

# DRAFT BUILDINGS THAT BREATHE

DESIGN GUIDE

**brisbane**  
australia's new world city



*Dedicated to a better Brisbane*



# VISION

Our city is a subtropical urban garden occupied by buildings that breathe - open to our climate and adorned with greenery.

Building walls and windows open up to natural light and air, capturing ambient daylight and cooling breezes, reducing our energy needs.

Shaded outdoor spaces with panoramic views create memorable places to meet and relax.

Generous planting grows on our streets, rooftops and walls, embedding green into our city and enriching our urban biodiversity.

In Brisbane, our buildings celebrate our subtropical climate.



## BUILDINGS THAT BREATHE EIGHT ELEMENTS

As the capital of our state and the heart of our economy, Brisbane's city centre will showcase the highest standards of architecture and subtropical design. Buildings that breathe (btb) are buildings in our city centre that embrace our subtropical climate and showcase our city's urban character and outdoor lifestyle. Openness, permeability and a strong connection with the natural environment are the main characteristics of well-designed subtropical cities. The following eight elements form a kit-of-parts that have been identified by Brisbane City Council as the key considerations to creating 'buildings that breathe'.

- 01 ORIENTATE YOURSELF ●
- 02 OCCUPY OUTDOOR SPACES ●
- 03 ILLUMINATE WITH DAYLIGHT ●
- 04 NATURAL AIR AND VENTILATION ●
- 05 SHADE AND PROTECT ●
- 06 LIVING GREENERY ●
- 07 IDENTITY MATTERS ●
- 08 REDUCE ENERGY AND WASTE ●

# FOREWORD

Brisbane's city centre is the thriving heart of Australia's New World City. With a robust economy fuelling demand for 50 new towers in 20 years, an unprecedented opportunity exists to shape our future city.

To compete in a competitive global market, cities need to take advantage of distinctive attributes and establish a unique identity.

Brisbane's subtropical climate offers an enviable lifestyle that can attract international investment and a highly skilled workforce. The *draft Buildings that Breathe Design Guide* has been prepared to provide a shared vision for subtropical building design in Brisbane's vibrant city centre. This guide will complement the *City Centre Neighbourhood Plan* by providing an inspirational benchmark for architects, planners, developers, property professionals and the broader community.

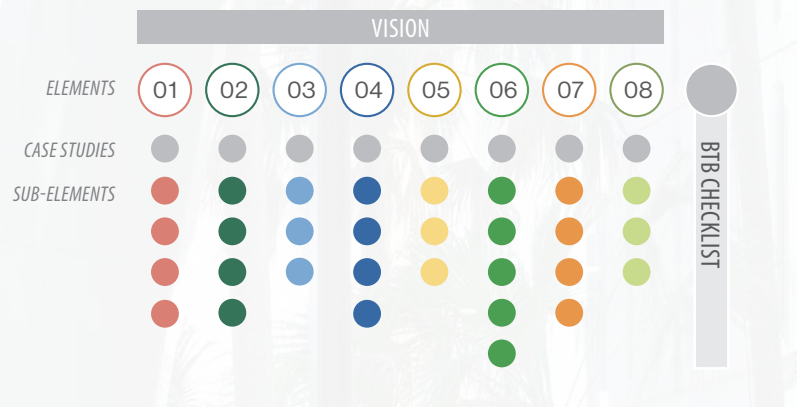
New buildings in our city centre will embrace our subtropical climates, opening up to cooling breezes, while providing lush landscaping, shade and comfort. Showcasing the highest standards of design and construction, these developments will contribute to an enviable urban environment that attracts investment and tourism, celebrates our lifestyle and stimulates economic activity.



## HOW TO USE THIS DOCUMENT

This design guide is a multi-dimensional tool prepared by Brisbane City Council to provide a common reference point amongst architects, planners, developers and the community when discussing the design of buildings in our city centre. It includes:

- » one vision: articulates the overarching vision for buildings in our city centre
- » eight key elements: the eight essential elements of buildings that breathe
- » sub-elements: a kit-of-parts contained within each element that provides guidance on potential ways to deliver buildings that breathe
- » case studies: best practice examples that demonstrate on-the-ground delivery and measured benefits
- » buildings that breathe checklist: a quick reference guide providing a summary of the key elements to consider when designing buildings in our city centre.



“clever building orientation saves energy, improves comfort and reduces operating costs”



# ORIENTATE YOURSELF





## RIPARIAN PLAZA AND 111 EAGLE STREET

ARCHITECT / HARRY SEIDLER ASSOCIATES AND COX RAYNER  
 LOCATION / 71 AND 111 EAGLE STREET, BRISBANE

### DESIGN RESPONSE /

- 1 Both buildings are designed to facilitate views and physical movement between the city streets and the river. The tower shape also allows for morning light and river breezes to penetrate into the city grid.
- 2 Building orientation and layout design maximise river views and capture natural light, while reducing heat load from the sun and achieving an appropriate relationship with neighbouring buildings.
- 3 The facade design of Riparian is varied to respond to the requirements of different uses.
- 4 The structural design of 111 Eagle reflects the organic structure of the nearby Moreton Bay Fig, while redistributing the weight of the building over existing car park structures.

DATE	2005 and 2012
STOREYS	53 and 54
USE	Mixed use - commercial and residential
GFA	70,000 m <sup>2</sup> and 64,000 m <sup>2</sup>
AWARDS	4.5 and 6 star Green Star



# ORIENTATE YOURSELF



## ORIENTATING OUR BUILDINGS IS THE FIRST STEP.

Brisbane’s subtropical climate has more than 300 ‘comfortable’ days each year. Characterised by warm summers and mild, dry winters, our enviable natural conditions provide our greatest untapped resource for low-energy, sustainable building design. Orienting buildings to respond to our local climatic conditions can create comfortable, internal spaces while reducing our reliance on artificial energy sources. Why not embrace the elements?

SUB-ELEMENTS	
LOCATION AND ORIENTATION	1.1
MASSING AND INTERNAL LAYOUT	1.2
VIEWS	1.3
STREET ACTIVATION	1.4

### DID YOU KNOW?

In Brisbane’s city centre cooling breezes primarily come from the east in summer and colder winds come from the south in winter.

LADY CILENTO CHILDREN’S HOSPITAL | BRISBANE  
Building massing responds to orientation and context

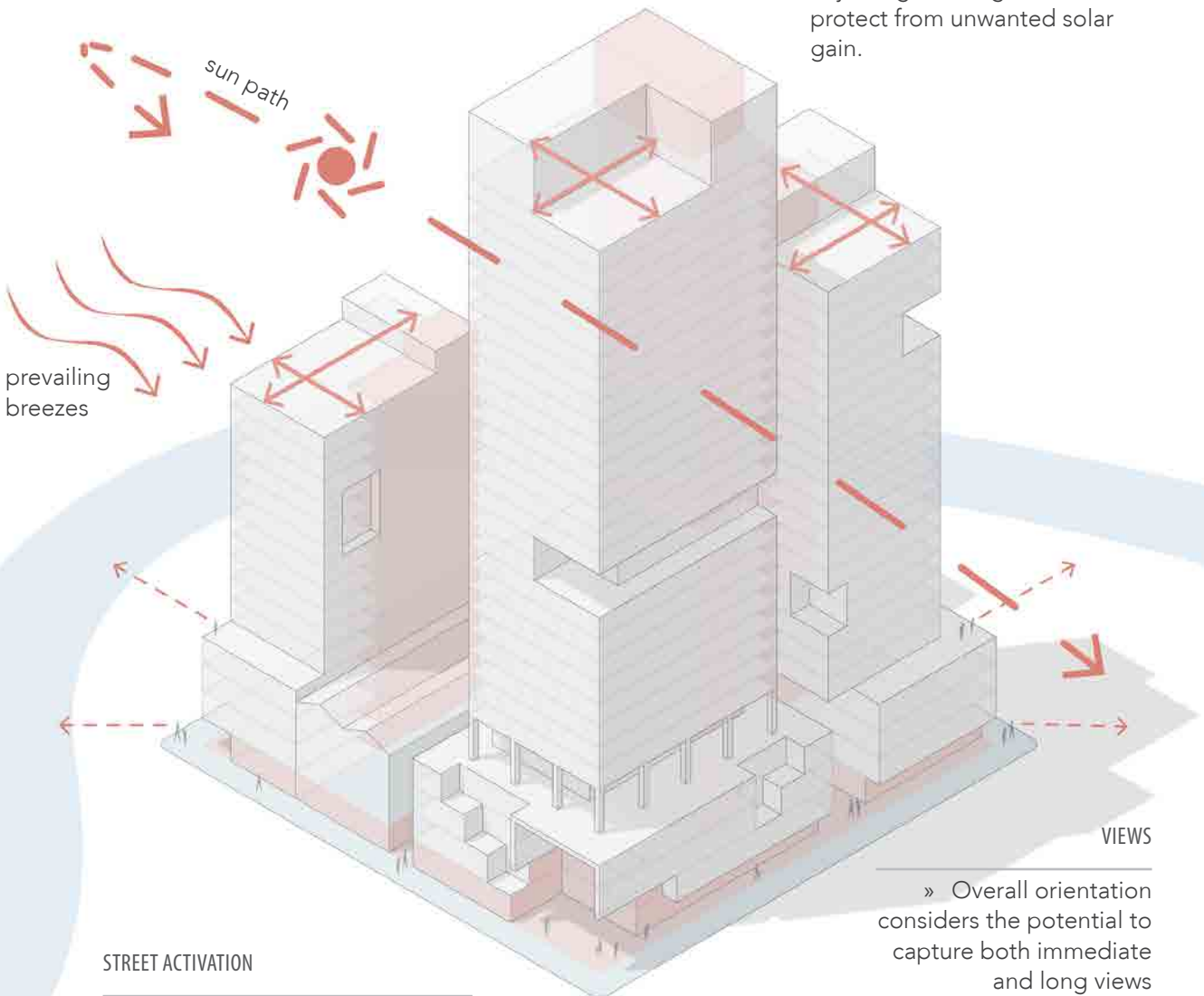


## LOCATION AND ORIENTATION

- » Clever orientation can minimise exposure to the harsh western sun and capture easterly breezes in summer, while embracing northern sun in winter.

## MASSING AND INTERNAL LAYOUT

- » Lift wells and circulation cores can be located adjacent to adjoining buildings and to protect from unwanted solar gain.



## STREET ACTIVATION

- » Building entrances, laneways and outdoor spaces activate our streets, public spaces and riverfront.

## VIEWS

- » Overall orientation considers the potential to capture both immediate and long views

## 1.1 LOCATION AND ORIENTATION

The dimension, location and context of a site heavily influences the shape and form of a building. Overall city form as well as immediate context are both key considerations. The orientation of a building considers solar access, prevailing breezes, natural features and topography. Buildings are also designed to respond to neighbouring buildings and spaces in the city centre ensuring they retain sunlight to key public spaces, contribute positively to the skyline, maintain views and provide access to natural light and air creating a city that breathes. Orientation is the first and most influential step in improving the passive performance of a building, including energy consumption and internal comfort.

## 1.2 MASSING AND INTERNAL LAYOUT

The intended use of the building will shape the overall massing including optimal floor plate and internal layout. Considering orientation in the location of occupied areas and the positioning of circulation and servicing areas will inform choice of materials, including use of glass, location of windows and positioning of circulation and services. In this context, different uses often require different building forms.

## 1.3 VIEWS

Building orientation provides the opportunity to capture significant views. This includes immediate views to vegetation and human activity or distance views to natural landscape features or building skylines.

## 1.4 STREET ACTIVATION

The design of the street building to respond to local conditions ensures our buildings activate our streets, public spaces and riverfront. This includes careful placement of windows, openings and entry ways to connect to our public realm.



