

BARANGAROO SOUTH Commercial Building C1

DESIGN EXCELLENCE REPORT

For Planning Application

Project No: 17012
30 October 2017 _ rev 5



Tzannes



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1.0 Introduction

This Design Report has been prepared to support a State Significant Development Application (SSDA) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

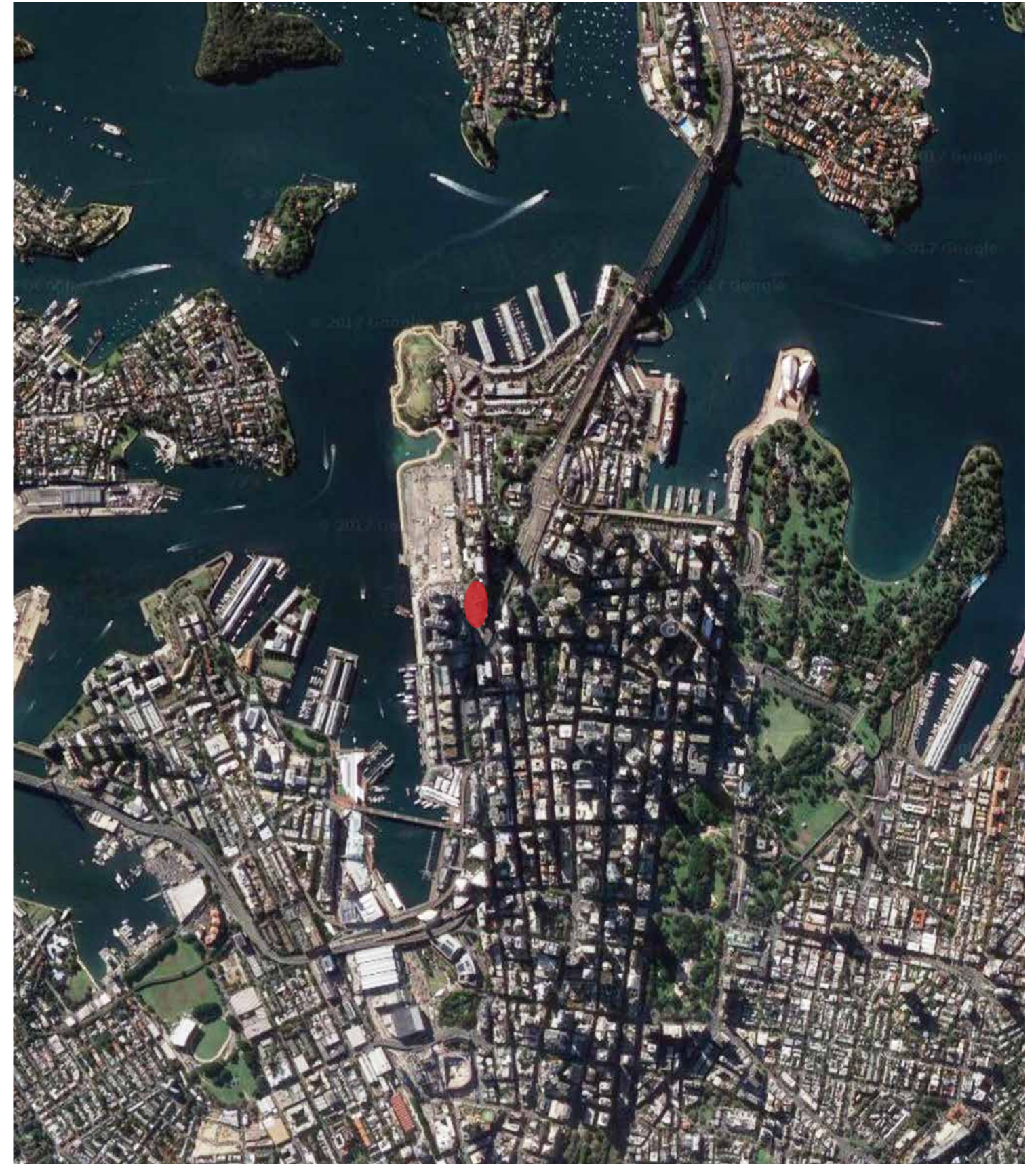
Barangaroo South is located on the north-western edge of the Sydney Central Business District, bounded by Sydney Harbour to the west, Barangaroo Central and Headland Park to the north, Sydney Harbour Bridge approach and northern Central Business District (CBD) to the east and a range of new development dominated by large CBD commercial tenants to the south.

The Commercial Building C1 site is located in the eastern portion of Barangaroo South and as such is a building closer to the precinct entry point from the CBD, via City Walk Bridge, Napoleon Street and Hickson Road on grade.

The Commercial Building C1 SSDA seeks approval for a building that reflects the significance of Barangaroo South as an important precinct for visitors, tenants and residents alike, as well as providing key public domain improvements at its location.

The Development Application is for a 7 storey building including the following elements:

- _ Continuation of the Hickson Road colonnade, which is intended to link the recently completed C2 Commercial Building, Barangaroo Central and northern Headland Park
- _ Ground level retail addressing Hickson Road to the east, Shipwright Walk to the south, Scotch Row to the west and Watermans Quay to the north
- _ Six floors of open plan commercial space with interconnecting lifts and stairs
- _ Paving on the Commercial Building C1 site to integrate with surrounding Stage 1A Barangaroo South Public Domain
- _ Incorporation of the live service risers and existing basement access points
- _ World Leadership standard of sustainable design with the use of renewable structural material and on-site renewable energy generation



1.1 Design Excellence

'Design Excellence' has been a fundamental goal of the design team and has been achieved through an intensive and rigorous design and critique process, via an endorsed Design Excellence Strategy by the Department of Planning. Regular collaboration with experienced design professionals representing the BDA and a continuing formal independent peer review process with Ken Maher from Hassell have enriched the design outcome of the project and ensured that each design decision has been interrogated and validated.

The Commercial Building C1 core design team comprises TZANNES, Lendlease, and a team of specialist consultants including structural, ESD and service engineers.

TZANNES is one of the most widely recognised and awarded architectural practices in Australia, combining a sophisticated understanding of urban design and commercial architecture with a pragmatic, flexible and collaborative approach to the design process. TZANNES' 30 year track record of excellence in projects of broad scales and typologies demonstrates a proven ability to design buildings of the highest quality. TZANNES are a respected advocate for the importance of good design in support of a 'better Sydney'.

TZANNES participated in early master planning workshops with RSHP, Hassell, PTW, Aspect Studios and others with Lendlease to set the urban design principles for Stage 1A and the role that the commercial buildings and tower podiums contribute to the public domain. Further TZANNES have been the designers of various other items in the Barangaroo South precinct, including street furniture, T3 west podium, Hickson Place Loggia and the unique C2 building known as International House Sydney. This commercial building has attracted international attention and acclaim (including the prestigious Athenaeum & European Centre for Architecture, Art, Design and Urban Studies - International Award), due to the innovative use of engineered mass timber construction for commercial buildings and proven the sustainability benefits that this construction method can bring to the built environment. With this experience TZANNES are well placed to design a building that integrates appropriately with surrounding structures and form the threshold to Barangaroo South.

Design feasibility work commenced on C1 in early 2017. The Commercial Building C1 design that forms the Planning Application has been presented to the Barangaroo Delivery Authority and also Ken Maher as independent peer reviewer (as required by the endorsed Design Excellence Strategy) at: early concept stage to confirm public domain strategy and proposed massing; 50% to discuss architectural expression; and at 90% concept design to confirm the more detailed design response. TZANNES directors Jonathan Evans and Alec Tzannes have been involved at every step of the process, combined with a passionate and skilled architectural team to ensure that the variety and depth of the practice's expertise and experience is applied to the design outcome.

Alongside C1's recently completed sister building C2, the proposal provides a distinctive, yet integrated built form as the front door to the Barangaroo precinct. Establishing a benchmark for high quality commercial timber structure buildings in Australia.



Barangaroo South C5, Barangaroo South C2
Central Park Brewery conversion,
Stonecutters Jacksons Landing, Day Street Apartments



1.2 Meeting Design Excellence Requirements

1.2.1 State Significant Precincts SEPP, Schedule 3, Part 12, Clause 19(02)

(2) In considering whether the proposed building exhibits design excellence, the consent authority must have regard to the following matters:

(a) whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved,

The proposed Commercial Building C1 represents a unique and innovative design solution as the second timber engineered building in Barangaroo. Commercial Building C1 has been designed to complement the newly built timber Commercial Building C2 (International House Sydney), also designed by Tzannes. The two buildings form a warm and welcoming gateway to Barangaroo South from the City. The materials and finishes of Commercial Building C1 are detailed in this report and include the internal timber structure, wrapped in a glass curtain wall which celebrates the timber as the hero. The materiality of Commercial Building C1 provides a high environmental performance while allowing views over the harbour and precinct to be enjoyed by the occupants.

(b) whether the form and external appearance of the building will improve the quality and amenity of the public domain,

The architecture of Commercial Building C1 forms part the street wall of the precinct to Hickson Road at a height which compliments and reinforces existing buildings on Hickson Road. The design responds to the public domain and continues the colonnade of Commercial Building C2 along the Western side of Hickson Road, from Exchange Place on the south to Headland Park to the north, providing an active and connected undercover edge to the eastern edge of Barangaroo, linking further south to the Exchange Place Loggia. Commercial Building C1 maintains key view corridors within the Barangaroo South precinct and promotes a sharing of both public and private views. Commercial Building C1 is consistent with the Barangaroo South Built Form and Urban Design Controls. The result is a building that is a distinctive element within Barangaroo.

(c) whether the building will meet sustainable design principles in terms of sunlight, natural ventilation, wind, reflectivity, visual and acoustic privacy, safety and security and resource, energy and water efficiency,

Commercial Building C1 has been designed to achieve a 6-star Green Star rating (version D.A.B. v1.1) and achieves the sustainability objectives set out in the design excellence strategy and detailed in the ESD Report submitted at Appendix O of the EIS, including: targeting carbon neutral, capable of being water positive, targeting net zero waste to landfill, planning for climate change, design with dignity, safety in design, green travel plan, ecology, and leaving a positive legacy.



2.1 Site Context

The Commercial Building C1 site is positioned on the eastern boundary of Barangaroo South Stage 1A precinct and with C2 forms a threshold to the area when approached from the CBD. Pedestrian entry points from the city to Barangaroo South at C1 comprise elevated Napoleon Street Bridge and on grade crossings from Napoleon St and Hickson Road. The primary vehicular entry point to Barangaroo South of Watermans Quay is located directly to the north connecting Hickson Road with the harbour waterfront. Pedestrian thoroughfares of Scotch Row and Shipwright Walk to the west and south respectively.

The east facade of C1 has frontage to Hickson Road and continues the streetscape initiated by C2, defining and reinforcing the eastern edge of Barangaroo South. The north facade forms the edge of Watermans Quay in association with the established T1 north foyer and podium structure.

Hickson Road itself is in the process of being upgraded with extended width footpaths, new street trees, additional cross overs, parking bays and higher levels to provide improved amenity along the eastern edge of the development. Similarly Watermans Quay will be upgraded to form a tree lined avenue and integration with the future development at Stage 1B Barangaroo South to the north, comprising of residential towers with street level retail activation. Further north again is the proposed Metro line station which will be the source of increased pedestrian traffic flows into the area.

The three high rise office towers above 3 storey podiums are positioned to the west on the opposite side of Scotch Row, forming a solid backdrop to the C1 building. These 5 buildings (C1_C2_T1_T2_T3) form the commercial core of Barangaroo South and are the primary generator of users to the site each day.

The existing structures surrounding this commercial core are a variety of architectural styles and uses, including the 5 storey face brick commercial Grafton Bond Store by architect William Wardell opposite the site on Hickson Road.

Parking and services are provided for Commercial Building C1 in the common 3 level basement for Barangaroo South Stage 1A Precinct. This common basement has placed a number of constraints upon the Commercial Building C1 site, including the location of the lift cores, fire egress from the basement, Fire Control room access, a number of service risers and ventilation shafts, diaphragm wall and bike and vehicular access routes. Commercial Building C1 is designed to accommodate these constraints where practical, and reduce their impact whilst maximising the opportunities of this very important site. At certain areas, it is proposed to revise basement infrastructure to better integrate with the proposed commercial building.



View from Hickson Rd looking South



View from Hickson Rd looking North

2.2 Site History

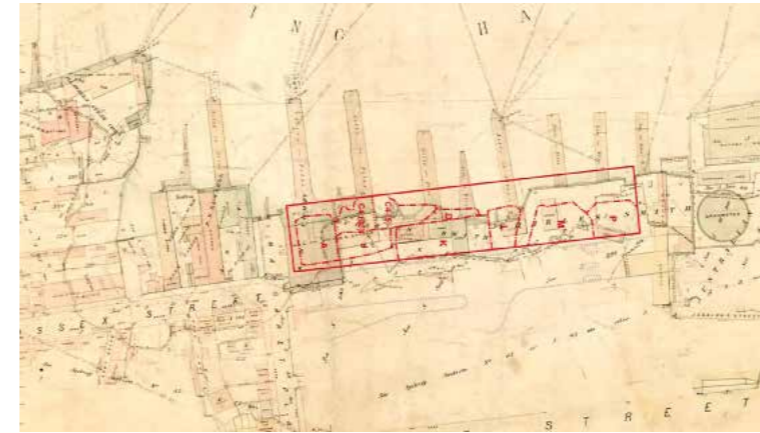
Barangaroo, the place, was used for fishing and hunting by the Gadigal people, the traditional owners of the Sydney City region. Large shell middens and numerous rock engravings close to the site indicate indigenous occupation dating back at least 6,000 years. However, radiocarbon dating from adjacent areas indicates that the wider area was occupied for at least 14,500 years prior to European Colonisation. Post 1788, the site was a place of industrial marine land use as depicted in the adjacent photographs.

The site was occupied by solid timber framed wharfs and piers, and warehouse buildings along the western edge of the city. This building typology used large profile timber sections as structural elements – piers, columns, beams, struts and trusses. Due to the marine environment and need for longevity and strength, the timber species used were typically resilient Australian hardwoods such as turpentine, tallow wood and ironbark.

This honest, pragmatic and expressed use of solid timber as the structural component of a building has instigated the use of modern engineered mass timber technology for both C2 and C1 structures and has provided an opportunity to reinterpret the Barangaroo marine history in the architecture. During the excavation of the basement levels of Barangaroo, a number of turpentine and ironbark logs were extracted from the foundations which will be milled and re-used in the construction of C1.

The site also marks the start of the Hungry Mile, being the name that harbourside workers gave to the dock area during the Great Depression, populated by men looking for day labour on the wharfs.

An area along the eastern colonnade of C1 has been dedicated to provide an interpretive installation space to communicate some of Barangaroo's rich history to the public. This installation would be subject to separate planning approval.



Historic Map and Photograph of Barangaroo Foreshore



Historic Photographs and Typical Use of Timber Marine Warehouse Structures



Hardwood Logs Excavated from the Site

2.3 Barangaroo Concept Plan

On 9 February 2007 the Minister approved a Concept Plan for the development of land at the Barangaroo Site. On 12 October 2007 the Barangaroo Site was rezoned to facilitate its redevelopment. The Concept Plan has been modified eight times since its original approval. The current approved Concept Plan (Mod 8) is for a mixed use development involving a maximum of 594,354sqm gross floor area (GFA), and approximately 11 hectares of new public open space/public domain, including an near 2.2km of foreshore promenade. The Concept Plan includes Urban Design Controls in the form of Built Form Design Controls, maximum building heights and GFA for each development block, as well as high level design guidelines. Commentary on the Urban Design Controls is provided below.



