



The Role of Design

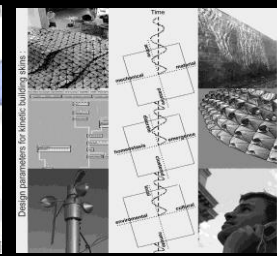
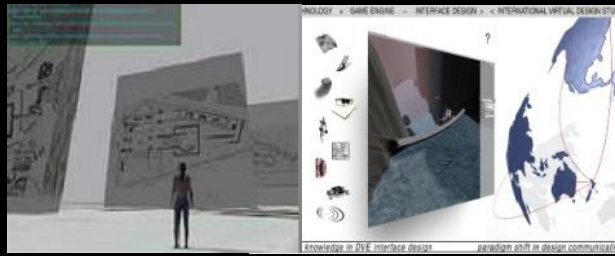
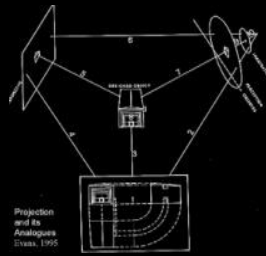
in achieving BETTER buildings

Professor Jules Moloney

School of Architecture

Victoria University of Wellington

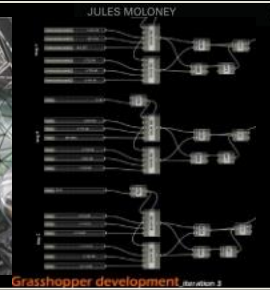
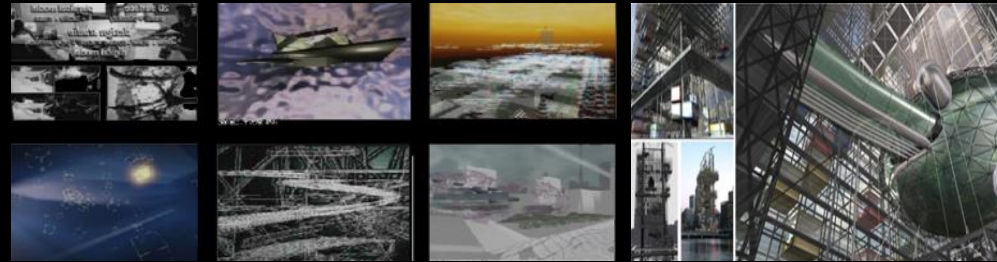
Research



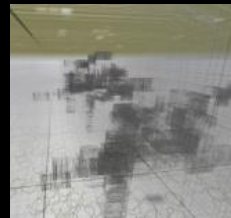
DESIGNING KINETICS
FOR ARCHITECTURAL
FACADES
STATE CHANGE



Teaching



Creative Works



Professional practice



BArch

BArch (hons) MA Urban Design

PhD

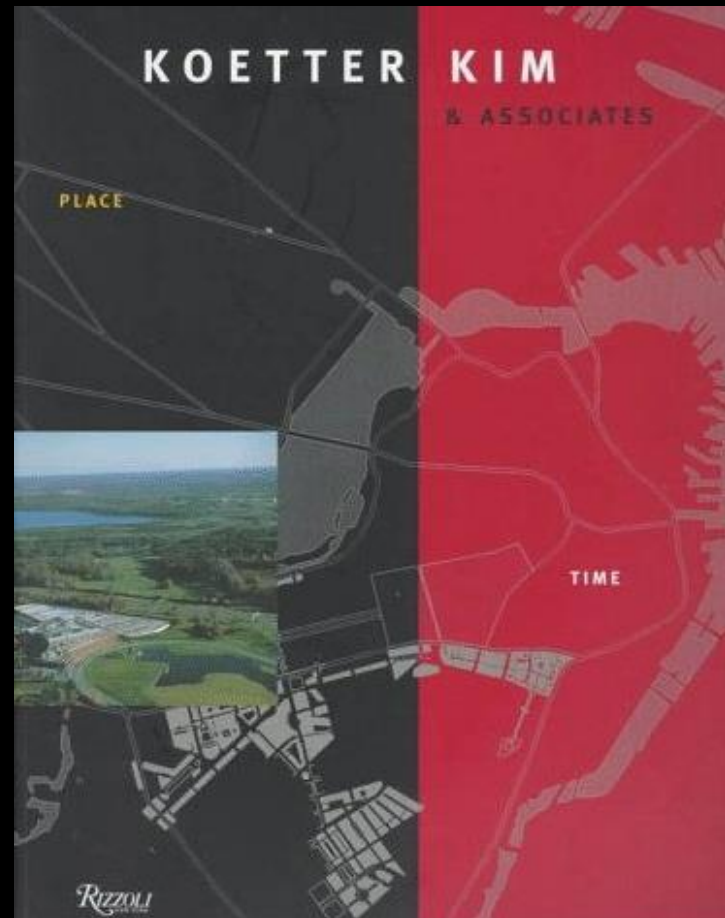
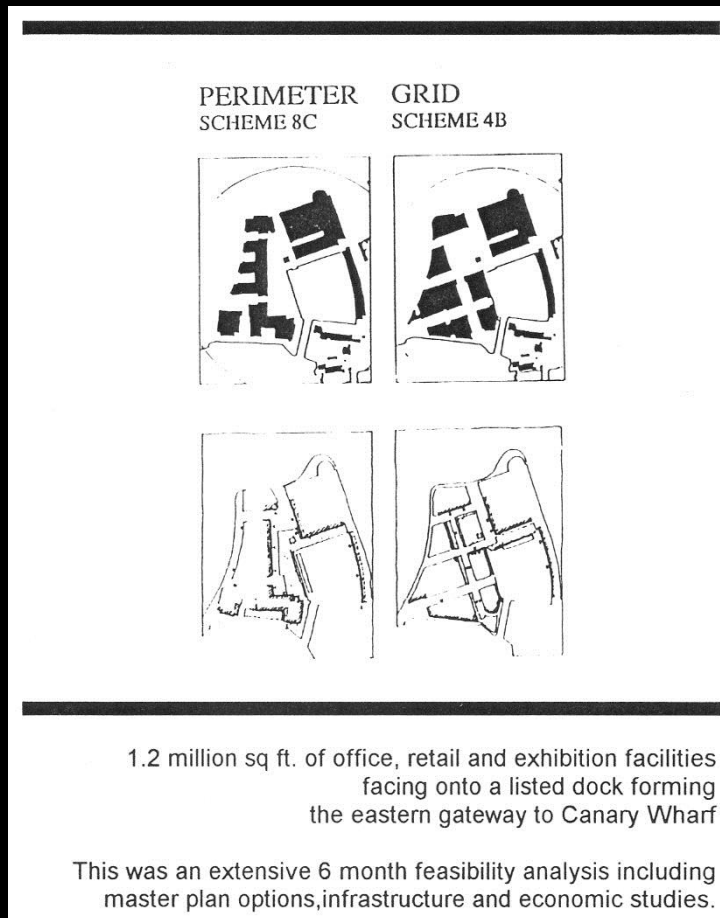
1980

1990

2000

2010

Auckland London Auckland London Auckland Melbourne Wellington



Professional practice

BArch

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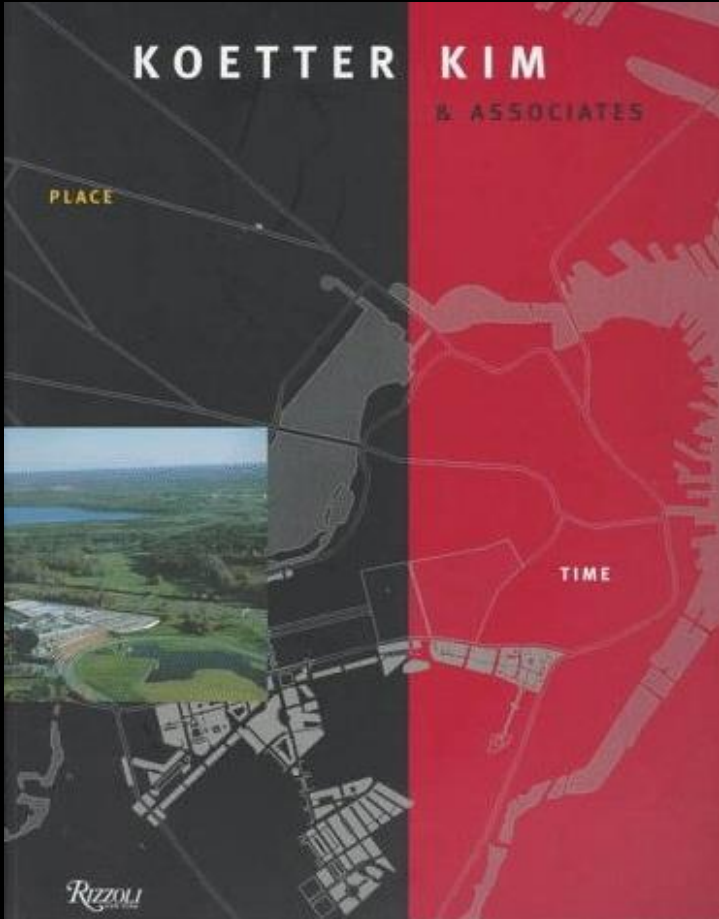
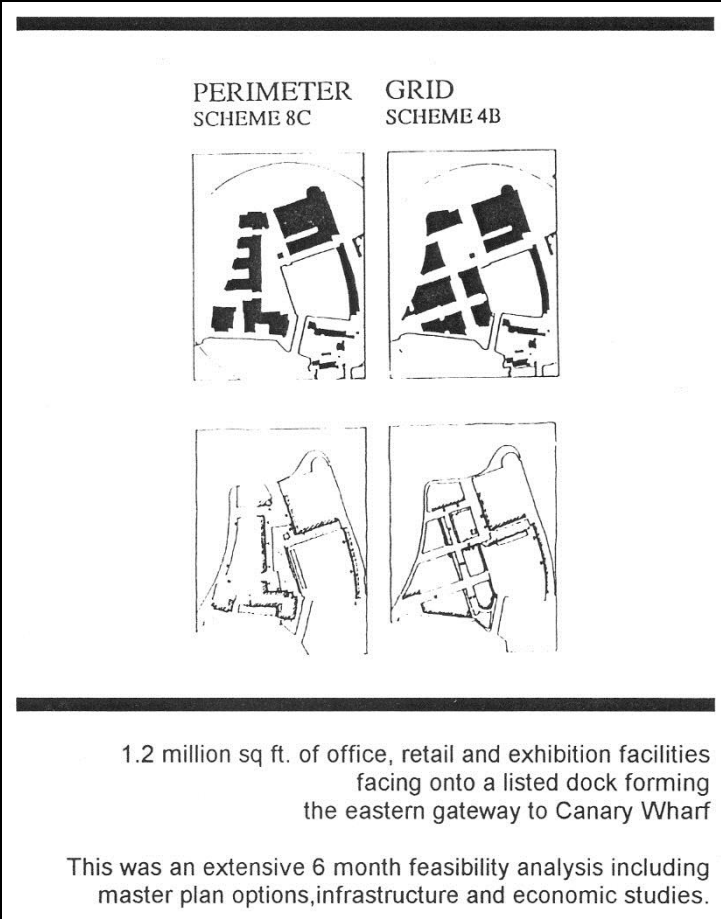
London

Auckland

Melbourne

Wellington

Lessons from Fred: design iteration... / evaluate / iteration / evaluate / iteration / evaluate ... /..



Professional practice



Two takes on Building Better

Pre Wellington

Enhancing decision making at early stages of design

- Collaborative virtual environments using videogame technology
- Augmented reality integrated with environmental simulation

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VUW Design Research

What do we mean by BETTER ?

- Between the science and art of building
- Tradition of design grounded in technical excellence

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One one liner :

Building a Better New Zealand through design-led research

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One one liner :

Building a Better New Zealand through design-led research

Panoramic projection
& spatialised sound.

1 Lead and 6 other participants

Synchronous communication
via avatar presence,
text and virtual laser pointer

Asynchronous communication
via upload of text, camera position
and 'white board' drawing tool.

server

VR center

remote users



FRACTAL TERRAIN

3D TEXTURE PAINT

SHADOW MAPS

CAD MODELS

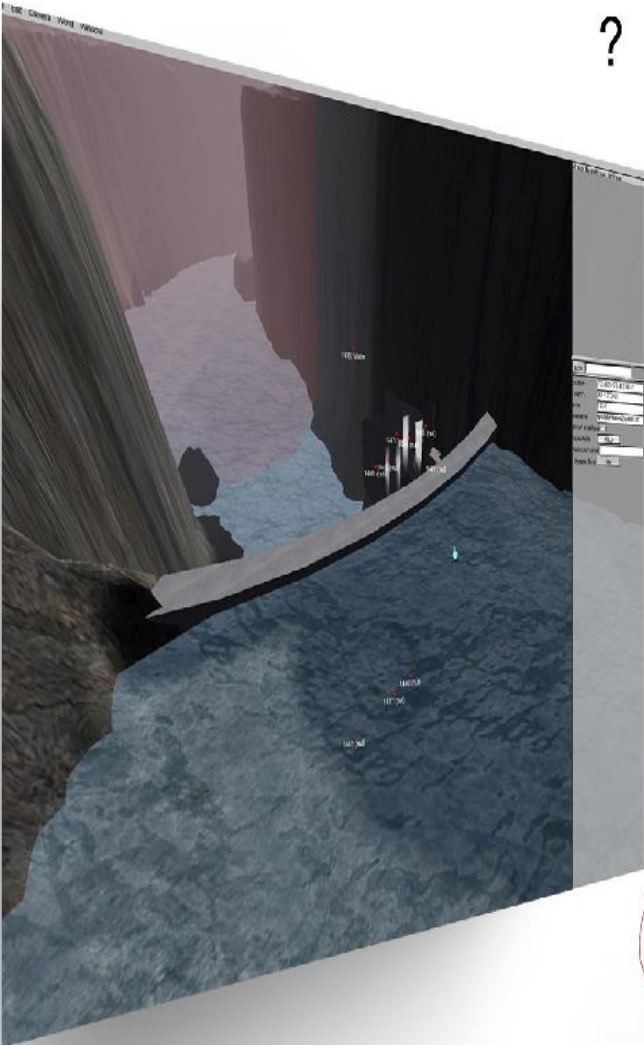
ANIMATION

CALCULATIVE DATA

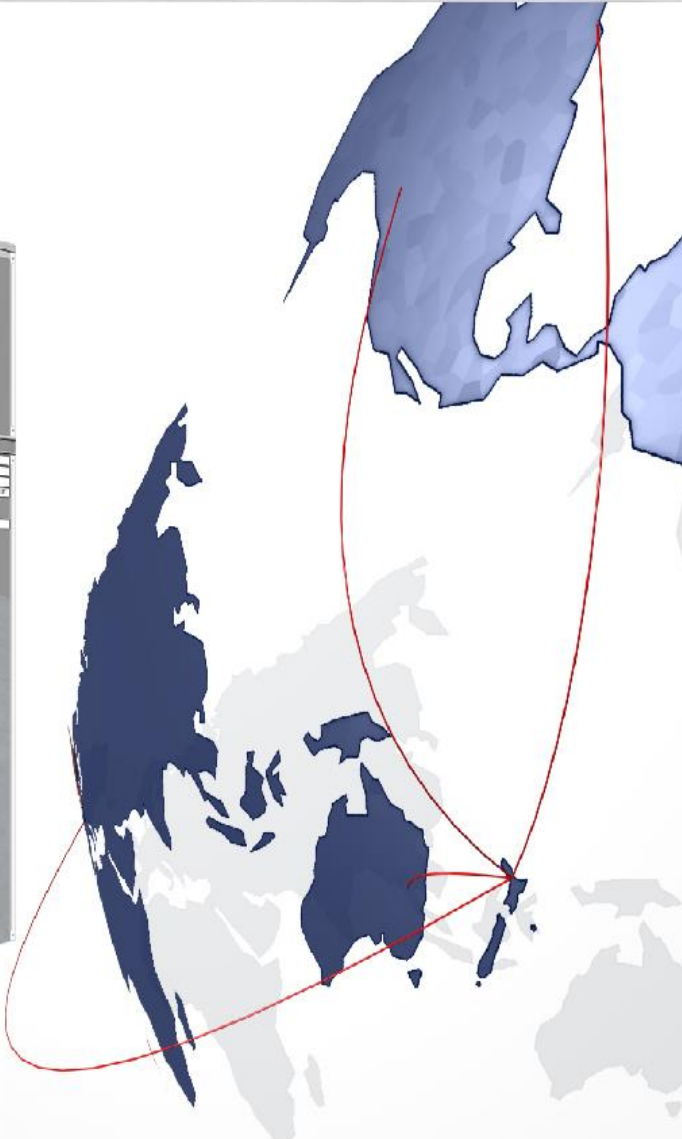
CULTURAL DATA

AUTONOMOUS AGENTS

3D SPATIALISED SOUND

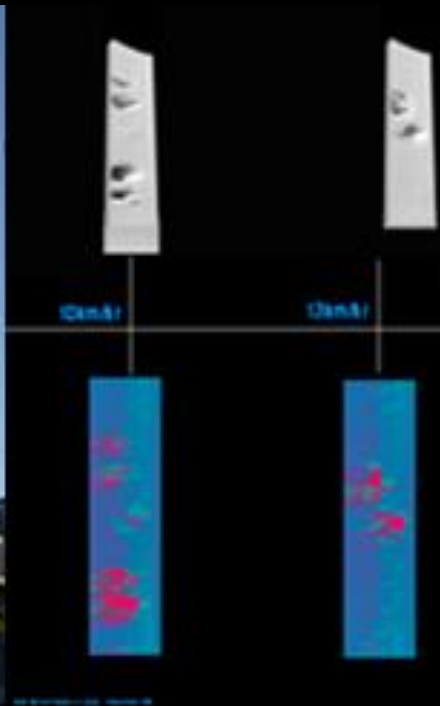


?



extension to knowledge in DVE interface design

paradigm shift in design communication



Design in Context
Augmented Reality Technology to
improve decision making at
early design stages

ARC Discovery Grant 2008 - 10

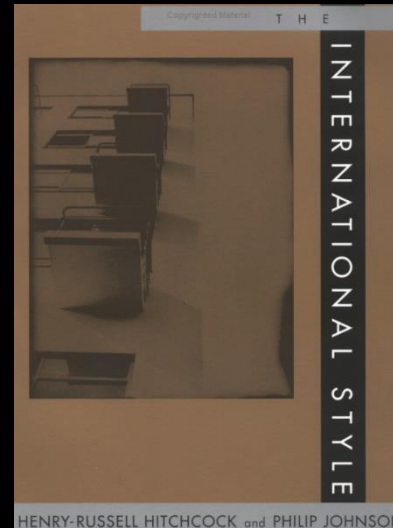
(Dave, Moloney, Billingham)

In collaboration with HITLab NZ

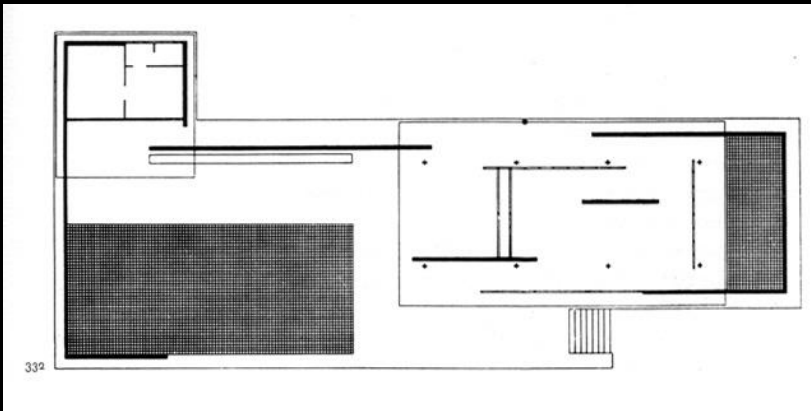
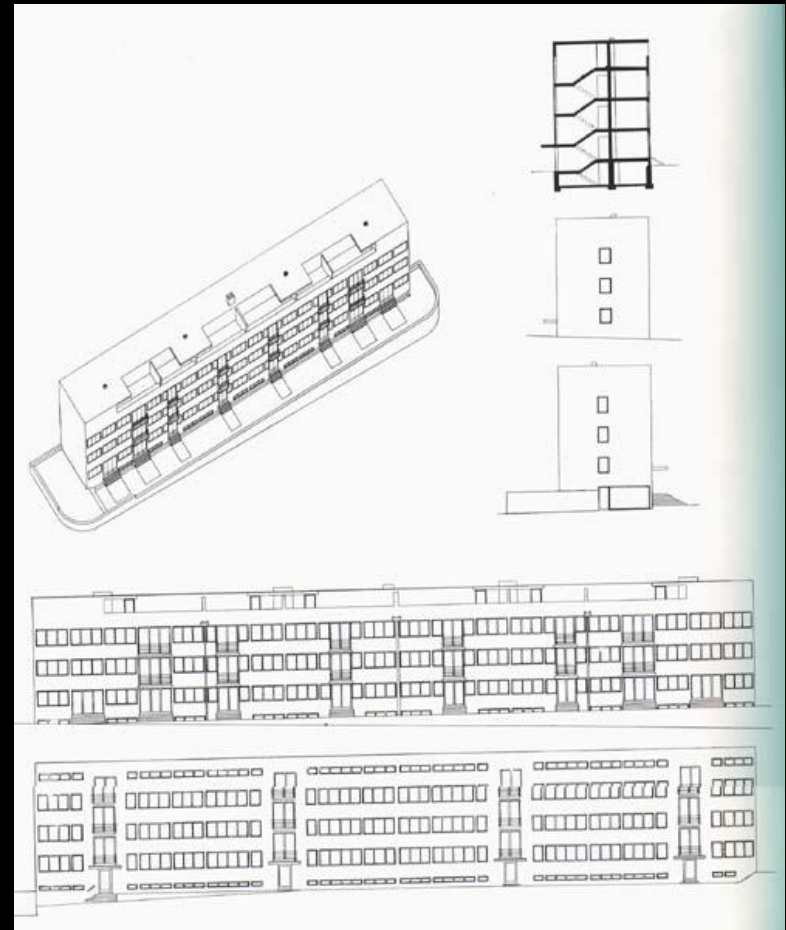
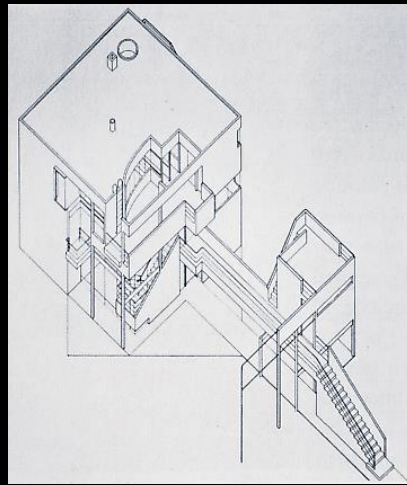


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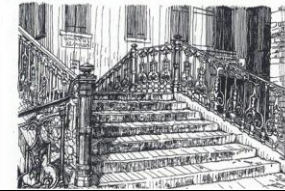
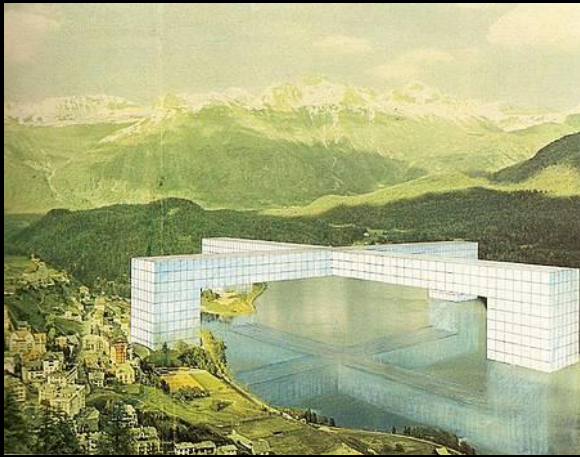
2006 -10 University of Melbourne



One view of the twentieth century is that it was an era dominated by the conception of architecture as **object devoid of context**. From its publication in 1932 until the early 1970's 'The International Style' was the mantra for a period of "*impaired vision*" in which architecture was "*conceived as a thing in itself*" (Berman, 1988)



Architectural drawings were abstract plans and sections, supplemented with axonometric projections as if they were describing engine parts.



The 1970's saw new approaches informed by visualisation that placed designs in context: photographic collage (Confurius, 1985); the re-immergence of perspective drawing and sequential sketch techniques eg. (Cullen, 1971); the use of urban figure-ground analysis (Rowe & Koetter, 1978); physical site models and video techniques (Bosselmann, 1997).