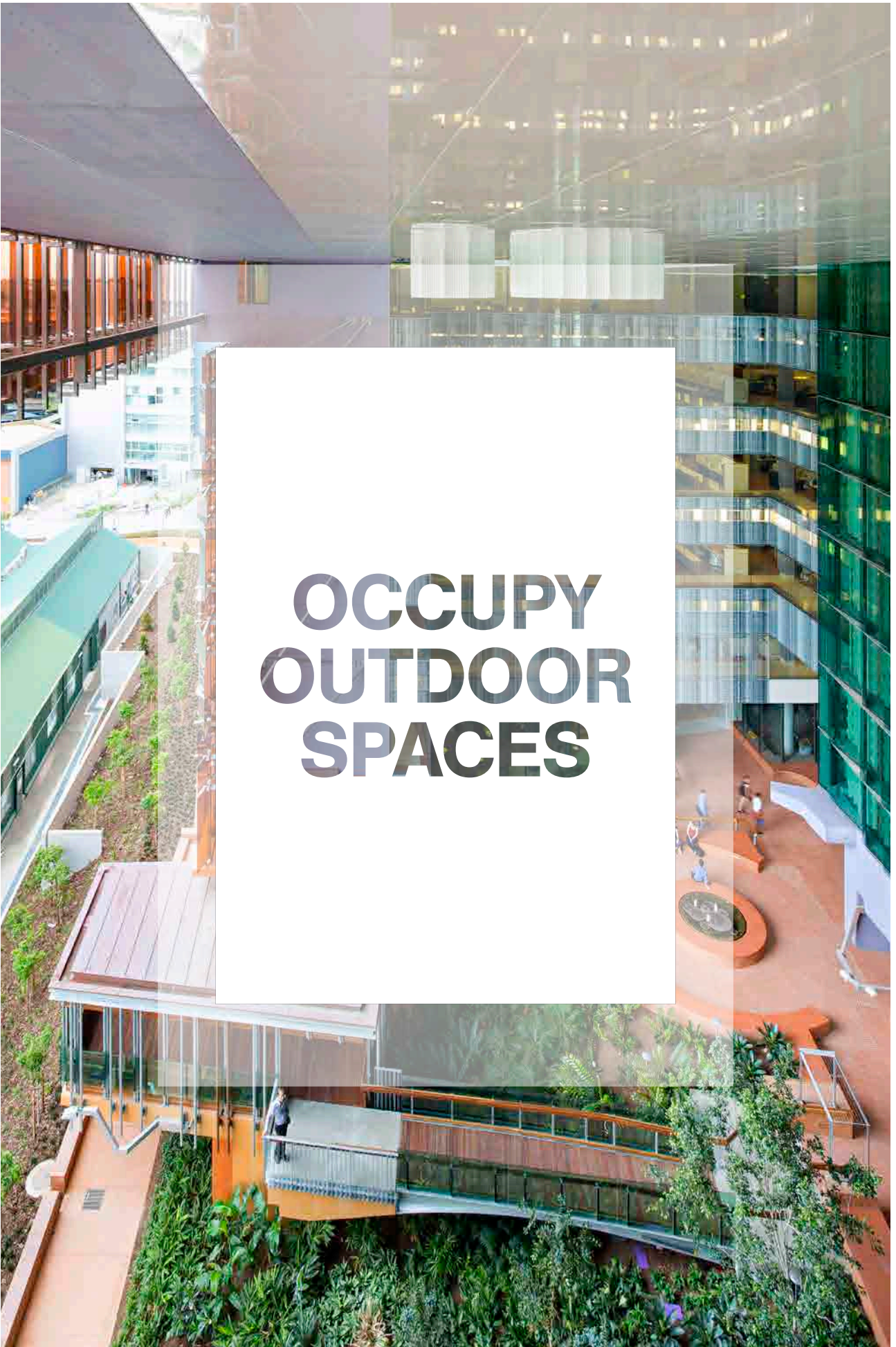
SW1 | BRISBANE

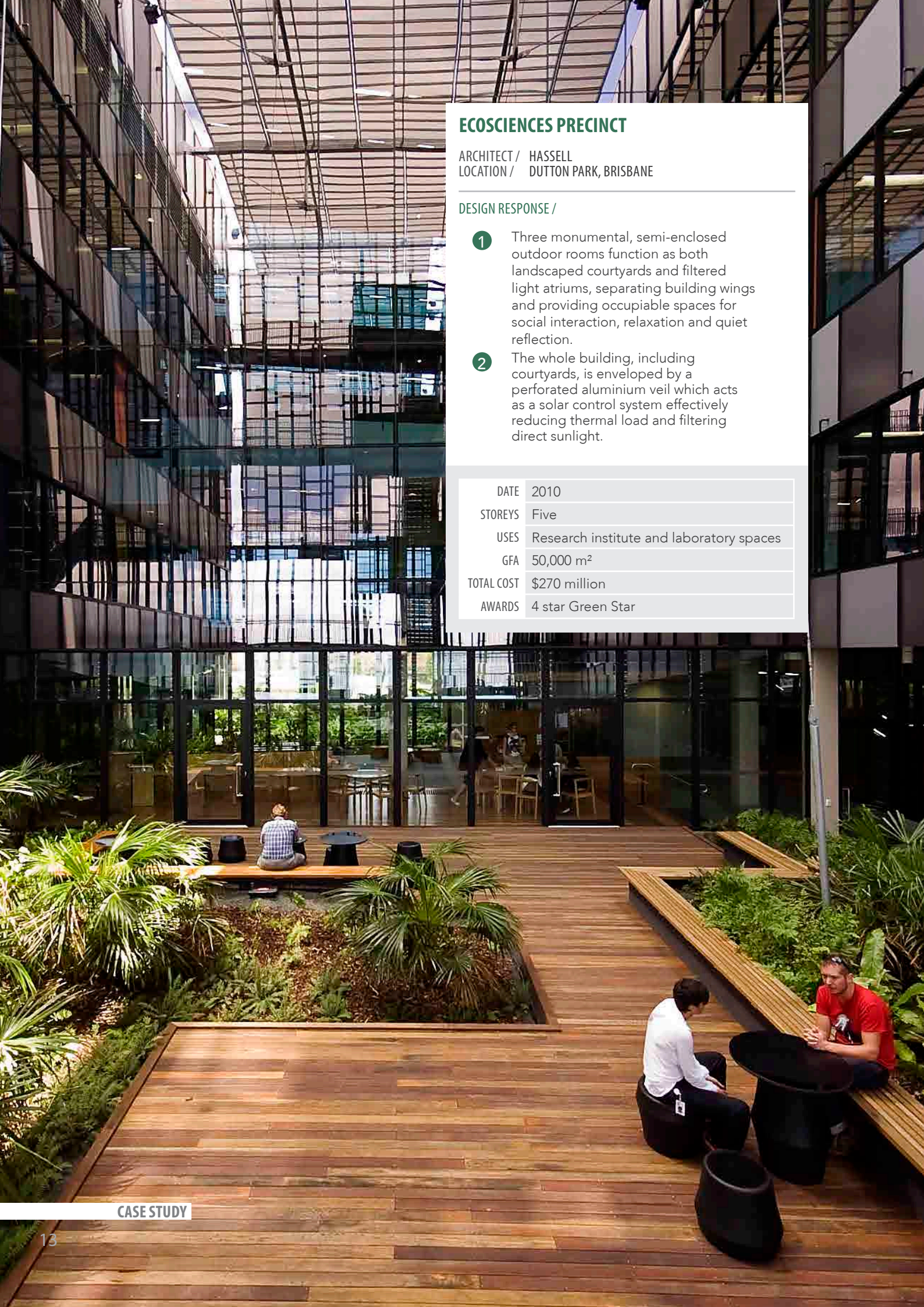
Overall massing and location of balconies considers optimal orientation, internal uses and opportunities to capture views.

“our outdoor spaces are high performance infrastructure, providing amenity, recreation spaces and enhancing biodiversity”



# OCCUPY OUTDOOR SPACES





## ECOSCIENCES PRECINCT

ARCHITECT / HASSELL  
LOCATION / DUTTON PARK, BRISBANE

### DESIGN RESPONSE /

- 1 Three monumental, semi-enclosed outdoor rooms function as both landscaped courtyards and filtered light atriums, separating building wings and providing occupiable spaces for social interaction, relaxation and quiet reflection.
- 2 The whole building, including courtyards, is enveloped by a perforated aluminium veil which acts as a solar control system effectively reducing thermal load and filtering direct sunlight.

DATE	2010
STOREYS	Five
USES	Research institute and laboratory spaces
GFA	50,000 m <sup>2</sup>
TOTAL COST	\$270 million
AWARDS	4 star Green Star

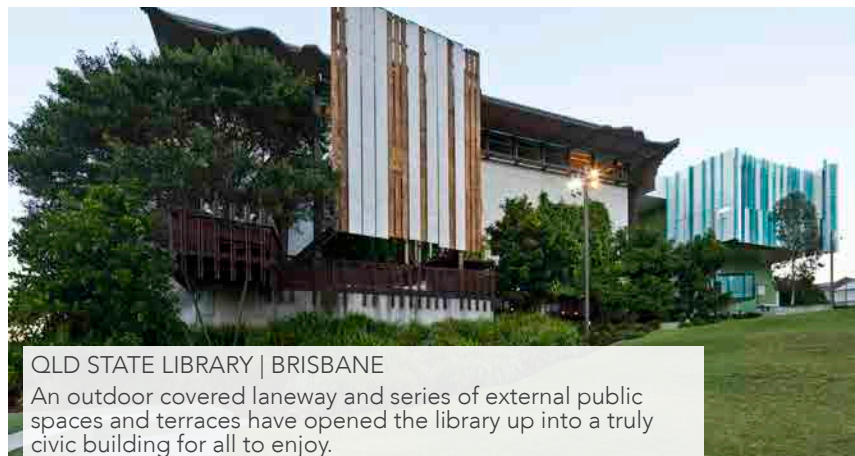
# OCCUPY OUTDOOR SPACES

## THE OUTDOORS IS A BIG PART OF OUR LIFESTYLE.

Brisbane is famed for its enviable climate. Clear blue skies, clean air and a mean annual temperature range of 15 to 25 degrees leaves little reason to stay indoors. Our buildings will be designed to make the most of this enviable climate creating outdoor spaces that are comfortable all year round. Incorporating rooftop gardens, sky terraces, generous balconies and open air tenancies at ground level will ensure our buildings reflect our outdoor lifestyle. These spaces will provide a flexible and seamless transition between indoor and outdoor, public and private. Characterised by subtropical landscaping, these outdoor spaces will be visible from the street and will contribute to the city landscape. As celebrated spaces they will embody the identity and experience of our city.

### SUB-ELEMENTS

- CITY ROOMS 2.1
- SKY TERRACES 2.2
- BALCONIES 2.3
- LANEWAYS AND CROSS-BLOCK LINKS 2.4



#### OLD STATE LIBRARY | BRISBANE

An outdoor covered laneway and series of external public spaces and terraces have opened the library up into a truly civic building for all to enjoy.



#### RIVER QUAY | BRISBANE

Conceived as an extension of the landscape the design includes a series of distinctive outdoor rooms celebrating Brisbane's subtropical climate.

## SKY TERRACES

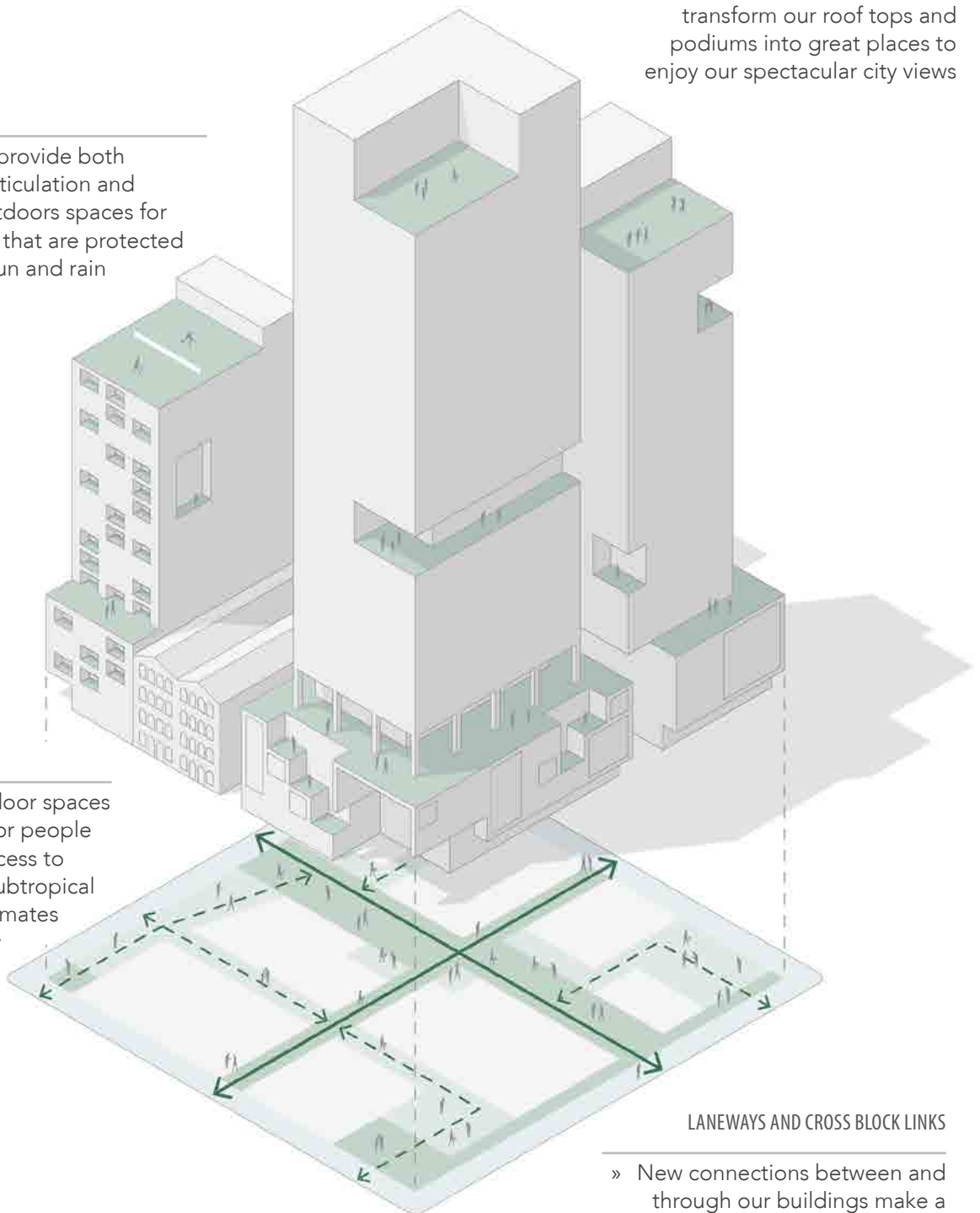
» Elevated outdoor spaces transform our roof tops and podiums into great places to enjoy our spectacular city views

## BALCONIES

» Balconies provide both physical articulation and private outdoors spaces for occupants that are protected from the sun and rain

## CITY ROOMS

» These semi-outdoor spaces provide places for people to meet, with access to natural air and subtropical planting that animates the edges of our buildings.



## LANEWAYS AND CROSS BLOCK LINKS

» New connections between and through our buildings make a more permeable city and provide valuable urban spaces in our fast-growing city.





## SUB-ELEMENTS

### 2.1 CITY ROOMS

The provision of generous semi-outdoor, subtropical spaces within the lower levels of our buildings creates an open and permeable ground plane where people can meet for work, lunch and to relax. Strategically located, these city rooms create visual and physical connections between indoor and outdoor spaces, drawing landscape and natural air into buildings. Varied in shape and size, they are united by the intent to open buildings up to the street and encourage occupation.

### 2.2 SKY TERRACES

In our city centre, outdoor space is at a premium. Elevated spaces for recreation support our active lifestyles and provide breathing room in an increasingly dense urban environment. Sky terraces transform latent spaces on podiums, towers or roof tops into recreational spaces, meeting facilities, bars and restaurants. Green and shaded, they are places to relax and enjoy spectacular city views.

### 2.3 BALCONIES

As with most elements, the role of a balcony is two-fold: it serves a public function as part of the visual expression of a building; and most importantly, creates private outdoor space to enjoy natural light, air, views and landscape. Designed with consideration they also provide shade to building facades and reduce heat load. The opportunity exists to further evolve our concept of the balcony to create private gardens, common recreation areas and more sophisticated living and working spaces.