C1 Concept Plan _ Stage 1A Precinct Shown with C1 Plot

2.4 Urban Design Controls

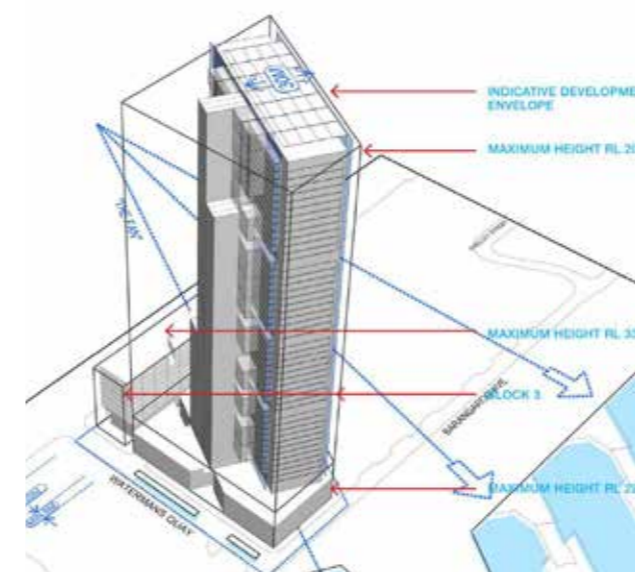
Barangaroo South Built Form and Design Guidelines

2.4.1 Building Mass and Location _ Control 1

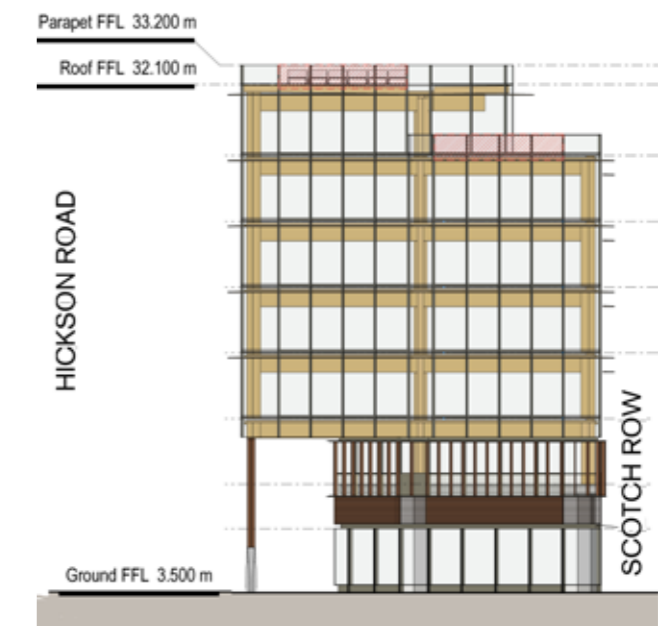
Objectives:

- _ Adoption of "fanning principle" for siting of buildings
- _ To ensure building mass is appropriate within the envelope
- _ The northern part of the block shall contain form of a comparatively lower scale (when compared to tower forms) as generally indicated in the indicative design

In accordance with the Built Form and Design Guidelines, Commercial Building C1 maximum building height is RL 33.2 above the ground plane of RL 3.5, resulting in a maximum overall height of 29.7m from the finished ground level to the highest part of the roof - being the glass parapet, lift overrun and service enclosures



Urban Design Control 1 Diagram
_ Building Mass and Location



Building Heights

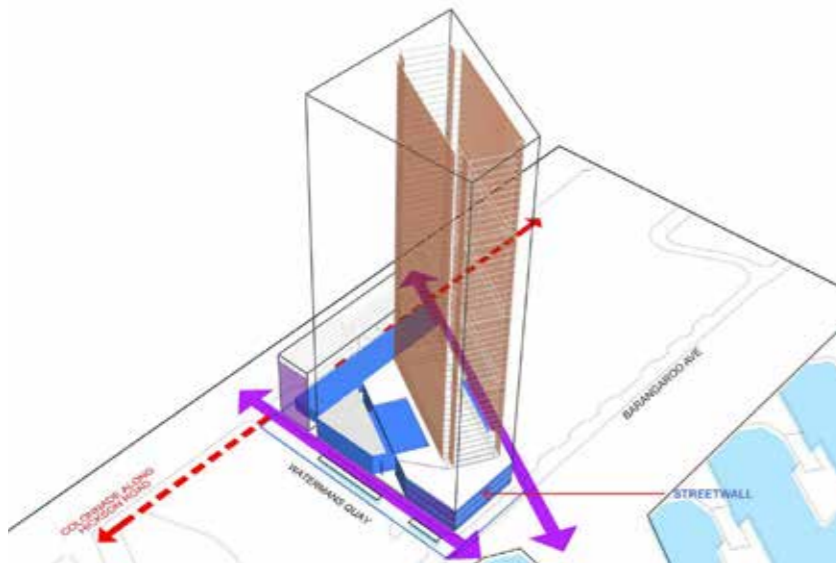
2.4.2 Street Wall Establishment _ Control 2

Objectives:

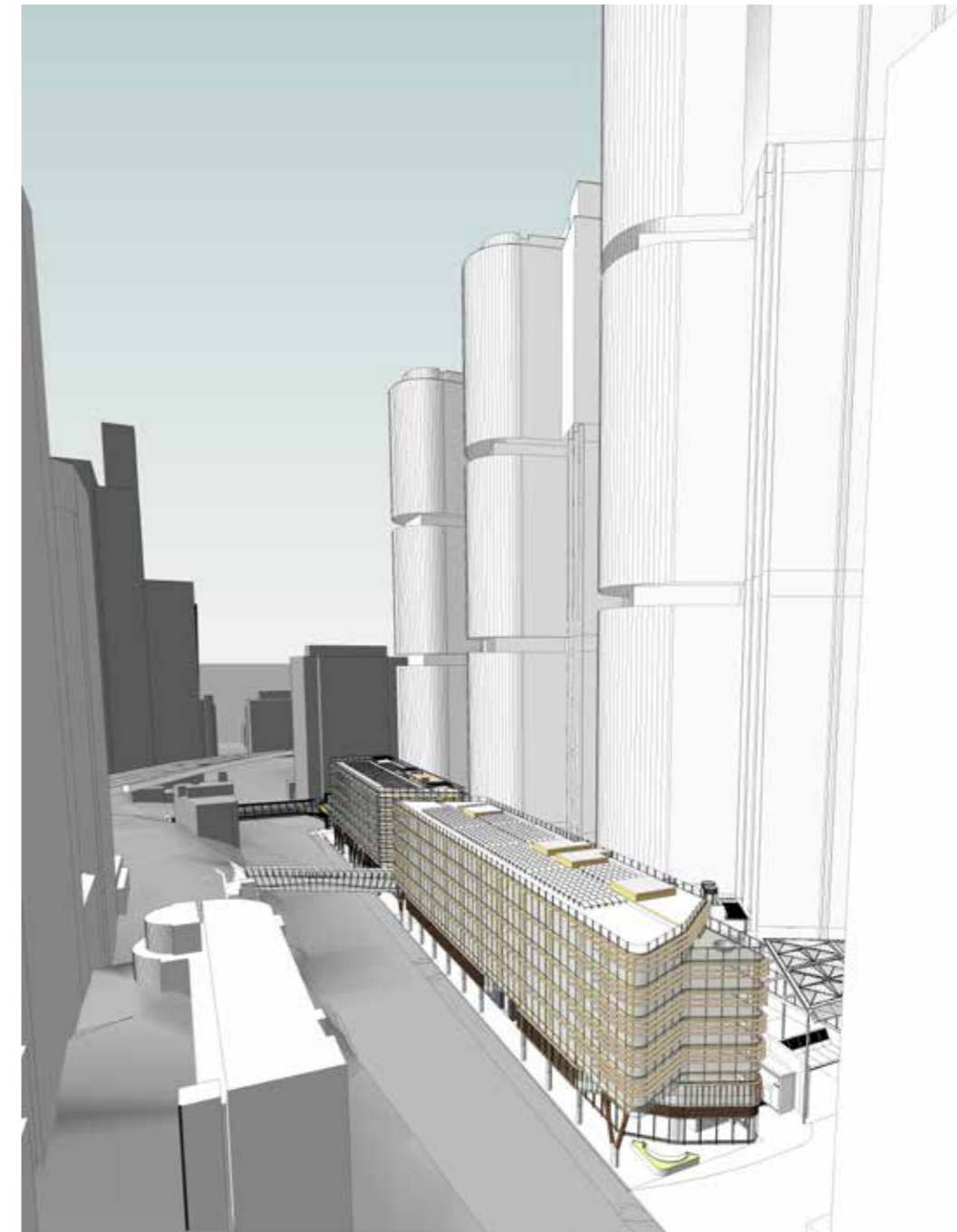
- _ To establish spaces to articulate and define facades
- _ Building mass at podium to form a continuous Street Wall with a minimum predominant podium height of 3 storeys
- _ Street Wall to define Barangaroo Avenue
- _ Podium height shall be determined having regard to compatibility of streetscape form with the surrounding area, and appropriate engagement and framing of the public domain, together with environmental considerations on the public domain and surrounding buildings

C1 continues the colonnade thoroughfare initiated with C2 along the western alignment of Hickson Road, providing direct pedestrian access along a north south path from Hickson Place towards Headland Park. As such, the colonnade will contribute to an active and connected undercover edge to the eastern extent of Barangaroo South.

Similar height facades and the continued use of an expressed engineered mass timber structure further reinforces the Hickson Road street wall and provides a uniform streetscape expression across both C1 and C2, delivering an appropriate grand boulevard character along Hickson Road.



Urban Design Control 2 Diagram
_ Street Wall Establishment



Hickson Road Street Wall

2.4.3 Building Articulation _ Control 3

Objectives:

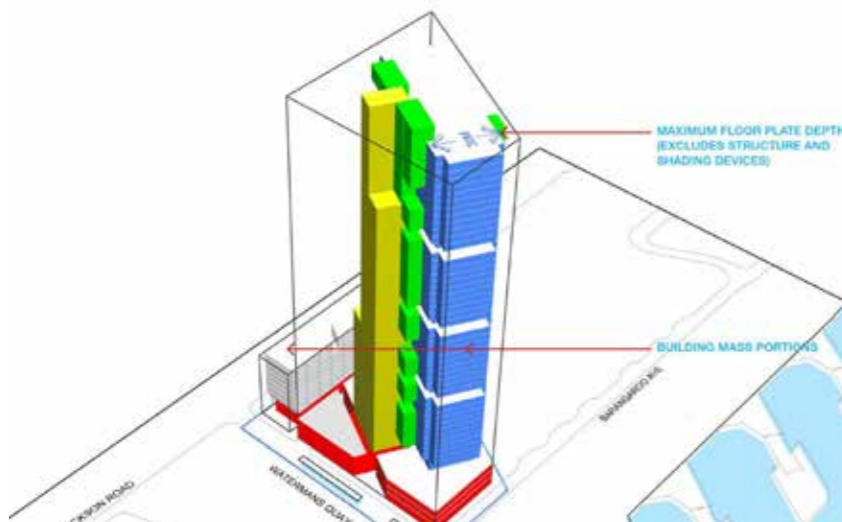
- _ To establish an articulated, well proportioned building mass
- _ To reduce the impact of the building mass

The northern end of C1 building acts as a pivot moment in the public domain, turning from the long straight Hickson Road avenue into the perpendicular Watermans Quay leading to the harbour.

The curved expression of the northern facade from level 2 to 6 assists in smoothing this transition and leading the streetscape around the corner, whilst still maintaining a strong definition at the corner and therefore urban design response. To provide generosity at the ground plane, the level 1 commercial floor bends in under upper level, with the ground floor retail turning in even sooner, to introduce the colonnade entry with layering down elements. This expression provides a double height undercoft space at pedestrian level and visual permeability at the entry point into the precinct. This layering expression is continued at the southern end of the building for the connection of Shipwright Walk with Hickson Road beneath a double height space at ground.

A further layering back of the level 6 north east corner provides a roof terrace in the premium corner of the site, resulting in an outdoor prow to the north and dynamic form from top to bottom.

All of the building corners are rounded to provide a smooth, fluid character to the timber heart, almost as if the building has been with a clear skin.



Northern End Building Articulation

Urban Design Control 3 Diagram
_ Building Articulation

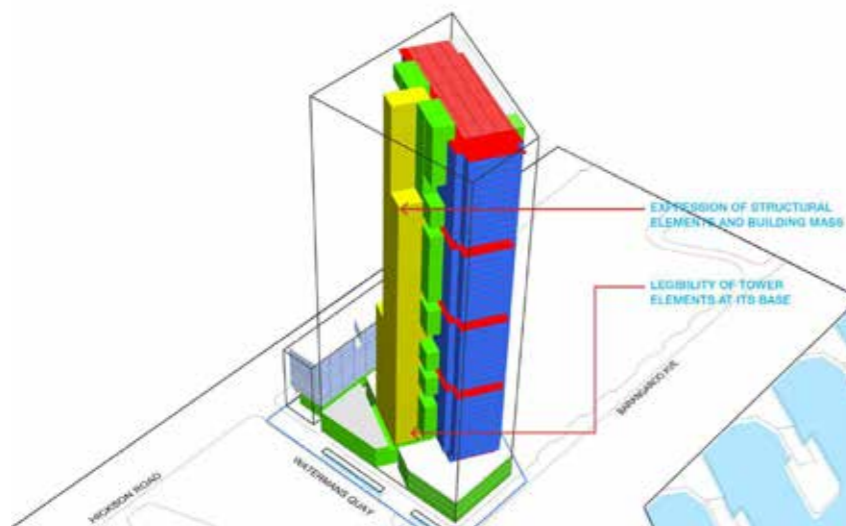


2.4.4 Building Legibility _ Control 4

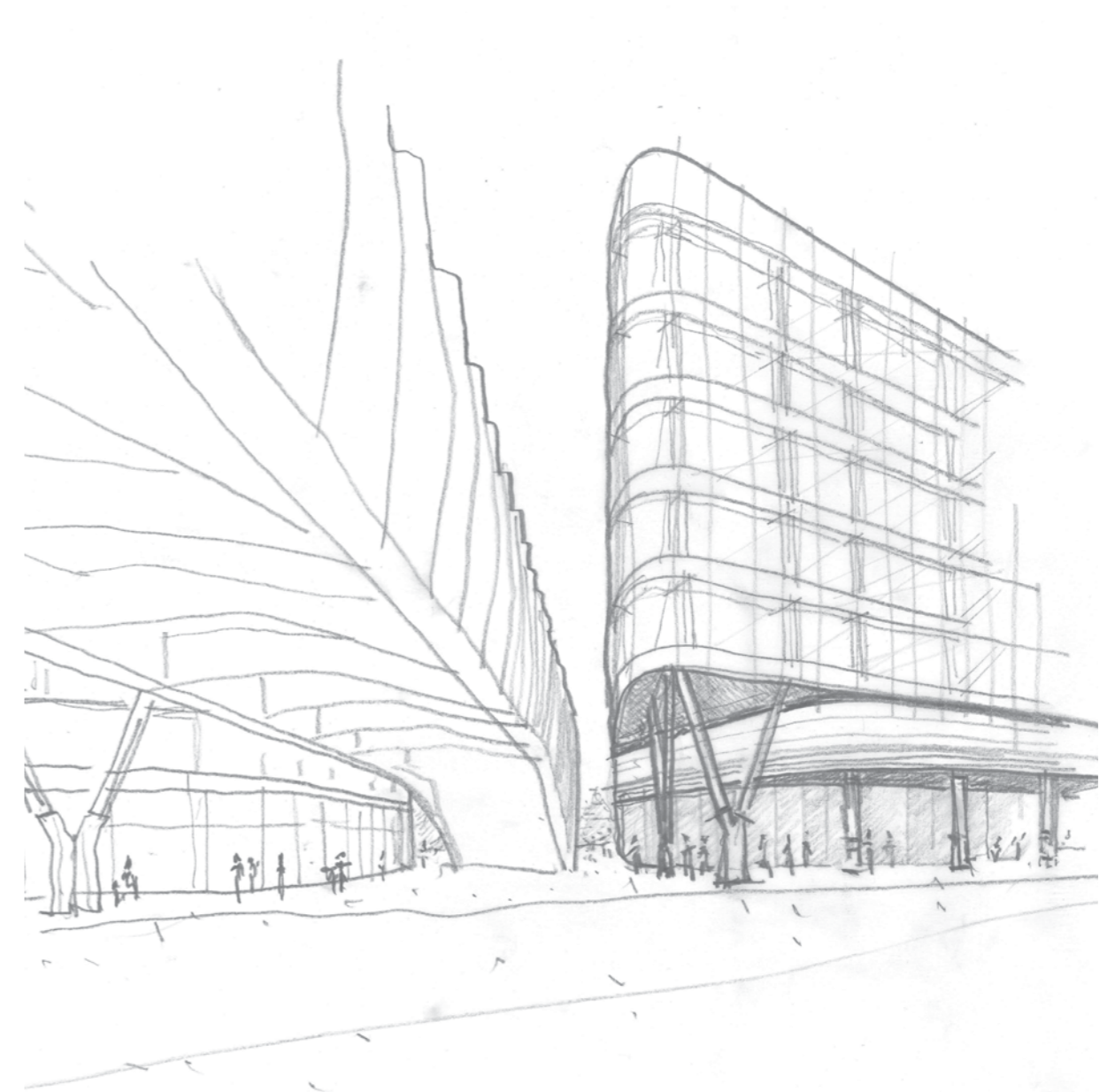
Objectives:

- _ Constituent elements of the building need to be articulated
- _ The elements and structure should be legible at the base of the building

The design presents as a clear “5 on 2” articulation, with the upper 5 storey element a clear celebration of the engineered timber frame with minimal adornments, over a richer and more articulated 2 storey base. This expression is continued through materiality, rhythm of elements and a higher level of solidity.



