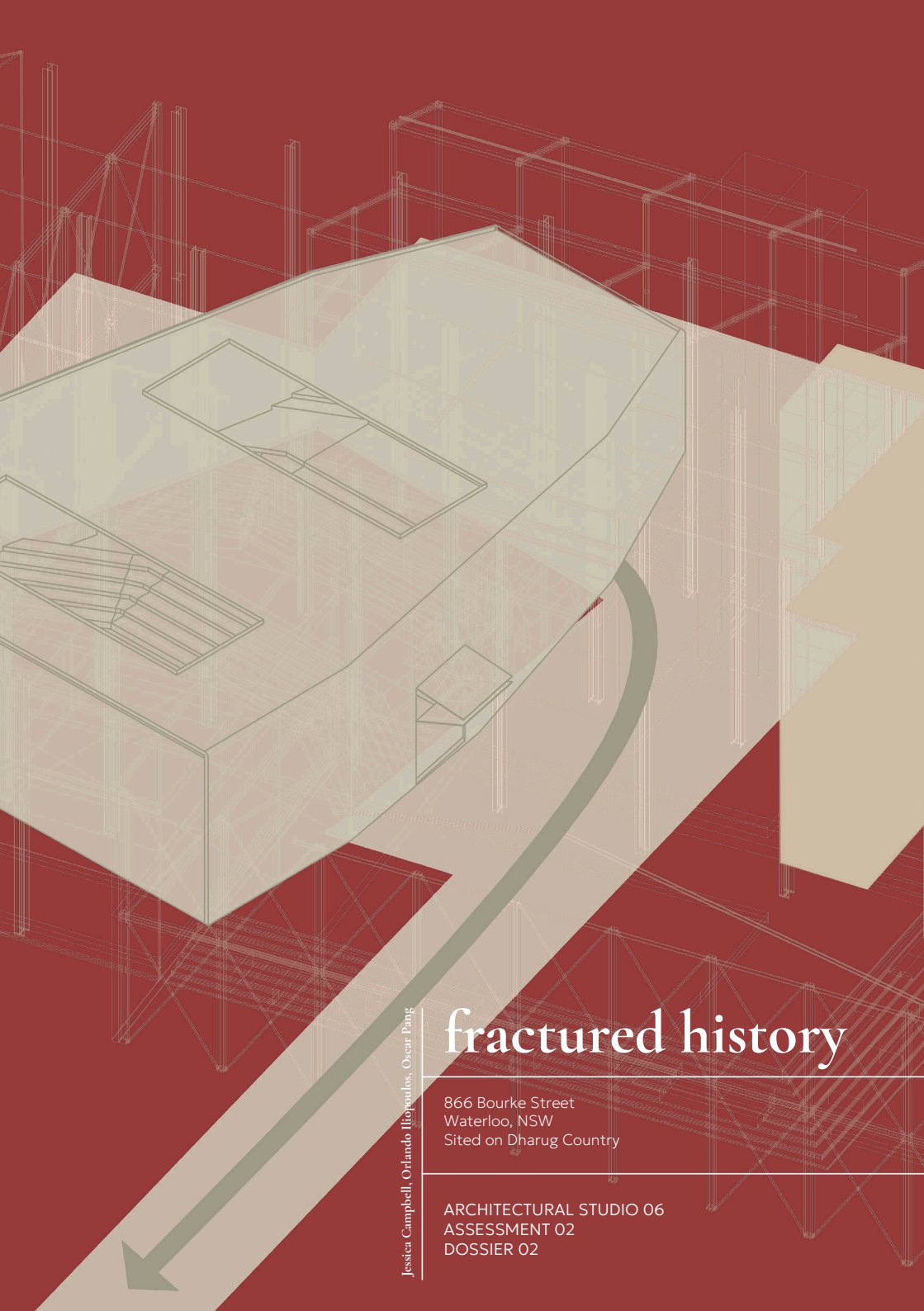


fractured history

866 Bourke Street
Waterloo, NSW
Sited on Dharug Country

ARCHITECTURAL STUDIO 06
ASSESSMENT 02
DOSSIER 02

Jessica Campbell, Orlando Iliopoulos, Oscar Pang

The colonial imposition of 'Terra Nullius' effectively reset the legislative representation of history. Seventeen Eighty-Eight marked the systemic erasure of histories, physical and metaphysical. This erasure redefined the notion of spatial custodianship to a definition of singular ownership - 'heritage' by definition attributes land to commodity.

Heritage defines itself invalid particularly in the implication of itself on the built form. As we shift to the notation of 'history' we couple collective responsibility in the preservation of the past.

As we redefine heritage, we acknowledge the collocation of histories on the site as both colonial and indigenous.

We acknowledge the custodianship of land of the traditional owners, the Gadi people of the Eora Nation and now extend the role of custodians to each person that situates itself on site. To care for, preserve, and facilitate the evolution of the country.

We acknowledge that the lands we design on are unceded indigenous lands - always was, always will be.

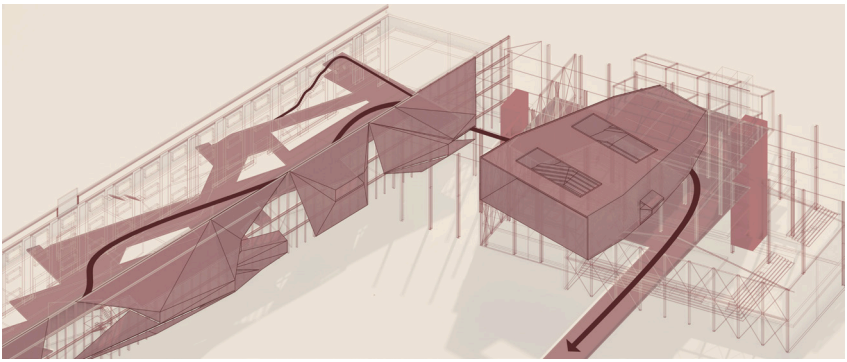
fractured histories
studio 6 capstone project
social condenser

program: community art precinct
concept: heritage reinterpretation

project team
jessica campbell
oscar pang
orlando iliopoulos

course coordinator: michael ford
tutors: shane marshall, david janson

00/ cover image



The geometric dissonance to the existing building is a key element to the response to the colonial structure. In breaking down problematic elements and reconnecting the buildings on site, we activate the currently iceberged heritage monument. In such the project reinstates the social relevance of the sites program that was once a key definition of person to place; colocating the knowledges held by both the colonial and indigenous situation of the sited Gadi country.

00/ statement

Preceding modern heritage laws are land stewardships that align with First Nations (specifically Gadi) culture. Sydney's heritage laws prioritise assessing material based on its heritage value. As a result, they often default to a 'Preserve at All Costs' approach, rather than considering the building's current relevance and role as a Heritage Site. Its legislative rigidity gives rise to social revolt, in itself challenging the conservationist mentality. This defines the character of the locality. Understanding First Nations frameworks of placemaking and care for the country, allow a deeper understanding of the building's spatial context - both physical and metaphysical.

As gentrification and re-zoning transform the area around the Waterloo Glass Factory (866-882 Bourke Street, Waterloo), it is encountering a mix of different cultural values without adequate urban planning to integrate them effectively. Graffiti and street art play a significant role in shaping the urban environment and in expressing the diverse senses of 'belonging' within the fragmented community of Waterloo. There is a deep connection to the role of the built environment and infrastructure in the way a person attributes themself to place, also affected by state legislated Heritage. Conservation zoning in itself acts as a titular protection rather than oneof an active and practical protection. As a result it often spatially correlates to areas presently having Graffiti, used as an active protest, vivifying the alienated state of person to "safeguarded … retained … managed" place.

By reinterpreting our view of heritage we aim to bridge the gap between person and 'third place' that is devoid in the current urban planning. The overlaying of Colonial and First Nations mapping techniques allows a greater understanding of the sites quality and relevance; with design intergrating both sensibilities to create formalistic interest and programmatic relevance to a contemporary urban dynamic, whilst still retaining its heritage character

In breaking down the colonial bias, the project seeks to respectfully integrate the two converging histories that define the site's occupancy, both colonial and First Nations. Indigenous connection to country denotes the innate dynamism that guides situation, an ethos that is contradicted by colonial settlement. In the many layers of connection to the country, the project takes specific focus on the social aspects that are lost at the urban scale of present day Waterloo.

"In reconnecting to the country, the project at its heart prompts a reconnection to each other"

The contradiction on heritage, in connecting the social context to the past, ultimately creates a division of relevance to the present day - treating aspects of mundane heritage, like WGF as an edifice to the past. In connection to place, we acknowledge the diaspora collective of individuals that settle on country, with the site, through country acting as a conduit of social connection.

The principles that guide the site's design are processes and features of indigenous placemaking, using the colonial shell to adapt meaning through its form. An axial design approach, with sensitivity to knowledge keeping, connects physical relationality between the site to its context, both directly adjacent and afar, also using the guide of metaphysical and celestial movement to guide design.

In acknowledging the role of colonial history in the understanding of indigenous place/displacement, the choice of intervention was not to destroy the structure rather using it as points d'appui to illustrate the contrast of imposition and situation. The site, through this process relinquishes its semantic overlay of place as program, rather, its program coming from a careful consideration and response to place and country.

00/ contents

01/
project context

The Waterloo site contextualizes itself with dual histories, defining its spatial heritage' with that of colonial imposition and indigenous intuition. The site, through alteration, both physicality and aesthetic has had a challenging placement on the heritage register, with utilitarian alteration ultimately fragmenting its historical significance.

The Waterloo site contextualizes itself, colonially, as a glass factory - programmatically a 'maker' space. Occupied by the crystal glass factory, the colonial built imposition on site, situates itself from 1916, ceasing trade and manufacture from the site in the 1960s. Architecturally, the integrated facade separates the structure from itself, a key concern in the role of the program in connection to 'country'; forming a placement on country rather than a site specific and considerate response.

Pre-colonially, the site situated itself, relationally, to the many points of significance to indigenous practice and culture. Coincidentally, by colonial placemaking the site's orientation follows the replicated route of the Shea Creek made by Bourke Road. Along a ceremonial songline of fresh to salt water, the site is innately a social condenser by its intersecting point in social migration.

In meshing the dual histories physically, the geometric imposition of the facade and its axial situation is a key facet to the design that detracts from indigenous relevance. Of key note is the spatial geometric performance of Bernard Tschumi's 'Parc de la Villette' (1987), a rational geometric deconstruction. The spatial performance of such is also defined by the performance of person to space, a key lacking in the Waterloo sites social relevance. In acknowledging the geometric imposition of colonialism on site, the reorganization of the west building is a key demonstration of building socially reconnecting to community.

The geometric reorganization of the site is a key conceptual driver, as a non-ecological, spatial move to resituate the building. A 'fragmentation' of the existing building, in both additive and subtractive means seeks to contextually realign without completely removing the real and relevant colonial role of the building in the heritage contextual relevance of the site

01/ contextualisation

site situation

The Eora Nation geographically locates itself between the Hawkesbury, Georges and Napean Rivers with water systems playing a key role in the definition of ceremony and self.

The Hawkesbury River is a primarily fresh water system and was a major first nations transportation route anf food source for fish, eels, water birds, & mussels.Colonially, the Hawkesbury Settlement represents the deaths of many indigenous people in the Napean-Hawkesbury wars.
The Georges River was a key location for oyster farming in first nations life. In such, it was a key meeting place for people for over 60,000 years - it was considered an important social place.

The orientation of indigenous ceremony ties itself deeply with water in the Eora Nation. The colocation of ecological qualities to indigenous use is especially important in a de-colonised understanding of site situation.

The Fresh and Saltwater proximities of site are key to a geographacised understanding of Indigenous placemaking. There are key differences in the roles of mens business and womens business in the custiodianship of land and responsibility.

The ubiquity of water in the indigenous stories of the area underpin the ceremonial roles of individuals, moieties and kinship groups

Specifically, the Alexandia Canal holds prominence in the local story telling as well as acting as its own ‘social condenser’ of the groups of the south eastern Eora/Dharawal nation. As a consequence of colonisation, its health and therefore the health of local practices were negatively impacted; diversion, pollution, occupation and misuse are all factors of in this

Fresh Water ceremonial roles are: Initiation, Healing, Cleansing, Rite of Passage, Land Fertility, Ancestral, Seasonal ceremony

Salt Water ceremonial roles are: Fishing and Marine, Totem / Ancestral, Seasonal, Cleansing, Corroborees, Protection, Dance and Song

In characterising the area beyond its natural and spiritual elements - the representation of land in culture and life is elucidated. The affordance of flora and fauna dictates the tactile elements of life, and in such becomes art.

A key element of colonisation is the appropriation of functional elements of life (typically spears, bowls and carrying mechanisms) as art. In acknowledging th converging contexts of the Gadi shorelines affordance of reeds, as well as the former function of the building being a glass factory, the notion of the 'vessel' is one that has been used as a metaphor of the space.

The land is a vessel of histories - carrying, spilling, transferring and sharing the stories of past present and future occupants to the next generation of people, or animals that occupy space. In noting this, we acknowledge that spatial treatment, particularly in a colonial context abuses and/or disregards this transferable quality that land has to history.

In the misuse of the land, we understand the fragmentation of relationship that person has to place - one that is further consolidated when site is 'iceberged' (Hall, E.) through heritage conservation rather than promoting relevance through programmatic and functional evolution. We use the notion of the vessel (formerly a woven basket, and glass container) to personify this shifting and converging program.

01/ legal heritage

legislation and classifications

The site itself occupies varying heritage classifications, defined by a hierarchy of importance imposed by State Planning Controls.

As previously illustrated, the notion of heritage preservation is ultimately a framework for retention, rather than preservation. This framework, in contradiction to traditional views of the nature of country, stagnates the dynamism of the site through both human interaction and environmental cycle. In this stagnation the social and physical relevance of the heritage meaning is lost through context. This spatial relevance is the ultimate reason for misuse - a lack of relationality and relevance to occupant. In challenging the social relevance of the building, we employ the formative goals of the heritage laws to build up and break down elements of the existing structure. In noting this, below categorizes key elements of the building in heritage relevance

High

Confined to restoration, preservation or reconstruction

West Facade particularly Bourke Street / O'Dea Avenue corner (this excluding third storey addition)

Moderate

Adaptation Acceptable if it considers the framework to protect the heritage of the building its entirety

South, East, North Buildings
West Building third storey

Little

Can be adapted / removed. Should ensure significance of original building if it is enhanced or revealed

Construction and Structural elements

Intrusive

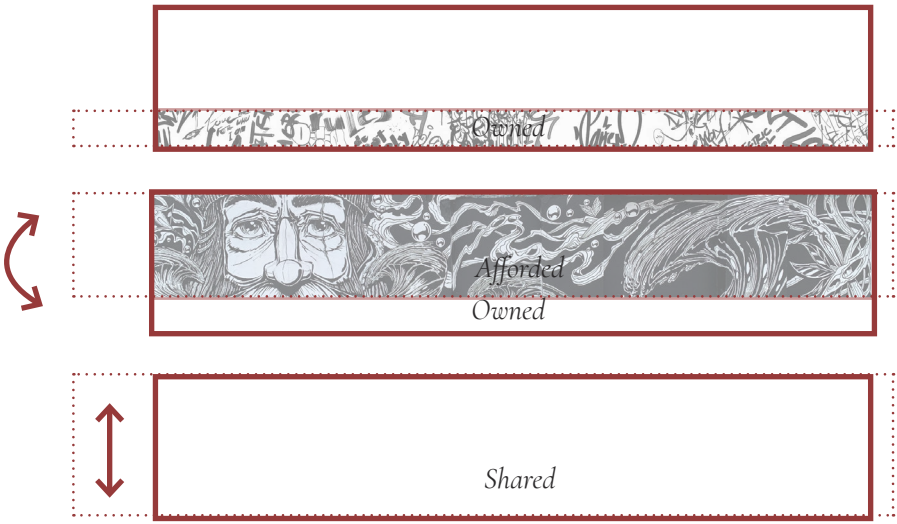
Detracts from the significance - Can be removed, replaced, or made more compatible to the overall site.

Pained Facade
Vertical Metal sheeting on O'Dea Avenue Facade

The ethos of Koolhaas' work, 'Delirious New York' underpins the social framing of Waterloo in relation to the Crown Glass heritage building. Its imposition to the landscape, deleterious to culture apart from the one that is overwritten, "The Grid makes the history of architecture and all previous lessons of urbanism irrelevant". Ultimately, the social layers of Waterloo are undermined by this

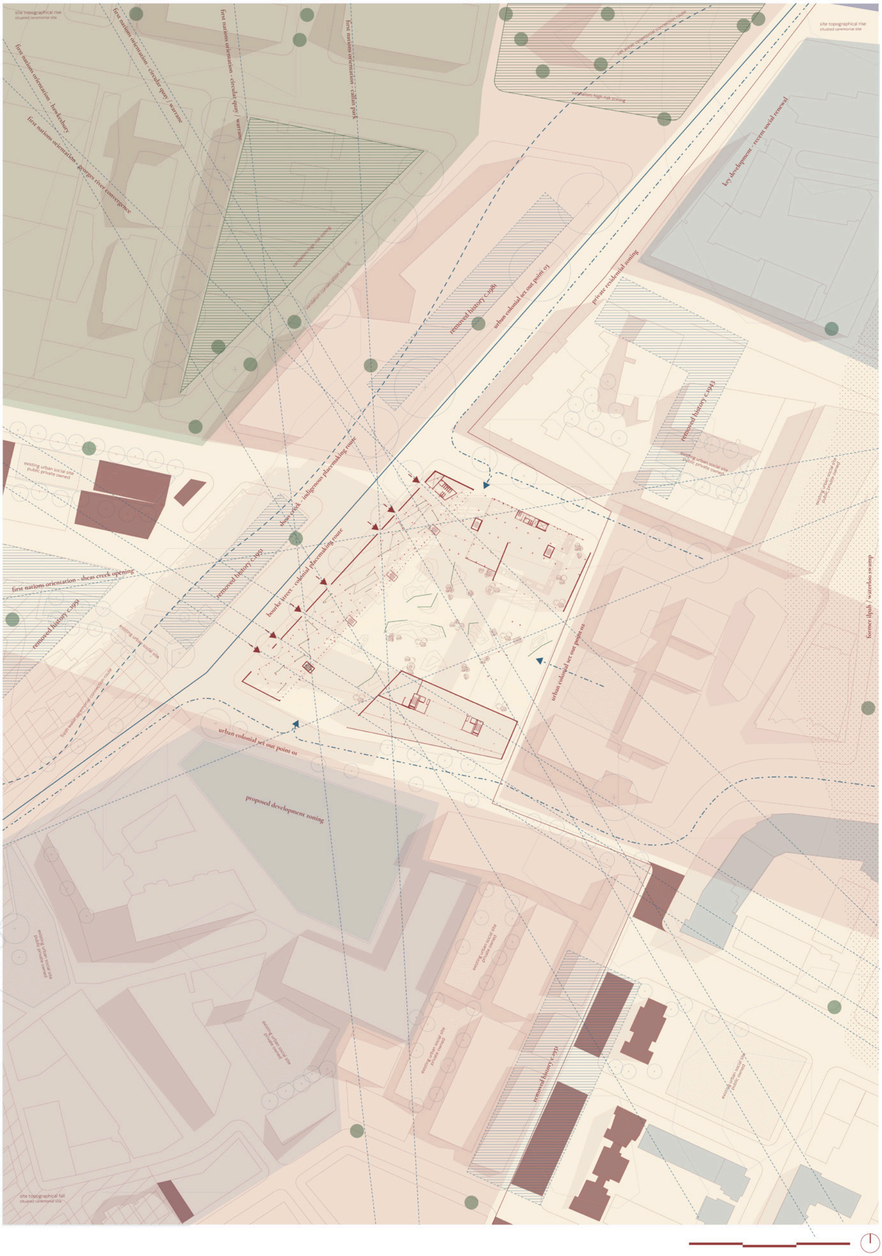
Graffiti arises as a result of a number of social conditions and is present prominently around Waterloo's newly diaspora community. People use graffiti as a way to make a space their own, ownership. Graffiti can also be used as a means for social upheaval as a catalyst for change. Furthermore graffiti can cross the threshold of vandalism when used to show disregard to a space, advocating the alienated of the locality

In redefining the nature of interaction and affordance, the nature of representation changes - from protest to spatial ownership and therefore a representation of self (both individually and collectively). It is when a space becomes equal access, shared or even afforded that the perception of a space becomes volumetricised, rather than occupying just the single plane. In such the art becomes meaningful in that a mutual ownership and responsibility is perceived.



01/ site analysis

ground floor plan integration summary



01/ site analysis

precinct analysis

False Ownership
False Place
False Setting
False Heritage
+

- Mapping Heritage Buildings
- Mapping Conservation Areas
- Mapping Areas Prone To 'Exempt' Street Art
- Mapping Graffiti Vandalism
- Mapping Ownership
- Mapping Protest

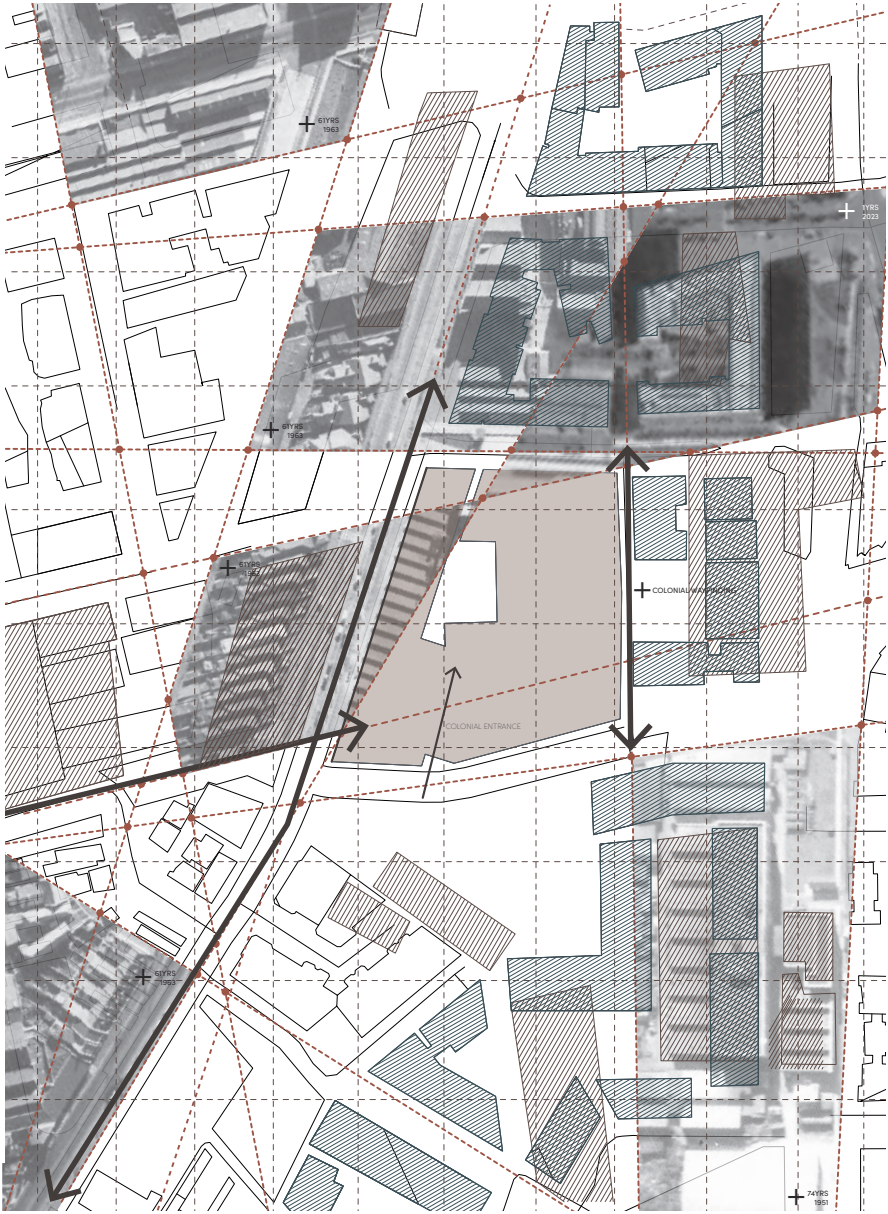
0 50 100 150 200

Colonial North

1:2000
Sited on Gadi Country

01/ site analysis

place analysis



False Preservation
False Organisation
False Proximity
False Heritage

+

Mapping Symbol Alignment
Mapping Symbol Evolution
Mapping Symbol Adjacency
Mapping Colonial Grid

Colonial Mesh

1:500
Sized on Gadi Country

False Country
False Ecology
False History
False Heritage

+

Colonial North

1:500
Sized on Gadi Country

02/
project concept

In acknowledgment of the buildings seeming irrelevance to current context, the adaptation of facade comes in a goal to co-situate the first nations, industrial and contemporary relations of site to the people to locate themselves around it.