### 2.4 LANEWAYS AND CROSS-BLOCK LINKS

Incorporating existing laneways and new cross-block links into the design of our ground floor public spaces contributes to the permeability and vibrancy of our city. These spaces create increased opportunities for pedestrian movement, business activity and urban vibrancy at the street level. Populated with fine grain tenancies, access to natural light and air is essential.

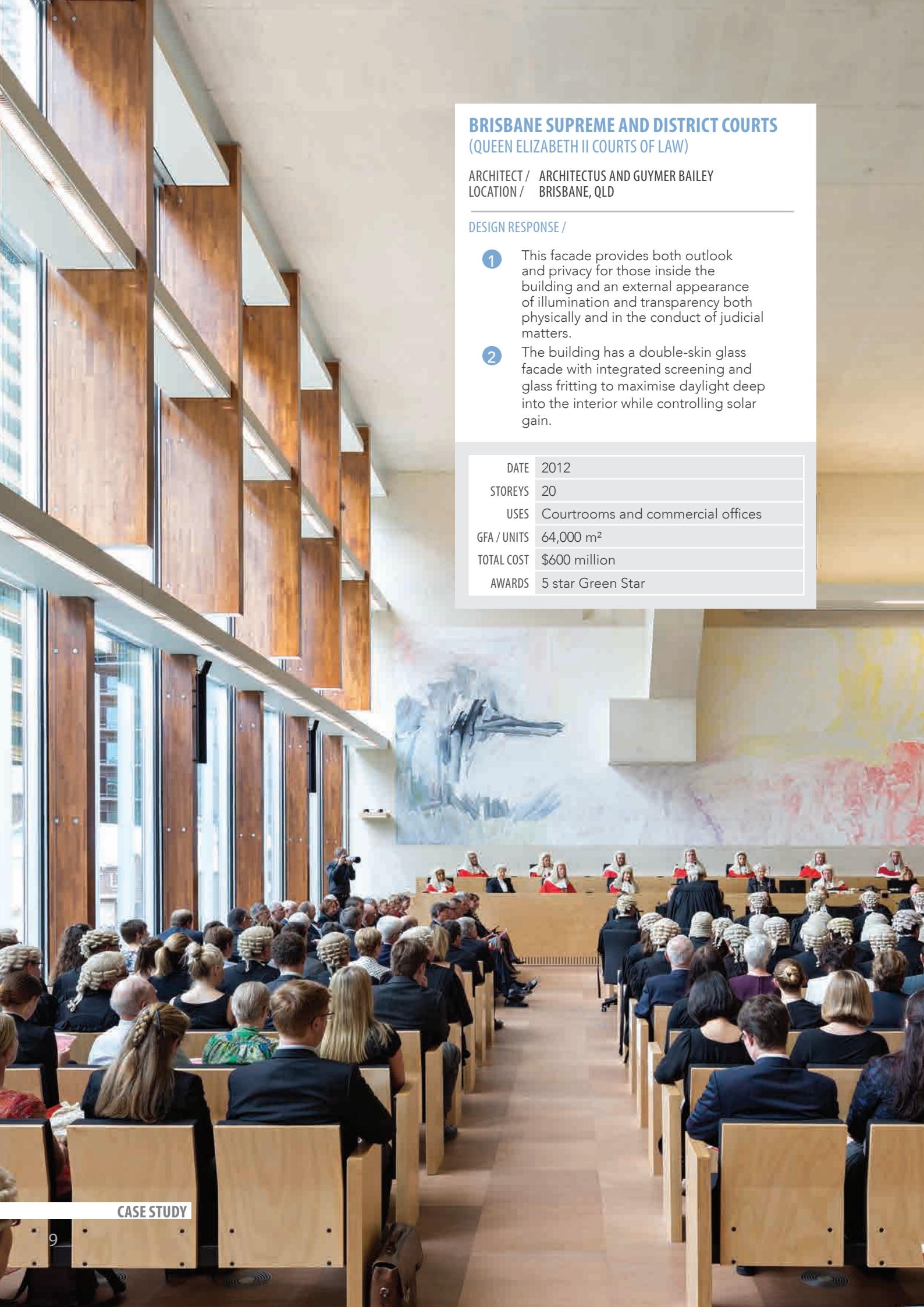


“maximising  
access to daylight  
enriches our lives  
and saves us  
money”



**ILLUMINATE  
WITH  
DAYLIGHT**





## BRISBANE SUPREME AND DISTRICT COURTS (QUEEN ELIZABETH II COURTS OF LAW)

ARCHITECT / ARCHITECTUS AND GUYMER BAILEY  
LOCATION / BRISBANE, QLD

### DESIGN RESPONSE /

- 1 This facade provides both outlook and privacy for those inside the building and an external appearance of illumination and transparency both physically and in the conduct of judicial matters.
- 2 The building has a double-skin glass facade with integrated screening and glass fritting to maximise daylight deep into the interior while controlling solar gain.

DATE	2012
STOREYS	20
USES	Courtrooms and commercial offices
GFA / UNITS	64,000 m <sup>2</sup>
TOTAL COST	\$600 million
AWARDS	5 star Green Star

# ILLUMINATE WITH DAYLIGHT

## MAXIMISING ACCESS TO DAYLIGHT ENRICHES OUR LIVES AND SAVES US MONEY.

Brisbane is blessed with an average of 261 sunny days each year. Utilising this abundant and free natural resource to illuminate our homes and workplaces has multiple long-term benefits. Natural light reduces our reliance on artificial lighting resulting in reduced electricity consumption, cheaper energy bills and less pollution.

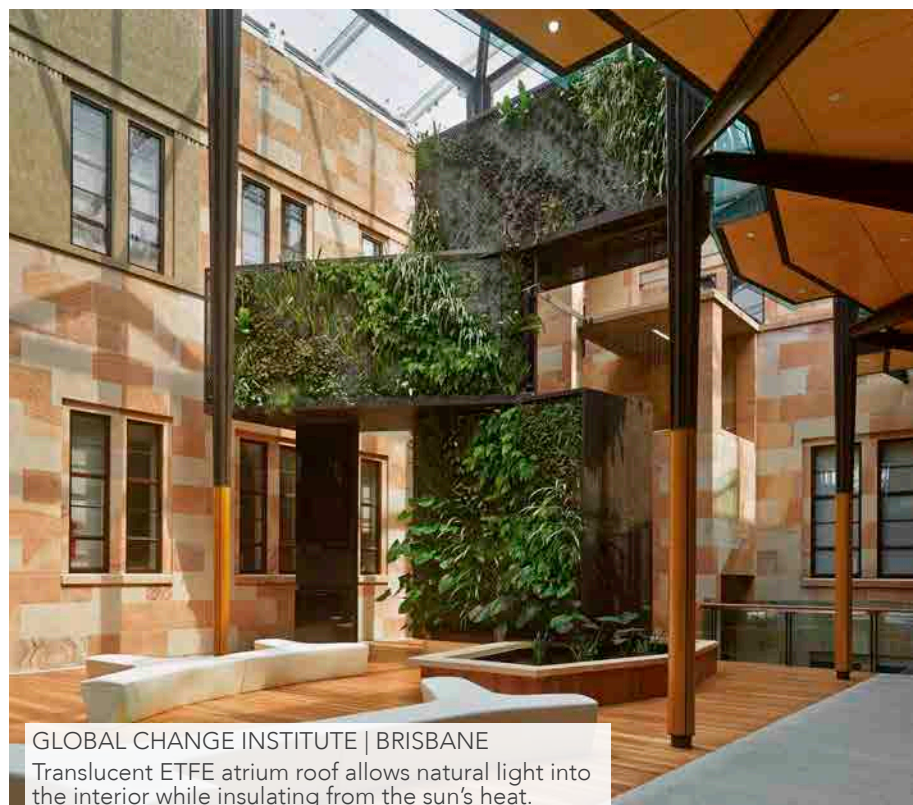
Additionally, exposure to direct sunlight, ambient natural light and the natural rhythms of the day have been proven to result in improved employee performance and positive health benefits. Buildings in Brisbane will consider the careful design and placement of glazing and light-wells to maximise natural light penetration while managing solar gain.

### DID YOU KNOW?

Natural light produces a spectrum of light unobtainable by artificial lighting. For indoor planting this allows them to photosynthesise, producing oxygen more effectively and creating truly breathable buildings.

### SUB-ELEMENTS

- BUILDING SETBACKS 3.1
- GLAZING 3.2
- LIGHT WELLS AND SKYLIGHTS 3.3



GLOBAL CHANGE INSTITUTE | BRISBANE  
Translucent ETFE atrium roof allows natural light into the interior while insulating from the sun's heat.

## GLAZING

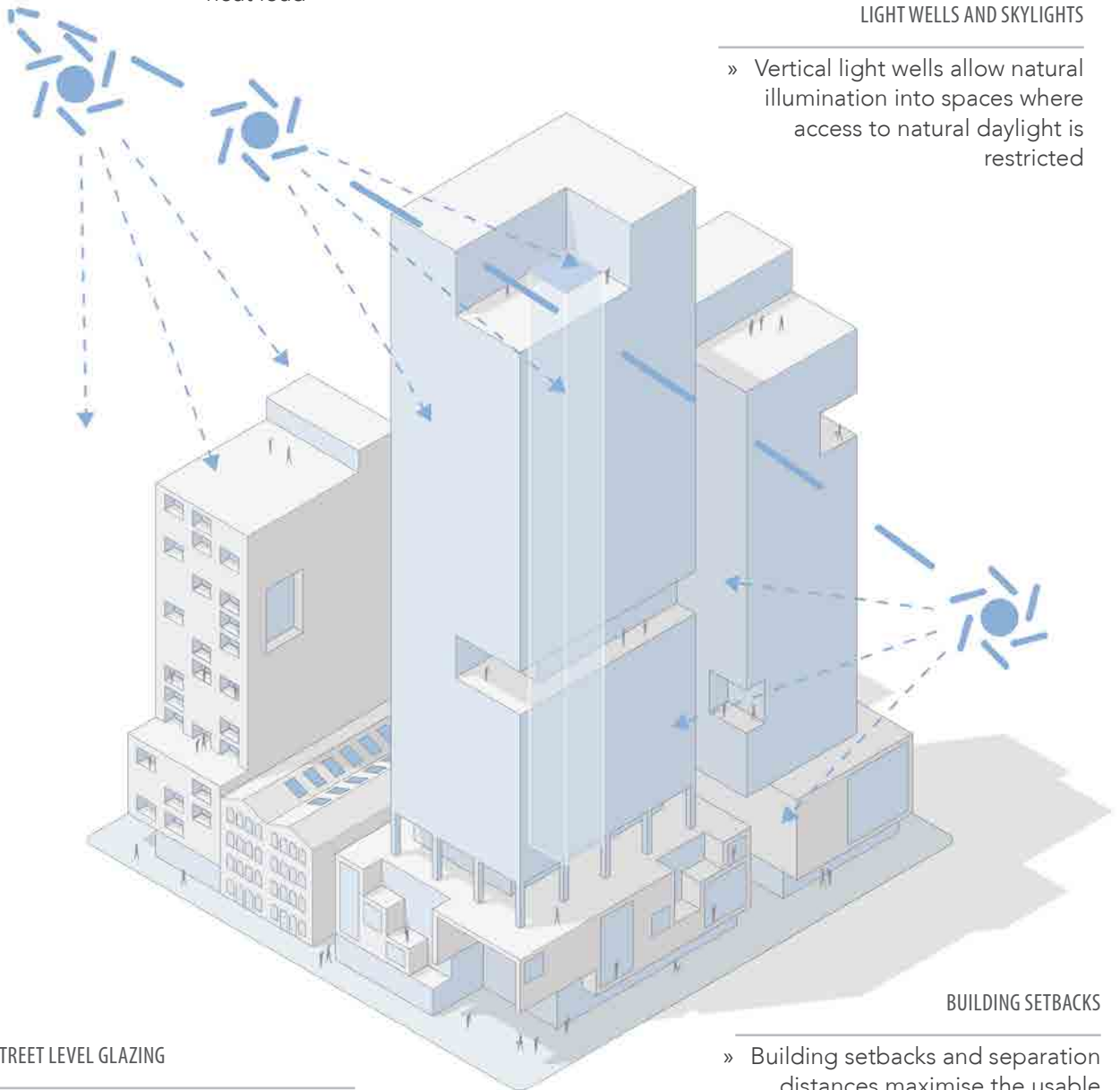
---

- » The choice and location of glazing balances daylight penetration with the need to provide privacy and reduce heat load

## LIGHT WELLS AND SKYLIGHTS

---

- » Vertical light wells allow natural illumination into spaces where access to natural daylight is restricted



## STREET LEVEL GLAZING

---

- » Glazing and windows at lower levels in the city can be larger as they are often shadowed by adjoining buildings

## BUILDING SETBACKS

---

- » Building setbacks and separation distances maximise the usable space within buildings ensuring daylight penetrates all sides of a building.



## SUB-ELEMENTS

### 3.1 BUILDING SETBACKS

Separation distances between adjoining buildings and setbacks to the street allow light to penetrate into buildings, between buildings and down to the ground plane. This ensures both internal and external spaces have access to natural light.

### 3.2 GLAZING

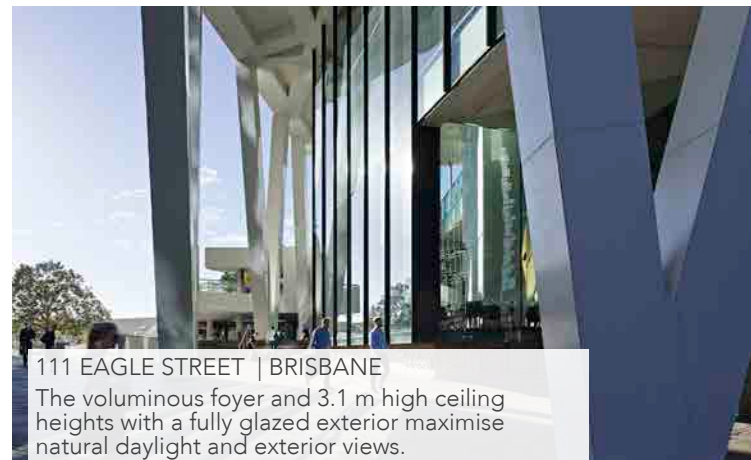
Daylight can penetrate several meters into a building, reducing the need for artificial lighting. Buildings are designed to optimise exposure to natural light through the use of glass and windows, while ensuring privacy and providing shade from the hot summer sun. Glass design and technology can help optimise light penetration while minimising heat load.