Urban Design Control 4 Diagram
_ Building Legibility



Southern End Building Articulatio

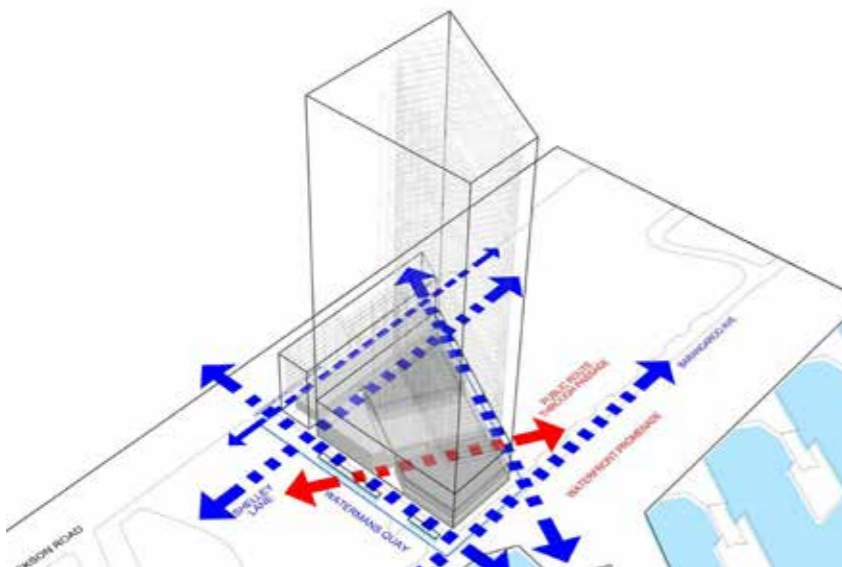
2.4.5 Ground Floor Permeability _ Control 5

Objectives:

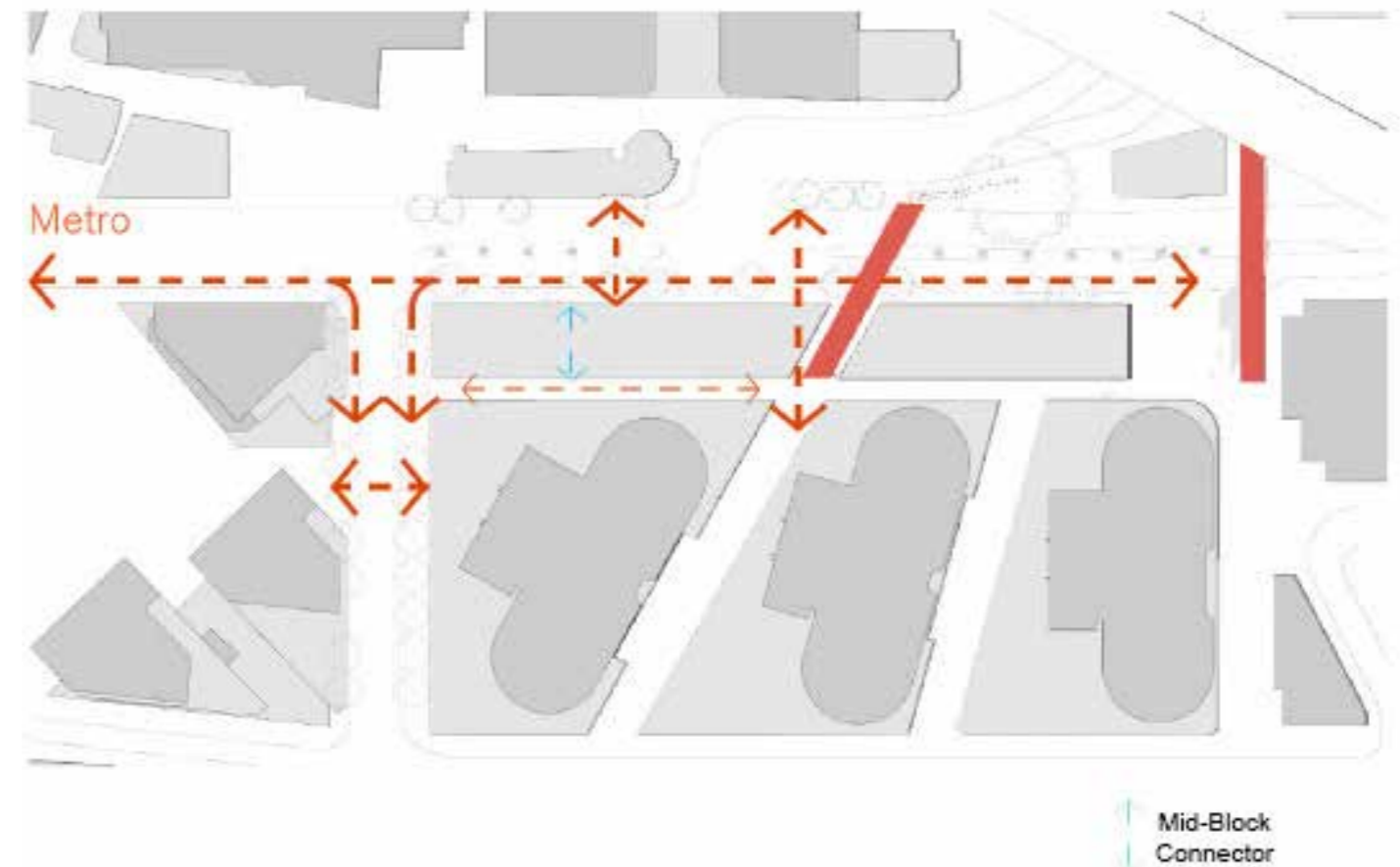
- _ To provide permeability and accessibility through Barangaroo South*
- _ To maximise safety in the public realm*

The C1 building is located 'in the round' with pedestrian network on all sides, each with a distinct character and usage pattern. Napoleon Bridge delivers a high volume of pedestrian traffic at the south west corner of the building, connecting with an on grade crossing from the bottom of Napoleon Street. The open and expanding ground plane at the south provides for these high volumes entering and leaving the Barangaroo site.

North and South movement is aided by the 4m wide colonnade on the east and 6m wide Scotch Row on the west. Due to the length of the block, the ground floor commercial lobby acts as a mid-block connection point between the colonnade and Scotch Row (shown in blue on the attached plan), delivering visibility, activity and pedestrian traffic to both entry points.



Urban Design Control 5 Diagram
_ Ground Floor Permeability



Ground Level Pedestrian Paths

2.4.6 Quality of Rooftops _ Control 6

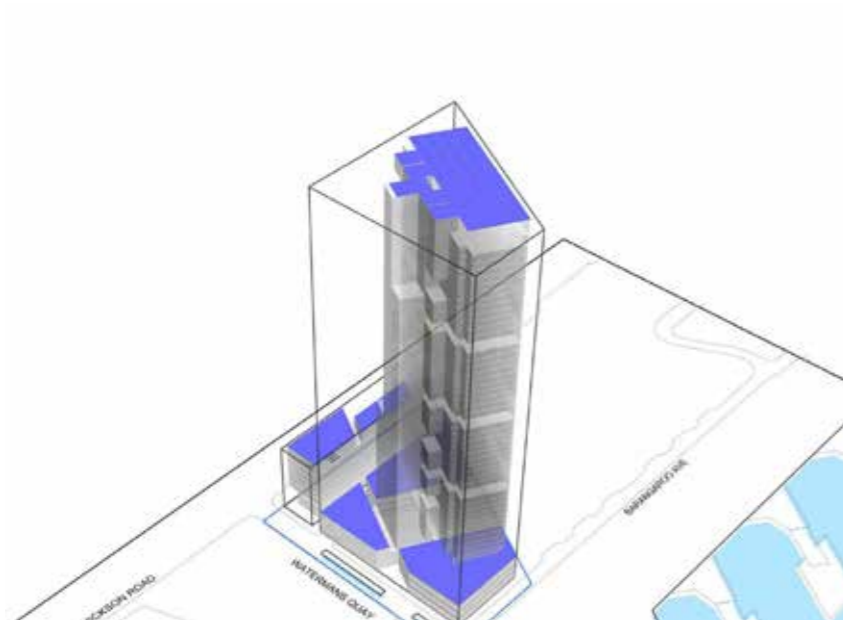
Objectives:

_ The mass at the rooftop shall be articulated and legible

To generate clean, renewable energy the majority of the C1 roof is fitted with photo voltaic panels to partially meet the needs of the building's energy demand. Over 700 sqm of panels are proposed to provide a 105kW array. Photo voltaic cells are similar to the response of C2 and Tower 1

The north west corner at level 6 of C1 provides an opportunity for activation with a landscaped terrace available to commercial tenants. This provides a visual continuation of the podium rooftop treatment of Tower 1

Lift overruns and service equipment like fans and ducts, will be shrouded to the top and sides, with perforated metal sheeting painted a recessive colour to disguise the equipment to view from surrounding higher buildings



Urban Design Control 6 Diagram
_ Rooftops



Roof Mounted Photovoltaic Array
_ Precedent Commercial Building C2

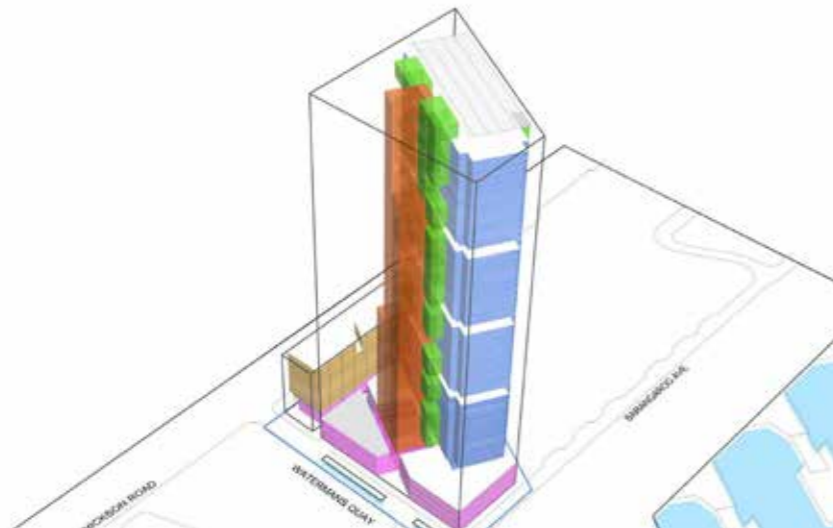
2.4.7 Facades _ Control 7

Objectives:

- _ To ensure the architectural quality of the facades
- _ To articulate the building's functions and massing with appropriate facade design and detailing
- _ To ensure the facades contribute to the building's articulation and mass
- _ To contribute to the "carbon neutral" aims for Barangaroo South

Similar in nature to C2, to fully express the warmth and logic of the mass timber structure, the envelope is intended to be as clean and clear as possible, with minimal visual interruption, almost like the timber framing has been 'shrink wrapped' with clear material for weather protection. The envelope is simply a sophisticated and high performance transparent protective skin rather than a dramatic feature of the architecture.

External sun shade devices are employed where needed in accordance with the solar studies to limit the heat load on the building - to not overload the perimeter chilled beam cooling technology and keep the glazing clear and untinted.



Urban Design Control 7 Diagram
_ Facades



C2 Facade System to be similarly applied to C1

2.4.8 Active Streetfronts _ Control 8

Objectives:

_ To ensure a vibrant public domain will be created at street level

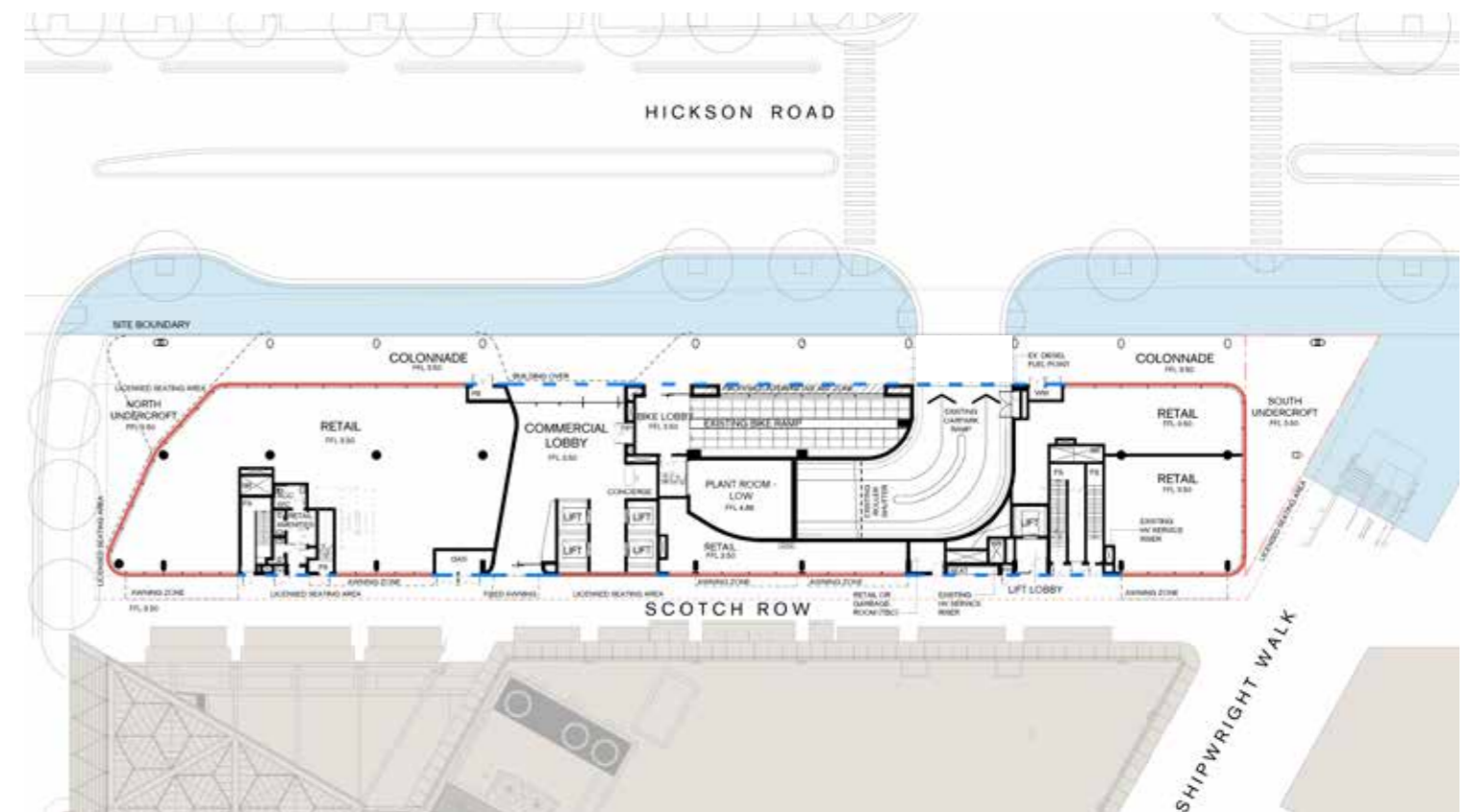
In total 60% of the ground plane is active street frontage - refer plan below. The majority of the activation is from retail tenancies facing all of the surrounding public domain. The commercial lifts have been included in the activation calculations as the facade to the lift wells and the lift cars themselves are fabricated from glass, which means that when walking along Scotch Row the unique sight of a 7 storey continuous shaft wall constructed from engineered timber will be visible day and night, with the glass lifts ascending and descending within the timber shafts - another world first and innovative demonstration of mass timber use

The existing driveway exiting onto Hickson Road on the east is dual carriageway of approx 7.5m width, subject to a separate planning application, the crossing point with the colonnade will be treated with an alternate cobblestone finish to highlight the fact that it is a pedestrian crossing zone. Existing traffic and pedestrian lights will be retained and relocated to suit the proposed building with signage to provide a safe crossing zone

The section of colonnade side wall adjacent to the bike entry and exit ramp from the basement will be set up as a 'canvas' for the future installation of an Interpretation Zone for future static graphic elements which provide interpretation of Barangaroo South, to maintain interest and activation of this otherwise passive area of facade. The future installation will be via a separate planning application, and not subject to the SSDA



Urban Design Control 8 Diagram
_ Active Streetfronts



Active Ground Plane - active area shown red

2.4.9 Signage _ Control 9

Objectives:

_ To ensure that the location, size, appearance and the quality of the signage on the building is appropriate

High level building signage zones are proposed to be limited to the east and northern facades as the other 2 face into existing buildings. One option has been provided for the east facade and two options have been provided for the north facade with only one option available. The final installation would be subject to a separate planning application

Height of the signs are limited to the balustrade and floor slab zone with height of 1.4m. Widths on the east elevation limited to 18m and the north elevation 8m, as indicated.

