

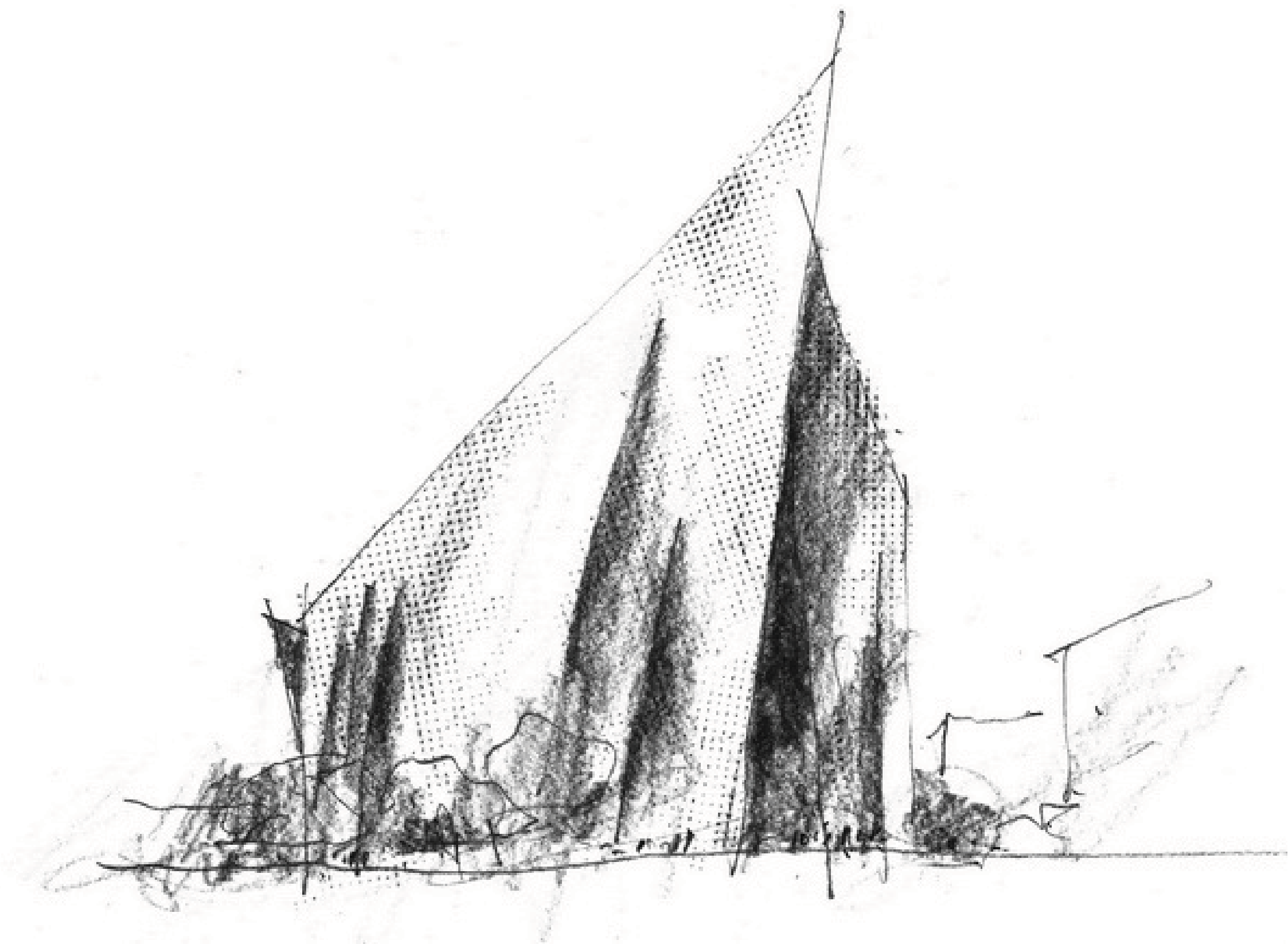
DESIGN REPORT

REV H

UTS BROADWAY BUILDING SYDNEY

MARCH 2011

UNIVERSITY OF TECHNOLOGY, SYDNEY



DENTON CORKER MARSHALL

49 EXHIBITION STREET
MELBOURNE, VICTORIA 3000

ARCHITECTURE URBAN DESIGN

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INTRODUCTION

This Architectural Design Report reflects the outcome of the continued engagement between the University of Technology, Sydney (UTS) and the Design Team, in the design of the Broadway Building, which will house the Faculty of Engineering and Information Technology (FEIT).

In 2009, UTS held a Design Excellence competition for the Broadway Building. Denton Corker Marshall was named the winning designer and was appointed as Lead Consultant and Project Manager for the new Broadway Building. Preparation and submission of the Preliminary Environmental Assessment Report was completed in November 2009.

The Broadway Building is one of a number of distinct projects proposed as part of the City Campus Masterplan.



Broadway Building forms a primary campus gateway on Broadway at Jones Street.

DESIGN RESPONSE

The design of the Broadway Building will provide a new facility for the Faculty of Engineering and Information Technology.

The following criteria have been addressed in the design response.

- Be an outstanding and innovative work of architecture in both appearance and performance.
- Be an outstanding work of urban design that creates a campus gateway activating and connecting the university with its community.
- Create a Faculty building that is highly inspiring, highly flexible, highly effective and highly accessible.
- Support creativity, learning and social interaction to help achieve the Faculty's vision for innovation and international leadership in spaces where technology and creativity intersect.
- Provide advanced performance in the operation of its environmental systems utilising best available techniques and technologies for sustainable design.
- Create an urban form that achieves at least 5 Star Green Star Rating.
- Interprets the University's and the Campus Masterplan objectives.
- Addresses the notified reduction in footpath width along Broadway by creating a covered colonnade. The weather protected footpaths extend along all street frontages.
- Interacts with neighbouring buildings.



Entry at the corner of Broadway and Jones Street

URBAN DESIGN + CAMPUS PLAN

Urban Context

The Broadway Building site forms an integral part of the UTS Campus Masterplan. It has frontages to Broadway, Wattle Street, Jones Street and the Laneway between it and Building 10 to the north.

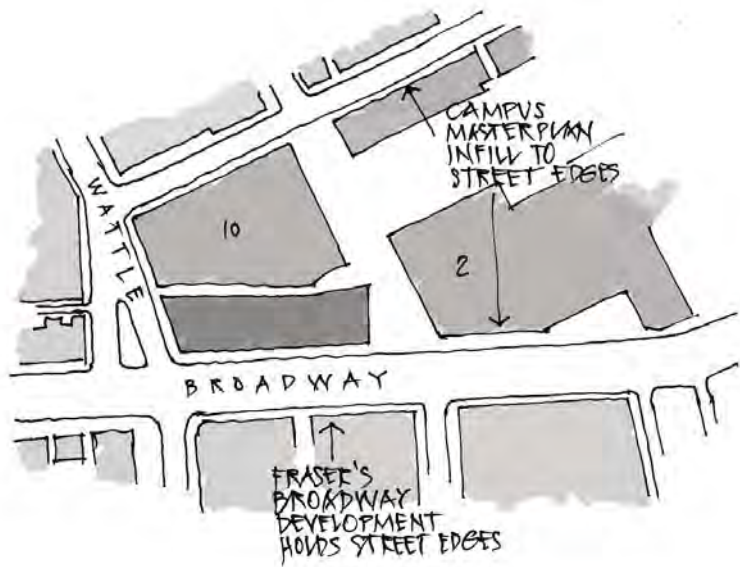
Immediately adjacent to the north and east are other UTS campus buildings CB10 and CB01. To the west along Wattle Street are a variety of uses, with predominately retail and residential, whilst to the south is the currently under construction Frasers Broadway.

Urban Design Response

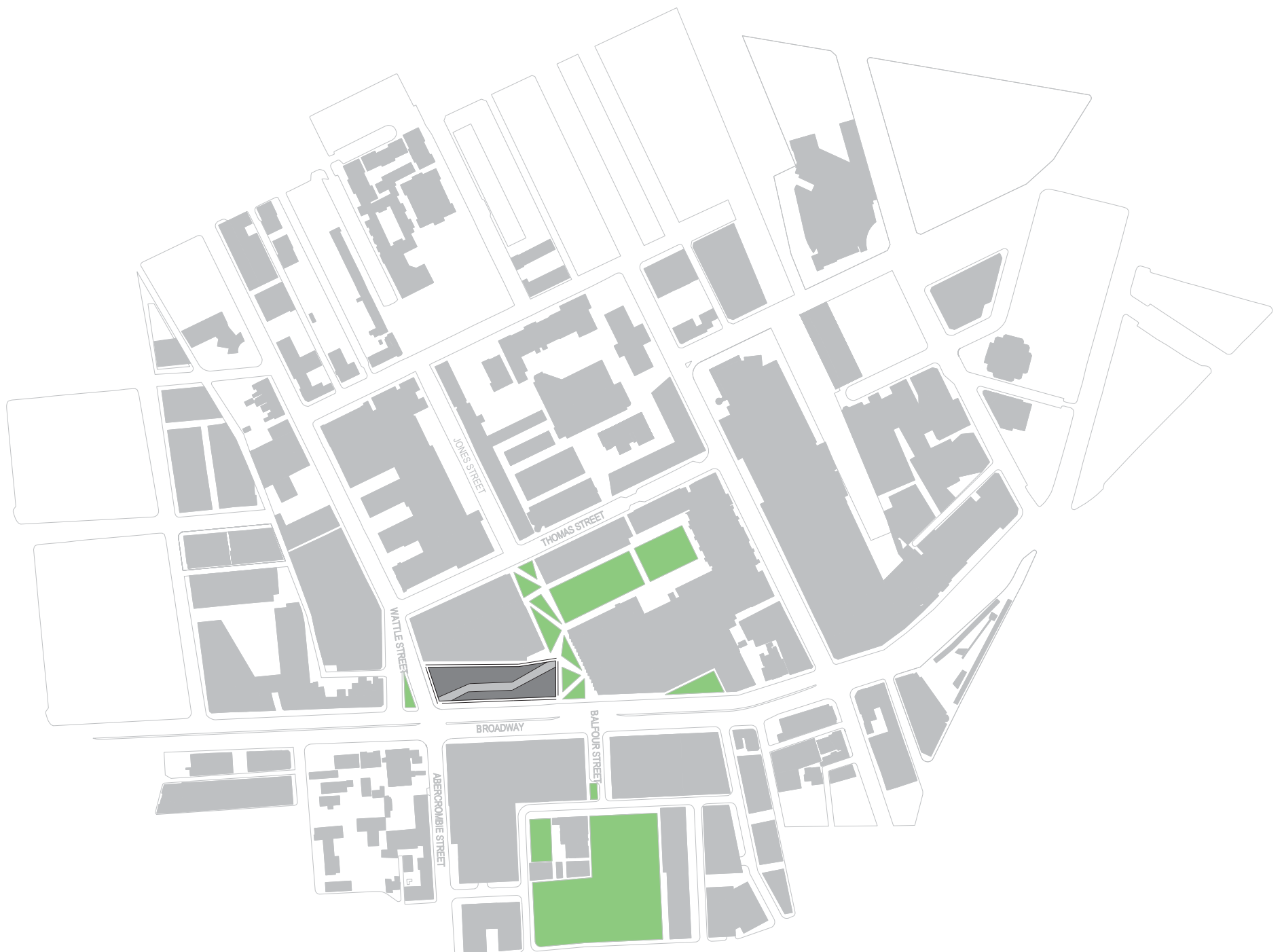
Our proposal creatively interprets the campus masterplan and the importance the Broadway Building has within it and in the broader urban realm. Key aspects of our urban design response are set out below.

Urban Pattern and Setting

Consistent with the urban nature of the site the street edges are held and reinforced.