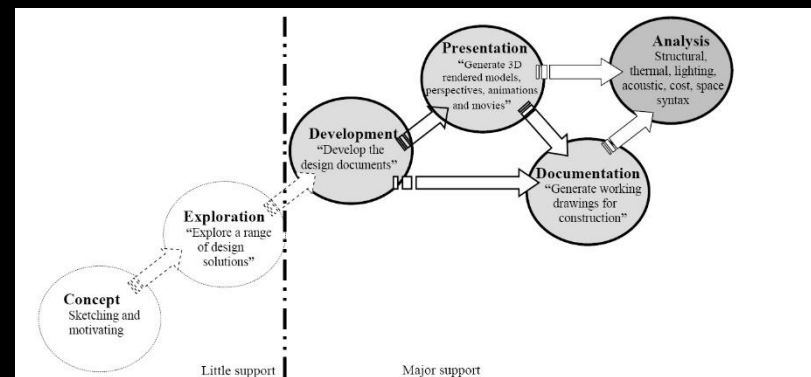
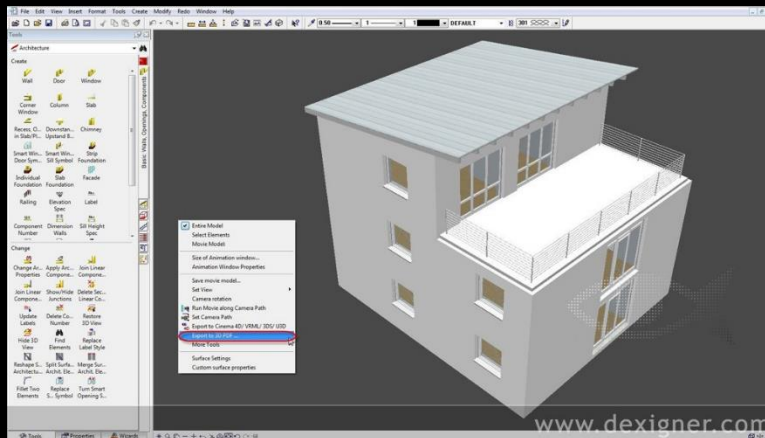
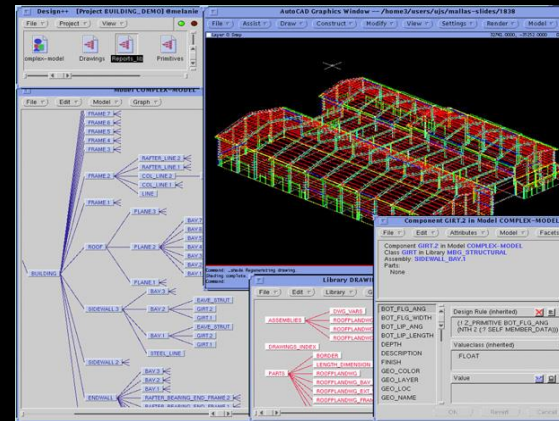
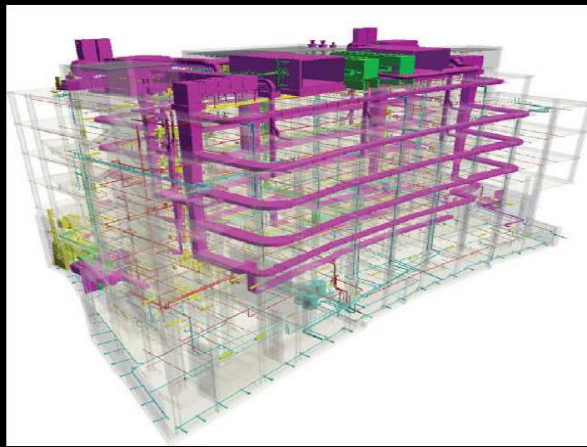
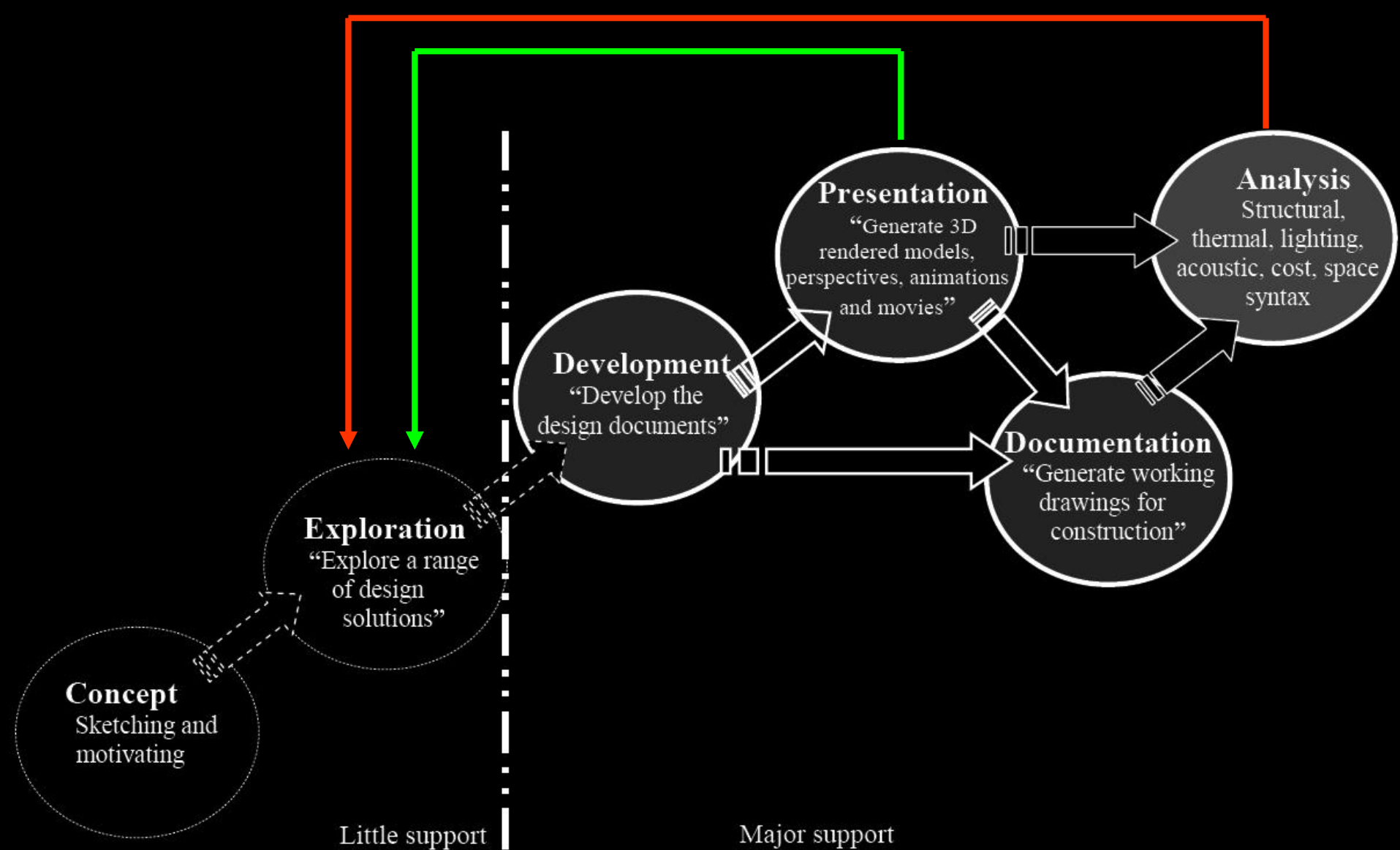


FIG. 3: Computer aided support to various stages of the design process in the second generation of CAAD.

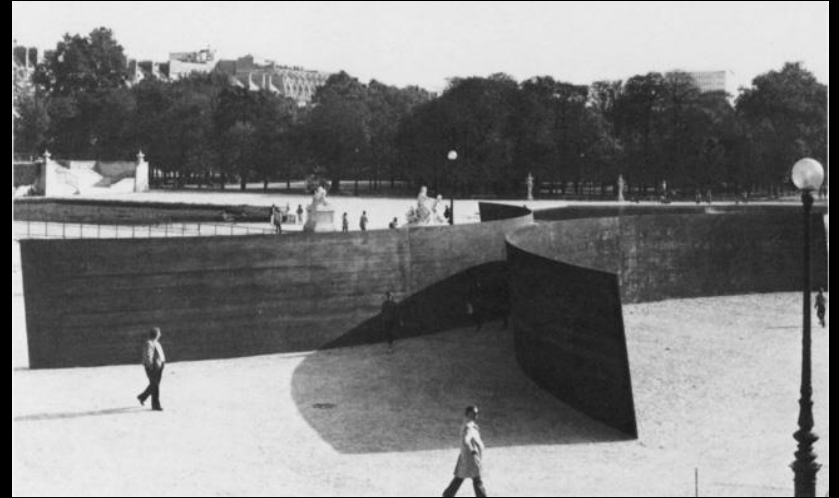
The evolution to 3D representation in digital tools such as the current development of a building information model (Eastman, 1999) continues the dominant functionalist and documentation orientated trajectory of CAAD (Refat, 2006)



temporal context # 1



spatial sequence over time



temporal context # 2

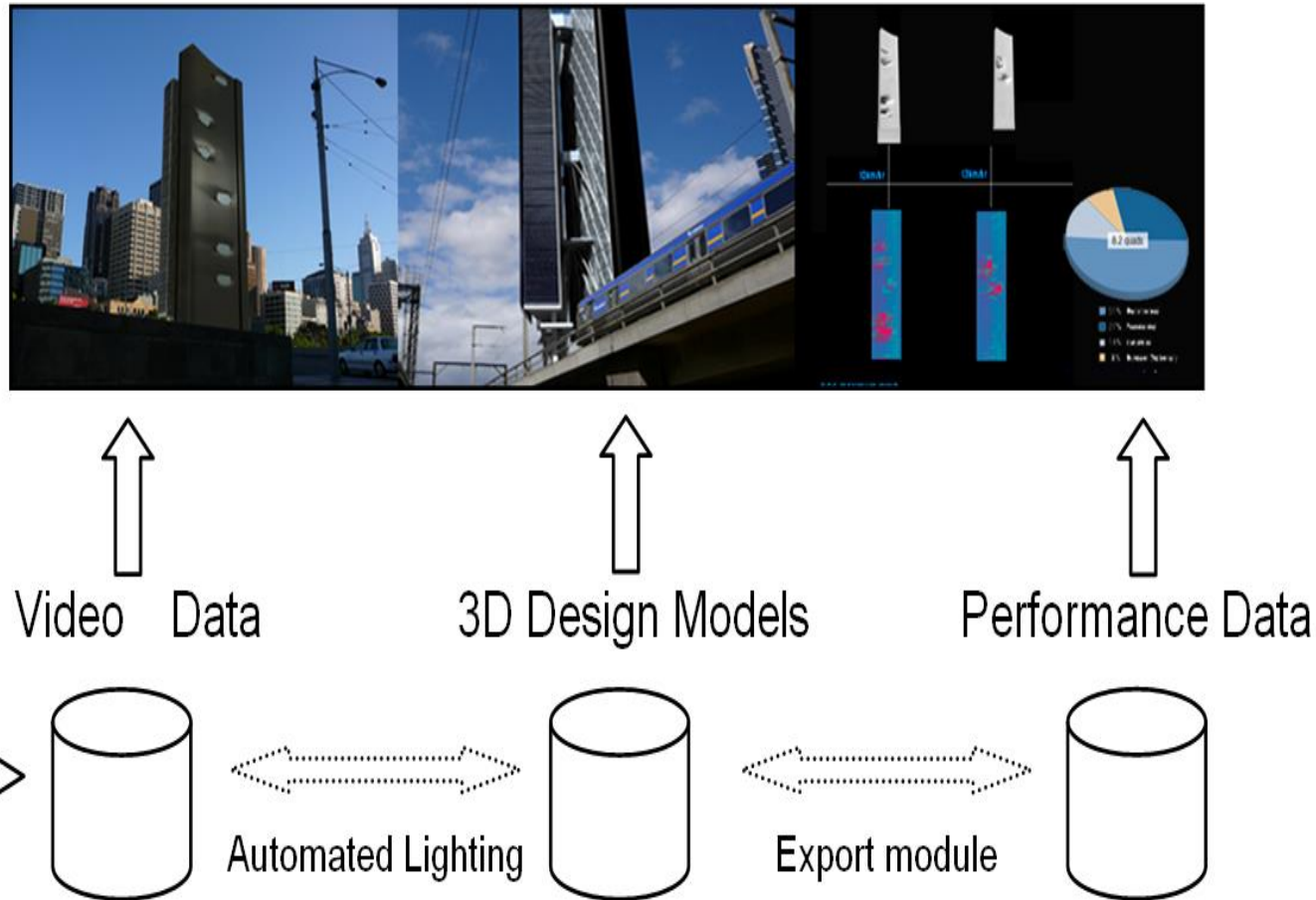
dynamic environment

qualitative evaluation



quantitative data

Video-dat AR Simulation Environment

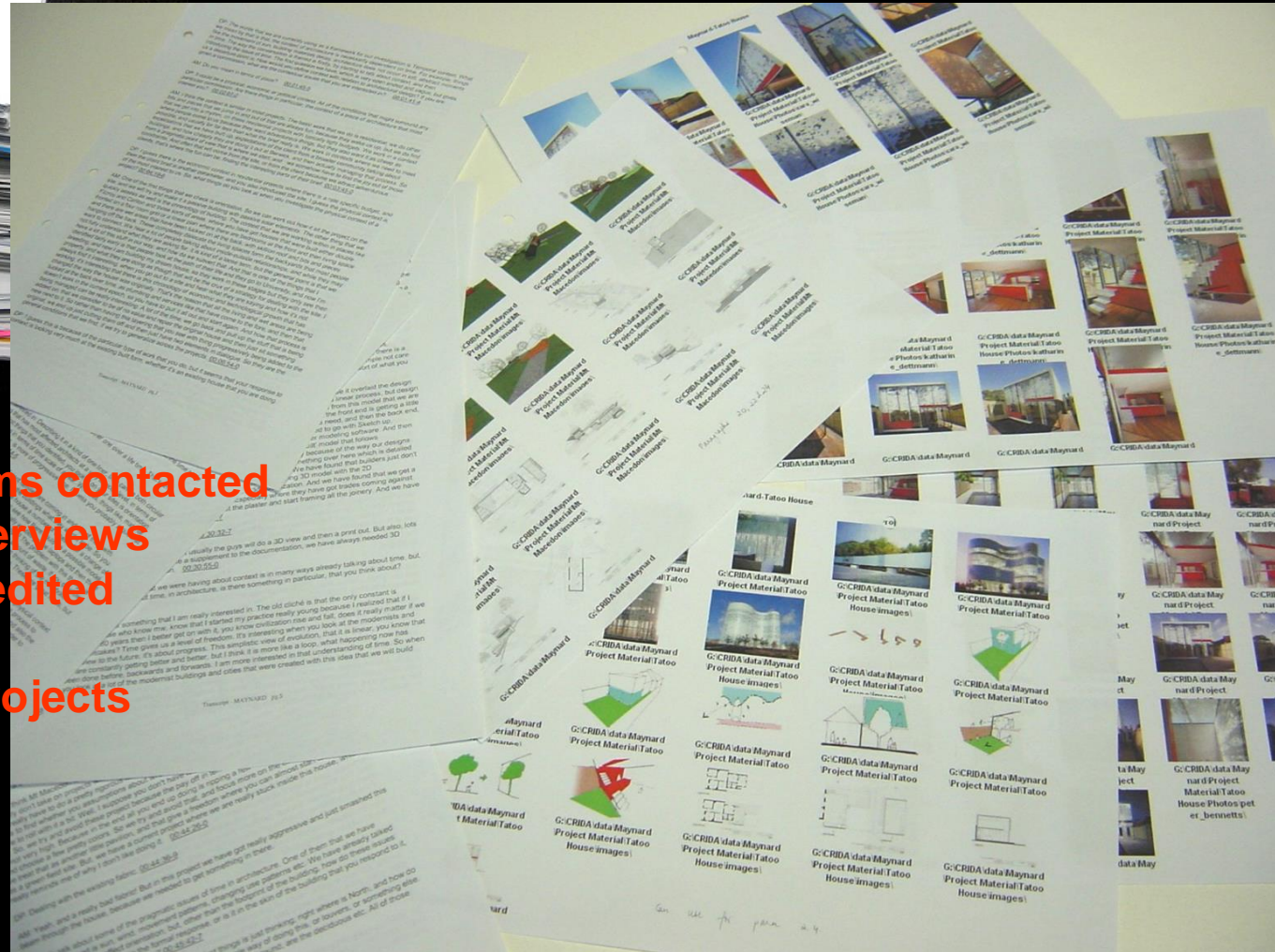


Prototype developed for ARC grant application

Practice Survey



32 Melbourne firms contacted
22 structured interviews
95,000 words of edited
transcripts
+ images of projects



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Analysis of Practice Survey

Prototype Specifications

Context

Time

Critical Junctures

Exceptions

Recurrent themes / typologies

Constraints and Opportunities

Situated view cones

Peripatetic movement

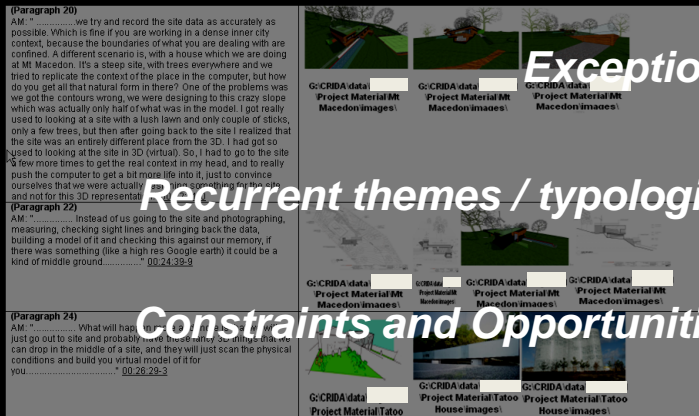
Site + Time dependent changes

Volumetric morphing bet' points

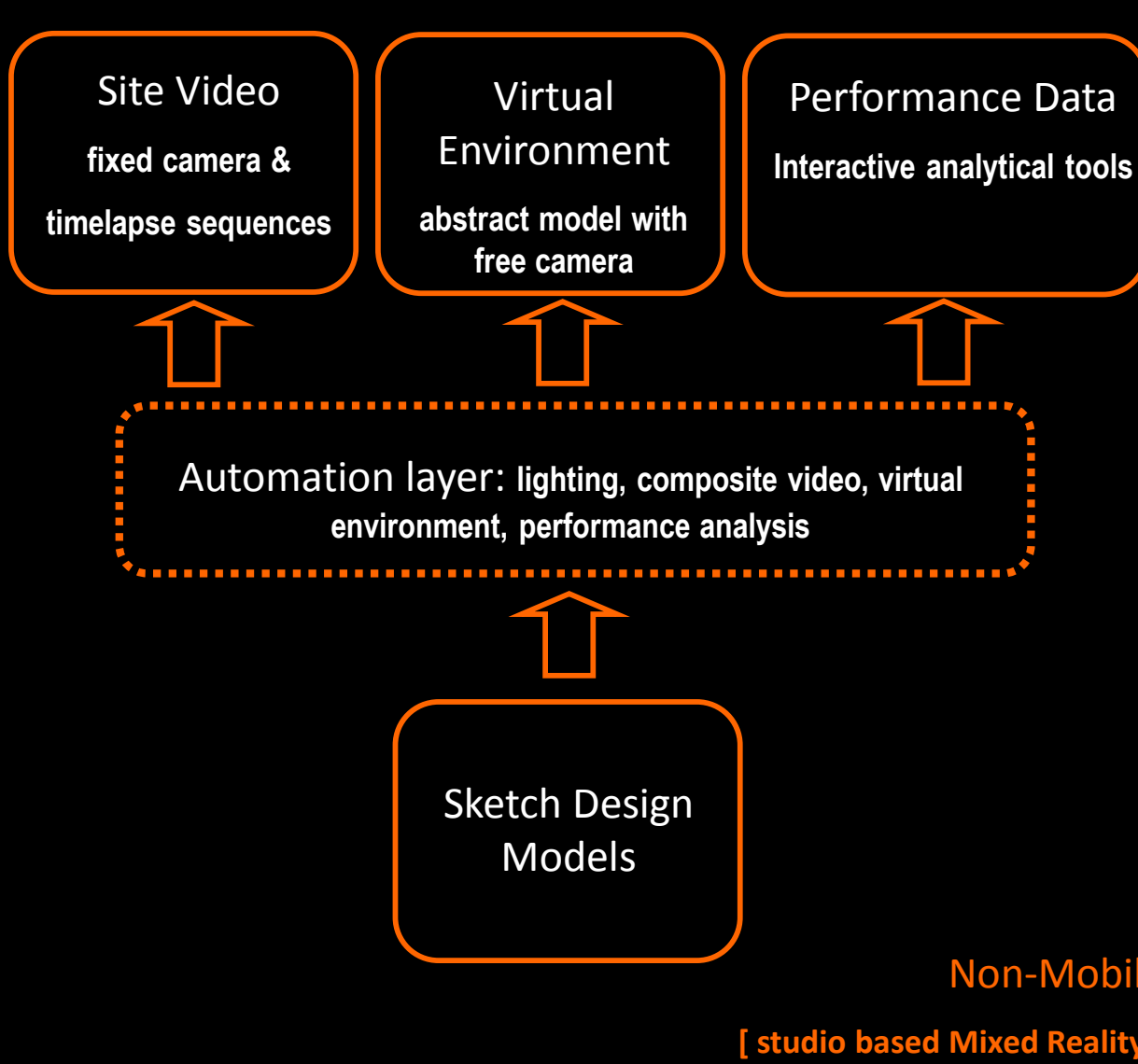
Switching representations

Working in 3D depth planes

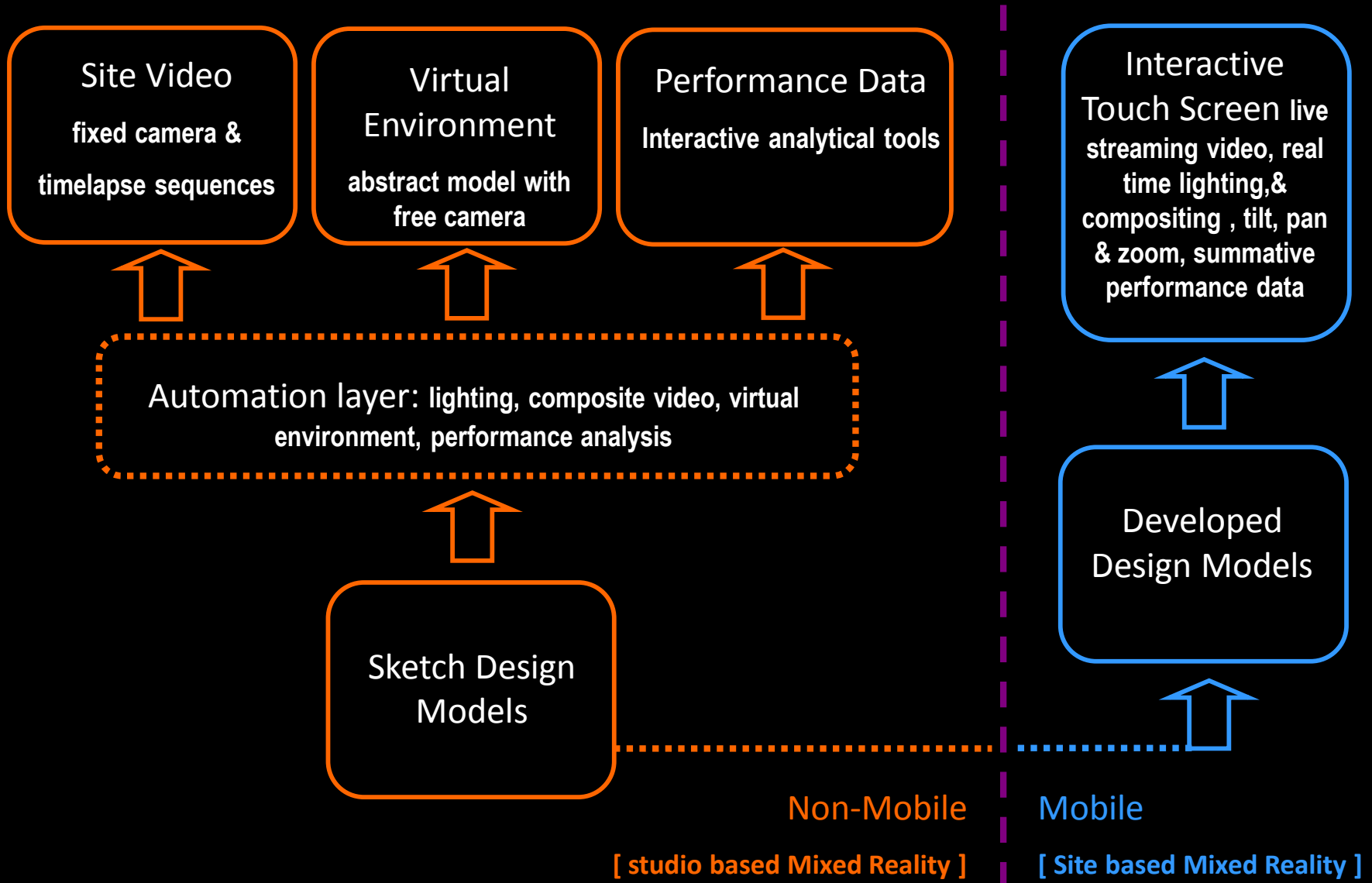
...