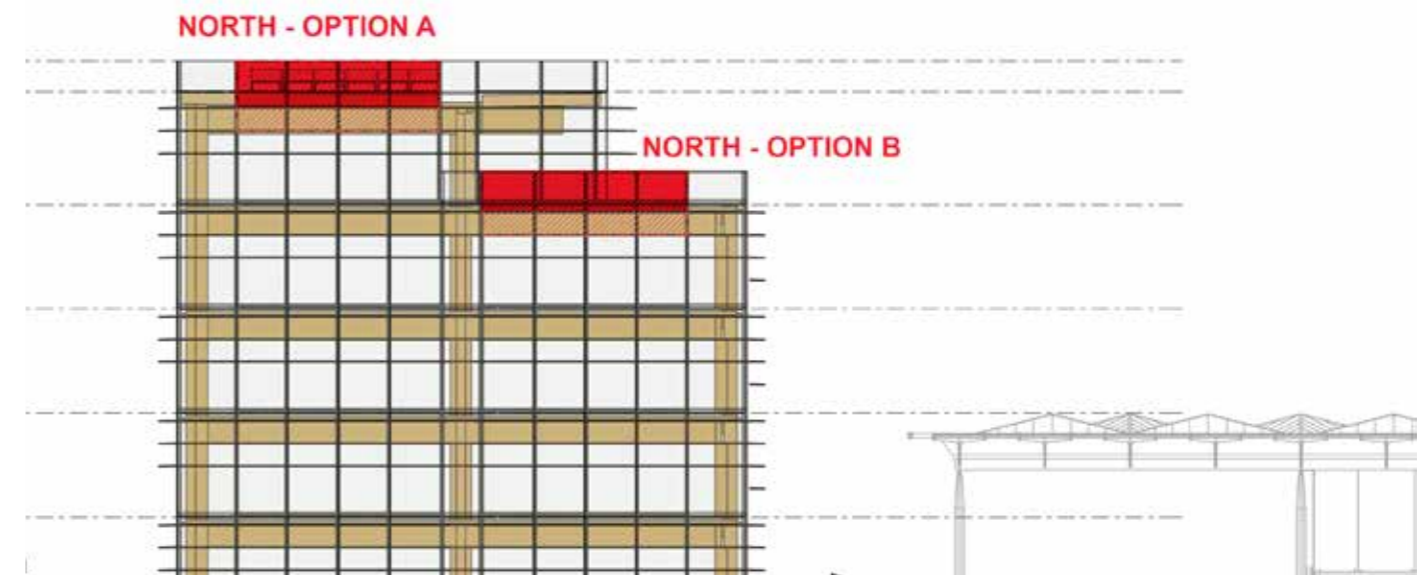
At ground level, a separate signage strategy has been developed to provide a coordinated response



Urban Design Control 9 Diagram
_ Signage



Signage Location - East Facade



Signage Location - North Facade

3.0 Urban Design and Architectural Principles

The distinctive character of Commercial Building C1 has been informed by the opportunities and constraints of the public domain and the unique benefits of the natural timber structural material used.

The two storey articulation of the lower levels, allow for a separate and distinct architectural expression of the upper levels of C1. Whilst the lower two levels address the scale of the ground plane and surrounding public domain elements, the upper levels form a continuous glass skin that wraps around the perimeter of the building and allows for maximum possible visibility to the hero of the building: the internal timber structure.

Internally, the primary structure of the building from Level 1 to the roof, comprises a renewable, sustainable material: engineered timber. The structural span constraints of engineered timber. The level 1 floor and ground level columns will be constructed from reinforced concrete, to provide a moment connection with the existing basement and provide the higher level of fire rating required of retail tenancies.

External structural elements have been regarded differently due to requirements for robustness, durability and weathering. The Hickson Road columns have shaped concrete base where they meet the ground, with recycled hardwood timber struts forming the upper portion of two storey columns.

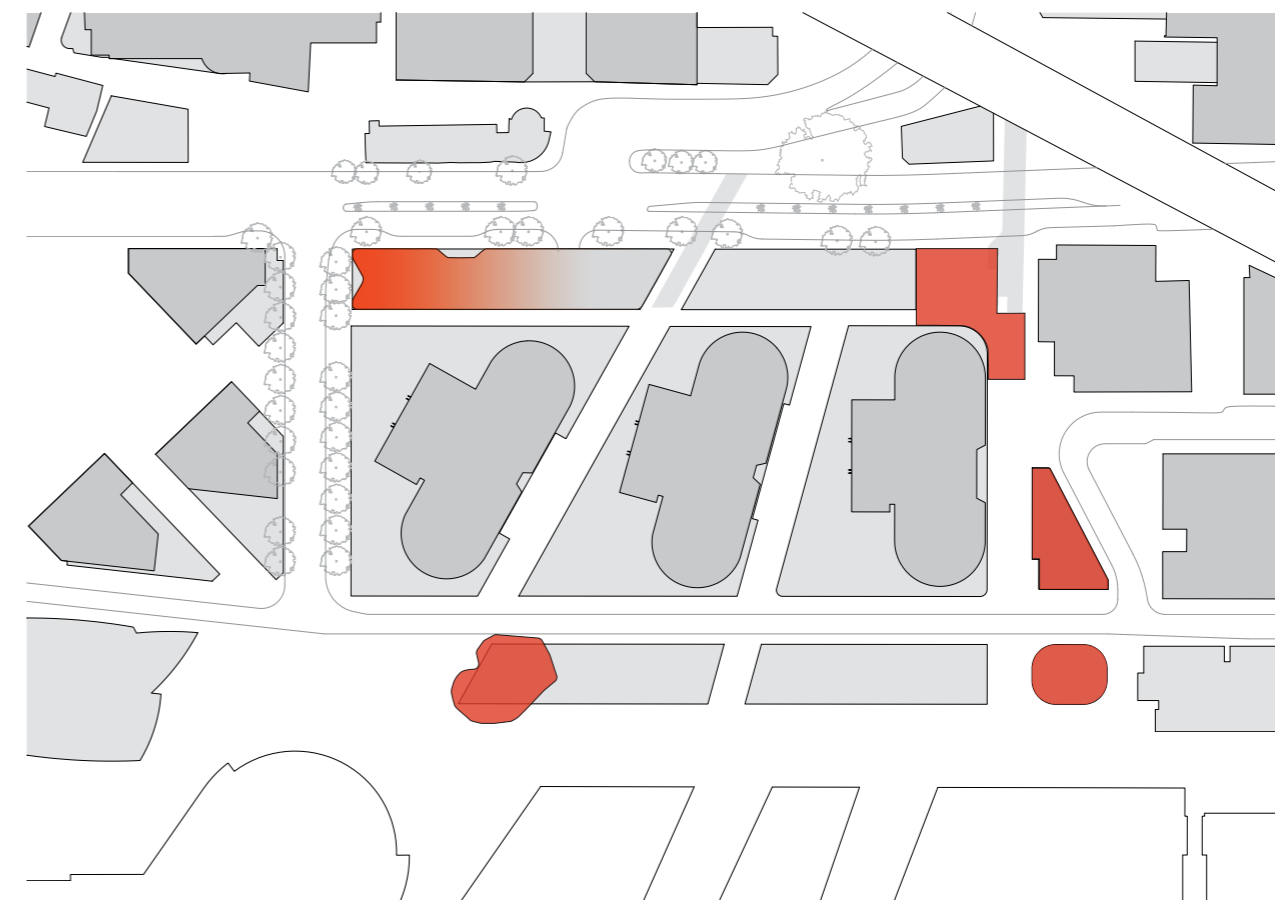
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Distinct Edge Elements Around the Commercial Core

3.1 Architecture

The building form of C1 is a response to a clear understanding of the urban design constraints of the site and that of the approved Concept Plan

The C1 building, along with C2 forms part the street wall of the precinct to Hickson Road at a height which compliments and reinforces existing buildings on Hickson Road outside of Barangaroo South, such as KPMG, the Sussex Hotel, and 30 The Bond

C1 further provides a transition in scale from the towers to the west and their associated 3 storey podiums

In response, the architecture is proposed as a distinctive element within the city. The Proposal is in two parts: a two storey base that includes the colonnade and responds to the scale of the public environment, and an upper 5 storey form as a clean simple glazed envelope that allows the interior timber elements to be visible from the outside and celebrated as the hero

The vertical uniformity of the façade is broken up by way of a transparent lift core for the full height of the building. The commercial entry is announced through a dramatic two storey entry statement with the underside of the level 2 engineered timber floor visible

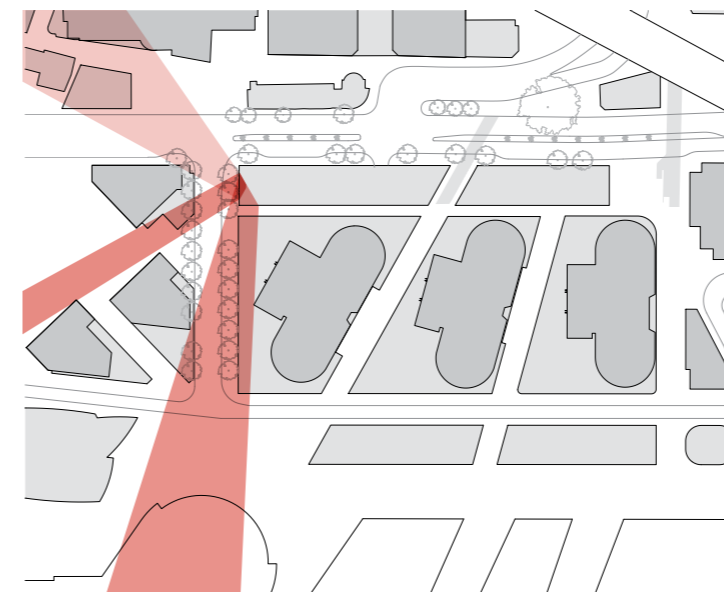
The project is integrated through a consistent approach to detail and the transformation of the more dynamic base to the simpler geometry of the glass envelope that is a smooth glass skin that reinforces the positive qualities of the public domain



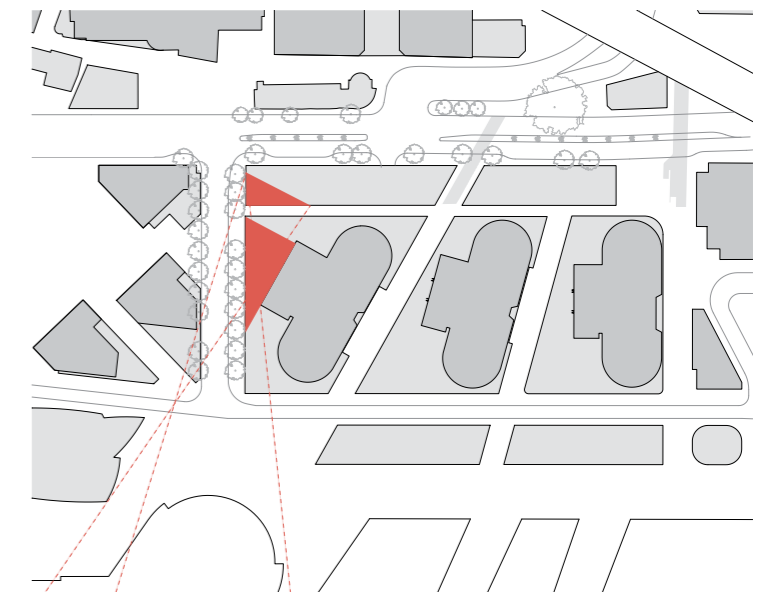
Family : Three Brothers and Two Sisters



Concept view from Scotch Row



Building Form : View maximisation



Building Form : Urban geometry drivers

3.1.1 Colonnade Design

C1 continues the colonnade thoroughfare along the Western edge of Hickson Road, providing direct pedestrian access along a north south path from Hickson Place to Headland Park. As such, the colonnade will contribute to an active and connected undercover edge along the eastern extent of Barangaroo South.

The scale of the colonnade is appropriate for the scale of the public domain and grandly scaled at the three entry points into the precinct, being the north end, south end and commercial entry. Scale and proportions are as follows:

- _ 4m wide from face of retail frontage to east facade
- _ Approx 8.7m high to underside of primary beams and 9.5m to underside of floor structure at the three precinct and building entry points
- _ Approx 5.4m high to the two sections of colonnade between the entry points
- _ Column spacing is generally 9m, with one column removed from the ground plane at the north and south ends to provide a more open public domain experience. This has been achieved through the use of a Y column, similar to the C2 columns
- _ The proportion of height to width is tall and elegant, compatible with other colonnade features across Sydney

Consistent with the structural authenticity of the project, the colonnade columns are constructed from timber whenever they are supporting a timber structure - ie all of the 8.7m high columns. The timber used for these columns is recycled ironbark and their structural capacity fully utilised - ie the timber is not cladding or a veneer but structural.