Street edges held and reinforced



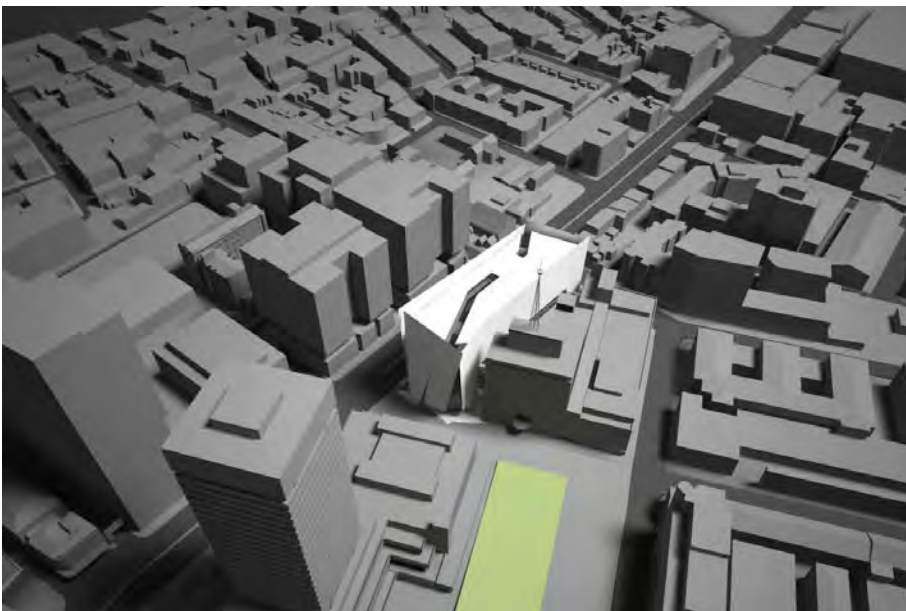
Site planning creatively interprets and reinforces the campus masterplan within the urban context

Built Form

Angled plates create a distinctive form within rectilinear urban fabric.



Built form from south east



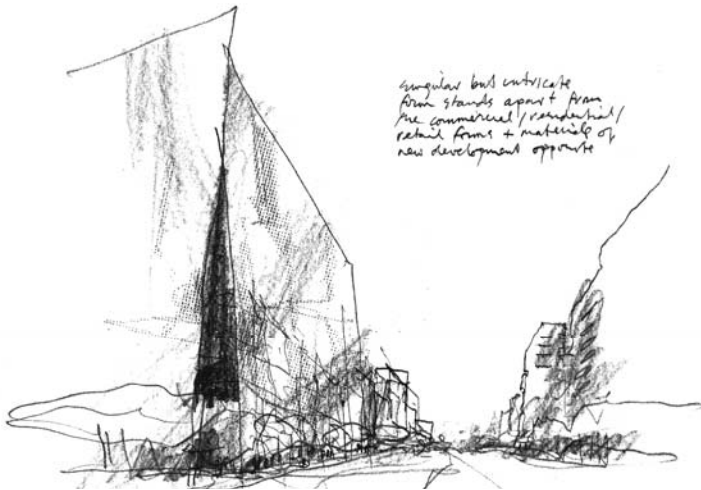
Built form from north east

Binary Screen on Broadway extends up to meet scale of Fraser's Broadway Block 1 opposite.

Urban Campus Gateways

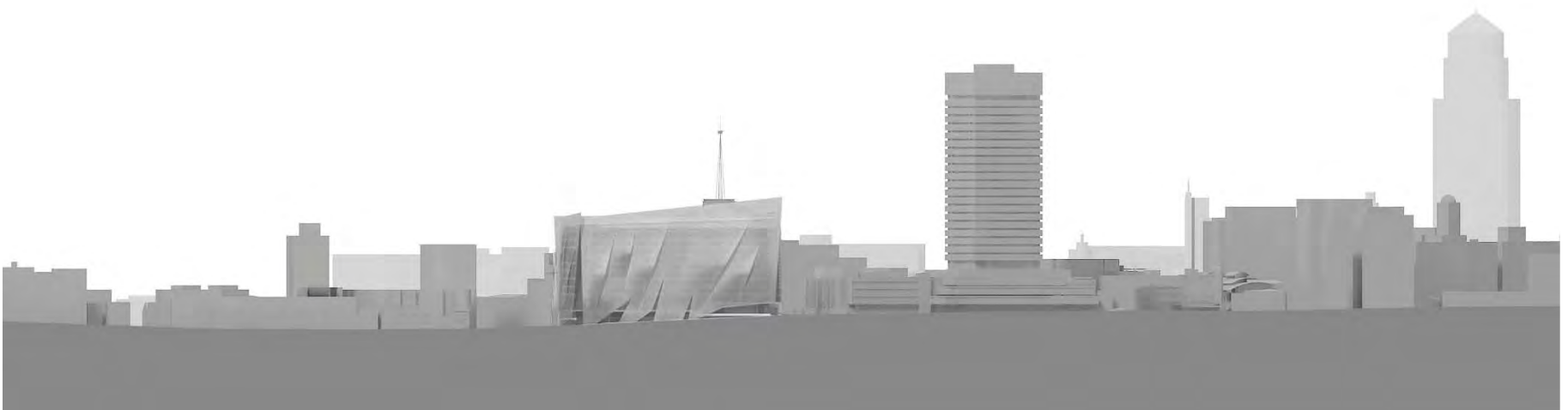
Built form creates urban campus gateways:

- at west entry to campus on Broadway
- On Broadway at Jones Street axis



Campus gateway at west end on Broadway

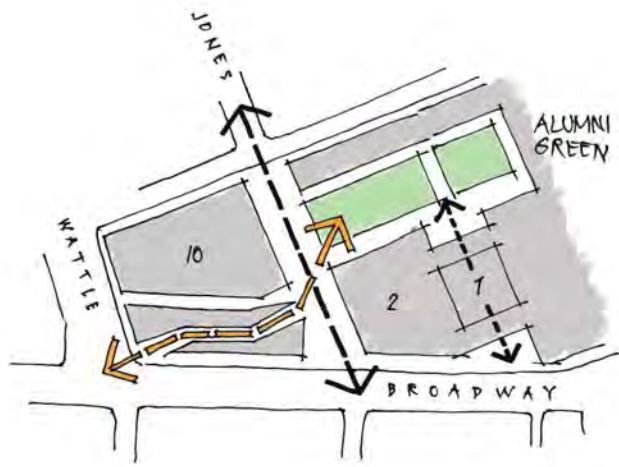
angular but intricate form stands apart from the commercial/residential/retail forms + materials of new development opposite



Context elevation on Broadway - Refer to Enlarged Elevation on Page 32

Campus Connections

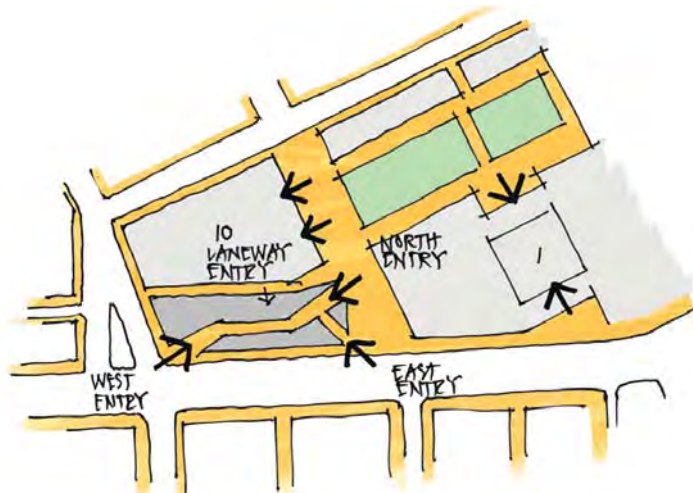
The building plan is generated by the primary campus pedestrian desire paths.



Primary desire path generates plan

Pedestrian Network

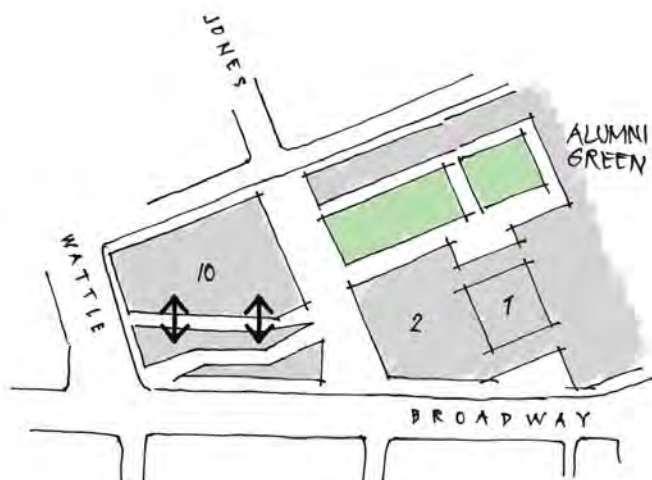
Pedestrian permeability is maintained and reinforced.
Building entries are located in direct response to pedestrian desire paths.



Pedestrian permeability is maintained and reinforced

Interbuilding Connections

- Glazed pedestrian bridge links connect the Broadway Building to Building 10 over the Laneway at levels 3 to 7 at the Wattle Street end and levels 4 to 7 at the Jones Street end.
- Regrading of the Laneway provides an on grade connection between the Broadway Building Student Union and the Building 10 Student Services.

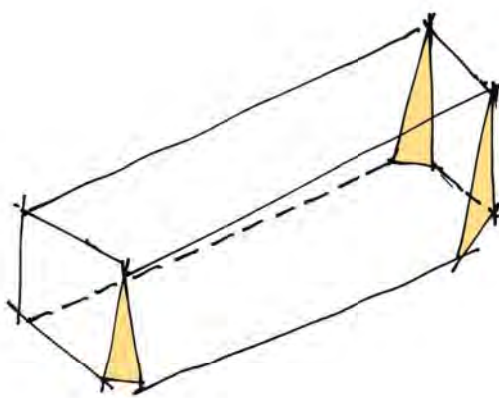


Elevated links to CB10

Address and Entry

Three principal building address and entry points are clearly identified.

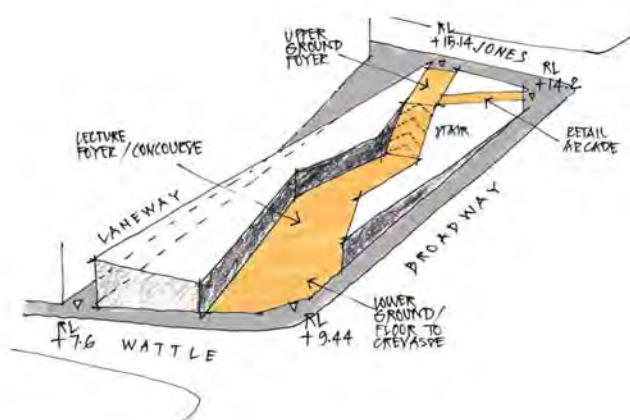
- Broadway and Wattle Street
- Broadway and Jones Street
- Jones Street and Laneway (Alumni Green)



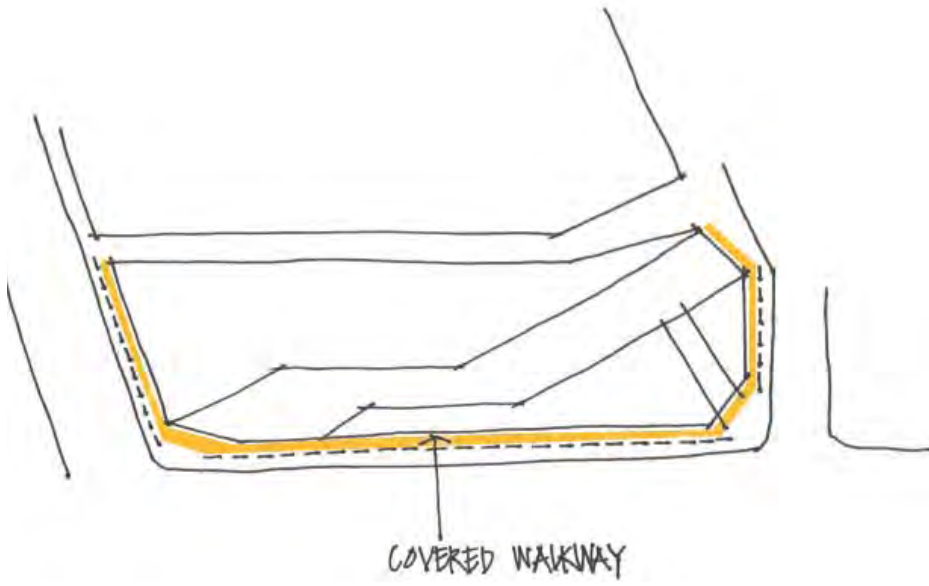
Three principal building address and entry points

Ground Plane

The vertical transition zone between the grade separated entries is effectively addressed by providing vertical circulation by way of stairs and escalators between the upper ground (Jones Street) and lower ground (Wattle Street) floor plans.