The nature of many heritage buildings is that, in form the are devoid of relationality of site, in the goal of maintaining architectural order and the aesthetic logic that is attributed to function.

In understanding the tri-axial nature of a building, the design process sought to break down the binary that defines its aesthetic.

The site, and more specifically its adjacency in Bourke Street materialise the inherent presence of placemaking that defines Waterloo and Green Square - a path of movement, appropriated from contextually overwritten pathways. Understanding this acted as a connector of context, a series of vectors from site define the spatial organisation of the new reinterpretation.

This reinterpretation has been conducted through (and not limited to) the followng means:

- Orientation
- Sight Lines
- Adjacency
- Minimisation of (legislativley imposed) spatial redundancy
- Material reticulation and redeffinition
- Spatial Affordance
- Egalitarianism of person to space

00/ concept

reorganisation

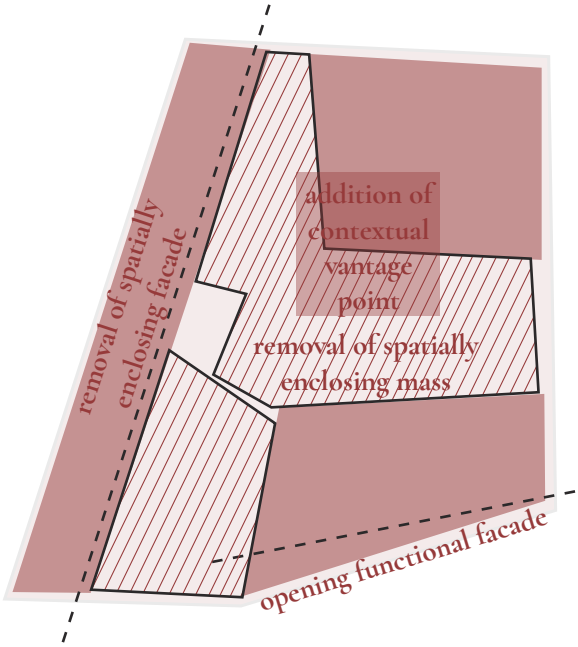
In challenging the imposition of heritage laws - we took a semantic and functional interpretation of the various classification. There were three key denotations of reason why/why not an element was considered heritage

1. Function/Program
2. Aesthetic/Material Value
3. Age

A key concern within the challenging of heritage is the demarcation of age being rationale for retention

A *'let's just keep it because it's old'* mentality is a key factor for the alienation of heritage buildings in an evolving context. This type of heritage imposition is refered to as 'iceberg heritage'.

Below is an overlay of the moves made to the existing building



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- Egalitarianism of person to space

03/
site progression elevations

west elevation
- pre-colonial (indigenous)
- post-contexturalised (colonial)
- re-contextualised (fragmentied history)

north elevation
- pre-colonial (indigenous)
- post-contexturalised (colonial)
- re-contextualised (fragmentied history)

south elevation
- pre-colonial (indigenous)
- post-contexturalised (colonial)
- re-contextualised (fragmentied history)

03/ concept

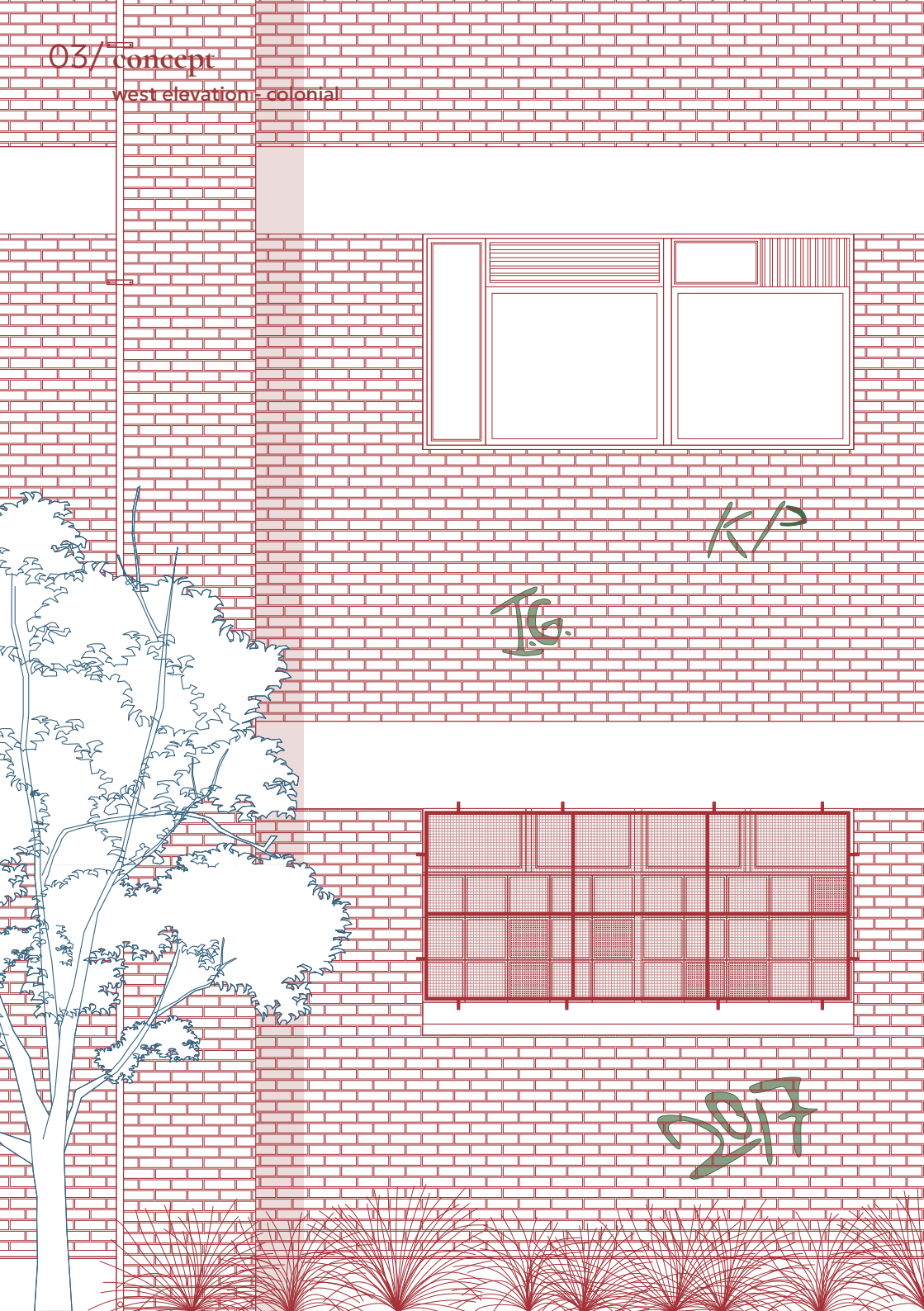
west elevation - pre colonial

The abstraction of the term ‘social condenser’ to a first nations interpretation in country is one of particular importance in the programming of site. The image across does not intend to assume the physicalised country, rather, defining the program of ‘exhibition’ in an indigenous social lens, that is above all else tied with country.

Traditional forms of exhibition within country were made through oral demonstration and conversation. An exhibition of teaching an art. As the proposed building’s program transfers, the physicalised ‘country’ typical of an exhibition space was one of shelter. Shared centrally around trees, the dynamism of social life meant places like these acted as a congregational meeting ground - of kinship, moiety and tribe; both human and non-human. The species of tree that is depicted, the Swamp Paper Bark, was used as a key wayfinding congregation tool to the tribes of the area and in such has been placed as a representation of its social role.

03/ concept

west elevation - colonial



In understanding the atrophying affects of Colonialism on the social systems that existed former to English Settlement, a comparison can be made between dynamism of site.

The site as it stands currently, remains a physical and immoveable monument to the past, a monument that without a contextual understanding, is meaningless. The illustration shows the projection of the social revolt to this socially decontextualised building in an alienated effort to reclaim what is public space. Tagging, as explored, is an exhibition of systemic adgitation, mobilised as a demonstration of self determinism within the built environment.

Further in highlighting the nature of colonialism to country, the replacement of histories remains a key mechanism, most boldly being the replacement of ceremonial and socially important flora. What was once a Way finding Swamp Paperbark is now an imported London Plane Tree

03/ concept

west elevation - fragmented history

In redefining the sites social and cultural value, the design concept opted for a convalescence between the two contexts of colonial and precolonial site occupation, redefining the personal relationship to the places history.

In understanding the role of art, the solidity of the facade is minimised allowing for interaction to take place between person and place. The nature of exhibition now is of true self determination rather than one of protest. Rather than the site monumentality itself, the buildings people and their interaction within become the monument to history. The inclusion of social and art affordances allow people to take respite in the structure, forging a key part of the areas social infrastructure.

03/ concept

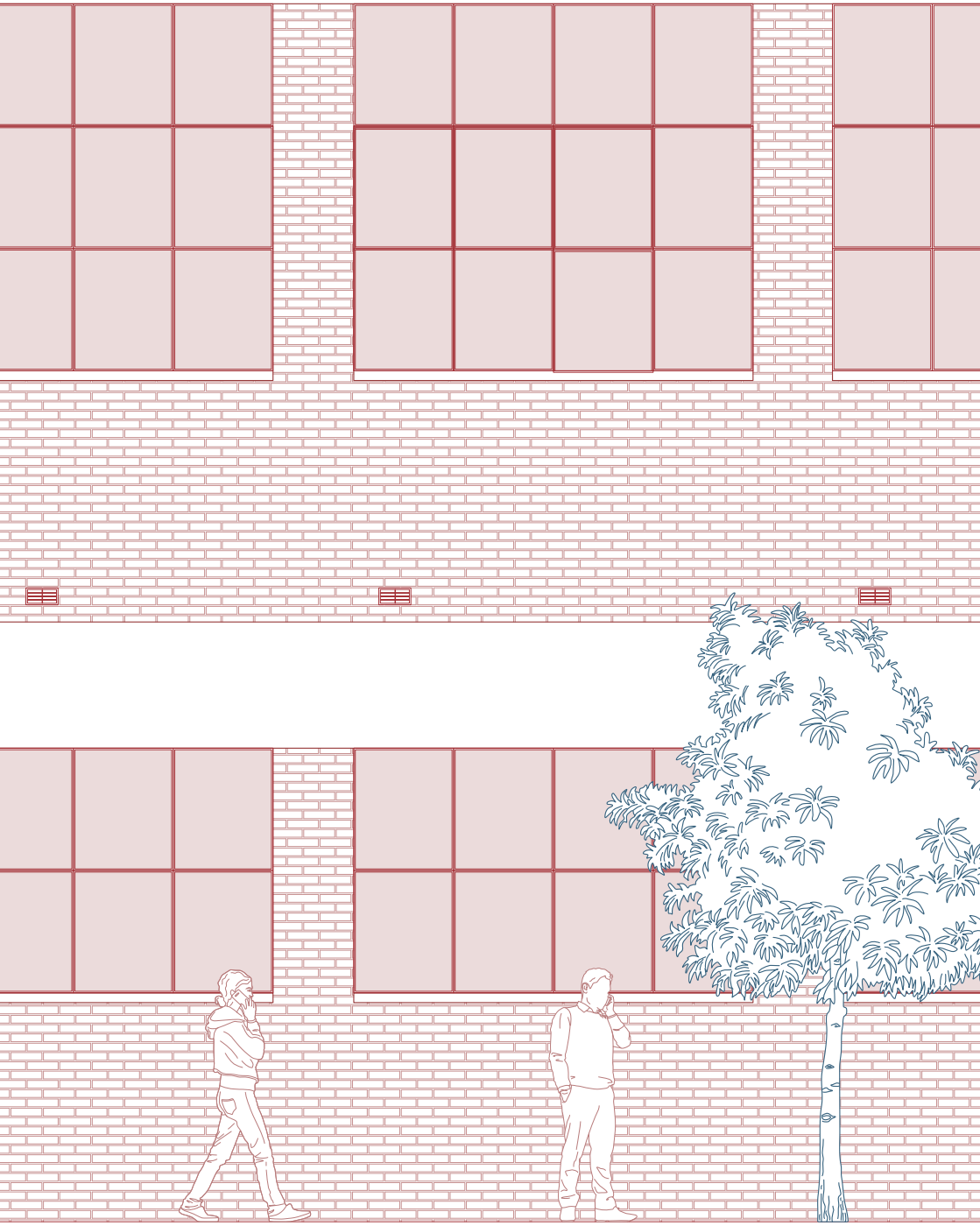
north elevation - pre colonial

Knowledge keeping and knowledge sharing is an integral part of indigenous culture and is a key facet to the connection of country. A key element of the dialogue of knowledge sharing is the processes that take place in the care for country; as well as the environmental processes that take place that form a deeper ancestral knowledge

Alike the program of a lecture hall, the transfer of information is oratory in the Dharug country - a major function of the responsibilities of moiety and kinship groups. Knowledge sharing locations often take place around country with topography - in elevation the placement of program also reflects this ethos.

03/ concept

north elevation - colonial



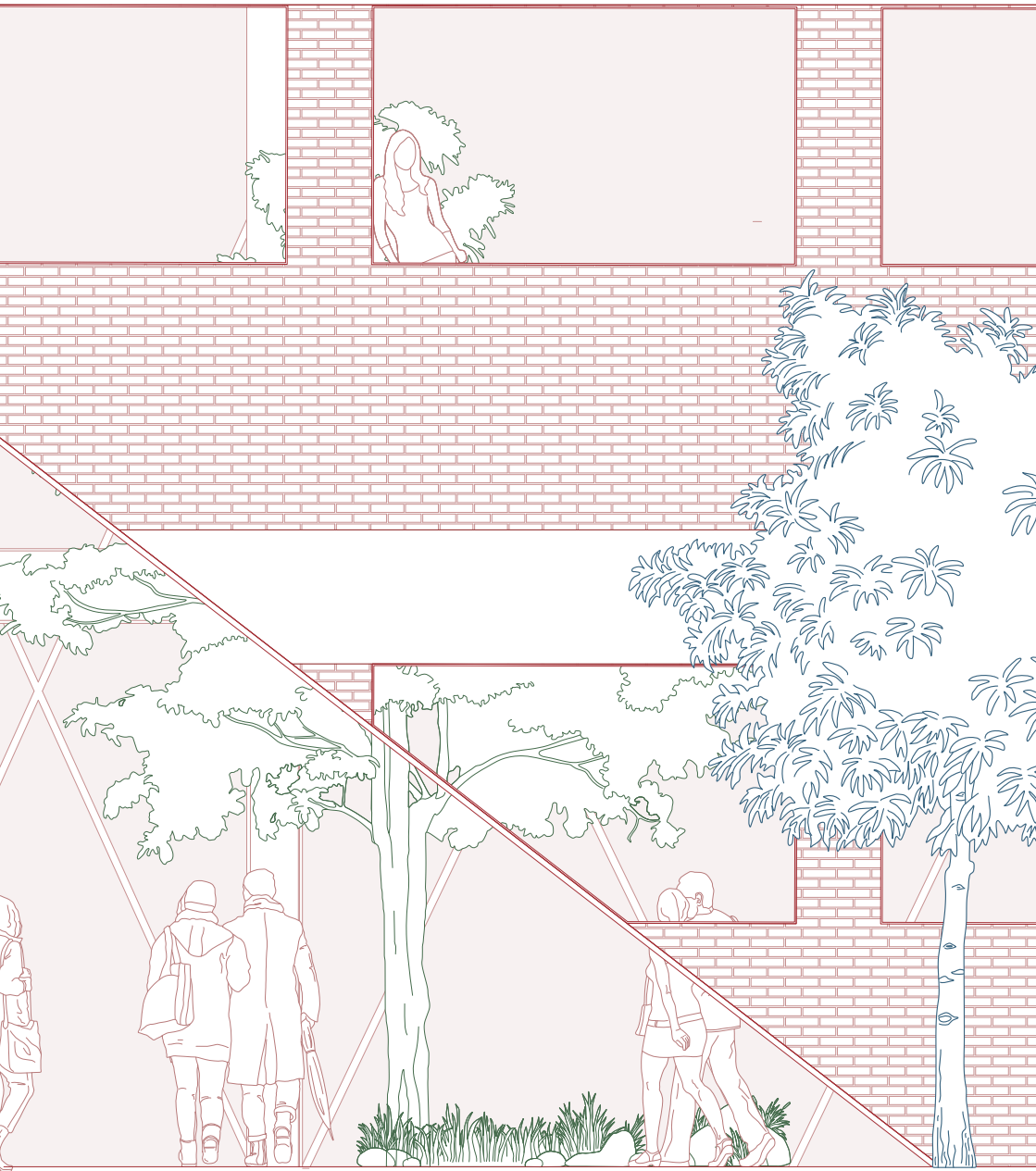
The breakdown of indigenous culture can be partially attributed to the breakdown of knowledge sharing systems as well as the significant sites that they take place on.

The nature of these sites are of both physical and cultural openness - contradicting the sites currently enclosed form. Physically, the colonial building insights a principle of exclusivity within, and fundamentally a notion of spatial ownership - a facet that does not apportion the means of discourse in culture.

Further situationally lacking is the affordance of space for interaction, in a direct street frontage that offers no publicly involved space other than for utilitarian transport to and from destination, one that has only been recently activated upon neighboring development.

03/ concept

north elevation - fragmented histories



03/ heritage

In the spatial revitalisation of the Waterloo Glass Factory, the topographic characteristics of site were noted, apportioning the slight incline to what it characteristically would have been used for - knowledge sharing. This metaphoric understanding of site conditions also was a key portion of the design process in programmatic massing

The opening up of the facade allows for the spatial separation that would have allowed for privacy on the ground plane;however it still being universally accessible to those passing by.

The choice to situate an elevated lecture hall (not included on the elevation) was made as a way to recontextualise person to place through axial placemaking.

03/ concept

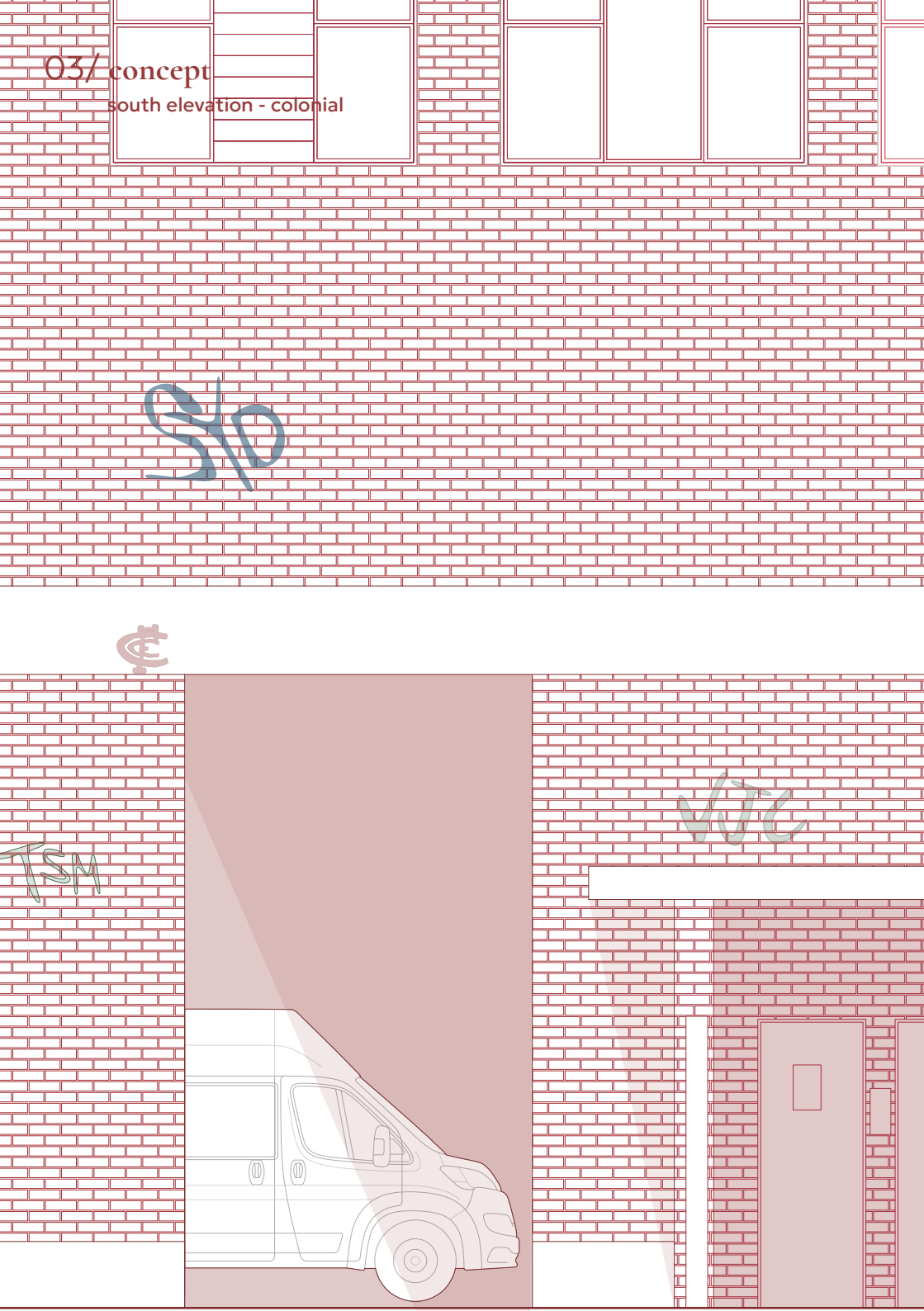
south elevation - pre colonial

The nature of indigenous ‘making’ was one centered around community but also necessity. The materials sourced to make items for clan are sourced locally and in such are a key definition of place and hold significant spiritual value . Reed baskets and carriers are a primary medium of functional ‘object’. In defining place the ‘Gadi’ tree was one of both symbolic and functional relevance, with its reeds used to make fishing spears.

The sense of place acts in duality, both as a key identification of coastal situation but also as the Gadi people, both holding totemic value of responsibility.

03/ concept

south elevation - colonial



Colonially, the site acts as a physical imposition without material consciousness to locality - with its bricks being sourced from St Peters. Although in proximity, the area offers vastly different interpretation of country to person.

The colonial facade in the snapshot highlights its complete utilitarian nature, with therefore offering maximum usable space with reference to building codes. The building in itself is socially abandoned.

Its imposition highlights the nature of a building when its concern is not the person or people occupying it or the flora that situates itself on site - it becomes purely a built form, deleterious to the existing social landscape.

03/ concept

south elevation - fragmented histories

03/ heritage

The fragmentation of history allows for greater interaction into the building, manipulating the existing building to show the interactive elements of the site. Acknowledging the deleterious nature of vandalism on a social landscape, the building offers a controlled interaction with site. The programming of the maker space also creates a modern connection to former interactions with the country and indigenous processes of care and placemaking

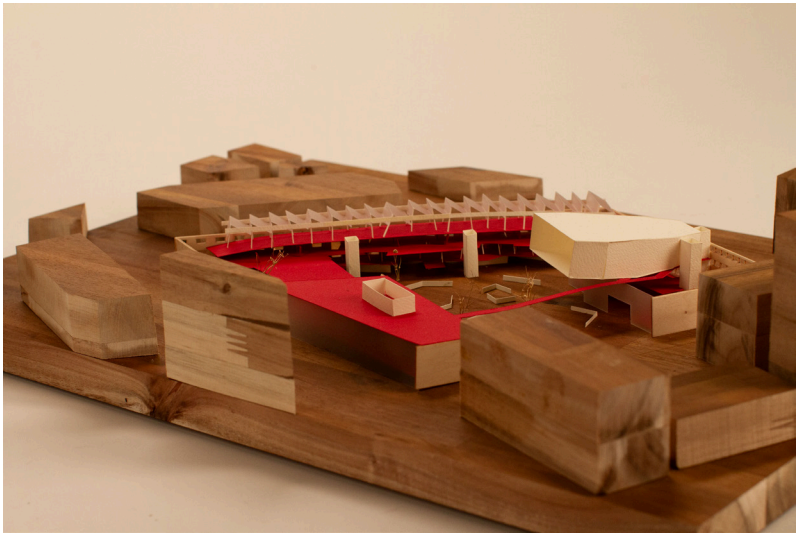
In also highlighting the role of socio-spatial misuse the notion of literal spatial transparency has been explored with the facade. The hit and miss brick pattern that this affords also allows for a literal fragmentation of the sites heritage to occur.

