

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
J1	Water storage	Hours of operation	4	2	–
J2	Grease line	Yes / No	Yes	Yes for buildings >= 30,000 sqm	–
J3	Non-potable water system	Yes / No	Yes	Yes	–

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
J1	Water Storage	Hours of operation	2	2 for buildings >= 30,000 sqm	–	–
J2	Grease line	Yes / No	Yes	Yes for buildings >= 30,000 sqm	–	–
J3	Non-potable water system	Yes / No	Yes	–	–	–

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EXPLANATORY NOTES – HYDRAULICS

J1 WATER STORAGE

Identifies the minimum base building water storage to enable the building to continue full operation (excluding fire services) in the event of interrupted mains water supply to the building.

J2 GREASE LINE

Identifies the requirement for a heated grease disposal line for all tenant office floors and retail food tenancies to the grease trap.

J3 NON-POTABLE WATER SYSTEM

Identifies the requirement for a complete non-potable water reticulation system connected to a recycled water plant if provided. Non-potable water can include rainwater or greywater.

Where a recycled water plant is not provided, the non-potable water reticulation system will be connected to the potable water supply.

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OFFICE QUALITY GRADE MATRIX – SECURITY

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
K1	Access system	Type	Proximity	Proximity	Proximity
K2	Control room / security desk	Location / availability	Onsite 24/7	Onsite 24/7 for buildings >= 30,000 sqm	Off site 24/7
K3	CCTV	Extent of coverage	Main public areas/ lobbies, car parks, loading docks, goods lifts and all points of entry and exit.	Main public areas/ lobbies, loading docks, goods lifts and all points of entry and exit.	Main public areas, main points of entry and exit.
K4	CCTV archive footage storage	Days	60	30	15
K5	Inter-floor fire stair access	Yes / No	Yes, minimum of two	Yes, minimum of one, with conduits for future expansion in other fire stair/s	–

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
K1	Access system	Type	Proximity	Proximity	Yes	Yes
K2	Control room / security desk	Location / availability	Onsite 24/7	Onsite 24/7 for buildings >= 30,000 sqm	Off site 24/7	Periodic patrol
K3	CCTV	Extent of coverage	Main public areas/ lobbies, car parks, loading docks, goods lifts and all points of entry and exit.	Main public areas/ lobbies, loading docks, goods lifts and all points of entry and exit.	Main points of entry and exit.	–
K4	CCTV archive footage storage	Days	60	30	15	–
K5	Inter-floor fire stair access	Yes / No	Yes, minimum of one	Yes, minimum of one	–	–

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EXPLANATORY NOTES – SECURITY

K1 ACCESS SYSTEM

Identifies the type of access system incorporated into the base building, including entry/exit, lift cars, tenant floors and the like (as applicable).

K2 CONTROL ROOM / SECURITY DESK

Identifies the minimum level of security provided by the base building.

EXAMPLE: A building with an onsite security control room or lobby security desk staffed 24 hours a day, seven days a week meets Premium Grade requirements.

K3 CCTV

Identifies the minimum level of colour and digital CCTV coverage provided by the base building.

K4 CCTV ARCHIVE FOOTAGE STORAGE

Identifies the number of days full archival storage of all CCTV images must be maintained.

K5 INTER-FLOOR FIRE STAIR ACCESS

Identifies the security access system (including door strikers and card readers) that is to be provided to the fire stairs to enable fire stair access between floors.

EXAMPLE: An existing building in which the access system is provided to at least one set of fire stairs, to enable access between floors, meets Premium Grade requirements.