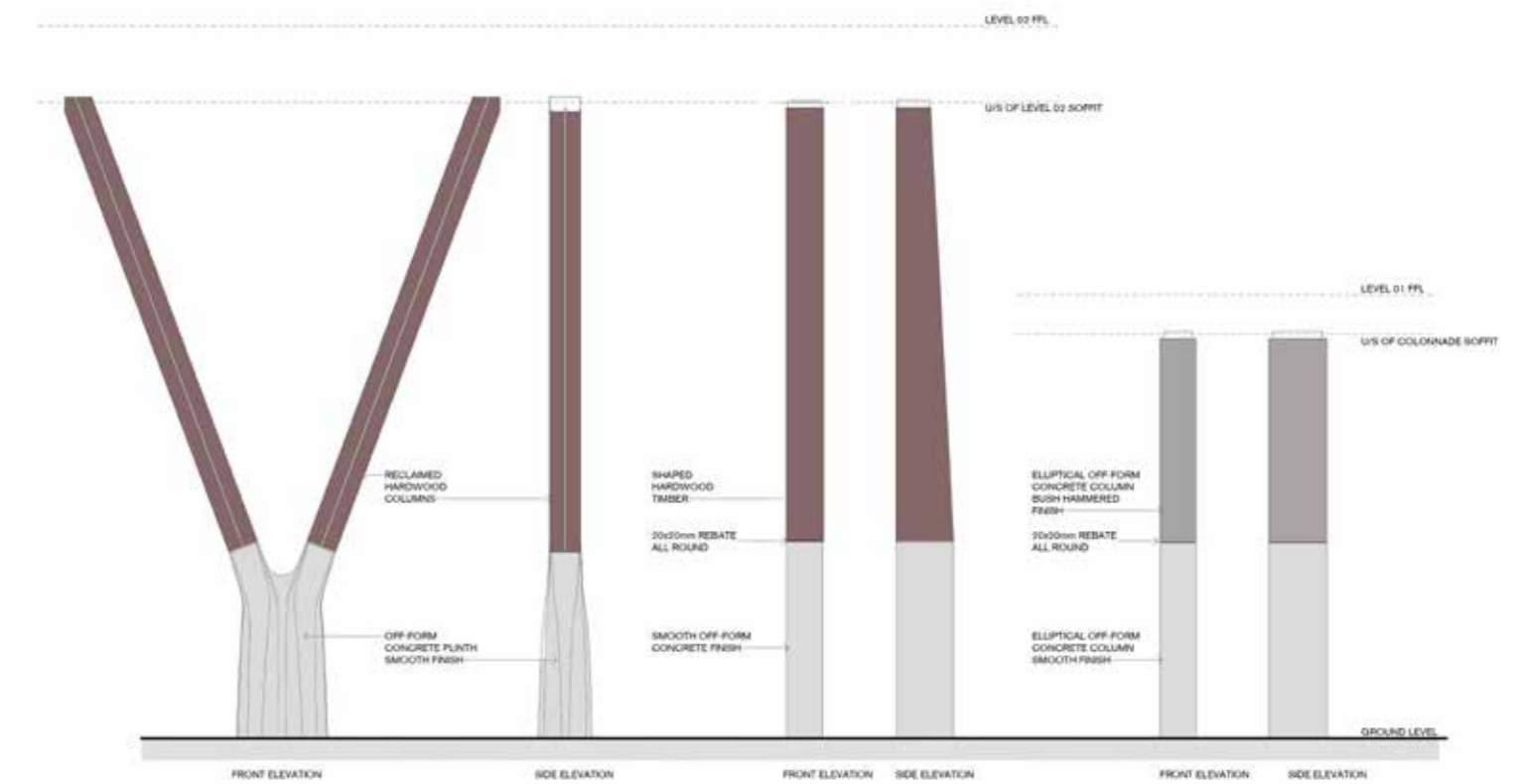
The 5.4m high colonnade columns are supporting the level 1 concrete slab and therefore are retained as concrete.

So that the 3 unique column forms visually combine as a united family, the lowest 2.7m of the columns will be finished with off form off-white concrete, the same colour as C2 concrete plinths, to again form a degree of uniformity. The upper half of the all-concrete columns will be bush hammered to give a different finish and texture to the plinth bases.

The lobby façade gives double height expression announcing the main building entrance. K bracing in the upper façade gives further, subtle expression to the entry adding an element of scale within the building length. The bracing doubles as a five storey truss allowing for the deletion of the colonnade column at the lobby entrance further opening up the ground plane, signifying the building entry point.



Building Entrance



Column Design Family



3.1.2 Materiality

The materiality of the building relates strongly to the local context and the marine heritage of the site.

The primary structure is made of engineered timber: glulam columns and beams with cross laminated timber (CLT) floors. This innovative technology uses certified FSC European Spruce, and is a highly sustainable alternative to traditional reinforced concrete construction and really the only renewable structural material that architects have available for buildings such as this. Internally the timber remains exposed and unadorned, forming the interior character of the commercial spaces from level 1 to the roof.

All external timber elements, including columns, column struts, and soffit linings, are proposed to be constructed from recycled hardwood for durability and weathering.

The internal timber structure is wrapped in a clean glass curtain wall skin.

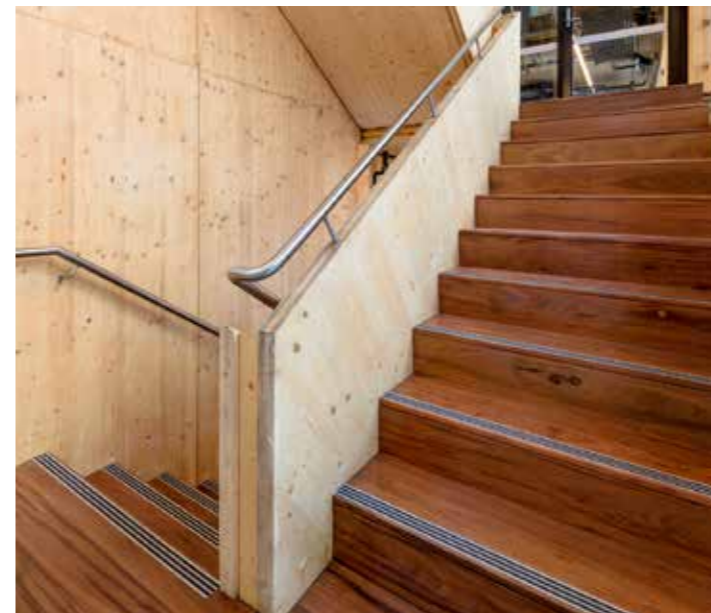
The glass curtain wall facade from Level 2 to the roof, consists of insulated spandrels and double glazed vision panels.

Ground level charcoal face bricks provide a durable finish with a finer and more personable unit scale.

The design and detailing of the glass vision panels provide a high environmental and acoustic performance while allowing the tenants to enjoy the views over the harbour and surrounding precinct.

Internally services are exposed and form part of the interior design of the spaces, raw and honest in their expression.

Adjoining public domain areas across the ground plane within the premises, such as the colonnade, north and south undercroft areas, will match the materials of the Stage 1A public domain



3.2 Structure

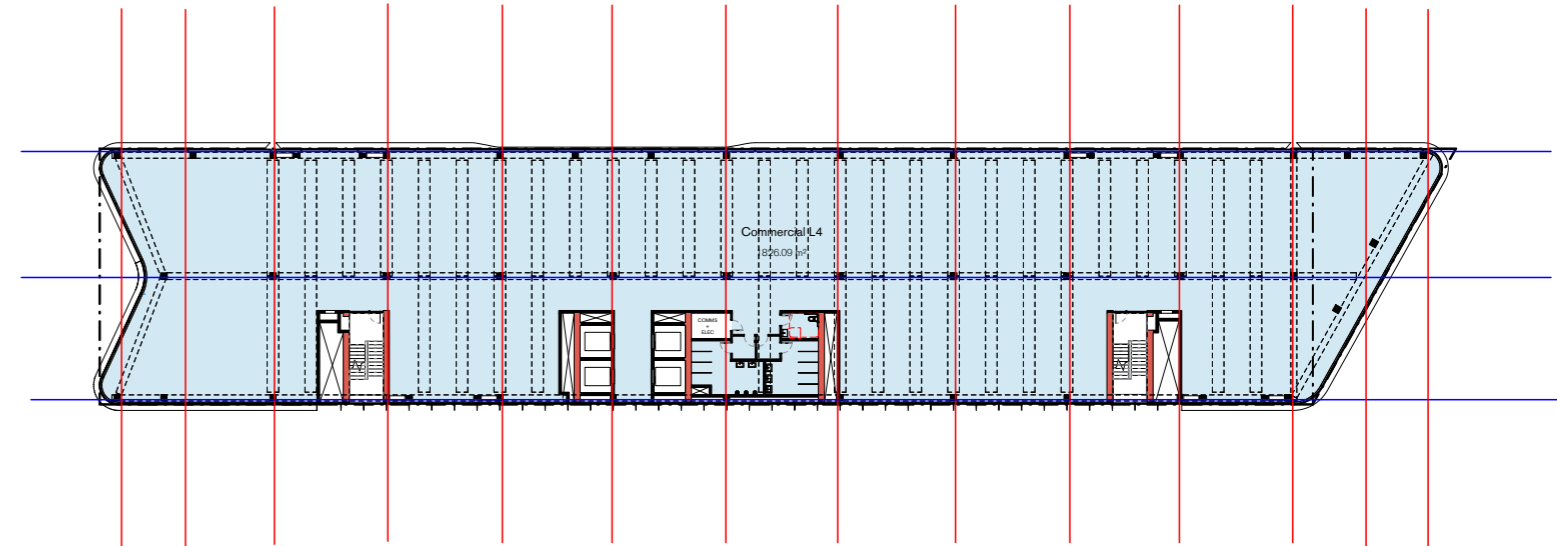
Structural engineered timber is an innovative, sustainable structural material derived from a renewable resource. Together with the use of recycled hardwood timber for elements such as the colonnade columns, cladding above the retail area including ventilation slots and soffit linings, it provides opportunity to re-interpret the working harbour history of the site at one of the main entrances of Barangaroo South

There are a number of limitations posed by the use of this material structurally. These limitations have been turned into opportunities and celebrated, giving the building a unique and distinctive character

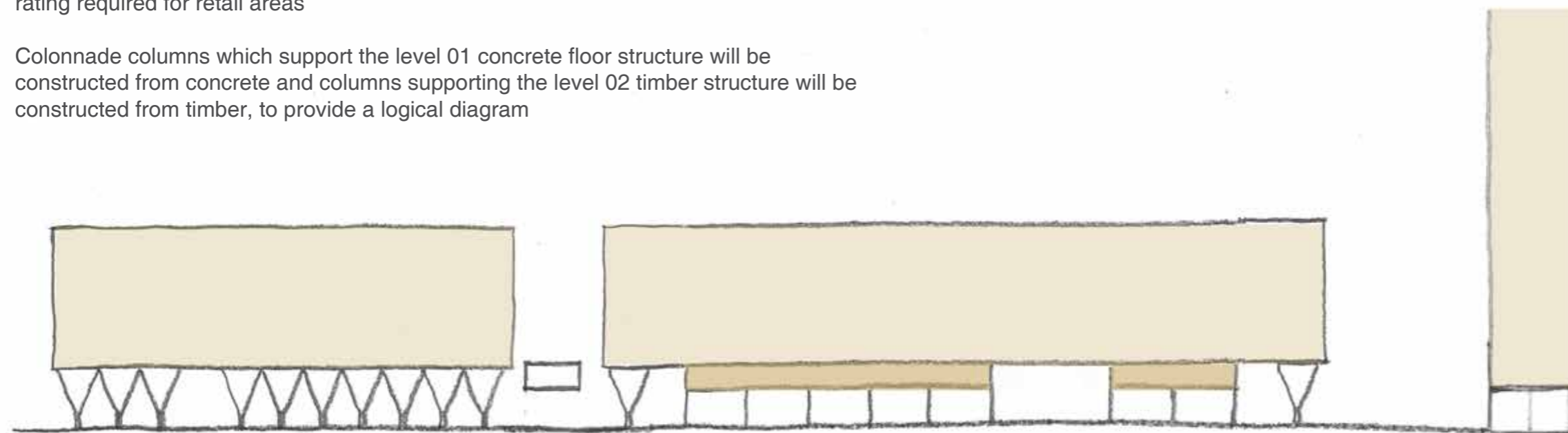
The C1 building grid is derived from the as built basement grid at 9m in the north-south direction and approximately 9.3m in the east-west direction. Primary beams follow the perimeter of the building and down the central spine, with secondary beams spanning between the primary beams at 3m centres. A timber CLT floor slab then covers the entire floor area. Lift cores, egress stairs, service risers and amenity pods are all constructed from timber CLT and glulam also to provide a cohesive and comprehensive engineered timber structure

The ground floor columns and level 01 floor structure will be constructed from reinforced concrete to: provide a stiff moment connection with the existing basement; allow minor transfers of columns locations, provide termite and weather protection; offer a higher fire rating required for retail areas

Colonnade columns which support the level 01 concrete floor structure will be constructed from concrete and columns supporting the level 02 timber structure will be constructed from timber, to provide a logical diagram



Typical Floor Plan Structural Grid



East Elevation Concept

3.3 Envelope

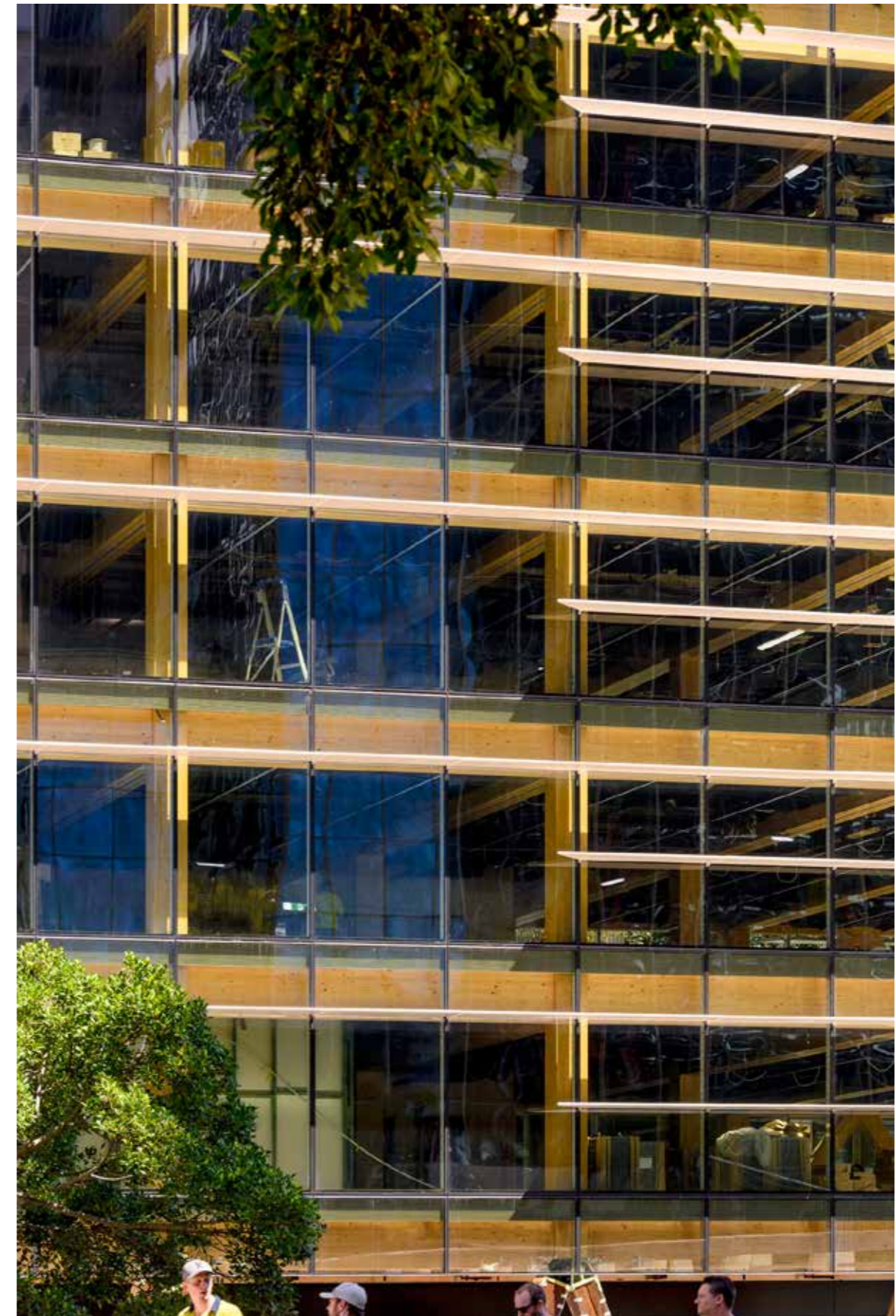
3.3.1 Facade Level 2 to Roof

As per C2, to fully express the warmth and logic of the mass timber structure, the envelope is intended to be as clean and clear as possible, with minimal visual interruption, almost like the timber framing has been shrink wrapped with clear material for weather protection. The envelope is simply a sophisticated and high performing transparent protective skin.