01/
physical modelling

01/ site model

at 1:500

aerial view (Dunkerley Place)



view from O'Dea Avenue (western aspect)

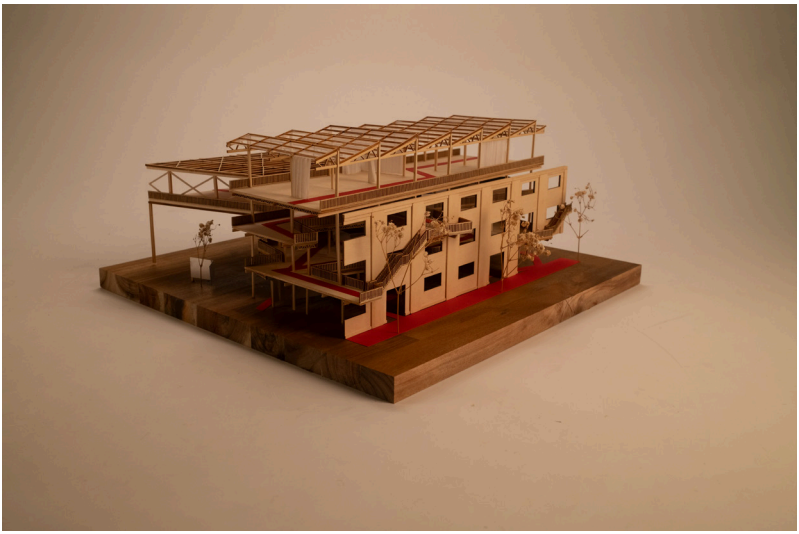
03/ site model

at 1:500

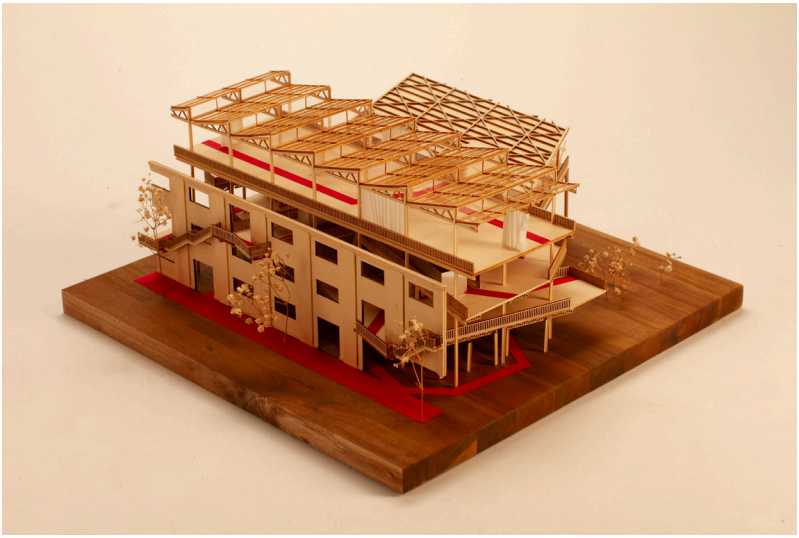
view from bourke street (northern aspect)

view from cnr Hatterly Lane and Dunkerley Place

03/ detail model
at 1:100



view from bourke street (southern aspect)

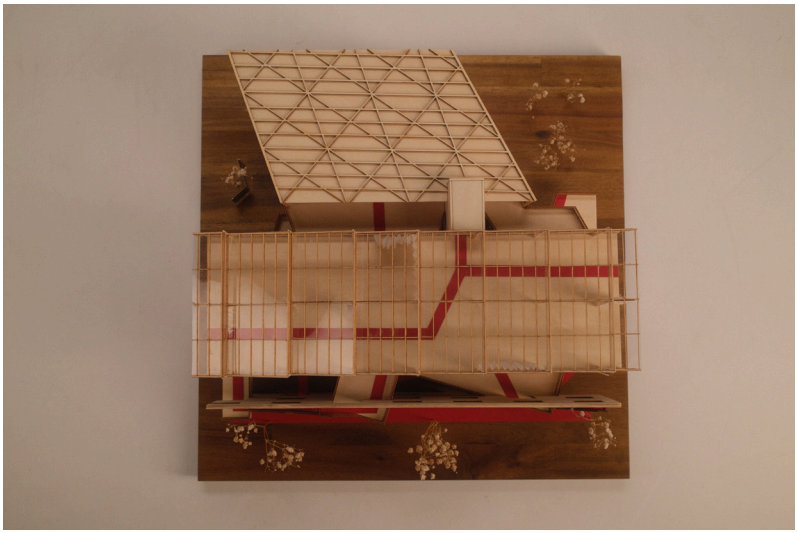


view from bourke street (northern aspect)

03/ site model

at 1:500

view from bourke street (northern aspect)



aerial view

03/ detail model

at 1:100

01/ mechanical ventilation

01/ mechanical ventilation

building zoning

Design Metholodology:
Minimise HVAC necessity, using building orientation, mass, openings and zoning to create specific climatic needs.

Limitations:
Due to floor area and occupancy, HVAC will need to be used

The use of HVAC is considered a ‘redundancy’ in areas that do not need to. Areas in which HVAC is purely considered a redundancy, the system is used purely as air flow.

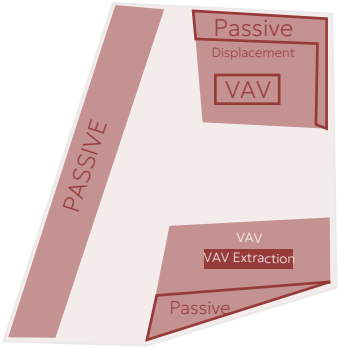
Mechanical Vetilation is therefore dictated by Fresh Air / Natural Ventilaiton and AS16682.

Workflow

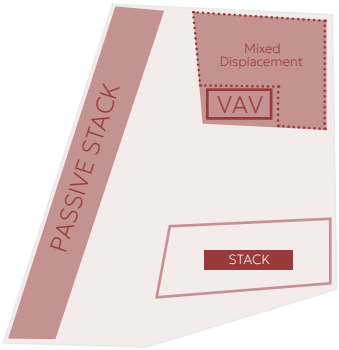
- Building Zoning (Plant Zoning)
- Progam Definition
- AS16682 Program/Zone classes
- AS16682 Fresh Air (see section)
- Mechanical System Categorisation
- Flow rate calculations

01/ mechanical ventilation

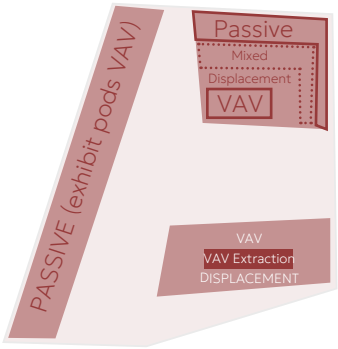
building zoning



GROUND (augmented)



LEVEL03 (augmented)



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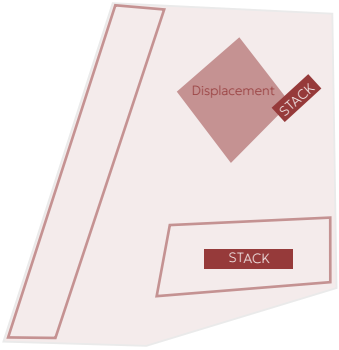
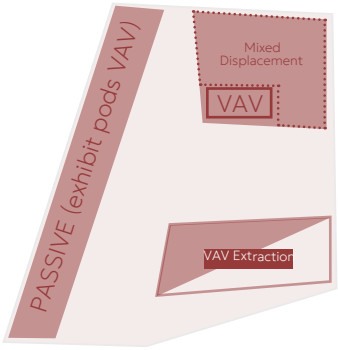


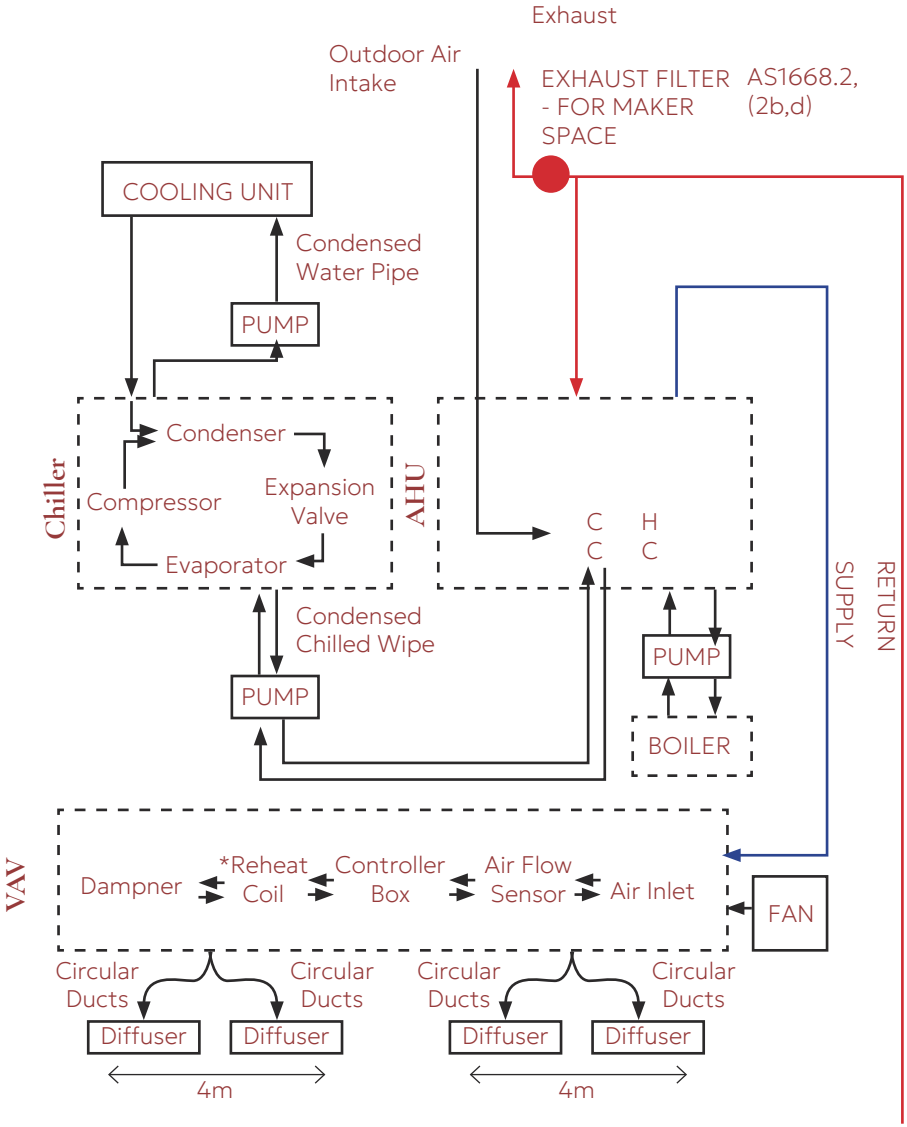
LEVEL03 (augmented)



LEVEL 02 (augmented)

01/ mechanical ventilation

typical flow diagram

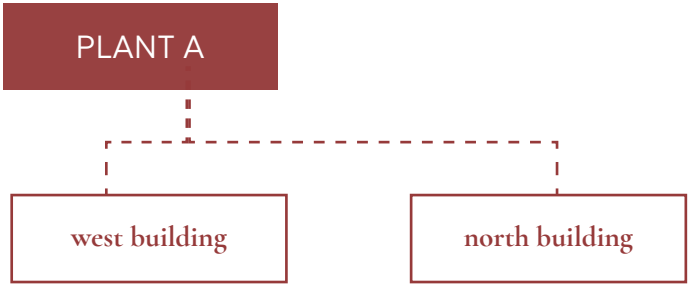


located west building (north perimeter) basement
6000X3200 PLANT ROOM A (Servicing Building W and N)

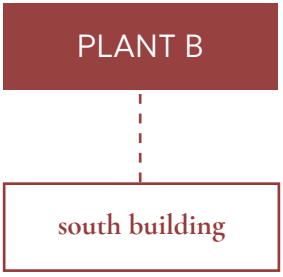
located south building central core roof
5000x2540 PLANT ROOM A (Servicing Building S)

01/ mechanical ventilation

plant overview



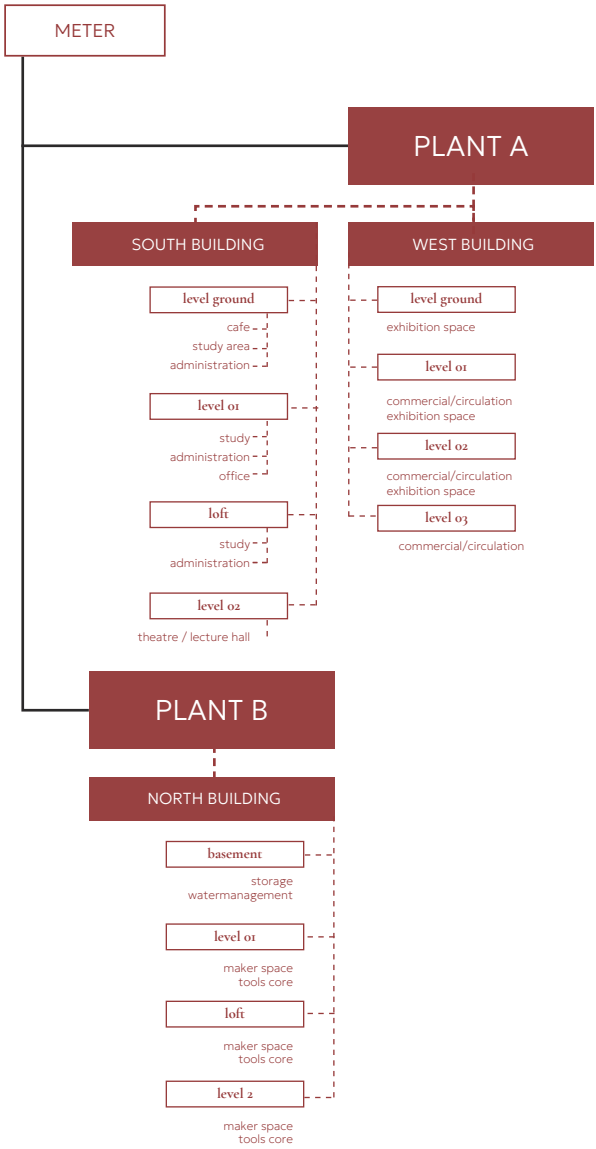
In order to account for HVAC energy consumption, the west and north buildings operate independantly from the south building. The west building, operated by minimal mechanical ventilation, shares the moderate consumption of the north building. Effectivley the building is able to slit into 2 climatic operations.



In acknowledgement of Fresh air and safety standards required with air extractions, recycled air is only present in the extrnal-to-core zones. This building is able to effectively shut off if the HVAC is not being used, or due to its necesity to have people supervising, be closed whilst not affecting the accessibility of the heritage west building and the public study areas

01/ mechanical ventilation
zoning

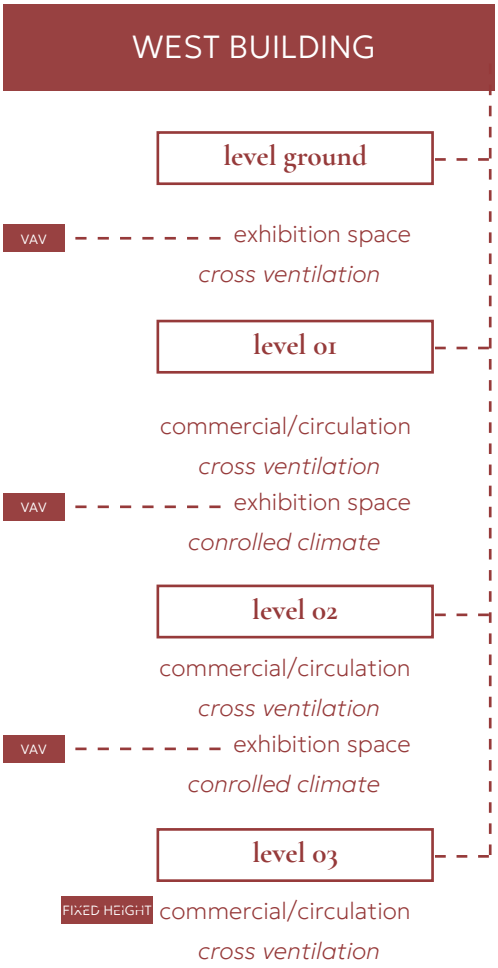
J6D33b - Aircon Cycles - 15min cycles @ 2/hr
(8hrs useage), therfore 4hrs active per day
*n.b. Sydney Climate Zone 5



01/ mechanical ventilation

building zoning

(plant a) - basement west building



	SQM
GROUND	155 sqm
L01	- 131 sqm
L02	- 125 sqm
L03	- 129 sqm

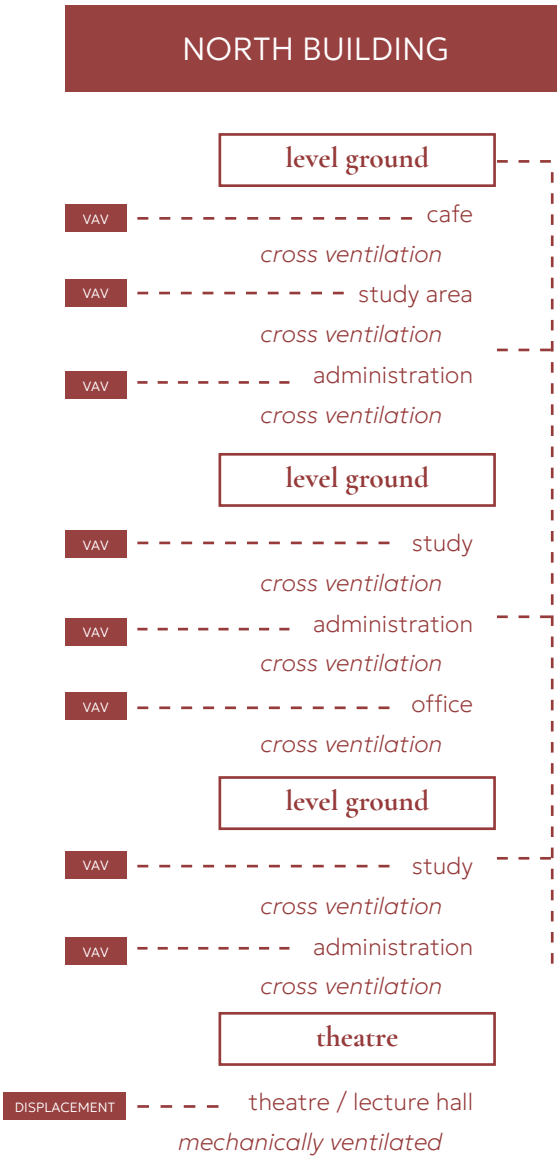
227.85	37. / 28	S ø 6.8 / R ø 5.9 / S ø / R ø 6.3	N/A	N/A
192.57	32. / 24	S ø / R ø 5.5	N/A	N/A
183.75	30.3 / ~~22.8~~	S ø 6.1 / R ø 5.5	N/A	N/A
169.63	31.6 / ~~23.6~~	S ø 6.3 / R ø 5.41	N/A	N/A

*Manufacturer not to spec.
- proposed flexibility supported by rounded flexi. ductwork.

01/ mechanical ventilation

building zoning

(plant a) - basement west building



PLANT & HVAC

$H = \sqrt{\frac{A}{2}}$

$W = \sqrt{\frac{A}{2}} \times 2$

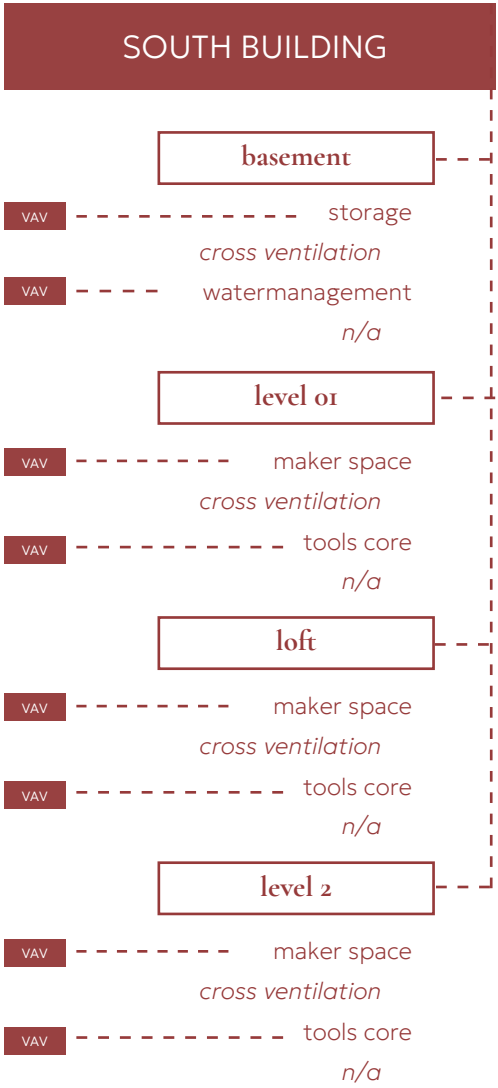
$A = \pi \left(\frac{D}{2}\right)^2$

	SQM	(1.47 x sqm) AIRFLOW	S/R FLOW	$2\sqrt{\frac{FLOW}{\pi}}$ DIAMETER	AREA	SQ. DIM
BASEMENT	944.97 sqm	1387 l/s	231 173.37	S: ø 542 R: ø 469	S 230721 R 172756	S 339.6 x 679.2 R 293.9 x 587.8
GROUND	1382.91 sqm	2351	391 293.8	S: 705 ø R: 610 ø	S 390362 R 292246	S 411.7 x 883.5 382.2 x 764.5
GROUND (i)	455 sqm	668.85	106.4 79.85	S: 367 ø R: 100 ø	S 105784 R 7853	229.9 x 459 62 x 125
L1	1077 sqm	1506	~~84~~ .3 63.25	S: ø 103 R: ø 89	S 8332 R 6221	S 64.5 x 129 R 55.7 x 111.5
L1(c)	455 sqm	668	106.4 79.85	S: ø 367 R: ø 100	S 105784 R 7853	S 229.9 x 459 R 62.125
LOFT	867 sqm	1186.29	179 148.25	S: ø 470 R: ø 430.	S 1734 R 1452	S 29.4 x 58.8 R 26.9 x 53.88

01/ mechanical ventilation

building program zoning

(plant a) - basement west building



	SQM.	AIRFLOW.	S/R FLOW	D	AREA	DIM.
STUDY	170	1719	R 214 S 286	R 521 Ø S 603 Ø	213189 285577	326.4 x 653 377.8 x 755
OFFICE	93	136	R 17 S 22	R 147 Ø S 164 Ø	16971 21903	92.1 x 184 104.64 x 209.2
STUDY	1162	1708	R 213 S 284	R 520 Ø S 601 Ø	212371 293686	325.86 x 651.72 376 x 753
ADMIN	75	66.15	R 8.2 S 11	R 102 Ø S 118 Ø	8171 10935	63.9 x 127.8 73.9 x 147
		147	R 24	R174 Ø	23778	109.0 x 218

02/
access and egress

01/ access and egress

building zoning

Design Methodology:
In determining the various roles of building elements, stairs proved to be most relevant in the way heritage is interacted with - a primary enabler of circulation.

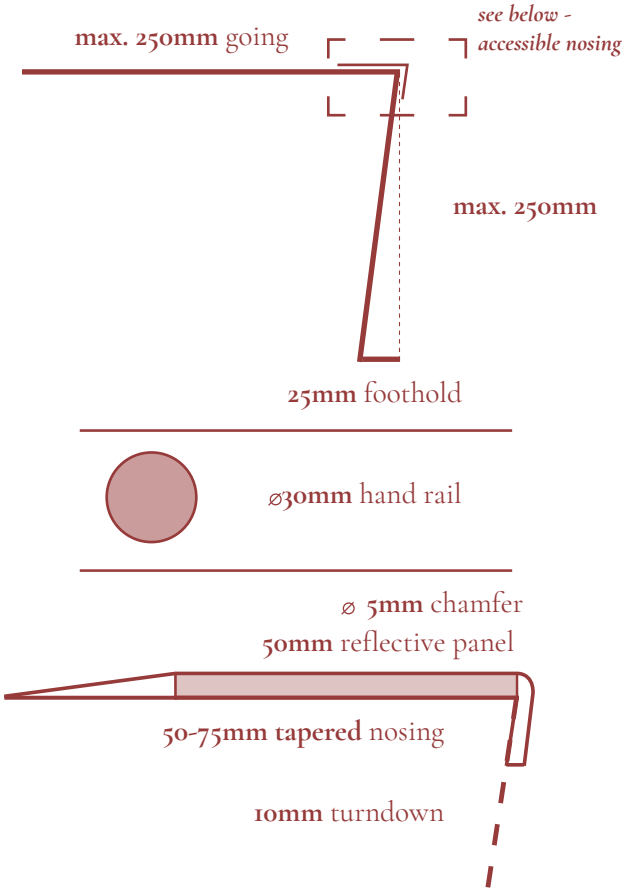
Shifting design approach, the floorplates of the heritage building were augmented (in conjunction with vectorised orientation mapping) to this hyperfunctional constraint. This literal interpretation of code occurs concurrently with the criticality of heritage laws.