Two prototypes



Two prototypes



ILLUSTRATIVE PROJECT

Quantitative Measures

- Impact of sunlight on internal temperature
- Internal Lighting Levels



Commonwealth Bank Tower, Melbourne

Qualitative Evaluation

- Legibility of embedded information (graphics & text)
- Visual impact on the internal spaces

Concurrent Evaluation the Quantitative and Qualitative in A Temporal Context

*Sun screening system that is required to perform environmentally
and also as a large scale information interface*

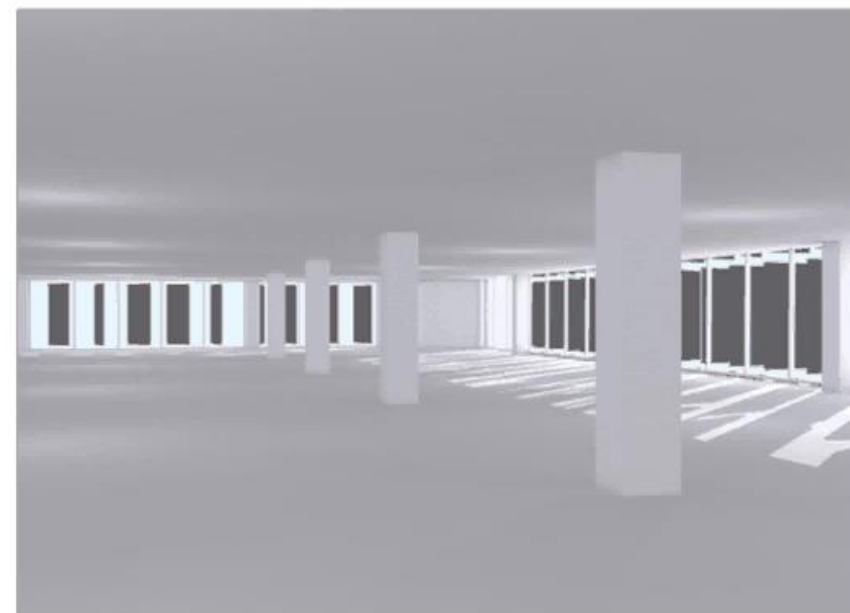
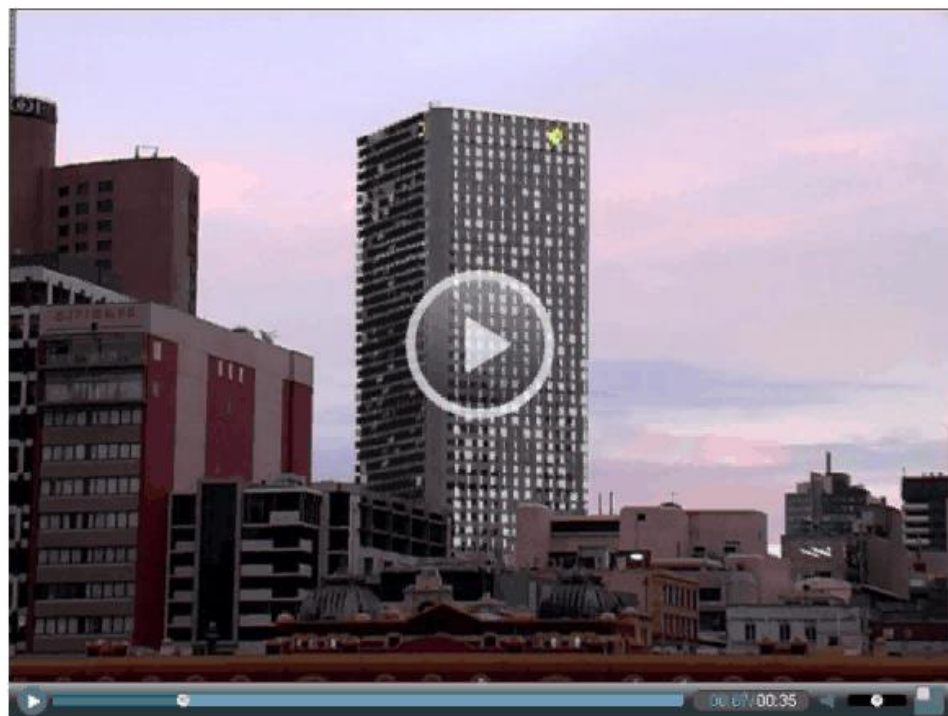
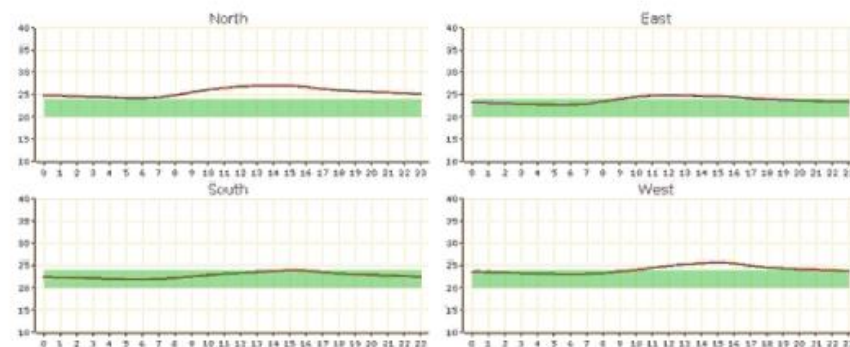
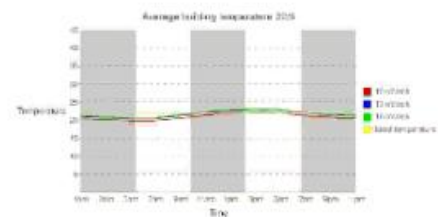
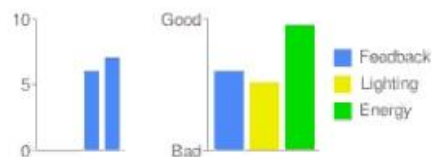
Rate range of aesthetic possibilities?

Average: 6

Jules Moloney: Grain suitable for low-res image
6/10

Grain suitable for low-res image from this distance and viewing position. Good exposure from river promenade and arts center. Not sure about other views - need to check again

6 Update



Sep 22: Video 1 Video 2 Video 3 Video 4



Mobile system

[Site based Mixed Reality]

2006 -10 University of Melbourne



Mobile system

[Site based Mixed Reality]

2006 -10 University of Melbourne



2011 Back to NZ ...



NEW ZEALAND

WHY NOT?



NEW ZEALAND DON'T EXPECT TOO MUCH - YOU'LL LOVE IT



WHY TRAVEL THE WORLD WHEN YOU CAN VISIT NEWTOWN



© Murray Neill 2008

NEW ZEALAND DON'T EXPECT TOO MUCH - YOU'LL LOVE IT

Legacy of NZ frontier mentality

Great landscape! ...

Minimal attention to the built environment

Why do we not aspire for better?

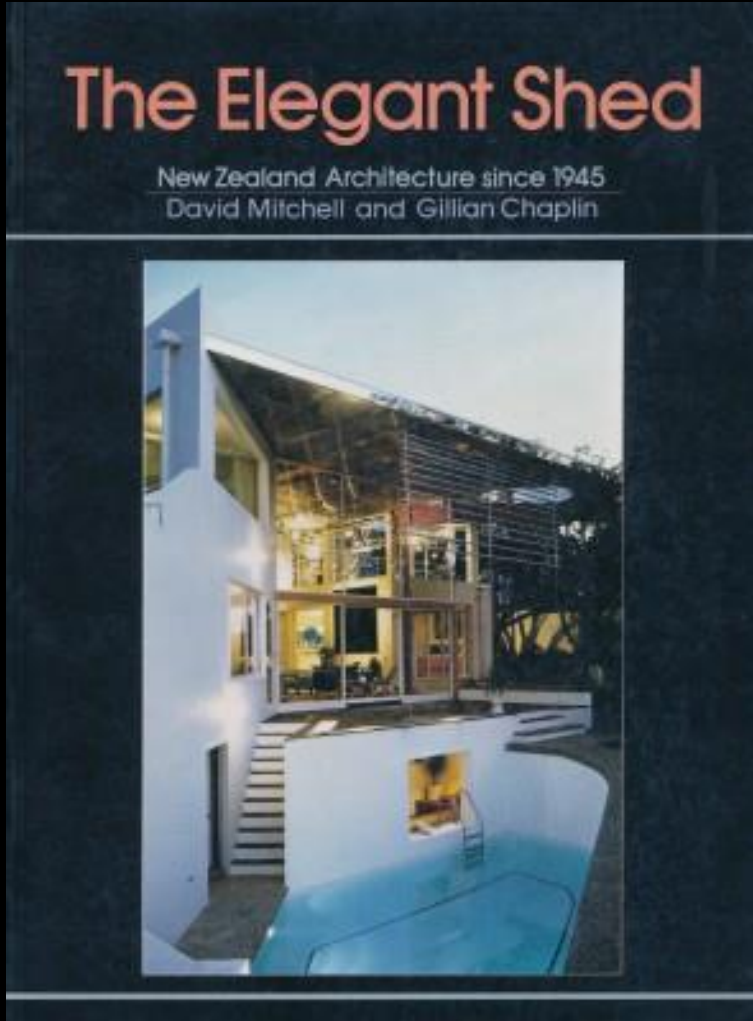
Legacy of NZ frontier mentality



Hans Peter Knutzen, manager of the Piha Mill, photographed sitting on the front veranda of his mill house has been used as an icon of New Zealand architecture for over 50 years

Shed Mentality

... sometimes elegant



Shed Mentality

... mostly 'cheap as'



Response to the housing crisis

... a bit (more) ugly

“There's no point having beautifully designed cities if 90 percent of New Zealanders can't afford to live in them. We might have to get a bit ugly.”

(Bill English, TV3 News 31.05.14)



... surely we are better than that ?

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What do we mean by BETTER ?

... towards a balance between the science and art of building

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*BETTER has a qualitative dimension that needs to be considered
alongside pragmatics and performance*

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... towards a balance between the science and art of building

*BETTER has a qualitative dimension that needs to be considered
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*.... best achieved by **design-led** research*

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*BETTER has a qualitative dimension that needs to be considered
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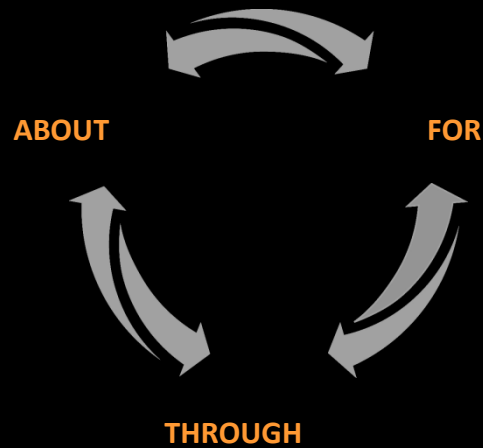
..... best achieved by design-led research

What is design-led research ?

Examples from VUW School of Architecture

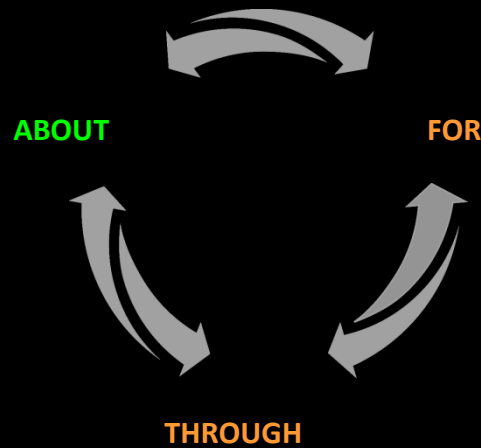
What is design-led research?

*Current thinking has settled and the tripartite model of **design about, for and through design** is generally accepted*



What is design-led research?

research about design focuses on the methods, media and techniques that are used to carry out design. In particular there is significant contemporary research and experimentation in alternate design methods based on opportunities afforded by advances in digital technology



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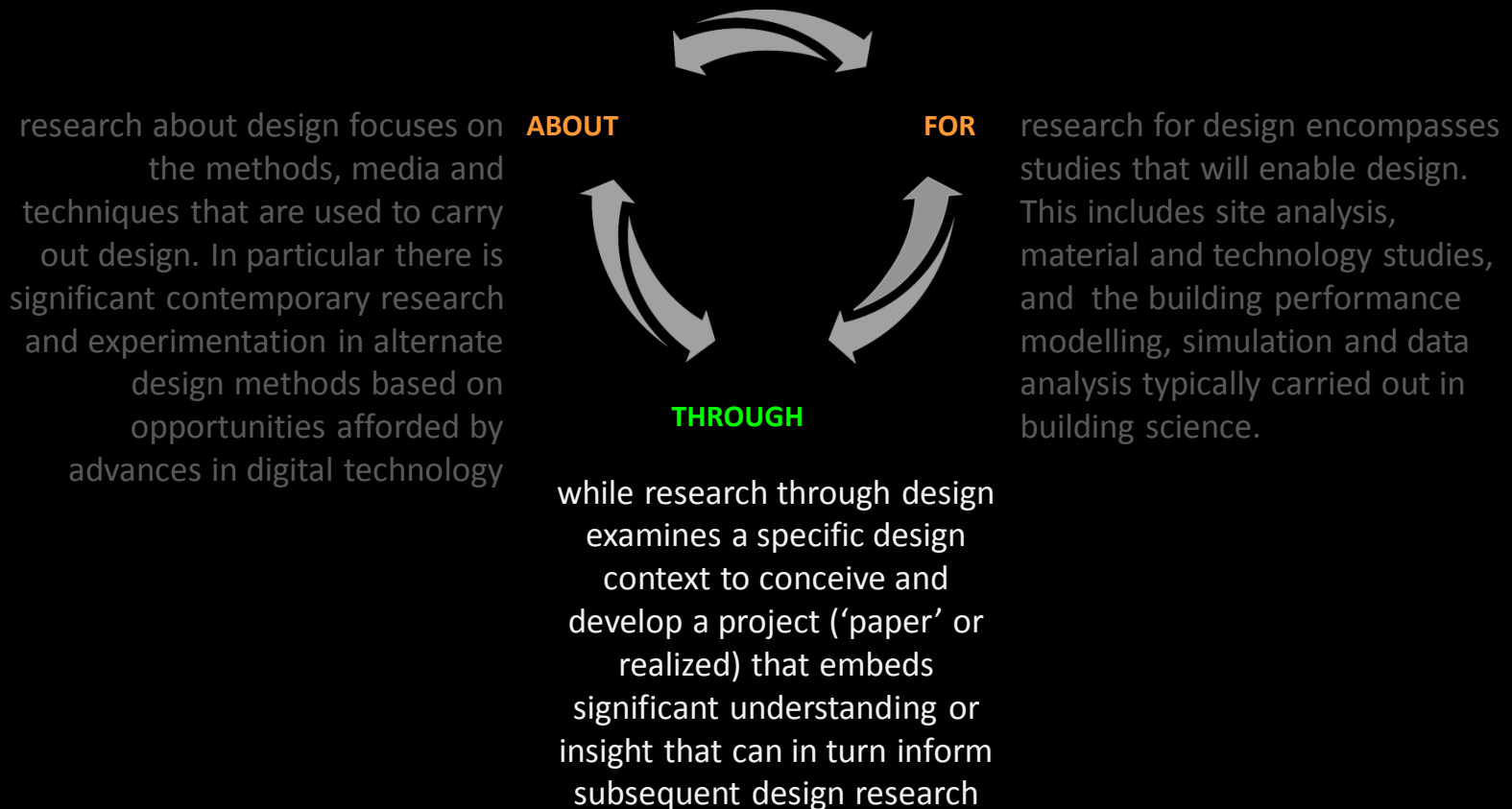
ABOUT

FOR

THROUGH

research for design encompasses studies that will enable design. This includes site analysis, material and technology studies, and the building performance modelling, simulation and data analysis typically carried out in building science.

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ABOUT

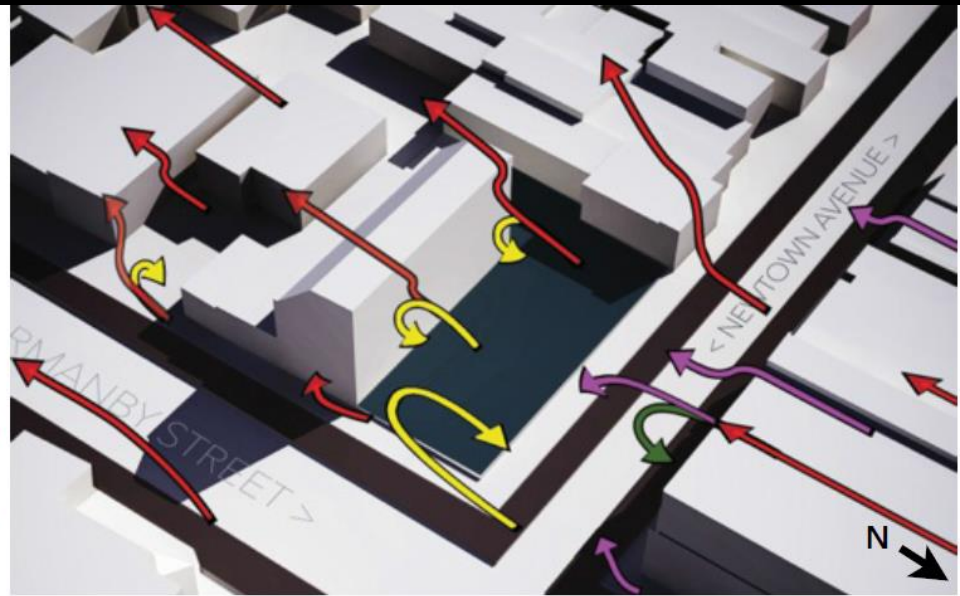
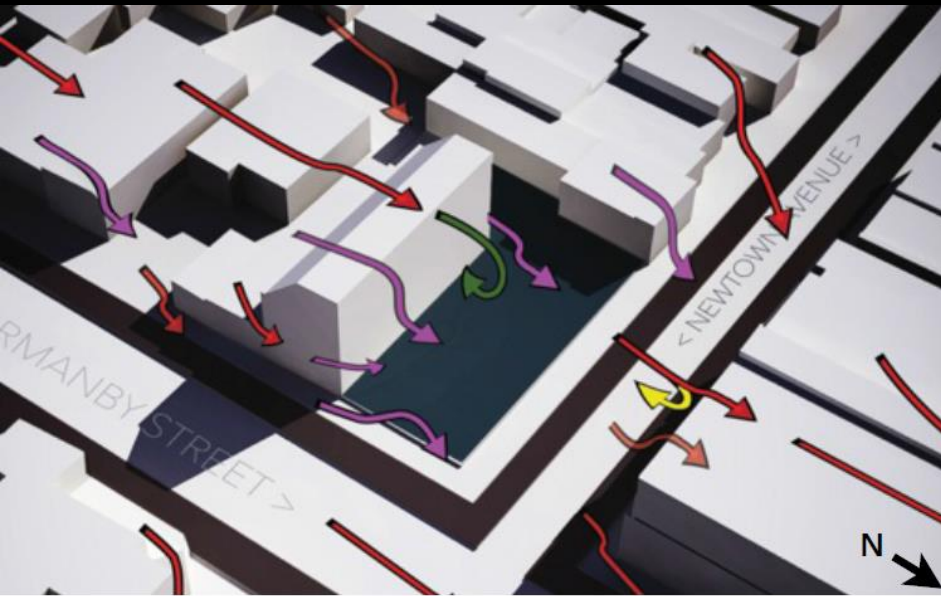
FOR

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THROUGH

while research through design examines a specific design context to conceive and develop a project ('paper' or realized) that embeds significant understanding or insight that can in turn inform subsequent design research

Design-led research examples from the VUW School of Architecture



Accelerated Airflow

- Wind being accelerated over buildings. Flowing around or over lower structures that offer no or weak resistance to the wind from the specified direction.



Rolling Vortex

- A tall stand alone building generates a rolling vortex where some air pressure gets trapped and 'rolls' over on the windward side causing an acceleration of wind speed.



Turbulent Wake

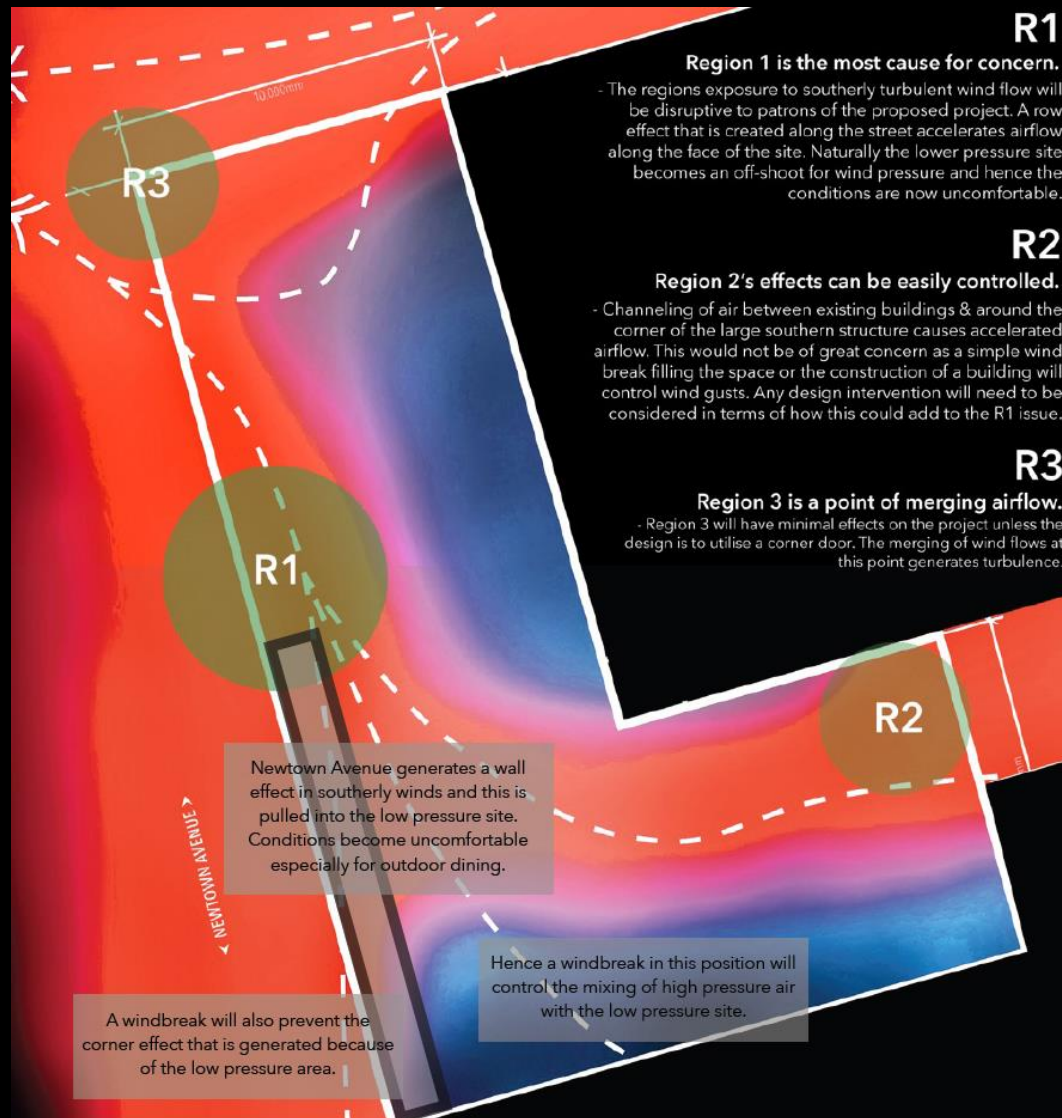
- Wake mixes with the downwind 'low pressure' air causing pockets of circulating and accelerated air; turbulent flow.