For high environmental performance and to employ clear, untinted, low-iron glazing, each facade responds to it's aspect by incorporating varying numbers of sun shading devices as required, bracketed off the mullion framing.

External shading devices are intended to be a mid-bronze coloured metal to compliment the warmth of the timber structure.

The high performance glass of the vision panel is expected to be approximately 60% VLT (visible light transmittance), with relatively low reflectivity. All areas are double glazed to reduce heat loss and conserve energy.



3.3.2 Facade Ground and Level 1

The 2 storey base of the building has a character that is distinct from the upper levels in order to relate appropriately to the scale of the ground plane public domain, and is also quite distinct from the C2 base to provide variety and a different personality to the 'sister' C2 building.

Dark coloured bricks at the ground level provide some solidity and a strong, neutral background for the more dynamic retail tenancies to populate. This colour also provides opportunity to disguise the many incursions into the facade for non-active but necessary elements, such as emergency egress and access doors, cupboards for fire safety equipment such as hydrant boosters and service requirements like meters, amenities and structure.

The retail tenancies have been provided with a 'kit-of-parts' for the shopfronts to provide the necessary flexibility for a variety of future retail uses within a controlled system and family of components. The 'kit of parts' are provided at Section 3.3

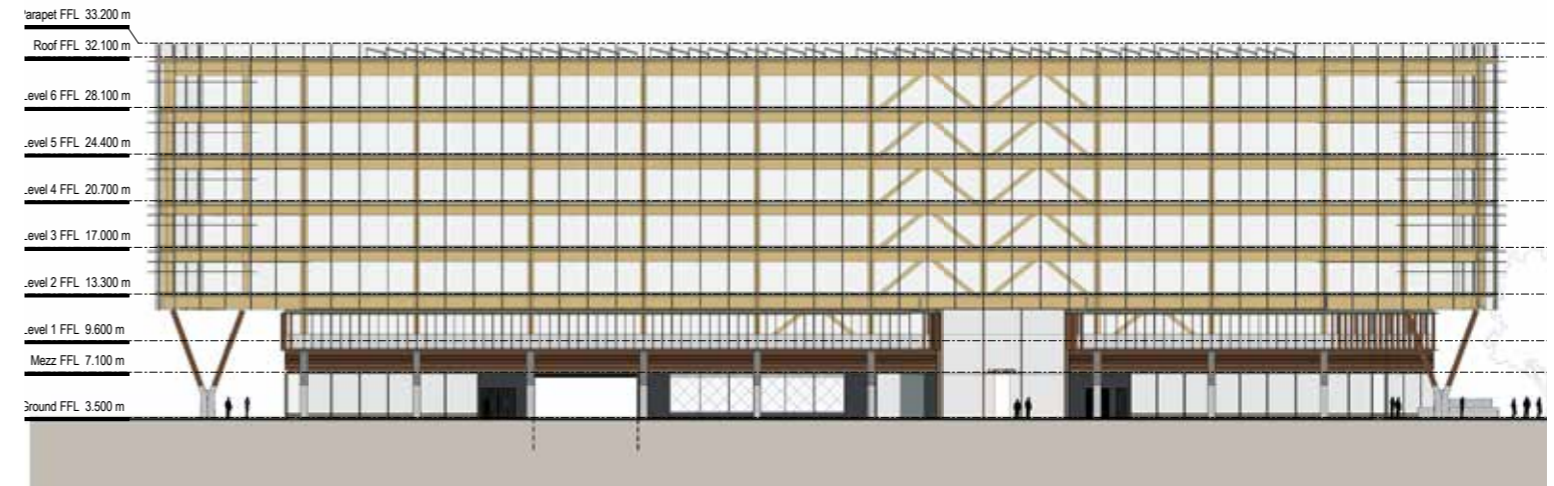
_ Colonnade facing retail shopfronts have predominantly fixed glazing with more formal, classically detailed entry points

_ North and south ends open to the double height undercrofts proving opportunity for outdoor seating and activation, therefore have the option of increased operability to reduce the barrier between inside and outside

_ Scotch Row tenancy shopfronts have more variety and a finer grain to respond to the reduced laneway scale. Further these tenancies have the option of narrow fixed or operable fabric awnings (located in an awning zone), to improve the intimacy and protection for patrons along Scotch row

Above the retail shopfronts is a continuous band of horizontal timber boards in recycled ironbark to match the colonnade column material. Slots are cut into the timber to provide an integrated solution for necessary ventilation through to facade for mechanical supply and ventilation.

The commercial first floor above the retail level is distinct from the rest of the envelope and forms a continuous loop around the building with the use of recycled hardwood timber vertical blades. These blades provide a level of screening of the commercial use from the ground plane and reinforce the rich red coloured hardwood recycled timber 2 storey base to the light blond softwood timber 5 storey top of the building.



East Elevation



West Elevation



South Elevation



North Elevation

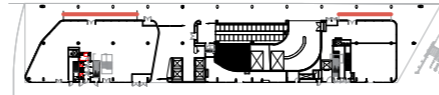
3.3.3 Retail Kit of Parts

The final selection and installation of shopfronts are to be signed off by the building certifier. This process is similar to the shopfront design and installation on other buildings in the Barangaroo South precinct.

Zone A

Shopfronts occurring on the eastern elevation within the colonnade. Occurs either side of the lobby and carpark access ramp.

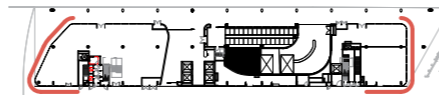
Character - Formal



Zone B

Shopfronts occurring on the northern and south elevation and returning along a portion of the west facade.

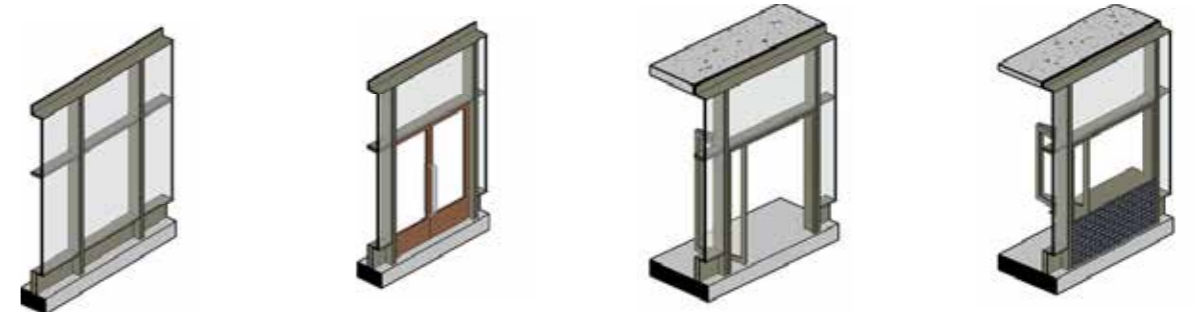
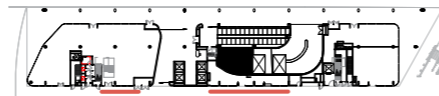
Character - Permeable and minimal threshold between inside and outside.



Zone C

Shopfronts occurring on the western elevation of C1 within Scotch Row. Zone occurs immediately north and south of the lobby entry.

Character - Richly textured and nuanced in response to the intimate spatial quality of the laneway.



Zone B + C

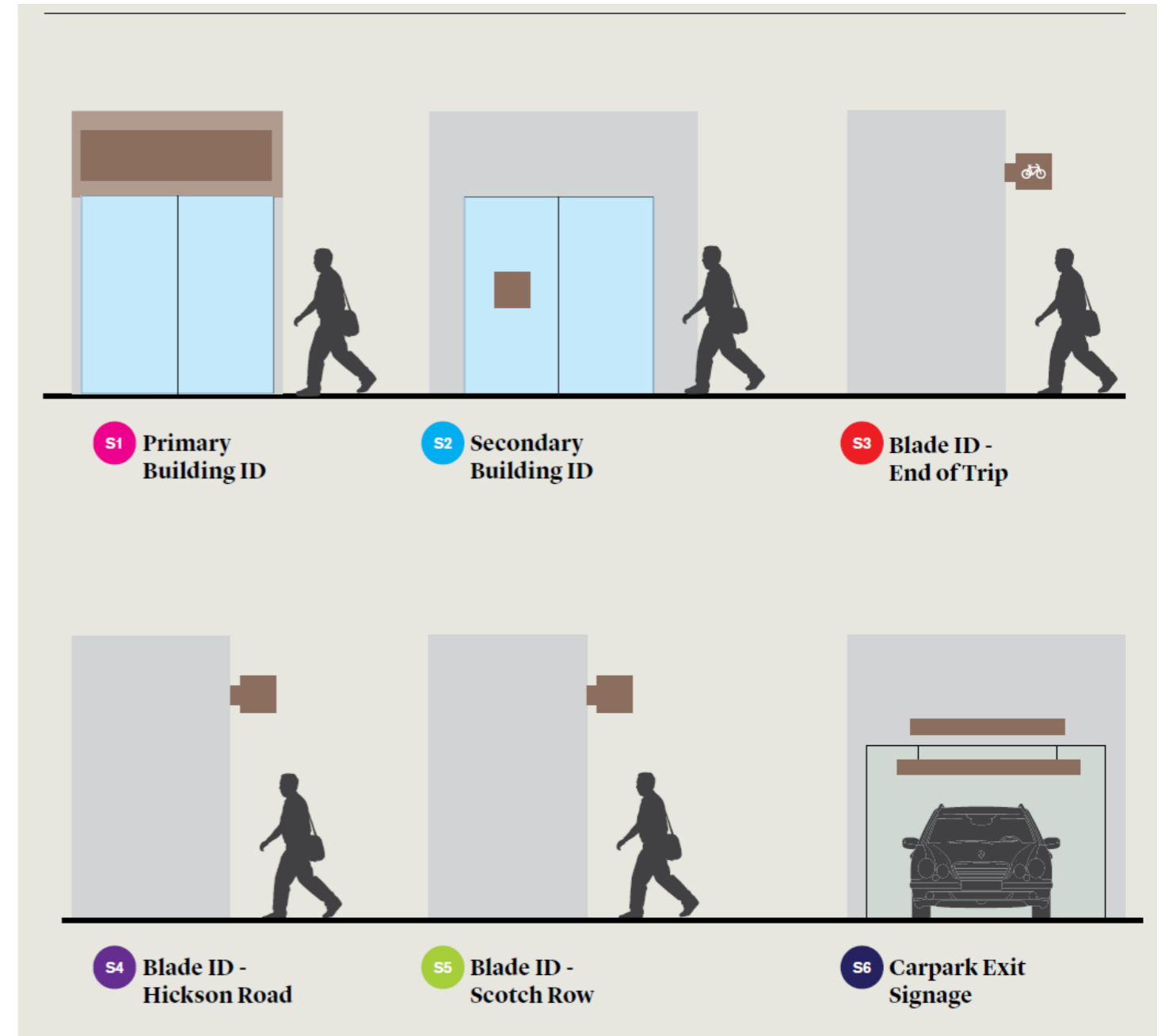
Awnings



3.4 Ground Level Signage

A separate Signage Strategy has been prepared by Urbanite to inform retail and business identification signage, safety and way finding signage. Signage Strategy provides for:

- _ Shop front signage to retail spaces in the colonnade, Shipwright Walk, Scotch Row and Watermans Quay - refer signage strategy.
- _ Building and address identification at commercial entry lobby
- _ Precinct facility and way finding signage such as bicycle entry and carpark exit etc by others
- _ Shared path crossover and traffic management signage at carpark exit



Exert from the C1 Signage Strategy
_ Prepared by Urbanite

4.0 Environment

4.1 Sustainability

Commercial Building C1 will be a world leader for sustainability and will complement the City of Sydney 2030 ambitions, supporting the Barangaroo South commitment to be a world leading climate positive precinct and Australia's first carbon neutral precinct of this scale.

ESD Initiatives

The Sustainability Report prepared by Lendlease and included in the Planning Application contains details of the ESD initiatives. Below is an overview for the primary ESD initiatives.

- _ Targeting a 6 Star Green Star design and as-built certification
- _ Healthy building environment which is tuned to Sydney's local climate conditions and maximises passive design strategies
- _ 20% embodied carbon reduction in the built form
- _ Reduction in operational energy use

Use of Sustainable, Renewable Engineered Timber

- _ Use of low carbon engineered timber from a sustainable source for the building's structure represents a significant reduction in carbon emissions compared to an equivalent reinforced concrete structure.
- _ Carbon is absorbed by the tree during growth and sequestered in the timber and stored for the life of the structure
- _ Reduces GHG and global warming impacts - displacement of energy intensive cement and steel production.
- _ Avoids emissions associated with concrete pumping and placement.
- _ Large mass engineered timber is likely to be recycled or reused in new structures at end of life, extending the life cycle further

Waste & Recycling

- _ Use of recycled timber for some structural and cladding elements, extending the life span of the material which has already provided structural capacity for wharfs and bridges
- _ Recycling of construction waste in accordance with the Barangaroo South (Stage 1) Waste Management Plan to target 90%+ diversion of construction waste
- _ Precinct wide aspiration to achieve zero waste by 2025

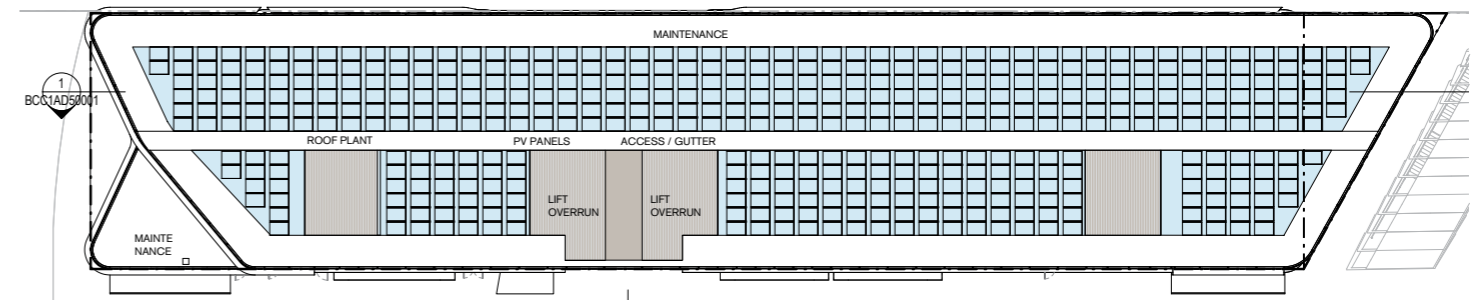
Energy and Carbon

- _ Low energy design incorporating external shading.
- _ Low energy LED lighting.
- _ Passive chilled beams and connection to the precinct district cooling plant, negating the need for rooftop cooling towers
- _ Inclusion of a 700 sqm rooftop solar photo voltaic array

Water Positive

- _ Incorporation of either a rainwater tank or green roof
- _ Connection to non-potable water supply from Recycled Water Treatment Plant for flushing toilets.
- _ Water efficient fittings and fixtures

