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# ENVELOPES OF ADAPTATION

## AN ARCHITECTURE OF SOCIAL THRESHOLDS AND FLEXIBILITY

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INVESTIGATING THE SOCIO-TECHNICAL  
RELATIONSHIP BETWEEN THE BUILT EDGE AND  
SOCIAL SURFACE

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# ACKNOWLEDGMENTS

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I would like to take this opportunity to express my appreciation and gratitude to the individuals, without whom, this design dissertation would not have been possible.

Firstly, I would like to thank my parents for their unwavering support and inspiration during my architectural studies, providing me with an environment in which to thrive.

I would like to thank my UCT supervisor, Francis Carter, for his constant guidance, support and encouragement during my postgraduate studies, providing an excellent environment in which to learn and develop.

I would like to thank my co-supervisors at Arup, Cape Town, Tessa Brunette, Matthew Lilley, Jaco Kemp and Carin de Beer, as well as Andrew Wade (Sound Research Lab), for their technical support and guidance, aiding in the realization of my postgraduate projects as well as expanding my multi-disciplinary knowledge.

I would like to thank the various role players and collaborators that aided me in my postgraduate research, providing resources and knowledge as I engaged with unfamiliar topics and communities.

I would like to thank my family for their moral support during my architectural studies, offering assistance if and when I required it.

Finally, I would like to thank my peers and fellow classmates, for contributing toward an environment in which we were all able to develop, learn and thrive, even in the most challenging circumstances.

# **ENVELOPES OF ADAPTATION**

## **AN ARCHITECTURE OF SOCIAL THRESHOLDS AND FLEXIBILITY**

INVESTIGATING THE SOCIO-TECHNICAL RELATIONSHIP BETWEEN THE BUILT  
EDGE AND SOCIAL SURFACE

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TOWN

DESIGN DISSERTATION REPORT PRESENTED AS  
PART FULFILMENT OF THE DEGREE OF MASTER OF  
ARCHITECTURE (PROFESSIONAL) IN THE SCHOOL  
OF ARCHITECTURE PLANNING AND GEOMATICS,  
UNIVERSITY OF CAPE TOWN.

**APG5079W**

**DECEMBER 2017**

# ABSTRACT

The concept of adaptability in architecture is one that very often bears technical rather than social connotations. What are the mechanisms and systems that allow buildings to adapt to fluctuating environmental and climatic conditions?

These responses are often the driving force behind design considerations, placing emphasis on the manner in which the technical resolutions facilitate appropriate adaptability and environmental response.

This adaptability is generally addressed through the building envelope, which acts as the mediator between the interior conditions of a building, and the exterior conditions of its environment (Lovell, 2010).

However, beyond addressing these environmental conditions, there are greater urban and social conditions that bear equal weight within any design inquiry. Building adjacencies, ethnographics, social development and imageability of spatial ordering are all fundamental factors that need to be addressed within building envelope design (Lovell, 2010).

The design dissertation inquiry explores the multi-faceted nature of building

envelopes as well as an architecture of internal and external thresholds. The inquiry examines ways in which building envelopes respond to both the environmental and social complexities of a context, as well as how internal and external threshold and edge conditions can be design generative and communicative; expressing spatial organisations, conditions of privacy and mechanisms of adaptability.

This topic of adaptive envelopes and defining thresholds in relation to social complexities has been explored in an architectural design project, which aims to practically address social and environmental issues.

This exploration yields a set of key findings into an architecture of thresholds and adaptability in response to the socio-technical conditions of a context where the lines between the formal and informal are blurred.

**Key Words:** Building Envelope, Adaptability, Environmental Response, Social Response, Thresholds.

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# GLOSSARY OF TERMS

## T E R M S

**ABALIMI BEZEKHAYA** - A Non- Governmental Organisation empowering disadvantaged communities with programmes and networks in urban agriculture.

**AMANDLA EDUFOOTBALL** - A non-governmental organisation that develops and implements youth programmes that use football as a metaphor for social development and healthy lifestyles.

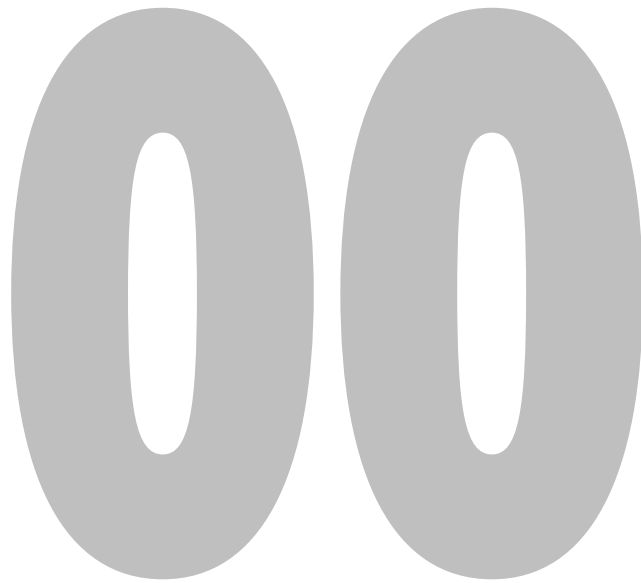
## A B B R E V I A T I O N S

**UCT** - University of Cape Town

**EBE** - Faculty of Engineering and the Built Environment

**VPUU** - Violence Prevention through Urban Upgrading

**NGO** - Non- Governmental Organisation



# **DESIGN DISSERTATION INQUIRY**

DEFINITION OF DESIGN DISSERTATION INQUIRY,  
TOPIC AND ARGUMENT

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ENVELOPES OF ADAPTATION  
AN ARCHITECTURE OF SOCIAL THRESHOLDS AND FLEXIBILITY

# DESIGN DISSERTATION INQUIRY

**W**hat is the space of adaptability in architecture? Is it viewed as a space or buildings ability to adapt to fluctuating climatic conditions, or are there more implicit social informants? Our image of buildings, spaces and places is intrinsically linked to the ingrained visual connections and perceptions that we have with them (Lynch, 1960).

The imageability and understanding of place is a fundamental value to individuals in every community and culture. At the very least, this sense of place is something that everyone instinctively recognizes (Kent, 2012).

The built environment offers fundamental elements which shape perceived identity. Spatial arrangements, structure and enclosure offer a narrative which expresses the life of the building as well as its place in the larger context (Lovell, 2010). This form of visual and spatial communication contributes to communal identity and sense of place. The building envelope, as the mediator between the internal and external social and climatic environments, plays a fundamental role in

this communication. A core objective of the building envelope is the control and regulation of comfort in and around the building, through moderating climatic conditions. However, as an element that contributes to the identity of place, the building envelope acts as a social armature, linking the community with the design response and the buildings place in the immediate context.

This design dissertation inquiry explores the multi-faceted nature of building envelopes, unpacking the socio-technical complexity of its design. The inquiry explores ways in which building envelopes respond environmentally, in terms of daylighting, ventilation and interior comfort, as well as how building envelopes respond socially, in terms of privacy, facilitation of activity, security and the adaptation of use (Figure 1).

These ideas and explorations are supported by a parallel inquiry into an architecture of thresholds, exploring ways in which defined thresholds and edge conditions can generate design thinking and provide design strategies for spatial organisation and hierarchies, conditions of privacy and systems of adaptation. Through the development of the design dissertation, the inquiries into adaptability and thresholds has synthesized into an architecture of communication and response.

The inquiry is supported by key theories and findings examined and produced in the Applied Theory and Technology study papers (Moodley, 2017). These key theories by Oscar Newman (1996), examining Defensible Space, spatial organisation and threshold conditions; Jenny Lovell (2010), exploring holistic building envelope design; and Claude Parent and Paul Virilio (Johnston, 1996), examining the oblique function and the production of new socio-spatial paradigms; form key theoretical underpinnings to the design dissertation inquiry.

The report is divided into four main sections. The first section, Design Dissertation Intent, explores the development of the design dissertation topic from broad ideas around building envelope design to more defined explorations of thresholds, degrees of privacy and adaptability. Furthermore, this section

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outlines the methodology implemented throughout the design dissertation development, from creative methods of conceptual exploration, to design - research methodologies.

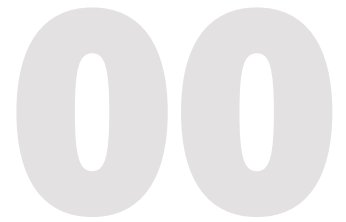
The second section, Fieldwork, outlines the design dissertation fieldwork study, exploring the site, an abandoned plot of land adjacent to a busy informal market in the southern region of Gugulethu, Cape Town. The fieldwork study examines the site, both socially and contextually, as well as reviewing key information and data obtained from the fieldwork study.

The third section, Design Work, Illustrates and explores the architectural proposition in relation to the design dissertation intent and fieldwork study. This section explores site selection and development, programmatic consideration and architectural response.

The fourth and final section, Findings, reflects on the architectural synthesis that has emerged from the design dissertation inquiry, reviewing the conditions and characteristics that define an architecture of thresholds and adaptability in a context of intense activity and overlapping conditions of formality and informality.



>> *Figure 1*  
*Edge and Activity. What is the relationship between the building envelope and the social surface?*



The design dissertation fieldwork study involved ethnographically based research comprising work with human subjects. Care was taken to ensure that only adults over the age of 18 years were interviewed, once informed consent was attained (via a signed interview consent forms – see Appendix B). The full extent of the ethical considerations of the research will be elaborated on in the Design Dissertation Intent section of the report.

The design dissertation inquiry aims to produce a set of findings on an architecture of adaptability, its thresholds and spatial response in a social context in which formal and informal conditions are intertwined.

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# DESIGN DISSERTATION INTENT

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DEFINITION OF DESIGN DISSERTATION  
METHODOLOGY AND DEVELOPMENT

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ENVELOPES OF ADAPTATION  
AN ARCHITECTURE OF SOCIAL THRESHOLDS AND FLEXIBILITY

# DESIGN DISSERTATION INTENT

## 1.1 INTRODUCTION

---

The design dissertation topic seeks to explore the relationship and interplay that exists between the building envelope/built edge and the social surface. The inquiry looks to explore building envelope design through a holistic approach (Figure 2) that considers both the physical attributes of an environment as well as the social characteristics that define the activity and identity of the individuals and community in the context.

The scope of the inquiry called for an exploration into the complexities of building envelope design, in terms of the characteristics of edge conditions, exploration of spatial ordering and hierarchical systems, review of the technical complexities of building envelope design and the understanding of patterns of inhabitation and networks of activity. These explorations were conducted through various exploratory and creative methods, in order to uncover and represent key concepts, theories

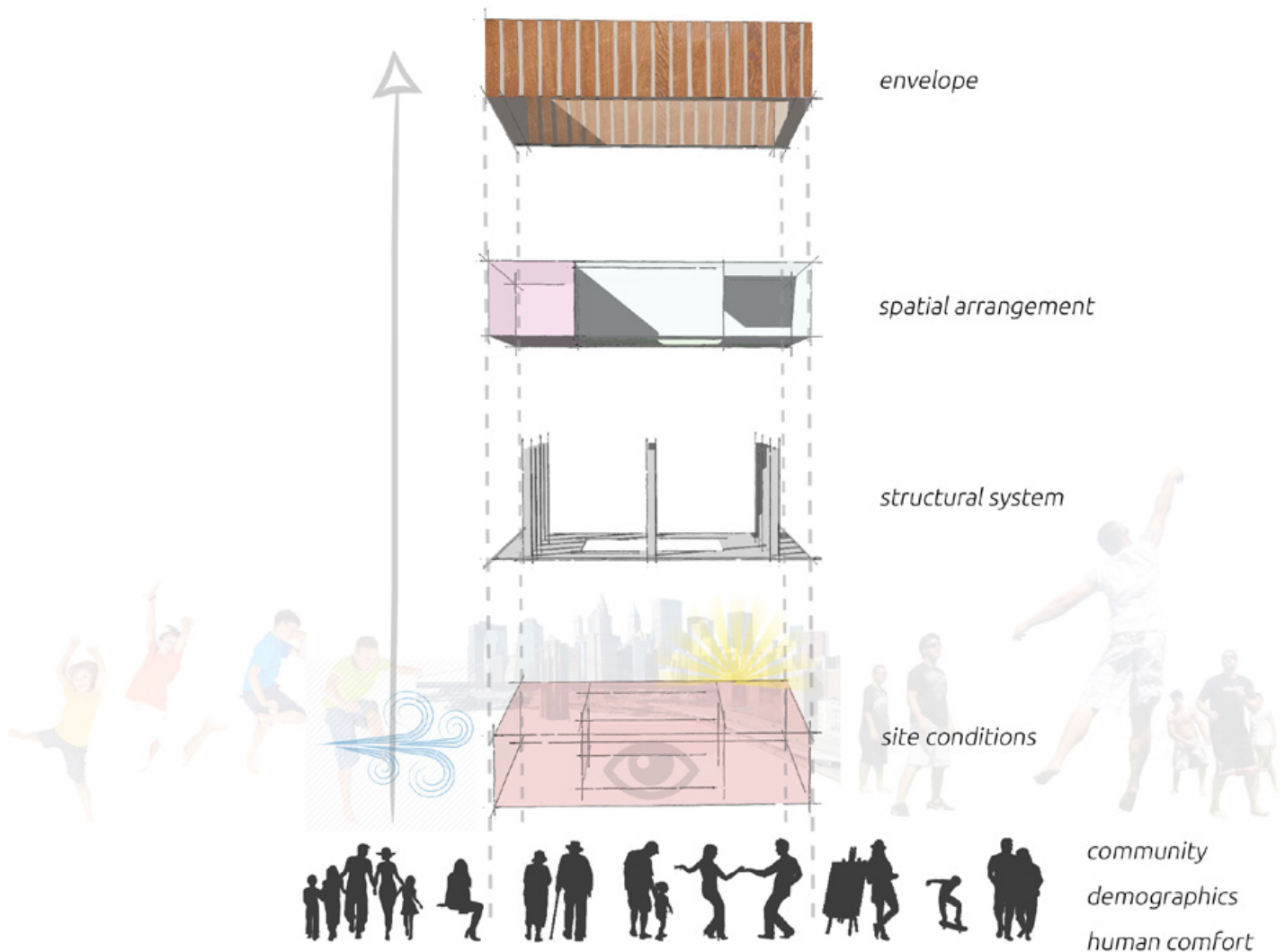
# 01

and ideas, which could be implemented within the design dissertation proposal.

In addition to these explorations, key theory and technical concepts were analyzed in an applied study in theory and technology (Moodley, 2017). These independent studies in theory (Architecture, Barriers and Human Behaviour), and technology (Dynamic Architecture: Responsive Design), yielded a set of design principles, which were tested in the design dissertation.

The following section defines the design dissertation methodologies and creative content, the implementation of the applied studies in theory and technology, and the design dissertation development.

>> *Figure 2  
Holistic Building Envelope  
Design. The envelope design  
emerges from a foundation of  
social awareness.*



## 1.2 METHODOLOGY

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**F**rom the outset, the design dissertation inquiry has been developed and represented through various mediums, such as writing exercises, collage, hand drawing and model making. These explorations have involved distilling complex ideas into clear and concise concepts, from which more specific lines of inquiry developed. As these studies and methodologies dealt with broad ideas with the intention of producing a direction for the design dissertation, the importance of certain explorations and concepts diminished or altogether fell away as the design dissertation moved forward. These creative methods will be reported in the following Design Dissertation Development sub-section (pg. 18).

A key component of the design dissertation inquiry is the fieldwork study conducted at the Nyanga Junction station precinct in the southern region of Gugulethu, Cape Town. This study involved ethnographically based research, in which observation and communication with human subjects was essential. For this reason, ethics clearance from the UCT Faculty of EBE, Ethics in Research Committee was attained (See Appendix A for ethics approval form).

The ethics approval was contingent on certain ethics considerations being implemented and adhered to during the fieldwork study. As the fieldwork study involved work with human subjects, in which the questions and observations related to personal patterns of spatial use and private life, care was taken to ensure that all information gathered and utilized was done so with the informed consent of the interviewee via a signed interview consent form which was distributed at the beginning of each interview (See Appendix B). The study was limited to the immediate vicinity of the Nyanga Junction train station, with the interviewees consisting of adults over the age of 18 years.

Anonymity was respected when requested and any personal/private information shall remain confidential and not accessible to the public without the informed

consent of the party involved. As the interview structure was based on information gathering, no conflicts of interest were anticipated or arose (See Appendix C for sample interview questionnaire).

As most respondents were of working-class/poorer communities, care was taken to ensure that their dignity was respected. It was made clear from the outset of each interview and interaction (verbally and through the interview consent form), that the design research was in aid of a purely speculative design inquiry and that it would not result in any built work, improvements to existing facilities or immediate benefit to the respondent or community. Furthermore, any access to facilities only occurred once institutional permission had been obtained from the facilities management.

Finally, the use of media such as photography, video recording and voice recording of individuals, was only used with the signed permission and consent of the subject. For general street or interior scenes where consent of groups of people were not obtainable, care was taken to ensure that individuals were not identifiable.

These methodologies, both for the creative development of the design dissertation as well as the fieldwork study, ensured a structured layout from which the inquiry developed.

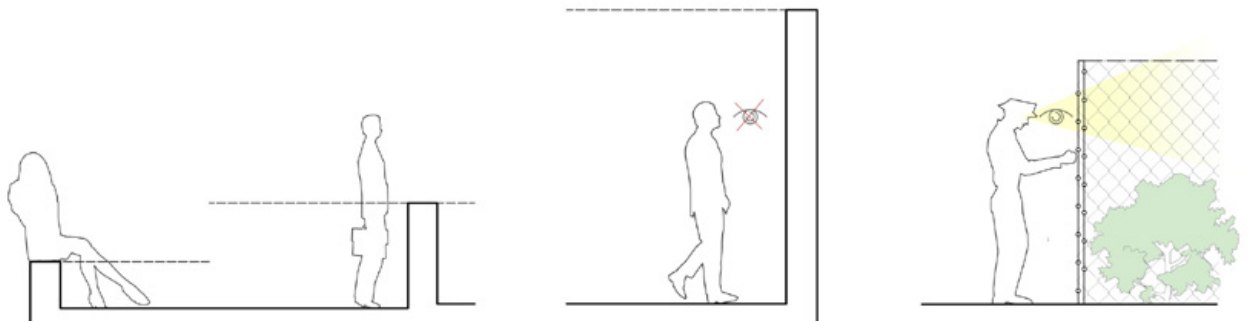
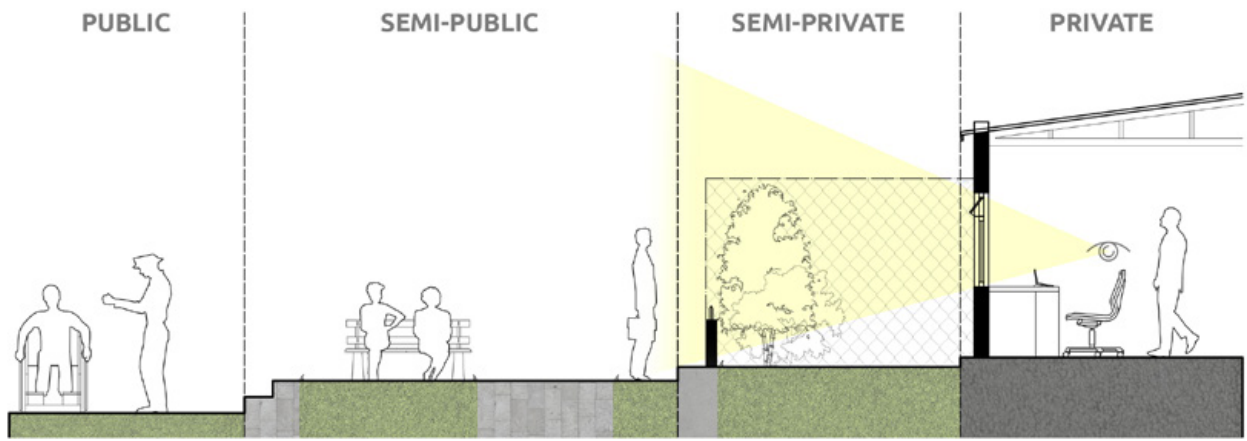
### 1.3 APPLIED THEORY AND TECHNOLOGY STUDIES

The studies in applied theory and technology (Moodley, 2017), emerged from the design dissertation argument, through the exploration of edge conditions, thresholds and technical complexities of building envelope design.