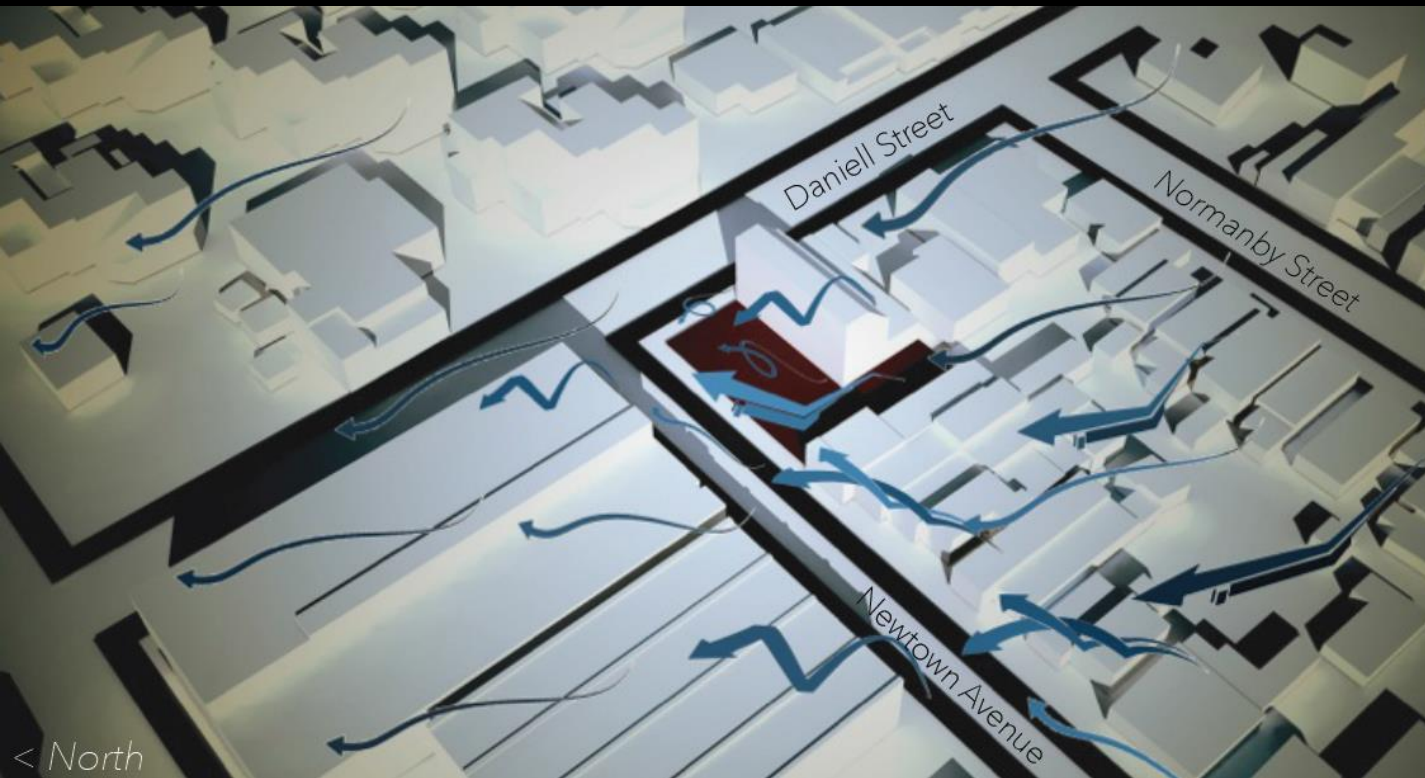
Wise Effects

- A more intense form of Turbulent Wake caused by a another building that traps the Accelerated air at street level (more severe if the lower building is to the wind).

Design-led research examples from the VUW School of Architecture



Design-led research examples from the VUW School of Architecture



Wall-Row Effect

Highly Accelerated Air Flow

Weak Vortex Roll

Turbulent Wake

Moderately Accelerated Air Flow

Design-led research examples from the VUW School of Architecture

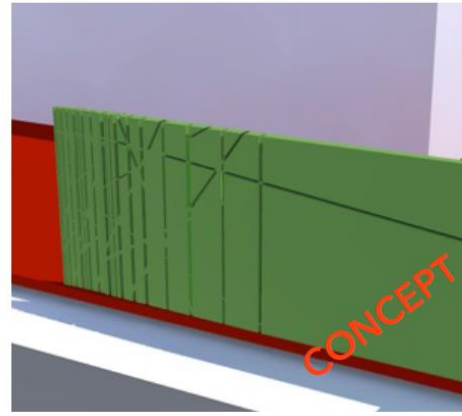
PLANTING ON CORNER - Basic

around and at the corner area to create a porous wall wind break system.



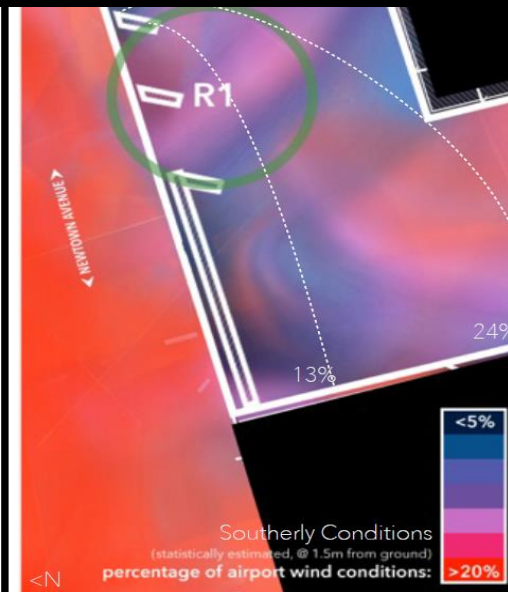
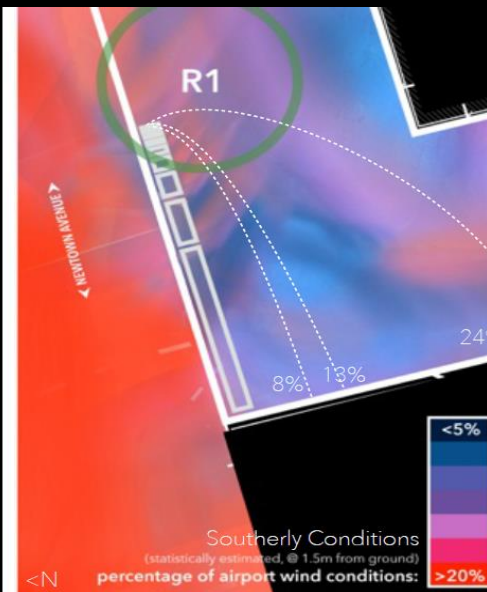
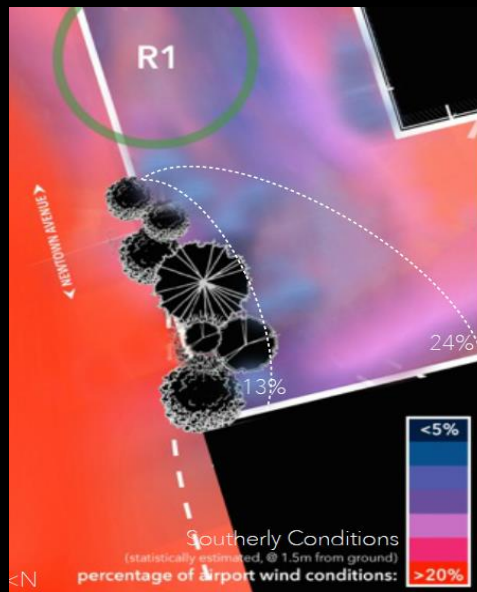
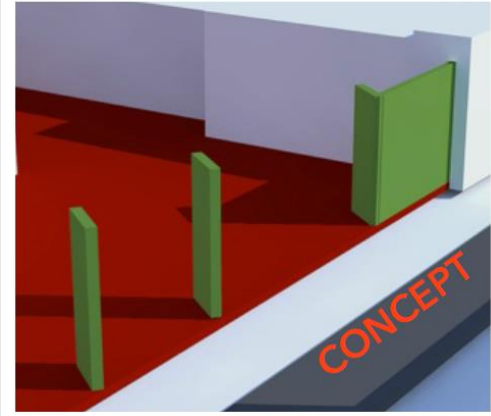
POROUS SHUTTERING - Medium

that deflects winds of the site and constructed of a transparent material.



FRACTURED FACADE - Advanced

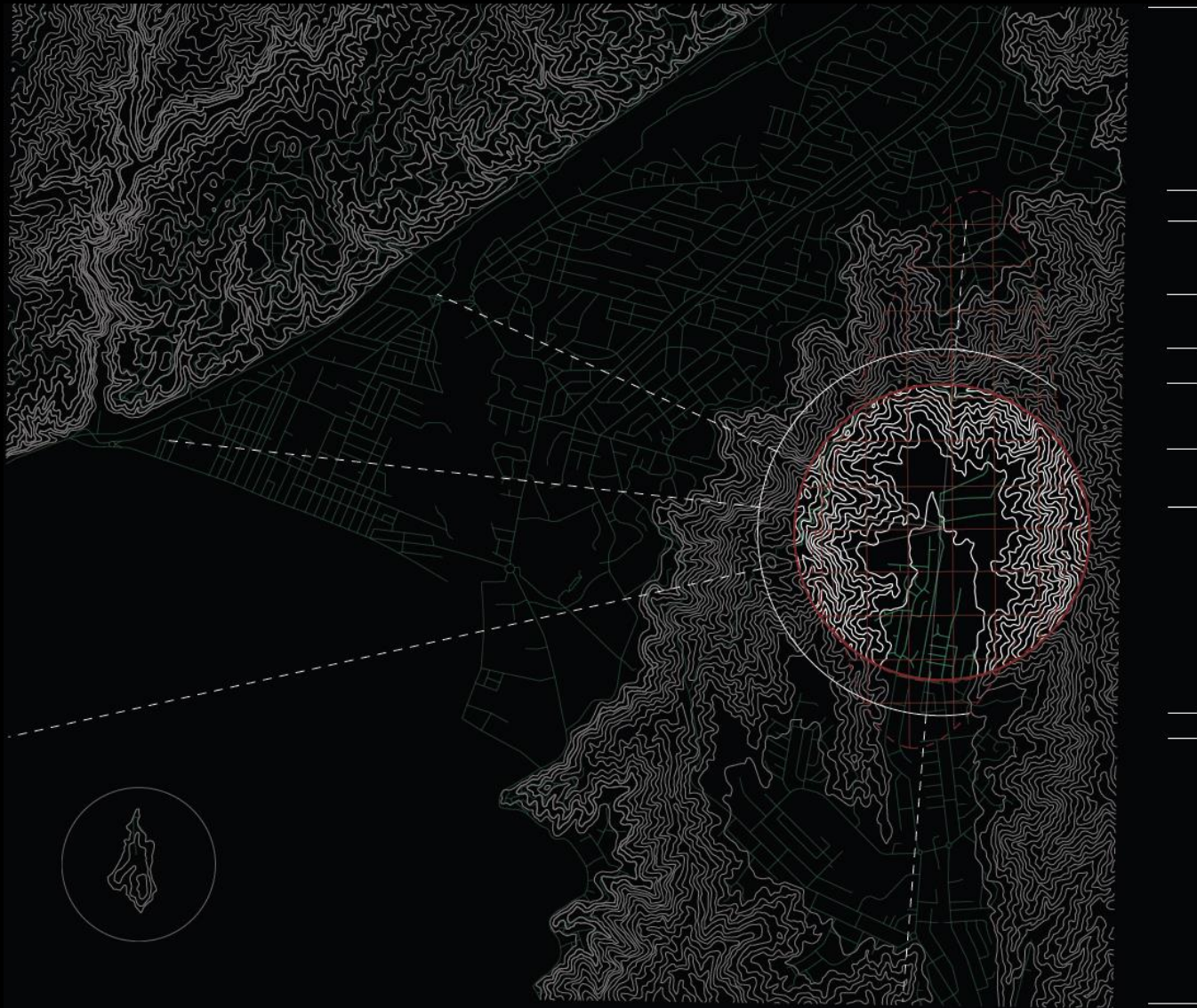
site frontage to displace wind streams (stepped forward and backwards).



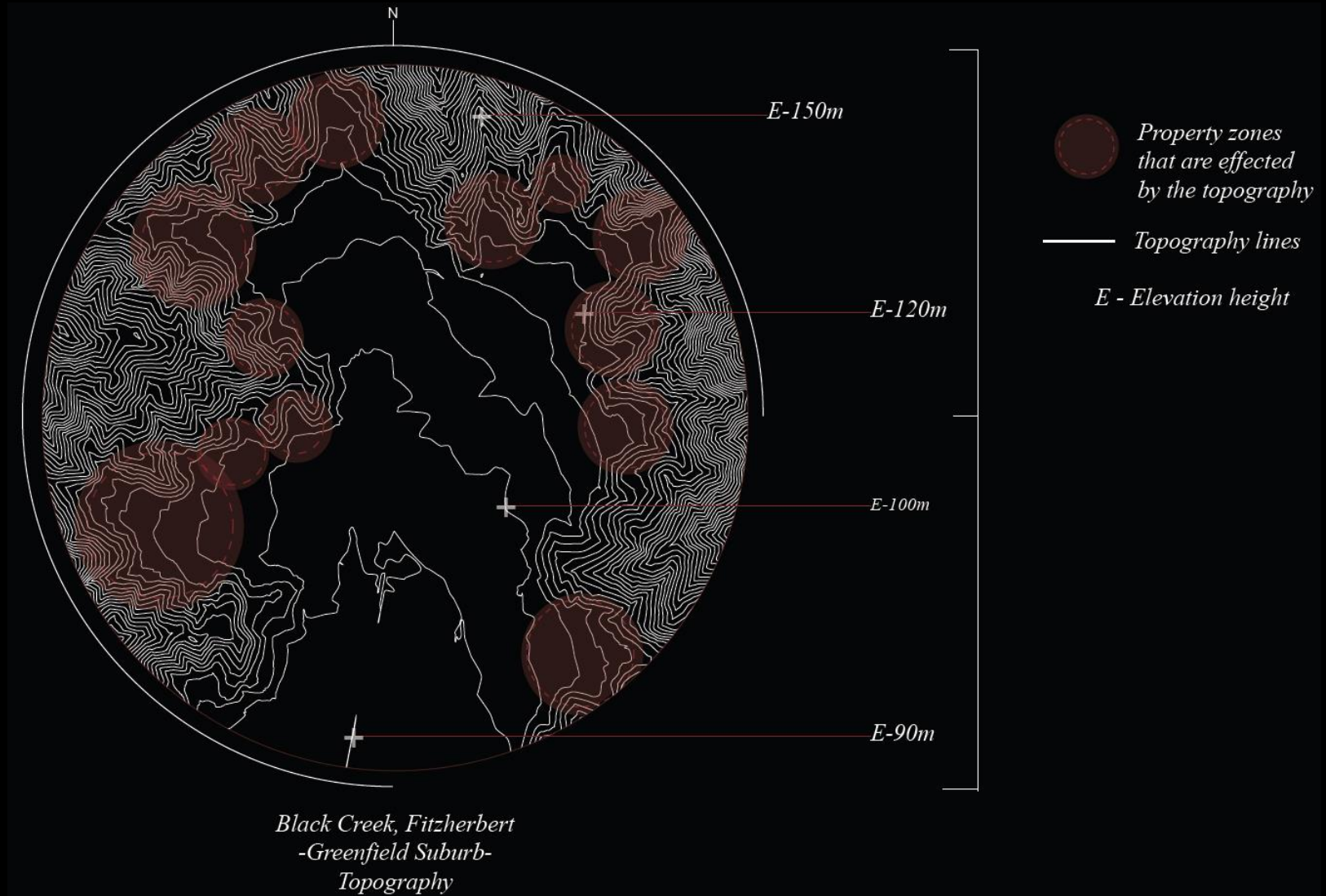
Design-led research examples from the VUW School of Architecture



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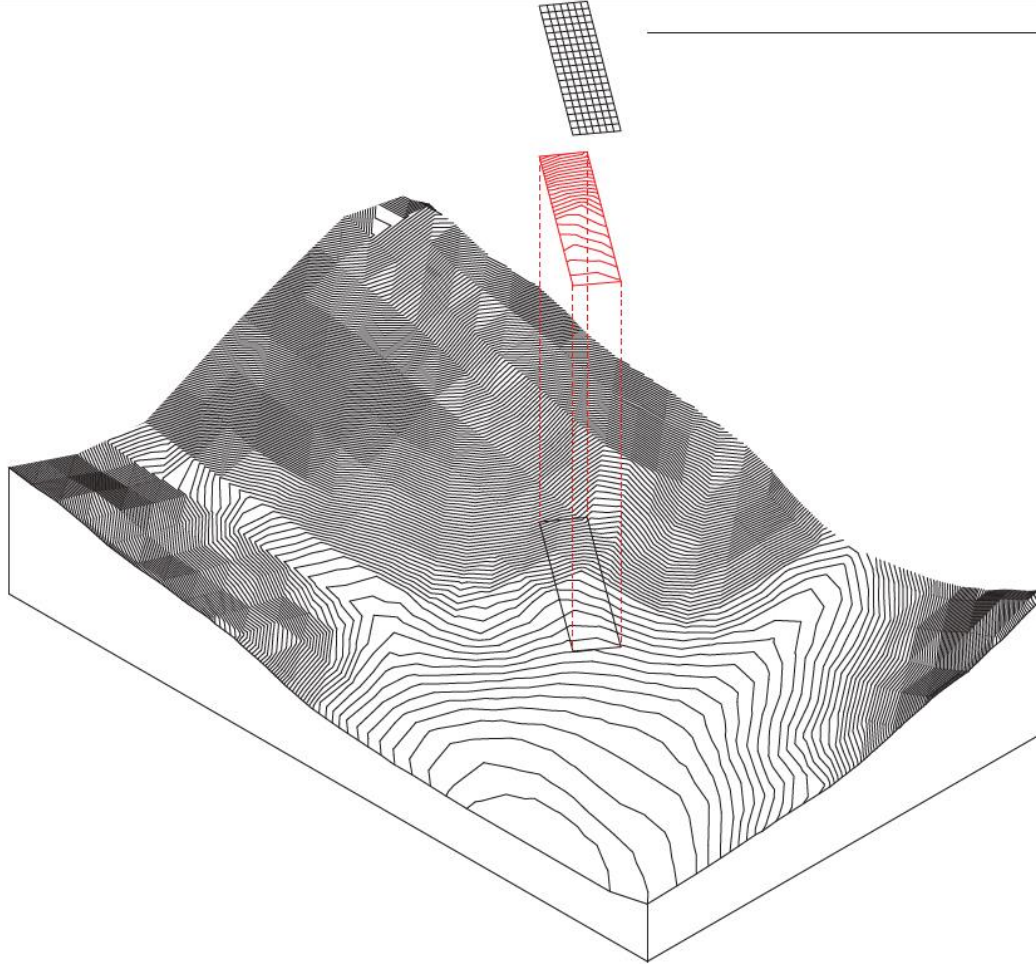
Design-led research examples from the VUW School of Architecture



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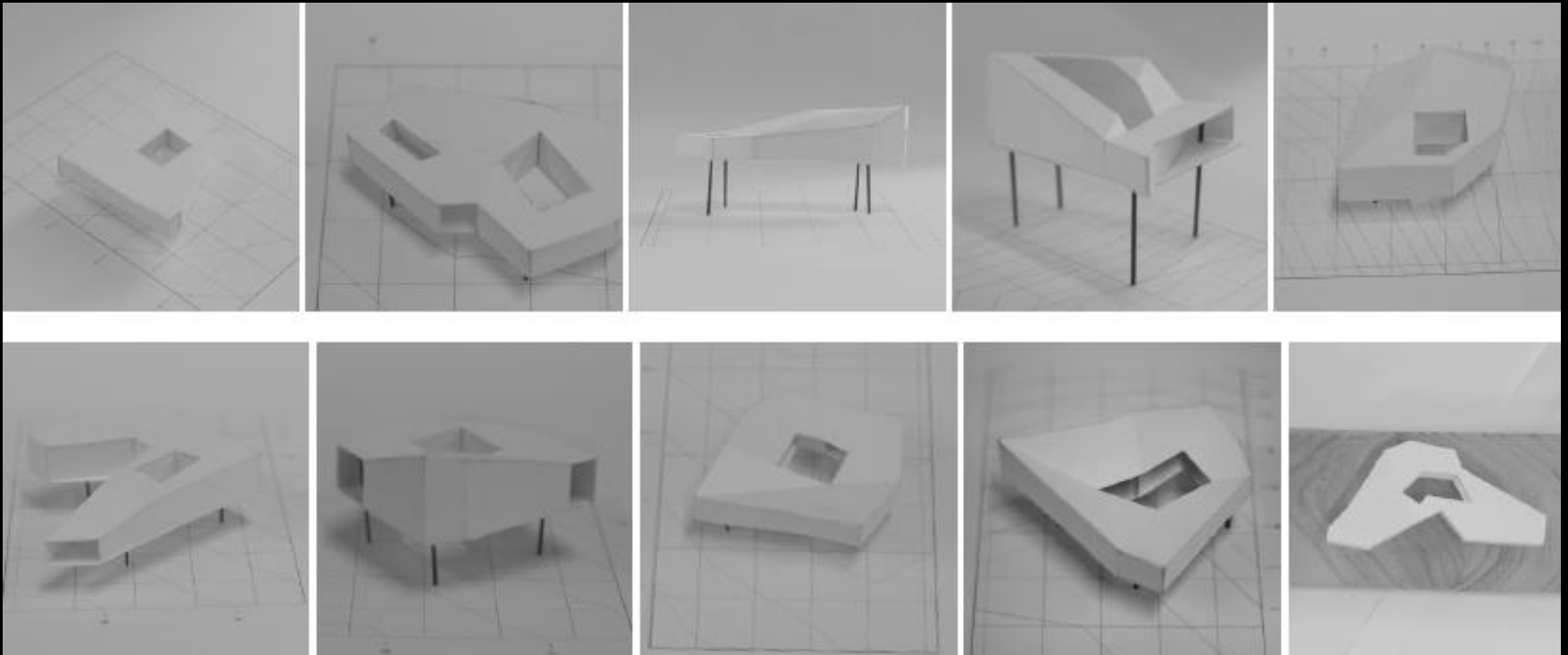
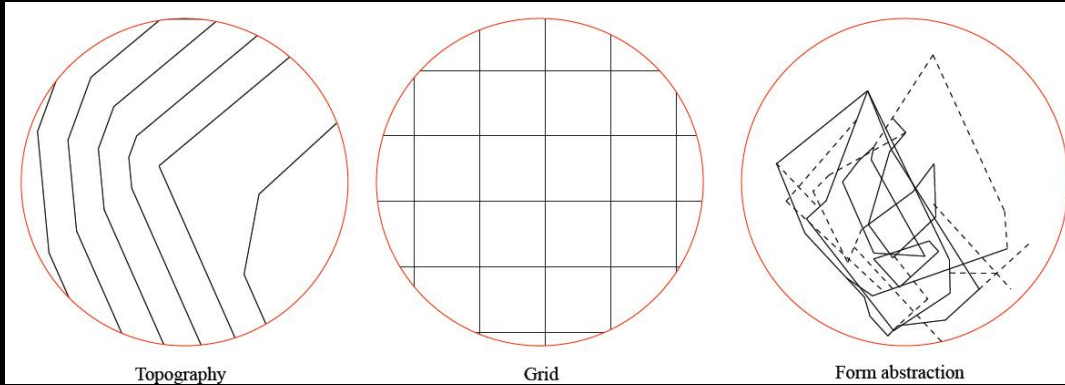