Commercial Building C1 _ Planning Application



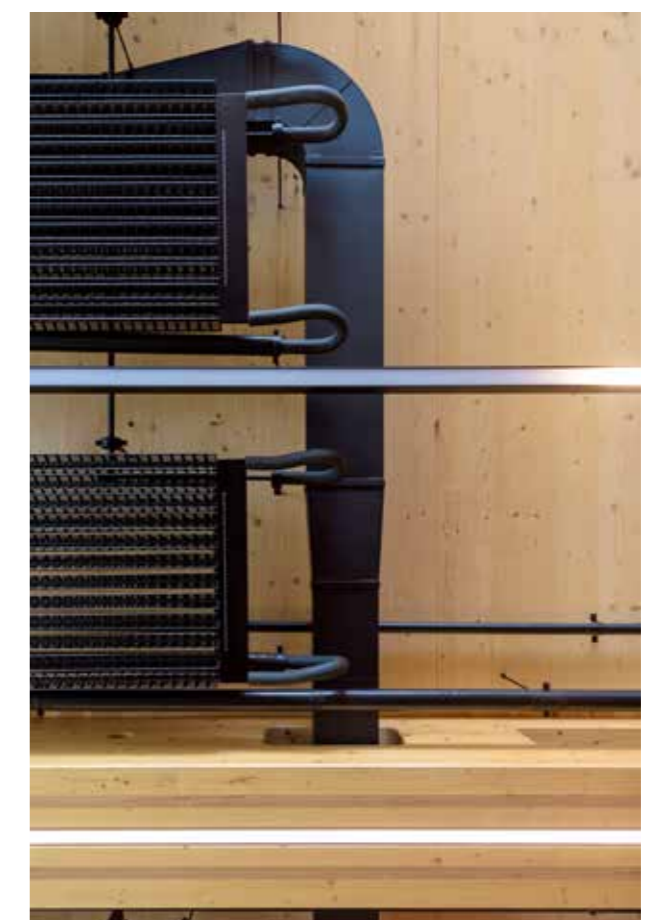
Roof Plan showing photo voltaic array



Engineered Timber CLT Panel



Photo voltaic Panels to Generate Renewable Energy



Low Energy Use Chilled Beams

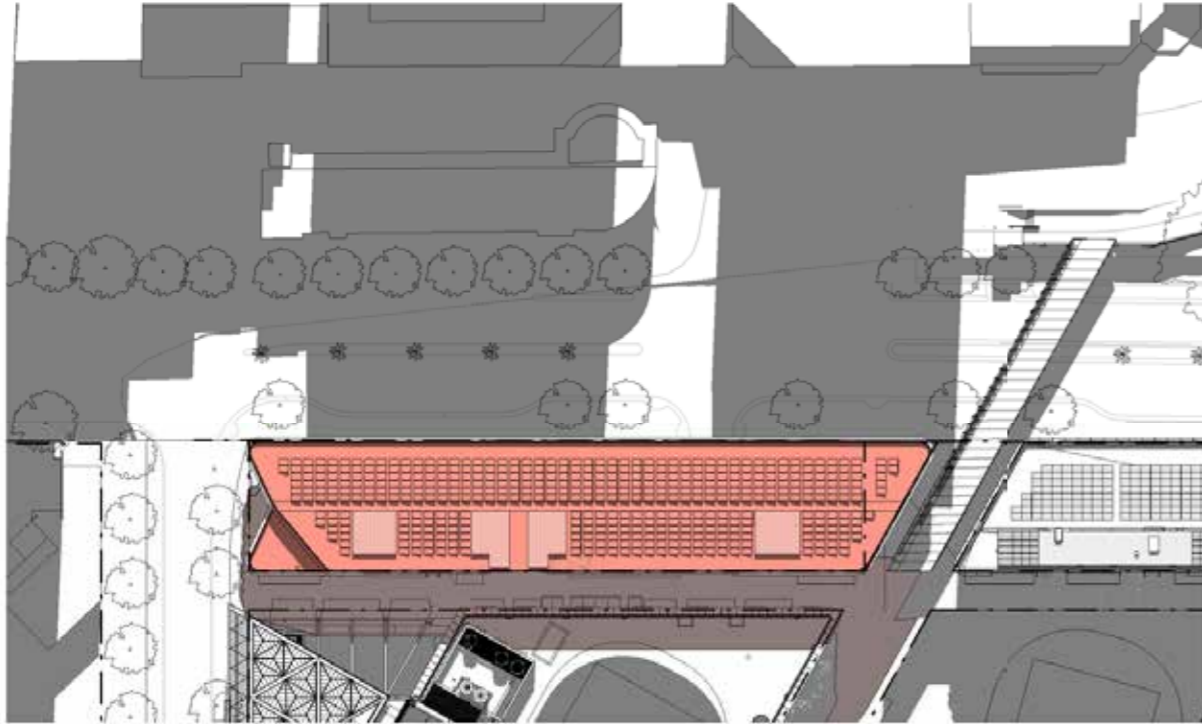


Tzannes

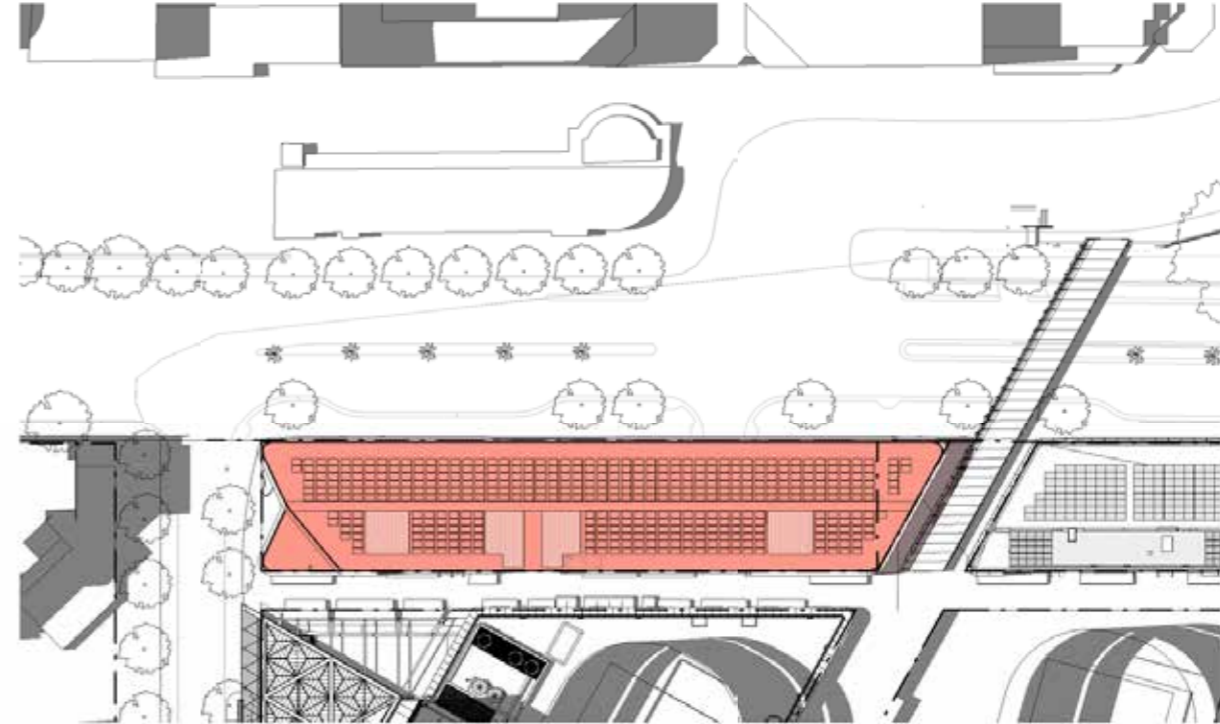
4.2 Solar Access

4.2.1 Summer

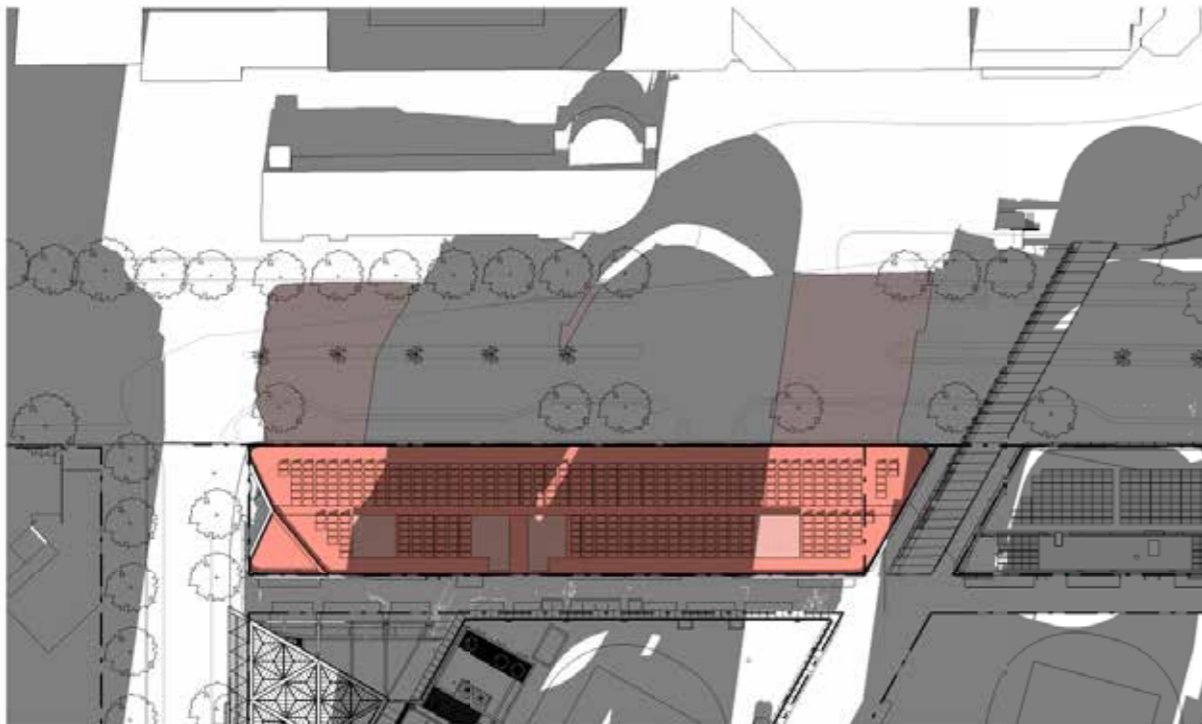
Solar access is available to the northern outdoor seating area at the study times of 9am, 12pm and 3pm on December 21. Scotch Row retains solar access at 12pm for lunch trade. Other areas are appropriate for the CBD location and context.



1 | Shadow Study 21DEC 9am
1:1000



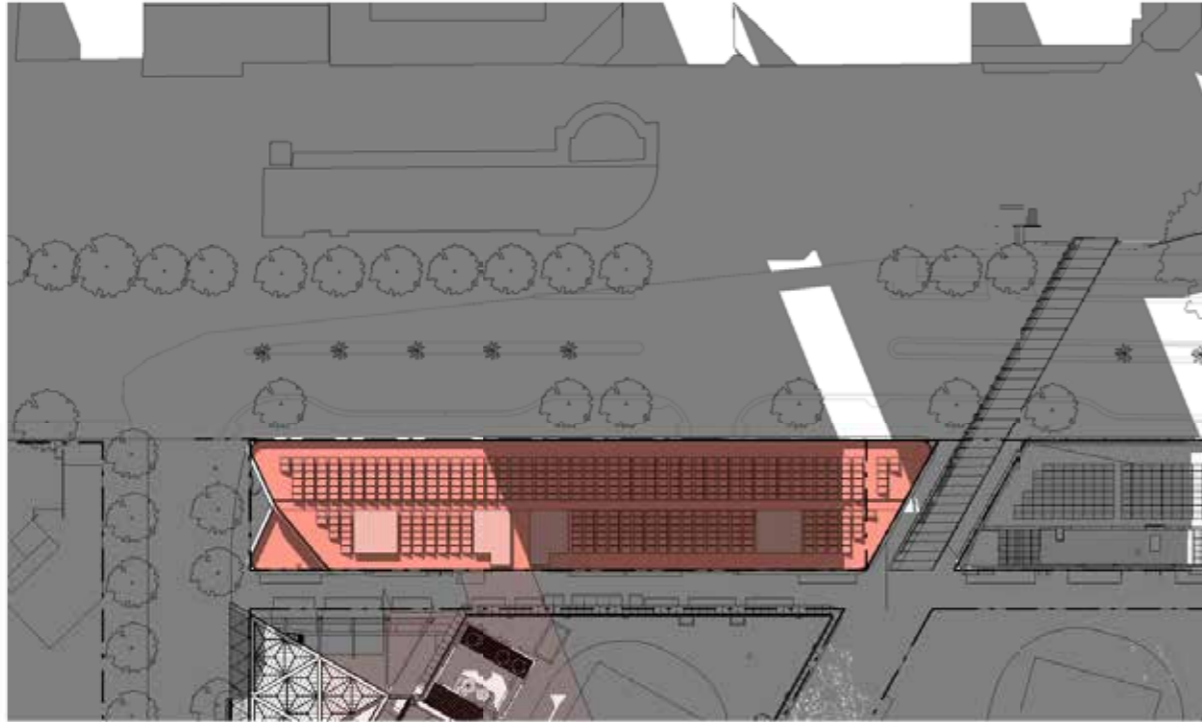
2 | Shadow Study 21DEC 12pm
1:1000



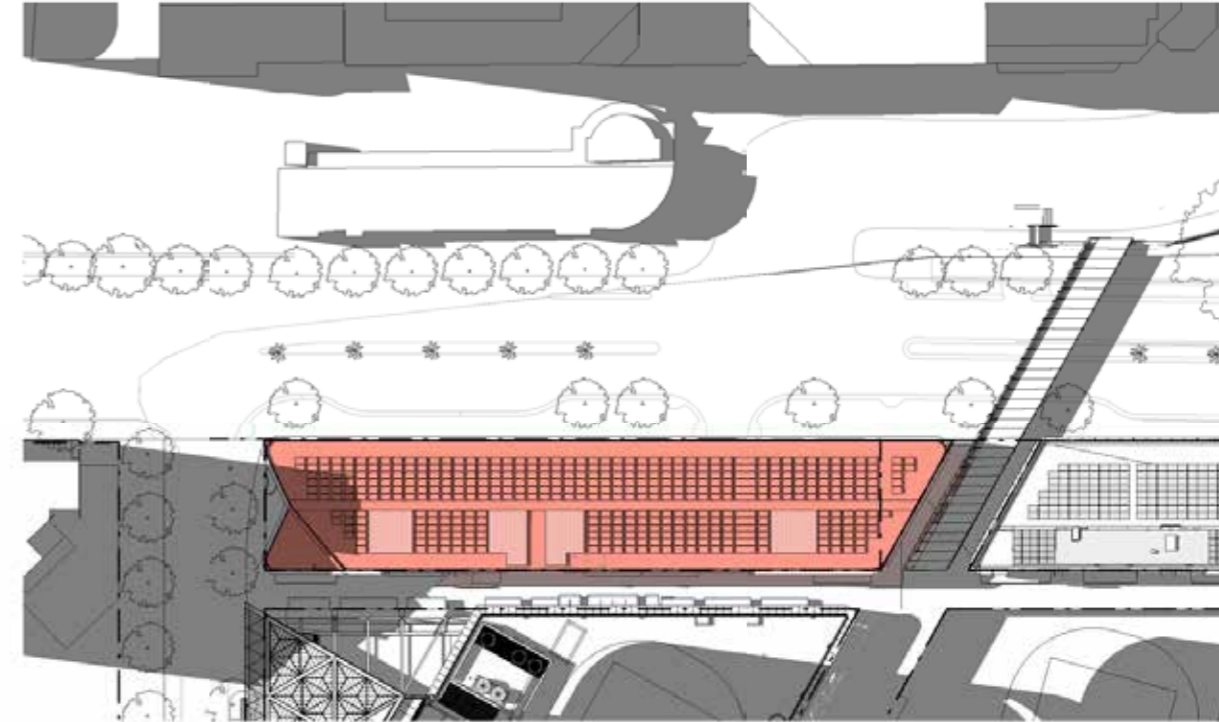
3 | Shadow Study 21DEC 3pm
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4.2 Solar Access

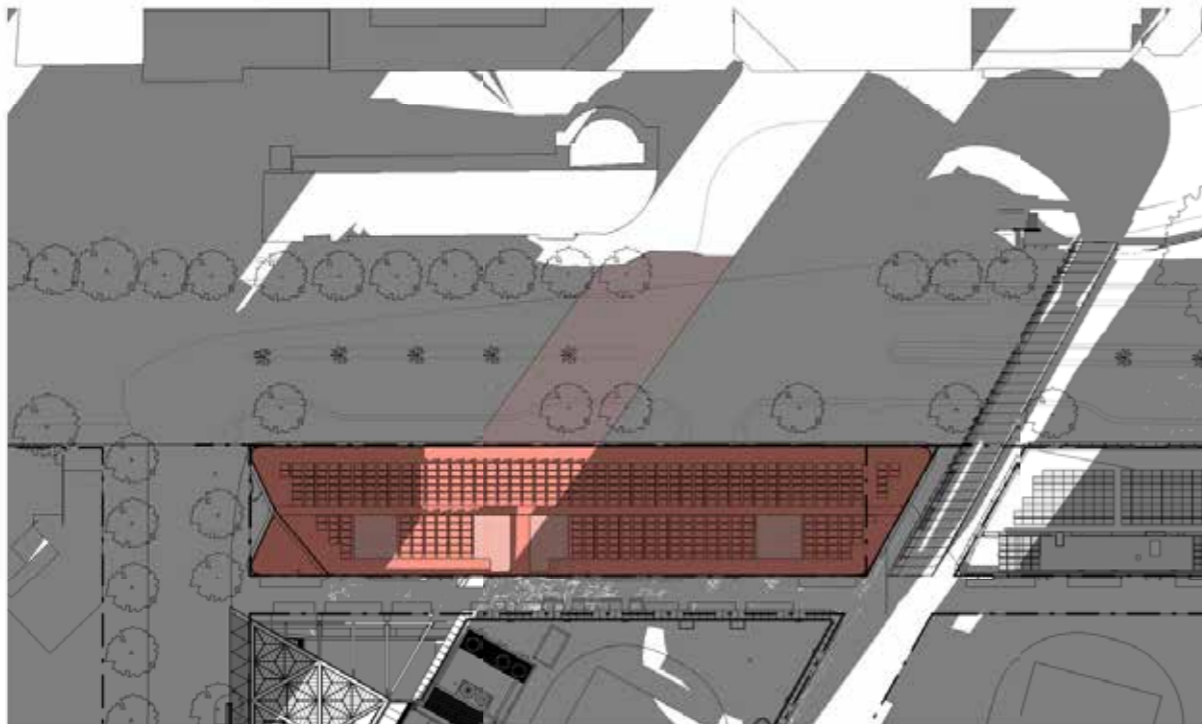
4.2.2 Equinox Solar access is substantially available to the surrounding public domain at 12pm at the equinox, otherwise generally consistent with CBD location.