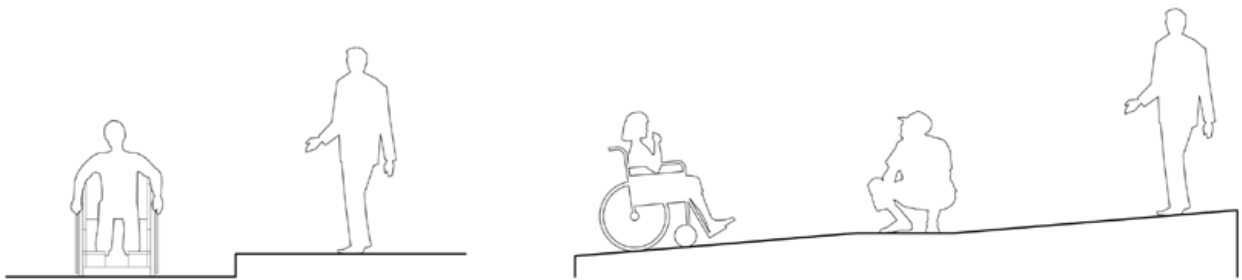
'Architecture, Barriers and Human Behaviour' (Moodley, 2017), a study in applied theory, developed the topic through analysis of edge and barrier conditions. The study explored the practical implications of varying conditions of scale and materiality of edges and barriers, and their impact on human behavior and spatial ordering. This was supported by examinations of key theories by Oscar Newman (1996), Claude Parent and Paul Virilio (Johnston, 1996), which looked at threshold and surface conditions as elements which define spatial ordering and social paradigms.

This study yielded as set of design principles to be implemented in the design dissertation proposal. These principles (Figure 3) offer points of design interrogation that aid in the establishment of defining thresholds and spatial organisation.

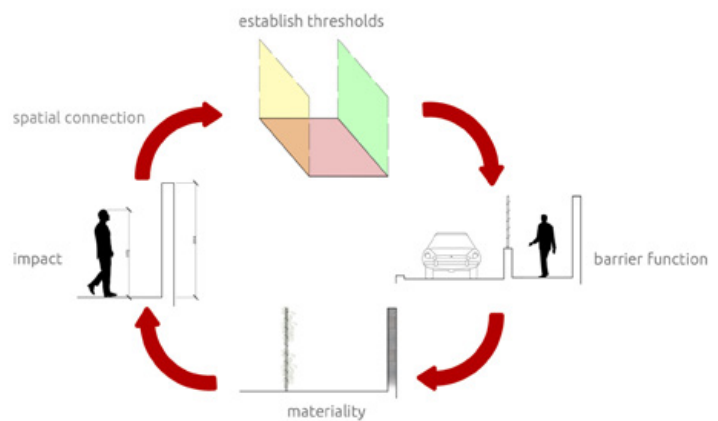
'Dynamic Architecture: Responsive Design' (Moodley, 2017), a study in applied technology, explored technical aspects and considerations of building envelope design. The study examined case study projects, analyzing key social and environmental design responses. Much like the study in applied theory, the technical study produced a set of design principles, which offer lines of design interrogation within the design dissertation architectural proposition. These principles (Figure 4) propose key strategies for building envelope design, exploring conditions of scale, interaction and adaptability.



Thresholds, Barriers, Function and Impact

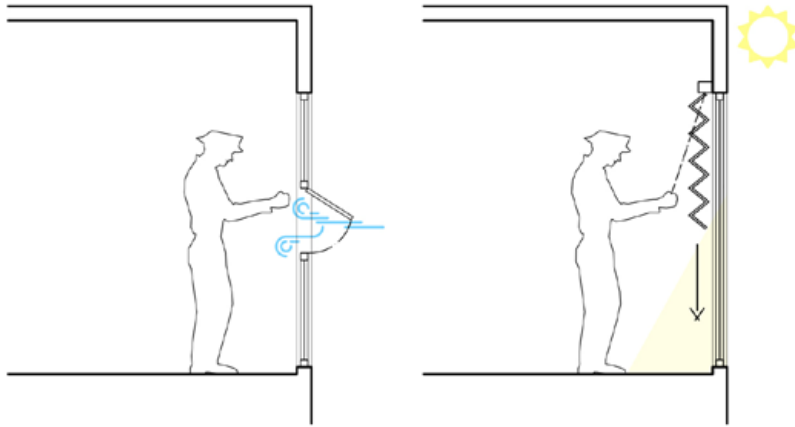


Access and Level

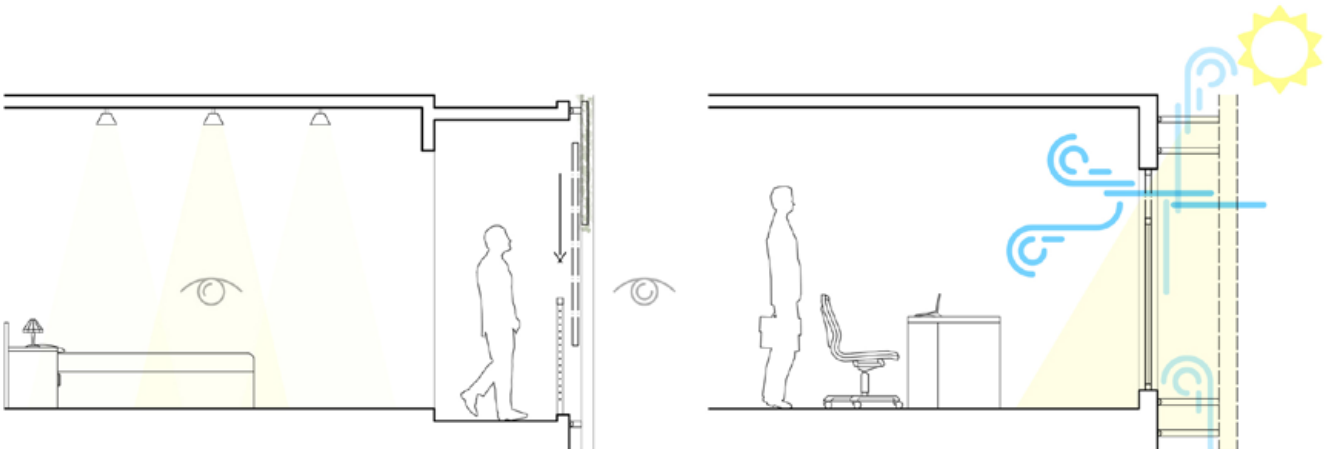


Design Implementation

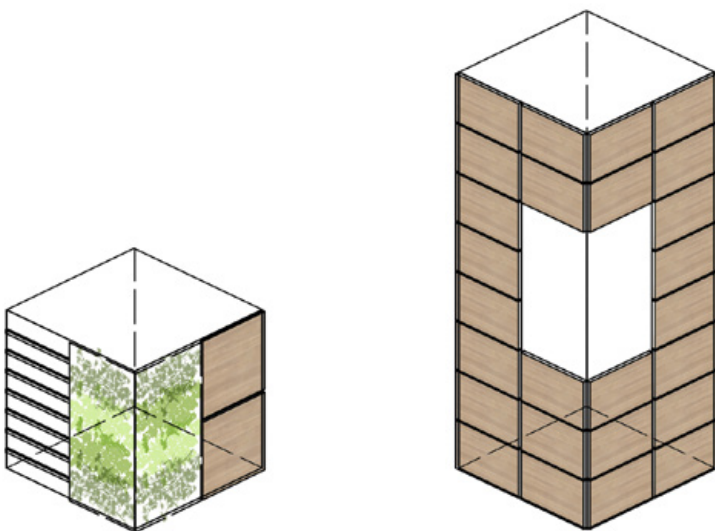
>> Figure 3  
Applied Theory Design Principles



Occupant Participation



Programmatic Response



Scale and Detail



Feedback-Loop System

>> Figure 4  
Applied Technology Design Principles

## 1.4 DESIGN DISSERTATION DEVELOPMENT

The initial design dissertation topic, developed through exercises of writing and collage, explored a fundamental question. What is the relationship between the building envelope and the social surface? Figures 5 and 6 illustrate that initial concept. The images explore the manner in which social activity is facilitated by the building envelope, as well as ways in which the building envelope or façade may begin to communicate a sense of activity or life of the building to the greater context.

Having worked within the context of Gugulethu during my BAS (Honours) studies, my observations of the variety and intensity of activity on the street as well as in and around public buildings was fully apparent. Figure 7 sought to illustrate that, within the context of Gugulethu, and very often in most working-class/poorer communities, the active street culture is a defining element that expresses the life of the community. In this situation, the public buildings that act as the backdrop to the activities should actively engage with and facilitate these activities.

As a creative method, I explored story telling as a device in which to engage with the social complexity, activity and lives of a community. This could also be used as a design generative tool, in which scenarios of use could be run in order to understand and develop social and spatial arrangements. This is represented in Figure 8, which illustrates a fictional journey of an informal trader.

These initial exploratory collages sought to represent the key ideas and lines of inquiry within the design dissertation topic. As the design dissertation progressed and developed through the theoretical and technical studies and inquiries, so too did the explorations.

Analysis of the works and theories of Claude Parent and Paul Virilio (Johnston, 1996) resulted in explorations in the function of the oblique (Figure 9). These explorations examined the relationship between the oblique surface, materiality and the human body. This line of inquiry sought to understand how new socio-

spatial paradigms may result from the manipulation of surfaces. Furthermore, this exploration sparked an interrogation of the human body and its response to various spatial conditions. This interest manifested as a series of wire models (Figure 10). Linked to the idea of storytelling, the intention of the models was to represent the active human body, communicating the form and space in which it occupied. This line of analysis, although interesting, lost traction as the design dissertation inquiry developed, making way to explorations of more built spatial conditions rather than bodily.

These spatial explorations emerged through the analysis of Defensible Space Theory by Oscar Newman (1996). Although Newman's theory communicates more residential conventions, I sought to apply his theories and principles in larger, more public settings.

“ The establishment of defining thresholds which demarcate degrees of privacy and territoriality should be a key design consideration. The nature (functionally and materially) of the barrier condition that defines these thresholds is then essential in the imageability, surveillance and spatial connections between the various boundaries and territories. By creating these thresholds and establishing a set of boundary conditions that are appropriate to the degree of privacy - Newman's theory can be used as an ordering device and as an early design guideline.

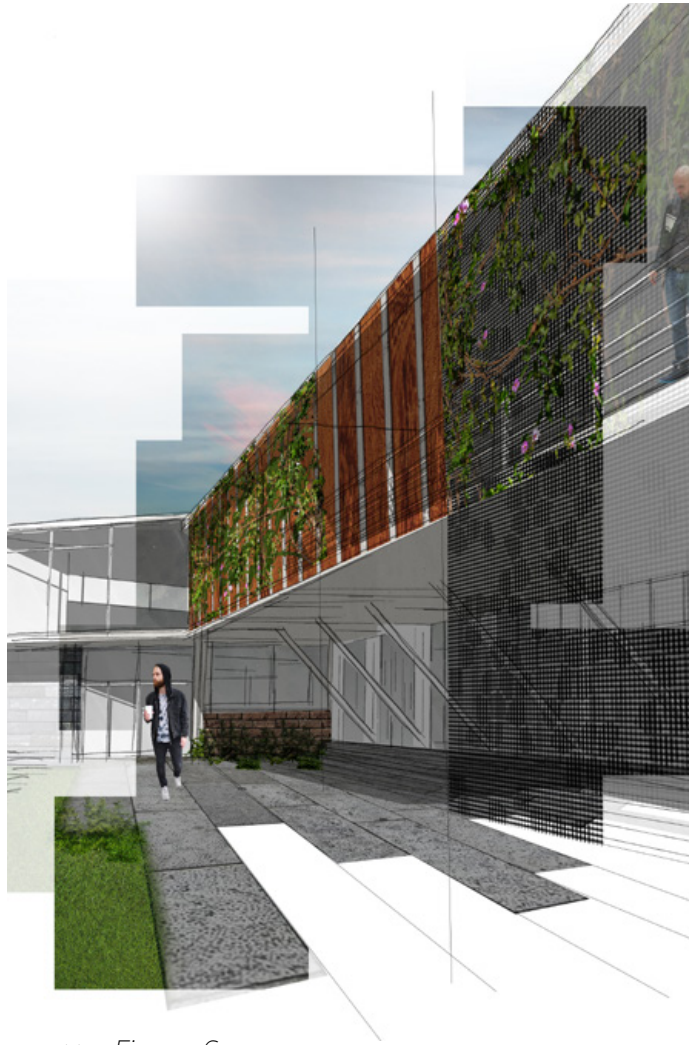
- (Moodley, 2017, p. 26)

The above excerpt from *Architecture, Barriers and Human Behaviour*, highlights a key concept of Newman's Defensible Space Theory: through creating and understanding the role and impact of defined thresholds conditions, one can begin to produce spatial configurations that demarcate degrees of privacy and conditions of security whilst also experimenting with the relationship between these spaces.

This concept was explored through collage as well as model making. Figure 12 illustrates an abstract model, which represents the above idea. The model represents spatial ordering in which degrees of privacy are layered. The outer layers, being completely bare, represent



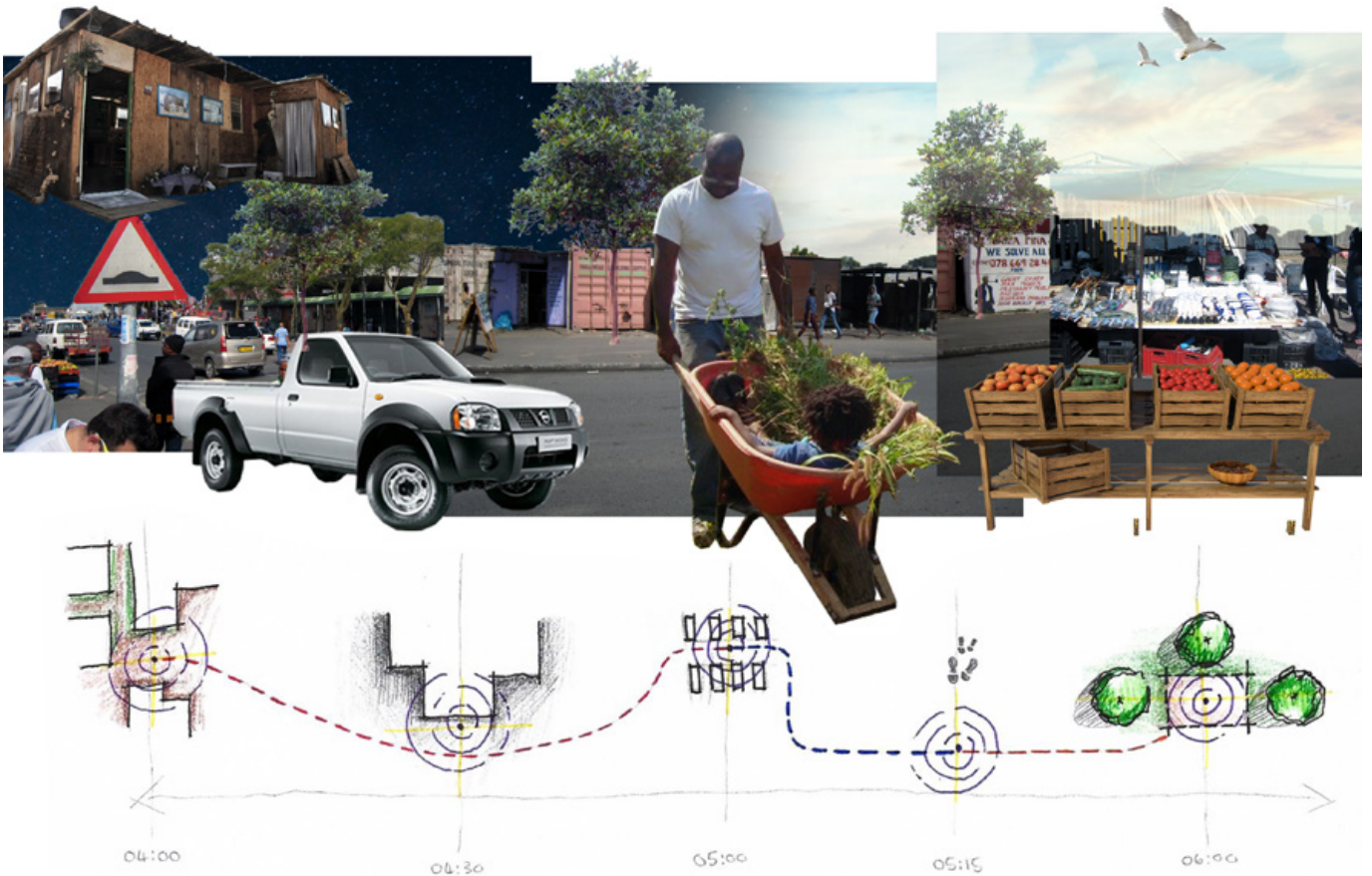
>> Figure 5  
Social Building Envelopes



>> Figure 6  
Active Building Envelopes



>> Figure 7  
Active Street Culture



>> Figure 8  
 Story-Telling: Traders Journey



>> Figure 9  
 Surfaces of the Oblique Function

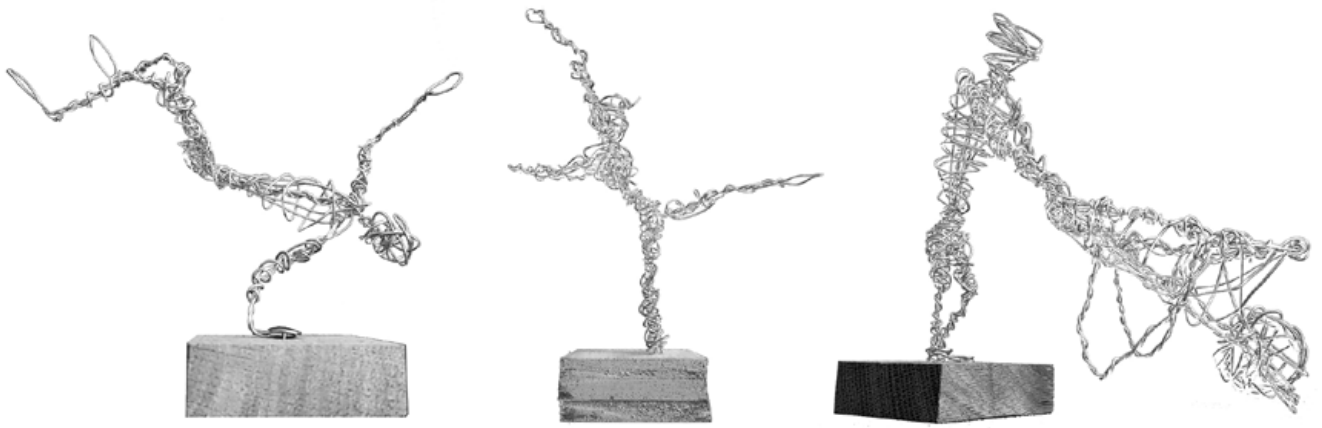
the most public space, which is free of barriers and obstacles. The layers that follow, representing semi-public, semi-private and private space, are defined by change in conditions of access, level, materiality and permeability, which become more stringent through each threshold progression.

Figures 13 to 16 illustrates the spatialization of this concept, through a sectional model. The section speaks to an ordering system, in which changes in level, materiality and permeability define the varying degrees of privacy and access within a building. The spaces/moments between these 'privacy bands' become the key thresholds that communicate the spatial characteristic. Furthermore, the section illustrates the overlap that can exist between these privacy conditions, in which the 'privacy bands' can be both vertical as well as horizontal spatial systems, and private space may be embedded within public space. This exploration is a key informant within the design dissertation proposal.