Exploded site axo



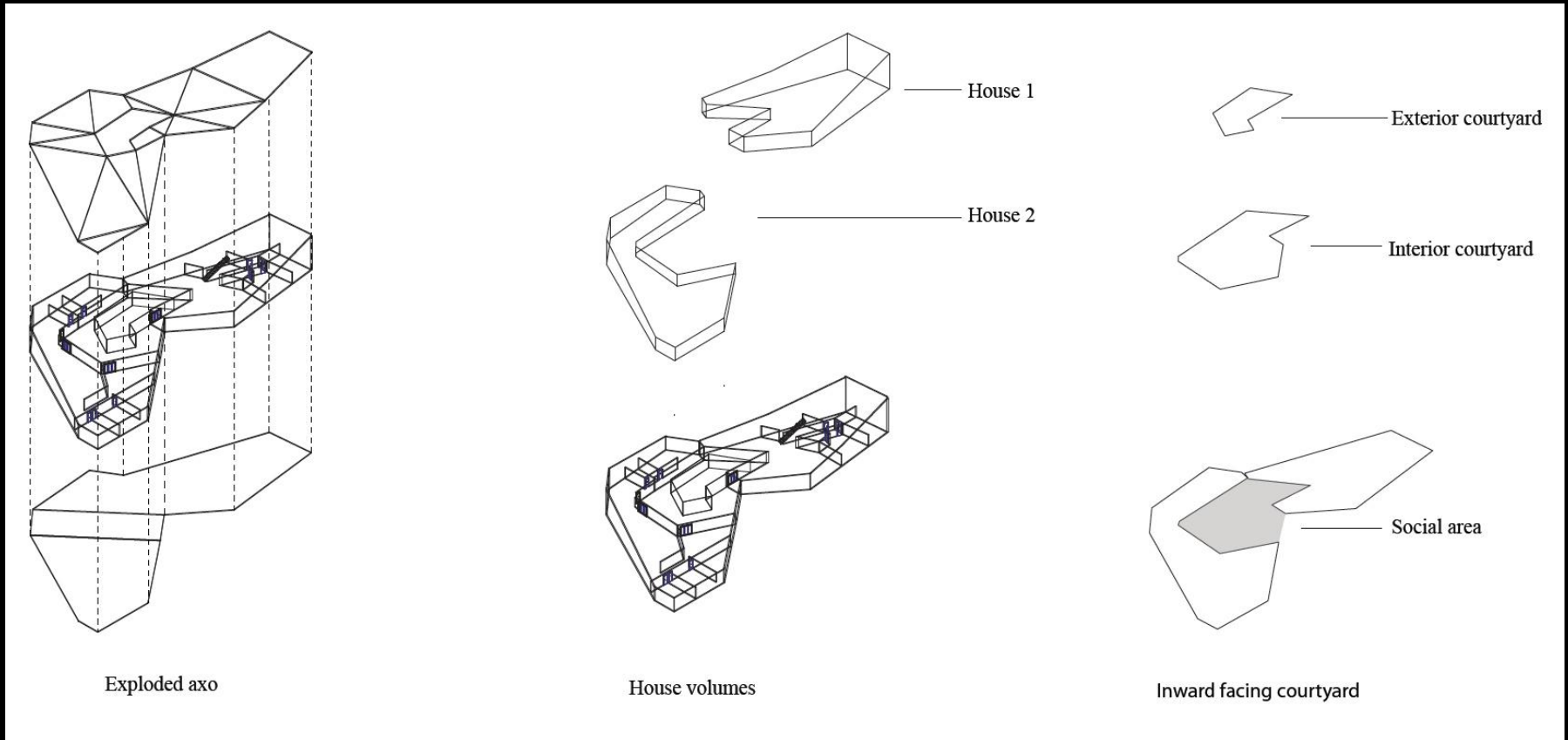
Site Images

Design-led research examples from the VUW School of Architecture



Year 3 / 4 Elective – House + Home (Simon Twose): **Calibrating development to typography and socio-cultural specifics**

Design-led research examples from the VUW School of Architecture



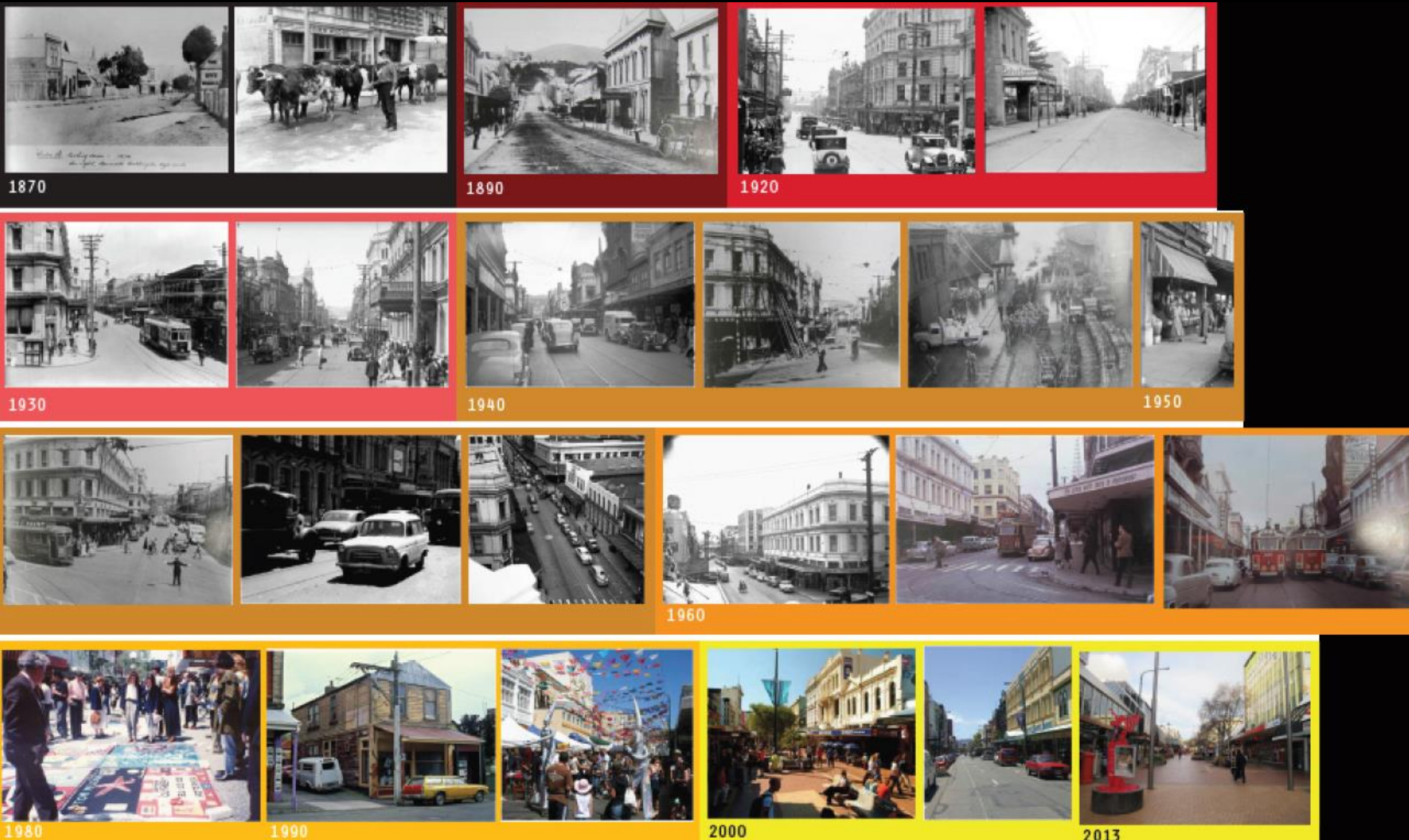
Proposition for a courtyard house type tuned to contours. The courtyard provides separation and privacy between the different homes while also creating a contained social space.

An example of design adding value to difficult sites and enhancing socio cultural context

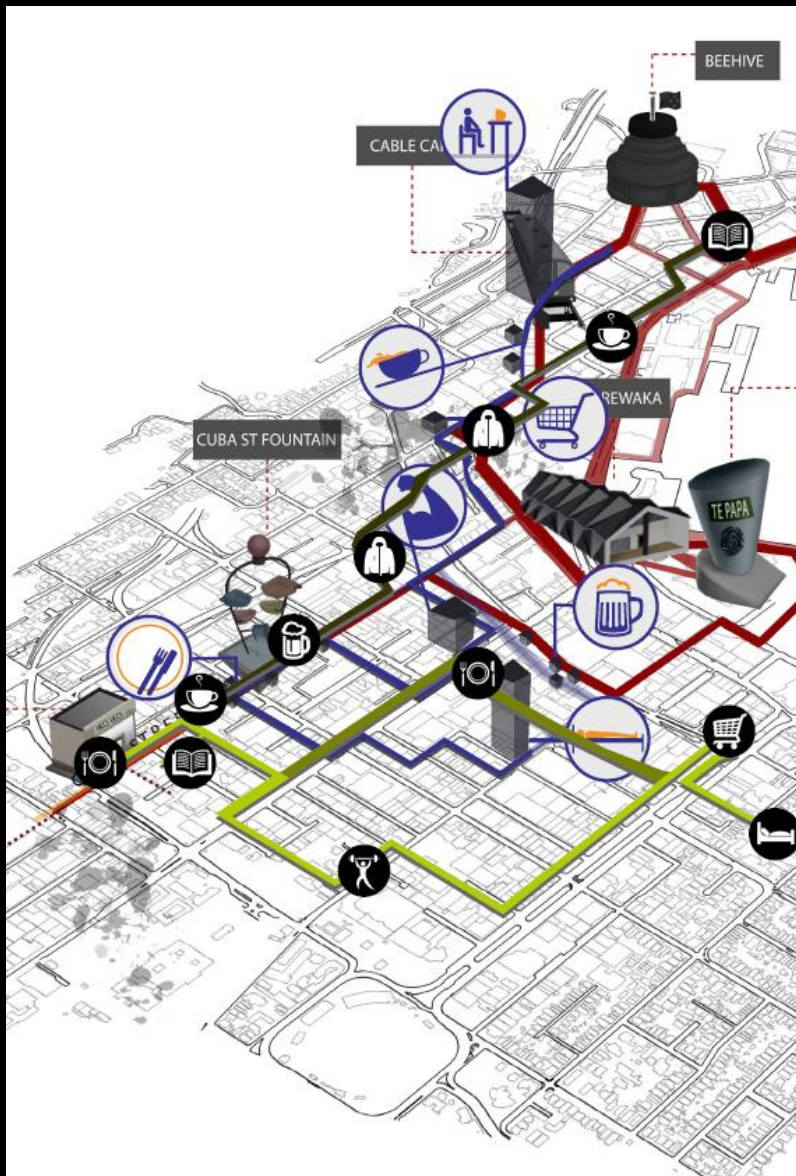
Design-led research examples from the VUW School of Architecture



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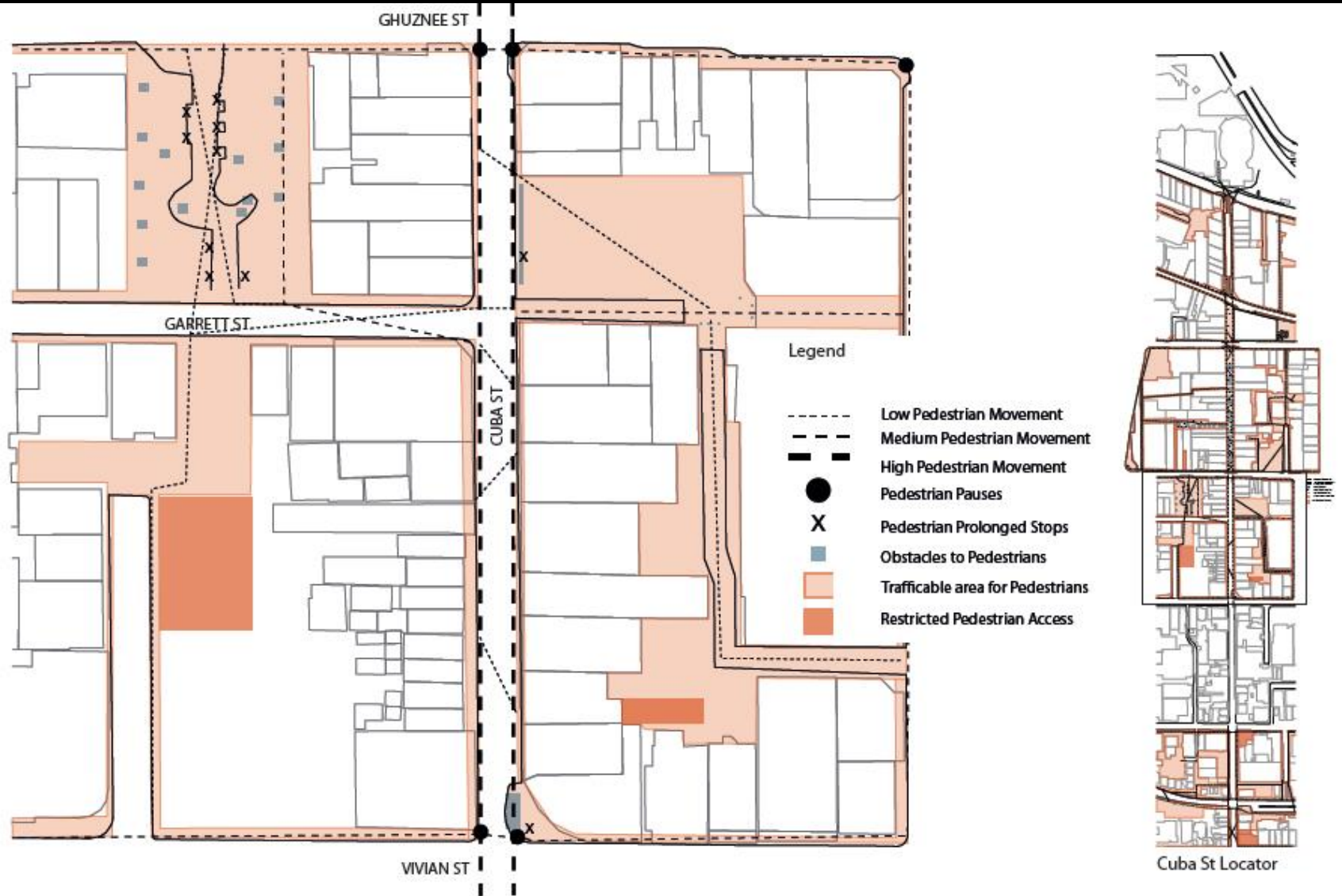


Design-led research

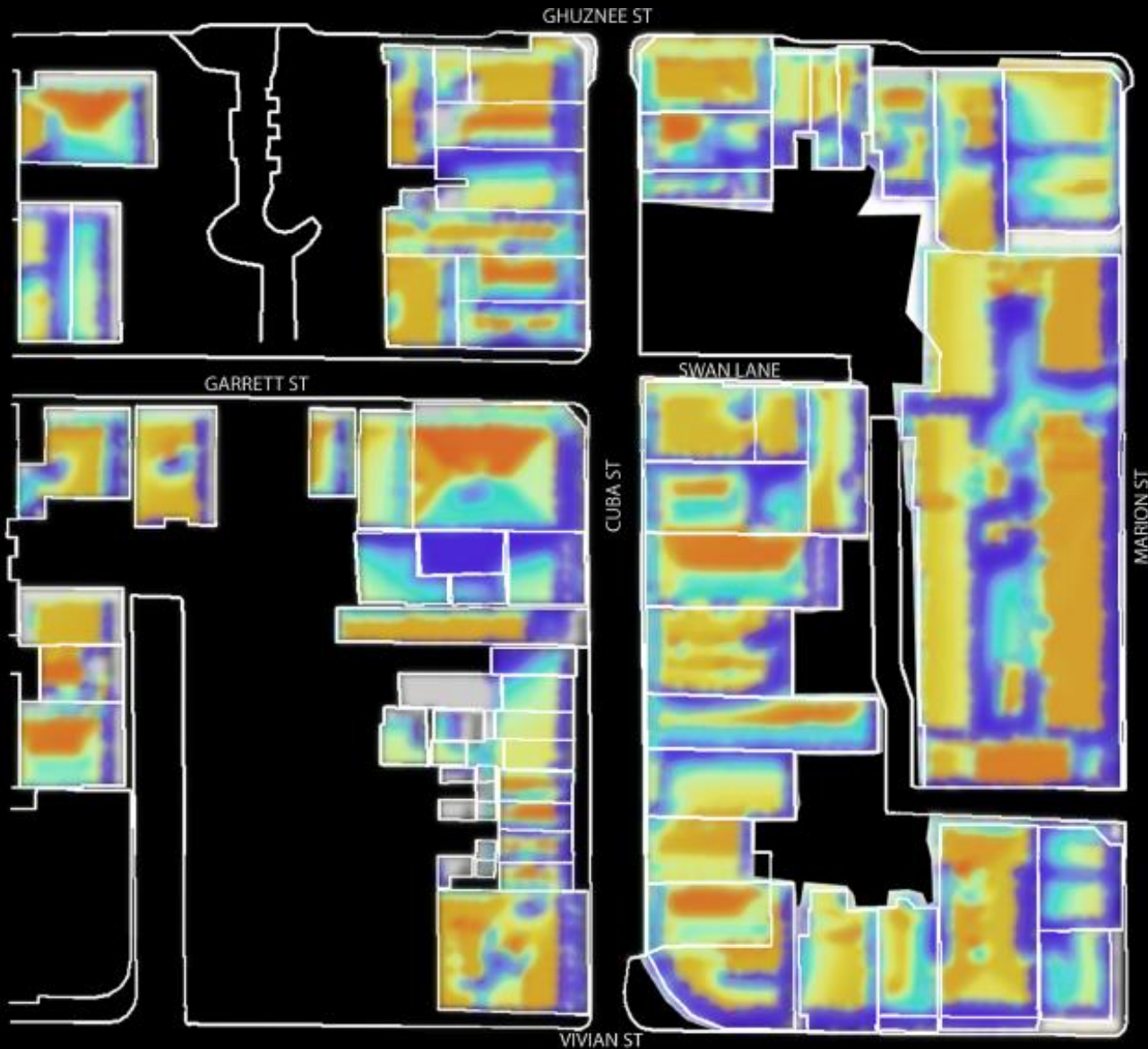


Year 4 Integrated Design Studio (Mark Southcombe / Andrew Charleson): **CUBA ST heritage seismic strengthening study**

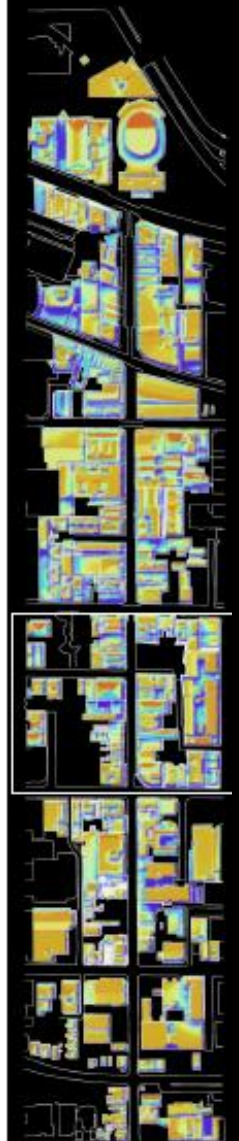
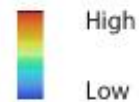
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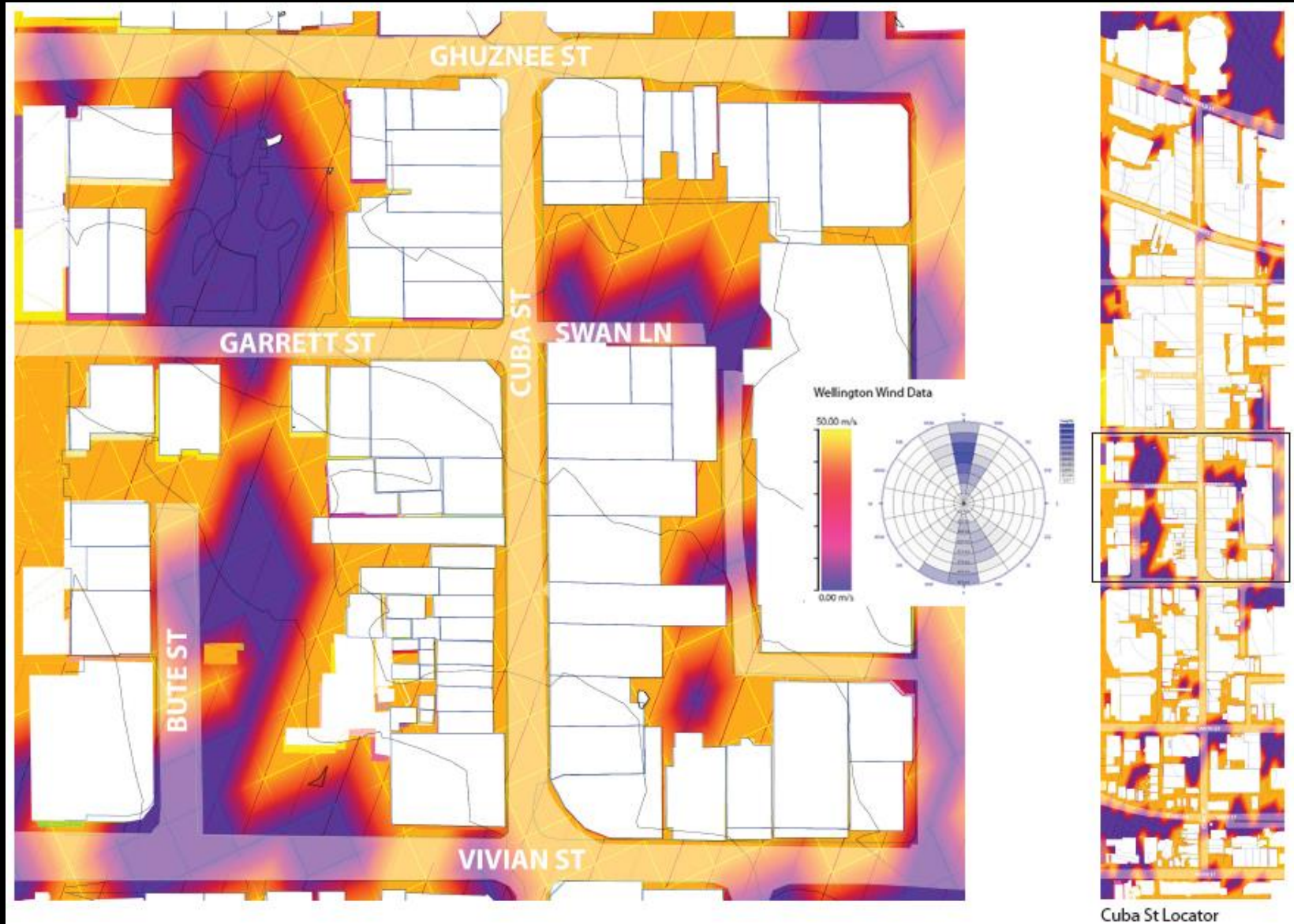
Design-led research examples from the VUW School of Architecture