### 3.3 LIGHT WELLS AND SKYLIGHTS

The provision of natural light to common areas of buildings is important in creating attractive and welcoming spaces as well as ensuring safe access during power outages. Atriums, vertical light wells and skylights allow natural illumination to penetrate deep into spaces where access to natural daylight is restricted. This includes the use of multi-storey outdoor rooms around which internal spaces are wrapped.

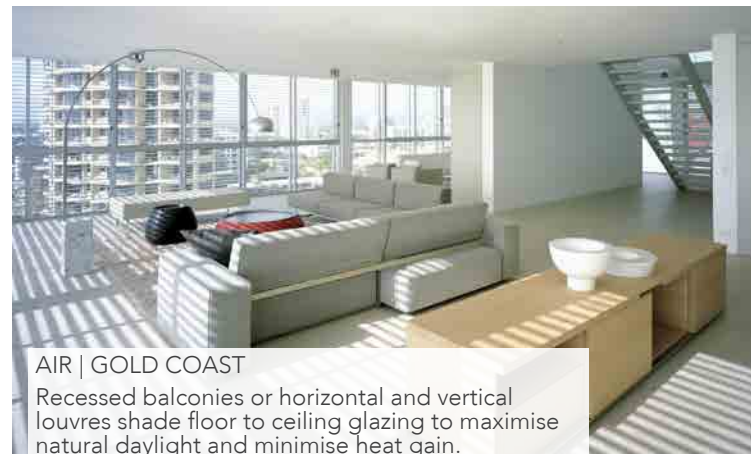
## DID YOU KNOW?

Daylighting from the perimeter windows will generally be adequate to a depth of two and a half times the height of the window.



111 EAGLE STREET | BRISBANE

The voluminous foyer and 3.1 m high ceiling heights with a fully glazed exterior maximise natural daylight and exterior views.



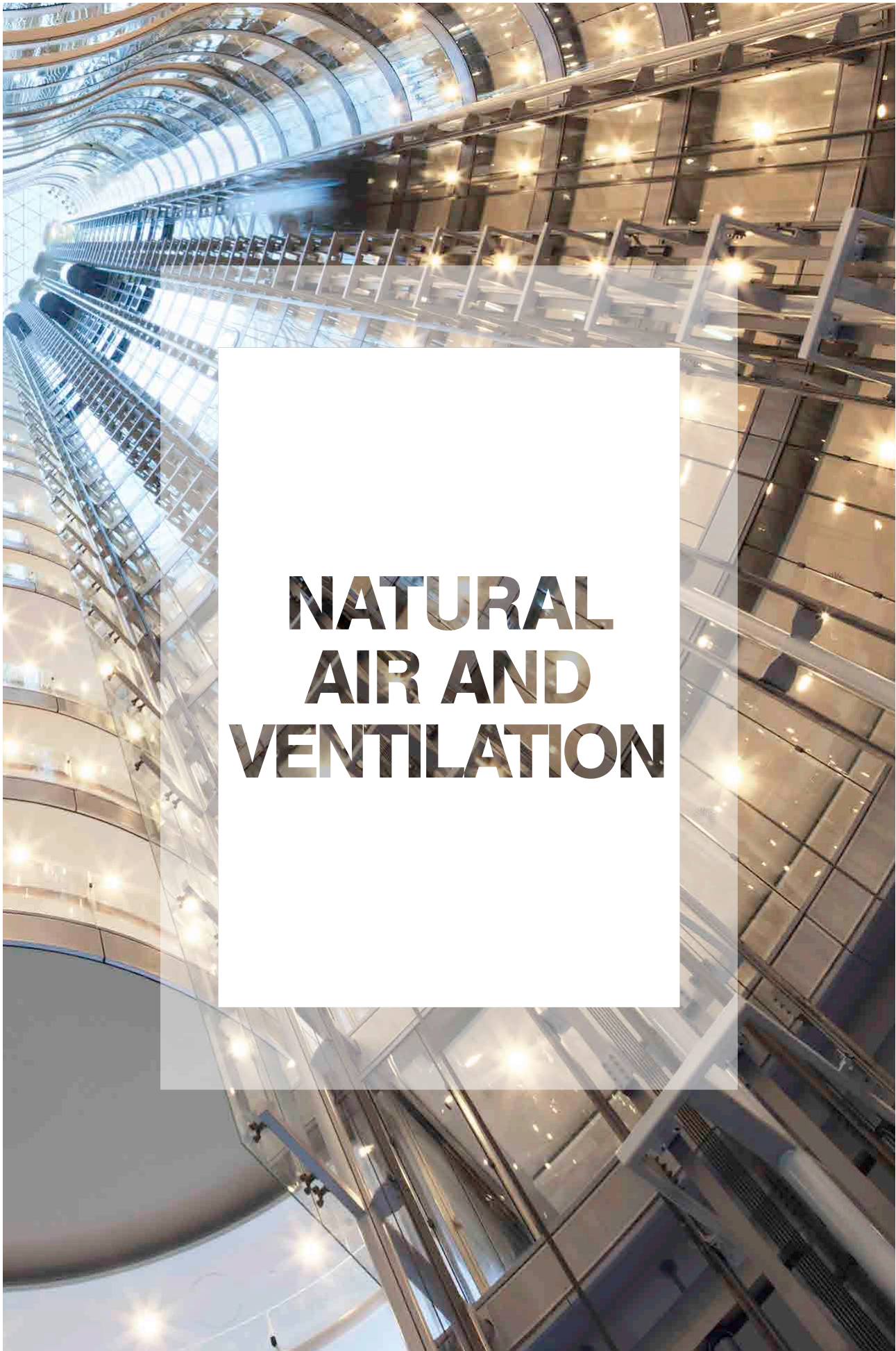
AIR | GOLD COAST

Recessed balconies or horizontal and vertical louvres shade floor to ceiling glazing to maximise natural daylight and minimise heat gain.

“with mechanical heating, ventilation and air conditioning systems accounting for between 30-40% of overall energy consumption in buildings, the provision of natural or hybrid ventilation systems could be the most important single step we could take in making tall buildings more sustainable”

Council on Tall Buildings and Urban Habitat  
(CTBUH) Natural Ventilation in High-Rise Office  
Buildings Technical Guide 2012





# **NATURAL AIR AND VENTILATION**



## COUNCIL HOUSE 2 (CH2)

ARCHITECT / DESIGNINC  
LOCATION / MELBOURNE

### DESIGN RESPONSE /

- 1 Post-occupancy evaluation for its first year has found it will pay for itself in seven years (three years ahead of schedule).
- 2 Staff effectiveness and productivity has improved by 10.9% saving Council over \$2m.
- 3 CH2 office spaces have 100% filtered fresh air which is drawn from roof level and supplied to offices and exhausted via vertical ducts.

DATE	2006
STOREYS	10
USES	Commercial office and ground floor retail
GFA / UNITS	12,536 m <sup>2</sup>
TOTAL COST	\$51.045 million
AWARDS	GBCA 6 star Green Star

# NATURAL AIR AND VENTILATION



## BUILDINGS ARE PART OF THE EVERYDAY LIFE, ACTIVITY AND EXPERIENCE OF A CITY.

Designing our buildings to embrace the benefits of our subtropical climate not only contributes to the identity and experience of our city, it can save us money as well. With a pleasant temperature range for much of the year, designing natural ventilation into our buildings greatly reduces the need for artificial heating and cooling.

Incorporating operable elements, such as windows, doors and movable walls, into the facades and rooftops of our buildings provides occupants greater control over the internal environment while contributing essential activity to life on the street.

The use of constant fresh air through natural or hybrid ventilation systems increases indoor health and occupant productivity while saving up to 50% on capital and ongoing costs. The inclusion of natural ventilation helps reduced pollution and could be the most important step in making tall buildings more sustainable.

SUB-ELEMENTS	
OPERABLE WINDOWS	4.1
DOORS AND OPENINGS	4.2
NATURAL VENTILATION SYSTEMS	4.3
DOUBLE SKIN FACADES	4.4



CH2 | MELBOURNE

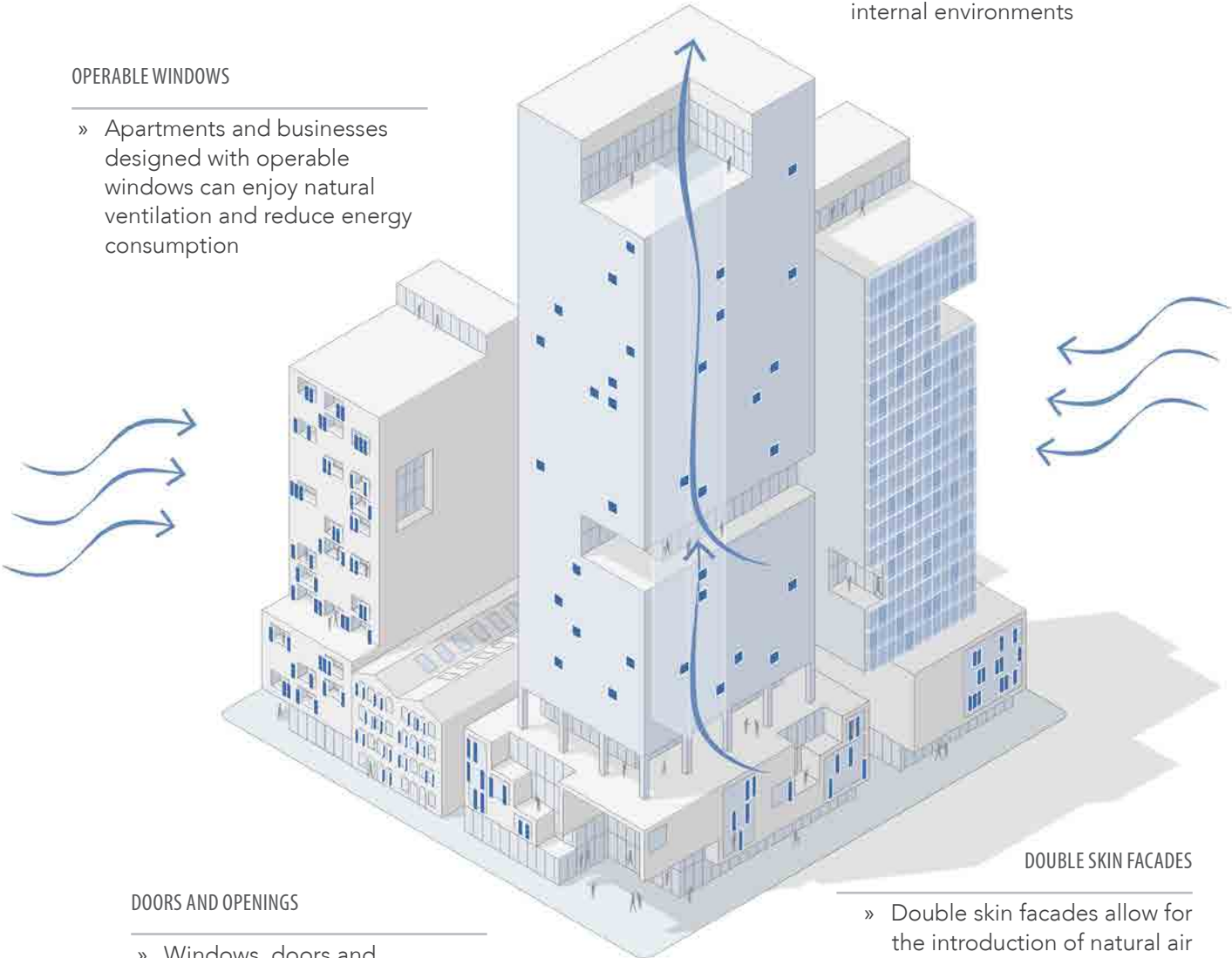
The 'displacement ventilation system' supplies fresh air to the floor at low velocity while older air is exhausted through ceiling vents on the roof.

NATURAL VENTILATION SYSTEMS

» Stack ventilation systems introduce fresh air into closed internal environments

OPERABLE WINDOWS

» Apartments and businesses designed with operable windows can enjoy natural ventilation and reduce energy consumption



DOUBLE SKIN FACADES

» Double skin facades allow for the introduction of natural air while managing solar gain

DOORS AND OPENINGS

» Windows, doors and openings at the ground level and in street buildings create connections between indoor and outdoor spaces



## SUB-ELEMENTS

### 4.1 OPERABLE WINDOWS

Operable windows are located, oriented and designed to capture cooling breezes, facilitate cross-ventilation and allow the passage of daylight while reducing unwanted heat transfer. The placement of these needs to be considered in the context of building setbacks and separation to allow the penetration of light and air through the city.

### 4.2 DOORS AND OPENINGS

Doors and openings function as the physical connections between indoor and outdoor spaces, both public and private and allow natural ventilation into common areas. Building entrances, foyers, atriums and large, outdoor rooms create welcoming, transparent spaces that are naturally ventilated. Larger tracts of movable walls, doors, windows and screens allow for the seamless connection between indoor and outdoor spaces providing plentiful opportunities for occupants to experience natural air without leaving the building.

### 4.3 NATURAL VENTILATION SYSTEMS

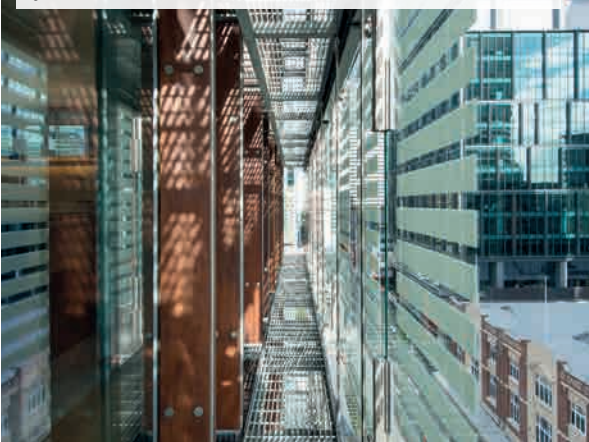
The inclusion of natural or hybrid ventilations systems, including stack ventilation, introduces fresh air into closed internal environments. Hybrid or mixed ventilation systems commonly use natural ventilation when the external conditions allow, but switch to full mechanical systems when external conditions are not optimal due to temperature, humidity, noise or pollution.