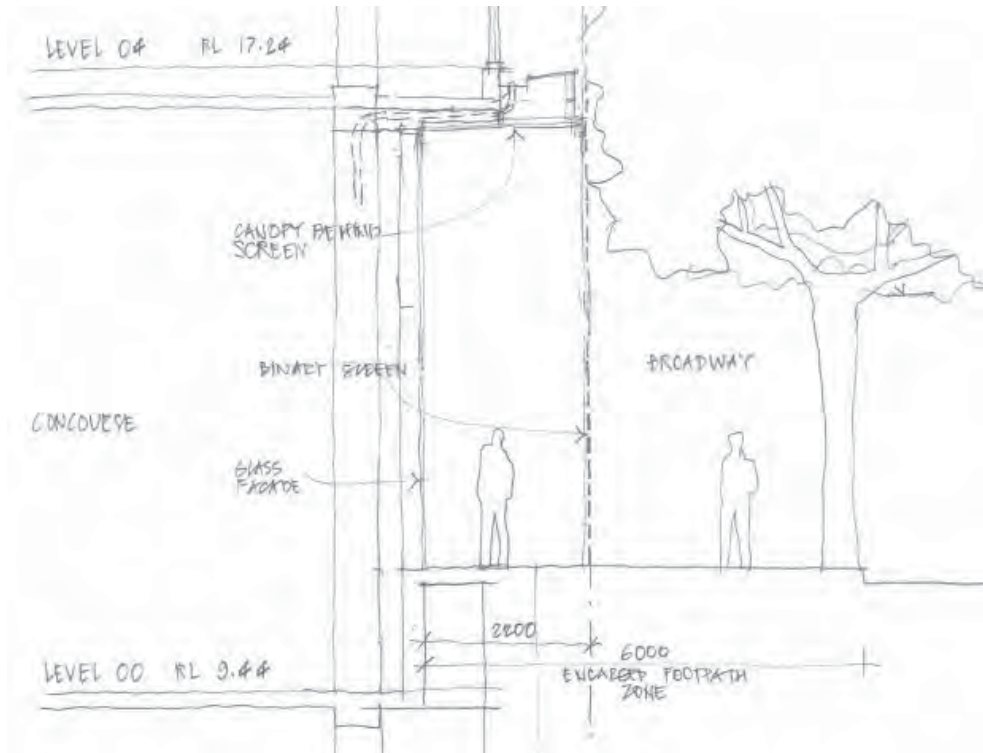
Effective resolution and sloping ground plane



Covered walkway extent to Broadway, Wattle Street and Jones Street

Covered walkway

In order to maintain the visual strength and simplicity of the single plane facade along Broadway an undercroft has been formed behind the screen at street level. This has been achieved by setting the facade back 2200mm from the site boundary at the lower level/s. This allows pedestrians to circulate behind the screen to avail themselves of protection from wind and rain and allows the imagery of the screen as a single element hitting the ground to be partly maintained. The additional footpath width provided by setting back the facade goes some way to offsetting the proposed reduction in footpath width as a consequence of the Frasers Broadway development opposite.



Typical covered walkway section

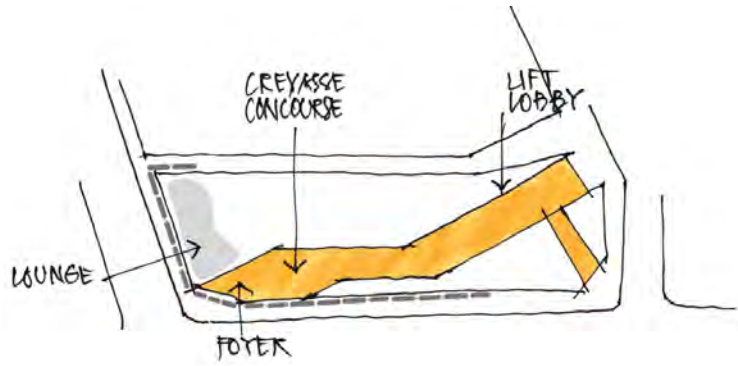


Wattle Street entry. Covered walkway

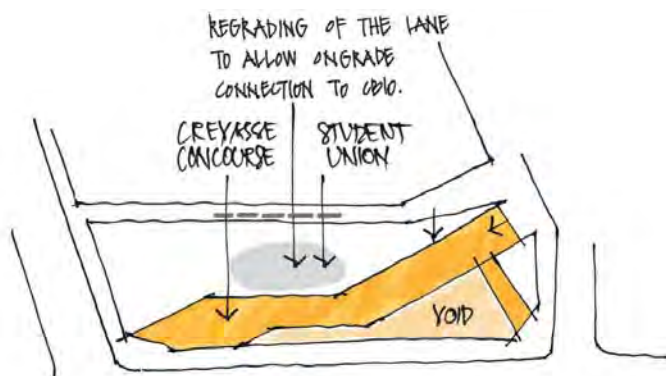
Street Activation

Glazed frontages to all streets allows for visual connection to internal activities. Publicly accessible uses including lecture complex; showcase highlighting the latest research within the faculty; the Data Arena with its state-of-the-art technology; student lounge; student union and retail outlets will activate street edges.

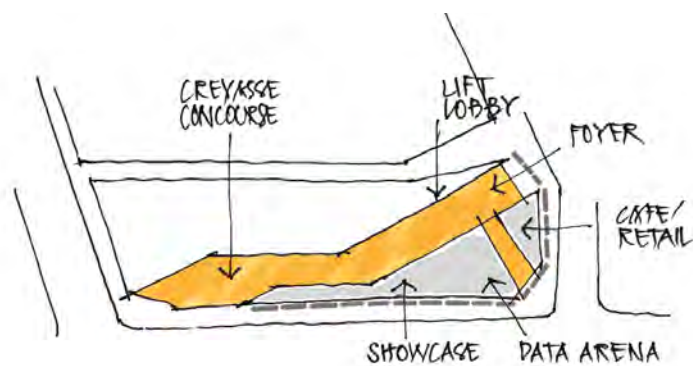
A Cafe is proposed on the Jones Street frontage, with potential for outdoor seating once Jones Street is pedestrianised.