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OFFICE QUALITY GRADE MATRIX – AMENITIES

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
L1	Concierge	Yes / No	Yes	Yes, for buildings >= 20,000 sqm	–
L2	End-of-trip facilities	Yes / No	Yes	Yes	–
L3	Onsite retail	Yes / No	Yes	Yes	No
L4	Access to public transport and amenities	Yes / No	Yes	Yes	No

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
L1	Concierge	Yes / No	Yes	Yes for buildings >= 20,000 sqm	–	–
L2	End-of-trip facilities	Yes / No	Yes	Yes	–	–
L3	Onsite retail	Yes / No	Yes	Yes	No	No
L4	Access to public transport and amenities	Yes / No	Yes	Yes	–	–

PROPERTY COUNCIL OF AUSTRALIA

EXPLANATORY NOTES – AMENITIES

L1 CONCIERGE

Identifies the requirement for a concierge facility, which may be incorporated into the lobby security desk, as part of the base building. New technological options could be used to replace a dedicated concierge personnel.

L2 END-OF-TRIP FACILITIES

Identifies the minimum required rating in accordance with GBCA's Green Star – Design & As Built Sustainable Transport Credit. Industry consultation for the bike storage, lockers and shower metrics are not currently available.

For existing buildings: Identifies the requirement for bicycle storage, lockers and showers.

L3 ONSITE RETAIL

Identifies the requirement for onsite food and beverage tenants.

For existing buildings: Identifies the building located in proximity to retail.

L4 ACCESS TO PUBLIC TRANSPORT AND AMENITIES

Identifies the requirement for easy access and within walking distance to public transport, healthcare facilities and childcare. Walking distance is defined as being within 800 meters of the property.

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OFFICE QUALITY GRADE MATRIX – PARKING

New Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings
M1	Car park	Yes / No	Yes	Yes	–
M2	Loading docks / delivery bay	Yes / No	Yes	Yes	–
M3	Courier parking	Yes / No	Yes	Yes	–

Existing Buildings

Code	Parameter	Unit	Premium Buildings	Grade A Buildings	Grade B Buildings	Grade C Buildings
M1	Car park	Yes / No	Yes	Yes	–	–
M2	Loading docks / delivery bay	Yes / No	Yes	Yes	–	–
M3	Courier parking	Yes / No	Yes	Yes	–	–

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EXPLANATORY NOTES – PARKING

M1 CAR PARK

Identifies the requirement for car parking as part of the base building.

For new buildings: Identifies consideration for the provision of electric vehicle parking in Premium Grade buildings.

M2 LOADING DOCKS / DELIVERY BAY

Identifies the requirement for a dedicated loading dock or delivery bay as part of the base building.