Limitations:
Due to heritage conditions, alterations may need to be made to bring the building to code. Further, the alterations of floorplates will change the distances required to meet egress standards - as a result the addition of new cores are needed or the augmentation of the existing cores and floorplates (reciprocally)

02/ access and egress

riser ang going calculations

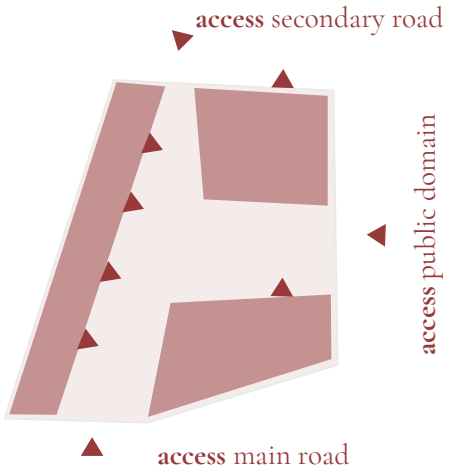
In order to retain as much of the building as possible, the existing floorplates will remain in place with some alterations to the egress cores. Given the age of the building, each of the floor levels are different. Based on BCA 3.9.1 each of the riser count and heights will differ between levels, not flights.

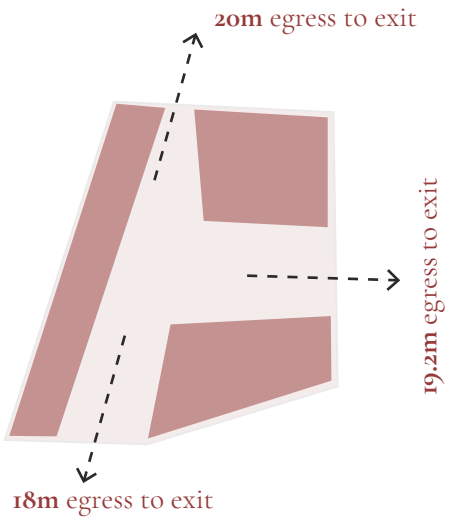


Riser no. = FTF/190 (rnd to higher whole)
Riser Arrangement = Riser no./2
Riser Height = FTF/Riser no.

02/ access and egress

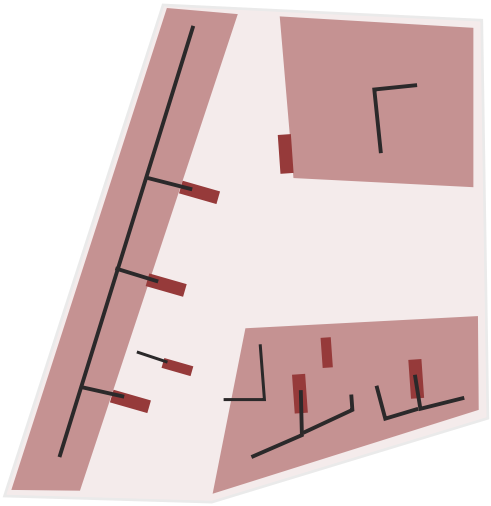
access and egress locations

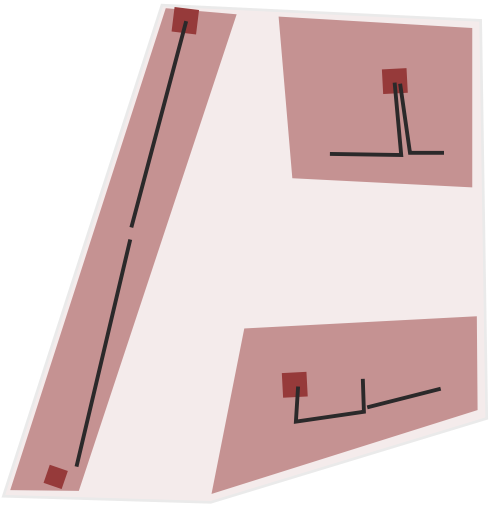




02/ access and egress

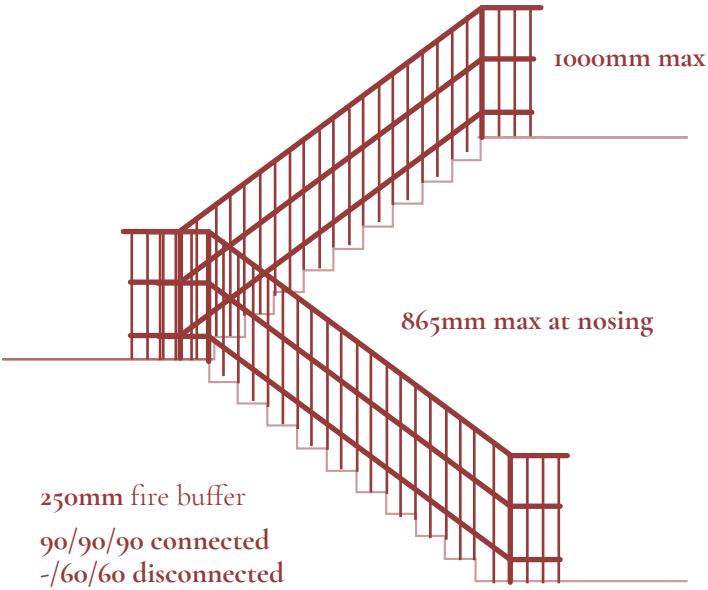
locations of access / egress network

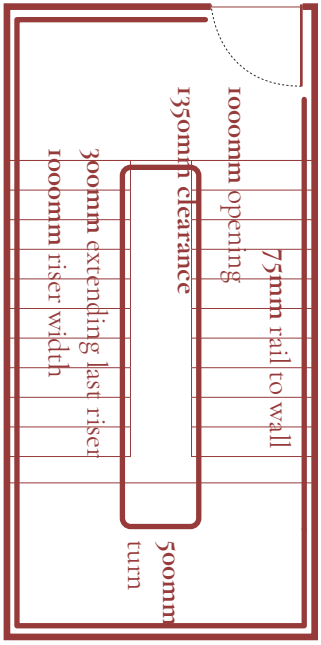


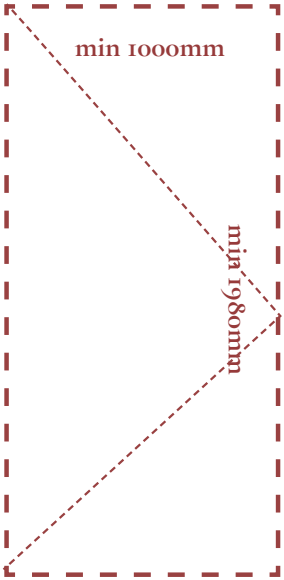


02/ access and egress

egress core dimensioning

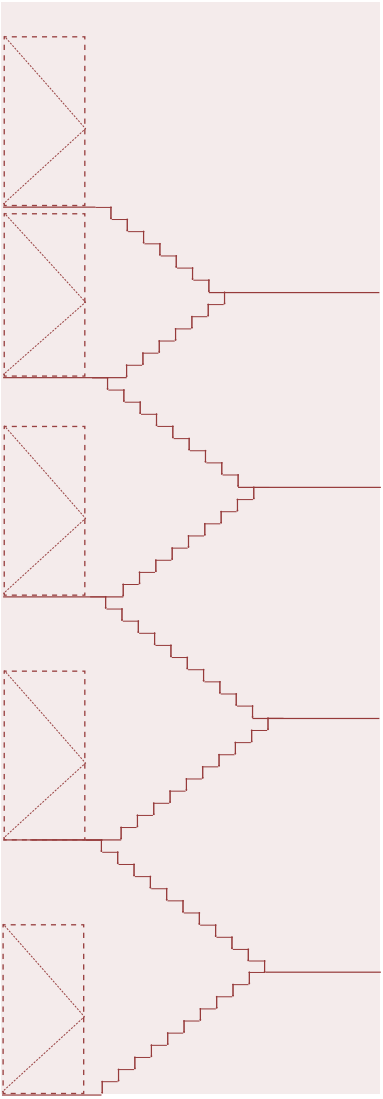






02/ access and egress

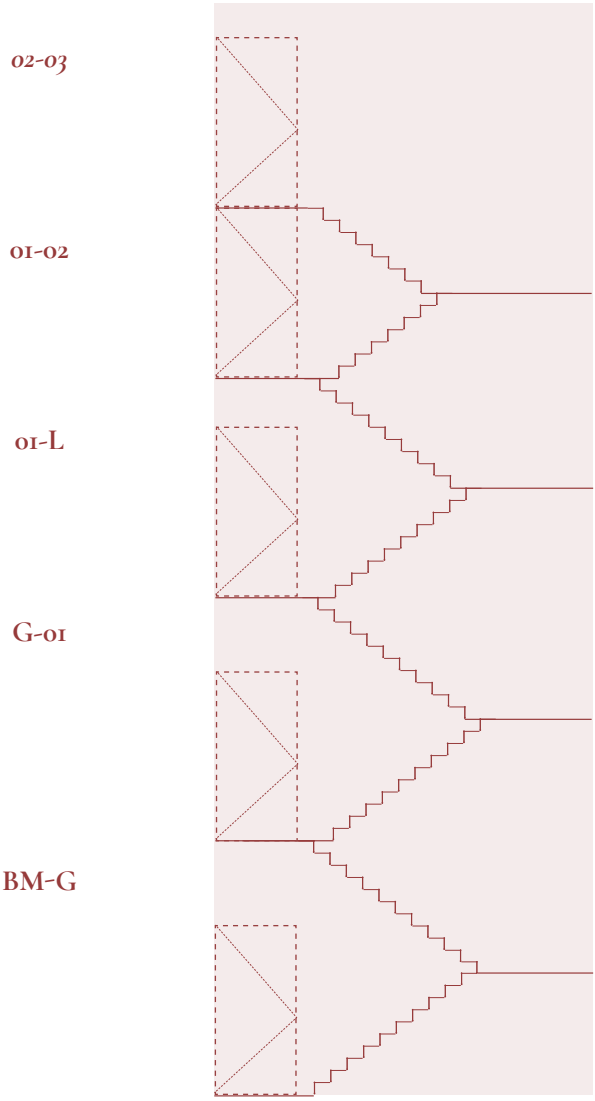
north egress riser and going calculations



Level	FTF (mm)	Risers	Arrangement	Riser Height
03-04	2400	13	7/6	184.61
02-03	3685	20	10/10	184.25
01-02	4115	22	11/11	187.045
G-01	4260	23	11/12	185.21

02/ access and egress

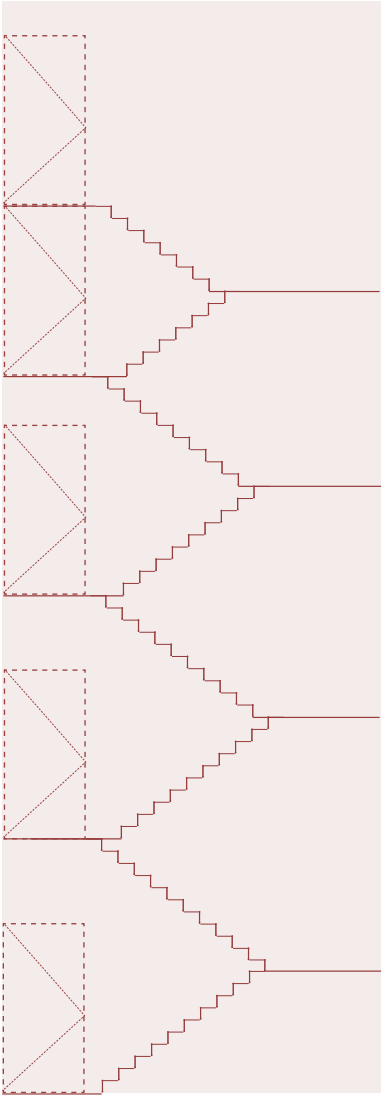
south egress riser and going calculations



Level	FTF (mm)	Risers	Arrangement	Riser Height
03-04	2400	13	7/6	184.61
02-03	3685	20	10/10	184.25
01-02	4115	22	11/11	187.045
G-01	4260	23	11/12	185.21

02/ access and egress

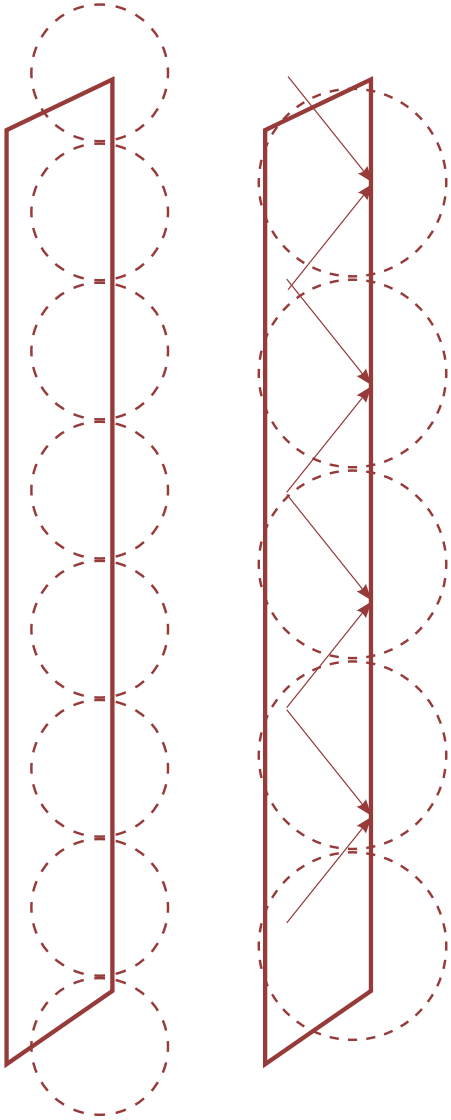
west egress riser and going calculations



Level	FTF (mm)	Risers	Arrangement	Riser Height
03-04	2400	13	7/6	184.61
02-03	3685	20	10/10	184.25
01-02	4115	22	11/11	187.045
G-01	4260	23	11/12	185.21

02/ access and egress

basic stair reach to AS (arrows to 15m)

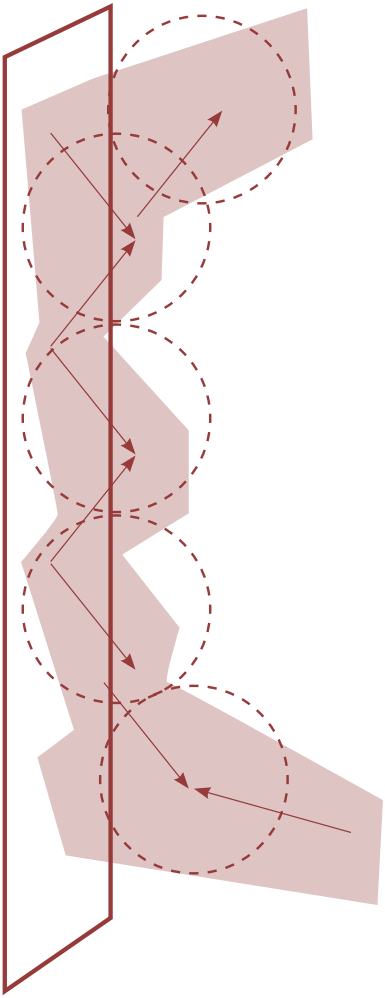


Step 1. Basic stair reach - determining location and amounnt

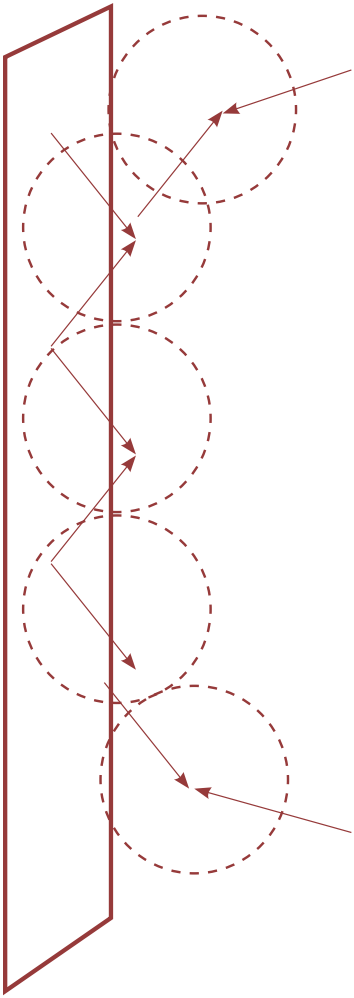
Step 2. Access testing and egress facade centralisation

02/ access and egress

basic stair reach to AS (arrows to 15m)



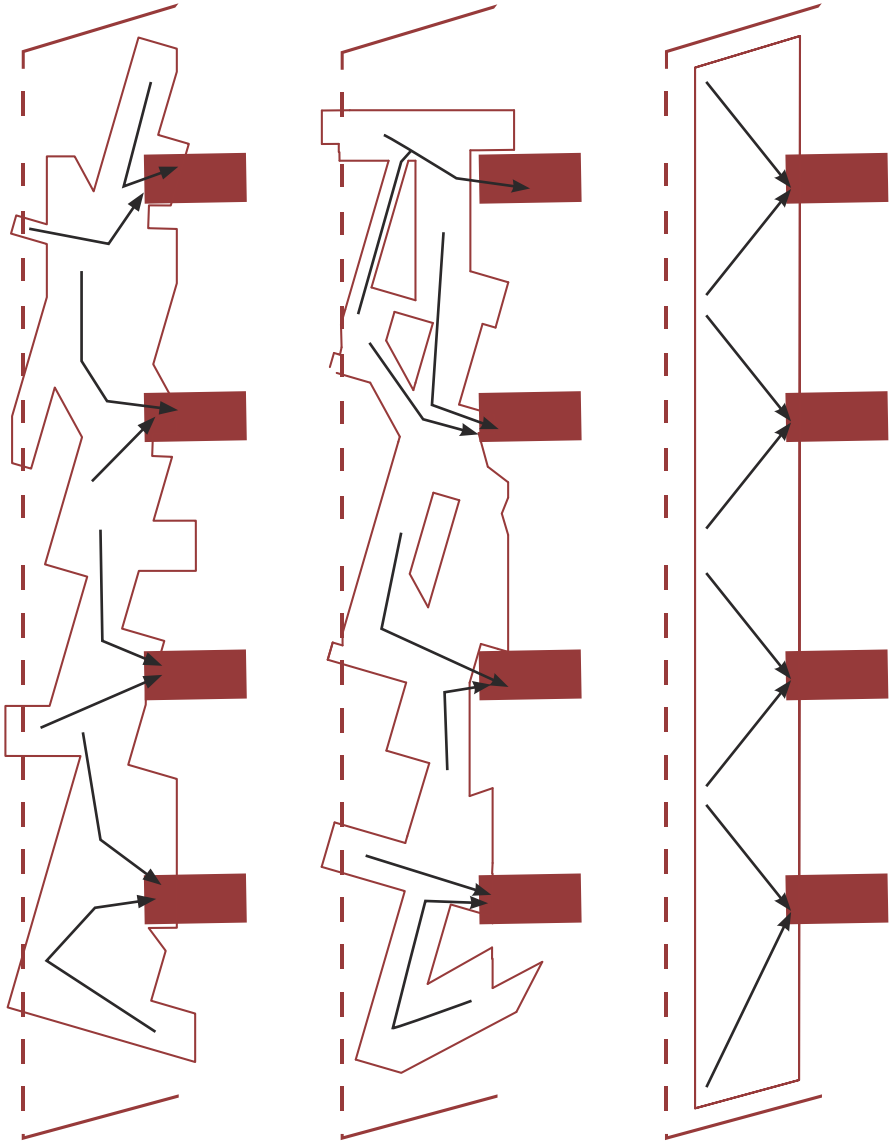
Step 2. Egress determining path/ circulation gemoetry



Step 2. Integration and augmentation to neighbouring buildings

02/ access and egress

basic linear access paths arond impositions



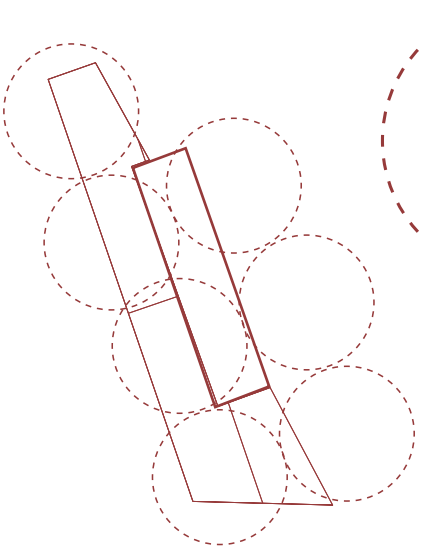
LEVEL 01

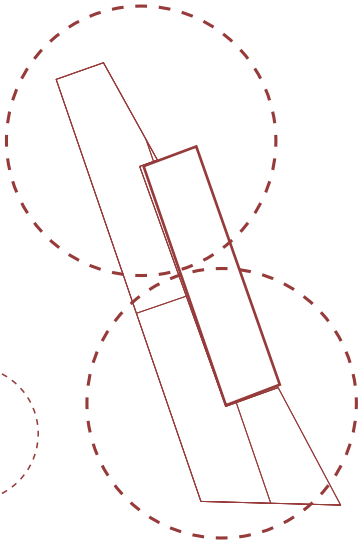
LEVEL 02

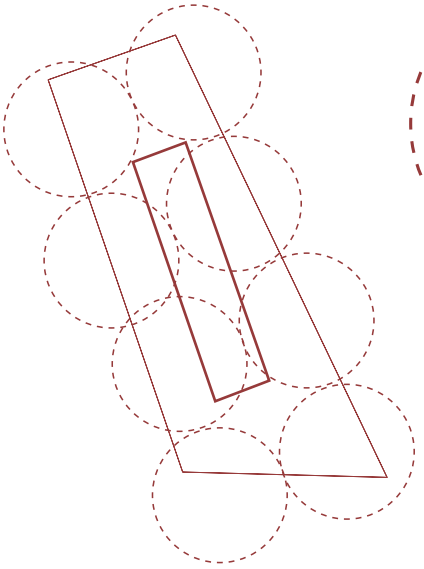
LEVEL 02

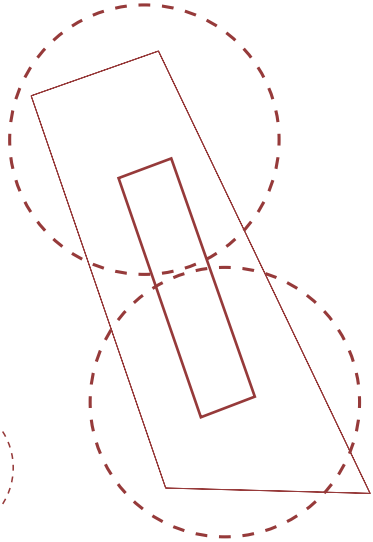
02/ access and egress

basic stair reach to AS (arrows to 15m)