Activation of street edges - Level 00



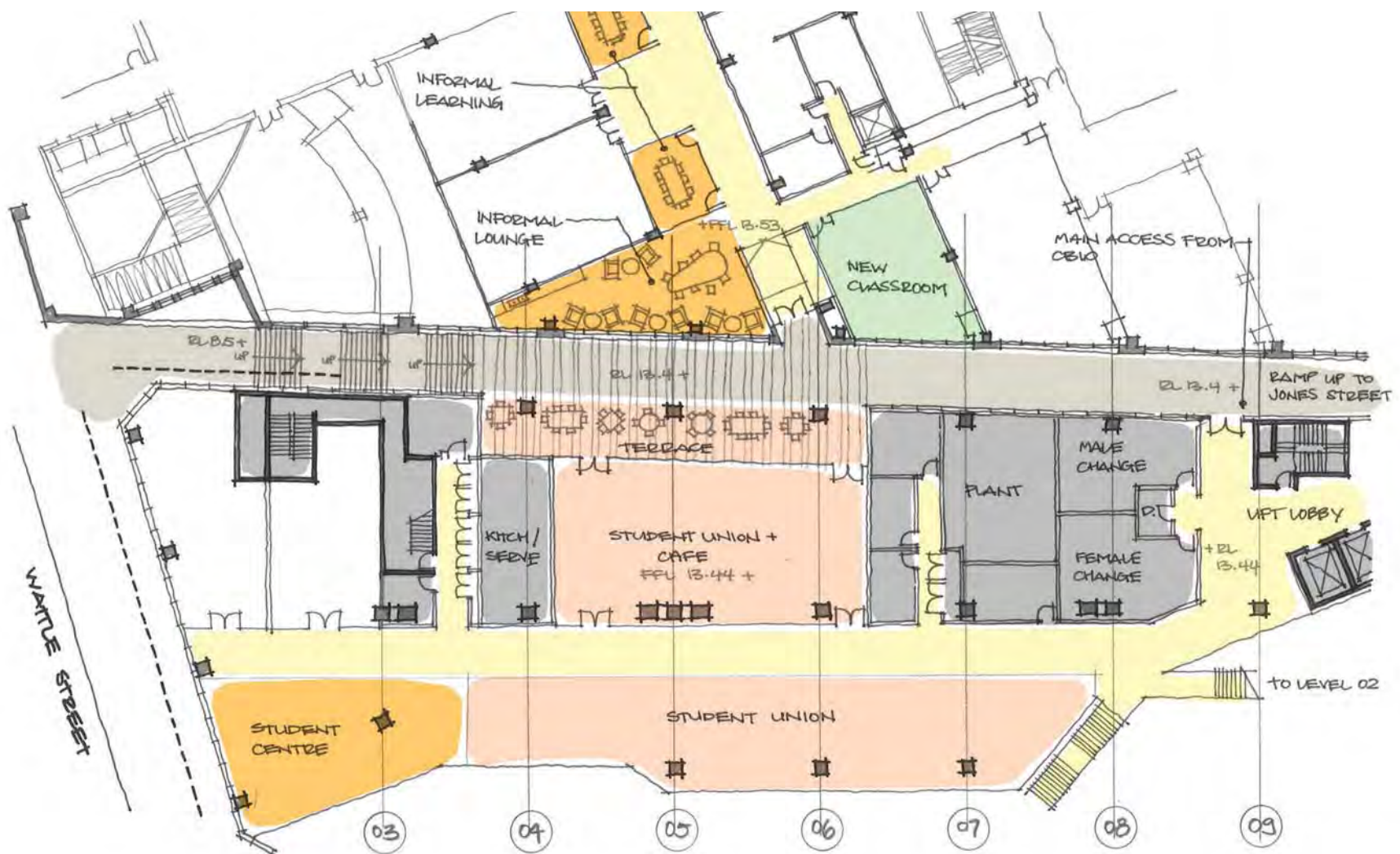
Activation of street edges - Level 01



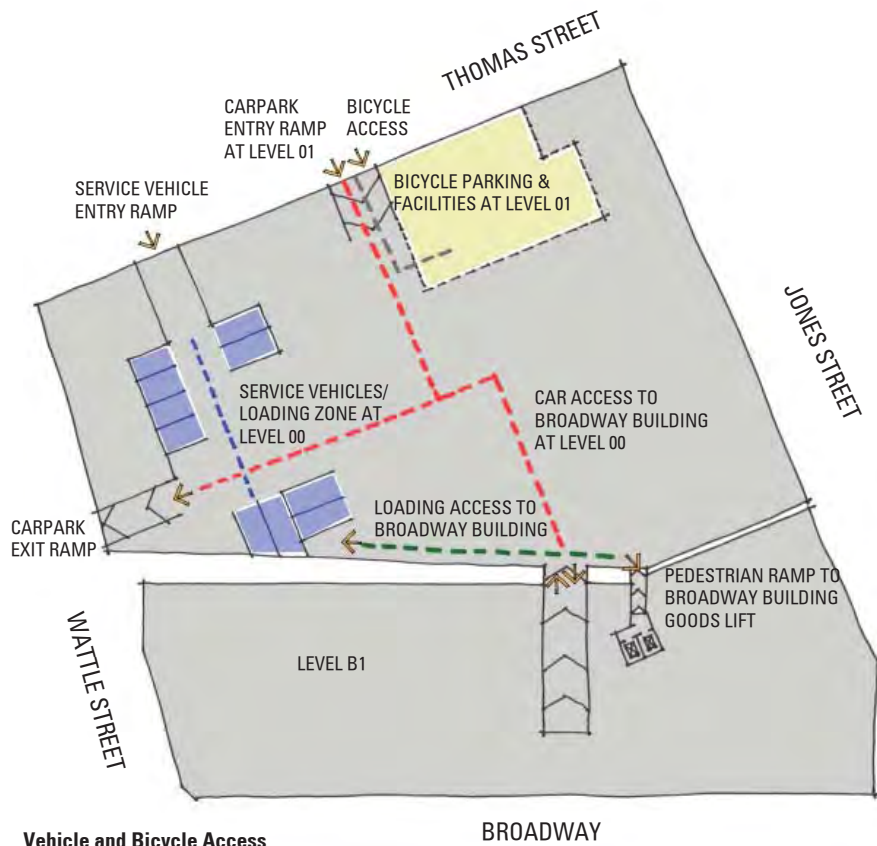
Activation of street edges - Level 02

Creating the Laneway

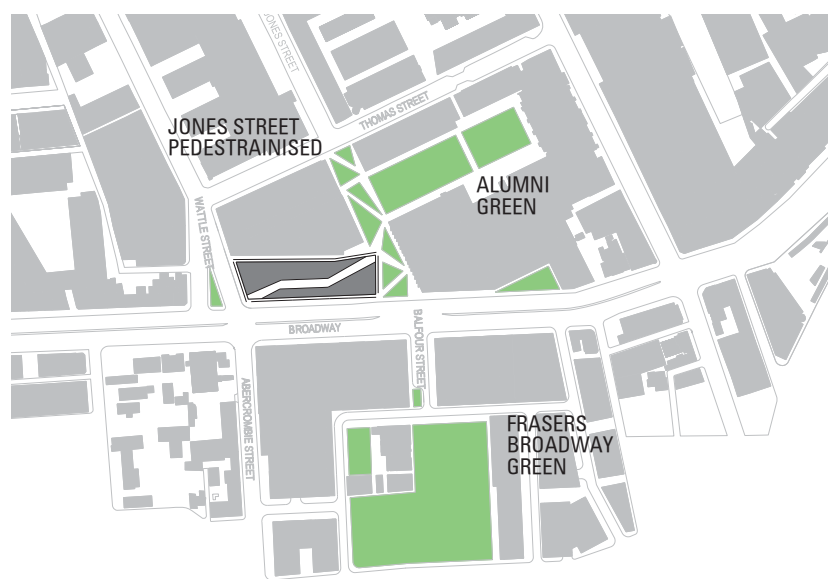
A Laneway is to be created by regrading the existing levels to provide an ongrade connection between Broadway Building and Building 10. Through access is still provided from Wattle Street to Jones Street by way of stairs and ramps. Internally, the link provides a connection of key student facilities, including the Student Union in the Broadway Building. An outdoor terrace associated with the Student Union will promote constant activity in the Laneway. A glazed roof will be provided at the parapet height of Building 10 to create a weather protected connection between the two buildings.



Laneway activation and connection between Broadway Building and Building 10



Vehicle and Bicycle Access



Open space and public realm

Vehicular and Bicycle Access

UTS is located adjacent to a major transport hub at the convergence of the Broadway car, bus and bicycle routes with the Central Station and Railway Square train, bus and pedestrian interchange. Also serving UTS's City campus are the light rail and monorail systems at Haymarket and the Ultimo Pedestrian Network (UPN).

All vehicular access and car parking is via Building 10. It is not intended to increase car parking provision within the UTS City Campus. The proposal is that the car spaces on the existing surface car park at Broadway and those lost as a result of expansion above Building 06 for student housing are replaced in the new basement car park under the Broadway Building. A total of 160 car bays inclusive of 6 PWD (Persons with Disability) car bays will be provided, as well as 16 motorcycle bays.

Bicycle parking is proposed to be located in the basement of Building 10. Parking for 102 staff and 148 student bicycles will be available in a secure area, accessed from the main entry ramp. Appropriate change and locker facilities will be provided. Existing bicycle parking in Building 10 will remain.

Refer to Halcrow Transport and Parking Report for further detail.

Open Space and Public Realm

An opportunity for 'Greening' Jones Street has been identified. Eastern entries to the Broadway Building and Building 10 will be enhanced.

Crime Prevention Through Environmental Design (CPTED)

The CPTED State Government initiatives have been readily incorporated into the design through the use of:

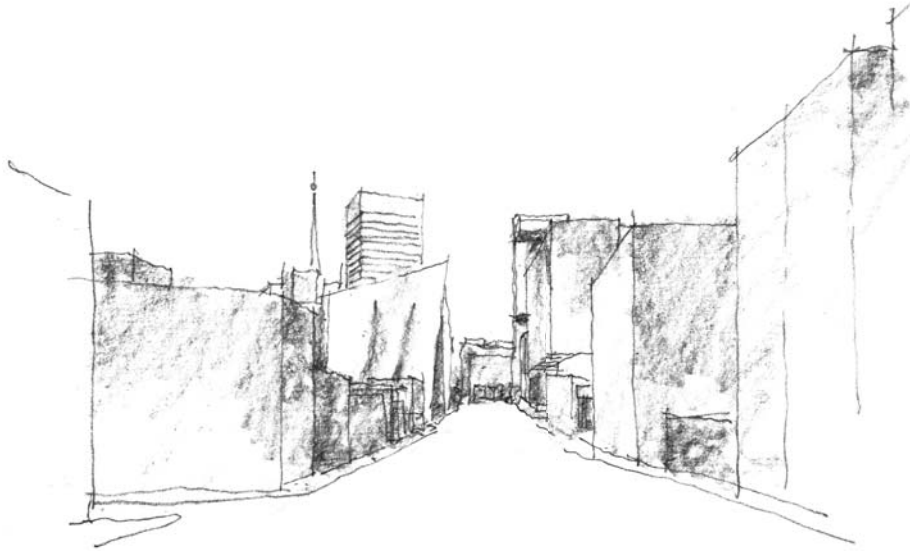
- Providing clear sightlines between public and private places
- Activated edges at ground level
- Effective lighting of public spaces
- After hours security controlled entry / exit points
- 24 hour Security
- Laneway access security controlled



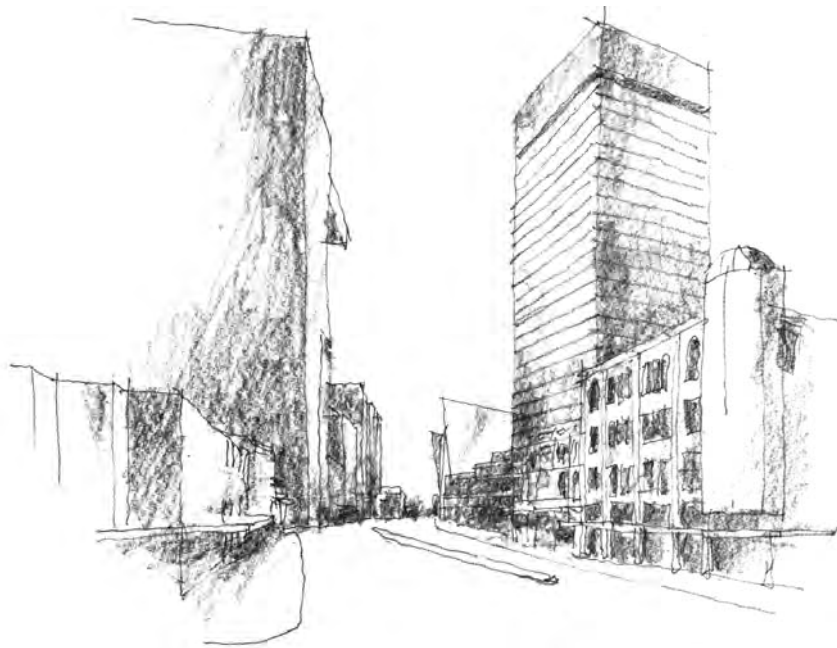
Western gateway to the campus on Broadway and Wattle Street marked with clear and legible entry

Urban Views and Streetscape

Distinctive building form and appearance makes a positive contribution to important urban views to and from the city on Broadway and from local side streets.



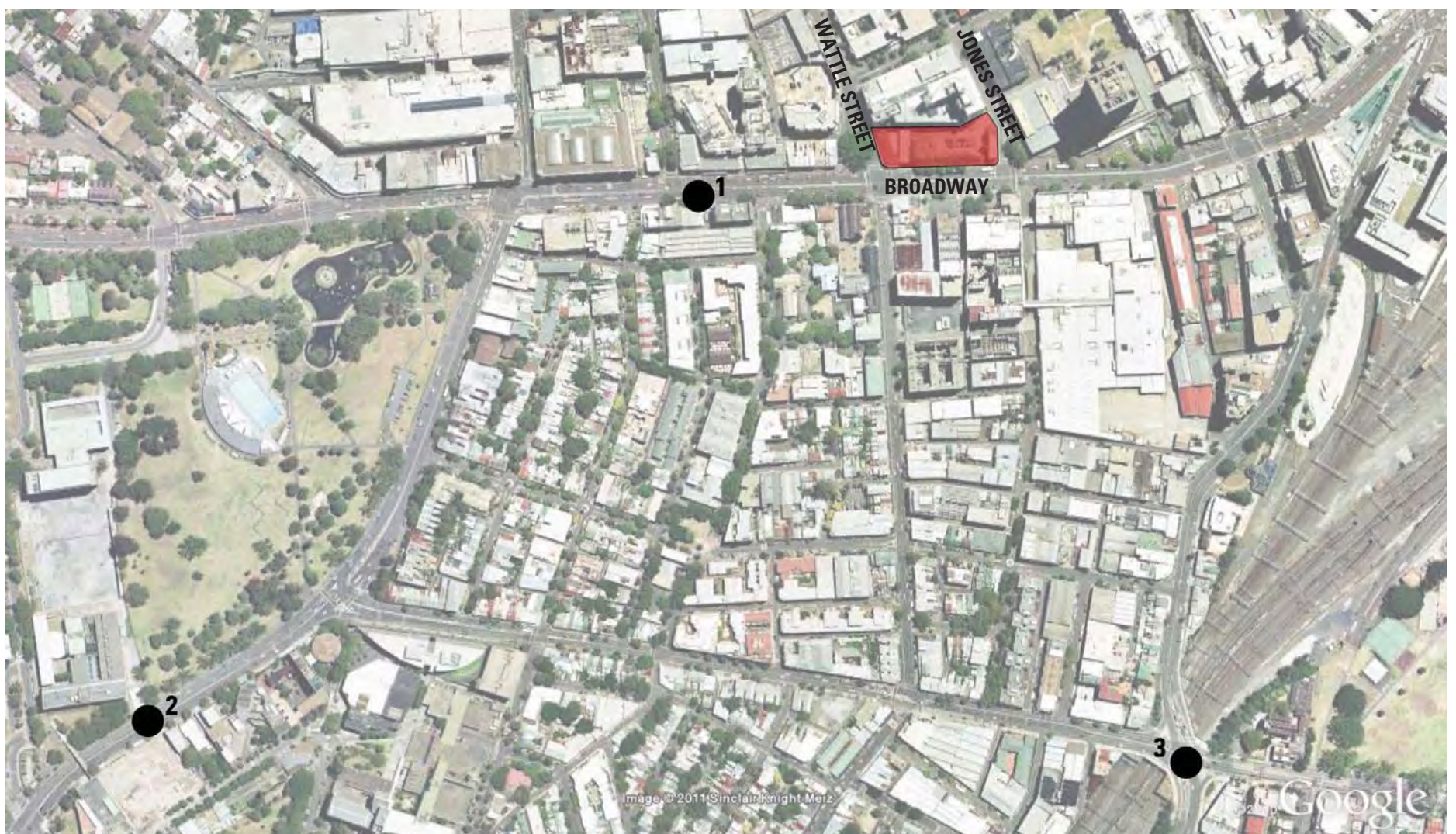
View looking east on Broadway to UTS



View looking west on Broadway to UTS

Visual Impact

As part of the Concept Plan, Clouston Associates completed a report on the Visual Impact of the UTS design proposals, particularly the impact of Broadway Building on the Building 10 Radio Tower. They identified three critical views to the Broadway Building as set out below. These views have been modelled to show their impact from the key vantage points and identify that the Broadway Building will have no impact on the visibility of the Radio Tower in Critical View 3, but will partially screen it in Critical View 1 and 2. However, as the facade of the Broadway Building is a perforated screen extending above the main building height, the impact is reduced with the tower visible through the perforations.



Visual Impact plan of critical views



Critical view 1:View from west



Critical view 2: View from south west



Critical view 3: View from south

Form, Scale and Articulation

The Building is expressed as a singular sculptural object, with floor levels concealed within its skin. Scale is established only by reference to surrounding landscape and built form. This enables the Faculty to establish a presence that sets it apart from the more traditional architectural expression of its existing and future neighbours. With slightly over 100 metres of street frontage to Broadway, Broadway Building project site is by far the largest of the new development sites and provides an unparalleled opportunity to create a new public front to the University.

Our conceptual approach to generating the form is set out below.