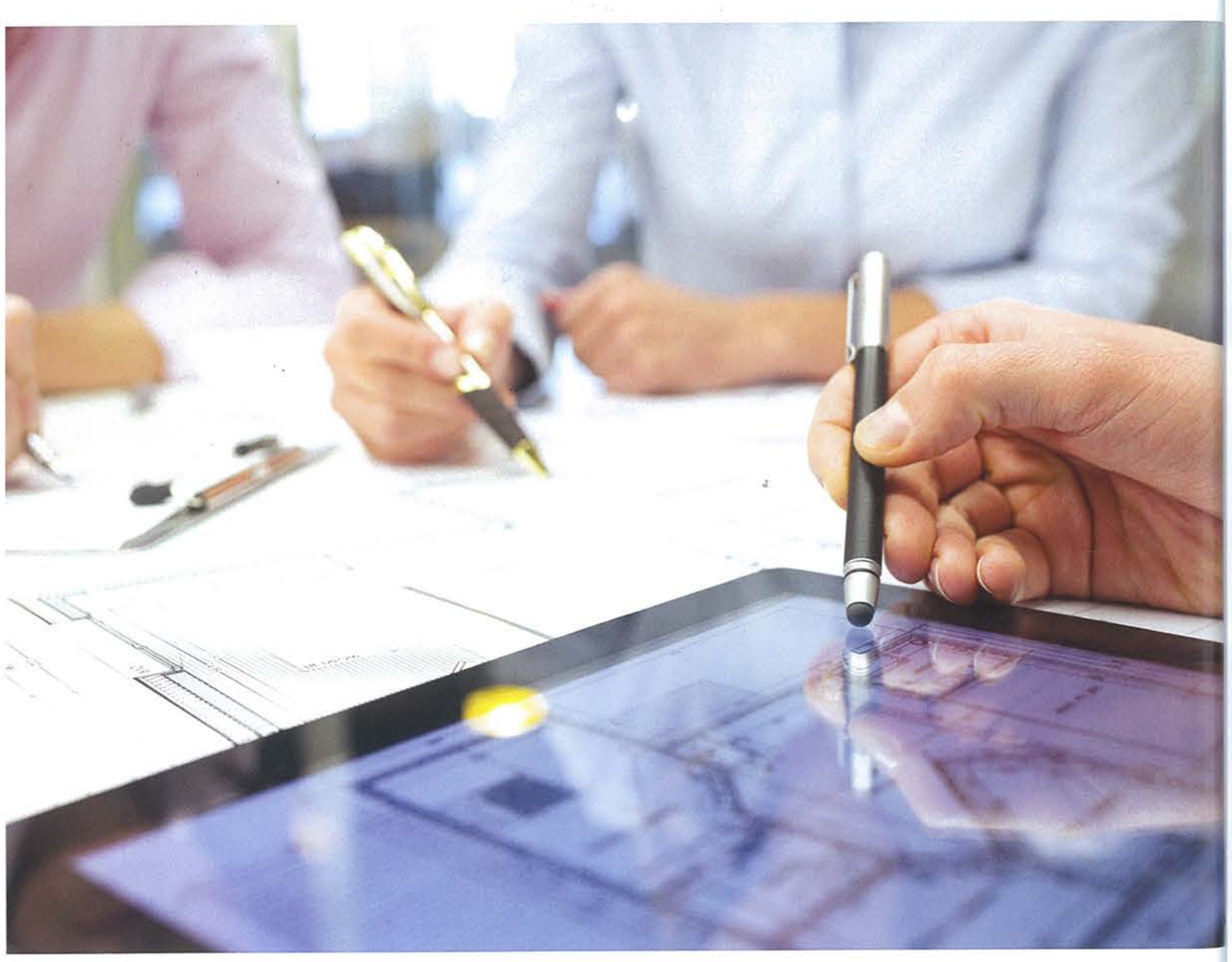
M3 COURIER PARKING

Identifies the requirement for courier vans and bike parking facilities as part of the base building.

LIST OF ABBREVIATIONS

BMCS	building monitoring and control system
CBD	central business district
CCTV	closed circuit television
DAS	distributed antenna system
GBCA	Green Building Council of Australia
GFA	gross floor area
Hyphen (–)	not applicable
IEQ	indoor environment quality
kg	kilograms
kPa	kilopascals
L/s	litres per second
L/s/sqm	litres per second per square metre
MATV	master antenna television
MDF	main distribution frame
mg	milligrams
mm	millimetres
NABERS	National Australian Built Environment Rating Scheme
NCC	National Construction Code
NLA	net lettable area
sqm	square metres
VA/sqm	voltage amperes per square metre
W/sqm	watts per square metre

EMERGING QUALITY ISSUES



The Guide recognises there will be limitations on the current parameters, definitions and referencing tools used in this publication. This section provides a snapshot of some factors that may be considered when designing or upgrading an office building in the next few years.

QUALITY INDOOR ENVIRONMENTS AND WELLNESS FACTORS

The provision of quality indoor environments and the overall impact of building design on health and wellness of occupants, while always important, will likely come under more scrutiny in the coming years. These issues include, but are not limited to, air quality, lighting and daylighting levels, thermal performance, and acoustic and water trends that will impact building performance. There is also an increasing need to consider lifestyle issues such as access to amenity, fitness and healthy foods. Building designers should also consider the impacts of external environments such as heat island effects, acoustics and air pollution. Tools and rating schemes continue to evolve to provide guidance in relation to these trends and should be considered. These include Green Star Performance, NABERS IE, Wellness, Living Building Challenge and the broader impact of a range of existing and new standards such as the ISO 41000 series.