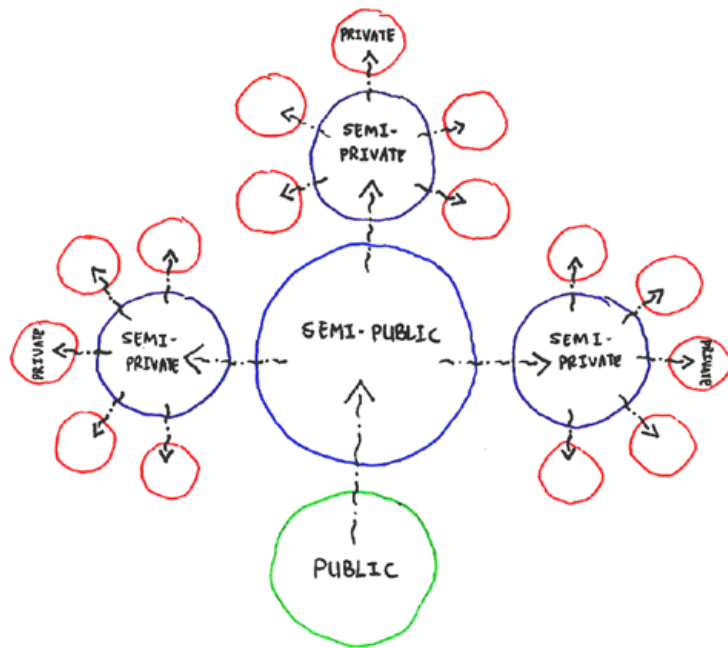
As the design dissertation progressed and required more practical representation and observation of these spatial conditions, I sought to produce a form of representation, which could characterise social and spatial conditions of my selected fieldwork site. These models (Figure 17) make use of an abstract representation of urban precincts, in which each element represents a different urban component, both vertically and horizontally. The large solid masses represent built spaces, whilst the circular and rectangular elements represent pedestrian and vehicular movement in and around these spaces, respectively.

Overall, these creative methods assisted me in defining and representing the key theories and ideas that would shape the direction and intent of the design dissertation.

Through the development of the design dissertation inquiry, I sought to examine these social and spatial conditions within a defined context. A practical fieldwork study provided the opportunity to observe the complex relationship between formal and informal activity, studying spatial organisation, threshold conditions and adaptability.



>> Figure 10  
The Body and Space



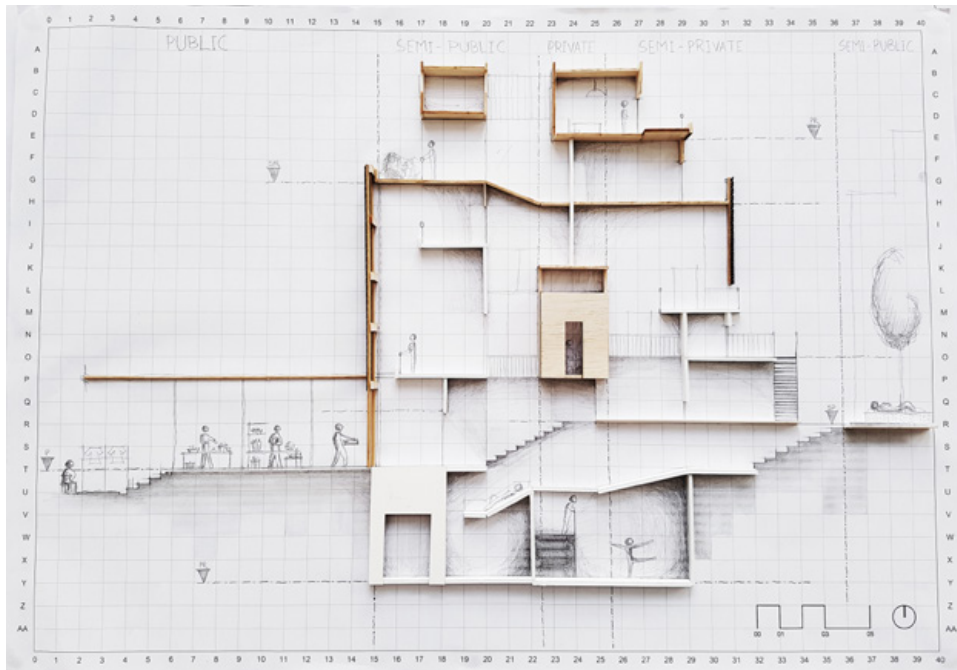
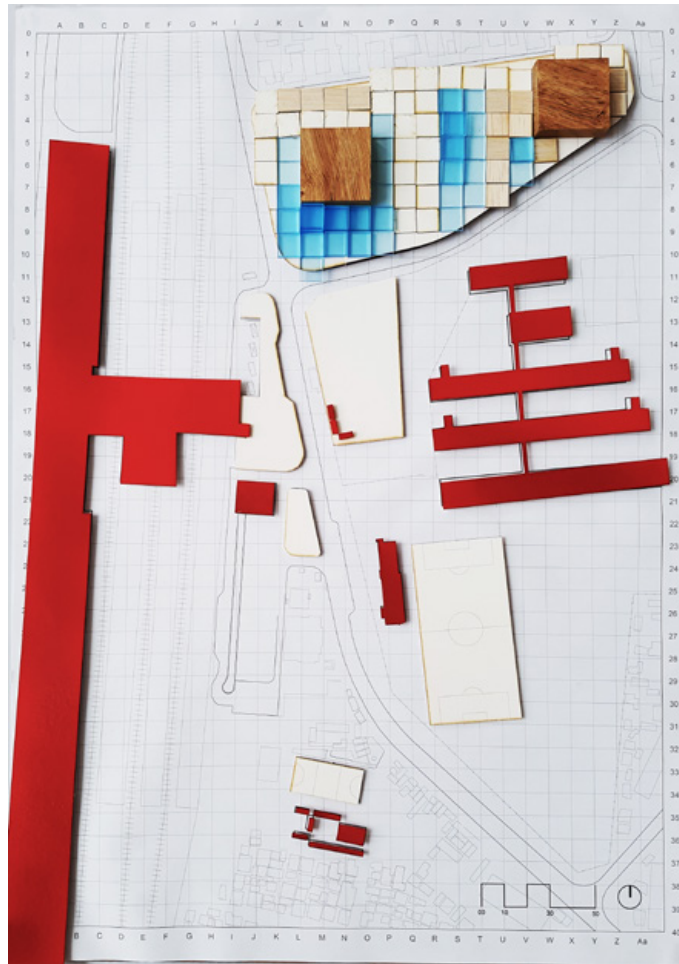
>> Figure 11  
Oscar Newman's Defensible Space Thresholds



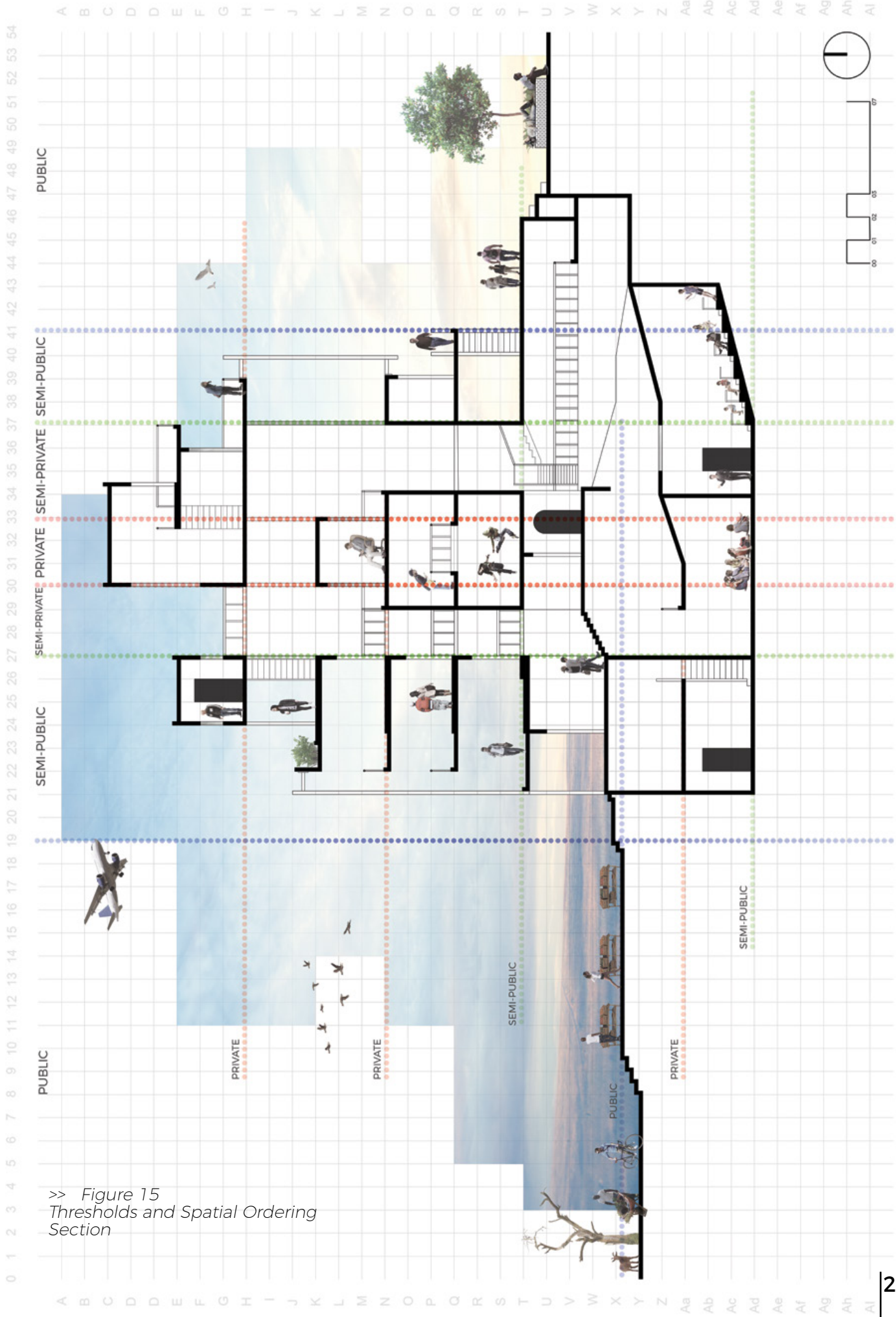
>> Figure 12  
An Abstract Study of Thresholds and Degrees of Privacy

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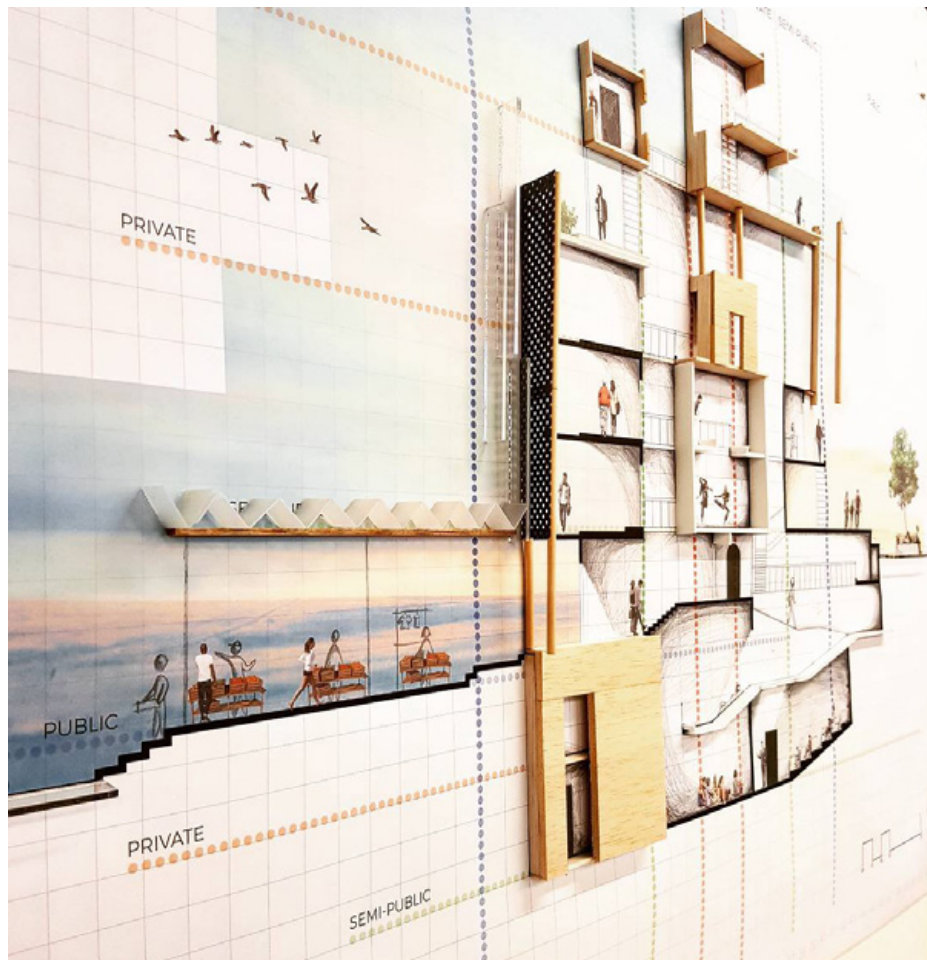
>> Figure 13  
Concept Spatialization  
Plan Model



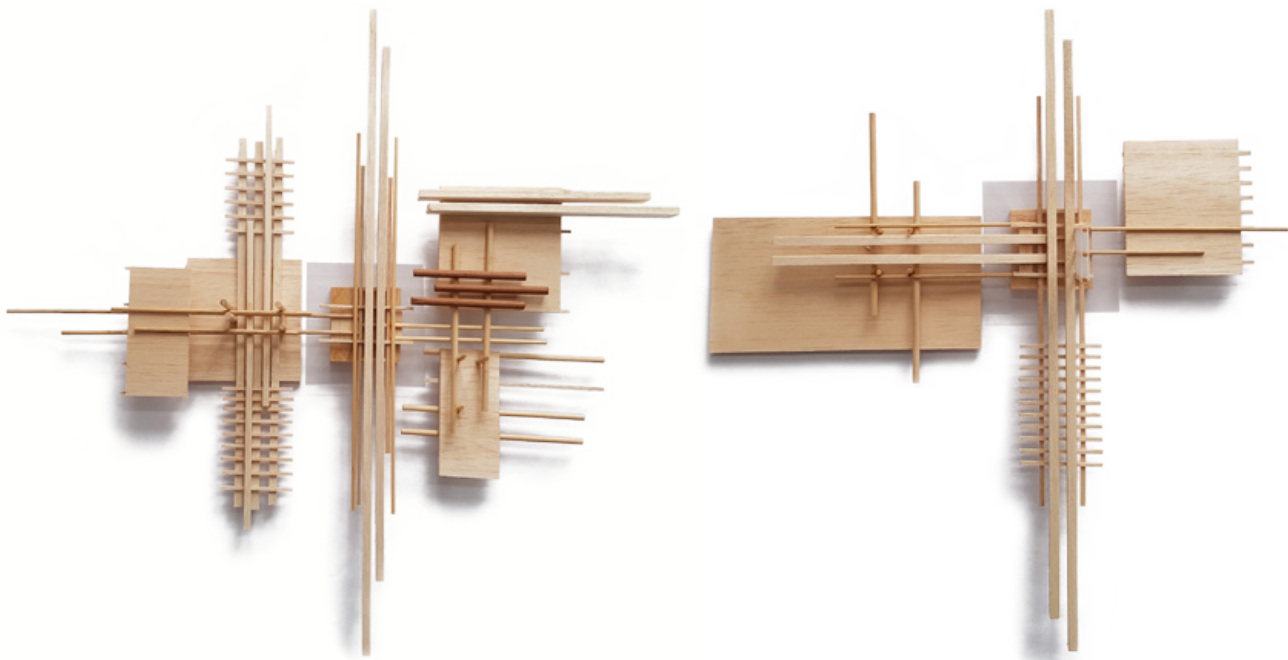
>> Figure 14  
Concept Spatialization  
Section Model



>> Figure 15  
 Thresholds and Spatial Ordering  
 Section



>> Figure 16  
Threshold Sectional Model



>> Figure 17  
Socio-Spatial Precinct Model

# 02

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## **FIELDWORK**

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DEFINITION OF FIELDWORK SITE, KEY DATA AND  
FINDINGS



# FIELDWORK

## 2.1 INTRODUCTION

---

The design dissertation fieldwork study, conducted in the Nyanga Junction precinct of Southern Gugulethu, Cape Town (Figure 18), sought to examine and understand the complex networks and varied activity that characterises the area, both formally as well as informally.

The precinct plays host to a wide range of programmes and activities, from transport, to informal trade, education and agriculture. These programmes operate alongside one another, contributing to the vibrancy and efficacy of the precinct spirit.

The study focused on the key points of activity within the precinct, examining their organisational structures, as well as the relationship between built form and flexible event. These areas, highlighted in Figure 19 and 20, were selected due to their programmatic mix as well as their facilitation of flexible and informal activity.

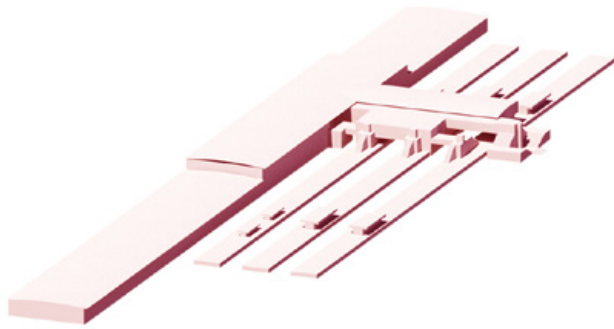
The fieldwork study comprised practical observation of the area, observing patterns of inhabitation, activity networks and conditions of operation. This study was conducted during several site visits at various periods of the day. In addition to the practical observations carried out during these site visits, a series of interviews were conducted with individuals with the intent of gaining in-depth data and information regarding the interviewee's specific activity and connection to the precinct.

As mentioned in the previous section, care was taken to ensure that the interview procedure (engagement, questionnaire and data gathered) posed no risk to the respondent and that the ethical aspects outlined on page 13 and 14 were adhered to.

The interview procedure involved initial engagement and explanation of the research intent (at which point consent for both the interview and photography was obtained), a conversational discourse guided by the interview questionnaire followed, and finally the taking of photographs of the interviewee as well as the immediate surrounding area took place. This interview methodology was established and developed from a BAS (Honours) year engagement with VPUU, in which we utilized their research methodologies in aid of conducting fieldwork studies on their behalf (Cooke, et al., 2015).

The interviews were conducted with the aid of a community fieldwork guide, Mr. Tarzan Mbita, who acted as the safety officer as well as provided support and translation when engaging with community members. His assistance with establishing a rapport with the interviewee's ensured that they provided rich and relevant information pertinent to my design dissertation inquiry.

The following section summarizes key information gathered from the fieldwork interviews, highlighting essential characteristics and aspects of each interviewee and activity.



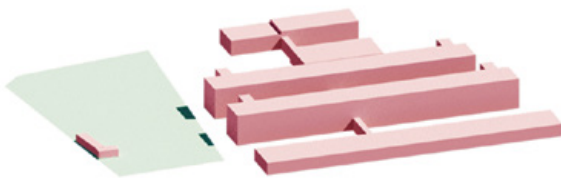
## 1. NYANGA JUNCTION STATION & TRADING FORECOURT

Nyanga Junction Mall and Train station provides a myriad of activity and vibrancy within the area. As a public transport interchange point, it accounts for the majority of pedestrian traffic moving in and around the precinct. Due to this vibrant activity, the forecourt and surrounds are populated by various traders and activities, drawn to these areas by the advantage of passing trade.



## 2. OLIVER KAHN SAFEHUB

The Oliver Kahn SafeHub, operated by the Amandla Edufootball NGO, is an accessible asset to the youth of Gugulethu. It offers youth development programmes utilising the medium of sports as a metaphor for healthy lifestyles. Its youth cafe facility, football field and Internet hotspots make it an ideal area for work or recreation.