Singular sculptural object set apart from rectilinear urban fabric

Building Form

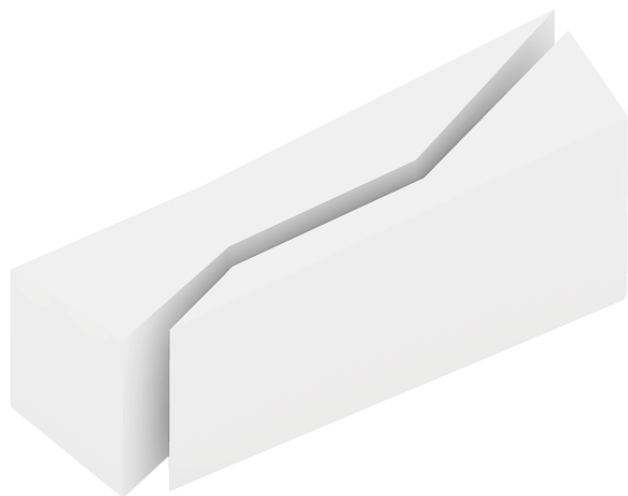
Basic volume extruded to 12 storey height limit.



Basic volume extruded

Crevasse

Basic volume is broken or eroded with a crevasse forming a linear atrium.



Basic volume eroded with Crevasse

Plates

The volume itself is a composite of four tilted and skewed plates – one for each facade. These form a series of triangular corner openings which extend to ground level, allowing access and visual penetration into the heart of the building.

The roof forms the fifth elevation with a titled plate set behind the four main facades.



Basic volume plated

Gills

The surface of each plate is creased to form a series of gills – visually reinforcing the sense of plate as skin, and symbolically allowing the building to breathe. The gills project from the sloping line of the Binary Screen. They start at a minimum 3.0m above street level so as to be clear of pedestrians. On Broadway, the gills project beyond the boundary a maximum of 1.0m.

Openings have also been incorporated into the facade at street level to provide a greater visual connection to the activity of the ground planes and to allow pedestrians to exit the undercroft in an emergency.



Surface of plates creased to form gills



Plates perforated for permeability and texture

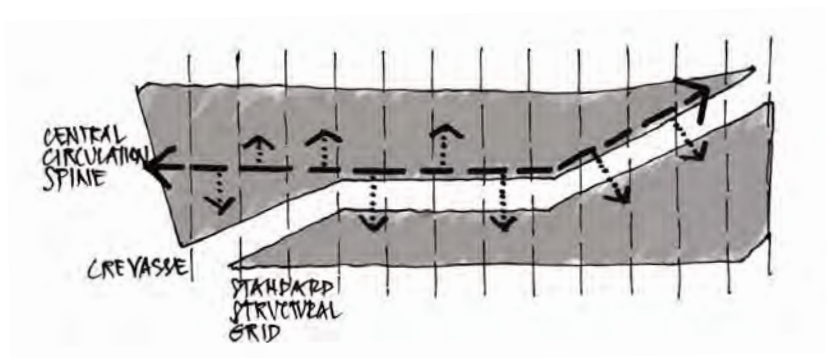
Texture

Permeability is established by the perforation of each plate, giving the surface a small scale visual texture and tactile sensibility.

Plan Form

A simple plan is adopted and extruded up through the building that:

- Avoids overtly complicated geometries, ensuring it is readily capable of adaption and evolution over time.
- Provides a light filled atrium crevasse at its centre.
- Scatters bridges and lounges across the crevasse to create a dynamic interior experience



Plan concept

Search for an appropriate image

What is an appropriate image for a School of Engineering and Information Technology Sydney in the 21st century?

Binary Code

The binary code is the system representing text or computer processor instructions by the use of two binary digits '0' and '1'.

The binary code is the foundation of computing and telecommunication. It is used for any of a variety of methods of encoding data.

Translation

The alphabetical character string 'University of Technology Sydney Faculty of Engineering and Information Technology' can be translated into binary code.

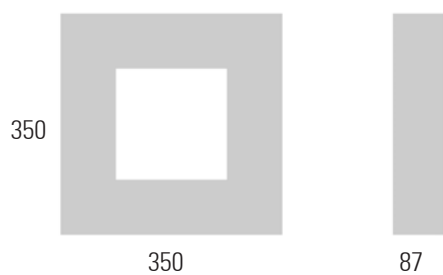
Each letter is represented by bit strings of zeros and ones to become:

```
01010101101110011010010111011001100101011100100111001101101001011101000111
1001001000000110111101100110001000000101010001100101011000110110100001101110
011011110110110001101111011001110111001001000000101001101111001011001000110
1110011001010111100100100000010001100110000101100011011101010110110001110100
0111100100100000011011110110011000100000010001010110111001100111011010010110
1110011001010110010101110010011010010110111001100111001000000110000101101110
0110010000100000010010010110111001100110111101110010011011011000010111
01000110100101101111011011000100000101010001100101011000110110100001101110
011011110110110001101111011001110111001
```

Conversion into a building form

The binary code '0' and '1' are converted into a square '0' and a dashed '1'. The square zeros and dashed ones from the translation are joined to form a screen.

Screen Size and Construction



Square '0' and dashed '1'

Scale

The screen operates at many scales:

Human scale / close up

The screen is transparent with clear visibility through it.



Human scale/close up

Building scale / mid-distance

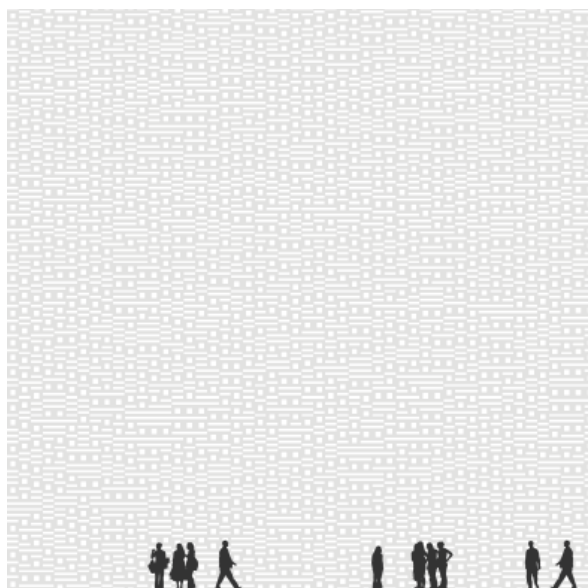
The screen appears both semi-transparent and semi-opaque.



Building scale/ mid-distance

City scale / far away

The screen appears uniform and continuous.



City scale/ far away

Applied to the building

The basic building block is extruded with the wall and roof planes expressed as tilted and angled plates in response to site topography, campus plan and planning controls. The binary screen is permeable and gives good visibility at close proximity. The architectural imagery requires the screen to hit and be perceived as going into the ground.

Binary screen pattern

The screen pattern is applied to the plates. The pattern is rotated 90° to generate more satisfying optical patterns when viewed from differing angles.

Safety

In order to make the screen difficult to climb it is proposed that the open elements of the screen be infilled with a fine perforation in the cladding panels within the climb zone of approximately 3.0m to 6.5m above street level so that it is regarded as part of the texture of the elevation rather than a response to a particular security risk. This will deny any potential climber any foot or hand holds on the facade. It will also structurally strengthen the panels where they are subject to impact loads

Structural Integrity at Edges

To provide additional stiffness at the screen edges at both the cantilevers and gills an additional perforation is introduced to provide increased structural integrity

Binary Screen characteristics

- a non directional net or web
- transparent yet screening, allowing full height glass behind
- provides shading to the curtain wall facade system
- creates the image and identity of the building
- is not arbitrary decoration but has embedded appropriate meaning
- screens views into and from existing and new adjacent buildings
- provides a platform for embedded electronic display, existing or not yet envisaged initiatives
- promotes a living building by allowing filtered light and air into the building skin
- creates a distinctive and memorable architecture, announcing UTS's western extent
- extends to ground to create a covered walkway to all street frontages



Binary screens applied to building

External Signage

Embedded within the perforations of the Binary Screen, a series of LED lights will be used as signage for the building.

Building Height

The maximum height of the building along Wattle Street is 46.820m (RL 54.550). Due to the sloping nature of the site, the height at the corner of Broadway and Jones Street is 40.110m (RL 54.550) and at Broadway and Wattle Street is 45.050m (RL 54.550).

Above this, the plant room is at a maximum height of 7.20m (RL 61.750) above the height of the building at the eastern end and slopes down to the west to a maximum height of 3.965m (RL 58.515). As the Binary Screen extends beyond this height on the street frontages, the plant room will not be visible from street level.

The Binary Screen extends to a maximum height at the corner of Broadway and Jones Street of 57.281m (RL 71.721).

As part of the EIF funding there is a requirement for some roof mounted plant including a wind turbine and solar panels. To be used as an educational tool as part of the faculties teaching and research programs, these extend past the height of the roof to 7.89m (RL 69.640) and 4.99m (RL 66.740) respectively.

To assess the visual impact of the plant and the roof mounted equipment, a view from the corner of Broadway and Wattle Street has been prepared. As can be seen below, the plant, wind turbine and solar panels are all concealed by the Binary Screen.



Visual Impact view corner Broadway and Wattle Street: Plant and roof mounted equipment is concealed.

New Educational Facility Benchmark

Our design provides a benchmark for best practice standards in educational environments. This will in part be achieved via:

- Quality research and academic office space with good outlook, natural daylight and adaptability of accommodation.
- Flexible open floor areas within an overall rectangular volume of around 30 by 105 metres, generating typical floor plates of approximately 1,800m² UFA.
- Quality lobby, lift and toilet finishes, and appropriate facilities.
- Good access, presentation and ease of building maintenance.
- Superior indoor environment quality including ample fresh air, good thermal comfort, sophisticated building services control systems, interior finishes that minimise levels of volatile organic compounds (VOC's) and formaldehyde, appropriate lighting levels and acoustic ratings, and ample natural light (with glare control).

The resultant work and teaching spaces will be light filled, with good internal lines of sight. Open stairs are located in the Crevasse encouraging internal department and inter-faculty circulation, enhancing interconnectivity and teamwork and breaking down organisational boundaries.

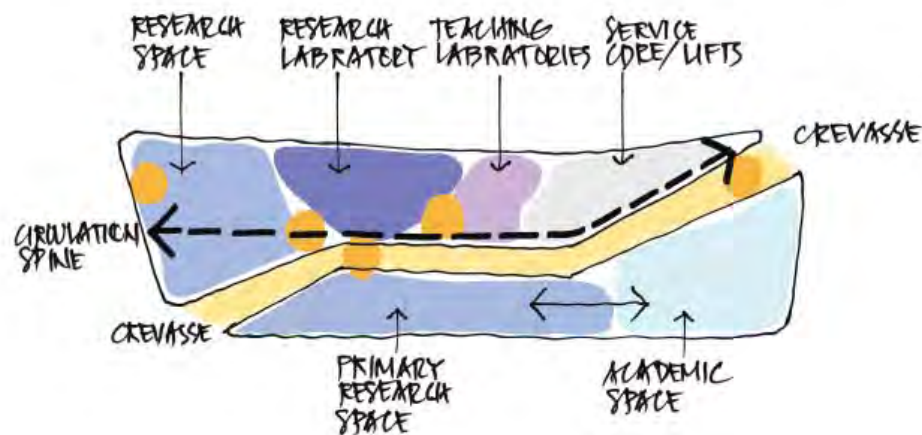
Functional Use Distribution

The spatial relationship diagrams show the current proposal stacking of uses within the building.

The inherent flexibility in the plan enables uses to be rearranged during detail design in conjunction with university stakeholders. It will also allow change and adaptation of uses during the life of the building.

Key characteristics of the functional use distribution include:

- Access is from the Jones Street and Laneway corner, providing direct access from the main foyer to the campus
- Locate the Data Arena and showcase at the main building entry to provide a dynamic entry that displays the work of the faculty.
- Clustering heavily populated lecture theatre on Level 00 with good access to the campus and public realm.
- Focusing the lecture spaces onto a central linear forum with informal learning and break-out areas immediately adjacent.
- Provide Student Union spaces on Level 01 to activate the crevasse and Laneway at the lower levels.
- Cluster classrooms on Levels 03, 04 and 05 and locate informal break out spaces close by.
- Mix of academic offices, teaching and research laboratories, seminar and break out room-son all floors above the lower levels.
- Administrative offices for the Faculty and Dean's Unit on uppermost floors with external access to an indoor winter garden located at the top of the Crevasse.
- Basement and roof top plant.
- Bridge links from Levels 04 - 07 at the Jones Street end and Levels 03 - 07 at the Wattle Street end



Pedagogical Plan Concept



The interior: Collaborative classroom

Defensive Design Provisions

The Broadway Building structure will be strengthened at the lower levels (level 00 to level 02) to avoid progressive collapse due to the loss/damage of a single column.