### 4.4 DOUBLE SKIN FACADES

Double-skin facades can provide insulation and facilitate natural ventilation, while protecting from rain and excessive heat. They can manage the flow of fresh air, buffer external noise and reduce energy consumption. Double skin facades come in many shapes and sizes with the common elements of an inner and outer wall with a cavity between them. Shading devices are often located within the cavity to manage solar gain.

#### QUEEN ELIZABETH II COURTS OF LAW | BRISBANE

The active double-skin facade and glass cavity is an integral component of the air climate control system.

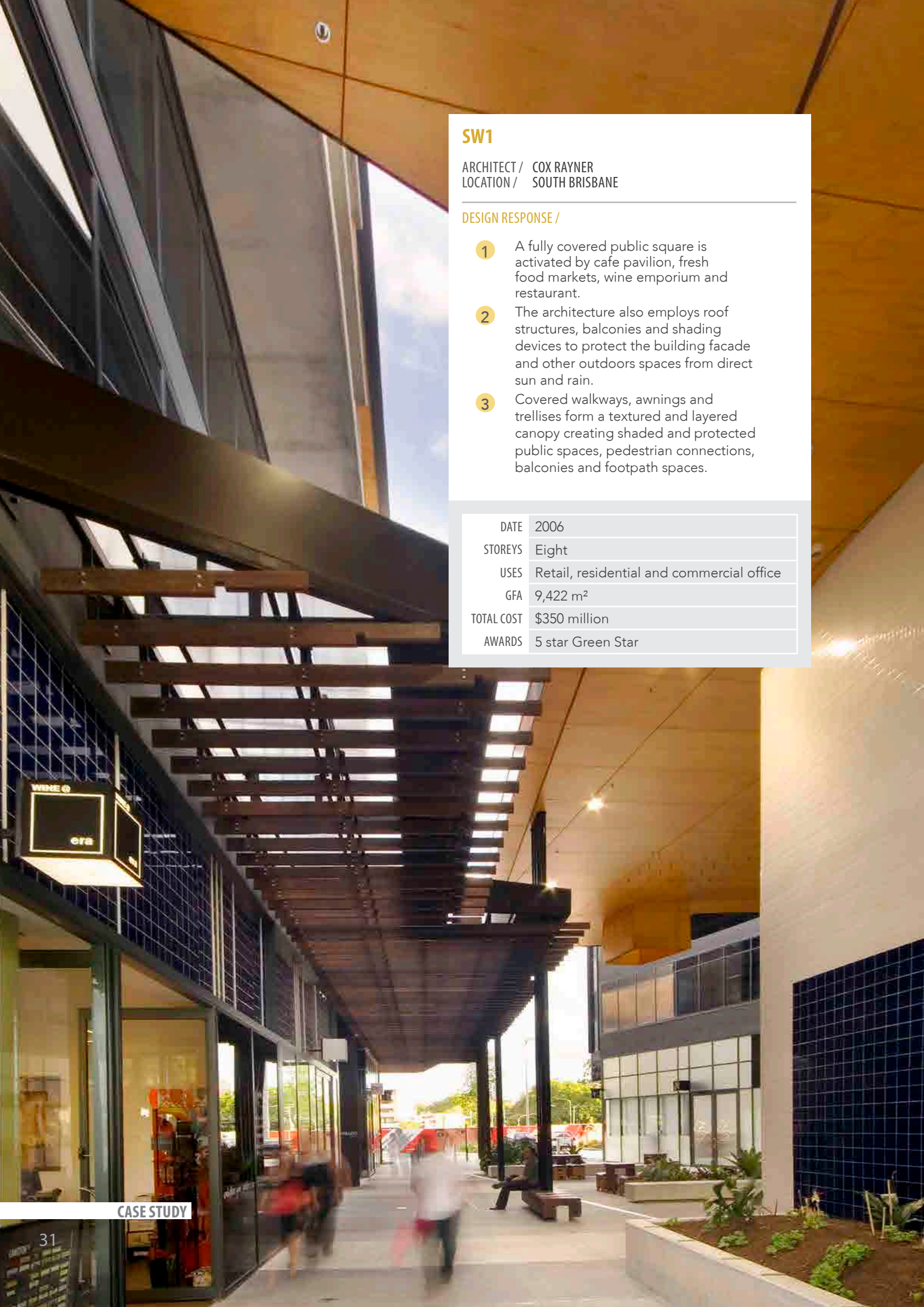


“fixed shading devices regulate solar gain in our buildings without any user effort, reducing the demand on mechanical heating and cooling”



**SHADE AND  
PROTECT**





## SW1

ARCHITECT / COX RAYNER  
LOCATION / SOUTH BRISBANE

### DESIGN RESPONSE /

- 1 A fully covered public square is activated by cafe pavilion, fresh food markets, wine emporium and restaurant.
- 2 The architecture also employs roof structures, balconies and shading devices to protect the building facade and other outdoors spaces from direct sun and rain.
- 3 Covered walkways, awnings and trellises form a textured and layered canopy creating shaded and protected public spaces, pedestrian connections, balconies and footpath spaces.

DATE	2006
STOREYS	Eight
USES	Retail, residential and commercial office
GFA	9,422 m <sup>2</sup>
TOTAL COST	\$350 million
AWARDS	5 star Green Star



# SHADE AND PROTECT



## BRISBANE'S CELEBRATED CLIMATE OCCASIONALLY DELIVERS SOME HARSH CONDITIONS.

Be it torrential rainfall or hot summer sun, our building design will protect us from the worst of our climate, while always welcoming its best.

The distinctiveness of our 'tin and timber' vernacular provides obvious clues as to how our climate shapes our identity. Deep verandahs, covered colonnades, operable screens and external shading devices both shade our buildings and protect us from the elements. Overall they combine to create a sense of sheltered openness, with layered screens providing degrees of privacy. The adaptation of these elements into the architecture and public spaces of the city centre, contributes to our uniquely Brisbane identity and allows us to revel in a relaxed, outdoor lifestyle.

### SUB-ELEMENTS

- AWNINGS AND COLONNADES 5.1
- EXTERNAL SHADING DEVICES 5.2
- SHADE STRUCTURES 5.3

### DID YOU KNOW?

Well-designed sun control and shading devices can dramatically reduce building peak heat gain and cooling requirements and improve the natural lighting quality of building interiors.

#### GOMA | BRISBANE

Wide-eaved aerofoil blade roof combined with a range of sun-responsive devices and materials including metal panels, timber slatting, projecting balconies and a timber-decked dining terrace that are markedly different on every facade responding to different climatic conditions.

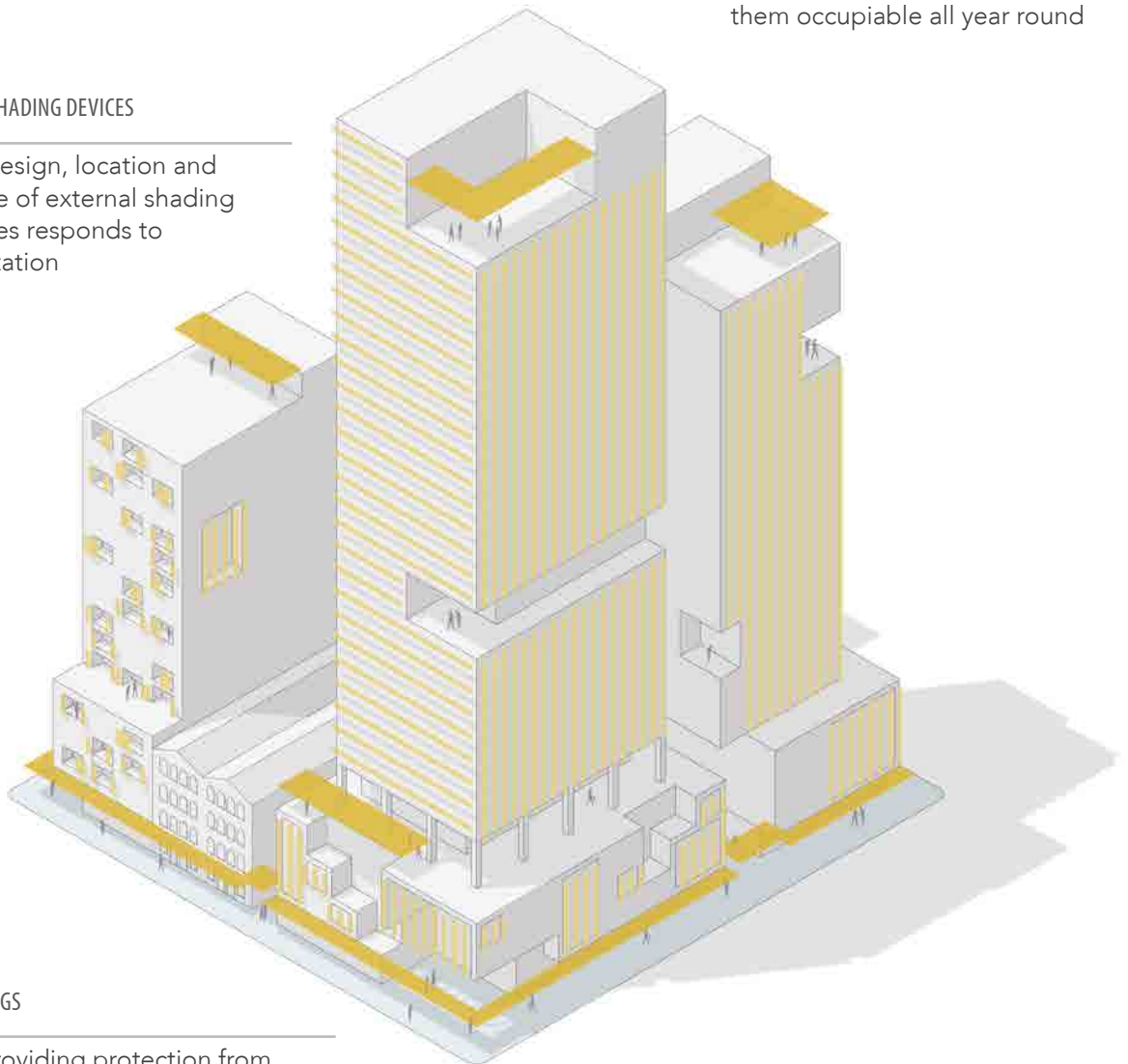


## SHADE STRUCTURES

- » Provision of shade structures for outdoor spaces makes them occupiable all year round

## EXTERNAL SHADING DEVICES

- » The design, location and choice of external shading devices responds to orientation



## AWNINGS

- » Providing protection from the elements along the street frontage transforms the edges of our buildings into habitable spaces



## SUB-ELEMENTS

### 5.1 AWNINGS AND COLONNADES

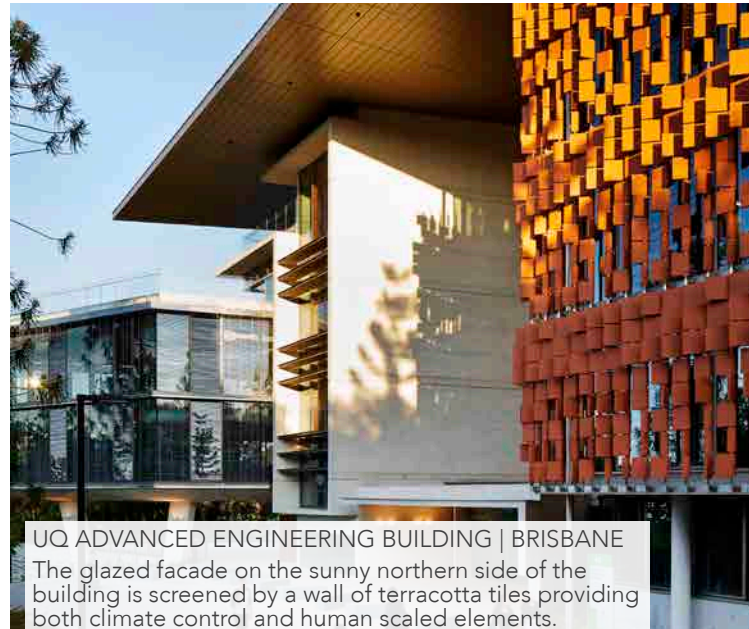
Awnings and colonnades transform our public footpaths, verandahs and terraces into habitable edges. They provide protection from the summer sun and seasonal storms, allowing us to create breathable, outdoor spaces and maintain activity on our busy city centre streets all day long.

### 5.2 EXTERNAL SHADING DEVICES

External screens and shading devices are at the heart of Queensland's design vernacular. They reduce heat load, temper bright light and protect against wind and rain, which in-turn reduces energy consumption and improves the comfort of residents and workers. Architecturally, they contribute to a sense of transparency, rhythm, scale and composition, with operability also allowing user control.

### 5.3 SHADE STRUCTURES

Planted trellises, sheltered walkways, free-standing shade structures and trees create occupiable outdoor spaces that are comfortable all year round. They embrace our indoor-outdoor lifestyle while protecting us from the hot summer sun and torrential rain. They allow us to cross bridges, occupy parks and enjoy rooftop views while enjoying the fresh air, natural light and openness our city is known for.



UQ ADVANCED ENGINEERING BUILDING | BRISBANE  
The glazed facade on the sunny northern side of the building is screened by a wall of terracotta tiles providing both climate control and human scaled elements.



SOUTH BANK GRAND ARBOUR | BRISBANE  
The one kilometre long structure, located in South Bank Parklands, comprises 443 steel tendrils upon which a bougainvillea canopy grows providing shade and acting as the key pedestrian wayfinding device in the precinct.

“urban green space  
can reduce the heat-  
island effect, improve  
the micro-climate,  
undertake localised  
air-cleansing,  
absorb pollutants,  
reduce noise levels  
and contribute to  
biodiversity”



## PARKROYAL ON PICKERING

ARCHITECT / WOHA  
LOCATION / SINGAPORE

### DESIGN RESPONSE /

- 1 The hotel's integration of greenery into the built form is estimated to offer a 30% energy saving in operation compared to a conventional building of the same scale.
- 4 With 15,000 m<sup>2</sup> of plantings, water features, terraces, green walls and sky gardens, landscaping within the 'hotel-in-a-garden' amounts to 215% of the site area.