CARBON NEUTRALITY

With the launch of the Low Carbon, High-Performance report by Australian Sustainable Built Environment Council (ASBEC) in 2016, our industry committed to achieving net zero emissions by 2050.

This target is in keeping with Australia's commitments to the Paris Agreement and will require joint action and support of industry and government to achieve. Following the release of this report, a collaborative effort between industry and government saw the release of the National Carbon Offset Standard for Buildings and Precincts, providing a pathway for Australia's buildings to be certified as carbon neutral.

The market for carbon-neutral buildings will continue to grow in the coming years as tenants seek to align their own sustainability agendas with the credentials of the spaces they occupy. Several Australian REITs have set their own net zero targets well before 2050, and the Green Building Council of Australia (GBCA) aspires for all new buildings to be net zero by 2030, and all existing buildings to be net zero by 2050.

With the first industry benchmarks in place now, the next revision of *A Guide to Office Building Quality* may look to leverage these benchmarks for Australia's top performing buildings.

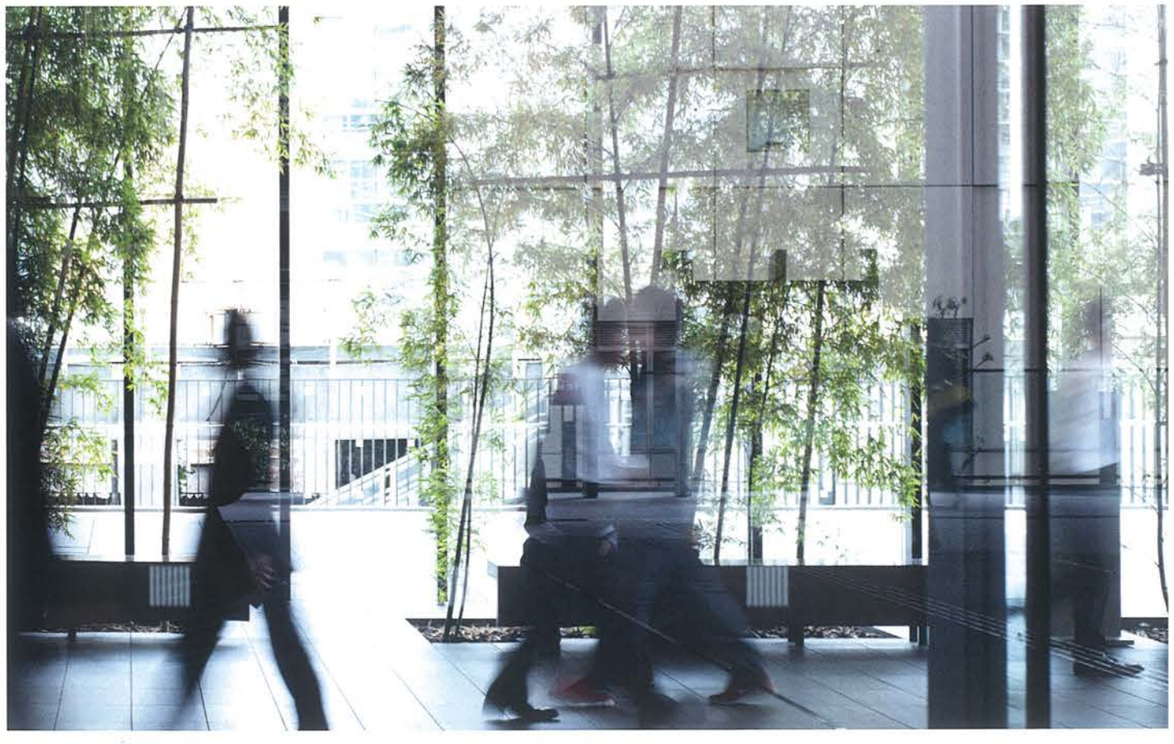
SUSTAINABILITY

Sustainable design considerations for office environments not only provide for comfortable, productive workplaces, but also help to minimise the whole-of-life impact on the built environment. Modern office designs are increasingly focused on attributes that are resource efficient, environmentally sustainable and cost-effective to operate.