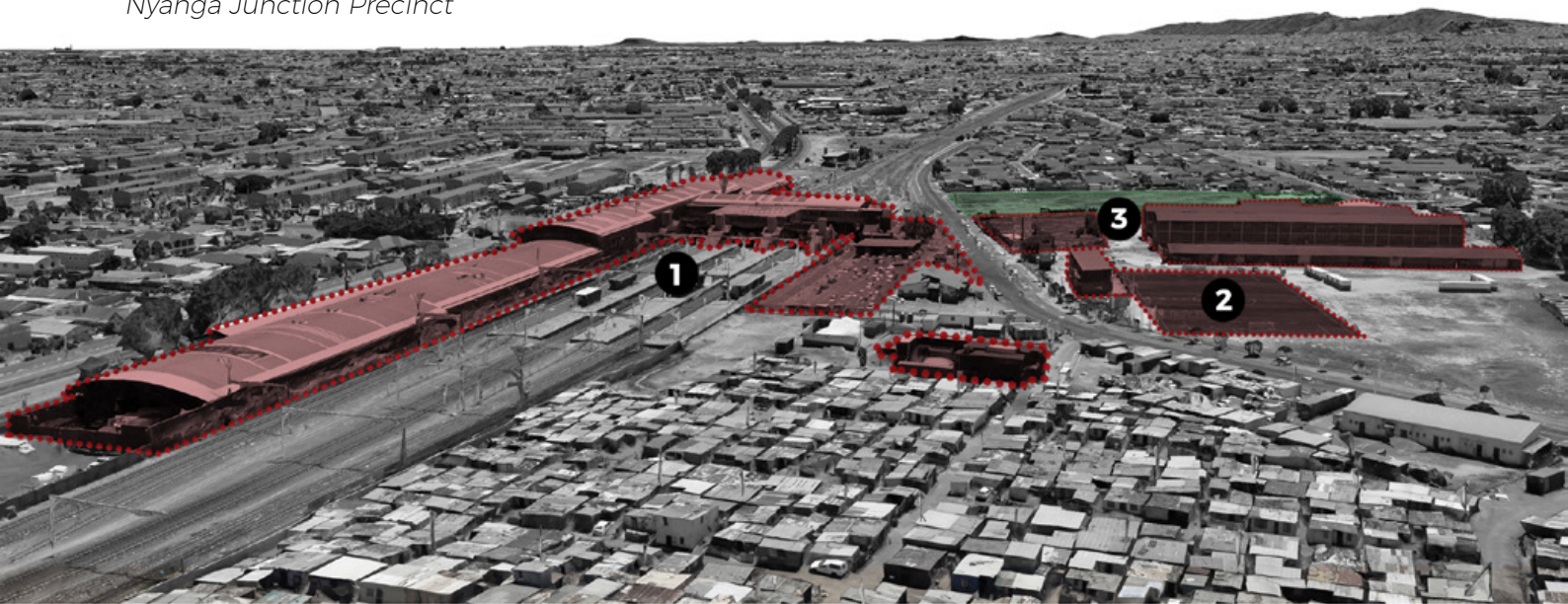


## 3. URBAN FARM & TECHNICAL SCHOOL

The Intshukumo Secondary School is a technical vocational school with several workshop spaces. The Urban Farm is located on its property, a quiet refuge from the vibrancy and intense activity of the precinct.

>> Figure 19  
Nyanga Junction Precinct Activity points

>> Figure 20  
Nyanga Junction Precinct



## 2.2 A SOCIAL STUDY

A total of five interviews were conducted throughout the fieldwork research. Figure 22 illustrates the location of where these interviews took place in relation to the Nyanga Junction Precinct.

The first two interviews were conducted with informal traders operating in the forecourt of the Nyanga Junction train station. These traders, Gertrude Tiyoni, a fruit and vegetable trader (Figure 24) and Amanda Sidimba, a clothing and confectioneries trader (Figure 25), provided insight into their day-to-day operations, networks and challenges. Both Gertrude and Amanda make use of the existing infrastructure of Nyanga Junction.



Gertrude operates a fruit and vegetable stall in the forecourt of the Nyanga Junction train station. When the stall is not operational, she stores her goods in storage lockers located near the train station. She exclusively trades on the main steps of the train station entrance, which is highly beneficial due to the high pedestrian traffic of the daily commuters. The positioning of her stall is ideal; however, during peak hours in which pedestrian traffic volumes are high, the stall is quite vulnerable. Ideally, Gertrude would like to have a sheltered space under which she can trade. This would provide her with potential additional security, storage as well the opportunity to trade during poor weather conditions.



The fruit and vegetable stall is a prime example of trade situated in an ideal location, but lacking the supporting infrastructure to truly thrive in the environment. Safety and functionality in poor conditions are issues that, when addressed, could see the business thrive.

>> Figure 21  
Fruit and Vegetable Trade

NYANGA JUNCTION  
TRAIN STATION

INFORMAL  
CLOTHING  
MARKET

URBAN FARM

INTSHUKUMO  
SECONDARY  
SCHOOL

OLIVER KAHN  
SAFEHUB

LOTUS PARK  
NEIGHBOURHOOD  
CENTRE



**INTERVIEW LOCATION PLAN**  
1:1500

2

3

5

1

4



1. FRUIT &  
VEG. TRADE



2. CLOTHING  
TRADE



3. URBAN  
FARM



4. SAFEHUB



5. SCHOOL

>> Figure 22  
Nyanga Junction Interview Locality

# 02

Amanda trades to the north of the main entrance staircase of the train station, in the foreground of a series of shipping containers. She co-owns a shipping container, which she uses for goods storage. Amanda's stall is situated on a vibrant trade corner, in which a clothing market spills out across the street on three edges. There is a territorial nature to the trade in the clothing space and indeed in the informal market of Nyanga Junction as a whole. Most traders claim specific areas from which to trade, however during poor weather in which certain traders are unable to trade, other traders may make use of their space.



The lively clothing market of Nyanga Junction facilitates the sorting and selling of clothing. Trade occurs with members of the community, as well as between the clothing traders themselves. Additionally, the clothing market situated opposite Amanda's stall (on the vacant land) conducts trade with the international members of the community, and fluctuates in size on a daily basis. This market emerges off three edges along the main road, with trade and sorting occurring simultaneously on these edges (Figure 18, pg.28). This vibrancy of activity acts as a charging element in this area of the precinct.



Amanda had originally traded out of a building located in Nyanga Junction; however, due to the business failing, she elected to return home to the Eastern Cape. Upon returning to Cape Town and Nyanga Junction in 2016, she found that her space in the building had been taken. She then elected to sell food from a container. Issues arose due to the formality of that trade at which point she elected to trade from her current, smaller, more informal stand. A key issue for Amanda as well as the other clothing traders is that of shelter. During poor weather conditions, most of the clothing traders are unable to conduct their daily operations.

>> *Figure 23  
Clothing Trade*

Amanda would like to one day own a mobile kitchen stall, in which she can prepare and sell food. Her story is one of resilience and upliftment and an indicator of the strength and aspirations of individuals and this community.



**GERTRUDE TIYONI**  
Fruit and Vegetable Trader



#### TIMETABLE

- Operates from 7am to 8pm
- Makes use of a taxi or family transport to get to and from stall



#### ACTIVITY TYPE

- Informal Trader
- Sells fruit and vegetables
- Operates in the forecourt of Nyanga Junction
- Sells out of crates and packets (No display tables)



#### NETWORKS

- Her brother assists with transport
- She recently started working at the stall, the stall has multiple employees



#### BARRIERS

- Lack of shelter and storage is an issue
- Lack of display infrastructure is an issue



#### WEATHERING

- Does not operate in bad weather
- No shelter and therefore is unable to deal with poor weather or move

>> Figure 24  
Gertrude Interview Profile



**AMANDA SIDIMBA**  
Clothing and Confectioneries Trader



#### TIMETABLE

- Operates from 7am to 7pm
- Makes use of a hired vehicle to transport goods



#### ACTIVITY TYPE

- Informal Trader
- Sells clothing and food
- Operates out of a shared storage container



#### NETWORKS

- Internal networks
- Bartering system among local traders
- Exchanges Tupperware for clothing



#### BARRIERS

- Owning a more permanent structure brings issues as you tend to be moved.
- Infrastructure does not support trade in bad weather



#### WEATHERING

- Cannot sell clothing in bad weather
- Cannot operate entirely in very bad weather

>> Figure 25  
Amanda Interview Profile

The third interview was conducted with Sibongile Sityebi, a farmer who, with two co-workers, runs the urban farm located opposite the train station (Figure 28). Sibongile provided information regarding the functioning, range of produce, trade networks and challenges regarding the upkeep of the farm.

The farm is located on land owned by the secondary school and has been in operation for nine years, having begun in 2008. Including Sibongile, there are three beneficiaries of the farm. They do not pay rent for use of the land, but rather have a five-year lease agreement with the school, which is subsequently renewed upon expiry.

The farm offers a quiet refuge from the intense activity occurring in and around Nyanga Junction. Producing over 40 different types of vegetables and herbs, the garden sells 80% of its produce through the Harvest of Hope organisation, a network of community gardens supported by the Abalimi non-profit organisation. The remaining 20% of produce is sold to community members or used for personal consumption.

The limited space does pose production issues, as they are limited in the variety and amount of produce that they are able to grow. Ideally, they would like more land in order to increase the yield of certain types of produce. Poor weather conditions can also adversely affect the farm. Strong winds tend to topple the taller plants, and heavy rains often cause flooding. Sibongile suggested that creating a windbreak with taller indigenous plants as a hedge along the farm perimeter may provide protection to the produce.

Sibongile has been eager to involve students through educating them on the upkeep and management of the farm, regularly encouraging educators from the secondary school to bring the students to the farm; however, interest and attendance, from both the educators and students is often low.

“ It was a long time ago we were trying ... to do that [teach the secondary school students], I even asked them to send some other kids here so that I can teach how to garden and how to do a garden...I was speaking to another guy recently to write a letter so that maybe we can approach the schools for their school nutrition, whereby they can come and buy, maybe we can offer them what we grow.

– Sibongile Sityebi (2017)

The farm does not trade with the traders in Nyanga Junction, as there is a strong competition of fruit and vegetable trade within the forecourt. Generally, the farm trades with international community members. In terms of infrastructure, the farm sufficiently makes use of a single water tank (which collects rainwater) and borehole water, as well as three shipping containers for storage and as an office, which are sufficient for its needs.

The urban farm stands as a shining example of individuals within Gugulethu utilizing their skills to uplift not just themselves, but others as well. There is a strong will to educate others and promote skills development within the community.



>> Figure 26  
Urban Agriculture

The fourth interview was conducted with coordinators of the Oliver Kahn SafeHub (Figure 29), Yanga Dudumashe and Wayne May. During this interview, they provided information on the day-to-day operations of the facility, the various youth programs that they facilitate as well as the range of users and requirements for running the facility.

The SafeHub is a youth development facility that features programs targeted at the youth of Gugulethu and Manenberg. Through the draw of sports activities, the Amandla Edufootball programme provides after school activities, ensuring that the children of the community are active and learning during off-school times, and not susceptible to the violence and dangers of street life in the community.

Through programs and workshops that assist young adults in improving their skills and preparing them for key phases such as interviews, providing barrister training (which in many cases leads to immediate jobs), and sports training, the facility aids in uplifting the youth in the community and making a tangible difference in the lives of disadvantaged individuals.

The facility is managed by various members and accommodates youth age groups up to the age of 35 years. Although there are plans to expand, the draw of sport, skills development and internet training means that the SafeHub is always busy.

The SafeHub encourages expression, and hosts regular public events. Poor weather does not drastically hinder the SafeHub's operation, as the youth Café and Academy hall can always be used should conditions not permit certain activities elsewhere. The coordinators stated that the imageability of the building results in a lack of engagement from the older community members.

“ I think the fence also determines access, In the sense of whether or not people feel comfortable wanting to actually enter the building. I think the challenge as we currently stand now is that the community doesn't necessarily see this building as theirs just yet. For us that is our challenge of wanting to break that kind of barrier down. It's not necessarily a physical barrier, because once you feel this is "my space", the building or the fence shouldn't prevent you from coming in.

- Wanye May (2017)

“ We work in a community that doesn't have many opportunities and when they see a building like this, they see an office space. They don't see a fun space to be in; they see 'ok, that's office, that's corporate, you don't go there'... It is the fear that this is too formal...it's a matter of caution. If there are more opportunities like this, people may start to relate more.

- Yanga Dudumashe (2017)

The SafeHub is a complex and essential component within the Nyanga Junction precinct. Youth see it as a refuge and a place of safety. It stands as an inspiring model, that illustrates the power of sports and recreation as a means by which to engage and uplift communities, while its facilities ensure that it is able to accommodate the needs of the community.



>> Figure 27  
Oliver Kahn SafeHub



# 02



**SIBONGILE SITYEBI**  
Farmer at the Urban Farm



**OLIVER KAHN SAFE HUB**  
Yanga Dudumashe & Wayne May



### ACTIVITY TYPE

- Urban Garden / Farm
- Leased school land
- Operating for 9 years
- +- 40 different types of produce (including herbs)
- 3 Beneficiaries



### NETWORKS

- Sells good at Harvest of Hope Market
- Sells to members of the community
- Sells Brinjals to farmers in Philipi
- Goods purchased from Harvest of Hope



### EDUCATION

- Attempts to educate children from the school
- Harvest of Hope Networks



### WEATHERING

- Strong winds topple larger plants
- Heavy rains lead to floods
- Suggested windbreaks on periphery



### TIMETABLE

- Offers various activities during the week
- Monday to Thursday closes at 6pm
- Friday closes late evening (10pm)



### ACTIVITY TYPE

- Youth development NGO
- Development seminars, training, youth events
- Football and other sports activities
- ICTS and youth cafe



### NETWORKS

- Funded by Department of Social Development as well as overseas donors
- Ikamva Tutoring
- Work with schools in the area



### BARRIERS

- Imageability of building means community does not always feel welcome
- Community has not take ownership of building
- Brand of SafeHub needs to be better established



### WEATHERING

- Bad weather prevents certain outdoor activities from occurring
- In that event, activities are performed in indoor spaces providing there is no timetable clash

>> Figure 28  
Urban Farm Interview Profile

>> Figure 29  
SafeHub Interview Profile

The fifth interview was conducted with Ntsikelelo, the principal of Intshukumo Secondary School, a vocational technical school (Figure 31). Ntsikelelo provided a tour of the school, information regarding the programmes and facilities and the various operations that occur after hours or during holidays. The school currently has 910 high school learners, coming from within Gugulethu, as well as from Khayelitsha and Nyanga. As the school is a technical vocational school, it focuses on technical training in addition to its core subjects.

The school has several workshop spaces, all accommodating a different form of technical training. These include electrical, metal, civil technology and engineering and graphic design workshops. These spaces can accommodate up to 25 learners and are secured via security gates due to the valuable equipment. During school holidays, the school runs a series of 'intervention' programs, such as winter school and tutoring, offering the opportunity for students to continue development and training once a term has ended.

The school hall, which is used for general assemblies, is also rented out, generating income. The hall is rented out to the community, which makes use of it for church events, weddings, funerals and large-scale meetings, as well as by the education department during exam periods. The hall consists of a large open space, flanked on either end by a large stage as well as kitchen and ablution facilities.

The school has a relationship with the SafeHub, making use of their academy spaces for meetings, as well as linking the subjects of Life orientation and Physical Education to the facilities and programs at the SafeHub. The technical focus of the school provides a great opportunity to nurture the crafting talent prevalent in the youth of the community. That element, coupled with the urban farm and Amandla Edufootball facility, provides a vibrant educational precinct that strongly caters to youth development across multiple spheres; be it through formal programs at the SafeHub, technical subjects at the secondary school, or agricultural education at the urban farm; the opportunity to plug in to this existing condition is exciting.



>> Figure 30  
Intshukumo Secondary School

# 02



## INTSHUKUMO SECONDARY SCHOOL

Ntsikelelo, Principal



### ACTIVITY TYPE

- Secondary School
- 910 Students
- Vocational Technical School



### NETWORKS

- I.D. Mkize Secondary School (Entrepreneurship)
- Fazeka Secondary School (Medical)
- Amandla Edufootball



### EDUCATION

- Intervention Programs
- Winter School, Ikamva



### FACILITIES

- Workshops
- Computer Lab
- School Hall (Kitchen, Toilets, Stage)
- Library (currently under renovation)

The Nyanga Junction precinct offers a complex mix of activity, both formally and informally. The relationships between these activities and the built infrastructure that accommodates or backgrounds them are varied. The informality of trade in the precinct sees the built infrastructure play a secondary role in the functioning of the activity - in most cases, used for advantageous pedestrian activity or storage.

In other cases, such as the farm, temporary/less formal infrastructure, with larger open space is all that is required for operation. In contrast, formal activities such as educational courses or youth development programs, require more robust and permanent infrastructure.

These connections between permanence of structure and formality of activity illustrate the diverse nature of the socio-technical conditions in the precinct. This concept, coupled with some of the key issues faced by individuals in the area (such as weather protection, spatial requirements and security), offers the opportunity for an architectural response that is contextually sensitive.

>> Figure 31  
Technical School Interview Profile

03

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**DESIGN WORK**

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EXPLORATION OF PROGRAMME AND  
ARCHITECTURAL PROPOSITION

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ENVELOPES OF ADAPTATION  
AN ARCHITECTURE OF SOCIAL THRESHOLDS AND FLEXIBILITY

# 03

## DESIGN WORK

### 3.1 INTRODUCTION

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The architectural proposition seeks to establish an architecture that is connected to the complex social, cultural and economic networks of the Nyanga Junction precinct. Through augmenting and building off the existing programme, structures and trade networks prevalent within the precinct, the proposal looks to develop and extend the diverse activity through its programmatic and architectural responses. It is therefore from the precincts existing activity, that the proposal draws its programmatic considerations.

Architecturally, the proposition is defined by varying threshold conditions, which demarcate degrees of privacy and accessibility. These thresholds are characterised by their barrier conditions, restricting or permitting access and continuities. These ideas are drawn from the aforementioned theoretical studies, which speaks to conditions of territoriality, control, and socio-spatial ordering.

The implementation of these theories are used as ordering devices, setting out potential connections and relationships between spaces, programmes and individuals.

This exploration examines both the internal and external thresholds that define, order and secure spaces and activity, whilst accommodating flexibility and adaptability of use. Within the context of Nyanga Junction, in which flexible event (both formal and informal) is an integral aspect of the precinct character, the need for spaces and an architecture that facilitates this fluidity is crucial.

In conjunction with the exploration of thresholds, the design proposition examines complex edge conditions in terms of the manner in which the building envelope engages with the complexity of the environment, community and immediate context. This exploration manifests through the interrogation of dynamic envelope elements; guided by the findings established in the technical studies paper.

The architectural proposition locates itself on the plot of abandoned land to the north of Nyanga Junction Train Station (Figure 33). The site is advantageously positioned in close proximity to the vibrant core of activity that defines the precinct, offering the opportunity to plug in to this intricate network (See Appendix D for site data).



>> *Figure 32*  
*Site Photographs*

WINTER NE WINDS

NOON

WINTER SUNSET

WINTER SUNRISE

SUMMER SUNSET

SUMMER SUNRISE

INFORMAL CLOTHING MARKET

PREVAILING SE WINDS

INTSHUKUMO SECONDARY SCHOOL

URBAN FARM

NYANGA JUNCTION TRAIN STATION

OLIVER KAHN SAFEHUB

LOTUS PARK NEIGHBOURHOOD CENTRE



**SITE LOCATION PLAN**  
1:1500

>> Figure 33  
Selected Site



## 3.2 PROGRAMME

---

The programmatic proposition for the design inquiry emerges from an analysis and understanding of the existing activities and infrastructure that characterises the Nyanga Junction Precinct. The proposed programme looks to build off and augment this existing activity, promoting more varied event and movement on the periphery of the precinct.

The programme establishes links to the existing informal market conditions of the area, the educational hubs and programs of the Oliver Kahn SafeHub and Intshukumo Secondary School, and the contained urban farm to the south of the site. Furthermore, the programme looks to accommodate facilities for use by NGO organisations such as Abalimi, as well as facilities, which can generate income through rental (See Appendix E for Institutional Arrangements).