DATE	2013
STOREYS	16
USE	Hotel and office
GFA	29,811 m <sup>2</sup>
TOTAL COST	\$137 million
AWARDS	Green Mark Platinum - Singapore's highest environmental certification

# LIVING GREENERY

BRISBANE IS AUSTRALIA'S MOST BIODIVERSE CAPITAL CITY WITH MORE SPECIES OF NATIVE PLANTS AND WILDLIFE THAN ANY OTHER IN AUSTRALIA.

The benefits of urban greenery and elevated sky gardens are extensive. Vegetation provides shade, reducing the urban heat island effect and cooling our public spaces. It contributes significant visual amenity and interaction with the natural environment, which has been proven to calm anxiety and contribute to overall health.

Usable green spaces promote opportunities for physical activity and active lifestyles while fostering community interaction. Research also shows that urban greenery and elevated gardens increase property values.

New developments that incorporate living greenery and vegetation enrich our urban experience and contribute to a vision for a distinctly Brisbane city that is open, green and subtropical. Our city is an urban garden.

## SUB-ELEMENTS

- GREEN ROOF 6.1
- VERTICAL GREENERY 6.2
- ELEVATED GARDENS 6.3
- INTERNAL PLANTING 6.4
- STREET TREES AND VEGETATION 6.5



LADY CILENTO CHILDREN'S HOSPITAL | BRISBANE  
Outdoor garden terraces provide essential respite spaces for workers, patients and their families.

## GREEN ROOF

---

- » Utilising our roof tops to cool our buildings, absorb rainwater and contribute to biodiversity benefits our city centre in a number of ways

## ELEVATED GARDENS

---

- » Vegetation transforms our balconies, outdoor rooms and roof top decks into great gardens at any level

## INTERNAL PLANTING

---

- » Internal planting and vegetation can reduce all types of urban air pollution, increase productivity and job satisfaction and greatly reduce stress



## STREET TREES

---

- » Street trees provide essential shade and allow people to experience subtropical planting on our city streets

## VERTICAL GREENERY

---

- » Green walls are a space efficient way to incorporate vegetation into a development, providing shade, insulation and visual relief





## SUB-ELEMENTS

### 6.1 GREEN ROOF

Roof tops provide great opportunities for incorporating vegetation into buildings. While not necessarily designed for occupation, they can offer multiple benefits including absorption of rainwater, providing insulation, creating a habitat for wildlife, providing a more aesthetically pleasing roofscape, and mitigating the urban heat-island effect.

### 6.2 VERTICAL GREENERY

The green wall typology is diverse and includes green facades, living walls, vertical gardens, hanging gardens, bio-shaders, and bio-facades. Green walls can be located internally and externally, providing shade and insulation as well as visual relief.

### 6.3 ELEVATED GARDENS

Private balconies, communal recreation spaces, outdoor rooms, roof-top decks and podium gardens are all opportunities for elevated green spaces that create usable outdoor spaces for active recreation and passive occupation.

### 6.4 INTERNAL PLANTING

Indoor plants are easy to install and enhance our experience of office spaces, apartments and communal areas. Research also shows that internal planting and vegetation can reduce urban air pollution, increase productivity and job satisfaction and reduce stress.

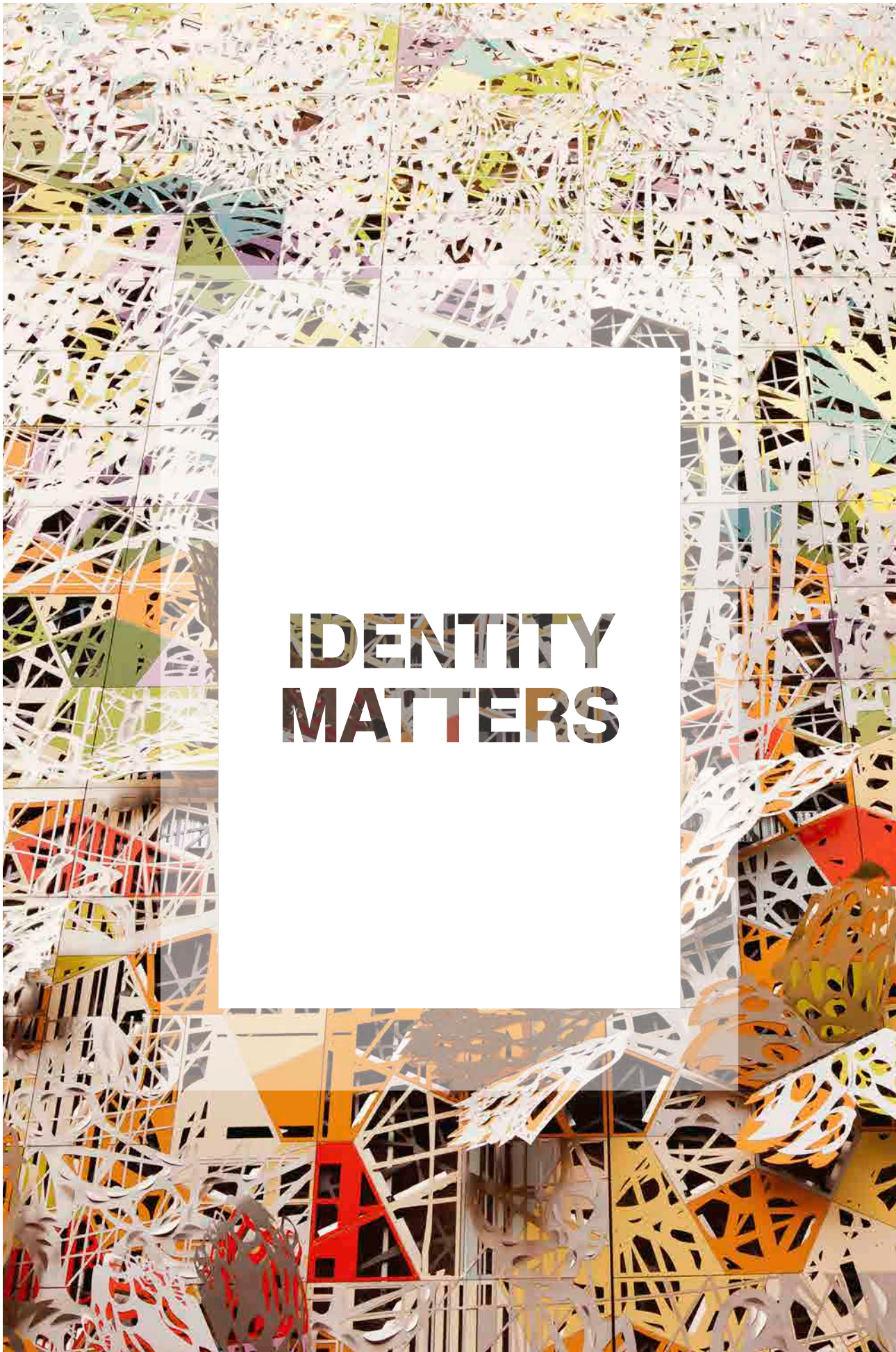
### 6.5 STREET TREES AND VEGETATION

Street trees and plantings are essential to the livability and beauty of our subtropical city centre. They provide shade and lower both surface and air temperatures, cooling our streets and public spaces and reducing the heat-island effect in our city. Street trees also contribute to development aesthetics and marketability.



LADY CILENTO CHILDREN'S HOSPITAL | BRISBANE  
Subtropical elevated gardens

“responsible material selection protects the biodiversity of the environment, ensures the health of occupants and minimises environmental impacts - it can even save you money”



**IDENTITY  
MATTERS**



## AM60

ARCHITECT / DONOVAN HILL  
LOCATION / 60 ALBERT STREET, BRISBANE

### DESIGN RESPONSE /

- 1 The use of materials on the facade includes colourful glass, tactile brick and concrete shading elements providing a contrast in colour, scale and texture while delivering substantial solar control to internal building spaces.
- 2 The tactile brick and concrete facade is embellished by perforations to allow filtered light to penetrate into four levels of glass-skinned board rooms within the building.

DATE	2009
STOREYS	23
USE	Commercial office and retail space
GFA	21,000 m <sup>2</sup>
TOTAL COST	\$177 million
AWARDS	4.5 star Green Star

CASE STUDY

# IDENTITY MATTERS



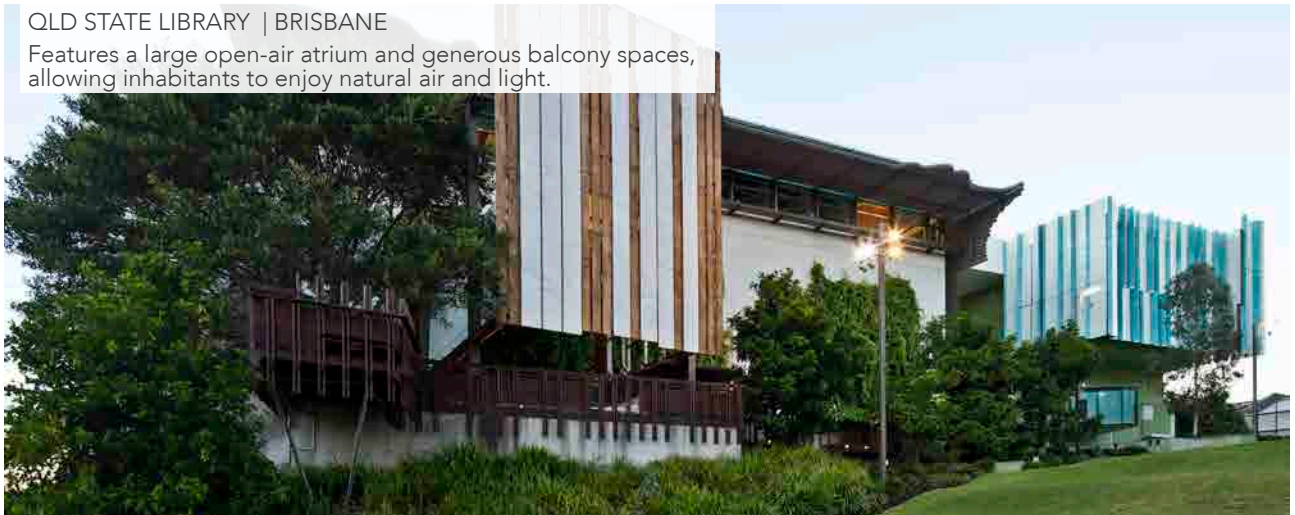
## OUR BUILDINGS ARE AN EXPRESSION OF OUR IDENTITY.

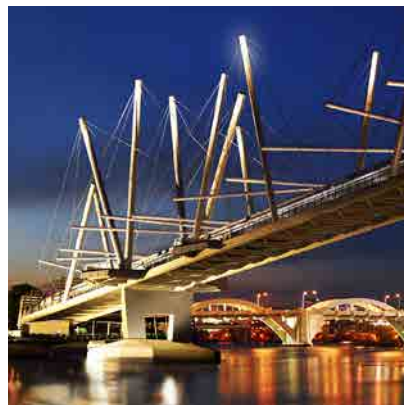
Brisbane’s subtropical character is the defining element that sets it apart from other Australian cities. The creativity and materiality of our buildings will express our identity and ensure the city centre is culturally diverse and vibrant throughout the day and night. It is essential that our buildings are a reflection of our culture, climatic conditions and local character. Well-designed buildings relate to their surrounding environment and enliven the public realm with a distinctive and memorable urban experience.

Considerations such as choice of materials, public art and lighting design are essential to the way that buildings represent Brisbane’s unique qualities and contribute to the overall identity of our city. For these reasons, identity (or authenticity) matters.

SUB-ELEMENTS	
CHOICE OF MATERIALS	7.1
LONGEVITY	7.2
PUBLIC ART	7.3
CREATIVE LIGHTING	7.4

QLD STATE LIBRARY | BRISBANE  
Features a large open-air atrium and generous balcony spaces, allowing inhabitants to enjoy natural air and light.







## SUB-ELEMENTS

---

### 7.1 CHOICE OF MATERIALS

The selection of high-quality building materials and their creative application in the design of buildings needs to respond to our local character, climate and lifestyle. The cumulative effect of doing this in every street, building and public space of our city centre has the ability to evolve our timber and tin design vernacular and translate our distinctive character and identity onto the world stage. Locally sourced materials, strong articulation through rhythm and a layering of transparent and solid materials and spaces provide texture and contribute to a sense of breathable, occupied buildings.

### 7.2 LONGEVITY

High quality materials selected for their durability yield innumerable benefits in terms of maintenance, robustness and sustainability. They also have the ability to save money in the long term as well as contributing to an enduring sense of civic pride.

### 7.3 PUBLIC ART

Public art is an expression of our city's culture and creativity, playing an integral role in sharing stories and interpreting places and people. The integration of artwork into buildings contributes to a person's city experiences, offers a new perspective and enriches our global identity.

### 7.4 CREATIVE LIGHTING

In moving towards a vibrant night-time economy for our city centre, quality lighting outcomes are essential, meeting functional needs as well as a means of creative expression. Innovative ideas for the illumination of our buildings will showcase our architecture and enliven our city streets.