These floors are required to be designed to counter the uplift forces associated with a 'backpack' sized over pressure event.

Additional reinforcement to floors, columns and walls will increase robustness of the Broadway Building, providing enhancement to aid the resistance of disproportional collapse.

The facade at ground/podium level will require the design to be cognisant of the 'design event'. Facade design will consider materials and detailing that will reduce the potential for glass shards to cause harm.

Education Investment Fund

UTS has been granted EIF funding to develop significant infrastructure on campus.

The funding will assist UTS to transform its teaching and research capabilities for the future.

The Broadway Building will incorporate many initiatives and items of equipment to promote this innovation in teaching and research. The use of such contemporary equipment will provide UTS with the most current technology and will enable the building to become a 'Live Lab', used in the everyday teaching and research of the Faculty. Sensors, displays and interactive monitors will allow staff and students to see how various components of the building operate, from structural movement to air quality.

Some pieces of equipment will be required to be roof mounted including a wind turbine and solar troughs, however as the screen extends past the height of the roof, the impact of these will be limited to neighbouring tall buildings and possibly distant vantage points. There will be little or no impact on surrounding streets.

Further to this, as the design is envisaged as a series of angled plates, with the roof being the fifth elevation, it is intended that the placement of roof top plant will be carefully considered so as the visual appearance and sculptural form of the building is maintained.



ENVIRONMENTAL SUSTAINABILITY

Summary of Environmentally Sustainable Design initiatives

Our design creates a vision for a sustainable building which not only strives for carbon neutrality and conservation of water and natural resources, but also enhances the health and wellbeing of the occupants. The form contributes to social and environmental aspects by creating a sense of community and cross-fertilization of minds. Flexibility of spaces will be regarded not only as a core operational objective of the University but also for the resultant economic and environmental lifecycle reduction.

The design is an evolving process derived from passive design principles utilising the facade and structure as the primary climate modifier. A highly efficient system moderates the ambient condition which reduces the need for energy inputs to the outdoor air. Natural ventilation via the central air handling plant and daylight will be optimised through intelligent facade systems combined with strategically positioned atrium spaces. Natural stratification in atrium space assists ventilation in the transient space.

Mechanical systems are designed to maximise the efficient delivery of comfort conditions to the space. The proposed underfloor air distribution (UFAD) system with increased levels of outdoor supply air and mixed mode facility promotes a healthy indoor environment and encourages flexibility allowing 'plug and play' internal spaces. Cooling efficiency will be enhanced by exposing the structural slab.

The Tri-generation system reduces the demand on the inner city power infrastructure, reduces carbon intensity and improves the overall efficiency by utilising the by-product waste heat to generate heating and cooling. Heat rejection water consumption is minimised by incorporating hybrid cooling towers that only use water when required. Rainwater will be harvested and re-used for cooling towers and toilet flushing. Through metering feedback, interactive control and system monitoring graphics, the building environmental systems will allow continual building monitoring by staff and students as well as demonstrate resource conservation.

The project is committed to achieving a 5 star Green Star Education design rating. Refer to Aurecon Energy Efficiency Report for further detail.



The Crevasse: a light filled dynamic interior experience enhancing interconnectivity and social interaction.

External Finishes Selection

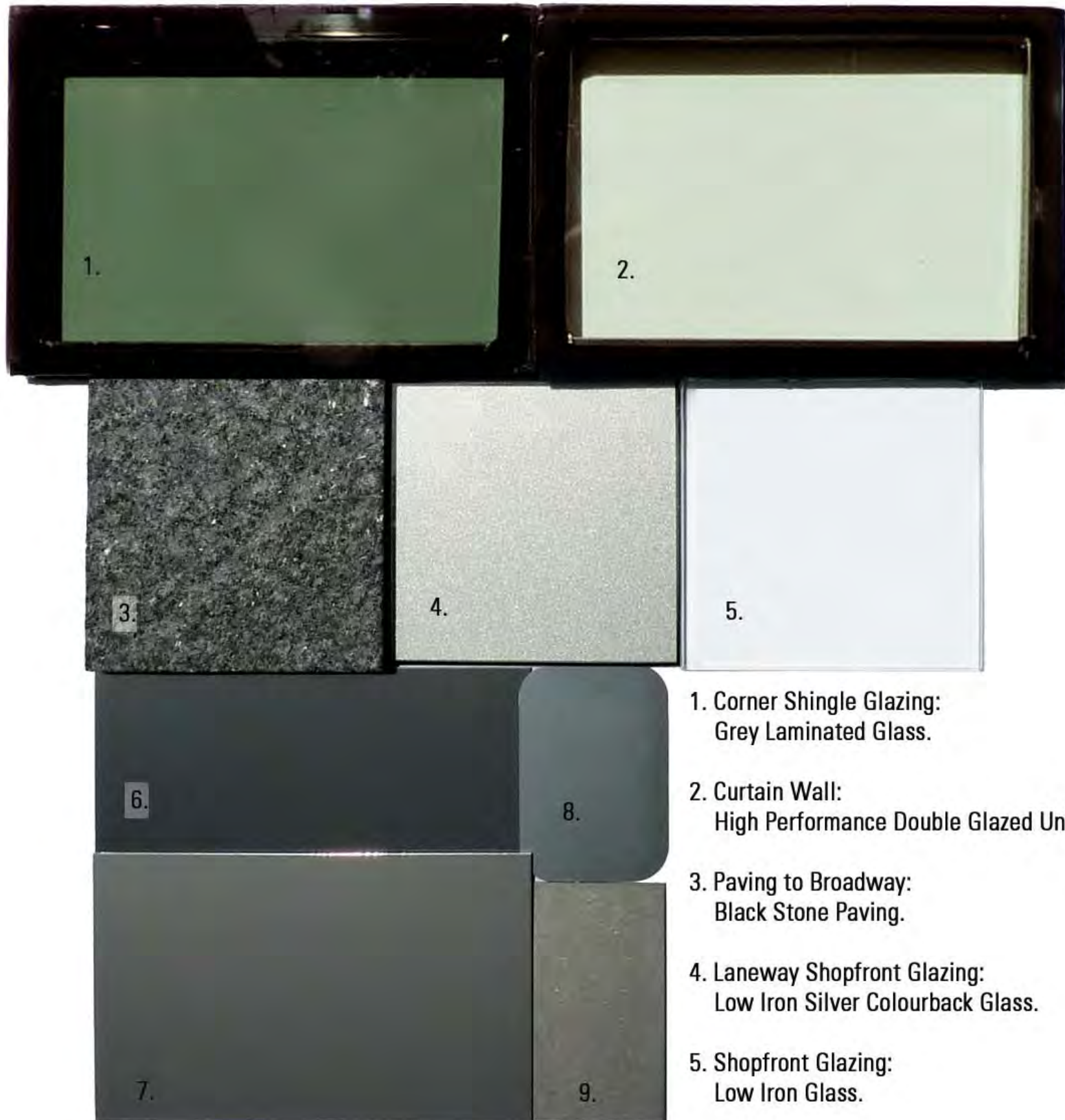
The Binary Screen provides the dominate external material. Perforated anodised aluminium has been selected to provide a durable and long lasting material in its harsh environment. With its proximity to Darling Harbour and the constant pollution from the surrounding roads, the aluminium will withstand these conditions with minimal maintenance.

Behind the screen, glazed curtain walls and shopfronts enclose the building on all facades, allowing natural light into the building at each level. The colourbond roof will provide a non-reflective finish, similar in appearance to the Binary Screen and the clear glazing to the skylight will allow additional natural light into the building.

The external paving proposed complies with the Concept Masterplan and the City of Sydney guidelines.

Element	Level	Proposed Finish Type
External Paving	Broadway	Austral Black Stone paving
	Wattle Street, Jones Street & Laneway	Asphalt
Entry doors	L00 & L02	Clear glazed double sliding doors to each entry - Corner Broadway & Wattle Street, Broadway & Jones Street, Jones Street & Laneway
Shop front glazing	L00 - L02	Street frontage shopfront glazing - Low iron clear glass fixed to aluminium mullions with a metallic paint finish
	L00 - L02	Laneway shopfront glazing - Low iron silver colourback glass fixed to aluminium mullions with a metallic paint finish
Covered Walkway	L03 & L04	Exposed concrete to footpath soffit.
Binary Screen	Typical	Perforated aluminium with anodised charcoal finish
		Aluminium framing with anodised dark grey finish
Curtain Wall	L03 - L13	Double glazed curtain wall system with high performance glass. Single glazed spandrels typically. Composite aluminium spandrel to be used where penetrations required to support binary screen
Corner Shingle Glazing	L03 - L13	Grey laminated glass with metallic paint finish for structural members
Bridge Links	L03 - L07	Low iron clear glass
Laneway Glazed Roof	L09	High performance clear glass
Intake and Exhaust Louvres	Typical	Prefinished aluminium louvres, dark grey metallic paint finish
Roof		Colourbond metal deck roofing, dark grey finish
Crevasse skylight	Roof	Clear double glazed with projecting metal sunshades with a high performance metallic finish

Sample Board



1. Corner Shingle Glazing:
Grey Laminated Glass.
2. Curtain Wall:
High Performance Double Glazed Unit.
3. Paving to Broadway:
Black Stone Paving.
4. Laneway Shopfront Glazing:
Low Iron Silver Colourback Glass.
5. Shopfront Glazing:
Low Iron Glass.
6. Binary Screen Framing:
Dark Grey Anodised Aluminium.
7. Binary Screen:
Charcoal Anodised Aluminium.
8. Roof:
Dark Grey Colourbond Metal Deck Roofing.
9. Curtain Wall, Shopfront & Laneway Mullions:
Stainless Steel.



WATTLE STREET

ENTRY SLIDING DOORS
LOW IRON CLEAR GLASS

SHOP FRONT GLAZING
LOW IRON CLEAR GLASS

JONES STREET

COVERED WALKWAY

BINARY SCREEN
ANODISED ALUMINIUM
(CURTAIN WALL GLAZING BEHIND)

CORNER SHINGLE GLAZING
GREY LAMINATED GLASS

1:250 @ A1 0 2.5 5 7.5 12.5M
1:500 @ A3

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SYDNEY

BROADWAY ELEVATION
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LANEWAY GLAZED ROOF
HIGH PERFORMANCE CLEAR GLASS

BRIDGE LINKS
LOW IRON CLEAR GLASS

LANEWAY

SHOP FRONT GLAZING
LOW IRON CLEAR GLASS

BINARY SCREEN
ANODISED ALUMINIUM
(CURTAIN WALL GLAZING BEHIND)

CORNER SHINGLE GLAZING
GREY LAMINATED GLASS

COVERED WALKWAY

BROADWAY

1:250 @ A1 0 2.5 5 7.5 12.5M
1:500 @ A3

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WATTLE STREET ELEVATION
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1:250 @ A1 0 2.5 5 7.5 12.5M
1:500 @ A3

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JONES STREET ELEVATION
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PRELIMINARY

1:250 @ A1
1:500 @ A3

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LANEWAY ELEVATION
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AREA SCHEDULE

Level	Useable Floor Area (m2)	Circulation (m2)	Amenities (m2)	Gross Floor Area (m2)	Plant (m2)	Car Park (m2)	Fully Enclosed Covered Area (m2)
B4	735	183	15	933	304	1,760	3,012
B3	585	305		890	359	1,760	3,009
B2	585	305		890	359	1,720	2,969
B2 Mezzanine				0	134		134
B1	1,635	663	80	2,378	768	160	3,386
L00	1,545	772	80	2,397	609		3,086
L01	780	388	80	1,248	228		1,556
L02	570	365		935	105		1,040
L03	1,145	418	45	1,608	230		1,883
L04	1,690	633	45	2,368	384		2,797
L05	1,825	567	70	2,462	267		2,799
L06	1,835	490	70	2,395	340		2,805
L07	1,825	487	70	2,382	349		2,801
L08	1,860	380	70	2,310	307		2,687
L09	1,865	397	70	2,332	294		2,696
L10	1,885	408	70	2,363	263		2,696
L11	1,813	413	70	2,296	325		2,691
L12	1,865	378	70	2,313	267		2,650
L13					2,531		2,531
Total	24,043	7,552	905	32,500	8,423	5,400	47,228

Note:
Gross floor area is measured in accordance with the Sydney LEP 2005

CAR PARK SCHEDULE

Building	Level	Car Bays	PWD Bays	Motorcycle Bays
Broadway Building	B4	52	2	6
	B3	51	2	6
	B2	51	2	6
Total		154	6	18

Shadow Impact

During the Winter Solstice at 12pm, the Broadway Building will cast a shadow over Fraser's Broadway on the south side of Broadway of approximately 23m in height. Beyond this, the screen will provide a further shadow of between 5m and 12m. This shadow will have less of an impact due to the perforated nature of the screen. As can be seen on each of the diagrams following, there will be no major impact on adjacent buildings.