In addition to these more fixed programmatic considerations, a strong feature of spatial and programmatic adaptability/flexibility is required. This adaptability will allow the building to function as a disaster relief management center, should the need arise. This specific programmatic consideration stemmed from an awareness of the hardships and hazards that are faced by low income or informal communities.

As was observed during my fieldwork studies as well as during a Vertical Studio fieldwork study conducted in the Lotus Park informal settlement (Moodley, Dowlath, & Van't Hof, 2017), the infrastructural conditions in informal settlements are often not able to withstand harsh climatic conditions, such as flooding, leading to individuals losing their homes and becoming displaced. With these prevalent circumstances in mind, the notion of public buildings having the capacity to provide assistance and accommodation in these situations is one worth exploring. Spatial flexibility is therefore imperative.

The initial proposal is defined by three main programmatic components. The Education and Studio

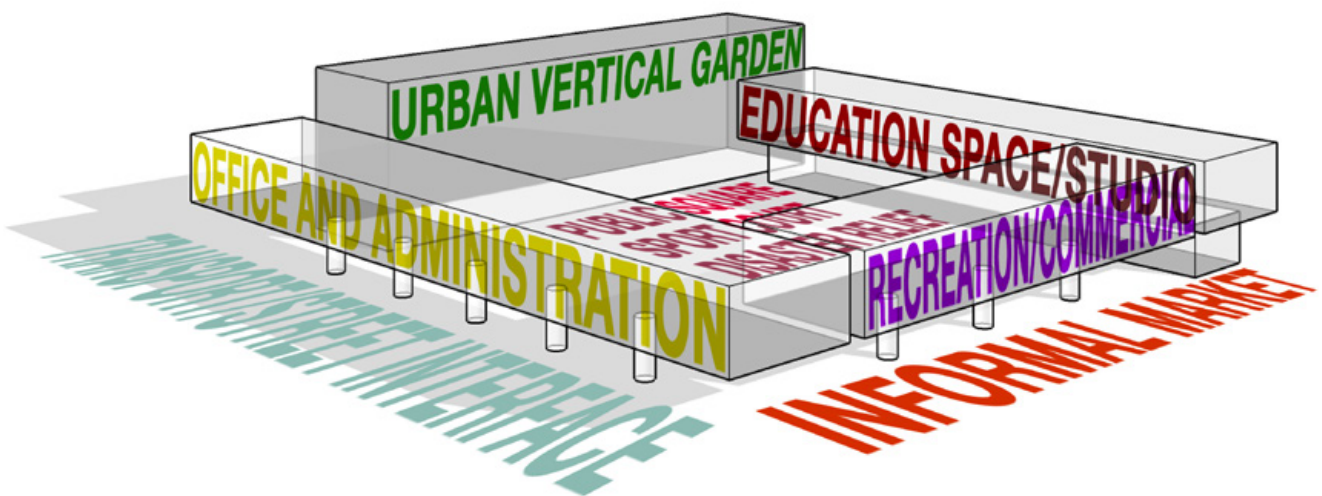
# 03

component, the Office and Community Programme component and the Vertical Urban Garden component. A Welcome Centre connects these three components. The scheme proposes an overlapping and changing of use between these various components, with their variance regulated through social and architectural threshold conditions. Figure 34 illustrates the early programmatic and massing proposition. Public spaces with varied programme are embedded within or surround the programmatic mass.

In front of the Welcome Centre is the existing informal clothes market. This market has a strong connection to the trade occurring in the Nyanga Junction forecourt and attracts activity to this peripheral edge of the precinct. As mentioned in the fieldwork study, the clothes market exists across three street edges, and forms a vital spatial practice that activates the site.

A courtyard provides a space of public activity at the core of the building. This courtyard accommodates sport and performance activities, through the implementation of a sports court, stage and seating area, whilst also accommodating larger community gatherings.

An extension of the existing urban farm characterises a large segment of the site. This extension seeks to tie into the proposed vertical garden component whilst also producing comfortable micro-climates within the precinct.



>> Figure 34  
Programmatic Components

These initial programmatic considerations, defined by the fieldwork study, were further developed as their spatial and functional requirements were established.

Figure 35 illustrates the programmatic matrix outlining the spatial conditions and key connections for each programmatic component. Here we see the common/shared spaces that connect the various programmes, as well as the key thresholds between them, these thresholds identified as the interface between the active public spaces (such as the informal market and urban farm), with the adjacent dynamic interior spaces (such as the studio spaces or welcome centre). This diagram offered an initial insight into the potential spatial configuration for the building, developing the initial diagram in Figure 34, and considering how these various programmes might link.

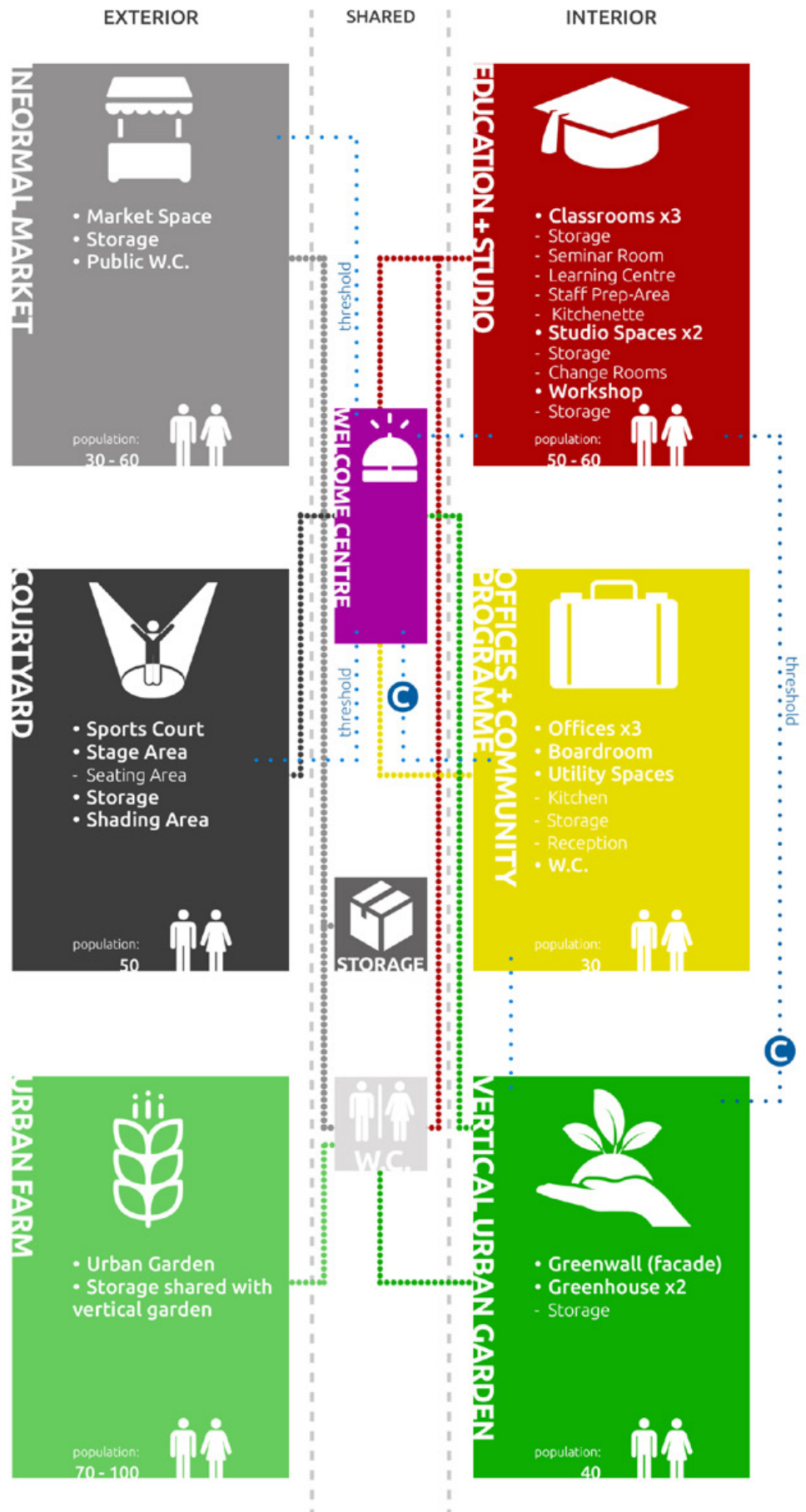
The spatial arrangements for each component was then further developed through unpacking their requirements, ancillary spaces and key dimensions (Figure 36).

This pragmatic approach to understanding and proposing the spatial composition of the building offered cues regarding issues of scale and arrangement. As the spatial complexity of the buildings primary programme progressed, the secondary programme (disaster relief management centre) was being developed in parallel.

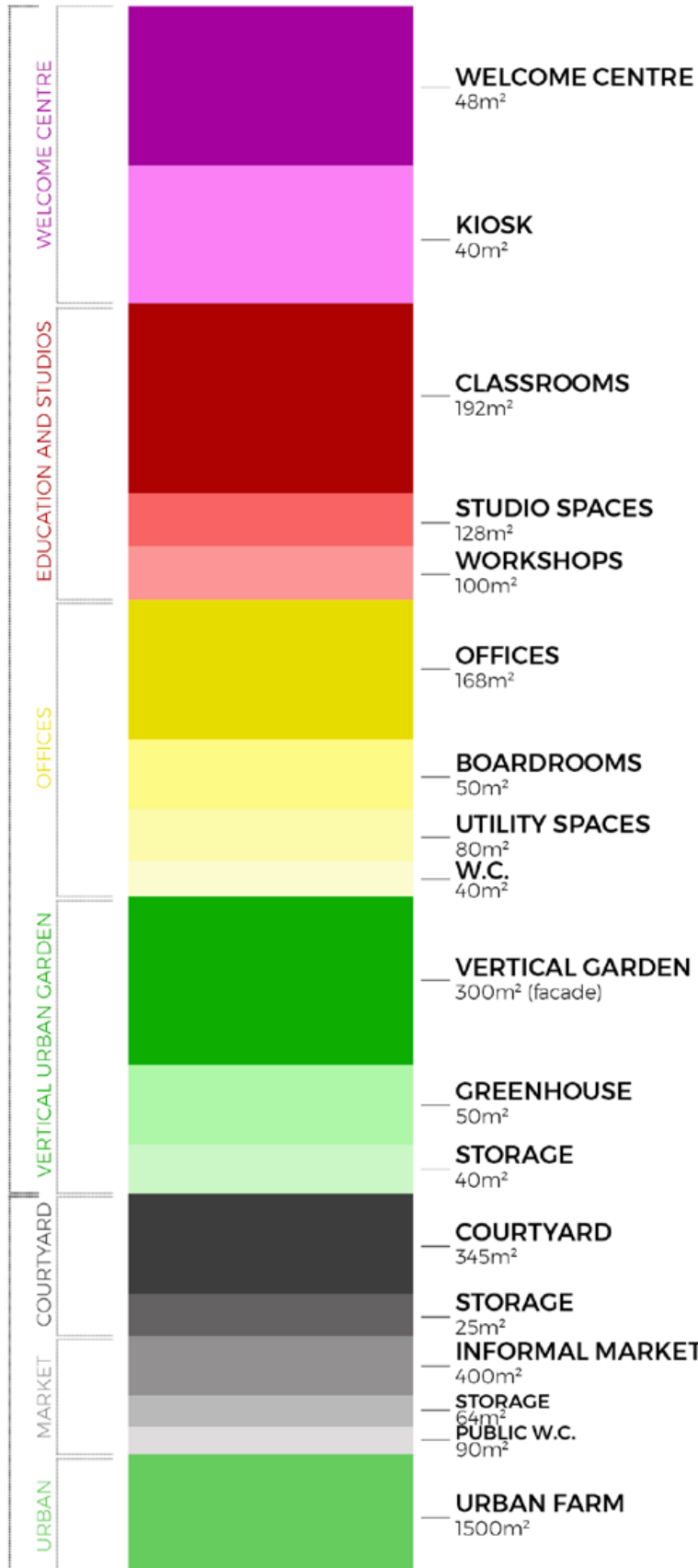
As is illustrated in Figure 38, this involved outlining and understanding the spatial requirements for formal disaster relief centres; this information derived from the Disaster Management Act number 57 of 2002 (Bruwer, et al., 2017). As the framework and requirements for formal disaster relief centres are quite rigid and restrictive, the intention was to identify the most crucial spaces required in a disaster relief centre, and ascertain the spatial connections and overlaps with the buildings primary programme, for a neighbourhood disaster relief centre. This can be seen in Figure 37.

This exploration sought to ensure that although the proposed building would not conform to the full regulations and requirements for a formal disaster

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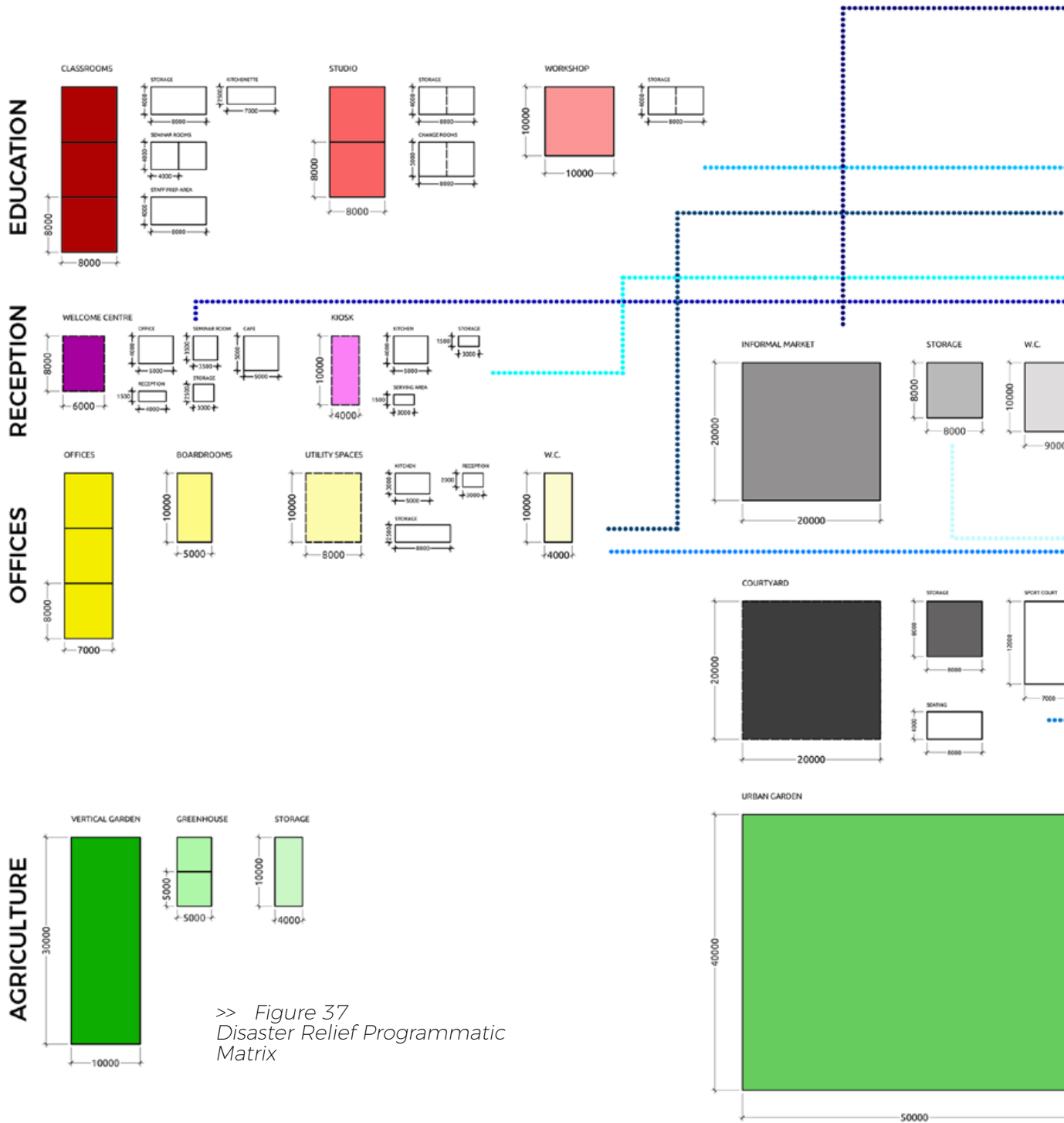
>> Figure 35  
Programmatic Matrix