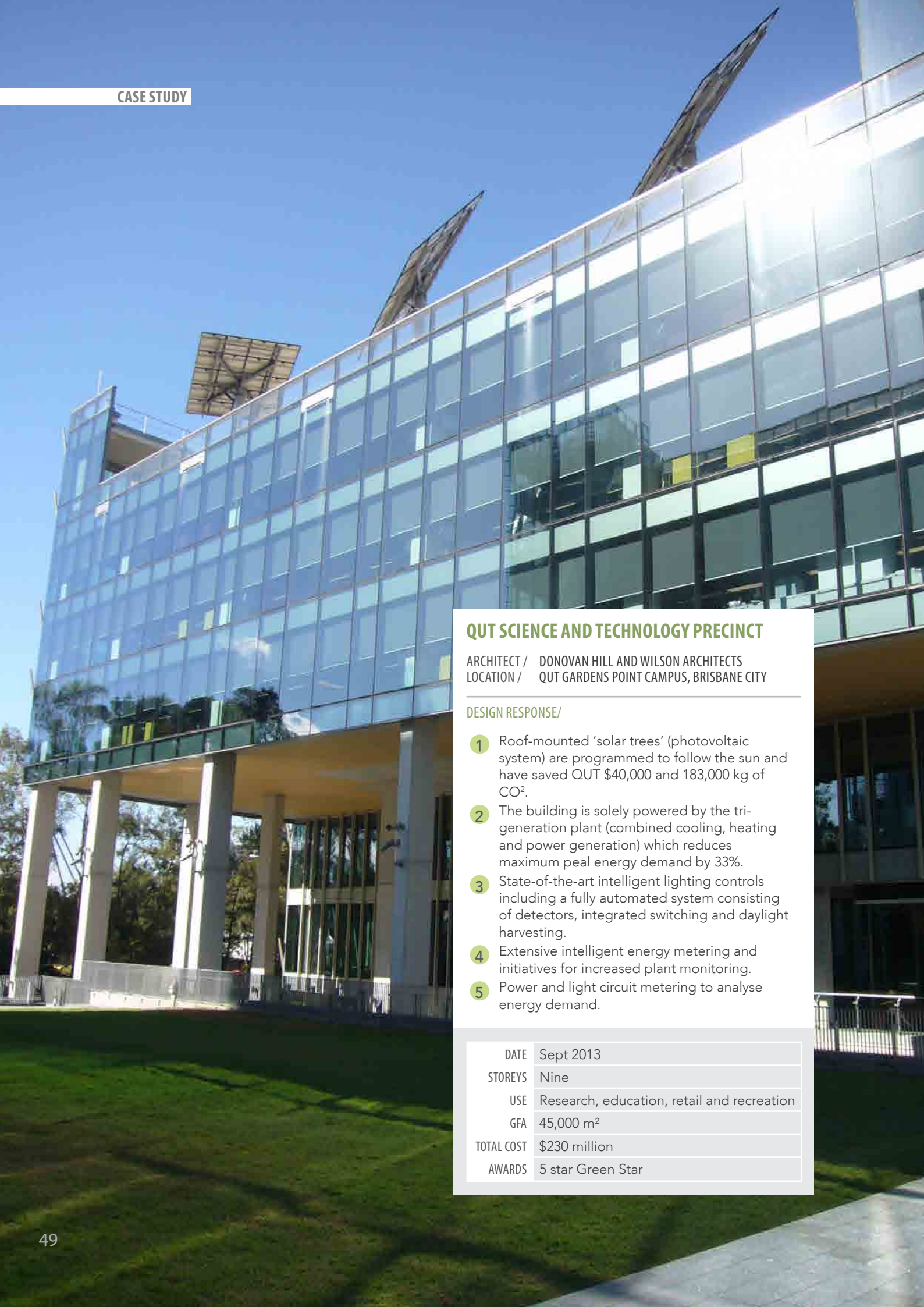
“achieving high environmental ratings reduces exposure to commercial risk and asset obsolescence by ensuring that assets are ‘future-ready’ ”

John Dillon, Fund Manager, APPF Commercial -  
joint owner of Commonwealth Bank Place





**REDUCE  
ENERGY AND  
WASTE**



## QUT SCIENCE AND TECHNOLOGY PRECINCT

ARCHITECT / DONOVAN HILL AND WILSON ARCHITECTS  
 LOCATION / QUT GARDENS POINT CAMPUS, BRISBANE CITY

### DESIGN RESPONSE/

- 1 Roof-mounted 'solar trees' (photovoltaic system) are programmed to follow the sun and have saved QUT \$40,000 and 183,000 kg of CO<sup>2</sup>.
- 2 The building is solely powered by the tri-generation plant (combined cooling, heating and power generation) which reduces maximum peak energy demand by 33%.
- 3 State-of-the-art intelligent lighting controls including a fully automated system consisting of detectors, integrated switching and daylight harvesting.
- 4 Extensive intelligent energy metering and initiatives for increased plant monitoring.
- 5 Power and light circuit metering to analyse energy demand.

DATE	Sept 2013
STOREYS	Nine
USE	Research, education, retail and recreation
GFA	45,000 m <sup>2</sup>
TOTAL COST	\$230 million
AWARDS	5 star Green Star

# REDUCE ENERGY AND WASTE

## OUR CITY WILL SHOWCASE INNOVATIVE TECHNOLOGY AND BEST-PRACTICE SUSTAINABILITY.

Cities are central to the causes and consequences of climate change. Consuming 78% of the world's energy and producing 60% of all carbon dioxide, cities are a major source of carbon emissions. With more than 90% of all urban areas being coastal, cities are also at risk of increased flooding, storms and sea levels rise.

Designing our buildings to incorporate passive design principles such as orientation, shading and natural ventilation will reduce energy consumption. Employing new technology can further enhance a building's performance by utilising renewable energy, reducing water consumption and minimising waste. Reducing the energy needs of our buildings will also help mitigate climate change and create a more efficient and robust economy.

### SUB-ELEMENTS

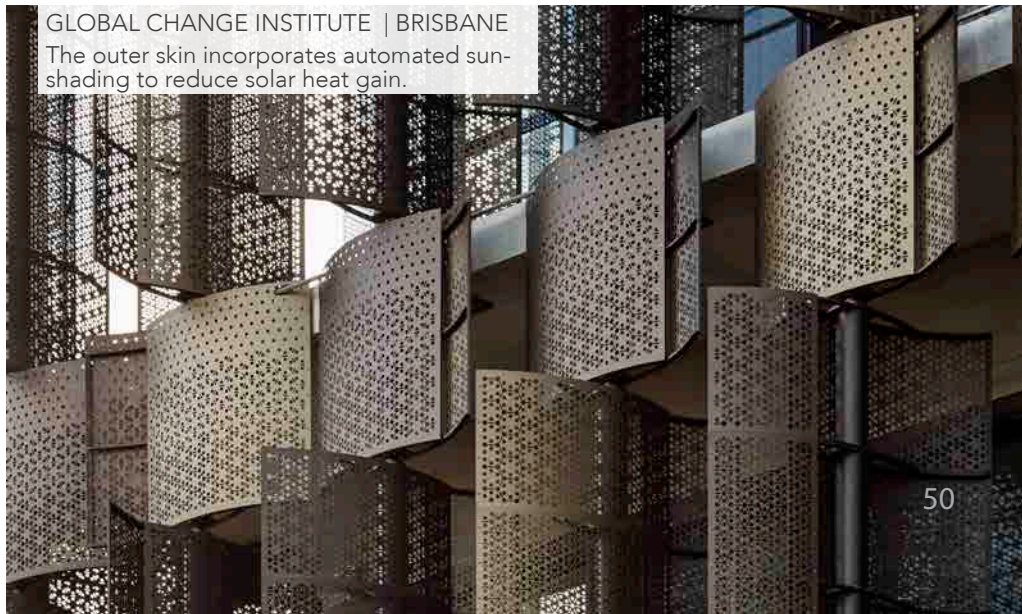
- NEW TECHNOLOGY 8.1
- ACTIVE TRANSPORT 8.2
- CERTIFICATION 8.3

### DID YOU KNOW?

The Australian Property Institute's Building Better Returns report showed Green Star certified buildings can reduce outgoings by 1.5% while increasing rental values by 5% and sales values by 12%.

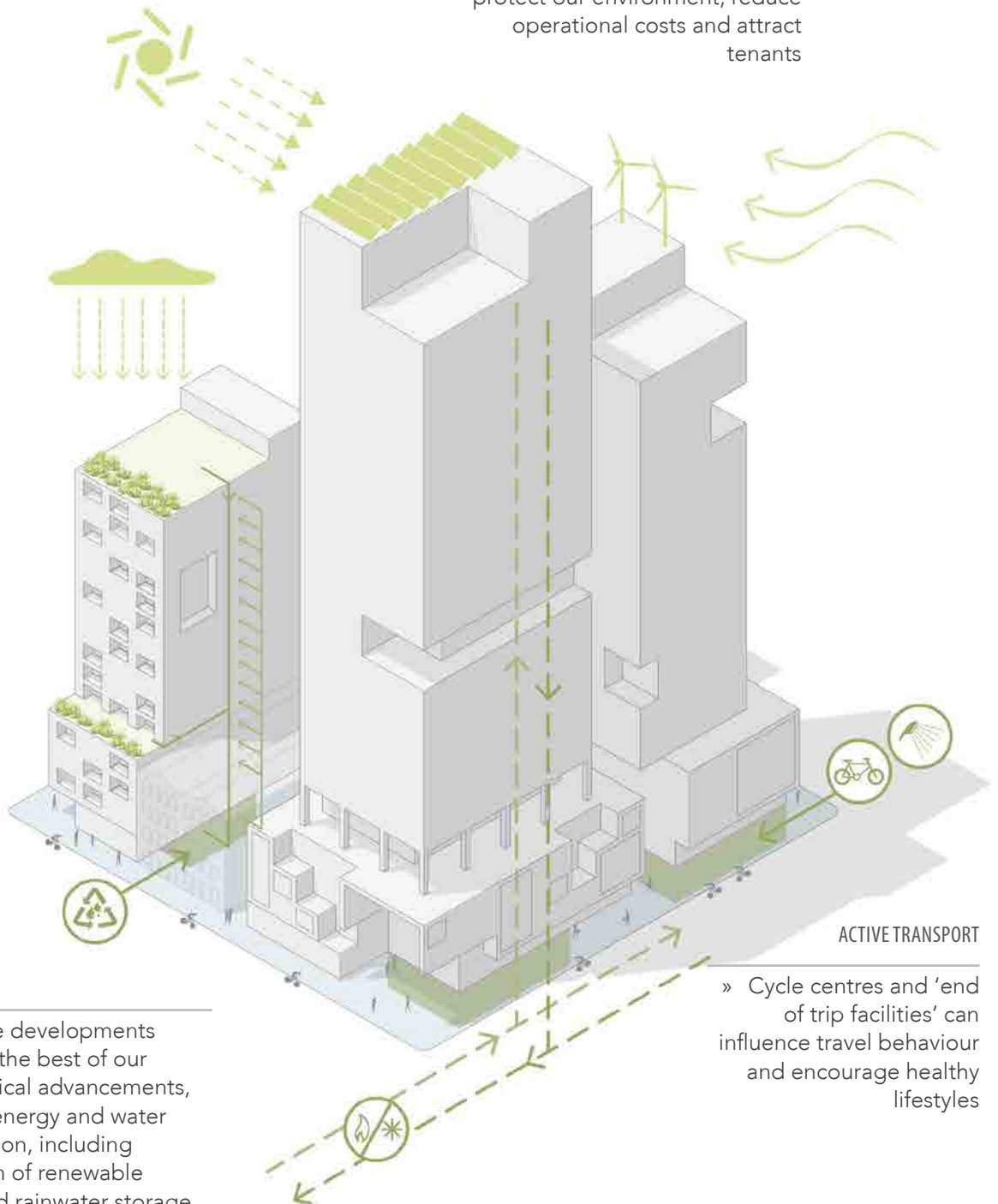
### GLOBAL CHANGE INSTITUTE | BRISBANE

The outer skin incorporates automated sun-shading to reduce solar heat gain.



## CERTIFICATION

- » Green Star rated design helps protect our environment, reduce operational costs and attract tenants



## NEW TECHNOLOGY

- » City centre developments showcase the best of our technological advancements, reducing energy and water consumption, including generation of renewable energy and rainwater storage and reuse

## ACTIVE TRANSPORT

- » Cycle centres and 'end of trip facilities' can influence travel behaviour and encourage healthy lifestyles



## SUB-ELEMENTS

### 8.1 NEW TECHNOLOGY

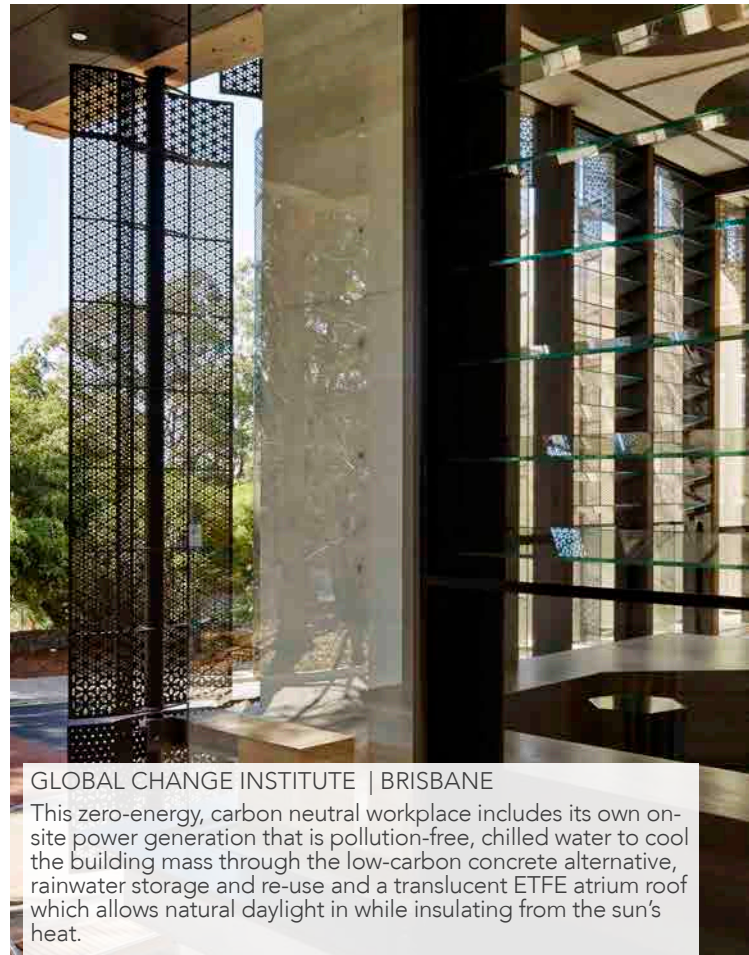
In a world where technology is changing and evolving every day, there are always new solutions to our problems. Keeping up-to-date with these is an ongoing task and not always captured in industry certified tools. Implementing new and upcoming technology that improves the performance of buildings is encouraged. This includes the reduction of energy and water consumption, the generation of renewable energy, the reuse of water and the reduction in overall waste during operations.