Legend

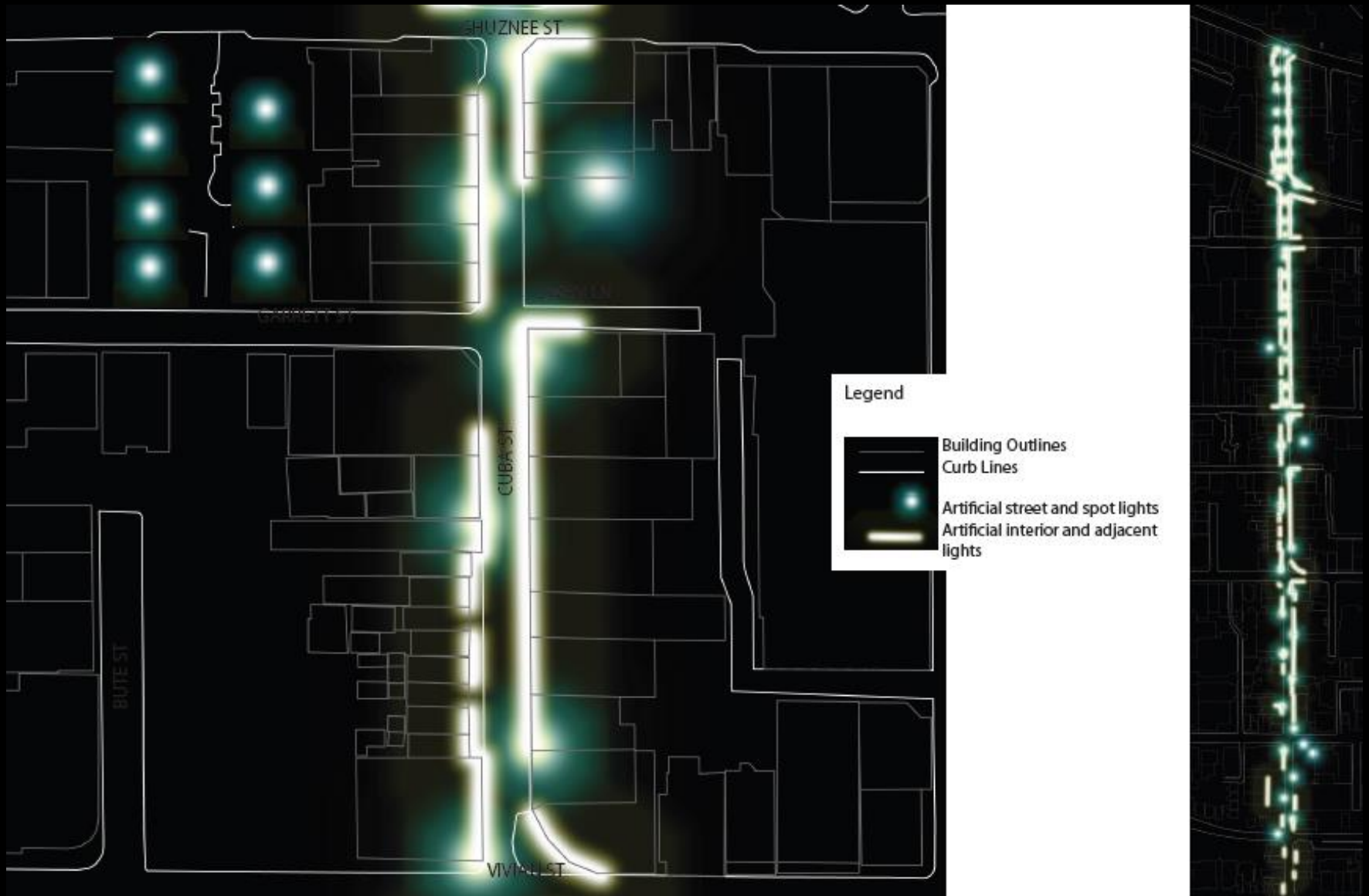


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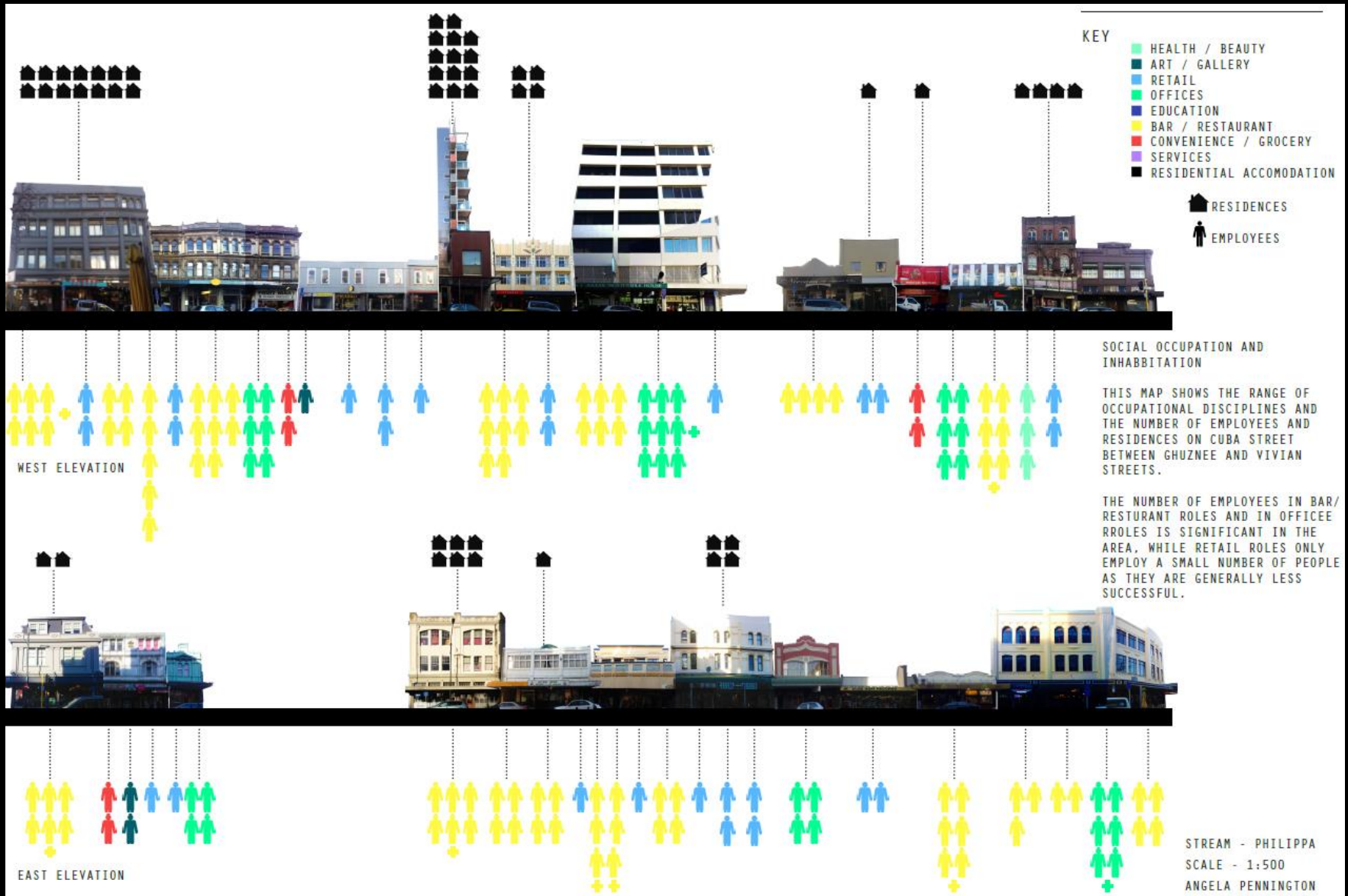


Year 4 Integrated Design Studio (Mark Southcombe / Andrew Charsleson): **CUBA ST heritage seismic strengthening study**

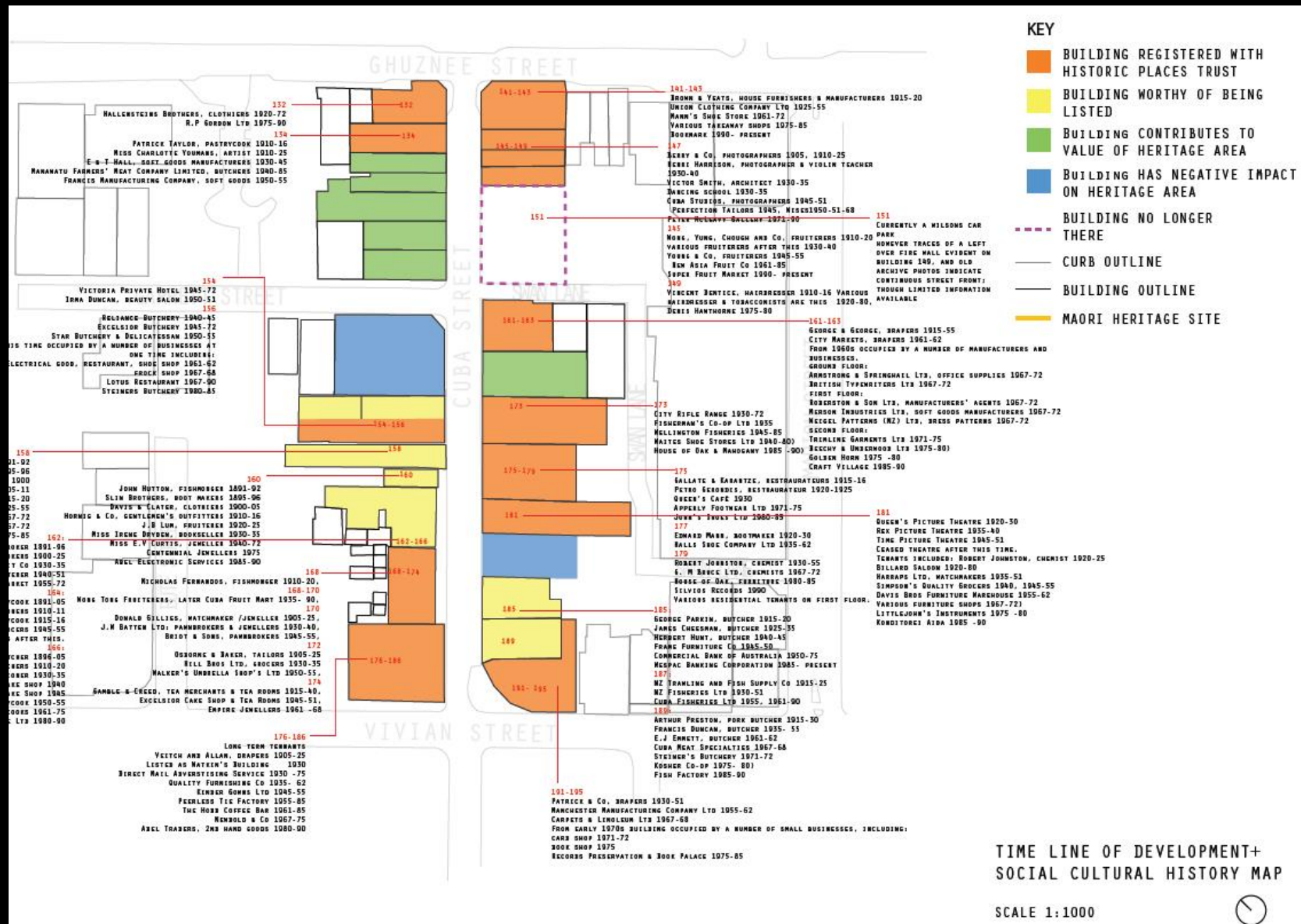
Design-led research examples from the VUW School of Architecture



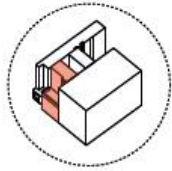
Design-led research examples from the VUW School of Architecture



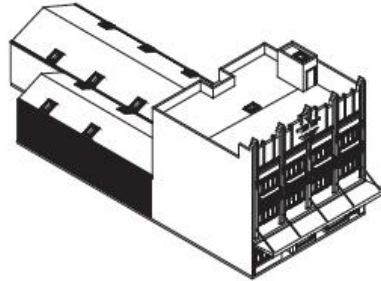
Design-led research *examples from the VUW School of Architecture*



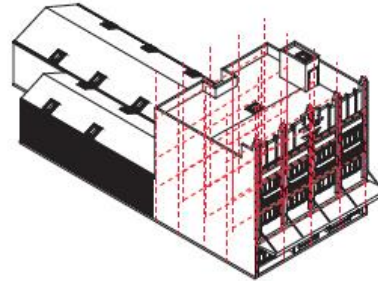
Design-led research examples from the VUW School of Architecture



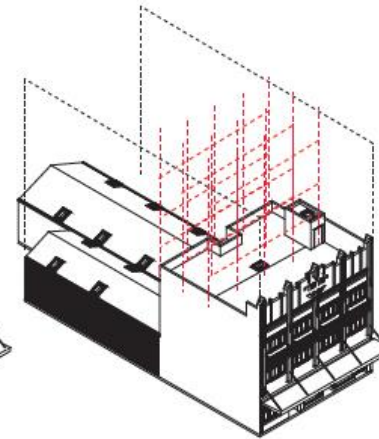
PHASE 1: HERITAGE RETROFIT



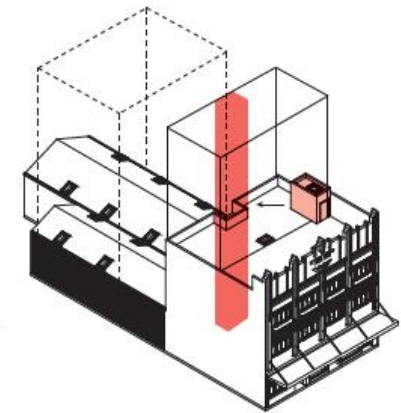
EXISTING



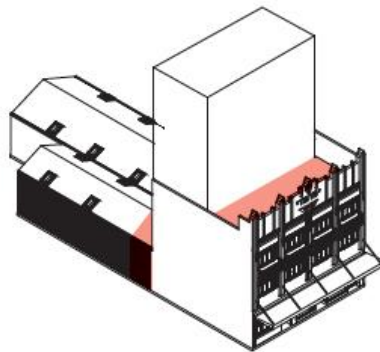
NEW STEEL MOMENT FRAMES REQUIRED TO SUPPORT HERITAGE BUILDING



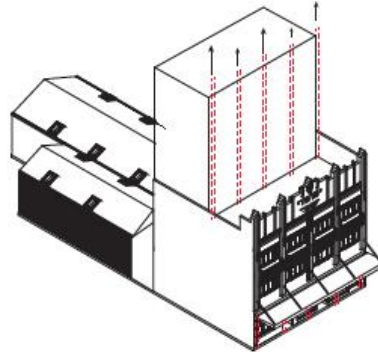
FRAMES EXTENDED UP TO SUPPORT ADDITION THAT FILLS THE VOID CREATED BY TALLER NEIGHBORING BUILDINGS



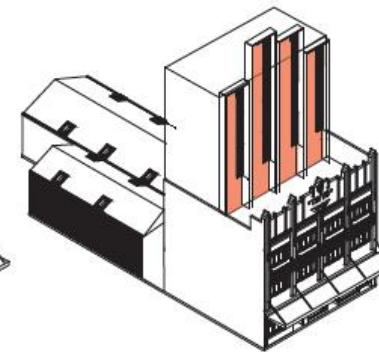
NEW CODE-COMPLYING STAIRWELL CENTRALISED IN EXISTING LIGHTWELL. THIS FUTURE-PROOFS THE CURRENT DESIGN AS AN OPEN SYSTEM WITH THE CAPABILITY OF CONNECTING INTO THE PROBABLE ADDITION OF A FUTURE BUILDING AT THE BACK OF THE LARGE PLOT.



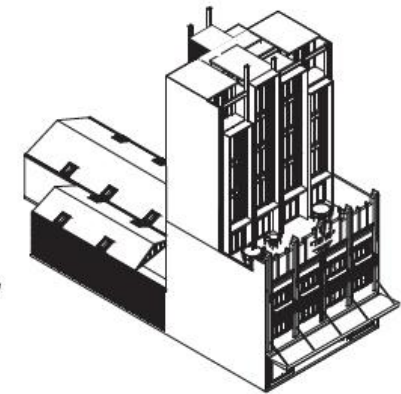
REMAINING PORTION OF EXISTING ROOF DECK INHABITED BY HOTEL ROOF BAR, WHILE PORTION OF SMALL BACK BUILDINGS CUT AWAY TO MAKE WAY FOR AN OPEN AIR COURTYARD ADJOINING THE GROUND FLOOR HOTEL RESTAURANT



EXTERIOR EVOCATION OF STRUCTURAL RETROFIT, EXPOSED COLUMNS ECHO THE VERTICAL LINES OF THE EXISTING FACADE IN A MODERN INVERSION. COLUMNS EXTENDED BEYOND HEIGHT OF NEW UPPER FACADE, CREATING A TECTONIC THAT MIRRORS THE CONCEPT OF BOTH INCOMPLETE ARCHITECTURE, RUINOUS AND/OR IN A STATE OF RENEWAL.



DEEP FRAMES SET BETWEEN THE EXPOSED STRUCTURE, AND REFLECT EXISTING BAY WIDTH, CREATING A SHADOW DEPTH TO THE VERTICAL LINES EMPHASIZED.



PROPOSED RETROFIT SCHEME.

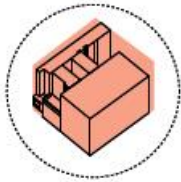
PHASE 3 NOTE THAT IT IS ENDED THIS IS THE END OF STAGE 3 AND THAT THE COMPLETES THE HOTEL AS A FUNCTIONING BUSINESS, BUT THE DESIGN MOVES WERE INTENDED TO CREATE AN OPEN SYSTEM THAT FUTURE-PROOF THE DESIGN AND WOULD ALLOW A SIZABLE ADDITION AT THE BACK OF THE SITE AS A POSSIBLE OR PERHAPS INEVITABLE PHASE 3 TO THE PROJECT.

PHASE 2

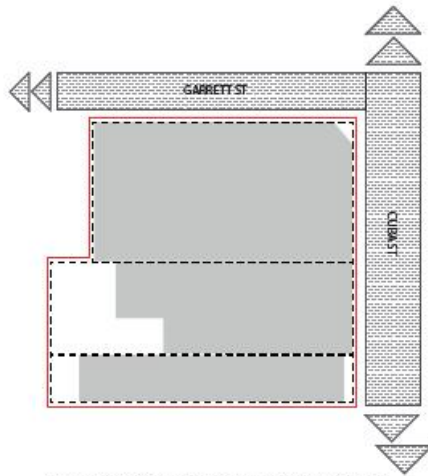
Design-led research examples from the VUW School of Architecture



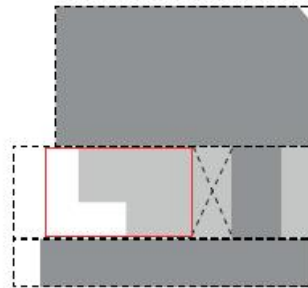
Design-led research examples from the VUW School of Architecture



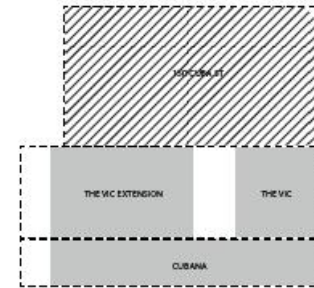
PHASE 2: CLUSTER MASTERPLAN



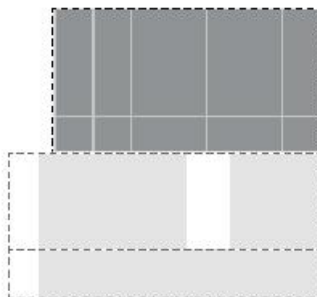
BUILDING CLUSTER INCLUDING CUBANA, THE VIC, AND 150 CUBA ST (CURRENTLY GOETHE INSTITUTE)



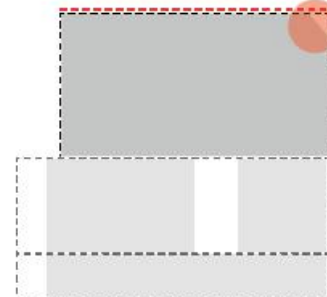
PORTION OF SITES THAT REACH MAX ALLOWABLE BUILDING HEIGHT (24M) IN DARK GREY. RED DENOTES POTENTIAL AREA TO INCREASE CURRENT HEIGHT TO MAX ROOM LEFT FOR ATRIUM BETWEEN EXISTING BUILDING AND NEW BUILDING TO ENSURE QUALITY OF NATURAL LIGHT.



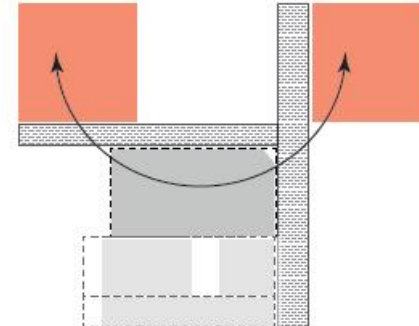
CUBANA WILL BE RETAINED AS A BUILDING OF ARCHITECTURAL QUALITY AND ONE THAT FITS INTO THE CUBA STREET CHARACTER AREA. 150 CUBA STREET WILL BE REMOVED AND REDESIGNED AS PART OF THE CLUSTER.



THERE IS GREAT NEED TO BREAK UP THE VOLUME OF THE LARGE PLOT (40m x 20m) BOTH VISUALLY AND PHYSICALLY AS IT CURRENTLY STANDS MONOLITHICALLY IN THE CUBA STREETSCAPE, WITH A LACK OF DETAIL AND VISUAL INTEREST. NEW BUILDING WILL HAVE TO BREAK DOWN AND CHISEL ITS BULK PROVIDING MORE LAYERING AND COMPLEXITY COMMON TO THE CUBA STREET AREA.



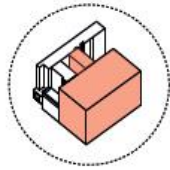
BUILT FORM WILL NEED ACTIVATE THE STREET EDGE ALONG GARRETT STREET UNLIKE ITS CURRENT UNACTIVATED STATE. BUILT FORM SHOULD ACKNOWLEDGE ITS PROMINENT CORNER SITE RELATIONSHIP WITH THE STREET.



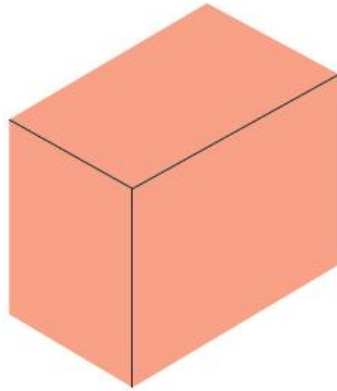
BUILDING SHOULD FORM SPATIAL RELATIONSHIP WITH BOTH GLOVER PARK AND THE ENVISIONED PARK ON SWAN LANE.

ARCHITECT
PROJECT

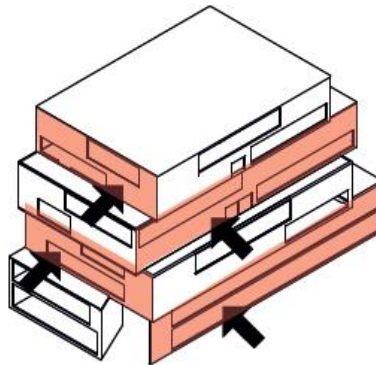
Design-led research examples from the VUW School of Architecture



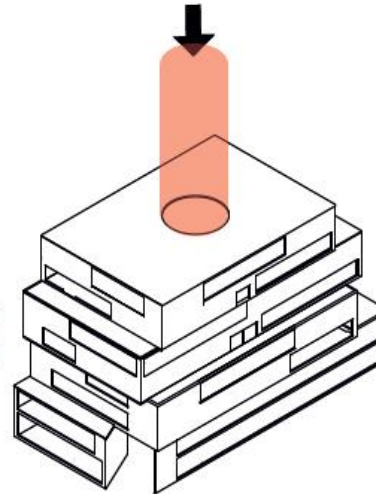
PHASE 3: NEW BUILDING DESIGN



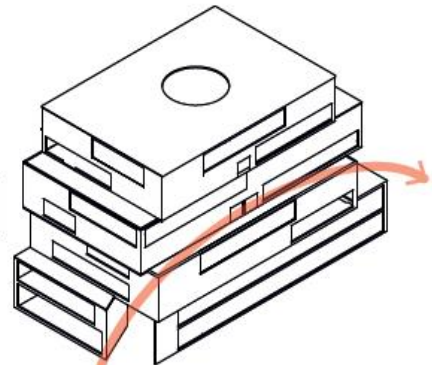
TOTAL BUILDABLE VOLUME. VERY LARGE PLOT SIZE FOR SURROUNDING URBAN GRAIN.



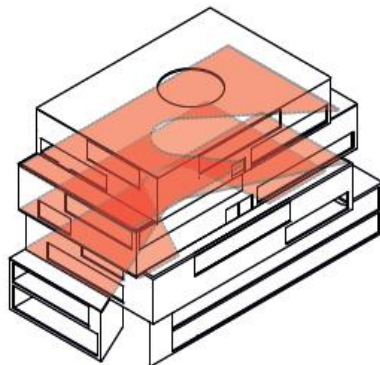
PUSHING AND PULLING OF BUILDING MASS BREAKS DOWN OVERALL FORM INTO FOUR MORE DISTINCT BLOCKS. USUALLY THIS EXPLODES THE TOTAL BULK INTO MULTIPLE MORE FAVOURABLE CHUNKS.



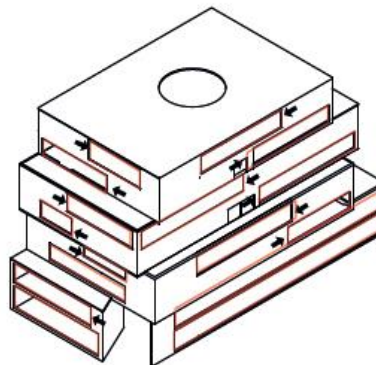
DEEP SITE REQUIRES CENTRAL LIGHTWELL TO ENSURE OPTIMUM NATURAL DAYLIGHTING. CIRCULATION CORE TO INTEGRATE INTO THIS CORE.