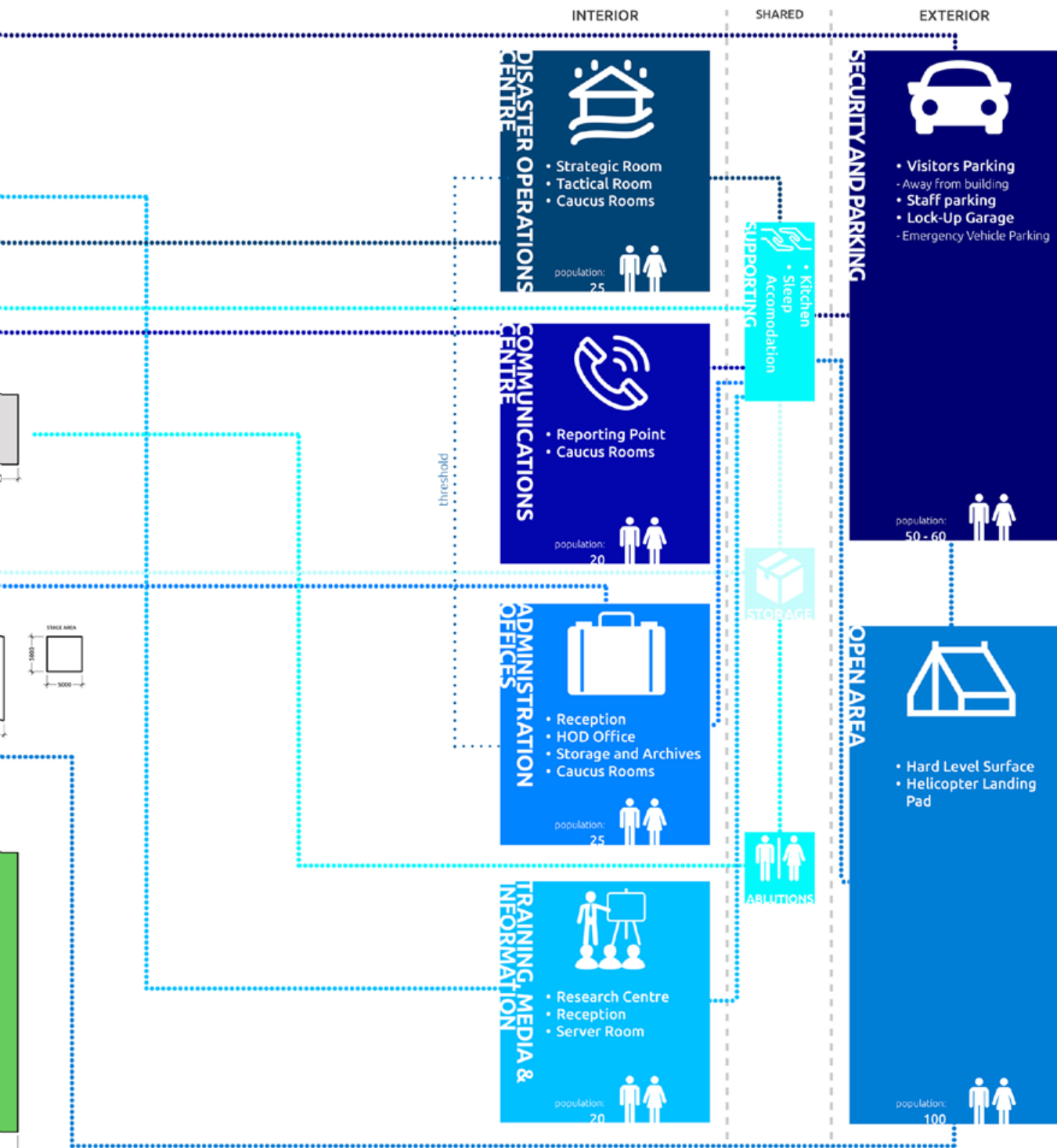
>> Figure 36  
Key Spatial Dimensions

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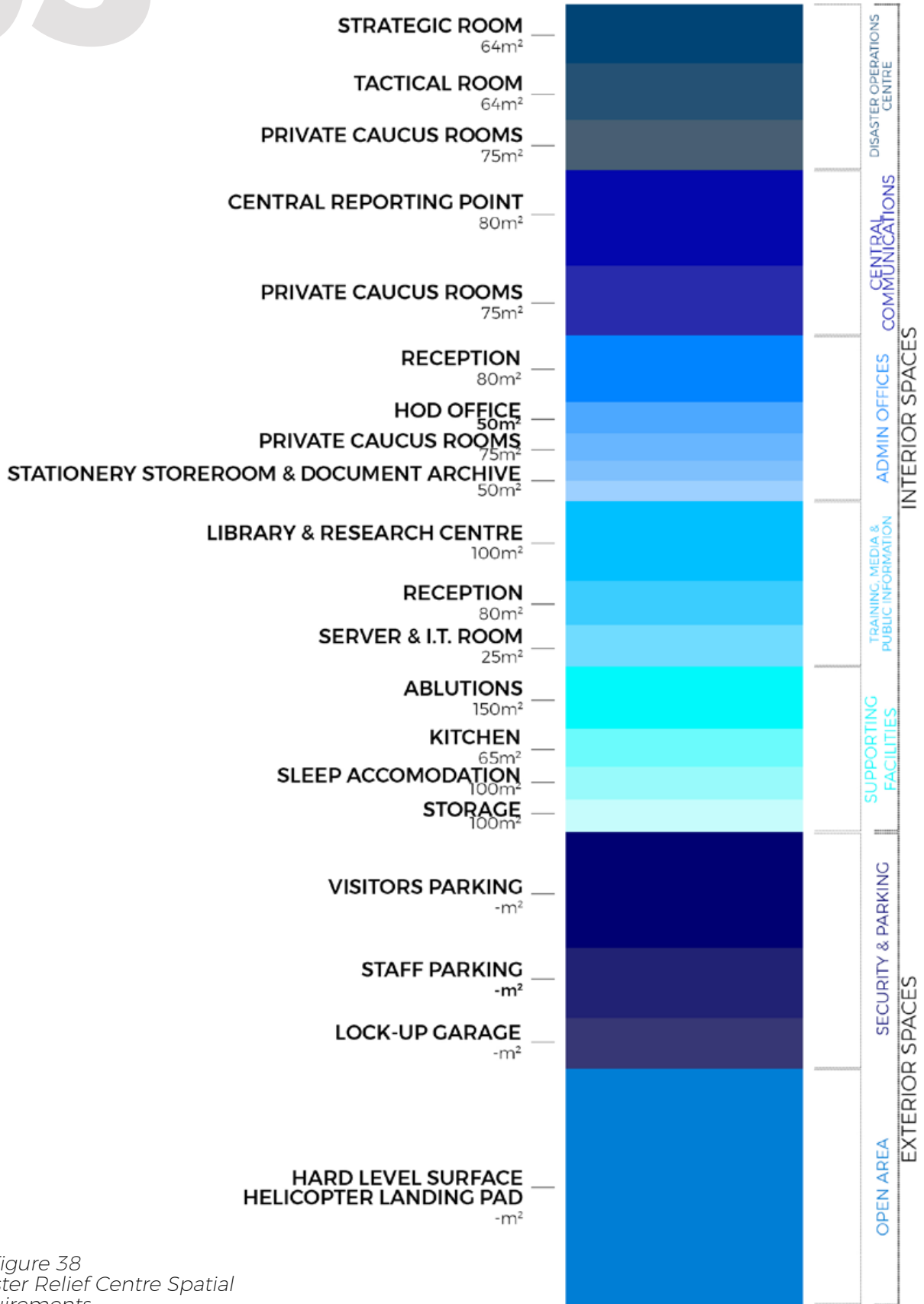
relief management centre, it would still be able to facilitate the core functions and activities. With this dual programme in mind, beyond physical flexibility, the architectural proposal would bear a key social adaptation and response, speaking to the social complexity of a disadvantaged community,



>> Figure 37  
Disaster Relief Programmatic Matrix



# 03



>> Figure 38  
Disaster Relief Centre Spatial Requirements

### 3.3 SITE DEVELOPMENT

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The site development looked to integrate key elements of the surrounding context, carrying through fundamental existing activities whilst communicating and accommodating new interventions. The spatial ordering system for the site development is derived from the initial studies into thresholds and layered privacy conditions (Figure 39).

The existing site is largely vacant, with the informal clothing market on the southwest corner, and a carport on the northeastern corner being the main points of activity. This is illustrated in Figure 33 (pg.46). Desire lines cross the site, running from the North East to the South West corners. This is an indication of a key movement route between the train station and the residential area, in which the site is used as a thoroughfare between the two points.

The site development proposes a layered site condition, in which active public spaces are located at the center of the site, with built edges flanking it on either side. These edges look to open up and engage with the activity occurring in the public space. The public space consists of the existing informal clothing market on the South-West corner of the site, an extension of the existing urban farm across the site with direct connection and access, a recreational lawn area for flexible and informal event and onsite parking which may also function as a flexible event space.

A proposed future development building is located on the Northeast corner of the site. This building is envisioned as being educational or research spaces, and is ideally positioned directly opposite the main entrance to the secondary school.

The organisational layout of the site development is conceived as a cross-layered approach. The main activities (both formal and informal) are offset from the street to accommodate pedestrian space. This acts as a buffer between the street and site activities. Each activity space is demarcated and defined by threshold

# 03

and barrier conditions of materiality and permeability. The urban farm maintains a visual permeability, with access controlled via a fence. The recreational lawn space is defined by rows of trees and a large open expanse, with this change in condition characterised by the textural change of the ground plane. This space is fully accessible, defined by shaded areas and unobstructed space.

The parking lot, although somewhat more rigidly structured by the symbolic barrier (Moodley, 2017) of the painted parking bays, still offers the opportunity for informal event and provides a direct link to the recreational lawn space, allowing activities to spread across the two layers.

Although subtle, these urban threshold conditions in public space communicate the spatial ordering of the site, with the informality of flexible event providing a synthesis between formal order and informal activity.

The site development is seen as an incremental approach, in which each component can be built in sequence, and catalytic to the next. The initial site development will focus on the synthesis between the community building, informal clothing market and urban farm extension. This initiating phase of the development deals primarily with the extension and progression of the existing activity of the precinct, whilst the incremental expansion of the public recreation spaces and future development building are seen as elements that result from community necessity.



>> Figure 39  
Site Development Plan (1:1000)



## 3.4 PROPOSITION

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### 3.4.1 DEVELOPMENT

The architectural proposition aims to synthesize an acute contextual response of site and programme with considered theoretical response of thresholds, layering and adaptability.

As a starting point, the courtyard typology represented the manifestation of the overlap between different degrees of privacy explored during the design dissertation development. The courtyard represents public space embedded within private space. This offers a charging active element to the core of the building, whilst promoting surveillance to this core via the flanking private spaces.

This initial concept was explored through model making, testing conditions of mass, void, enclosure and access. These explorations, illustrated in Figures 40 to 48 involved quick studies into the relationship between the central void of the courtyard and the built mass of the surrounding edges, exploring the impact of various massing schemes. The exploration was conducted as a sequence, in which the large massing block is punctured and fractured as conditions of courtyard access and enclosure were tested.

This exploration developed through an engagement across scales and media. The initial diagram of the courtyard typology was then developed through a sectional analysis of threshold and layering conditions (Figure 50) as well as building envelope response through model making (Figure 49).

In Figure 50, the sections illustrate the urban to architectural layering condition, in which the relationship to the street and surrounding context is tested in terms of scale, spatial organisation and activity. Figure 49 illustrates a massing model study, testing ideas around conditions of enclosure. In the model, each elevation bears a distinct façade treatment, responding to their immediate context. These studies into the architectural

layering both in terms of the spatial organisation of the building as well as the layering of the external building envelope in relation to the unique context of each elevation, formed the early lines of inquiry for the design dissertation.

As the architectural inquiry developed, studies in massing, geometry and programmatic relationships saw the design proposition progress. Figures 51 and 52 illustrate this progression, in which sight lines, movement patterns and engagement with existing conditions began to influence the architectural response. The diagrams in Figures 53 to 56 illustrate the exploration of these key ideas, examining conditions of enclosure, access control, programme and axuality. These diagrams act as informants, articulating key conditions, which defined the spatial framework from which the architecture develops.

The architectural proposition is structured as a layered condition. Figure 57 illustrates the spatial organisation and arrangement of the building in which each layer communicates and sets out spatial hierarchies.

This resulted in an initial scheme characterised by a strong diagonal influencing the geometry and an articulated response to the peripheral edge conditions (Figures 58 to 65). Spatial organisation and functions were determined from reviewing the connections between programmes, response and adaptability.

As the programmatic and organisational complexity of the building developed, so too did the building envelope. Stemming from the early study model in Figure 49, the building envelope proposition looked to address the unique conditions for each elevation, responding to the immediate context whilst also communicating the complexity of the building itself (Figures 66 to 68).

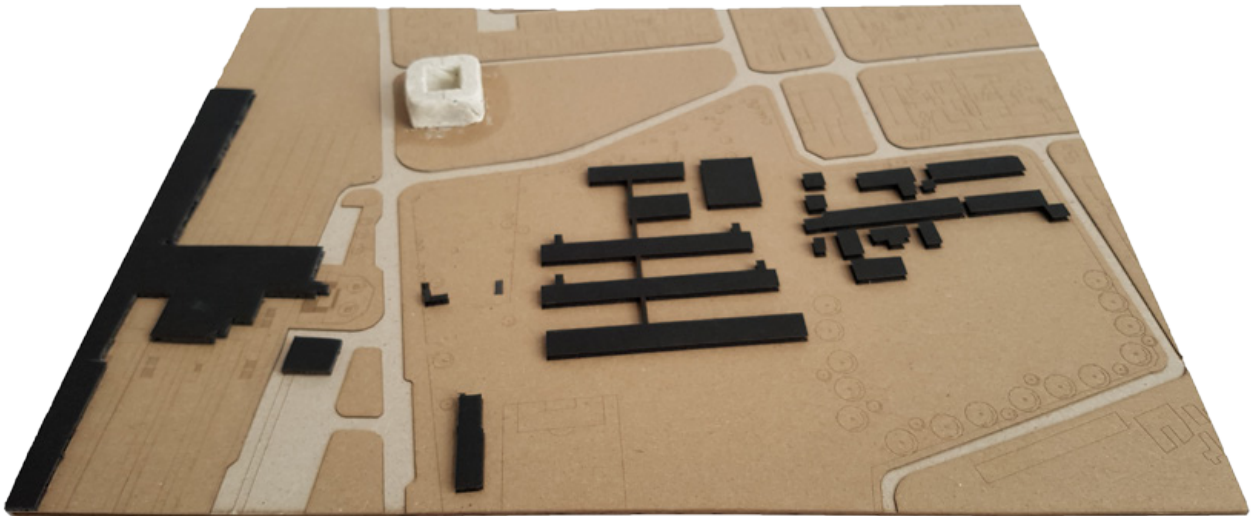
These initial concepts dealt with issues of function (what is the purpose of the façade?), expression (what is the façade communicating) and execution (how is this achieved?).

# 03



An exploration of the bulk massing on the corner of the site. This study looked at the basic ratio between public space (the informal clothing market), and the built edge that addresses it. The use of clay allowed for quick modeling exercises, in which form was never fixed and could be constantly shifted and molded.

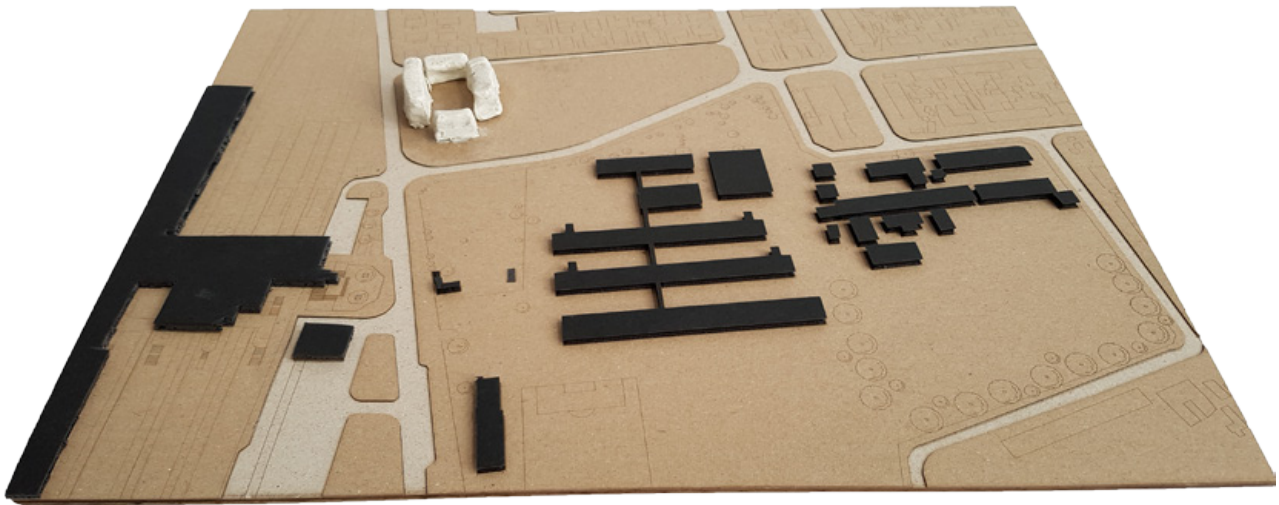
>> *Figure 40*  
*Clay Massing Study Model*



Courtyard study. From the initial bulk massing, the following clay model expressed the fundamental system of the courtyard typology, in which a central void punctures the building mass.

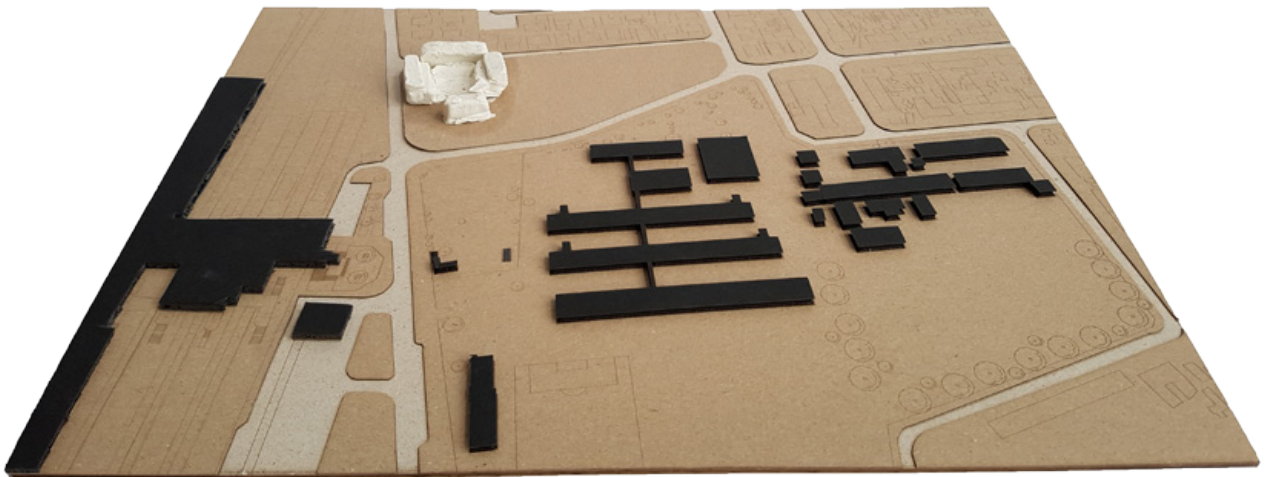
>> *Figure 41*  
*Clay Massing Study Model*

# 03



Fractured form. The relationship between the surrounding public spaces and the courtyard was then explored, through fragmenting the rigid form and creating connections and access in and around the mass.

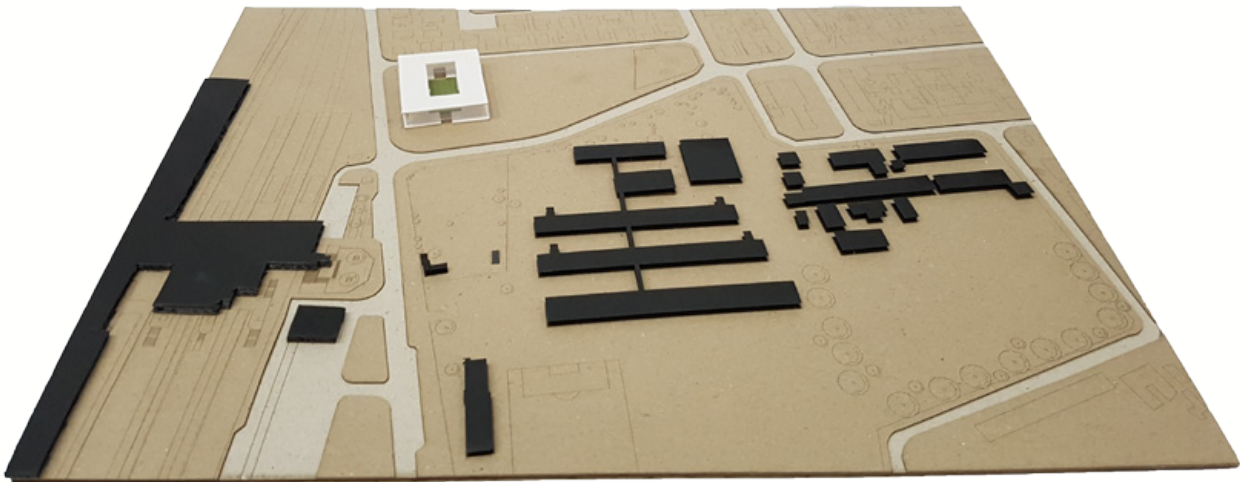
>> *Figure 42*  
*Clay Massing Study Model*



Event Space. The conditions of courtyard enclosure were then examined, looking at how the built edges may begin to strongly define the central event space as well as emphasize the access spaces. The massing closes to the north of the site, leaving the main access point to the courtyard off the market space on the south west corner of the site.

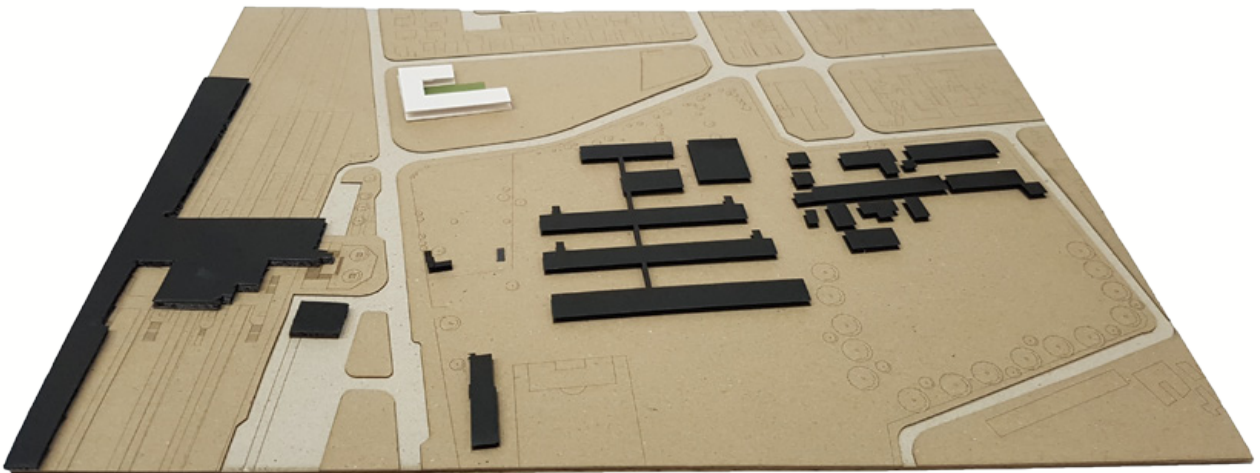
>> *Figure 43*  
*Clay Massing Study Model*

# 03



As the clay modeling progressed, a more detailed massing exploration was conducted. Here the concept of the large mass with a central void space is examined using different materials to express surface and permeability.