An example of the growing adoption of sustainable amenities in office buildings is end-of-trip facilities (EoT) and the negative impact these have on water usage. Work-life balance has been a significant driver of workplace culture. Exercising and cycling to/from work is becoming increasingly popular in modern society. The availability of EoT can be a point of differentiation for tenants; however, for landlords, EoT can increase water consumption. To help mitigate the rise in water usage, landlords could consider recycling excess EoT water to irrigate gardens, flush fire systems, or treat it and feed it back into the water grid.

To make office environments more energy efficient, project teams can incorporate cost-effective principles for energy management, including fluorescent and dimmable light fittings, motion sensors and daylight sensors in appropriate locations as well as zoned heating and cooling functions.

To ensure sustainable outcomes are achieved, it is necessary to address a number of components, such as the selection of building and fitout materials, waste, water efficiency, energy efficiency, as well as access to sustainable transport, indoor environment quality, land use and ecology and emissions. Tools and rating schemes are also available to help provide guidance and assurance that new or refurbished office accommodation can deliver an improved sustainable outcome.



URBAN RESILIENCE

The global initiative of 100 Resilient Cities describes urban resilience as the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and thrive no matter what kinds of chronic stresses and acute shocks it experiences. With two Australian cities (Sydney and Melbourne) participating in the program, there is a spotlight on the way our cities are planning to become more resilient to chronic stresses, such as increasing health services demand, diminishing social cohesion, decreased housing affordability and lack of transport diversity, as well as acute shocks like extreme weather events, infrastructure failures and cyber attacks.

The built environment has an enormous role to play in making our cities more resilient in tackling these challenges. Natural disasters such as bushfires, floods or cyclones constitute real threats to buildings in operation. The long-term effects of climate change are likely to increase the frequency of these events. Therefore, it is important, given our broader understanding of urban resilience beyond climate-related events, to have design solutions that address the building's capacity to respond and adapt to changing conditions and extreme events that occur in our cities.

WORKPLACE STRATEGY

There is a range of economic, technological and social forces changing the way business is conducted today. Modern workplace strategies embrace these changes and drive productivity and satisfaction levels of organisations and their people, impacting on brand, market perceptions and supporting talent attraction and retention.

We have seen an increasing change in workplace typology. Distributed workplace, activity based working (ABW), serviced offices, shared offices, hoteling, coworking, video conferencing, telecommuting, virtual reality interfacing, call centres, and work from home are just a few of the new working environments in our commercial world today. Each of these may have impacts on the specific and overall density and utilisation of our work environments, some increasing and some reducing the population of our buildings and their operational life cycles.

Also, see Explanatory Notes – Overview (page 9) of this Guide for an explanation on how office density is currently dealt with.

INTEGRATED TECHNOLOGY

Technology is increasingly enabling and changing how we interact and experience our built environment in terms of how we live, work and play. Emerging issues in office design include, but are not limited to:

The Internet of Things (IoT) will expand exponentially, including communication network bandwidth, coverage and availability – from both external providers and in-building Wi-Fi and mobile data networks.

User ability to influence office space conditions will continue to increase, as will the ease of doing so. Examples such as customisable preferences for control over lighting and air conditioning, real-time monitoring, analysis and display of wellness-related indicators and the like are, or soon will be possible.

Fully integrated building systems will be best able to leverage opportunities provided by the emergence of intelligent systems or smart buildings with greater use of data analytics to regulate operational performance.