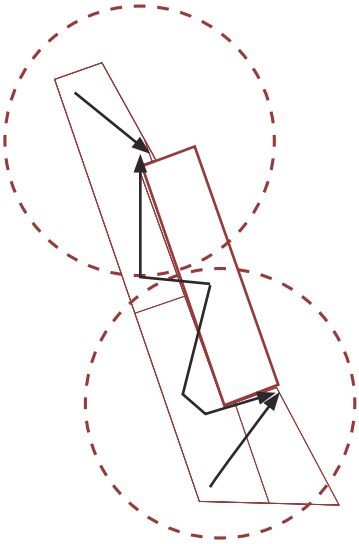


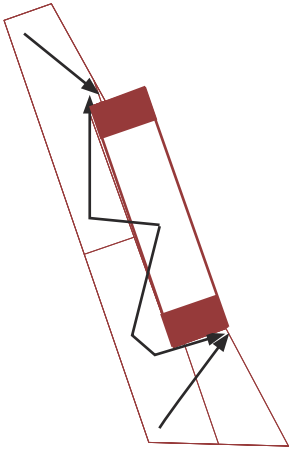
LEVEL 01, 02

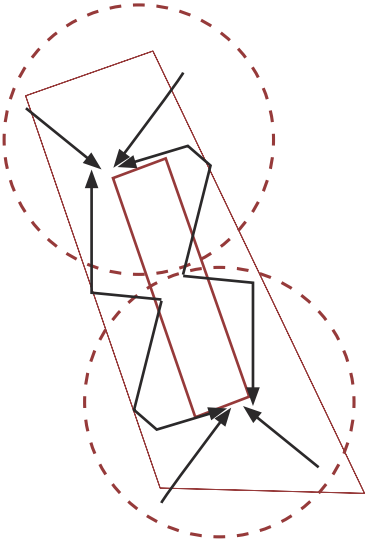
LOFT

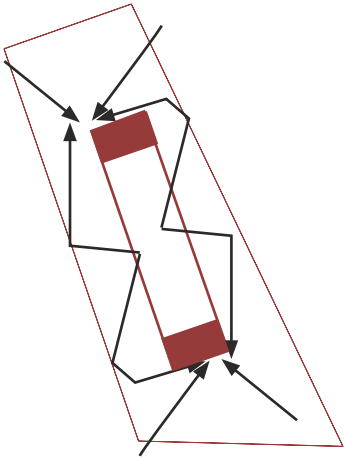
02/ access and egress

basic linear access paths arond impositions







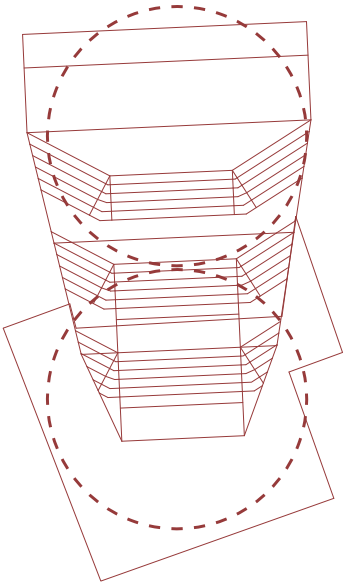


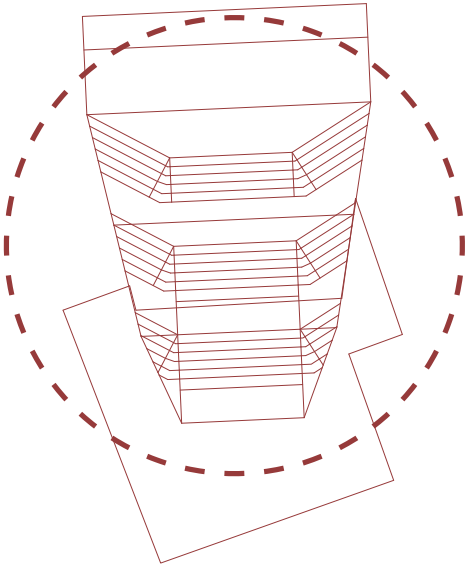
LEVEL 01, 02

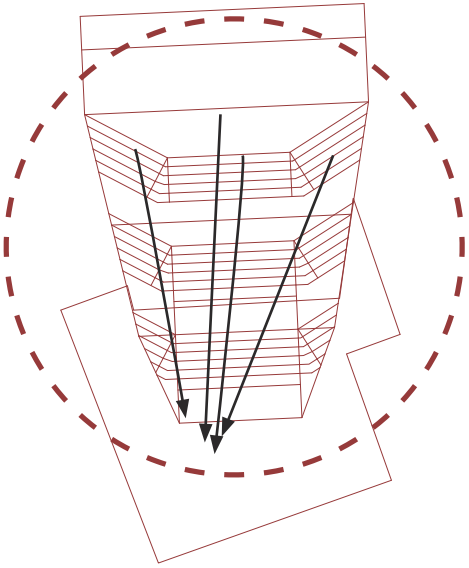
LOFT

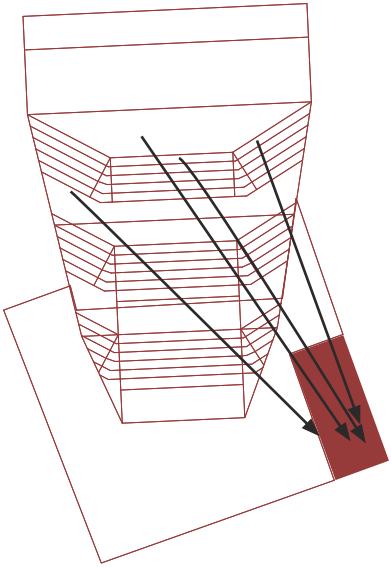
02/ access and egress

basic linear access paths arond impositions



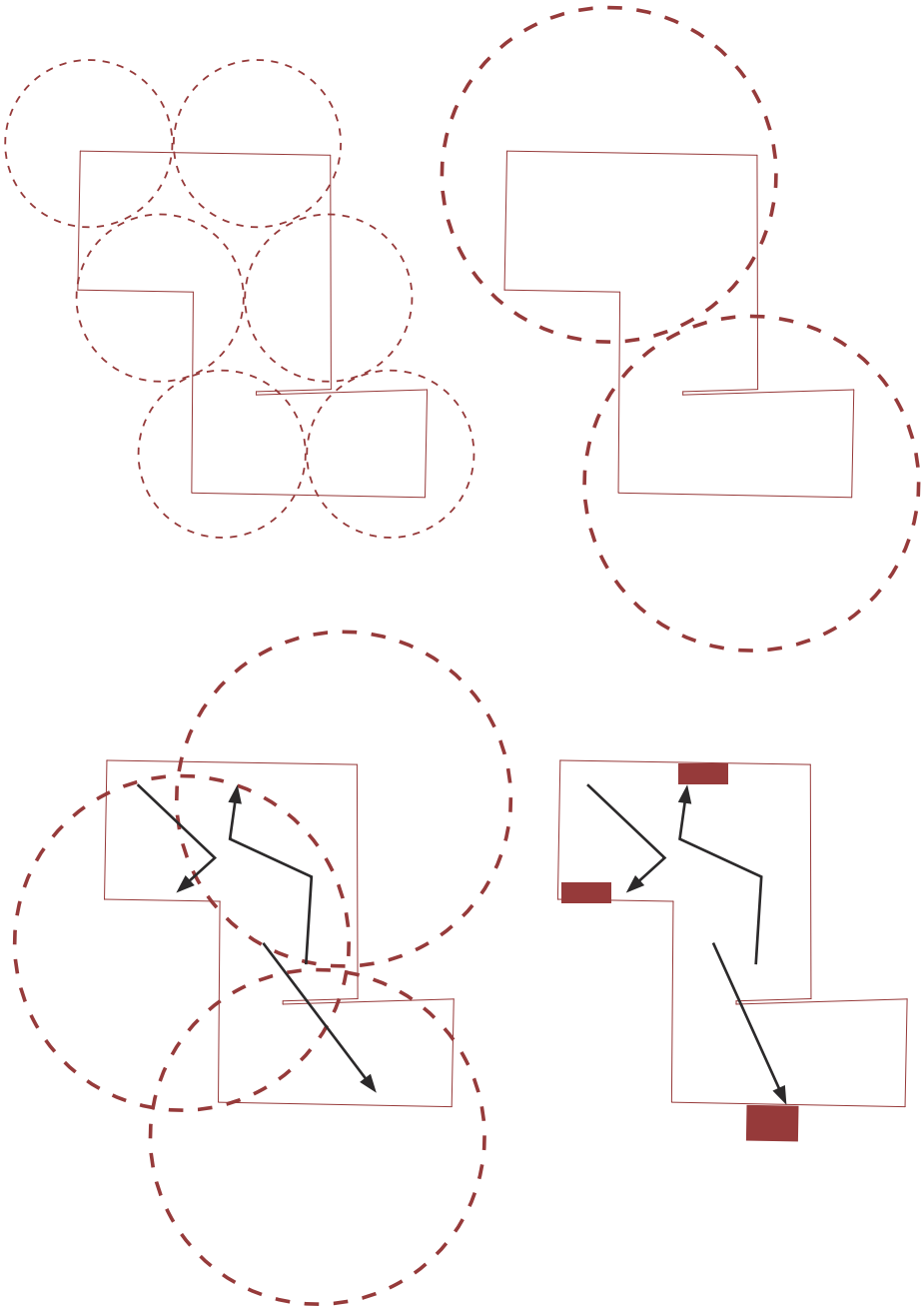






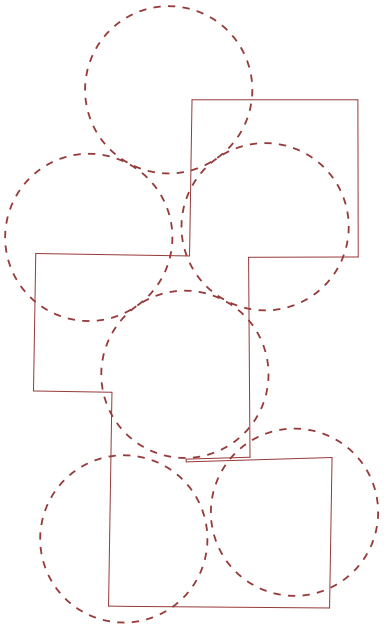
02/ access and egress

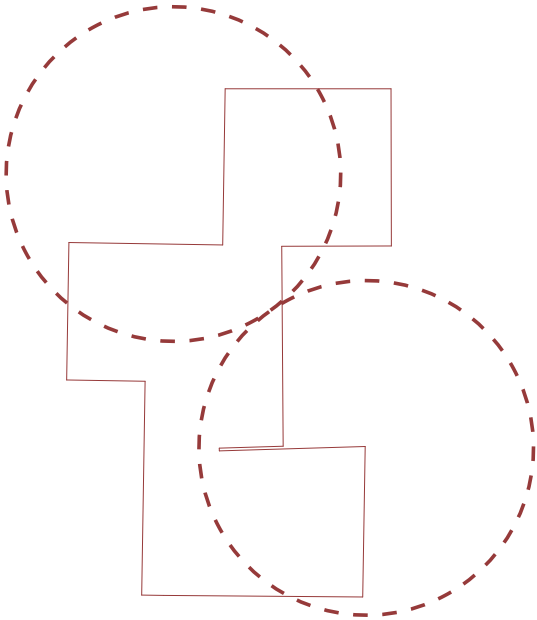
radial reach (pre-programmed)

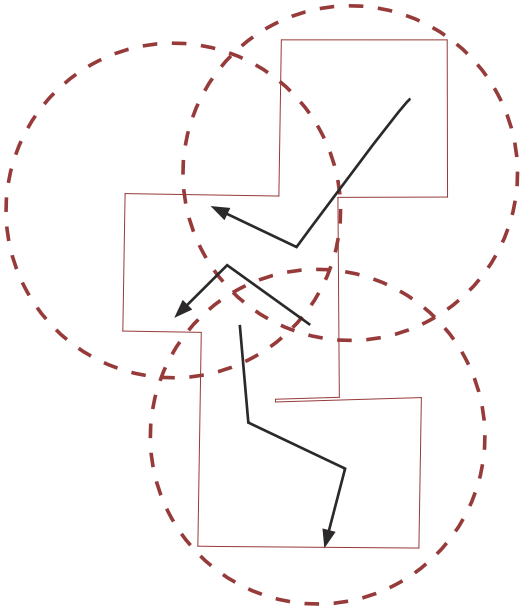


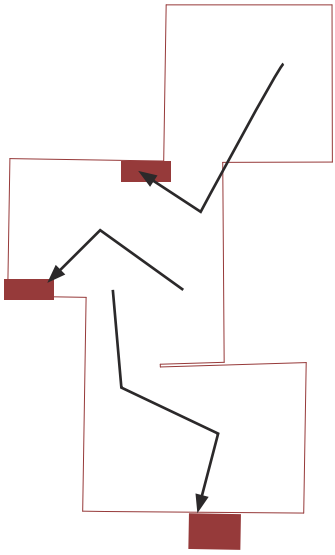
02/ access and egress

basic linear access paths arond impositions



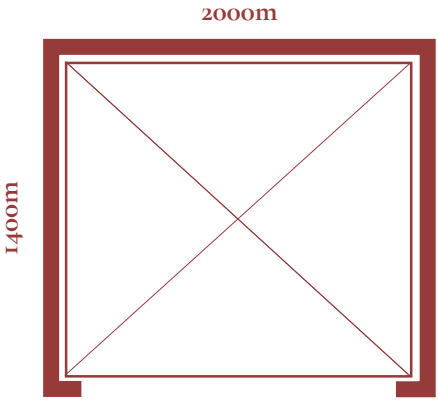






02/ access and egress

lift core dimensioning



Disability access provisions suggest that the appropriate dimensioning for a commercial lift at a building catering to Classes 9 being 2000x1400. Otis lifts offers lifts to this specific dimension, it also working within the existing structural cores

Given the sizing of the items exhibited and workshopped, the co-utilisation as a goods lift and circulation lift only imposes the need for a high speed mechanical system rather than a secondary shaft to cater the secondary mode.

This choice is further attributed to the goal to minimise the amount of redundant services in the building.

02/ access and egress

2R+G Dimensioning

West Building

Level	FTF (mm)	Risers	Going	Going
	2400	184.6	300	13
	3865	184.05	300	21
	4115	178.91	300	23
	4260	177.5	300	24

South Building

Level	FTF (mm)	Risers	Going	Going
	3410	179.47	300	19
	5505	177.58	300	31
	2870	179.38	300	16
	3685	184.25	300	20

North Building

Level	FTF (mm)	Risers	Going	Going
	2400	184.6	300	13
	3865	184.05	300	21
	4115	178.91	300	23
	4260	177.5	300	24

03/
natural ventilation

01/ natural ventilation

building zoning

Design Methodology:
It is in the interest of the Sustainability goals of the site that as much of the site is passively ventilated in compliance of Australian Standard, BCA and Best Practice.

Limitations:
Spatial Zoning (in compliance with AS16682) dictates heavily what areas can rely fully, partially or not at all on passive ventilation.

In the classification of the South Building as a maer space (AS16682 Workshop) areas contaning/chance of containing hazardous items cannot be passivle ventilated for health and safety reasons

AS16682 indicates the North Building must be Mechanically Ventilated - Best Practice and AS16682 also suggest the area within should account for double the standard flow achieved by HVAC systems, in such passive filtration and circulation mechanisms cannot be employed.

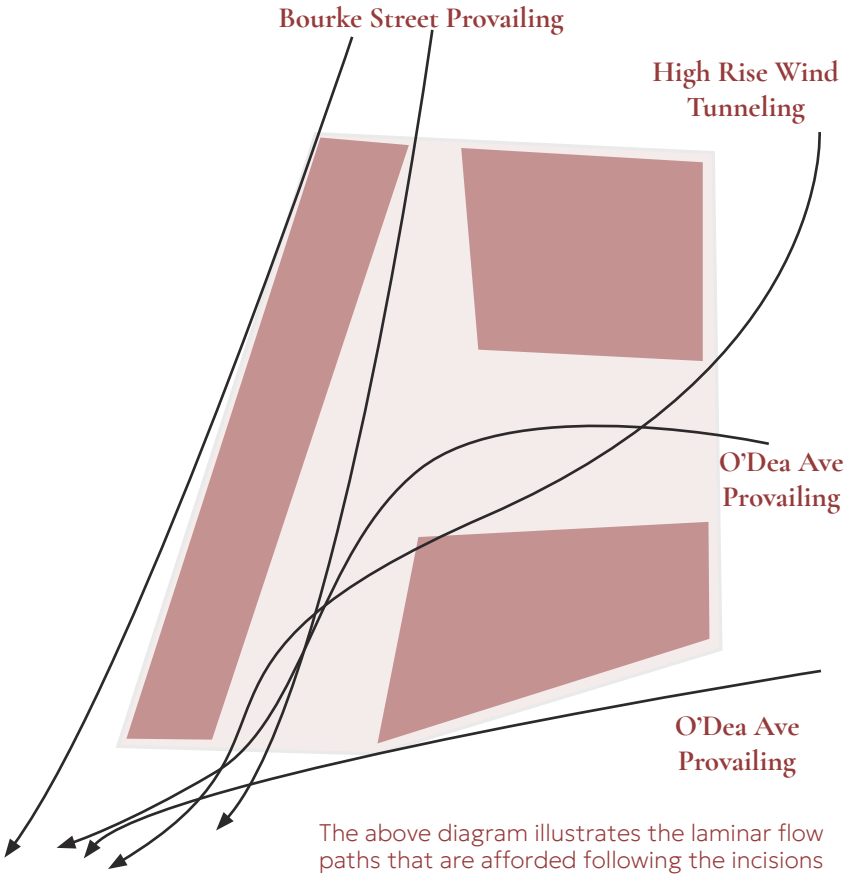
Work Flow:

- AS16682 Passive Classification
- Floor Area Zoning
- Floor Area Depth and Program
- AS16682 Fresh Air requirements
- Occupancy Analysis
- HVAC redundancy and compensation requrements

03/ natural ventilation

site ventilation

The sites location axially across two main roads affords a ventilative approach due to provailing wind paths.
In order to capture this opportunity to reduce the necesity for HVAC intervention, incisions were strategically made following onsite testing of high wind impacted points

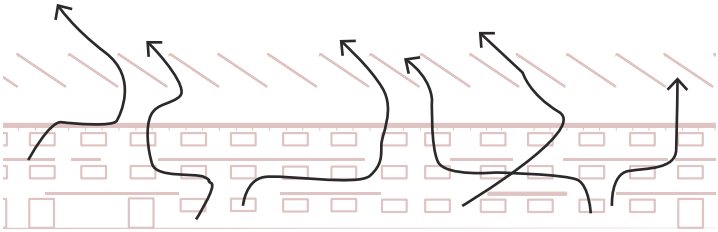


The above diagram illustrates the laminar flow paths that are afforded following the incisions

03/ natural ventilation

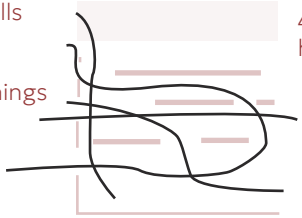
cross ventilative methods

In creating a passivley ventilated space, the alteration of floor plates was necessary in the making of a stack effect system. The organisation of the space is intended to work around this



3. Two openings adjacent walls

2. Two openings same wall

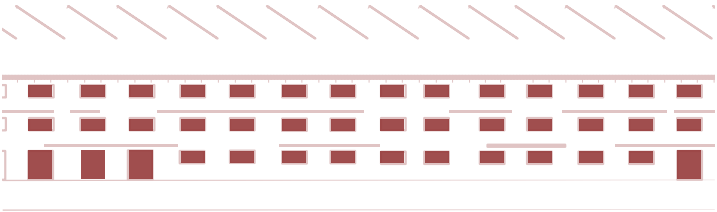


4. Gravity approach heat transfer

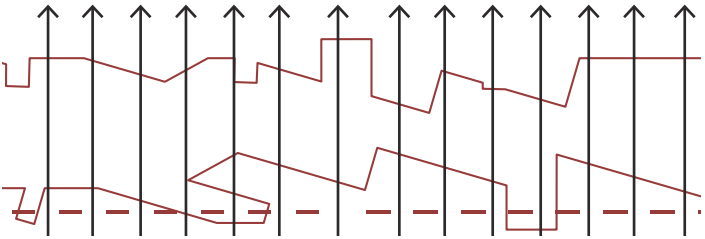
1. Two Openings Opposite Walls

01/ natural ventilation

facade incisions



Front facade openings at 34.2% total mass



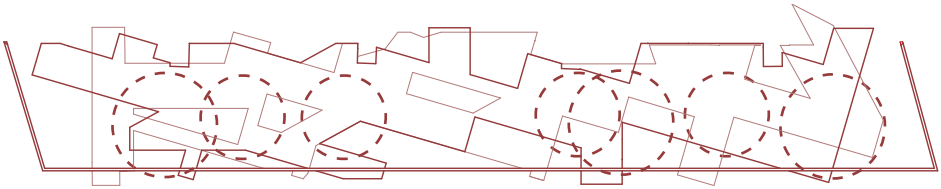
Back facade opening at 100%

The venturi effect is created in the the process of removing fixed glazing from the facade, utilising a series of small openings to accelarate wind speed by increasing (and funneling) force.

04/
facade

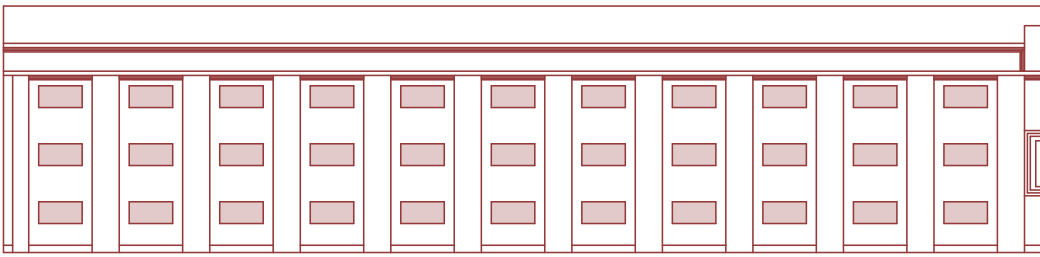
04/ facade

West Building

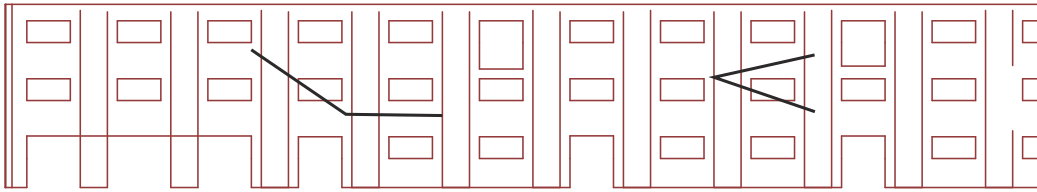


Cantilevered platforms featuring stairs are designed to foster interaction with the western heritage facade, inviting people to engage more with the historical elements of the building.

CURRENT



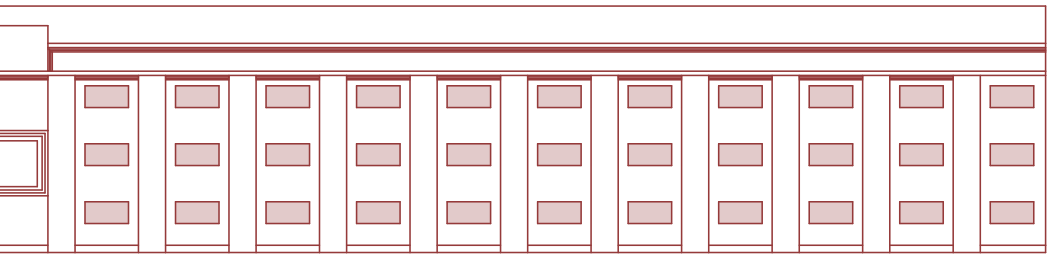
PROPOSED

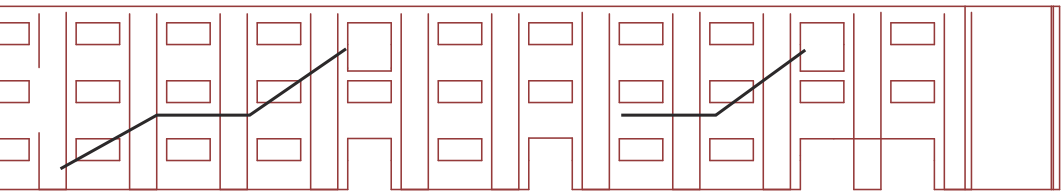


04/ facade

West Building

The removal of glazing passive ventilation for the western building, enhancing airflow and promoting a more comfortable environment. This design choice not only improves the building's energy efficiency but also encourages a greater sense of interaction with its architectural features.