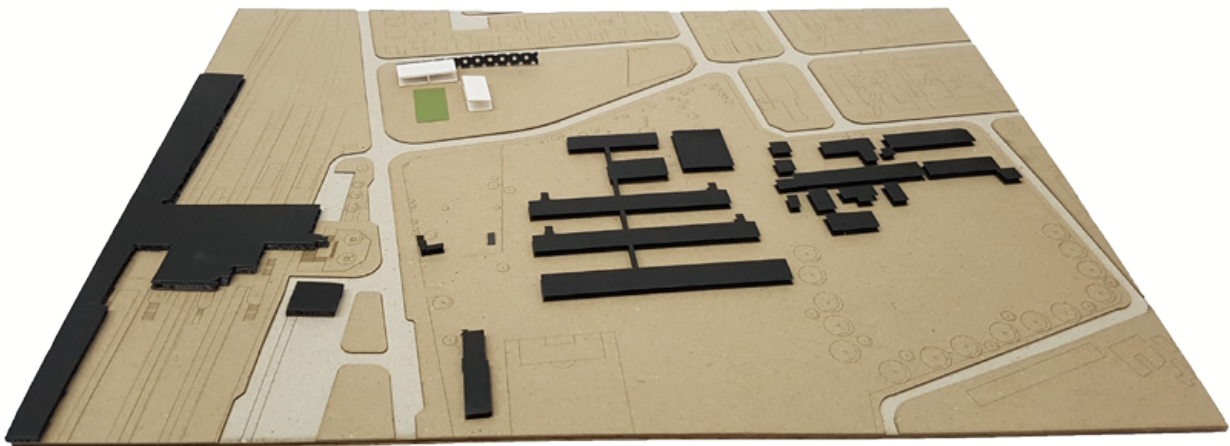
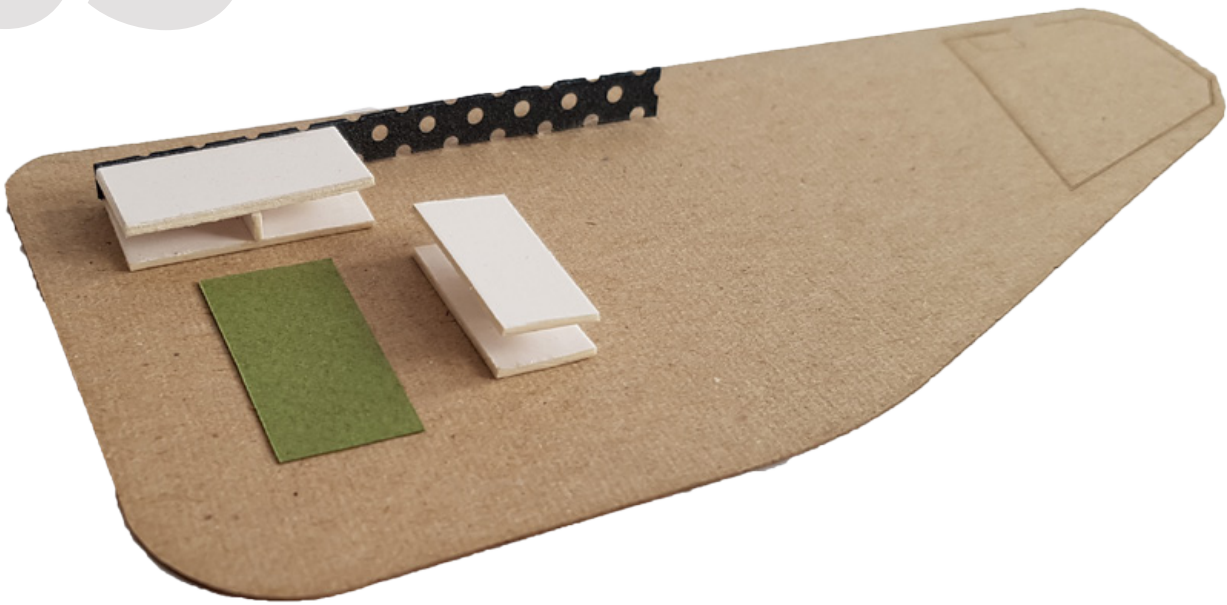
>> *Figure 44*  
*Enclosure Massing Study Model*



The modeling exploration began to look at different massing strategies, in which the relationship between the built mass, courtyard and public space changed. This example explored having the courtyard space open to the center of the site, with the informal clothing market addressing a strong edge condition.

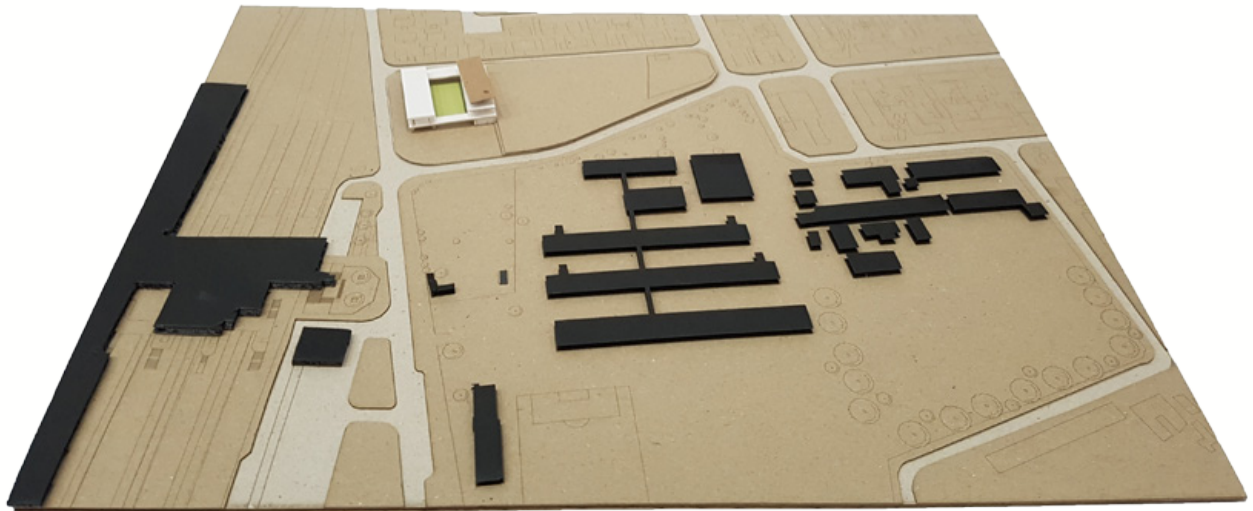
>> *Figure 45*  
*Enclosure Massing Study Model*

# 03



This massing study looked at integrating the market and courtyard space by completely exposing the central public space. The event space is then flanked on the northern and eastern edges, with elements protruding and extending toward the center of the site.

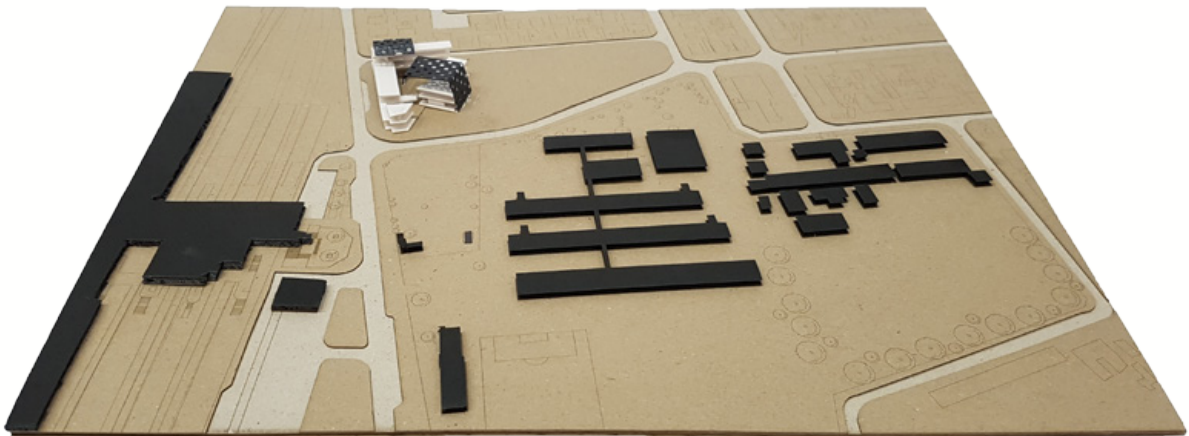
>> *Figure 46*  
*Enclosure Massing Study Model*



This exploration returned to the simplified courtyard structure, and began to express conditions of scale, access and enclosure. Access to the courtyard is maintained on the ground plane, with more private spaces elevated above, providing surveillance to the central space. This model also begins to engage with the levels of the site. As the site has a 2m fall across its length, the opportunity to introduce varying datums was examined.

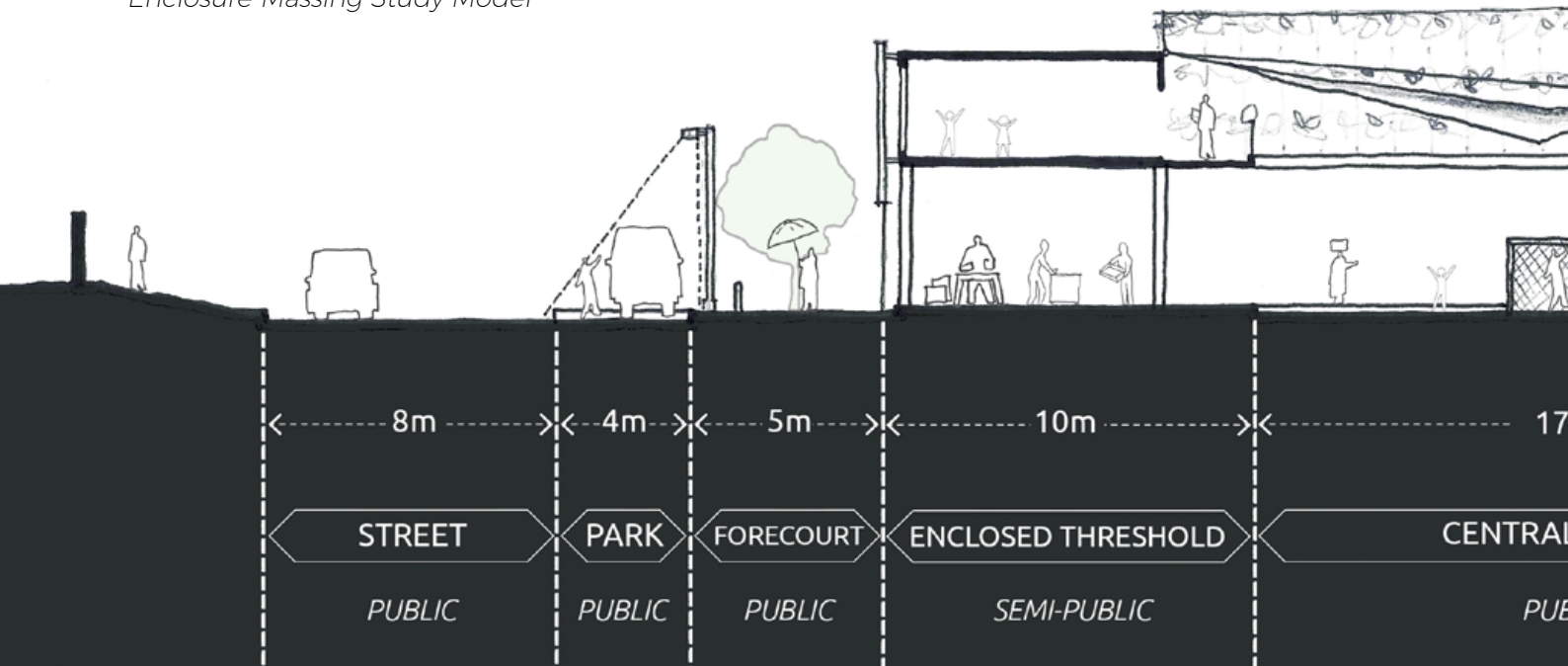
>> *Figure 47*  
*Enclosure Massing Study Model*

# 03



This exploration examined conditions of enclosure and altered geometries. The model explored how building envelope elements might define key components of the building through continuous form.

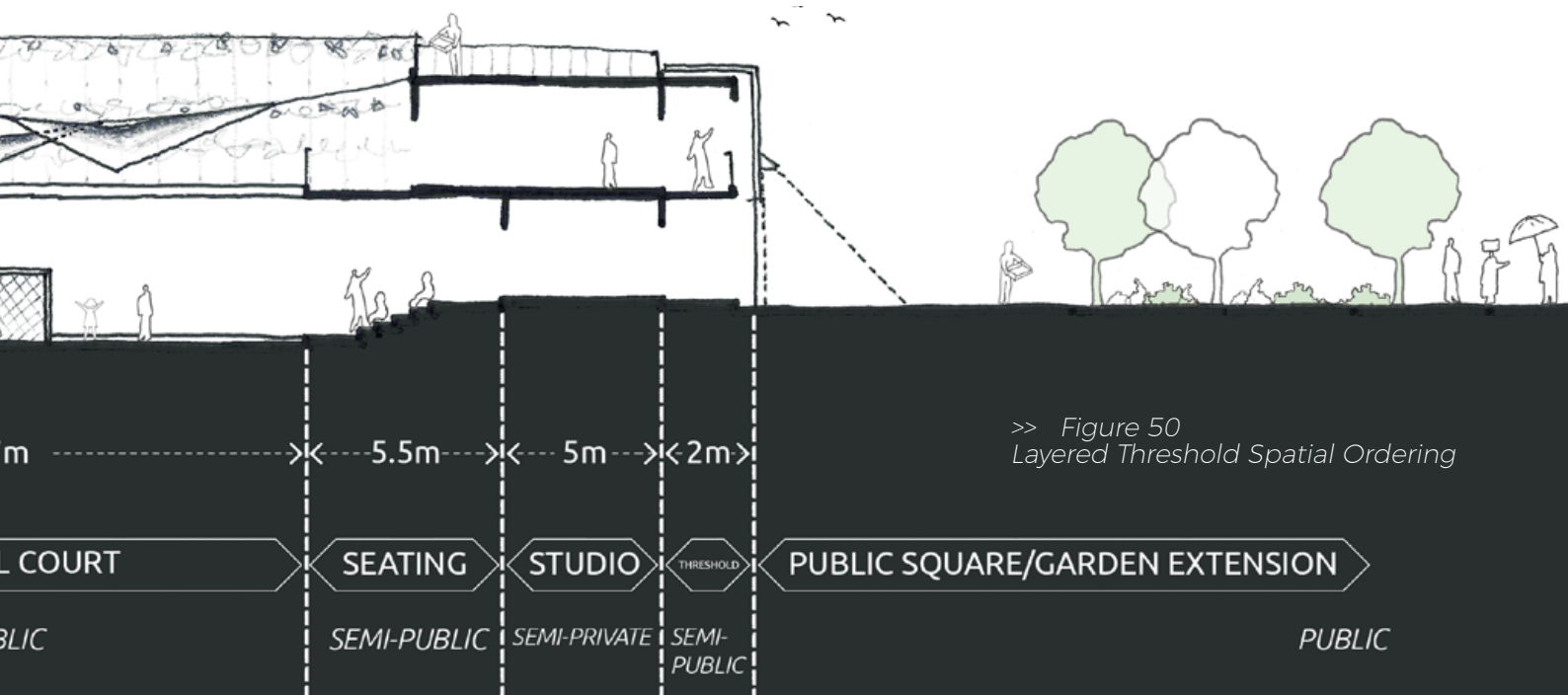
>> *Figure 48*  
*Enclosure Massing Study Model*



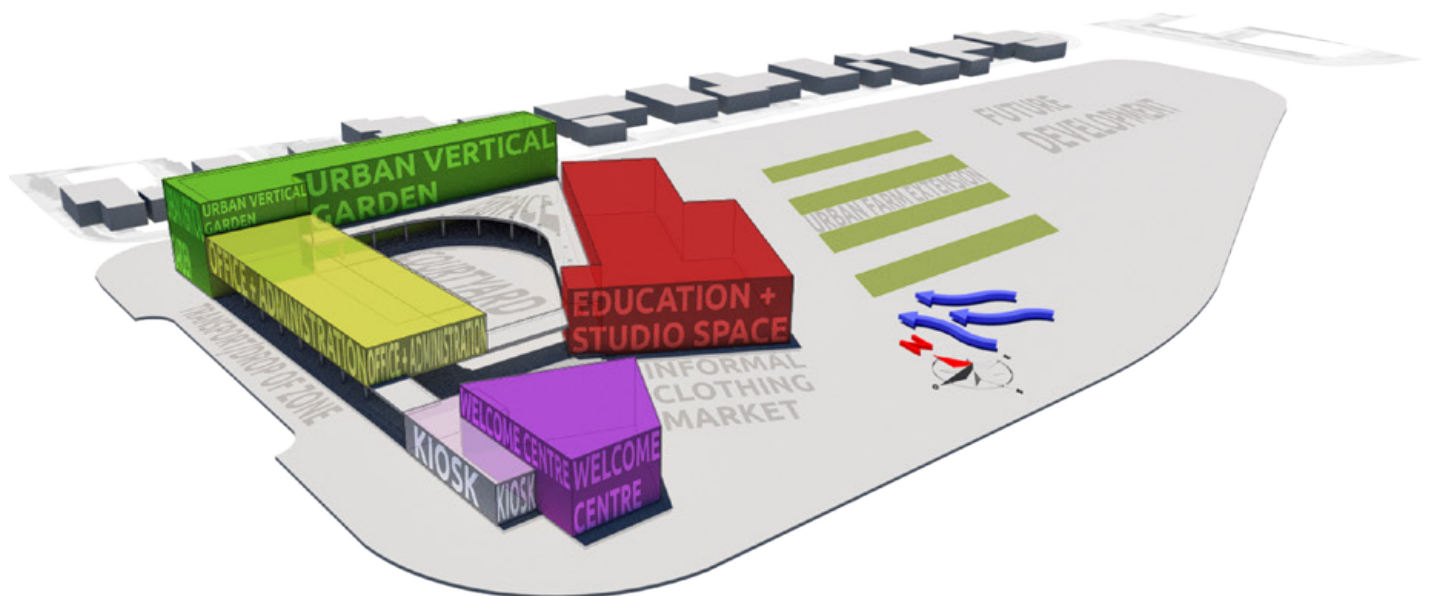
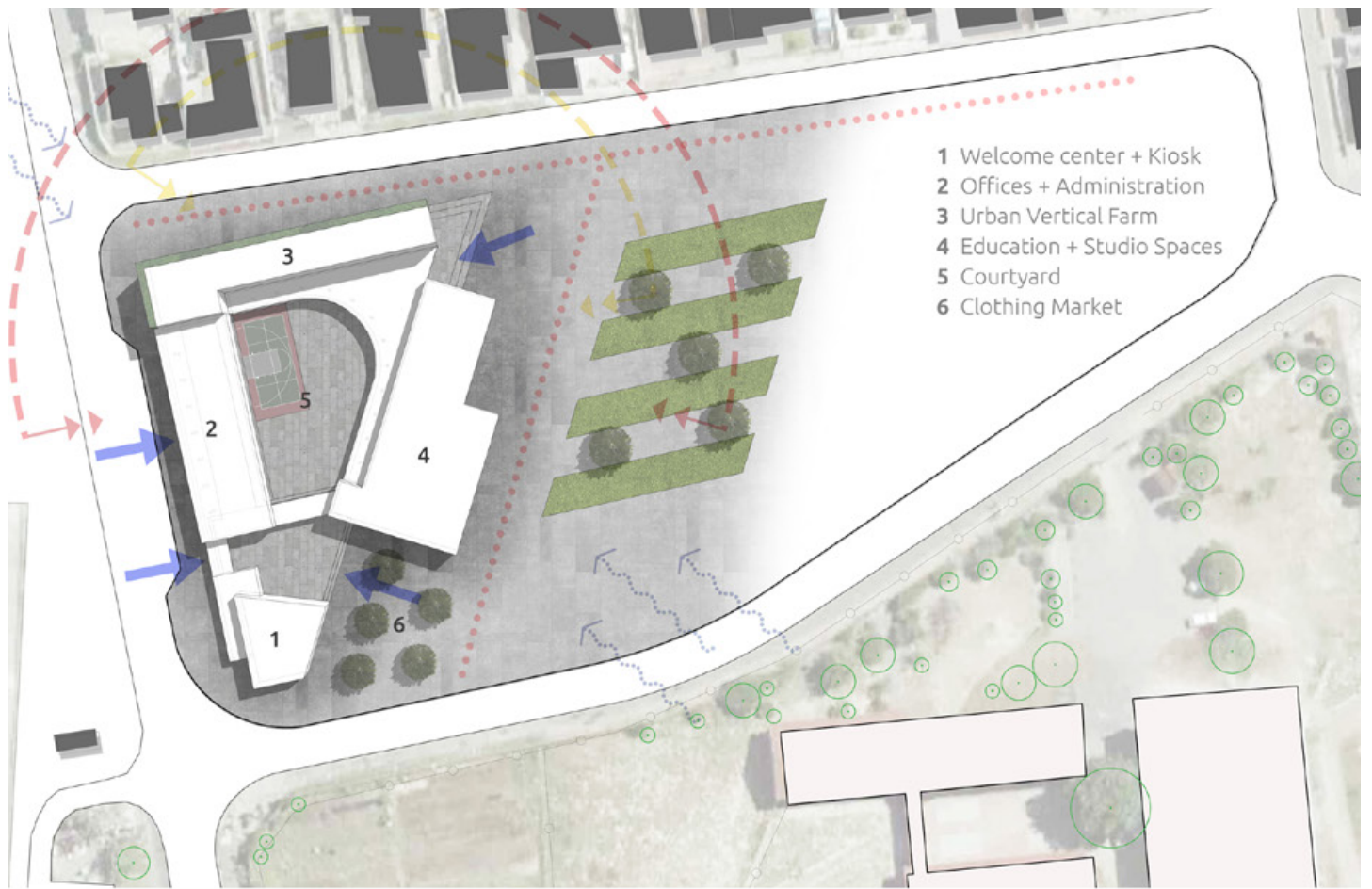


An exploration of massing and edge condition. Utilising the simplified courtyard typology, this model explored the manner in which each elevation might bear a unique response to the immediate context, such as through shading, shelter or permeability.