Cyber security will become paramount in protecting against both accidental and malicious flows of information between systems and organisations.

This includes the ability for the workplace to support big data environments, host blockchain servers, ability to adapt and apply virtual reality and robotics.

Such issues will be increasingly reflected in the changing attitudes in how commercial property is delivered. The office market is seeking much more than just office space.

PROJECT HISTORY AND ACKNOWLEDGEMENTS

The first and second editions of the Property Council's *A Guide to Office Building Quality* were published in May 2006 and January 2012, which updated and expanded the Property Council's Office Quality Grade Matrix of the 1990s. During 2017, a new Steering Committee of industry experts was formed comprising a combination of authors from previous editions and new contributors, and regular meetings were held to revise the Guide. Sub-committee working groups were also formed to gain deeper understanding of selected parameters and emerging building quality issues.

The Property Council engaged the industry through consultation via their website, and submissions were invited. In addition, several member forums and a webinar were held to discuss the document to ensure broad input from all sectors of the market.

The Property Council sincerely thanks members for their huge contribution to this project, which directly shaped the third edition of *A Guide to Office Building Quality*.

A Guide to Office Building Quality was formally adopted by the Property Council's Board of Directors, for implementation from 1 July 2019.

The Property Council also acknowledges the tireless work of the project Steering Committee and sub-committees in reviewing all submissions received and shaping a valuable voluntary assessment tool for the industry.

GUIDE TO OFFICE BUILDING QUALITY STEERING COMMITTEE

Stephen Ballesty (Committee Chair) – In-Touch Advisory
Ingrid Bakker – HASSELL
Jeff Bracken – The GPT Group
Jorge Chapa – Green Building Council of Australia (GBCA)
Andrew Cialini – BuildSurv
Rebecca Fitzgerald – WSP
John Goddard – J Goddard & Co
Bryn Grainger – Optus
Stuart Grierson – Queensland Government Accommodation Office (Department of Housing & Public Works)
Trevor Hamilton – Nettletontribe
Scott Hampson – Arup
Ian Hanna – Norman Disney & Young
Stuart Hunter – Optus
Jake Kennelly – Floth Sustainable Building Consultants
Dennis Lee – NSW Office of Environment & Heritage (NABERS)
Graeme McRae – Floth Sustainable Building Consultants
Peter Morley – Dexus
Ashak Nathwani AM – The University of Sydney
Steve Newton – Schindler Lifts Australia
Bradley Norris – Charter Hall
Andrew Packness – Elevator Project Management
Lona Parker – Tract Consultants
Lucy Pullin – Mirvac
Tom Pullinen – Pullinen Property Group
Mark Quinn – Property Cost Management & Advisory
Jeffrey Robinson – Aurecon
Phil Senn – Charter Hall
Darren Teoh – AMP Capital

The Property Council and the Steering Committee wish to acknowledge and pay respect to Peter Tomlinson (Arup), who passed away during the course of the project.

GUIDE TO OFFICE BUILDING QUALITY SUB-COMMITTEE WORKING GROUP

Stephen Ballesty (Committee Chair) – In-Touch Advisory
Rachel Blackburn – Dexus
Peta Carey – Dexus
Carlos Flores – NSW Office of Environment & Heritage (NABERS)
Gerard Healey – University of Melbourne
Malin Lindblad – Arup
Valerie Mack – Buchan Group
David Palin – Mirvac
Steven Peters – ISPT
Daren Price – The Hills Shire Council
Nathan Rosaguti – Mirvac
John Unsworth – JHA Consulting Engineers
David Waldren – Vicinity Centres

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Ric O'Connell – Scentre Group
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Adrian Taylor – Charter Hall

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Property Council of Australia

Property Council of Australia House

Level 1, 11 Barrack St Sydney NSW 2000

Telephone: 02 9033 1900

Email: info@propertycouncil.com.au

Website: www.propertycouncil.com.au