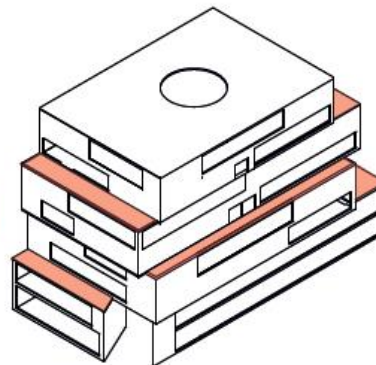
PROMINENT CORNER SITE CONSIDERATION TAKEN TO ACTIVATE BOTH CORNERS AND CREATE A SPIRITUAL RELATIONSHIP WITH THE PARKS ADJACENT AT EITHER CORNER.



MAJOR AXIAL MOVEMENT CREATED AT GROUND FLOOR CONTINUED AT DIFFERING TANGENTS UP HEIGHT OF BUILDING, OVERLAPPING AND OPENING UP DOUBLE AND TRIPLE HEIGHT SPACES THROUGHOUT THE BUILDING.



FENESTRATION VARIEGATED ACROSS FACADE DEPENDENT ON OPENING OF FLOOR PLATES. THIS CREATES AN INTEGRAL RELATIONSHIP BETWEEN THE INTERNAL PLANNING AND THE EXTERNAL EXPRESSION OF THIS - WHILE MAXIMISING LIGHT BY ALWAYS ENSURING WINDOWS ALIGN WITH FLOOR VOIDS.



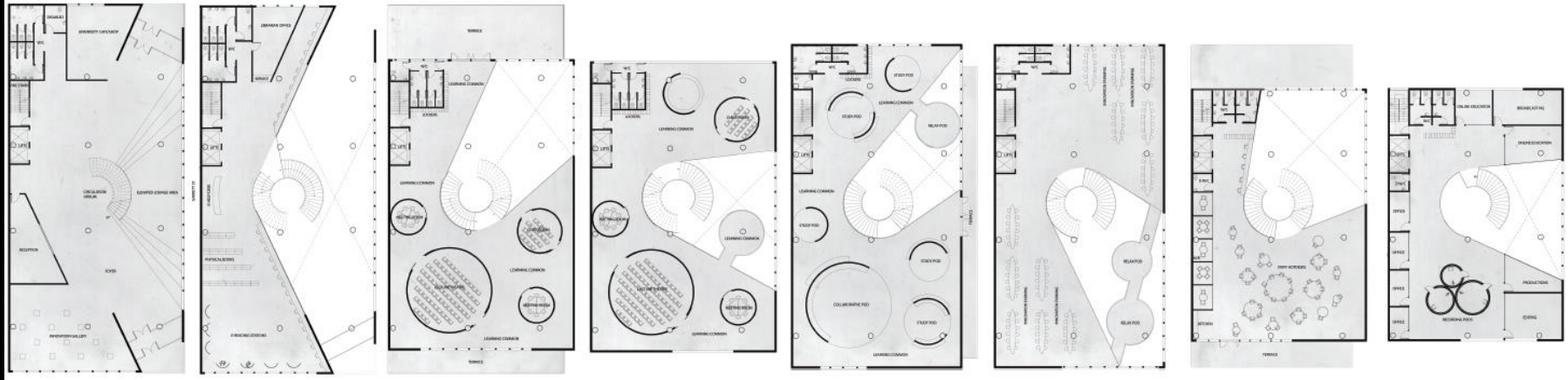
DUE TO BROKEN DOWN FORM, TERRACES ARE CREATED AT ALTERNATING LEVELS, PROVIDING USERS' ACCESS TO FRESH AIR AND OUTDOOR/SUNNY SPACES EVEN AT THE HIGHER LEVELS OF THE BUILDING. THESE TERRACES ARE BOTH WELL ORIENTED TO LIGHT AND TO VIEWS OF BOTH PARKS.

Design-led research examples from the VUW School of Architecture



Year 4 Integrated Design Studio (Mark Southcombe / Andrew Charleson): **CUBA ST heritage seismic strengthening study**

The image consists of three vertical panels showing the interior of the National Museum of the American Indian. The left panel shows a wide, curved staircase with a dark, polished metal railing, set against a light-colored wall. The middle panel shows a similar view of the staircase, but from a different angle, highlighting the curved wooden floor and the large, curved wooden ceiling. The right panel shows a group of people standing on a large, circular wooden floor in a spacious atrium, with a curved wooden ceiling and a large, curved staircase in the background.



VICTORIA
UNIVERSITY OF WELLINGTON
TE WHARE WĀNANGA
O TE ŪPOKO O TE IKA A MĀUI



Design-led research

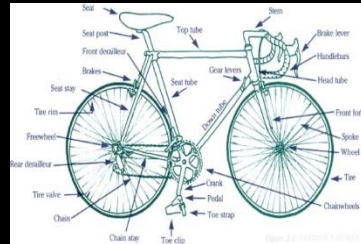


Mark Southcombe with Cuba St 2035 collective model exhibition, Wellington Town Hall for NZ Society of Earthquake Engineers conference. Dominion Post 27 April 2013. Photograph Kevin Stent Fairfax Media.



Design-led research

examples from the VUW School of Architecture



UG 1

2

3

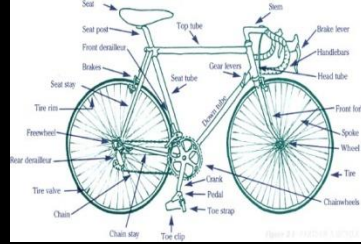
Masters 1

2

MASTERS THESIS 'RESEARCH ENGINE' : 100 + YEARS OF RESEARCH *EVERY YEAR* AT VUW

Design-led research examples from the VUW School of Architecture

*One year design
research thesis
undertaken by 100+
students*



UG 1

2

3

Masters 1

2

MASTERS THESIS 'RESEARCH ENGINE' : 100 + YEARS OF RESEARCH EVERY YEAR AT VUW

Design-led research examples from the VUW School of Architecture

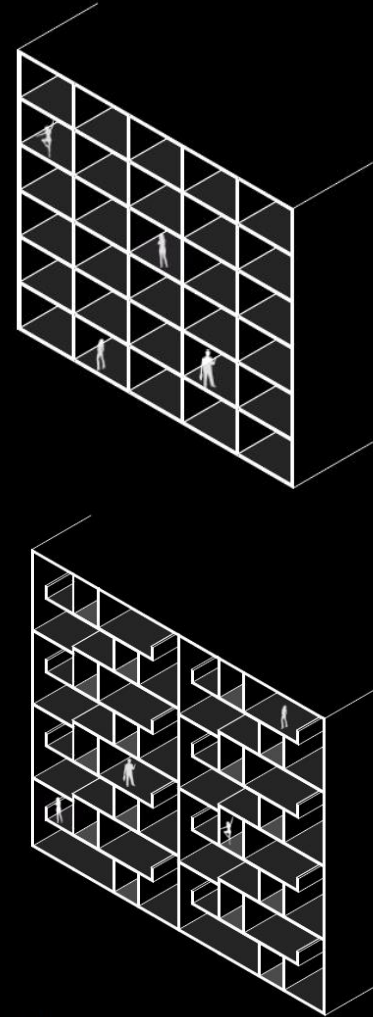
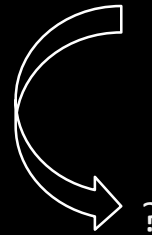
ABSTRACT (*abbreviated*)

An existing response to the need for housing in NZ is a trend of higher density apartment buildings within our inner cities. However these small standardized apartments have created a negative view toward urban apartments, commonly being described as 'shoe-boxes'.

Can urban inner-city higher density housing be better designed?

A critique of existing 'shoe-box' apartments is developed, proving they lack spatial quality, and have lost a crucial connection with the dweller.

The research seeks to remedy the 'shoe-box' apartment by applying principles from the theory of phenomenology and an interlocking typology.



File 2/3

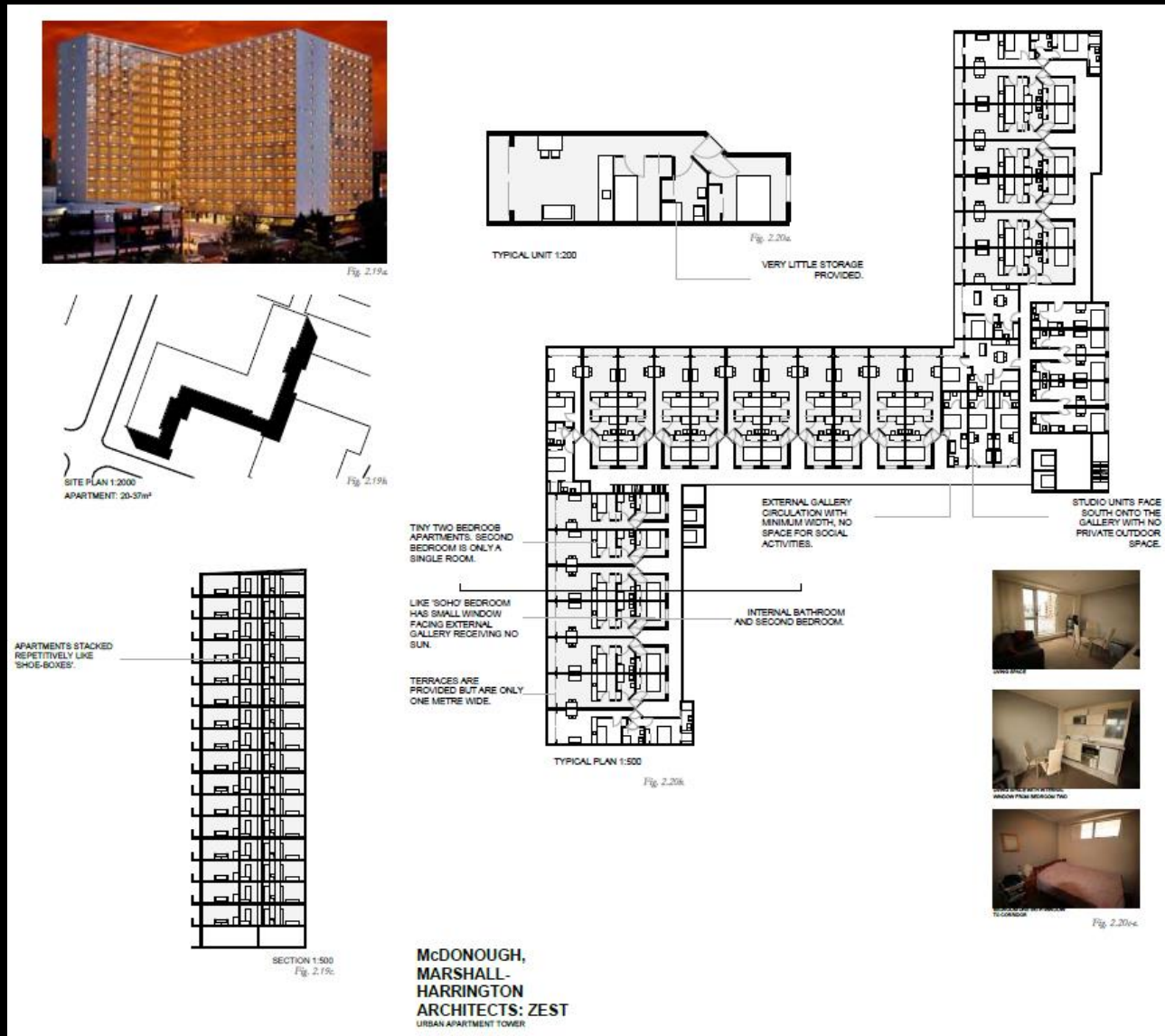
In *Places of the Soul*, Christopher Day is not specifically explaining the New Zealand apartment, however his comments are readily comparable to the current situation. He describes buildings having "rooms that are rectangular with hard smooth finishes" and "are indeed designed as boxes for storing people".¹² This description is highly relevant to the 'shoe-box' apartment, where small spaces and their resultant basic rectangular shape, as seen in 'shoe-box' apartments, by their very nature "have function problems that are a direct result of their size" and also "often fail to satisfy their owner's visual, spatial and emotional needs".¹³ This section analyses five 'shoe-box' apartment buildings built or planned within the last five years.

13 Smith, Norman. *Small Space Living* (Rockport: Rockport Publishers, Inc. 1995), 5.



Design-led research examples from the VUW School of Architecture

- Repetition
- Single aspect
- No sectional differentiation
- Lack of access to outdoors
- Poor common circulation
- Small cellular rooms
- 'Borrowed' light.
- Cheap materials
- Poor acoustics





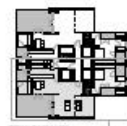
CHARLES CORREA:
KANCHANJUNDA
TOWER
CHENNAI, INDIA
1968



Fig. 1-101



CHARLES CORREA:
KANCHANJUNDA
TOWER
CHENNAI, INDIA
1968



TYPICAL FLOOR 1-100



TYPICAL FLOOR 1-100



TYPICAL FLOOR 1-100



TYPICAL FLOOR 1-100

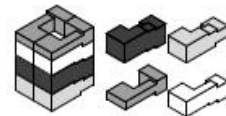


Fig. 1-102

Fig. 1-103

CHARLES CORREA:
KANCHANJUNDA
TOWER
CHENNAI, INDIA
1968

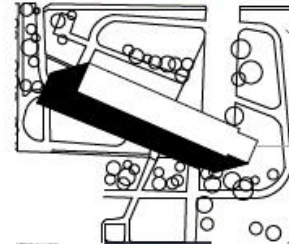


Fig. 1-104



Fig. 1-105

LE CORBUSIER:
UNITÉ D'HABITATION
CHENNAI, INDIA
1968



TYPICAL FLOOR 1-100



TYPICAL FLOOR 1-100



Fig. 1-106

Fig. 1-107

LE CORBUSIER:
UNITÉ D'HABITATION
CHENNAI, INDIA
1968



Fig. 1-108

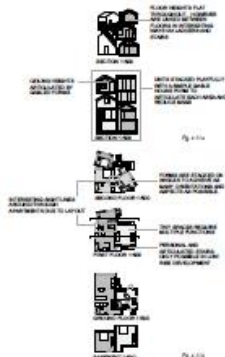


Fig. 1-109



Fig. 1-110

SOU FUJIMOTO:
TOKYO APARTMENTS
TOKYO, JAPAN
2018



TYPICAL FLOOR 1-100



Fig. 1-111

Fig. 1-112

SOU FUJIMOTO:
TOKYO APARTMENTS
TOKYO, JAPAN
2018



Fig. 1-113

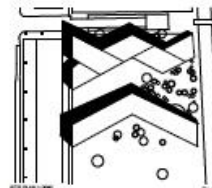


Fig. 1-114

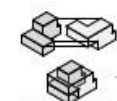
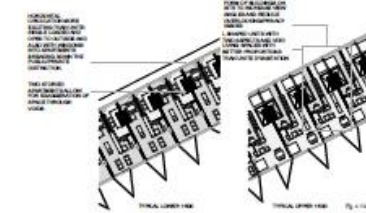


Fig. 1-115

PLOT:
VN APARTMENTS
HO CHI MINH CITY, VIETNAM
2018



TYPICAL FLOOR 1-100

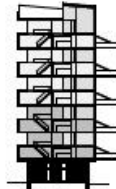


Fig. 1-116

Fig. 1-117

Design-led research examples from the VUW School of Architecture

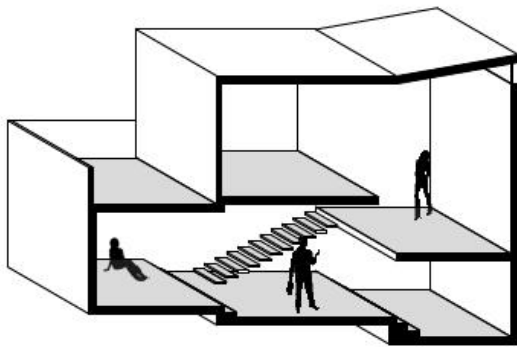


Fig. 4.24.

Technique One: Range of ceiling and floor heights developed through section/perspective.

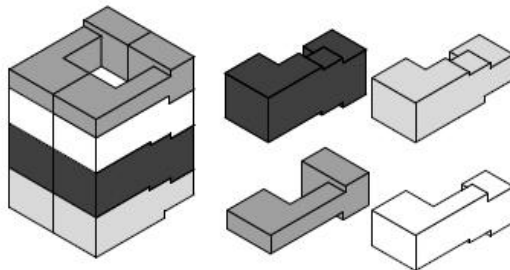


Fig. 4.25.

The 'Kanchanjunga Apartments' are salient in showing this shift to design in section and perspective, resulting in range of different floor and ceiling heights. Here Correa "pushed his capacity for ingenious cellular planning to the limit", the result, interlocking types of apartments which range from three to six bedrooms.

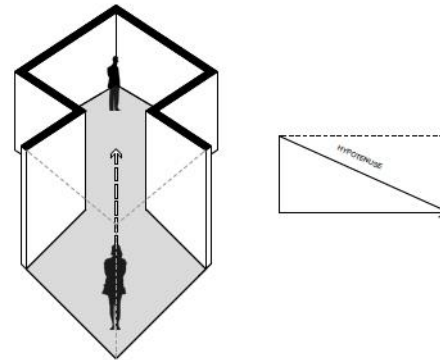


Fig. 4.32.

Technique Two: Internal sightlines; perception of space increased using geometry and internal voids.

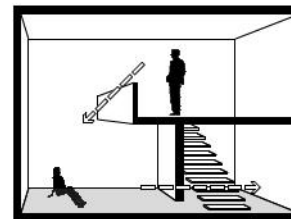


Fig. 4.33.

Technique Two: Internal sightlines; perception of space increased using geometry and internal voids.

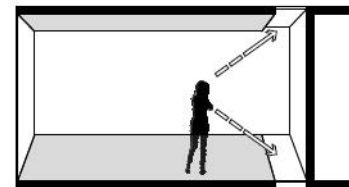


Fig. 4.34.

Design-led research examples from the VUW School of Architecture

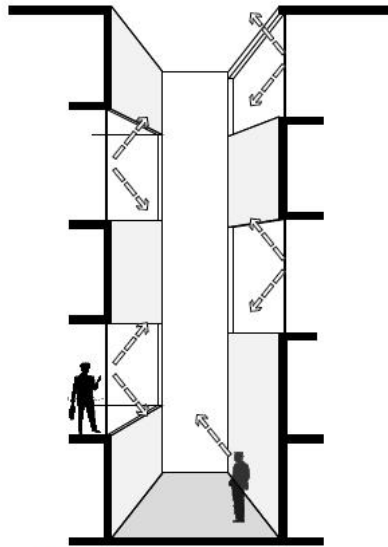


Fig. 4.40.
Technique Three: Shared Views; shared light and views between apartments using horizontal and vertical voids.

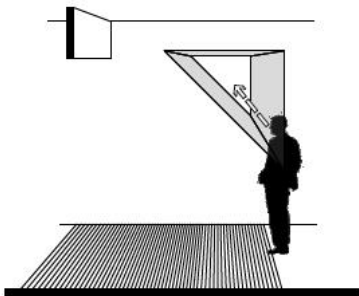


Fig. 4.41.
Technique Three: Shared Views; shared light and views between apartments using horizontal and vertical voids.

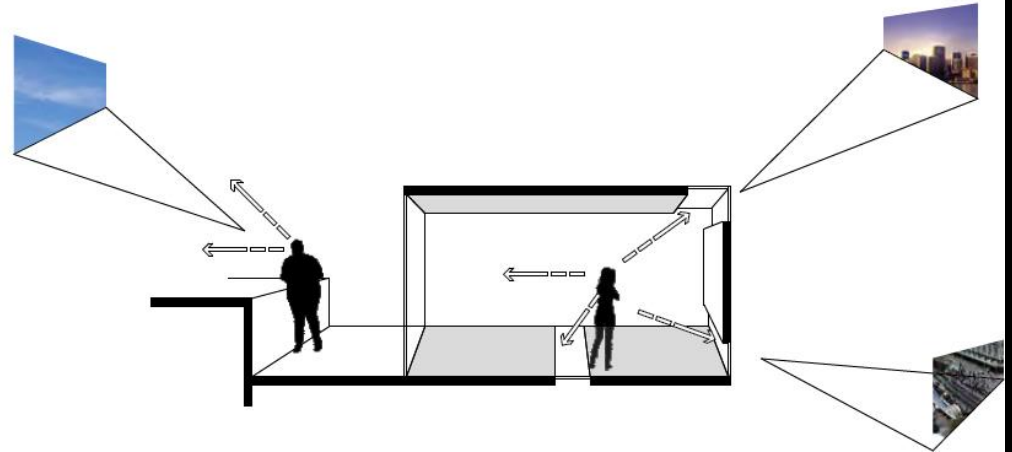


Fig. 4.44.
Technique Four: External sightlines and range of outdoor spaces.

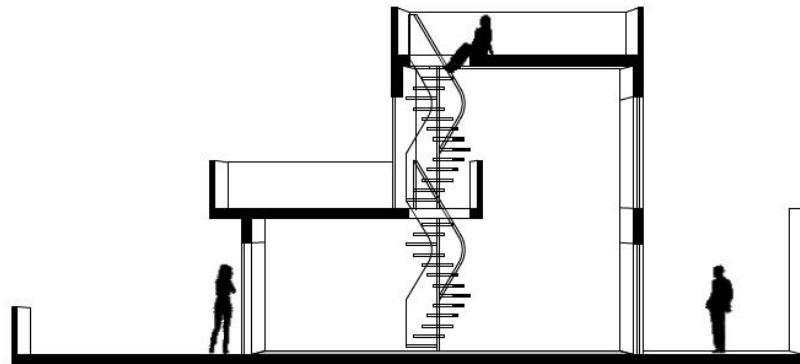


Fig. 4.45.
Technique Four: External sightlines and range of outdoor spaces.

Design-led research examples from the VUW School of Architecture

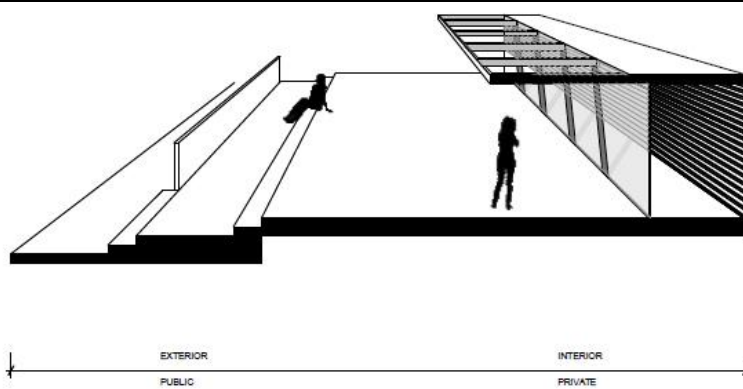


Fig. 4.55.

Technique Five : Threshold between inside & outside and threshold between public and private.

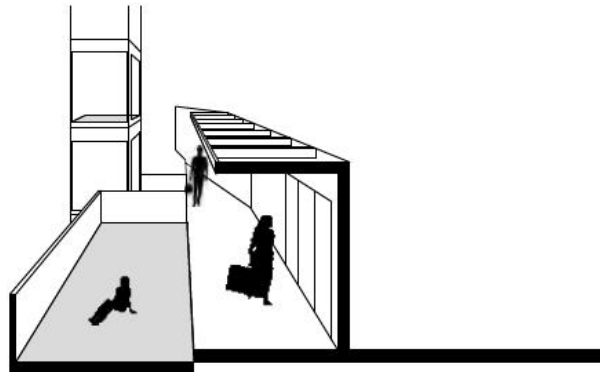


Fig. 4.56.

Technique Five : Threshold between inside & outside and threshold between public and private.

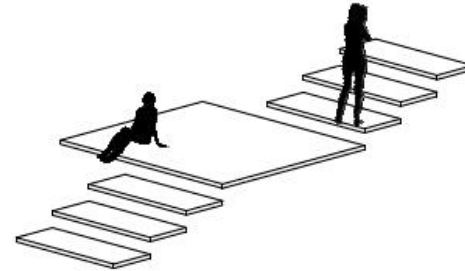


Fig. 4.61.

Technique Seven: Integrate internal circulation.

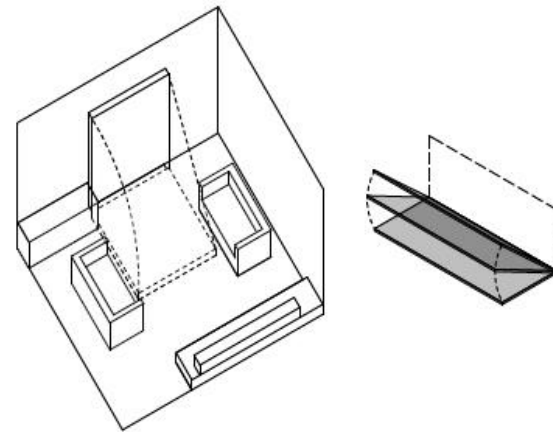


Fig. 4.62-3.