1 | Shadow Study 21MAR 9am
1:1000



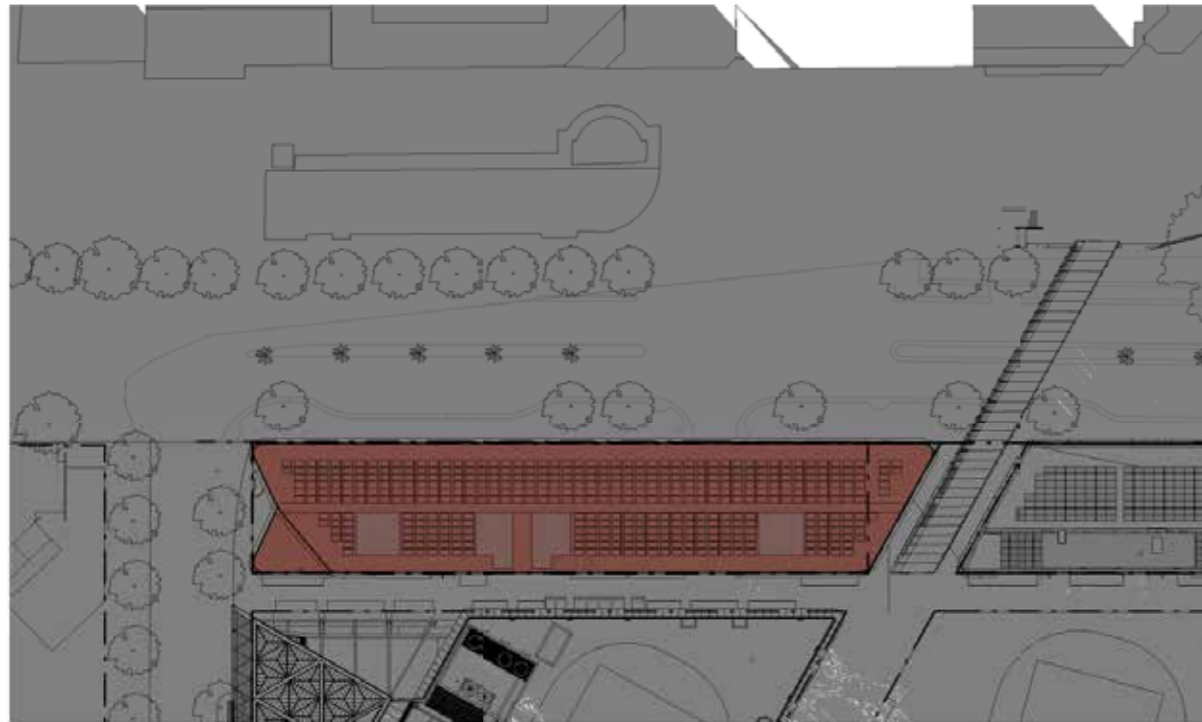
2 | Shadow Study 21MAR 12pm
1:1000



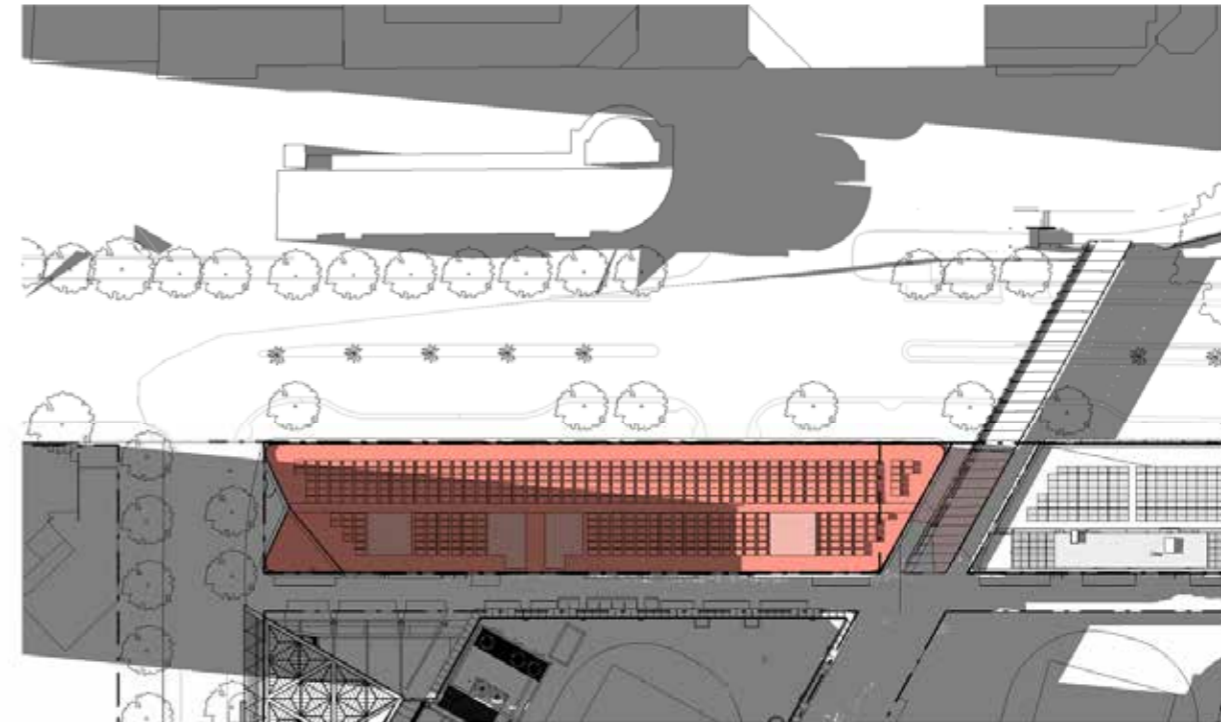
3 | Shadow Study 21MAR 3pm
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4.2 Solar Access

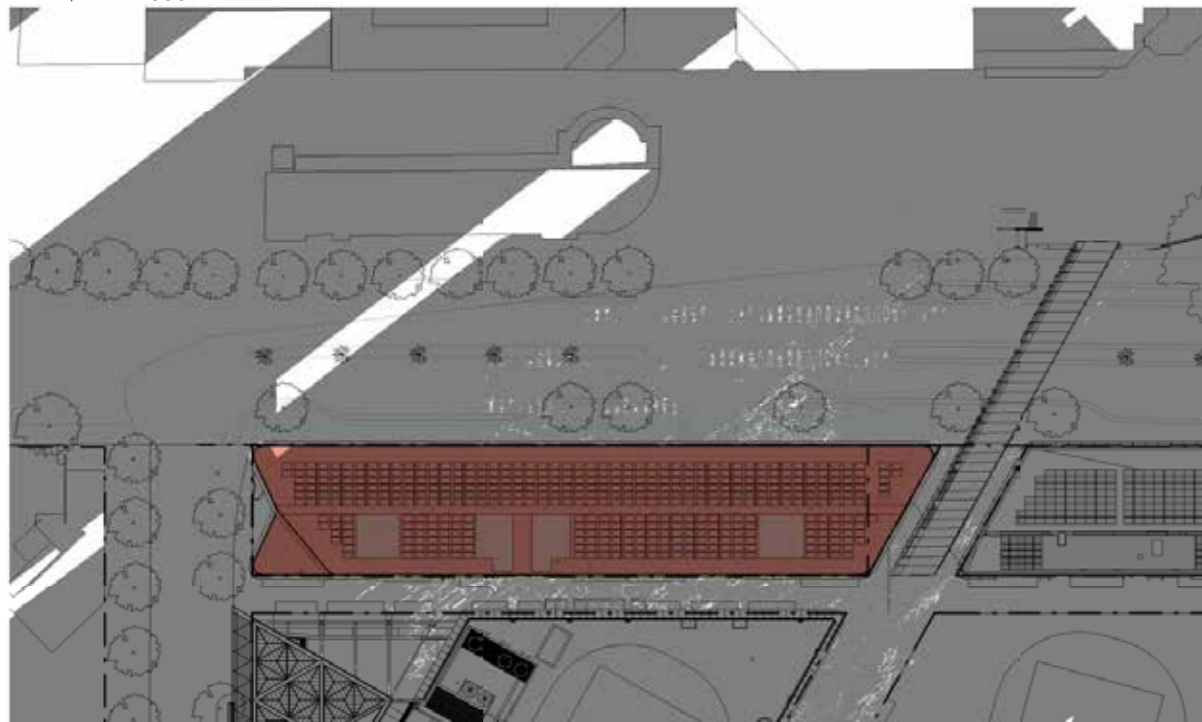
4.2.3 Winter Commercial Building C1 adds very little additional shadow to those created by other Barangaroo South and existing Kent Street towers



1 | Shadow Study 21JUN 9am
1:1000



2 | Shadow Study 21JUN 12pm
1:1000



3 | Shadow Study 21JUN 3pm
1:1000

4.3 Wind

Refer to Wind Assessment Report prepared by CPP for assessment of the wind conditions around the site and conclusions

Original wind tunnel testing, using a simple building mass for the site, demonstrated that the wind conditions around the site are typically classified as being suitable for “pedestrian sitting (considered to be of long duration)” of 2-4 m/s and “pedestrian standing (or sitting for a short time or exposure)” of 4-6 m/s.

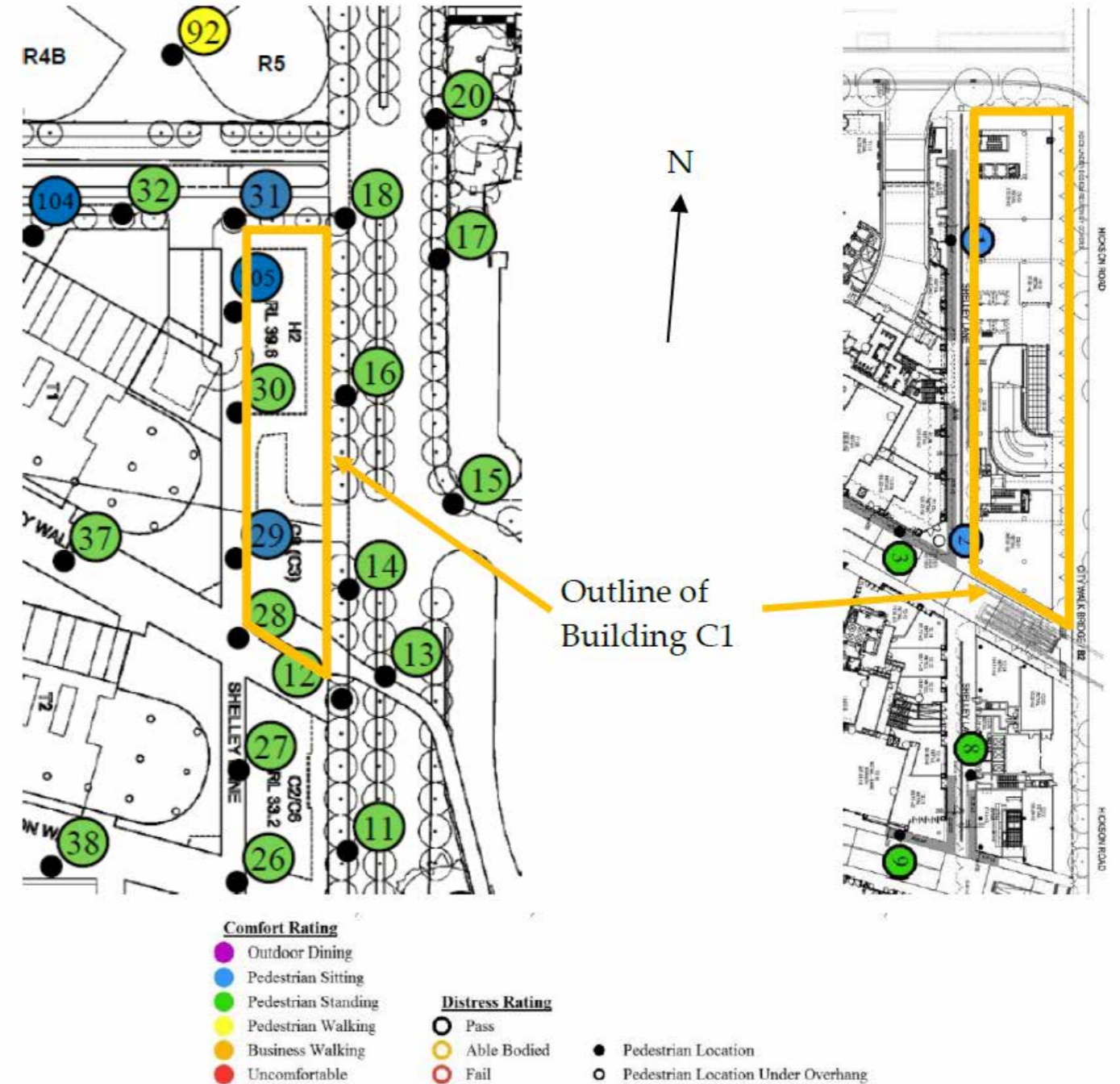
To further enhance the amenity of the outdoor seating area associated with the north retail tenancy, a permanent planter with curved glass screen and integrated timber seat protects the north and east perimeter of the outdoor seating area.

Gas points will be located in the ground paving of the north seating area to connect gas heaters without the need for individual LPG tanks, to counteract some of the cooling effects of the wind

Further studies will be undertaken during design development phase.



Indicative Design for Northern Seating Area with Wind Amelioration Elements Shown



Exert from the Wind Report
_ Prepared by CPP

4.4 Reflectivity

An External Reflectivity Compliance Report prepared by Inhabit confirms that the proposed facades achieve compliance with the requirements, with reduced reflectivity to 15% in some instances.

Further studies will be undertaken during design development phase.



Exert from the External Reflectivity Compliance Report
_ Prepared by Inhabit



View From the North-East



View From the North-West



View From the South-East