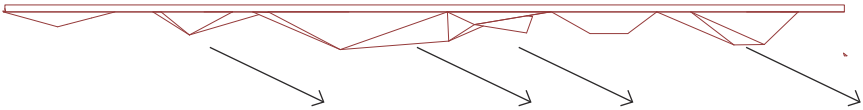




04/ facade

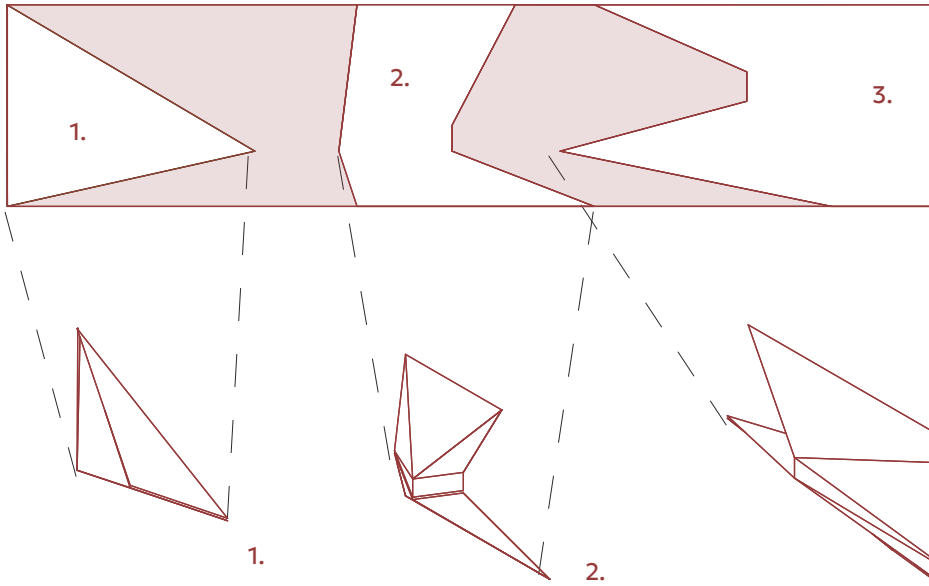
West Building

TOP

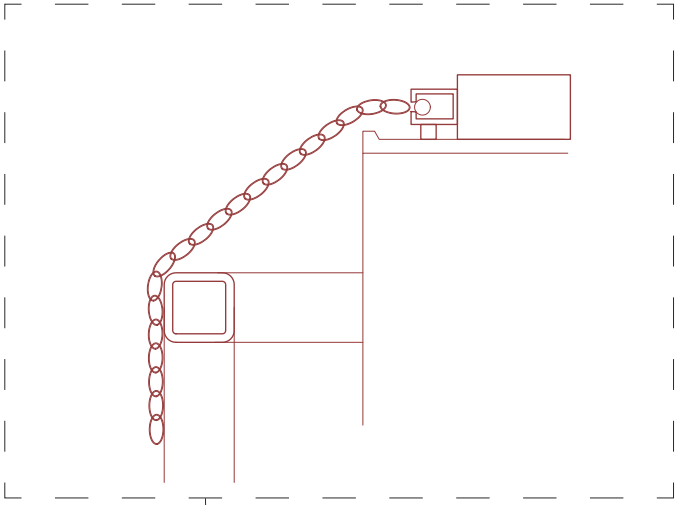


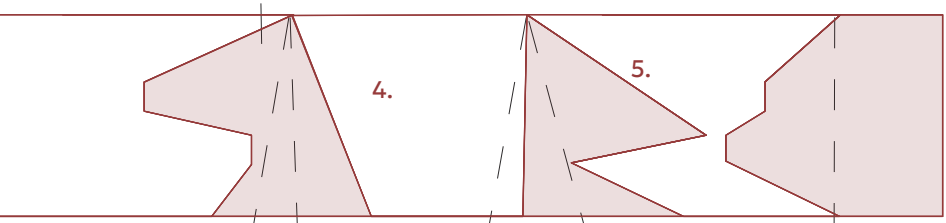
All windows on the inner west façade are oriented to the north to enhance natural light and optimize views. This design strategy maximizes daylight penetration while minimizing heat gain, creating a bright and inviting atmosphere within the space.

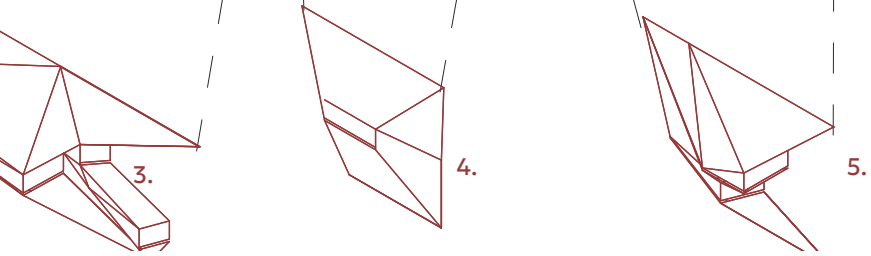
ELEVATION



Metal mesh facade designed to diffuse light while maintaining structural integrity and privacy. This facade scatters incoming sunlight, creating a soft, even illumination within the space. The intricate design of the mesh allows for airflow and visibility from certain angles, creating a balance between transparency and solidity.




4.
5.


3.
4.
5.

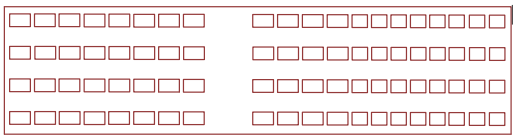
04/ facade

South Building

CURRENT

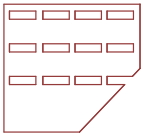
1.

2.

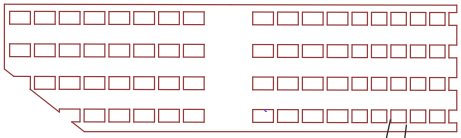


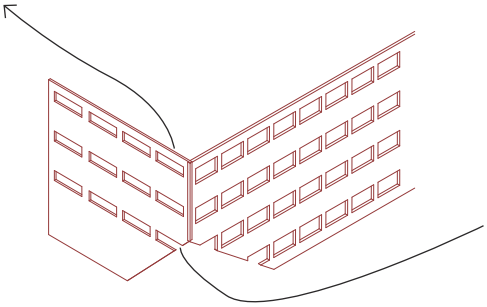
PROPOSED

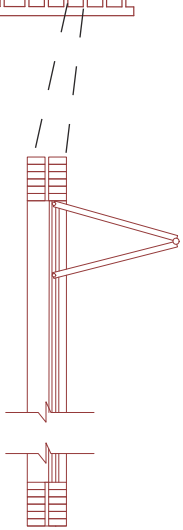
1.



2.

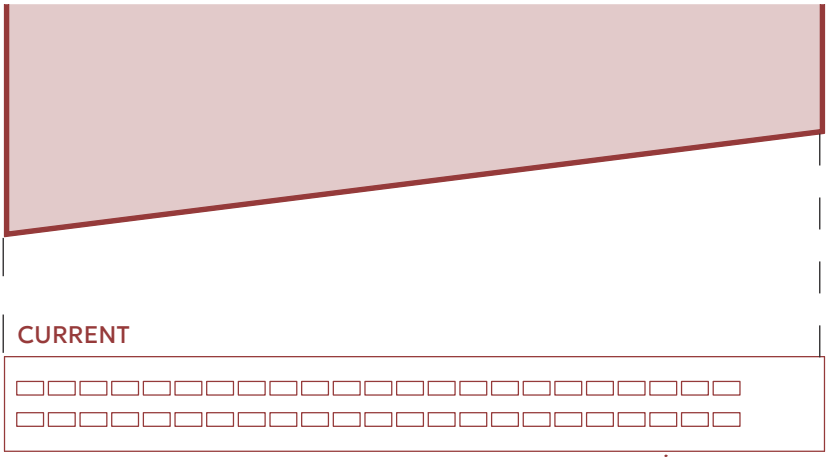






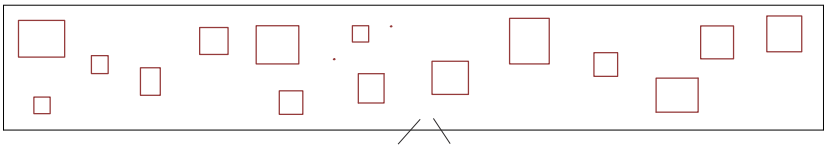
By exposing the original north facade, the design significantly enhances access and circulation between Hattler Lane and Dunklerey Place. The facade opens up pathways, encouraging movement from two streets that usually experience limited traffic and constrained conditions.

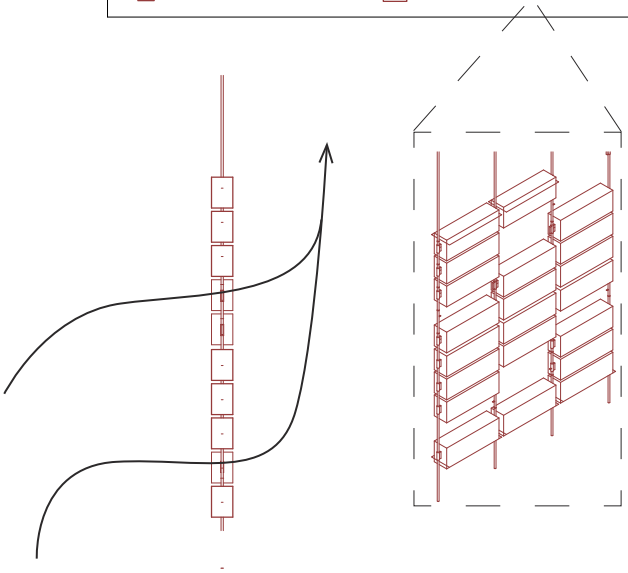
Operable WIndow



CURRENT

PROPOSED

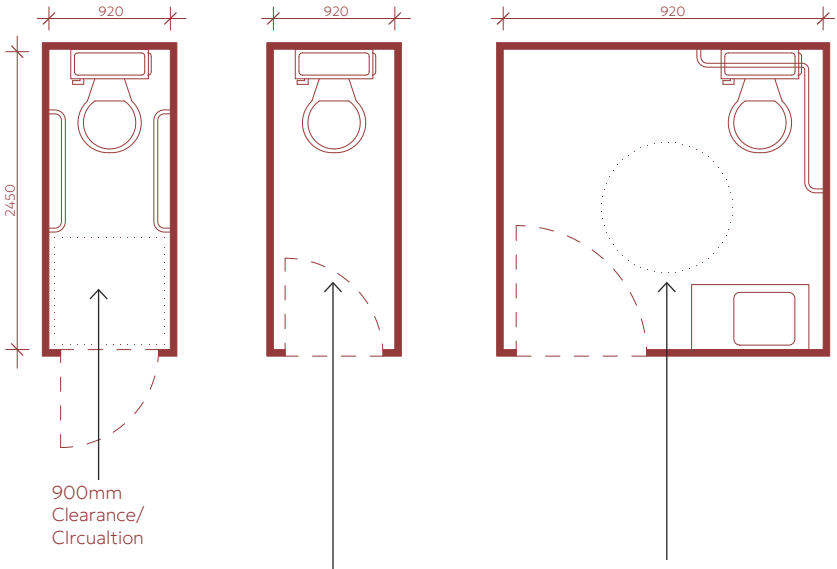




While still maintaining the form of the original facade, The arrangement and patterning of the bricks create visual interest, enhancing the building's tactile quality and inviting interaction. Large openings and a transparent design allow natural light to permeate the space, promoting a connection between the indoors and the surrounding environment.

05/
Sanitary facilities (WC's, urinals + basins)

05/ sanitary
general dimensioning



04/ sanitary facilities

West Building

West Building

Level	Program	Class	Area (m2)	Table	People	Women	Male
1	Exhibiton/ Circula-	9b	2900	F4D4h	725	CP: 13 WB: 4	U: 8 CP: 3 WB: 5
2	Exhibiton/ Circula-	9b	1840	F4D4h	460	CP: 8 WB: 5	U: 5 CP: 2 WB: 4
3	Exhibiton/ Circula-	9b	1750	F4D4h	435	CP: 7 WB: 5	U: 5 CP: 2 WB: 3
4	Exhibiton/ Circula-	9b	1900	F4D4h	475	CP: 9 WB: 4	U: 5 CP: 3 WB: 4

South Building

Level	Program	Class	Area (m2)	Table	People	Women	Male
1	Maker space	8	1400	F4D4b	28	CP: 2 WB: 2	U: 2 CP: 2 WB: 2
2	Maker space	8	1650	F4D4b	33	CP: 3 WB: 2	U: 2 CP: 2 WB: 2
3	Maker space	8	652	F4D4b	14	CP: 1 WB: 1	U: 1 CP: 1 WB: 1

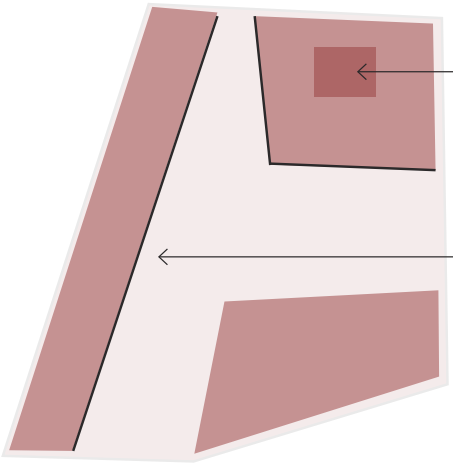
04/ sanitary facilities

North Building

Level	Program	Class	Area (m2)	Table	People	Women	Male
1	Co Working	5	1000	F4D4b	100	CP: 7 WB: 5	U: 2 CP: 5 WB: 5
1	Cafe	6	150	F4D4d	150	CP: 1 WB: 1	U: 1 CP: 1 WB: 1
2	Admin	5	140	F4D4b	14	CP: 1 WB: 1	U: 1 CP: 1 WB: 1
2	Co Working	5	1030	F4D4b	103	CP: 7 WB: 4	U: 2 CP: 5 WB: 5
3	Admin	5	100	F4D4b	10	CP: 1 WB: 1	U: 2 CP: 1 WB: 1
3	Co Working	5	630	F4D4b	63	CP: 3 WB: 2	U: 2 CP: 3 WB: 3
4	Lecture	9b	500	F4D4i	500	CP: 1 WB: 1	U: 1 CP: 1 WB: 1
5	Winter Garden	9b	652	F4D4b		CP: 1 WB: 1	U: 1 CP: 1 WB: 1

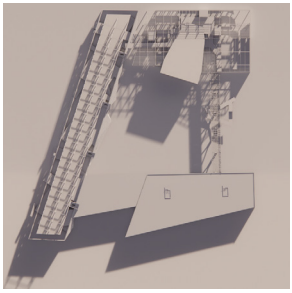
05/
Solar access to landscape and Public Domain

05/ solar access

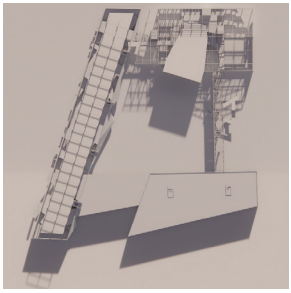


New additon located onto the north-west building, adjacent to neighbouringh high rises to minimise shading onto the pubic domain

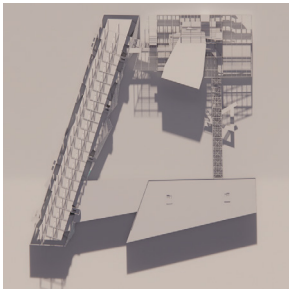
New polycarbonate facades have been introduced to enhance the flow of natural light into the public space, creating a brighter and more welcoming environment.



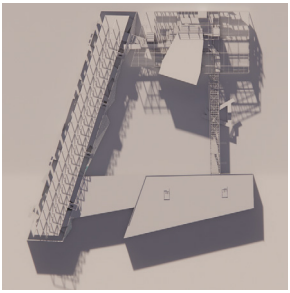
10am



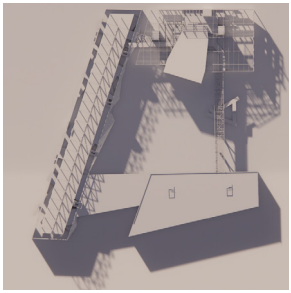
11am



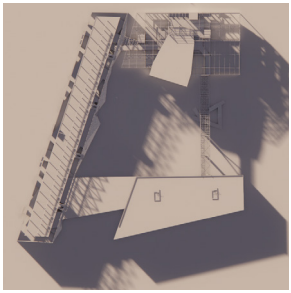
12pm



1pm



2pm



3pm

Direct solar access to over 50% of the landscaped and public domain areas for at least 2 hours between 9.00am and 3.00pm on 21 June

06/ structural systems

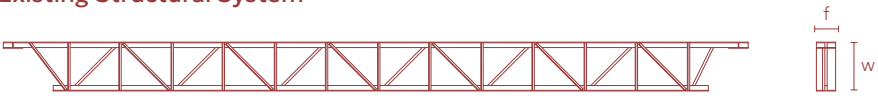
06/ structural systems

Design Methodology

Structural systems, or the skeleton of the building, play a vital role in the function and programming of space. It provides a snapshot of a place's past and can help our understanding of the future. Yet, structure is typically overlooked by the aesthetics of its form and facade.

In challenging our site's heritage, we want to bring back interaction to these neglected structural systems by playing with the existing and the new. How can we intertwine our structural knowledge of the past and the present to create a unified site that can evolve and adapt to its ongoing demand of belonging?

Existing Structural System

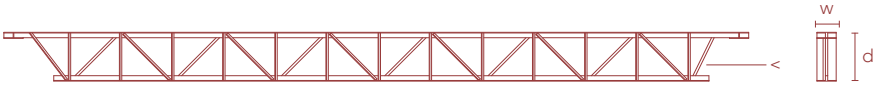


Universal column and beam structure supports the existing building. Dimensions range from:

Flange (f): 205 - 418mm

Web (w) : 214 - 500mm

New Structural System



Warren truss beam and bracing to support new additions to the existing building. Dimensions ranges from:

Depth (d): 454 - 1202 mm

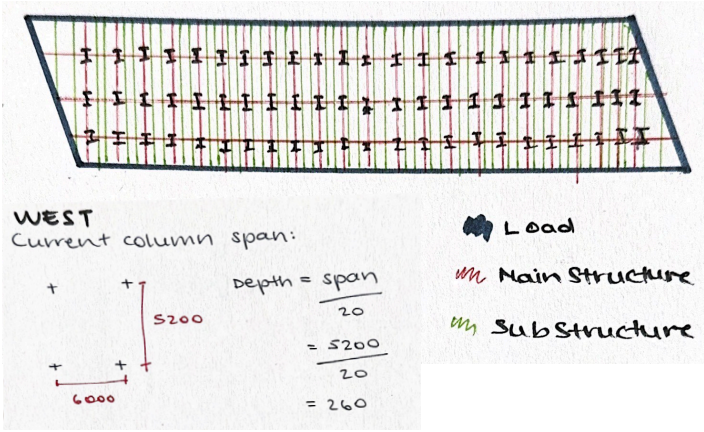
Width (w) : 178 - 472 mm

Angle (<) : 45 degrees

Design Brief:
The west building challenges the typical notion of heritage by keeping the existing facade and gutting the existing internal structure. The new structure is offset from the facade following the exisiting and new column grid. The floor plates must keep to the geometric site lines whilst mainting a structural grid.

Existing West Structural System

The third floor plate follows the exisiting multi-bay structural grid.



Existing Universal Beam corresponds to its span and load.

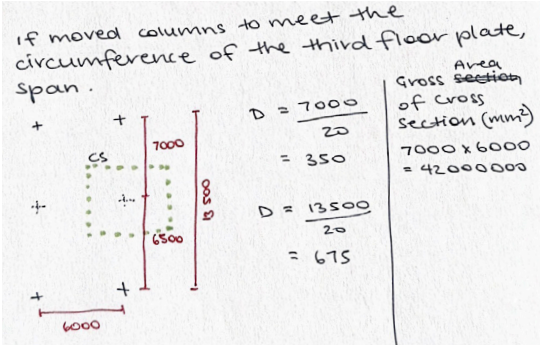
1. Handy Steel (2024) 310 UB 32.0 UNIVERSAL BEAM https://handysteel.com.au/channels-beams-columns-universal-beams?p=2#product

06/ structural systems

West Building

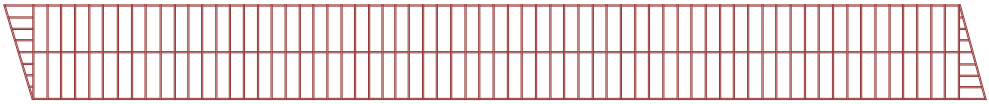
Although the existing structure satisfied the span and beam depth, it wouldn't support the new exhibition program that has a heavier live load (large numbers of people walking around).

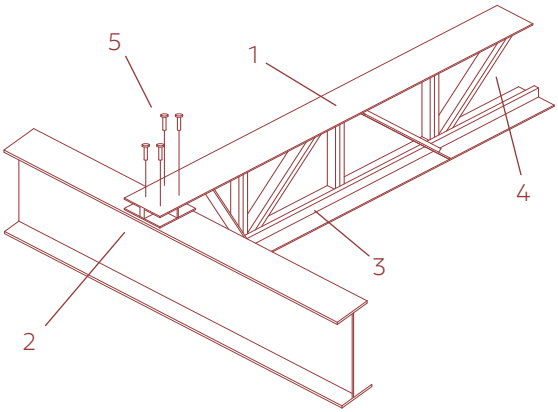
Thus, it was decided to adapt the column grid (to follow the new offset floor plate) and replace the beams with 410mm UB and truss beams to support a heavier live load.



1. Handy Steel (2024) 410 UB 53.7 UNIVERSAL BEAM https://handysteel.com.au/channels-beams-columns-universal-beams?p=3#product

New Third Floor Plate

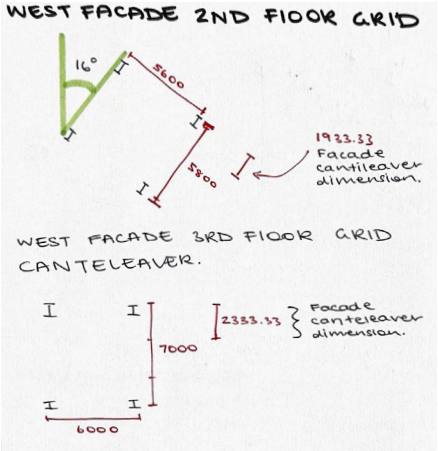


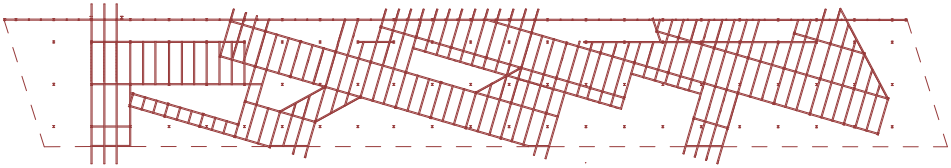


1. Top T Chord Member
2. Bearing Member
3. Bottom T Chord Member
4. Angle Web Members
5. Joiner Bolts

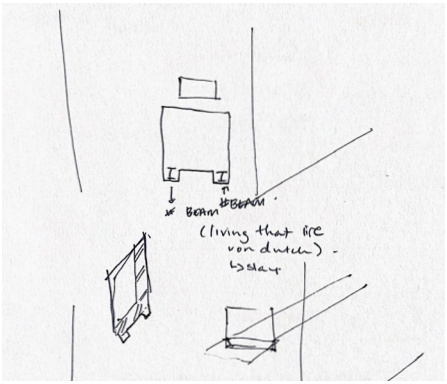
2nd Floor Plate

To get the shape of the second floor plate, a new 16 degree rotated column grid was set. Centeleaver balconies follow the 1/3 rule.





Truss beams cut through the facade and sit on the load bearing wall.

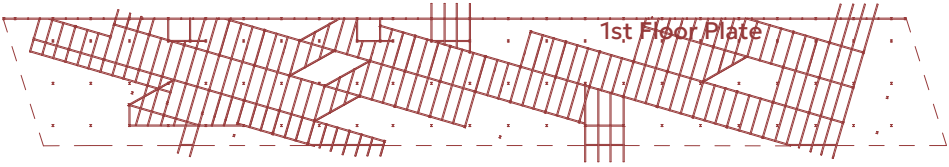


06/ structural systems

West Building

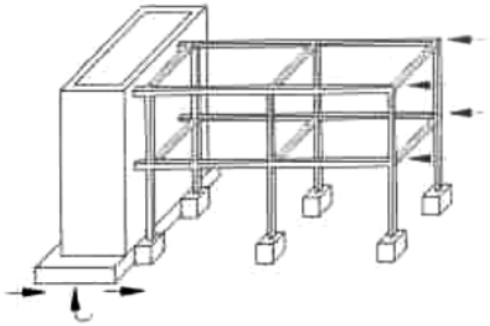
1st Floor Plate

The first floor plate follows the same 16 degree grid as the second floor.