### 8.2 ACTIVE TRANSPORT

Integrating active transport facilities, such as cycle centres and 'end of trip facilities' into the fabric of our city and its buildings can influence travel behaviour and contribute to active, healthy lifestyles and improve occupant productivity all while reducing carbon emissions and traffic congestion.

### 8.3 CERTIFICATION

Industry recognised certification systems provide independent ratings for the sustainable design and operation of buildings. This includes detailed requirements on energy reduction, waste minimisation and operational performance. Industry and Council recognised tools in Brisbane include Green Star and NABERS.



#### GLOBAL CHANGE INSTITUTE | BRISBANE

This zero-energy, carbon neutral workplace includes its own on-site power generation that is pollution-free, chilled water to cool the building mass through the low-carbon concrete alternative, rainwater storage and re-use and a translucent ETFE atrium roof which allows natural daylight in while insulating from the sun's heat.



12 CREEK STREET | BVN DONOVAN HILL





480 QUEEN STREET | BVN DONOVAN HILL



WHARF STREET STUDENT HOUSING | ARKHEFIELD

# LOOKING TO THE FUTURE

Brisbane's architects and developers are already embracing the concept of buildings that breathe with a number of recent development approvals proposing innovative architecture that will transform our city.







## ACKNOWLEDGEMENTS

Brisbane City Council thanks the following architects and photographers for their invaluable contribution to the *draft Buildings that Breathe Design Guide*.

### PHOTOGRAPHERS

© 360°	13
© Australian Institute of Architects	32
© Christopher Frederick Jones	Front and back cover, 1, 4, 7, 8, 12, 19, 22 (top), 31, 36, 38, 39, 40
© David Hannah	26 (bottom)
© Dianna Snape	25, 26 (top)
© HGEsch	6, 24
© Jennifer Mendez	45 (top left and centre left)
© John Collings	14, 28, 32
© Jon Linkins	30
© Peter Bennets	20, 50, 52
© Rocket Mattler	18, 22 (bottom)
© Shantanu Sharick	14 (top), 43, 44

### ARCHITECTS / ARTISTS

Arkhefield	14 (bottom), 54 (bottom)
Architectus	6, 19, 24, 28, 32
BVN Donovan Hill	16, 54 (top)
Conrad Gargett Riddell	8, 38, 40
Cox Rayner	Front and back cover, 4, 7, 10, 22 (top), 31, 36, 45 (bottom left and right)
Daniel Temperman	45 (top left)
Donna Marcus	45 (top right)
Denton Corker Marshall	34 (bottom), 48
DesignINC	25, 26 (top and bottom)
Donovan Hill	12, 14 (top), 30, 43, 44, 49, 53 (left)
Guymer Bailey	19
Harry Seidler Associates	7
Hassell	13, 20, 50, 52
Ian Moore Architects	18, 22 (bottom)
Ingenhoven Architects	24
Richard Kirk	1, 34 (top)
studio505	45 (centre right)
Wilson Architects	13
Woha	37

### PAGE # REFERENCE

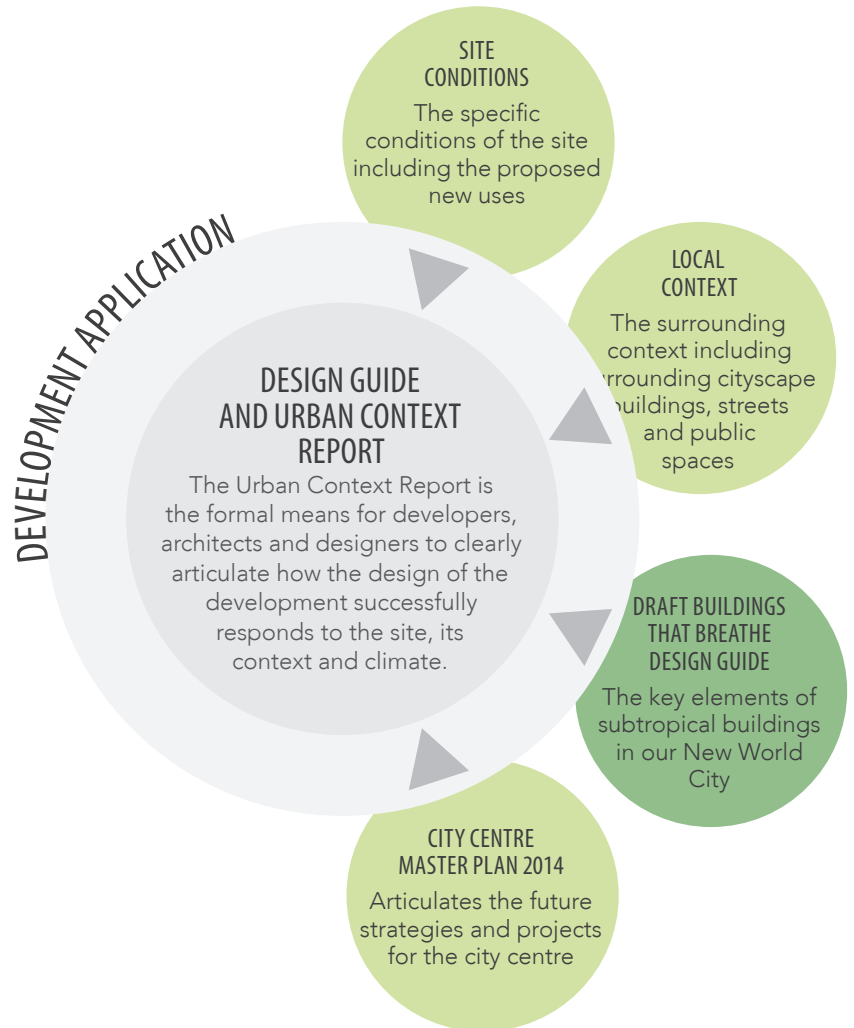
## PURPOSE OF THIS DOCUMENT

---

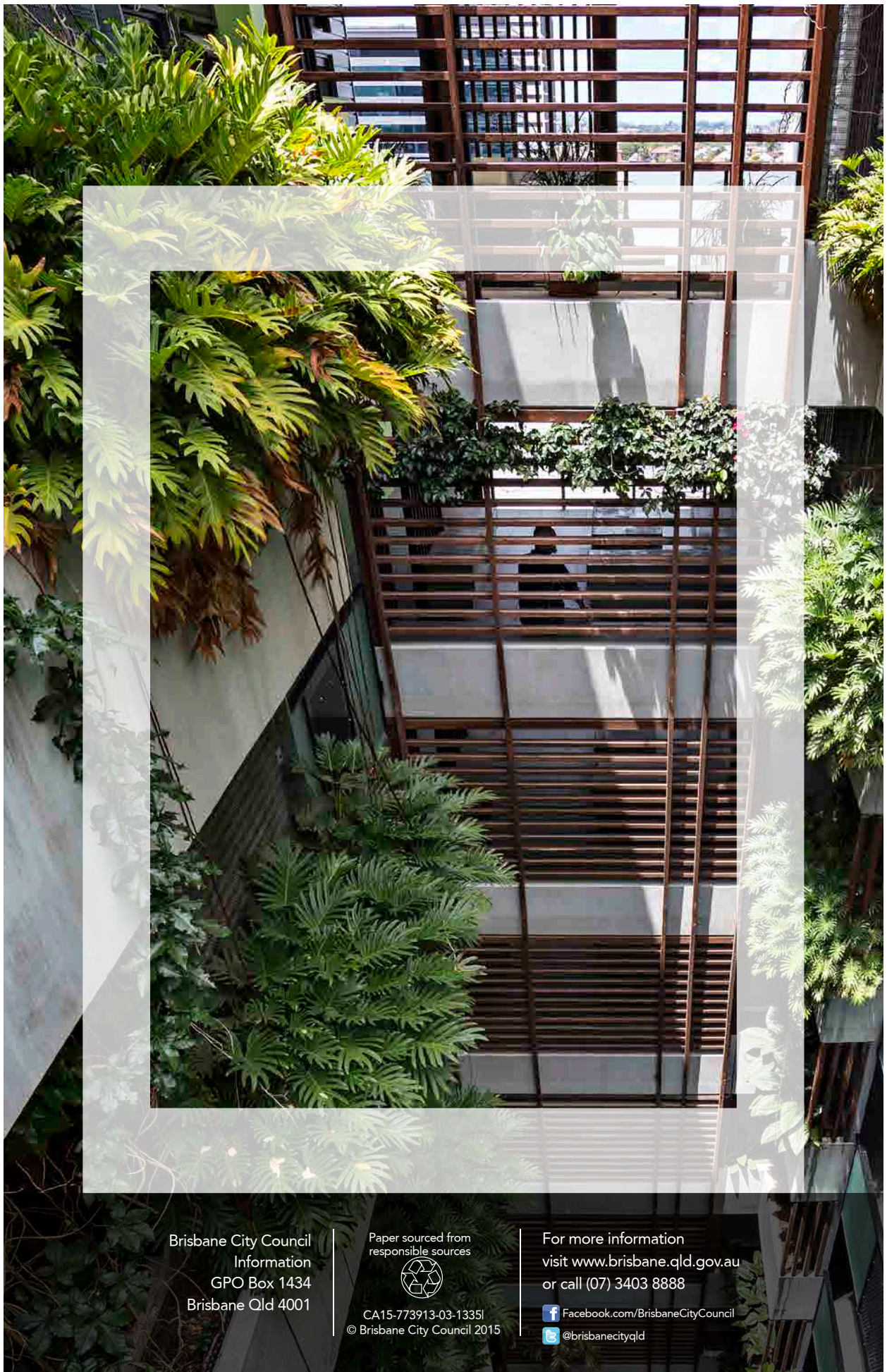
The *draft Buildings that Breathe Design Guide* provides a shared vision for the development of subtropical buildings in our city centre. The guide articulates Council's aspirations for new developments in our city centre in a way that can be understood by a wide range of stakeholders.

An initiative of the City Centre Master Plan 2014, the guide forms a companion document to the *City Centre Neighbourhood Plan (CCNP)*, illustrating best-practice examples and easy-to-understand design elements. Practitioners are encouraged to use the guide to assist them in understanding and responding to the requirements of the CCNP.

Any significant new development in Brisbane's city centre will require an Urban Context Report to demonstrate how the proposal achieves key performance outcomes. When preparing an Urban Context Report, practitioners should demonstrate how they have incorporated the eight design elements of the *draft Buildings that Breathe Design Guide* into the development proposal.



	ELEMENTS	NOTES	Y/N
<b>01</b>	<b>ORIENTATE YOURSELF</b>		<input type="checkbox"/>
	1.1 LOCATION AND ORIENTATION		<input type="checkbox"/>
	1.2 MASSING AND INTERNAL LAYOUT		<input type="checkbox"/>
	1.3 VIEWS		<input type="checkbox"/>
	1.4 STREET ACTIVATION		<input type="checkbox"/>
<b>02</b>	<b>OCCUPY OUTDOOR SPACES</b>		<input type="checkbox"/>
	2.1 CITY ROOMS		<input type="checkbox"/>
	2.2 SKY TERRACES		<input type="checkbox"/>
	2.3 BALCONIES		<input type="checkbox"/>
	2.4 LANEWAYS AND CROSS-BLOCK LINKS		<input type="checkbox"/>
<b>03</b>	<b>ILLUMINATE WITH DAYLIGHT</b>		<input type="checkbox"/>
	3.1 BUILDING SETBACKS		<input type="checkbox"/>
	3.2 GLAZING		<input type="checkbox"/>
	3.3 LIGHT WELLS AND SKYLIGHTS		<input type="checkbox"/>
<b>04</b>	<b>NATURAL AIR AND VENTILATION</b>		<input type="checkbox"/>
	4.1 OPERABLE WINDOWS		<input type="checkbox"/>
	4.2 DOORS AND OPENINGS		<input type="checkbox"/>
	4.3 NATURAL VENTILATION SYSTEMS		<input type="checkbox"/>
	4.4 DOUBLE SKIN FACADES		<input type="checkbox"/>
<b>05</b>	<b>SHADE AND PROTECT</b>		<input type="checkbox"/>
	5.1 AWNINGS AND COLONNADES		<input type="checkbox"/>
	5.2 EXTERNAL SHADING DEVICES		<input type="checkbox"/>
	5.3 SHADE STRUCTURES		<input type="checkbox"/>
<b>06</b>	<b>LIVING GREENERY</b>		<input type="checkbox"/>
	6.1 GREEN ROOF		<input type="checkbox"/>
	6.2 VERTICAL GREENERY		<input type="checkbox"/>
	6.3 ELEVATED GARDENS		<input type="checkbox"/>
	6.4 INTERNAL PLANTING		<input type="checkbox"/>
	6.5 STREET TREES AND VEGETATION		<input type="checkbox"/>
<b>07</b>	<b>IDENTITY MATTERS</b>		<input type="checkbox"/>
	7.1 CHOICE OF MATERIALS		<input type="checkbox"/>
	7.2 LONGEVITY		<input type="checkbox"/>
	7.3 PUBLIC ART		<input type="checkbox"/>
	7.4 CREATIVE LIGHTING		<input type="checkbox"/>
<b>08</b>	<b>REDUCE ENERGY AND WASTE</b>		<input type="checkbox"/>
	8.1 NEW TECHNOLOGY		<input type="checkbox"/>
	8.2 ACTIVE TRANSPORT		<input type="checkbox"/>
	8.3 CERTIFICATION		<input type="checkbox"/>





Brisbane City Council  
Information  
GPO Box 1434  
Brisbane Qld 4001

Paper sourced from  
responsible sources



CA15-773913-03-1335I  
© Brisbane City Council 2015

For more information  
visit [www.brisbane.qld.gov.au](http://www.brisbane.qld.gov.au)  
or call (07) 3403 8888

 [Facebook.com/BrisbaneCityCouncil](https://www.facebook.com/BrisbaneCityCouncil)  
 [@brisbanecityqld](https://twitter.com/brisbanecityqld)