Refer to the following shadow diagrams:

Shadow Impact Study

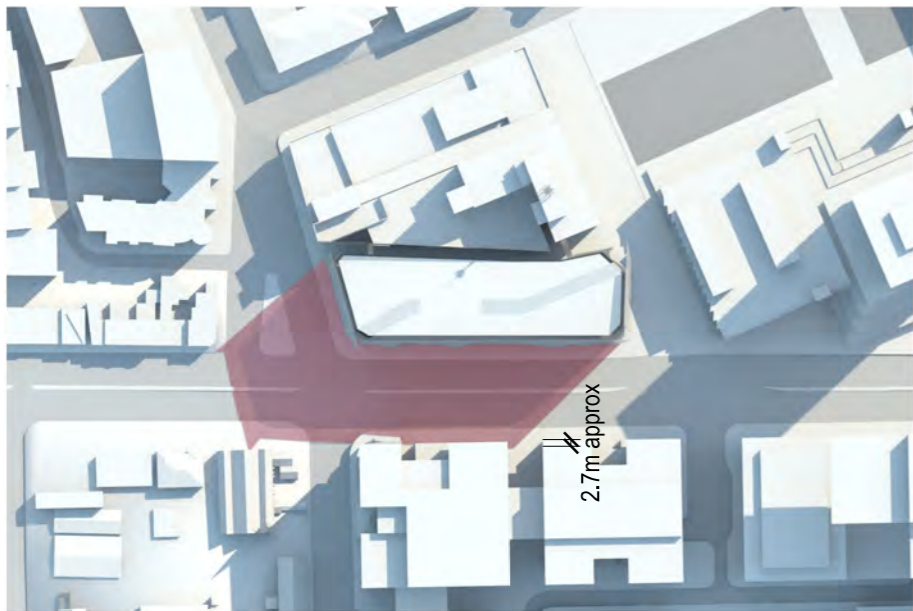
Shadow Impact Study - Winter Solstice Sheet 1

Shadow Impact Study - Winter Solstice Sheet 2

Solar Access

The three primary facades are full height glazed. The Binary Screen has 45% open area. Combined they maintain a high level of transparency particularly when viewed from the interior looking out. The high degree of openness to the facade allows interior activities to be visible, engaging and inviting to professions, industry and community beyond the campus.

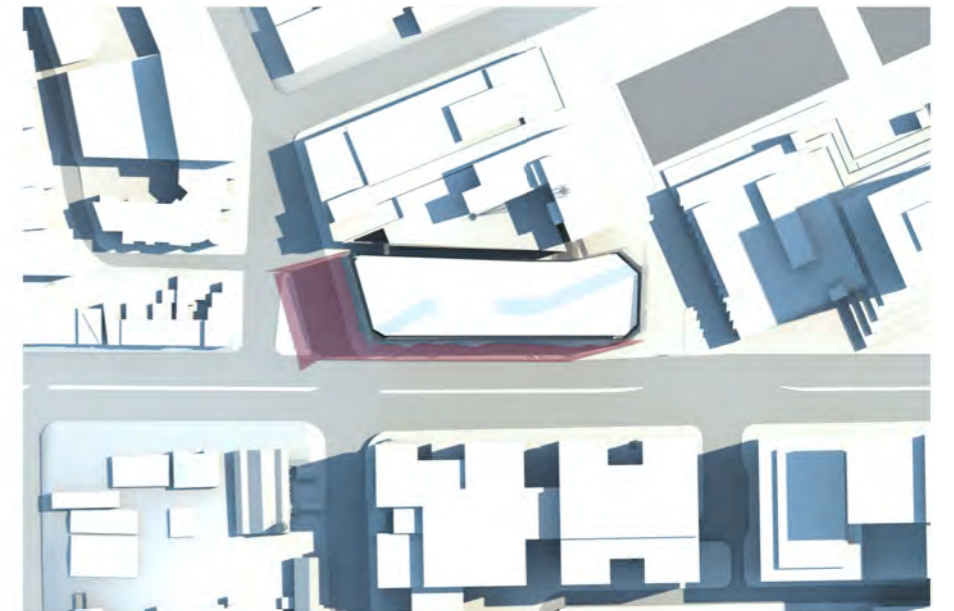
Internally, glazed partitions are proposed to all main circulation paths, including full height to the south side of the crevasse, promoting a transparent and active interior and allowing visual connectivity throughout the crevasse.