Structural Core

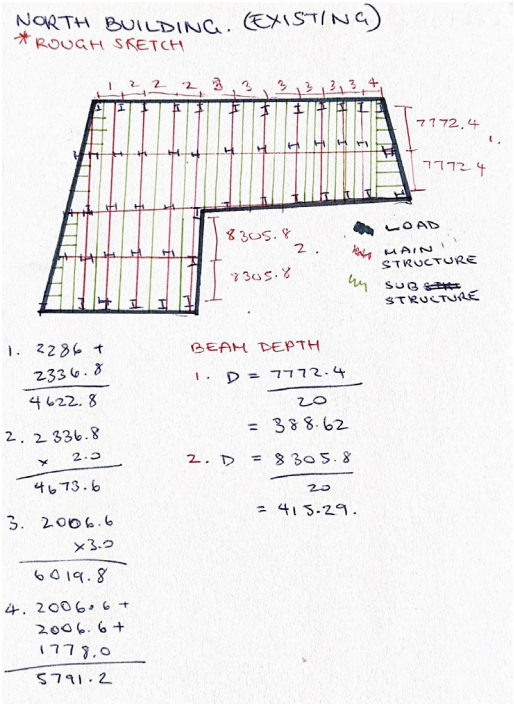
The services, egress and stuctural cores on circumference of the west building, stabilise the offset internal building.



1. Staib, Dörrhöfer, A., & Rosenthal, M. J. (2008). Components and systems : modular building: design, construction, new technologies (1st ed.). Birkhäuser

Design Brief:
Like the west building, the north building explores the interaction between new and old structures. The facade is now considered with the structure, exploring truss cross bracing, The main structure is the new lecture hall that must canteleaver over the public domain, following the logic of the shed precedent.

Existing North Structural System



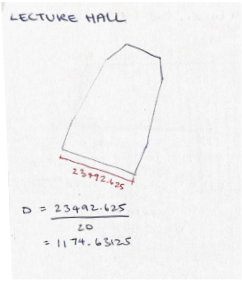
Replaced 310 UB with 460 UB to support heavier live load.

1. Handy Steel (2024) 460 UB 67.1 UNIVERSAL BEAM (PHOTO INCLUDED TWICE) https://handysteel.com.au/channels-beams-columns-universal-beams?p=3#product

06/ structural systems

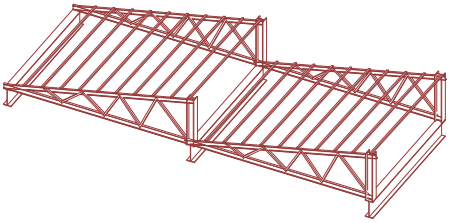
North Building

The alternating floor plates follow the same structural grid as the existing. Below is an example of the first foor.



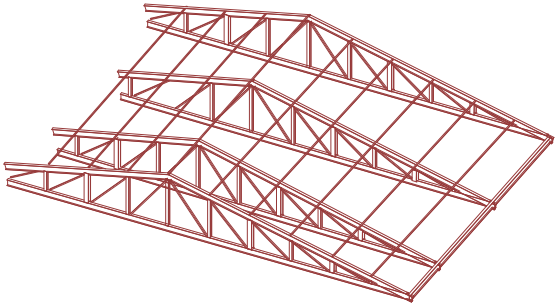
Sawtooth Roof

The existing sawtooth structure was kept for the north building's roof. Polycarbonate sheets are secured on top of the existing structure to make it visible to the public.



Truss Gable Roof

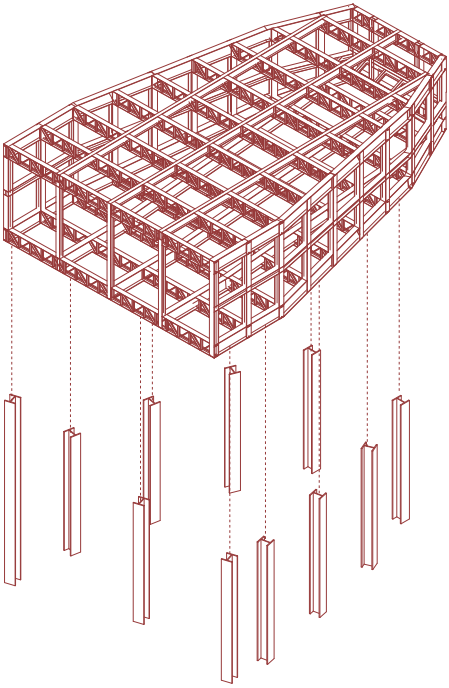
The south extension to the north building follows the exposed polycarbonate steal truss structure with a new gable roof. Light weight steel gable roof covers the extension to copy the triangular vernacular of the saw tooth roof.

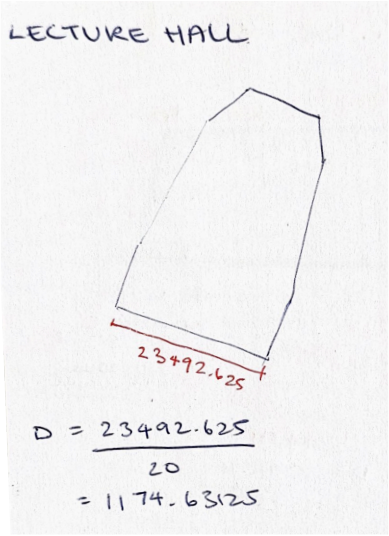


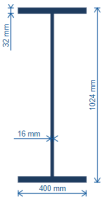
Lecture Theatre

The lecture hall has been designed to be the final destination after promenading through the site. It is intended to be a large void space and thus not have intruding columns. It acts as its own seperate structure to the north building.

1200mm deep truss beams were used to support the load of the lecture hall.







Dimension	Value
Depth	1024 mm
Top Width	400 mm
Top Thickness	32 mm
Bottom Width	400 mm
Bottom Thickness	32 mm
Web Thickness	16 mm
Fillet Radius	0 mm

1. BeamDimensions. https://beamdimensions.com/database/Australian/Steel_(300_Grade)/Welded_beams/1000_WB_322/

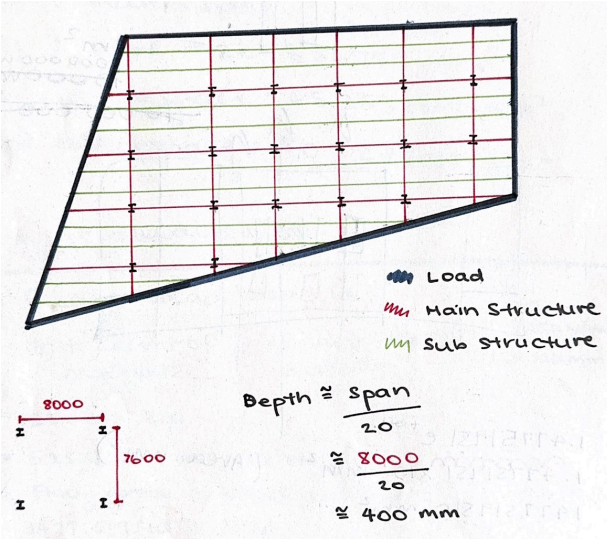
Along with the existing column structure, 1000 WC Columns were used to solely support the lecture theatre.

06/ structural systems

South Building

Design Brief:
Previous analysis found that lack of building interaction prevents the possibility of belonging, typically seen with abonded heritage buildings. Thus, the South Building has more of a focus on facade adaptation and maintains the structural systems of the typical industrial factory. The aim is to keep as much of the exisiting structure.

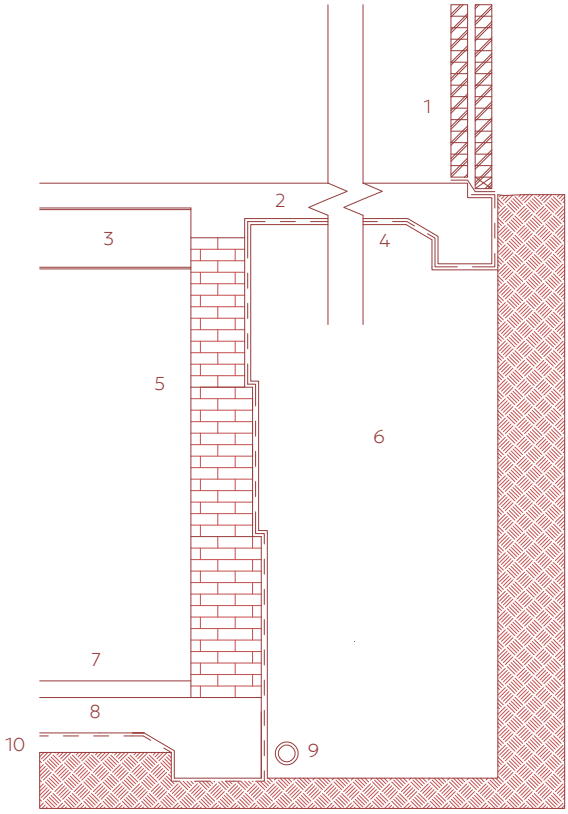
Existing South Structural System



The existing 460 UB beams cater to the load and span of the building.

1. Handy Steel (2024) 460 UB 67.1 UNIVERSAL BEAM (PHOTO INCLUDED TWICE)https://handysteel.com.au/channels-beams-columns-universal-beams?p=3#product

The South building is the only building was an existing basement. Water management on site requires large 3000L tanks. To avoid being open to the public domain, water tanks will be stored in the building's basement. The south basement structure is to be replicated in all buildings on the site for water/storage purposes.



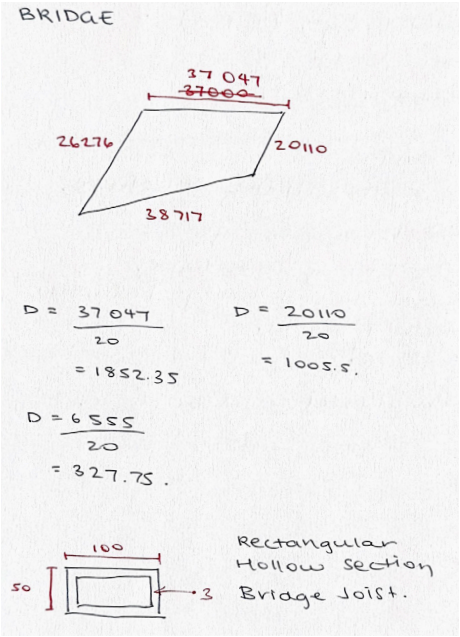
1. Double brick veneer wall with 60mm cavity
2. 164mm reinforced concrete floor slab
3. 460 UB beam
4. Polythene moisture membrane
5. Brick stepped face retaining wall following 1/3
6. Sand (consolidated)
7. 110 polished concrete floor slab
8. 341mm reinforced concrete floor slab
9. Agricultural drain
10. Sand bed

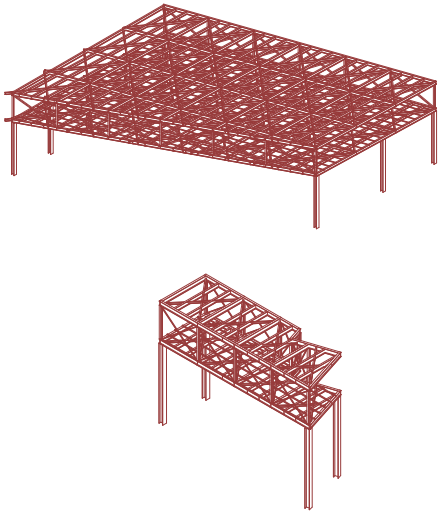
06/ structural systems

Bridges

Enclosed trusses bridges connect the west building to the north and south buildings. Trusses were used to minimise columns interupting the public domain.

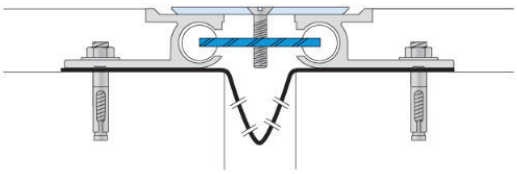
North / South Bridge





Mechanical Expansion Joint

A mechanical expansion joint is required between a bridge and building threshold. The Latham Flat-Lines Series expansion joint will be used as the bump free surface creates a flat surface, necessary for accesibility. The systems offer thermal and structural movement and shrinkage and will accommodate limited seismic movement.



1. Latham Australia (2024). MECHANICAL EXPANSION JOINT. https://www.latham-australia.com/mechanical-expansion-joint-covers/flat-line-series

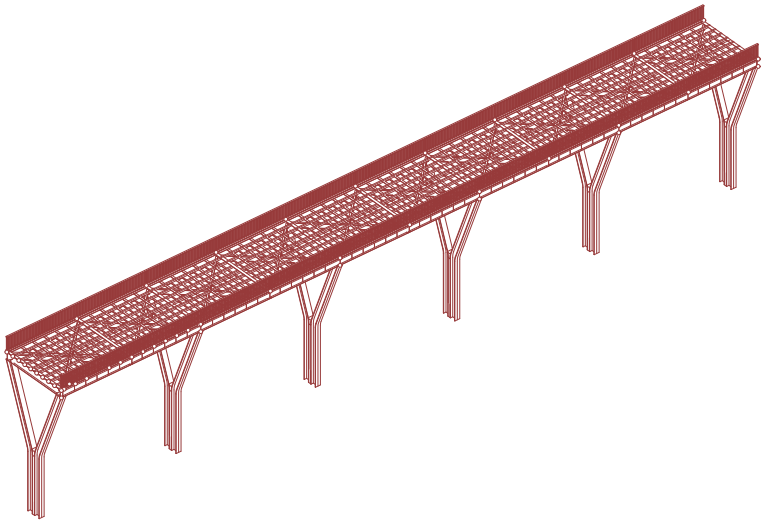
An open truss bridge joins the north and south building together. 30 degree Y shape UB columns were used to evenly distribute the load of the bride to reduce the number and material of columns. They span every 12000mm.

Depth = 3000/20

= 150 mm

530 UB beam was used due to the heavy live load.

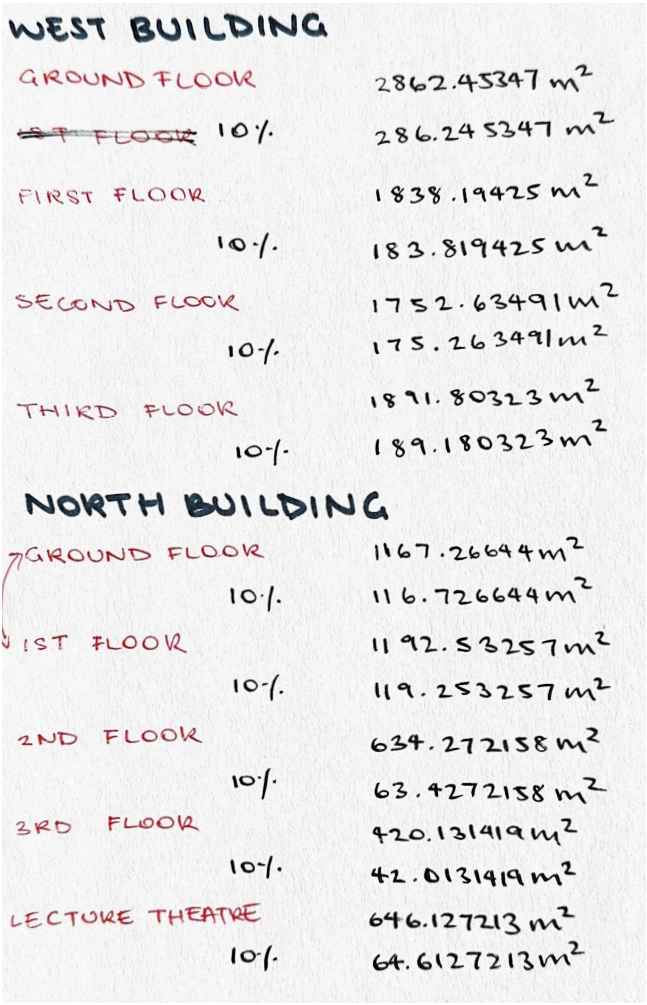
1. Handy Steel (2024) 530 UB 82.0 UNIVERSAL BEAM. https://handysteel.com.au/channels-beams-columns-universal-beams?p=3#product



07/
Daylight

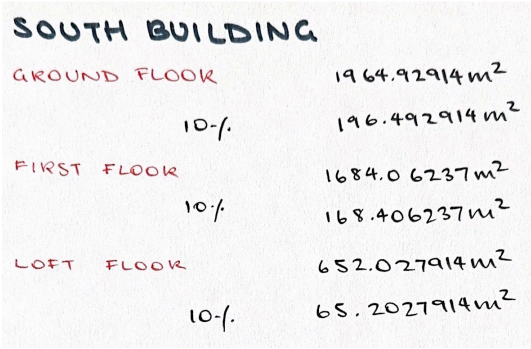
Following the F6D2 - F6D4 Provisions, the west and north buildings (Class 9B) must provide natural light to all general purpose rooms.

Natural light must be provided through windows that have an aggregate light transmitting area of no less than 10% of the floor area.



07/ daylight

Floor Area Calculations



Daylight Techniques

The offset internal structure of the west building was a technique to get more useable daylight. The small window opening and double brick veneer wall prevented a lot of natural light from entering the building. By offsetting the building, the void space between the internal and external building acts as an atrium to maximise daylighting.

The site prioritises translucencies to maximise daylighting and cooling:

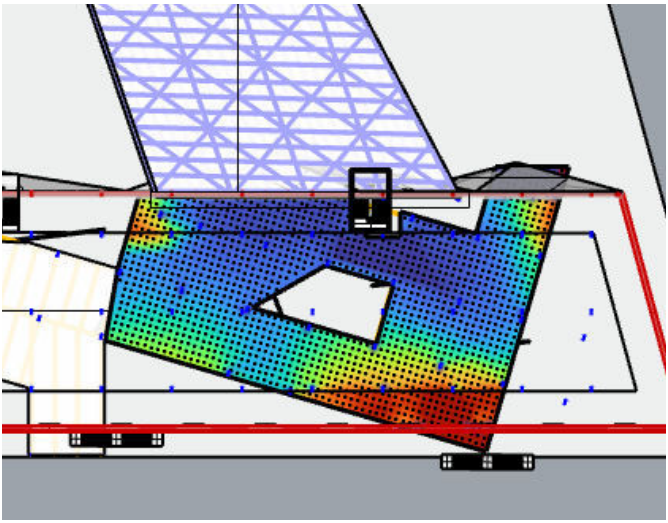
Polycarbonate: Used in the north and west building for the sawtooth roof and facade. The only limitation is that the buildings are more suseptable to harsh light. This is softened through soft thresholds, like curtains and blinds.

Brick: The south building facade suspends bricks using a steel wire and beam/column structure. Space is intentionally left between bricks to allow for light to seep through.

Metal Mesh: Egress stairs and bridges use metal mesh to enclose the spaces, yet the thinness of the material still allows light to seep in.

07/ daylight

West Building Daylight Factor Rendering



9AM	3PM
40.7% 300-3000 lux	32.8% 300-3000 lux

ID	Description	Tags	Sq.ft	%.Acceptable.9am	%.Acceptable.3pm
floor			6191	62.78%	50.64%

By offsetting the building from the existing facade, natural daylighting is maximised. At all times of day, acceptable daylighting is above 50%.

As expected, balconies or void areas are more exposed to harsh daylighting. However, shading techniques like curtains and blinds will help to soften the direct lighting.

08/
Building + site water management + PV panel optimisation

Rain water tanks are to be stored in the basement level of all buildings. A filter will then clean the grey water to then be circulated for toilet flushing.

RAIN WATER TANK CALCULATIONS

SOUTH BUILDING.

Roof Area = $1684.06237 m^2$

80% Roof Area = 0.8×1684.06237
= $1347.2499 m^2$

Tank Capacity = $\frac{1347.2499 \times 3000}{100}$
= 40417.5 L

WEST BUILDING.

Roof Area = $1891.80323 m^2$

80% of Roof Area = 0.8×1891.80323
= 1513.44258

Tank Capacity = $\frac{1513.44258 \times 3000}{100}$
= 45 403.2775 L

NORTH BUILDING.

Roof Area = 1978.70265

80% of Roof Area = 0.8×1978.70265
= $1582.96212 m^2$

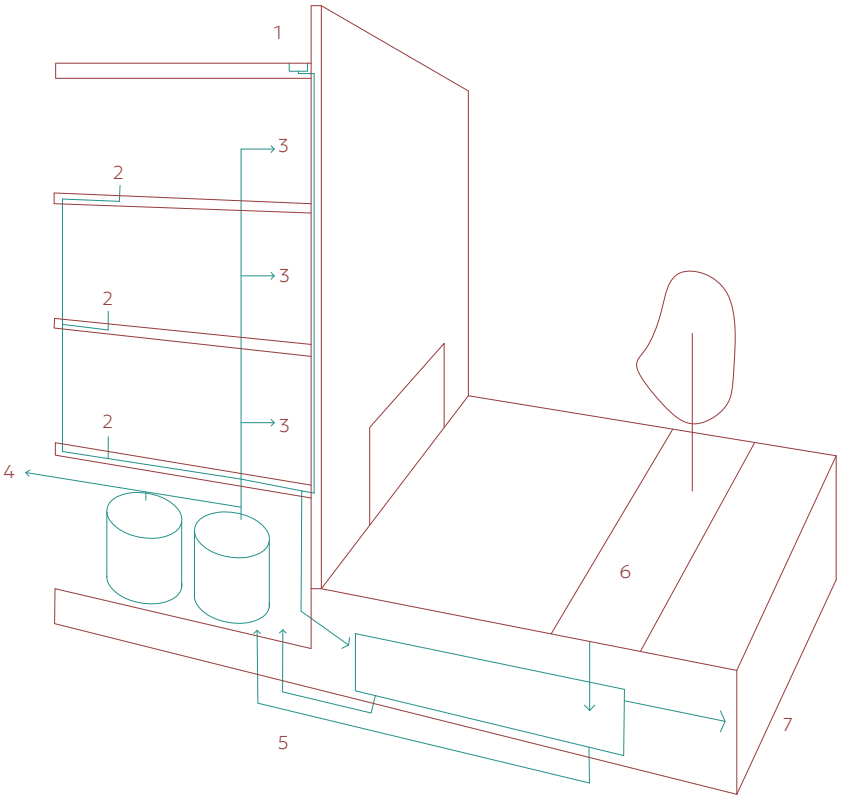
Tank Capacity = $\frac{1582.96212 \times 3000}{100}$
= 47488.8636 L

Thus all buildings need one 50 000 Litre rain water tank. However, the floor to ceiling height of the existing south basement is 3410mm which is just short for the tank to fit. In order to store tanks in the basement, buildings will require 2 x 27000 litre rain tanks.