Technique Seven: Double duty spaces and convertible furniture.

Design-led research examples from the VUW School of Architecture

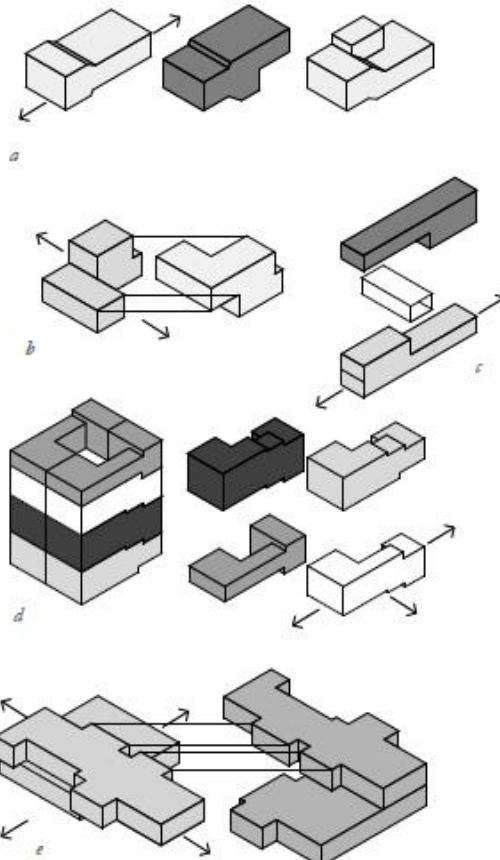


Fig. 4.60.

The simple 'L' interlock, seen at the City Lofts, VM Apartments and Unite d'Habitation provide two aspects (front and back) (a-c). A second approach is wrapping the apartment around the central service core, 'Kanchanjunga Apartments' are designed to have half a floor each, resulting in each apartments having three aspects (d).

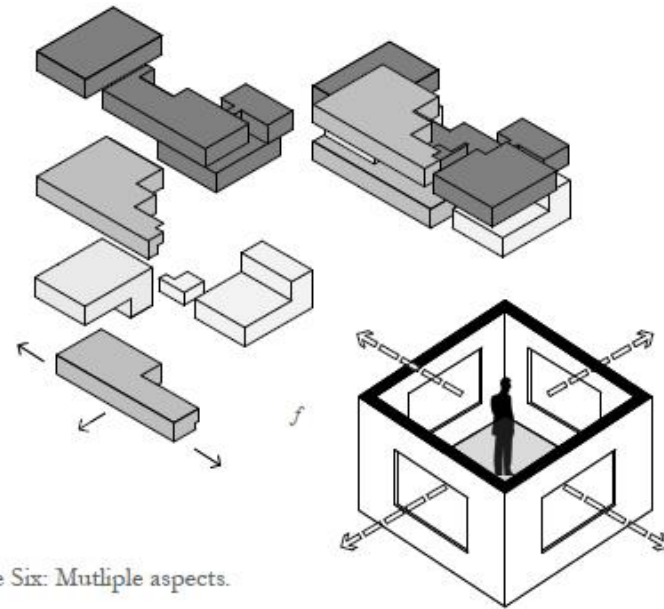
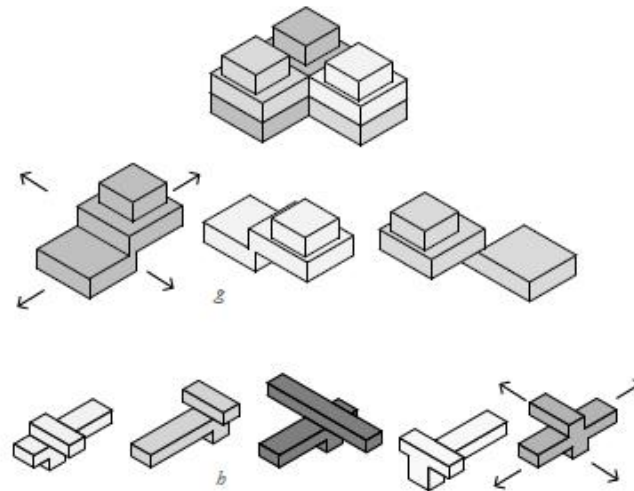


Fig. 4.59.

Technique Six: Multiple aspects.



Design-led research examples from the VUW School of Architecture



Fig. 5.02
79 Dixon/ 161 Victoria Street.
1:5 000

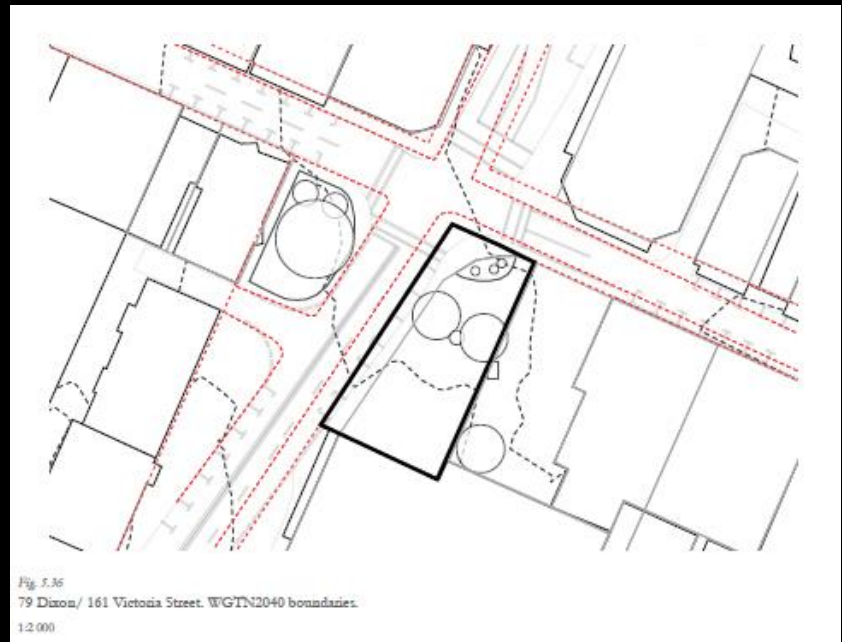


Fig. 5.36
79 Dixon/ 161 Victoria Street. WGTN2040 boundaries.
1:2 000

Design-led research examples from the VUW School of Architecture

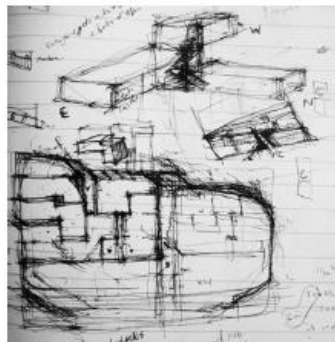
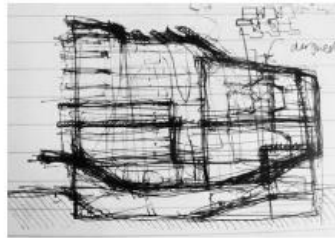
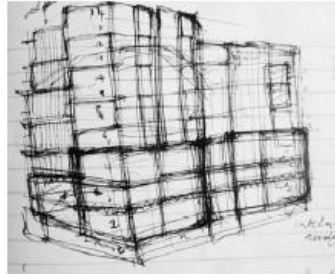


Fig. 6.03
Process sketches of the overall building.

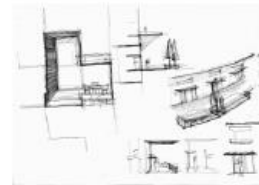
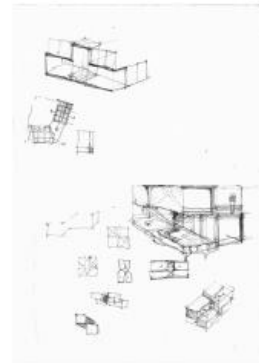
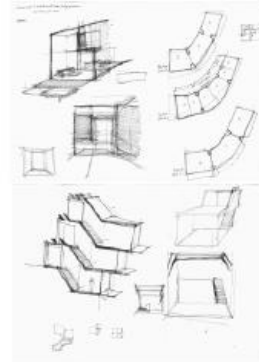


Fig. 6.04
Process sketches of interlocking apartments.

Design-led research examples from the VUW School of Architecture

6.1 DESIGN DESCRIPTION

DESIGN PROCESS

The process of the design had four key stages of iterations, with smaller iterations within each stage.

The process initially focused on the development and design of the

apartment itself with an emphasis on the interior. After this was determined, the interior was developed simultaneously with the exterior of the building (refer Appendix One).



Fig. 6.02a
Iteration A.

The first design stage looked at a single apartment design which interlocked with adjacent apartments, but was duplicated across the entire building. The design of these apartments resulted in interesting interiors, views and met many of the interlocking techniques, however this approach resulted in the same unit module replicated twenty times, resulting in a repetitious facade, which was an attribute of 'shoe-box' apartment, which was to be avoided. This approach was developed with four different apartment layouts, with different approaches to interlocking (refer A1-A8 in Appendix One).

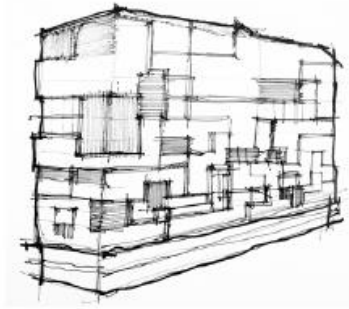


Fig. 6.02b
Iteration B.

This approach resulted in the design of all the apartments being different and interlocking in a variety of ways. Having all apartments unique was an economic feasibility issue and also planning issue which resulted in a less resolved building. The result of the uniqueness was read on the external form, which is highly articulate, but lacked consistency or order.



Fig. 6.02c
Iteration C.

The third iteration involved a reduction in the variety of apartments, resulting in the design of a module. The module was tested with five, then four and finally three floors which was then replicated vertically. It was also decided to have two distinct modules (north and south separated by a 14 storey atrium) which allowed for four larger apartments in the north and six smaller apartments in the south module. These two modules were repeated vertically four times resulting in 40 apartments. The variety of interlocking was reduced and restrained to within the boundaries of the modules giving spatial experience within a controlled overall space. Vertical and horizontal circulation was excluded from the modules and located to the rear via circulation decks at every third floor.

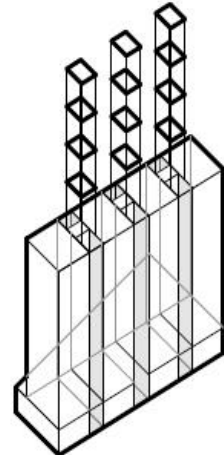
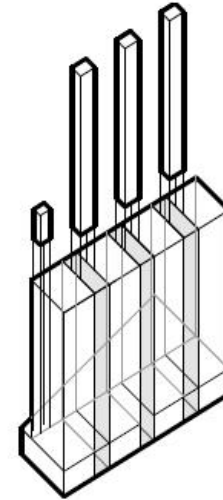
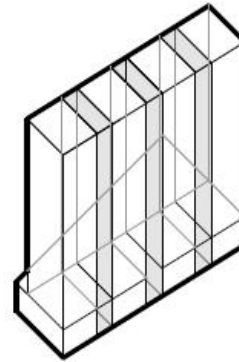
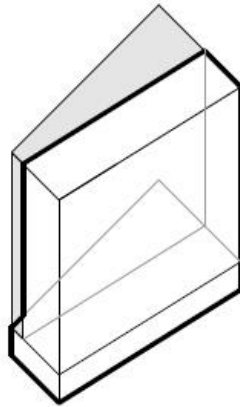
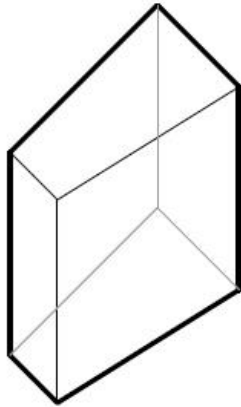
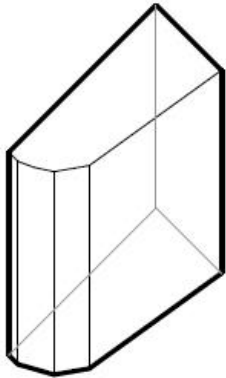


Fig. 6.02d
Iteration D.

Developing from the last design, the circulation decks were removed and inserted into the modules. This resulted in the three circulation voids in the final design, which in turn split the two north and south modules in half again to become more porous. Iteration D resulted in the final design.

Design-led research examples from the VUW School of Architecture

DESIGN MOVES



1. The current approved envelope of the site. The site is extruded up to the Wellington City Council's District Plans height restriction of 43.8m.

2. The site is widened to the WGTN 2040 plan.

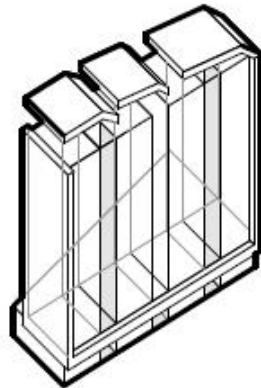
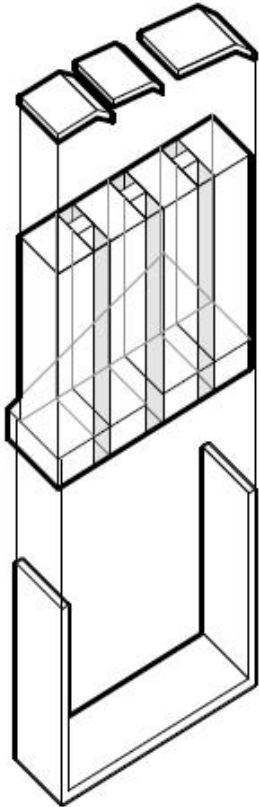
3. The building mass is focused on the street edges and corner to create a strong urban edge and emphasise the corner. To achieve double aspect apartments (east and west) of 11m, the mass is removed from the back. The ground and first floor use the footprint of the entire site.

4. Three circulation voids are inserted to allow access to the apartments, and give the apartments three or four aspects.

5. Vertical circulation is introduced into the circulation voids for the apartments and the office entrance. This is located in the centre of the building to provide minimal disruption to the apartments. The multiple circulation cores allow separate entrances for each tower on Victoria Street and also an office entrance on Dixon Street. Egress stairs are located opposite each the lift shafts.

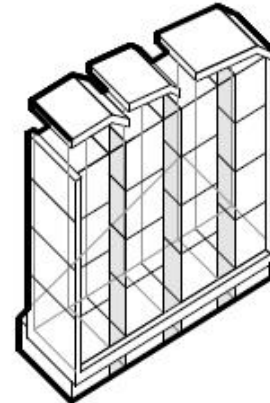
6. The horizontal circulation is introduced at every third floor (the central floor of each three story module). The horizontal circulation is a small terrace between the lift and stairs and extends to the entrances of each apartment. This is broken up with semi-private outdoor sitting areas.

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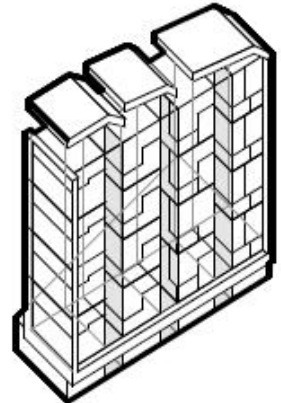
7 & 8.

A roof form and a floor form which houses the basement is introduced which reduces the perceived regular form of the building. The terraced



9.

The introduction of the eight modules.



10.

Final building with interlocking apartments inserted into the modu

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MASTERS THESIS 'RESEARCH ENGINE' : 100 + YEARS OF RESEARCH PA Thesis by Jarod Shepherd (Supervisor Chris McDonald)

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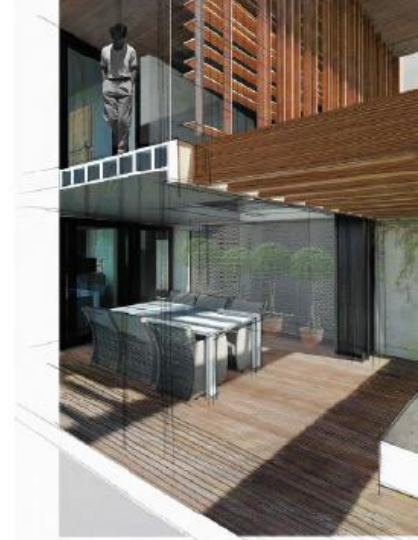


MASTERS THESIS 'RESEARCH ENGINE' : 100 + YEARS OF RESEARCH PA Thesis by Jarod Shepherd (Supervisor Chris McDonald)



Fig. 6.10.17
Apartment One interior
Apartment One interior perspective (top-down)

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UNIT TWO

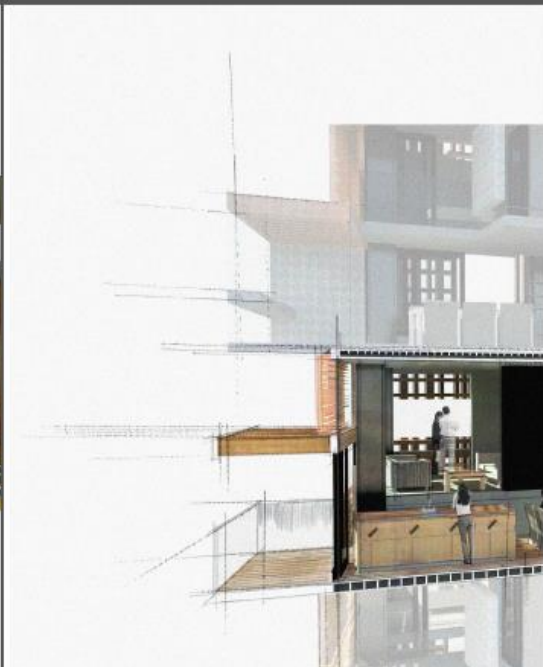
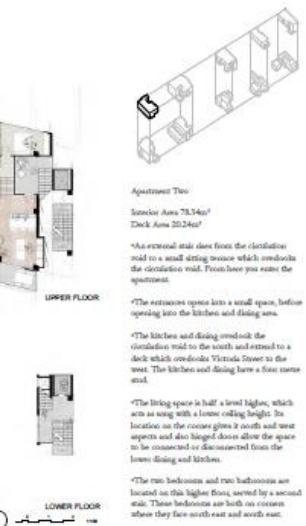
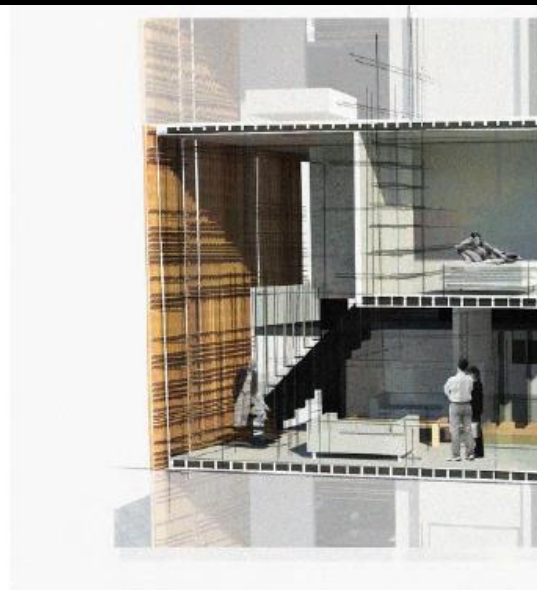




Fig. 4.10
Apartment 11 from section perspective

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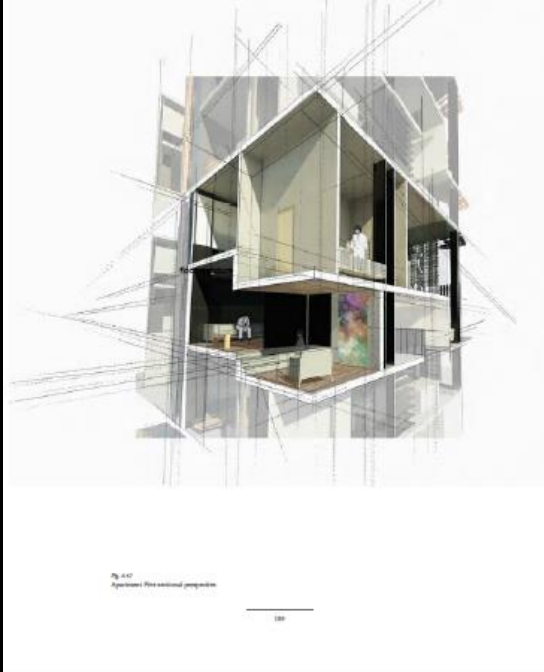


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6.4 KEY FINDINGS

1. Voids allowed the Strategies and the Techniques to be implemented effortlessly.

The use of voids, the internal, the external and the external circulation voids, all contributed to the success of achieving the strategies and techniques. The use of voids allowed the objectives to be accommodated to result in apartments with three or four aspects, double height spaces, shared views and develop a narrative to the space. The result of not close-packing the interlocking apartments allowed room for the voids to break up spaces internally and externally, where traditional impenetrable party walls would be used. This traditional definition to apartment boundaries is blurred, where these voids act as buffers between apartment dwellers.

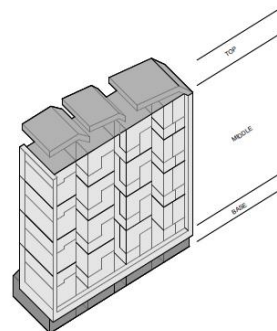


Fig 6.85
Regulating lines for future development on Victoria Street based on this catalytic design.

2. The Intermediate Module produced an articulated and controlled urban facade.

A simple system for controlling the interlocking of the apartments resulted in the development of the use of modules. Developed neither specifically from phenomenology of interlocking, but rather as a result of the design process. This intermediate scale (between single unit and whole building) resulted in a positive outcome for the street frontage and facade of the building. The ability to articulate the intermediate scaled elements automatically results in a breaking up a mass of a large building, which is a pleasing outcome for an urban building of this scale. The intermediate module helped to prevent both excessive variation and excessive repetition in apartment type. Visually, the intermediate module could be read as the greatest form of amalgamation, acting as the connection between the single unit and whole building.

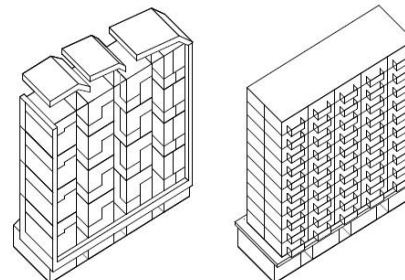


Fig 6.86
The final case study design facade compared to a 'shoe-horn' facade with uniform repetition.

3. The Intermediate Module allowed Voids and Structure to be integrated without compromise.

The use of an intermediate module allowed all these voids to be integrated easily without compromising the structural integrity of the building. Derived from the 'amalgamation' limited-concept', the structure was developed simultaneously with the modules, where a moment resisting steel structure encases each three storey module. This resulted in only the outer floors of the modules to be reinforced concrete, allowing the two internal floors to be lightweight timber construction. This allowed the freedom to introduce the voids which are intrinsic to the interlocking apartments without weakening the what would otherwise be reinforced concrete diaphragms.

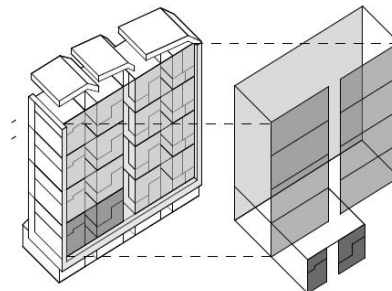


Fig 6.87
Facade broken down into scaled elements emphasising the intermediate scale.

Response to the housing crisis

... a bit (more) ugly

“There's no point having beautifully designed cities if 90 percent of New Zealanders can't afford to live in them. We might have to get a bit ugly.”

(Bill English, TV3 News 31.05.14)



Towards Building Better through Design Lead Research

research about design focuses on the methods, media and techniques that are used to carry out design. In particular there is significant contemporary research and experimentation in alternate design methods based on opportunities afforded by advances in digital technology

ABOUT

FOR

research for design encompasses studies that will enable design. This includes site analysis, material and technology studies, and the building performance modelling, simulation and data analysis typically carried out in building science.

THROUGH

while research through design examines a specific design context to conceive and develop a project ('paper' or realized) that embeds significant understanding or insight that can in turn inform subsequent design research



Thank you for your attention