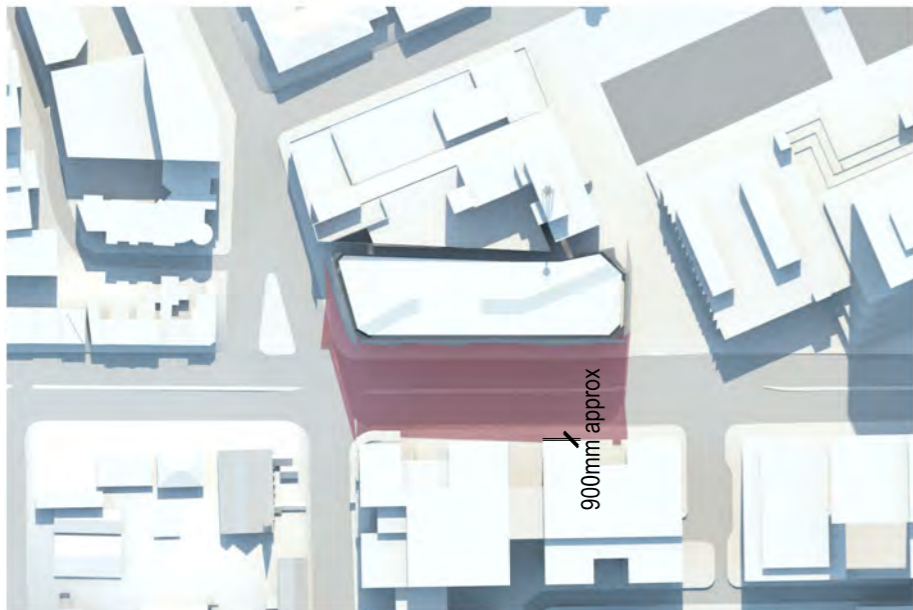
EQUINOX, 20 MARCH 10AM



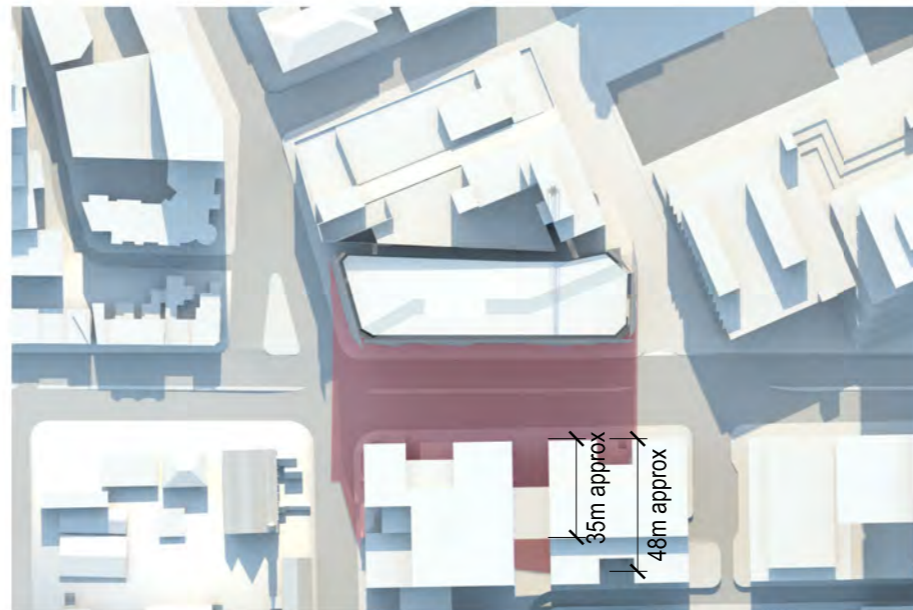
WINTER SOLSTICE, 21 JUNE 10AM



SUMMER SOLSTICE, 21 DECEMBER 10AM



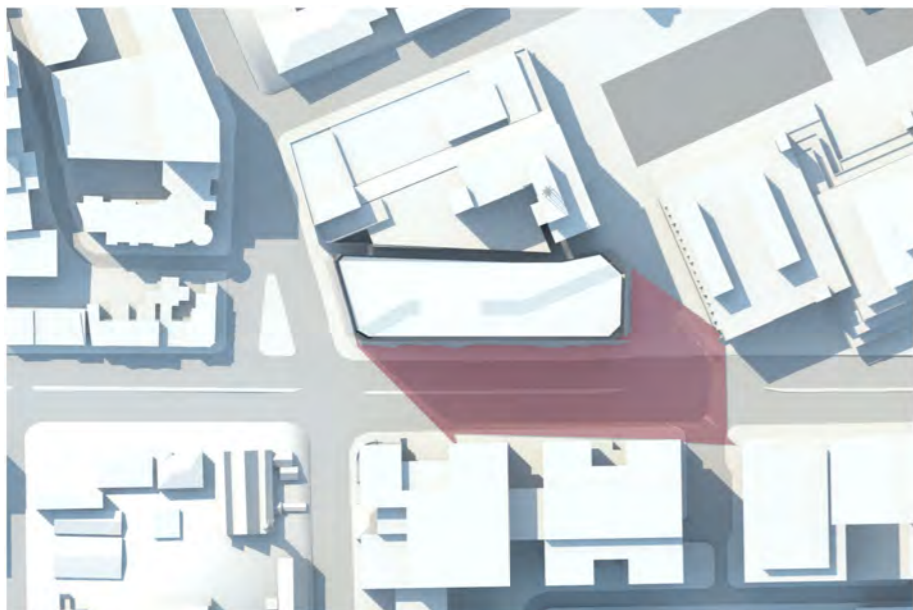
EQUINOX, 20 MARCH 12PM



WINTER SOLSTICE, 21 JUNE 12PM



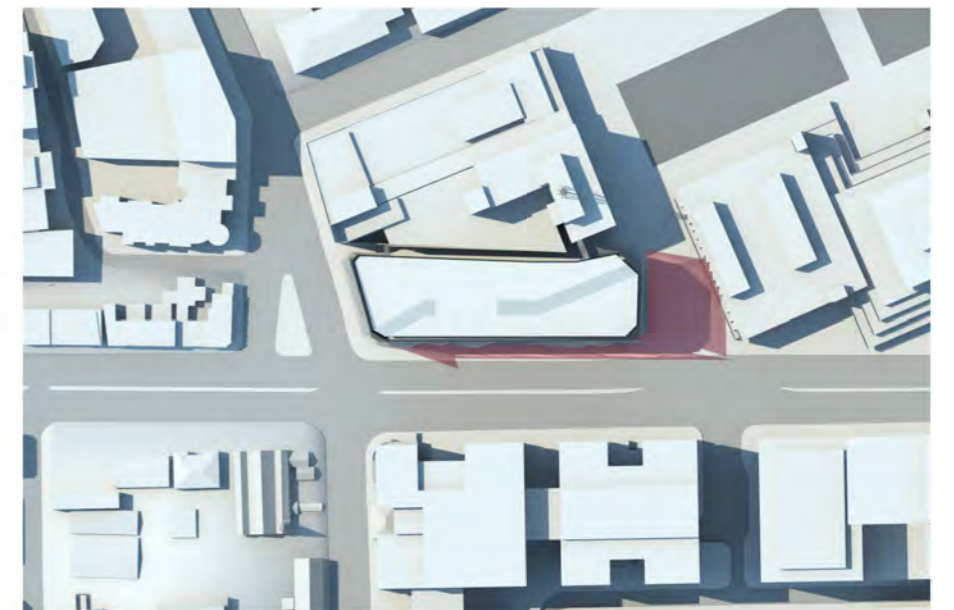
SUMMER SOLSTICE, 21 DECEMBER 12PM



EQUINOX, 20 MARCH 2PM



WINTER SOLSTICE, 21 JUNE 2PM



SUMMER SOLSTICE, 21 DECEMBER 2PM



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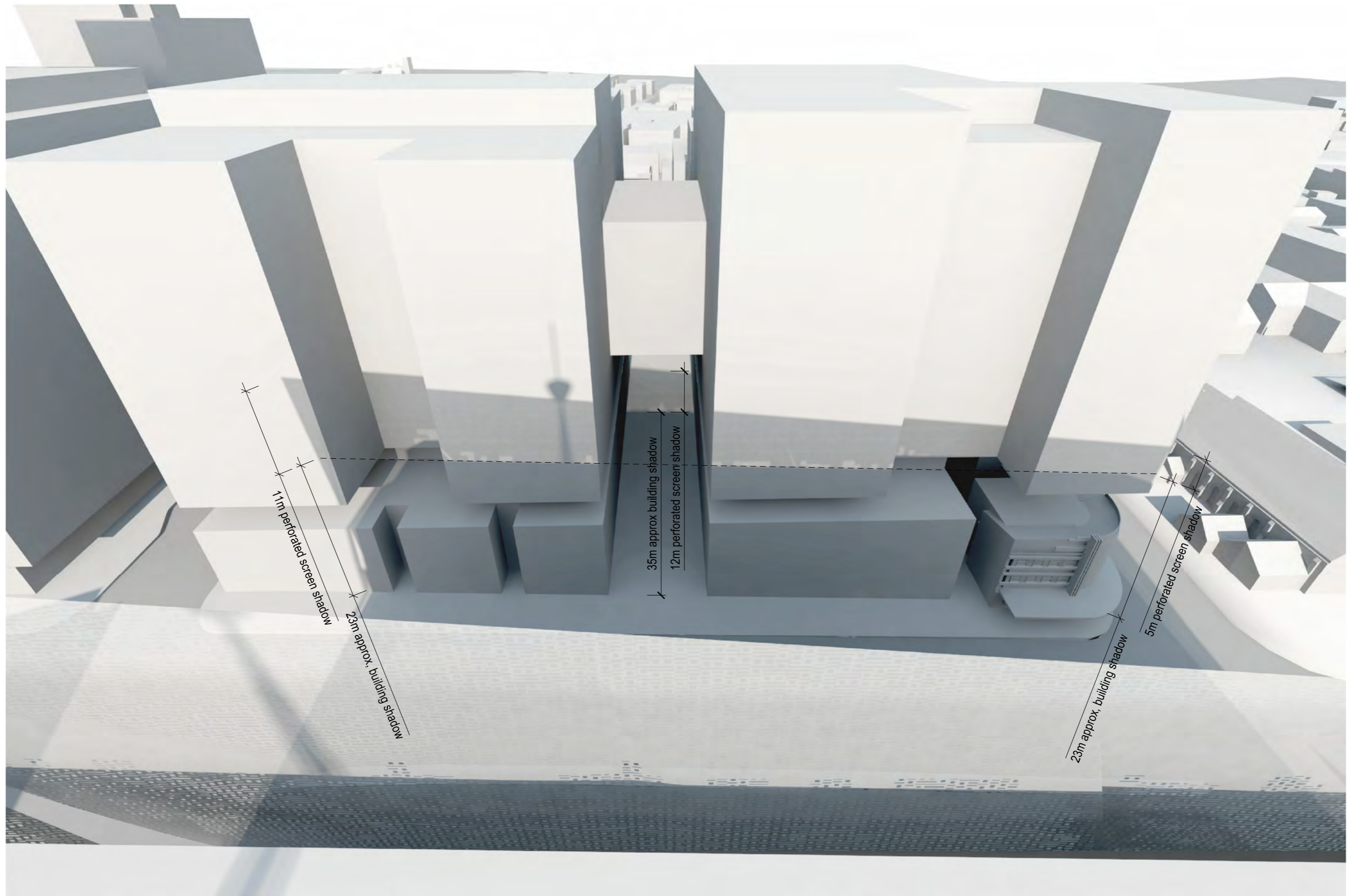
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SHADOW IMPACT STUDY

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VIEW FROM BROADWAY BUILDING ROOF

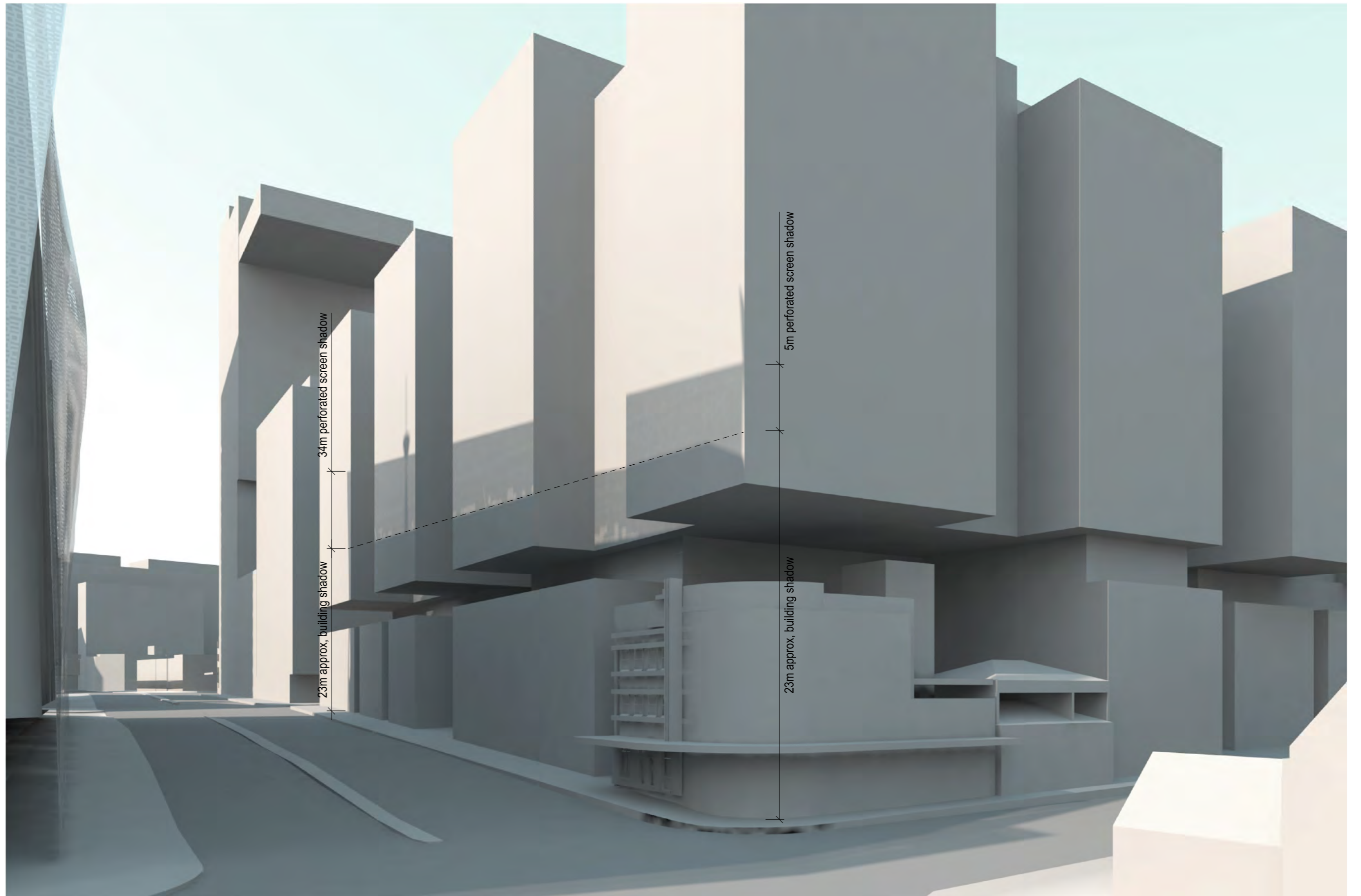
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VIEW FROM CORNER OF BROADWAY AND WATTLE STREET LOOKING SOUTH-EAST

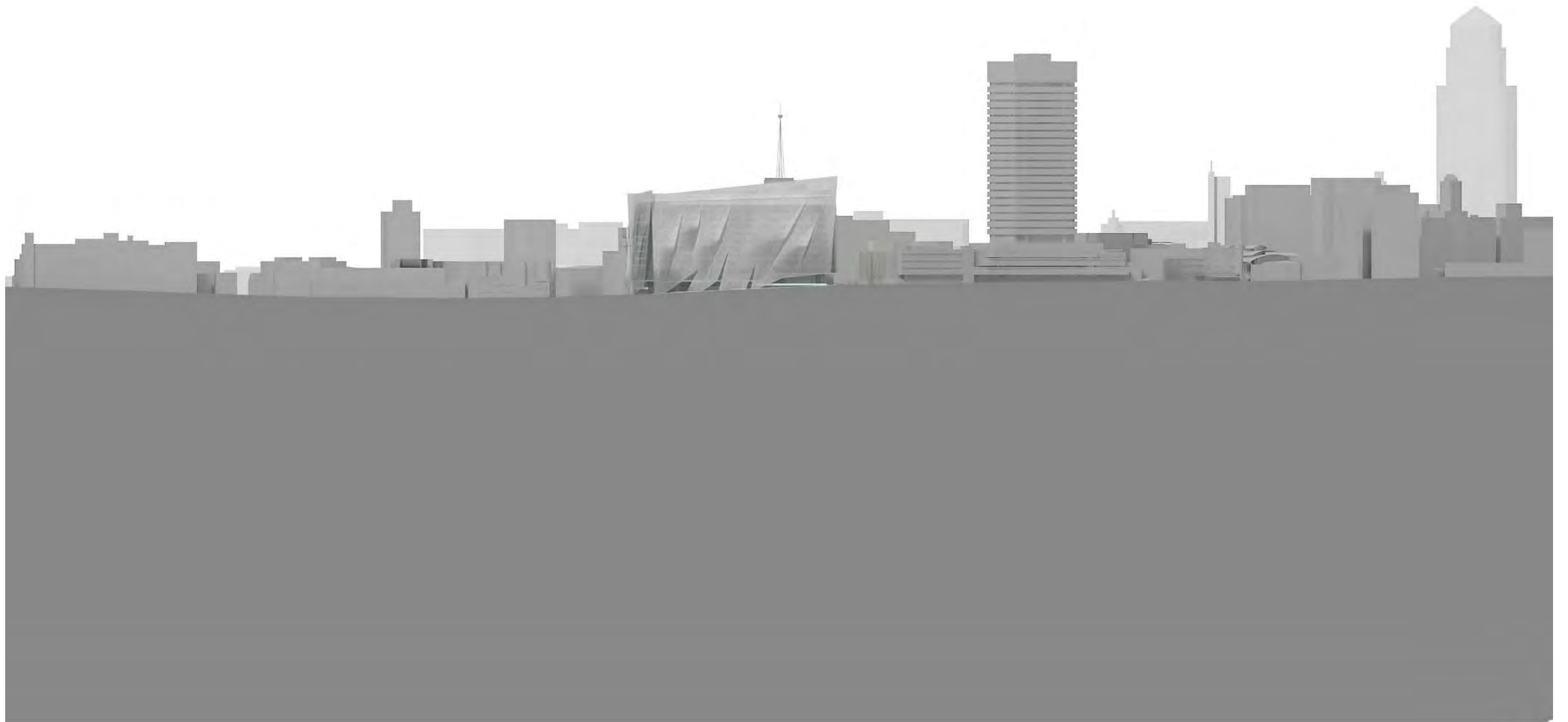
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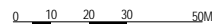
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SYDNEY
SHADOW IMPACT STUDY
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ENLARGED CONTEXT ELEVATION FROM PAGE. 4

1:1000 @ A1
1:2000 @ A3



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09 MARCH 2011