1. Rapidplas (2024). 27L RAIN TANK. https://www.rapidplas.com.au/27000l-rain-tank-advise-colour

08/ water management

Rain Water Tank Calculations



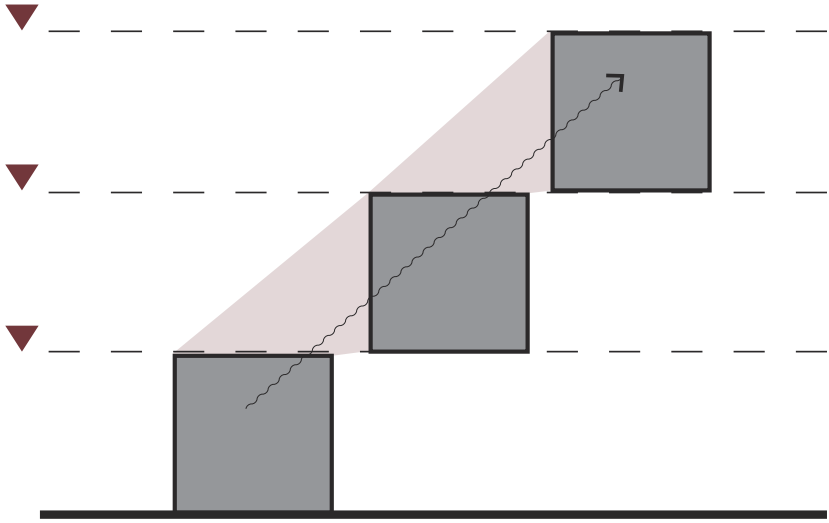
1. Siphonic rainwater guttering
2. Grey water collection
3. Treated water supply to toilets
4. Treated water supply to irrigation
5. Water pumped from cisterns
6. Soft landscaping for underground water storage
7. Overflow to storm drain

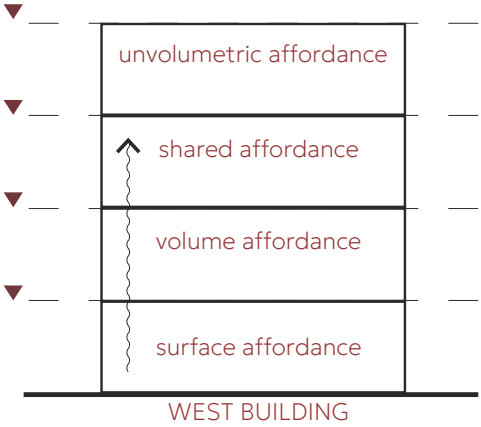
02/
precedents and diagrams

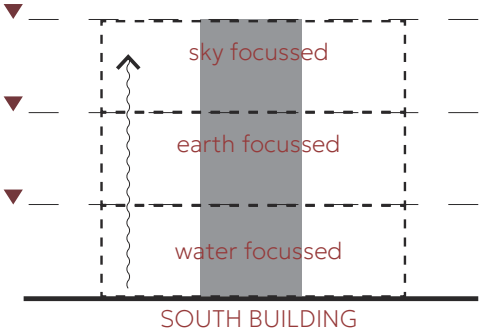
03/ precedent analysis

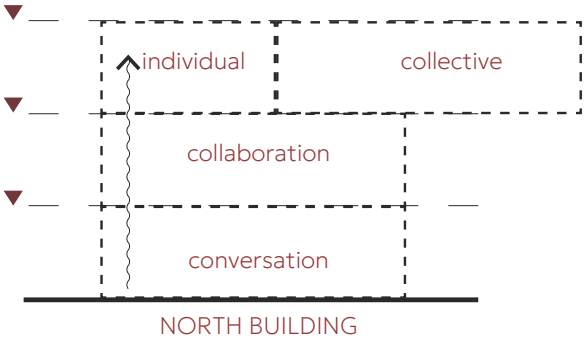
museum

Berlin Holocaust Museum
Daniel Liebskind Architect




unvolumetric affordance
shared affordance
volume affordance
surface affordance
WEST BUILDING


sky focussed
earth focussed
water focussed
SOUTH BUILDING

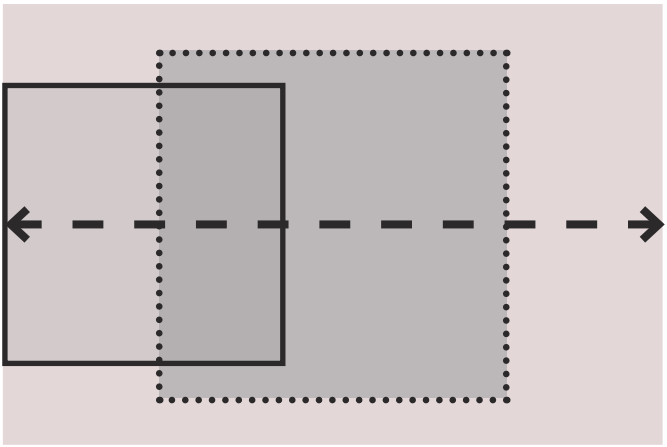

individual
collective
collaboration
conversation
NORTH BUILDING

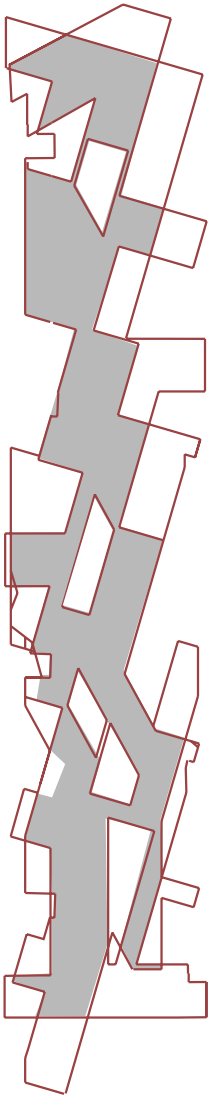
03/ precedent analysis

exhibition

The Shed

Diller Scorfidio + Renfro



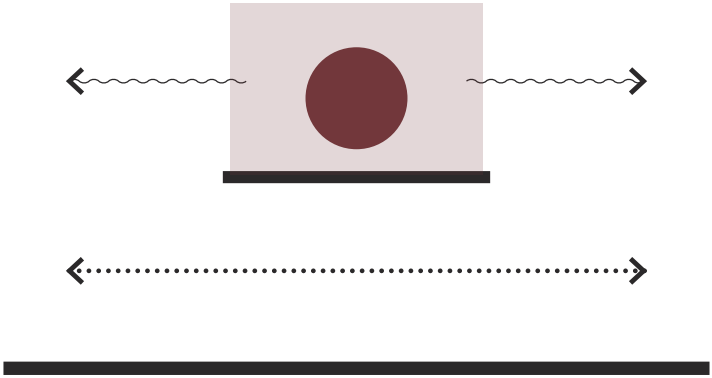


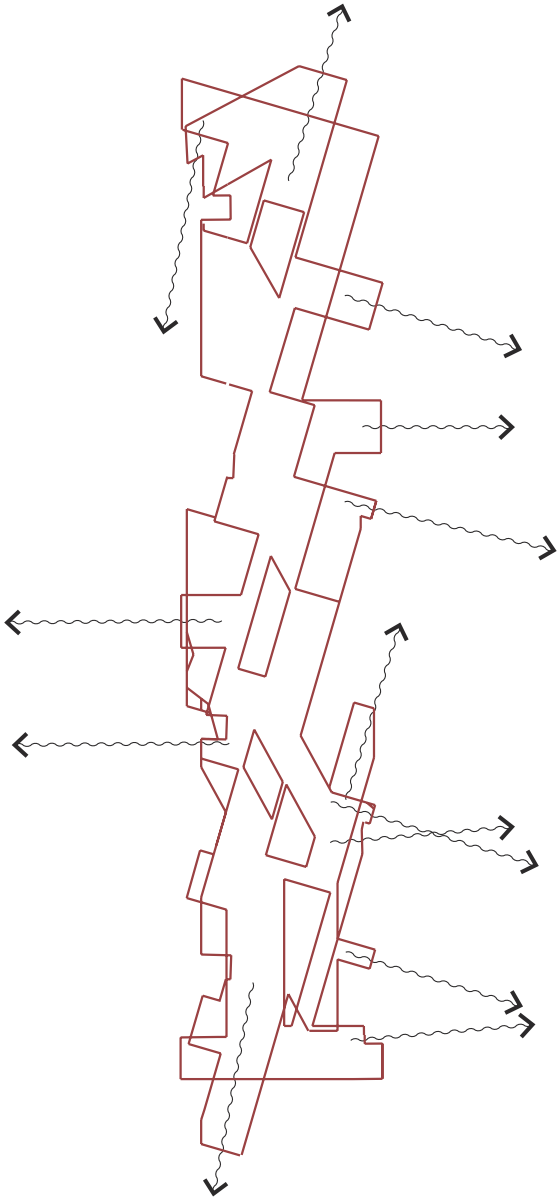
03/ precedent analysis

public domain

TKTS Times Square

CHROFI Architects



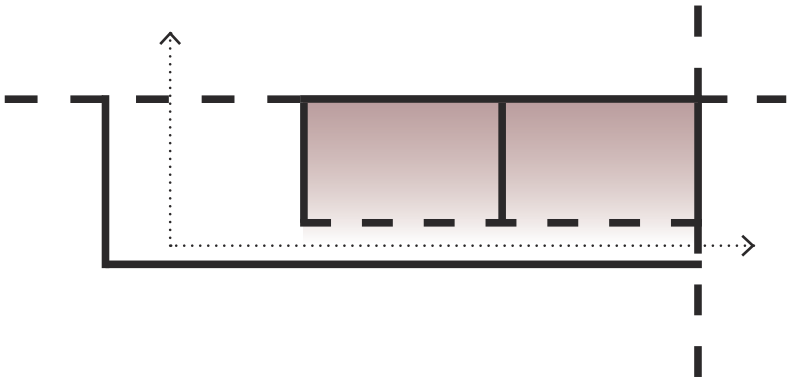


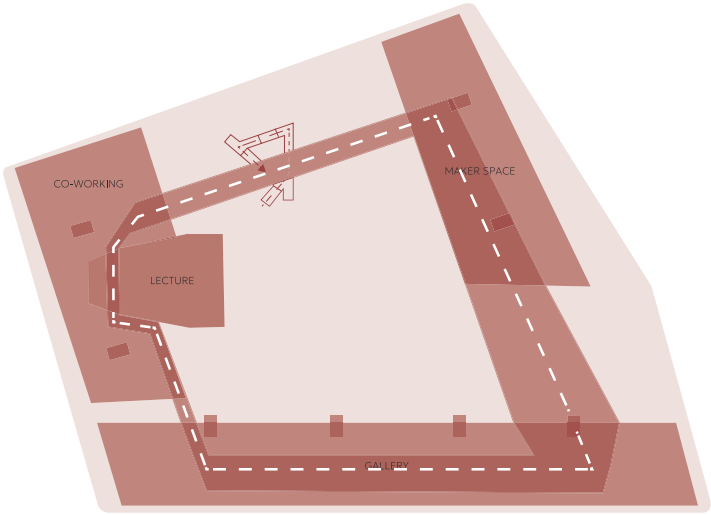
03/ precedent analysis

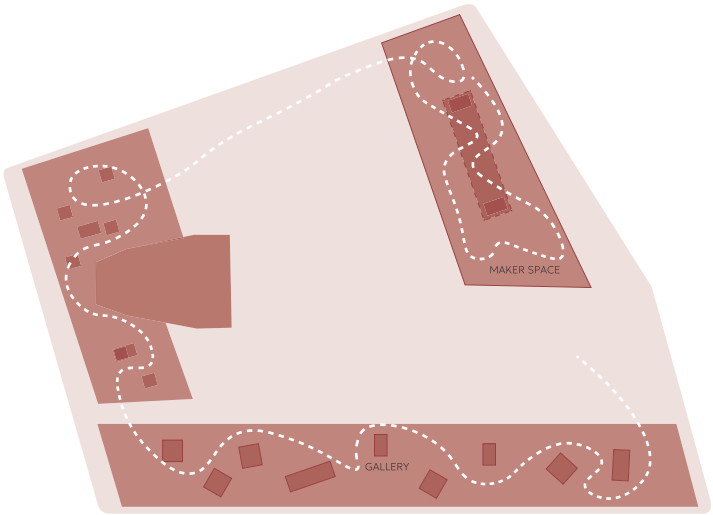
maker space

The Forge

Emrys Architects




CO-WORKING
LECTURE
MAKER SPACE
GALLERY

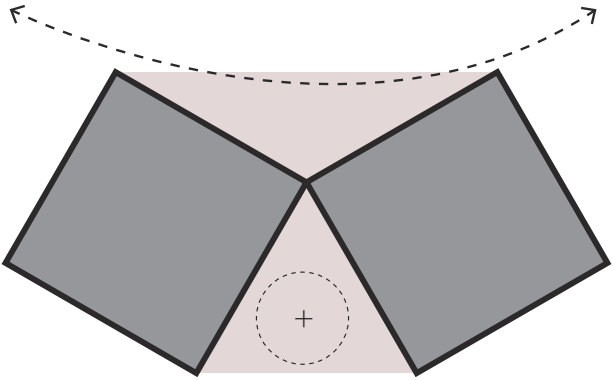

MAKER SPACE
GALLERY

03/ precedent analysis

country

Karratha central healthcare

Coda Studios



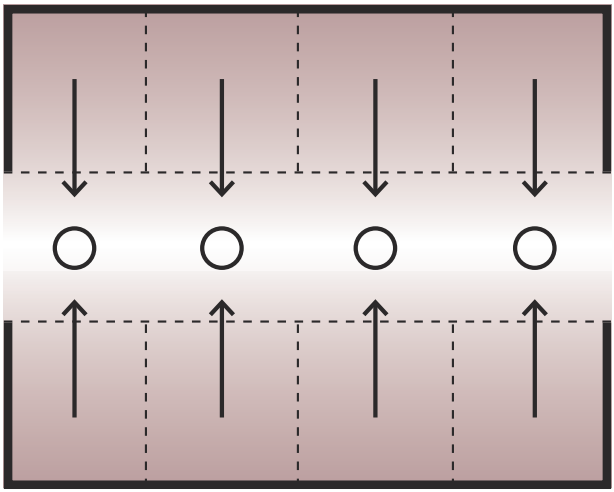

CO-WORKING
LECTURE
MAKER SPACE
GALLERY

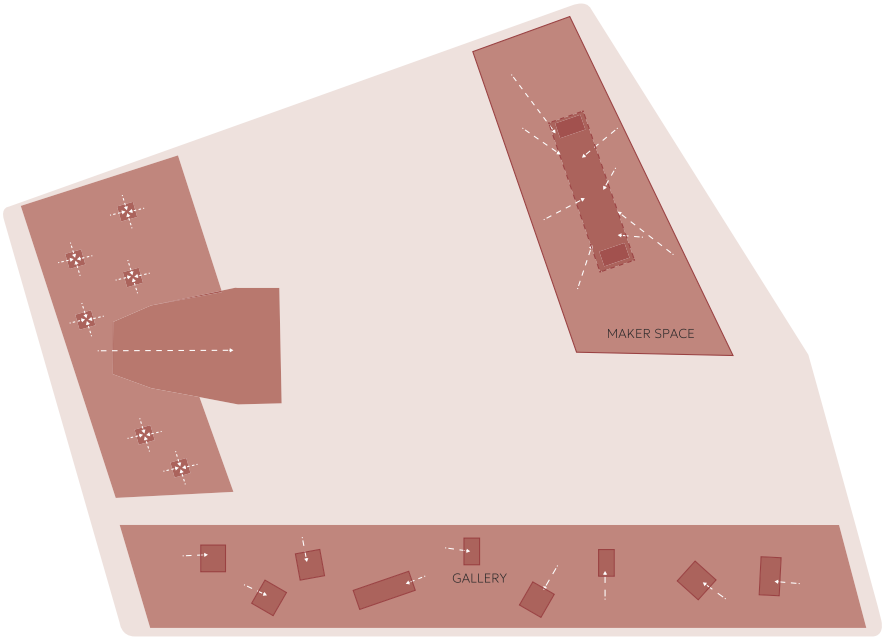
03/ precedent analysis

commercial

Medicins sans Frontieres

Saurerbruch Architects



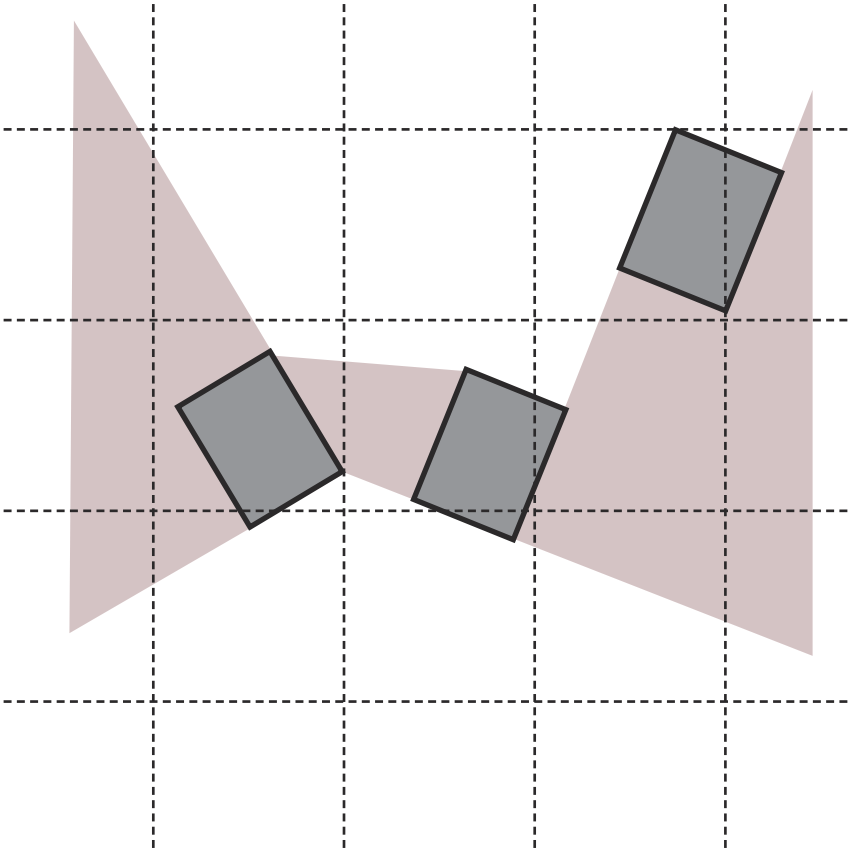

MAKER SPACE
GALLERY

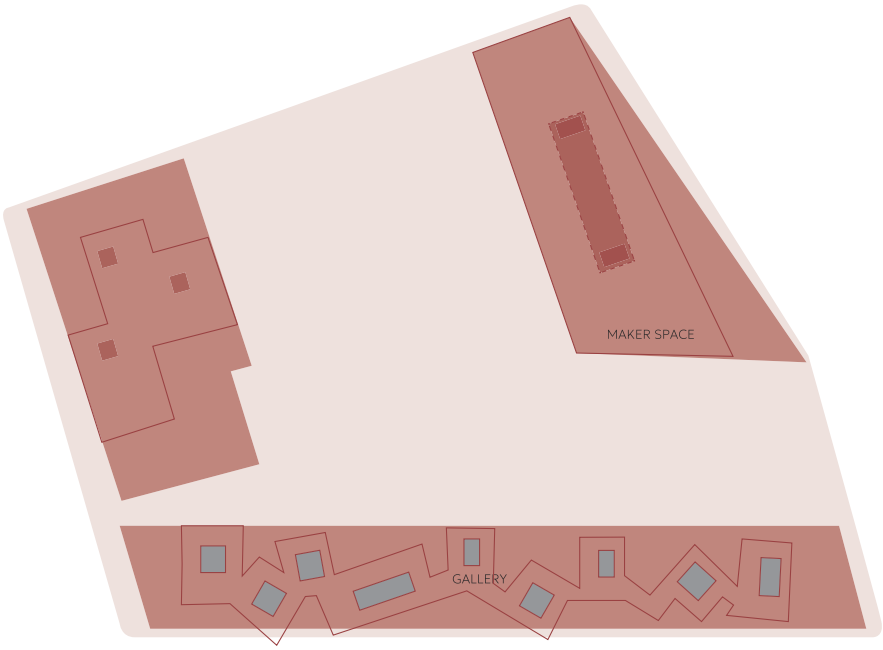
03/ precedent analysis

coworking

Zamness Co-Working Office Space

Nook Architects

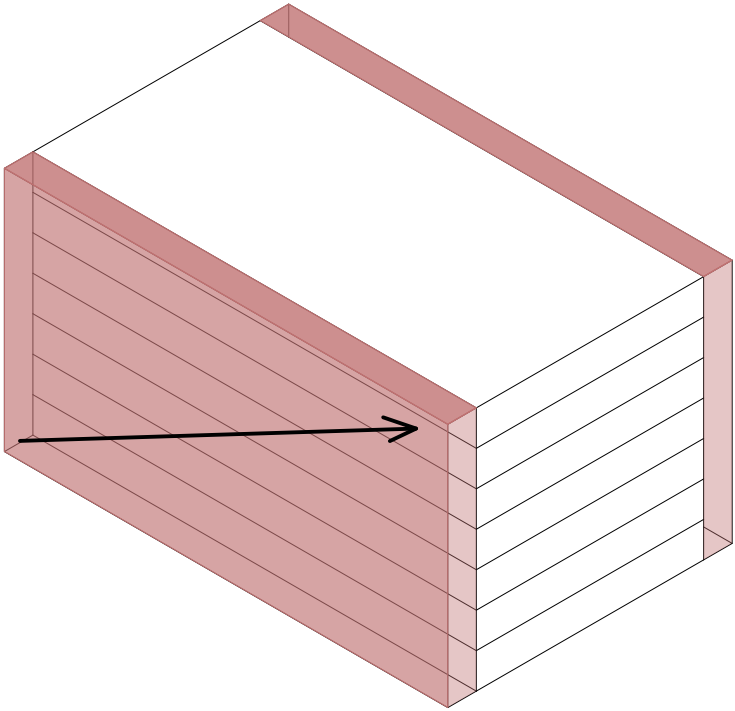


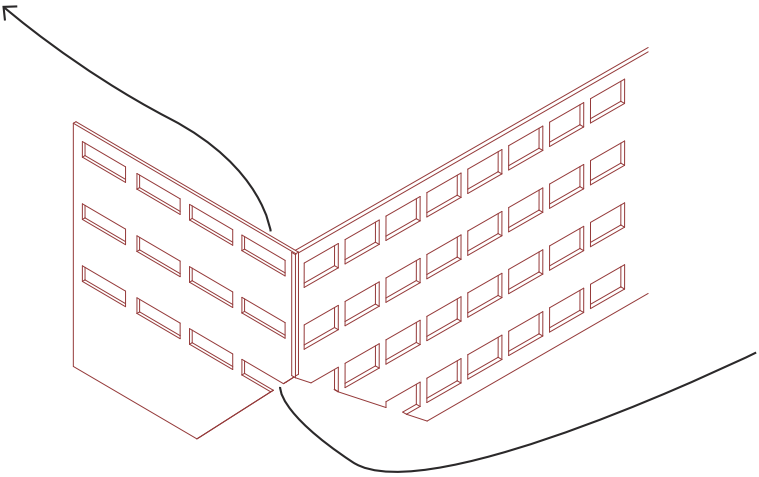

MAKER SPACE
GALLERY

03/ precedent analysis

wildcard

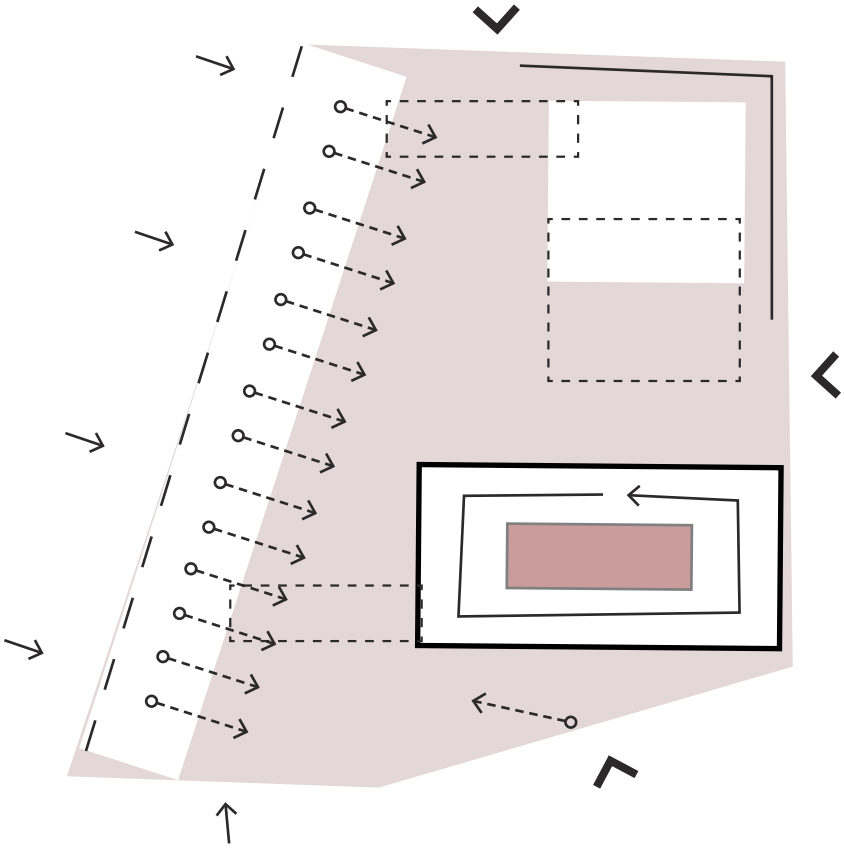
The Centre Pompidou
Renzo Piano, Richard Rogers





03/ precedent analysis

augmented diagram



03/ references

***every effort has been made to correctly cite works, sources and intellectual property of others in the collation of this dossier**

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30. Handy Steel (2024) 460 UB 67.1 UNIVERSAL BEAM (PHOTO INCLUDED TWICE)https://handysteel.com.au/channels-beams-columns-universal-beams?p=3#product

We acknowlege the contribution of Jessica Campbell's right thumb in the making of the base of the Site Model.