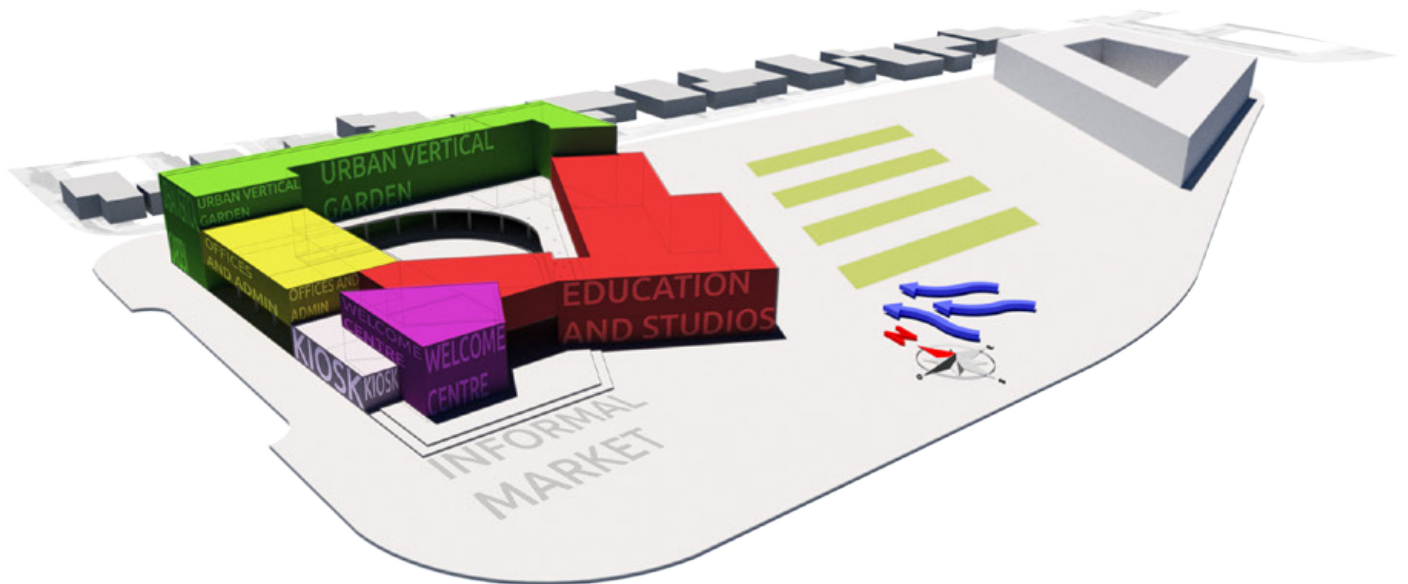
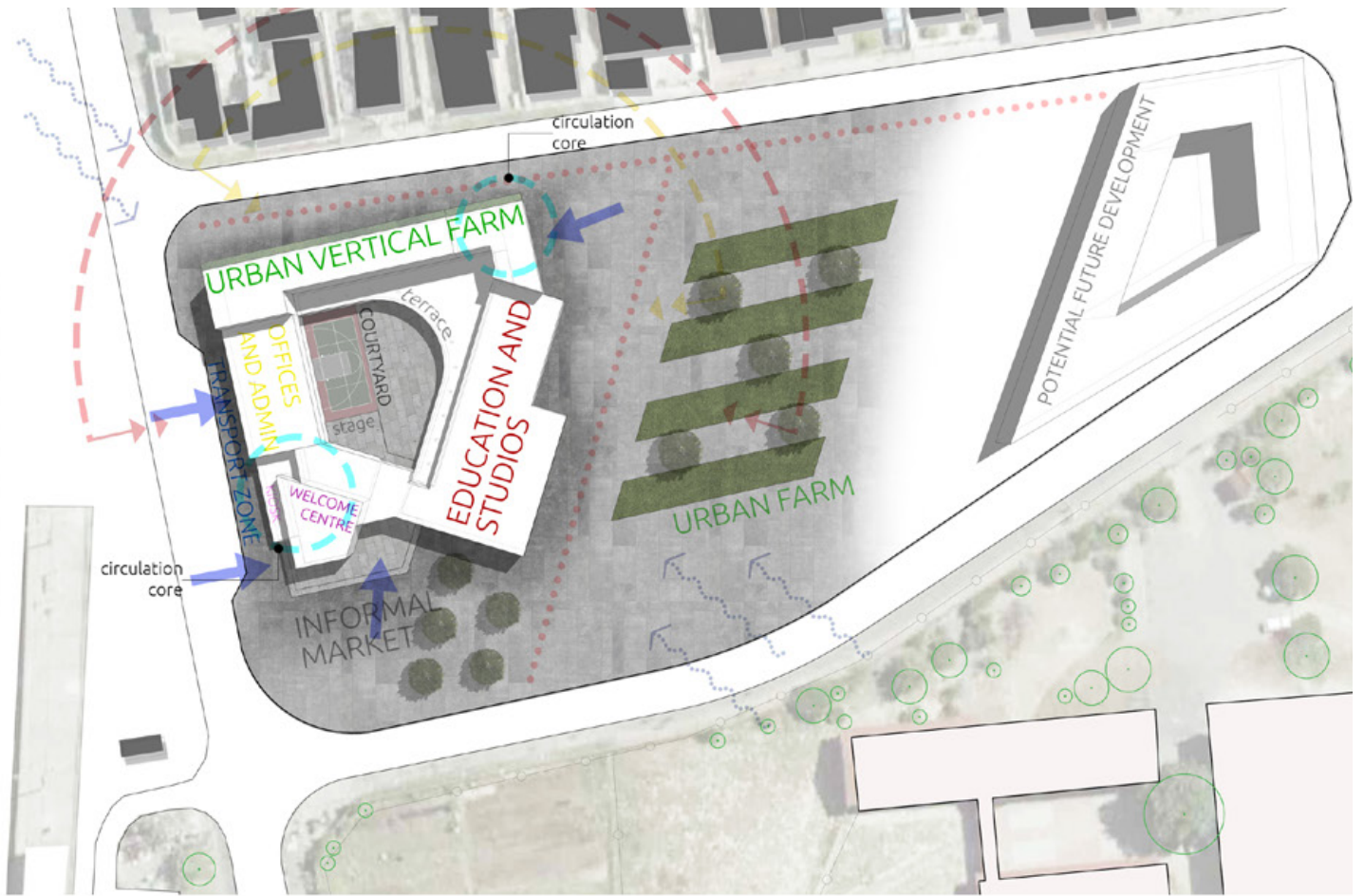
>> Figure 49  
Dynamic Envelope Massing Study Model



>> Figure 50  
Layered Threshold Spatial Ordering

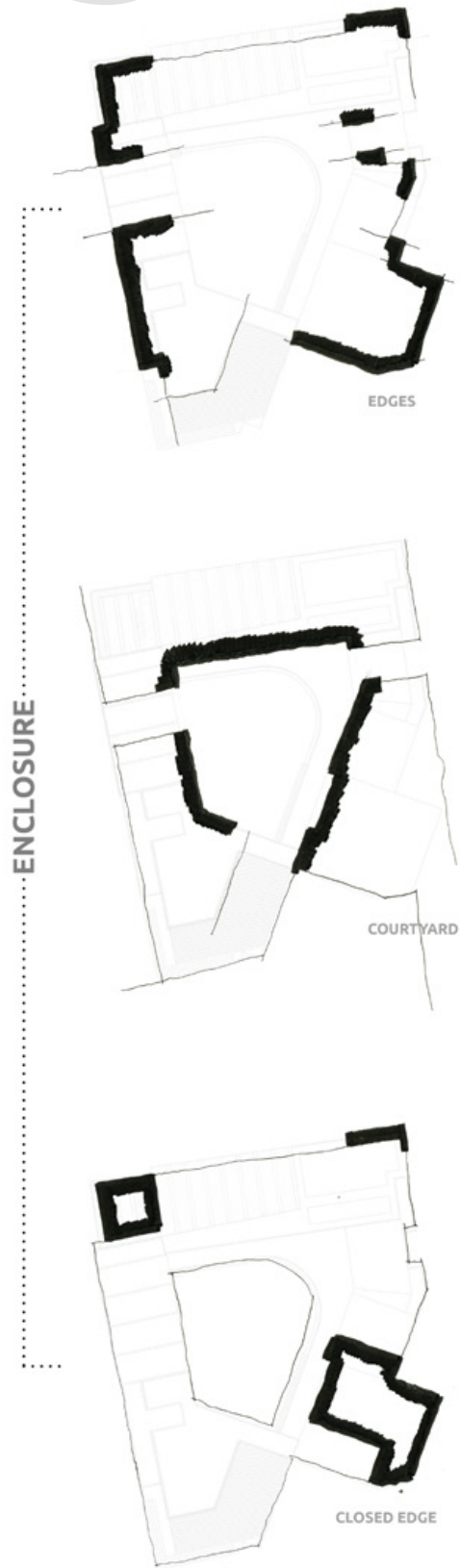


>> Figure 51  
Massing Study



>> Figure 52  
Massing Study

# 03



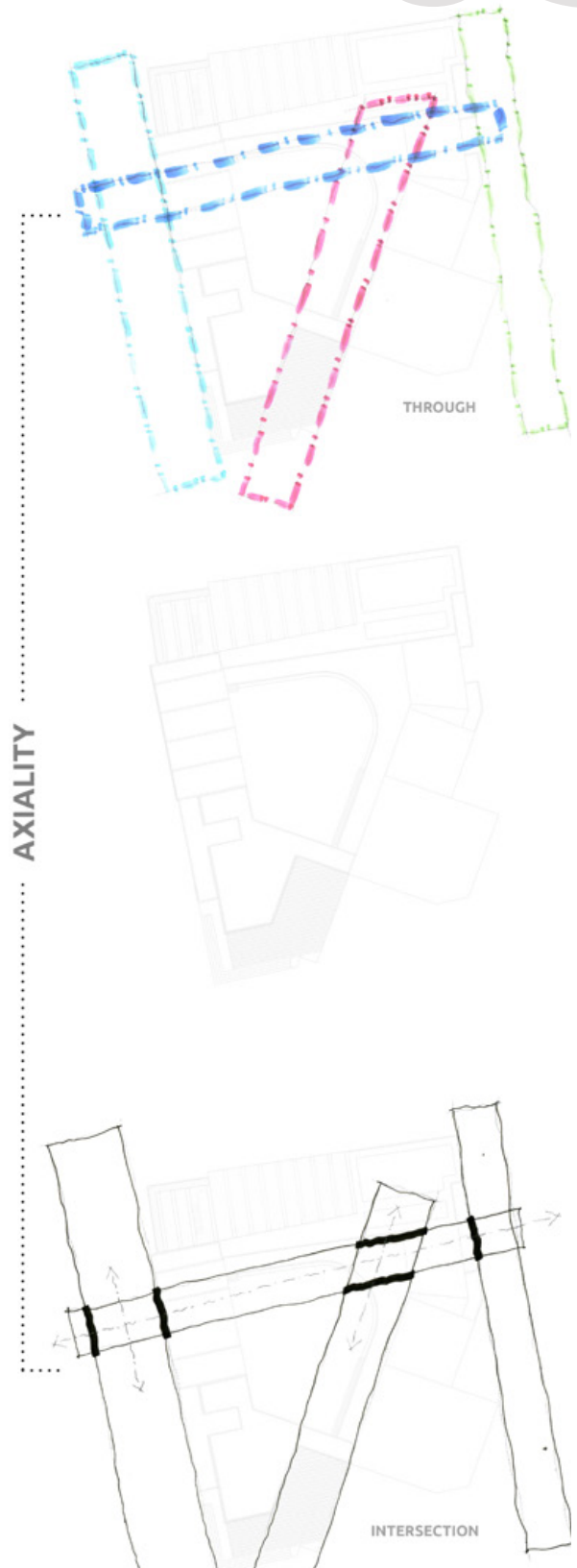
>> Figure 53  
Enclosure Study Diagrams



>> Figure 54  
Programme Study Diagrams



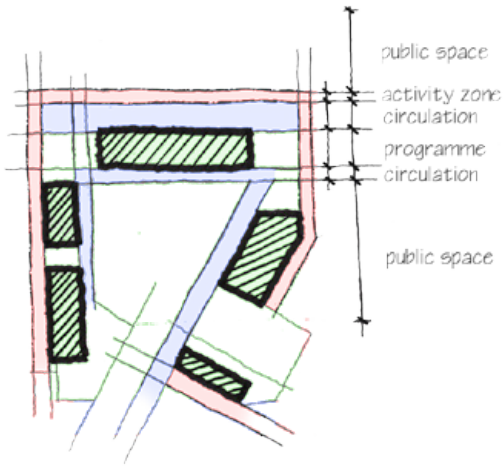
>> Figure 55  
Access Study Diagrams



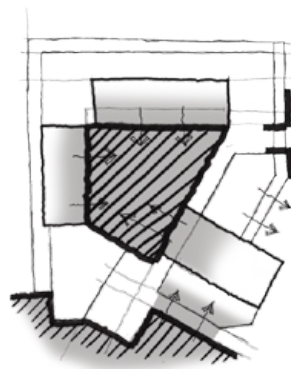
>> Figure 56  
Axiality Study Diagrams

# 03

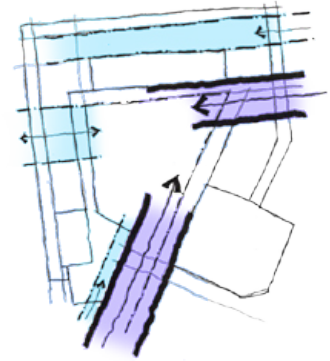
SPATIAL LAYERING



CONNECTION TO PUBLIC SPACE



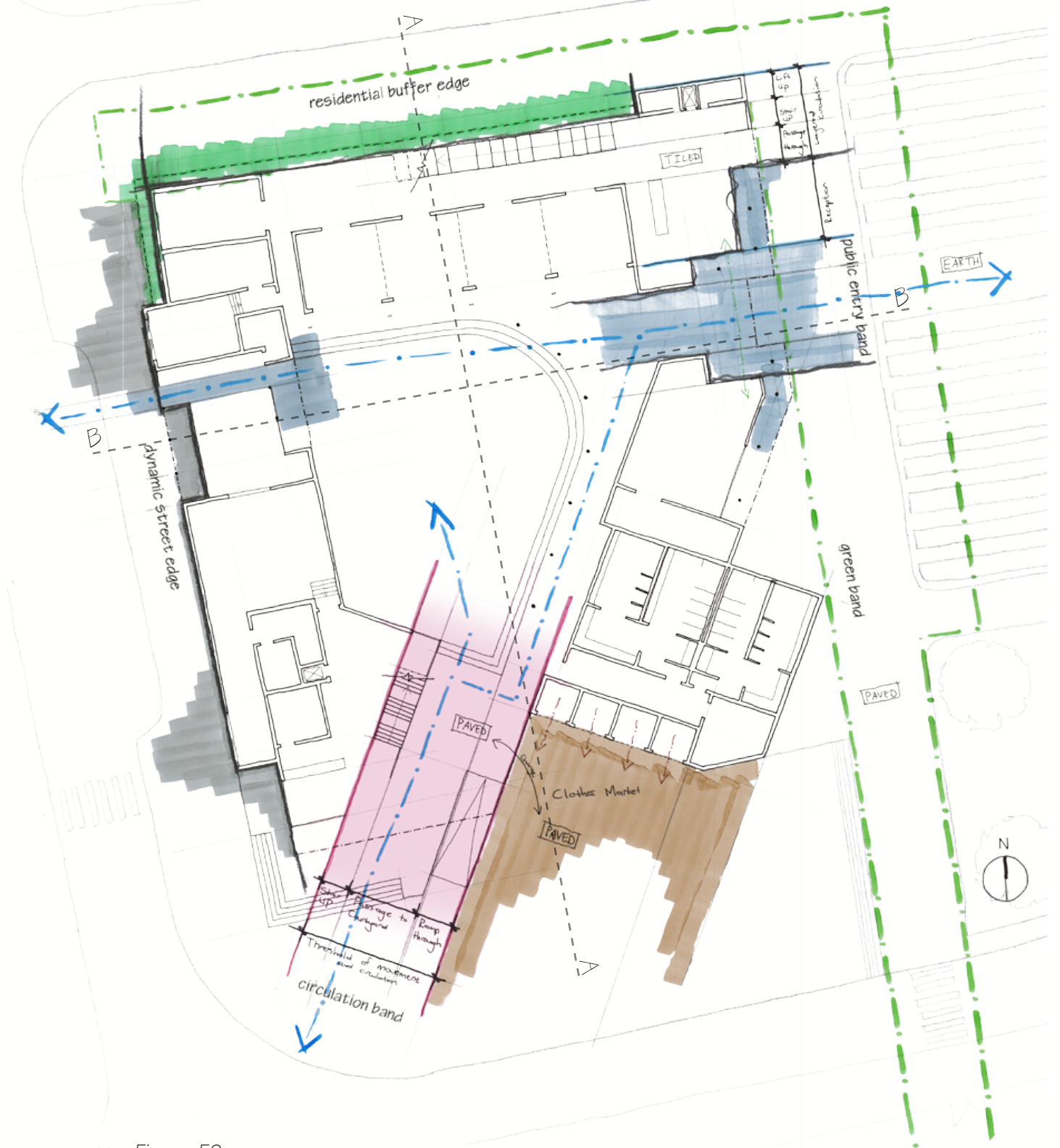
PRIMARY AND SECONDARY ACCESS



>> Figure 57  
Spatial Organisation Diagrams

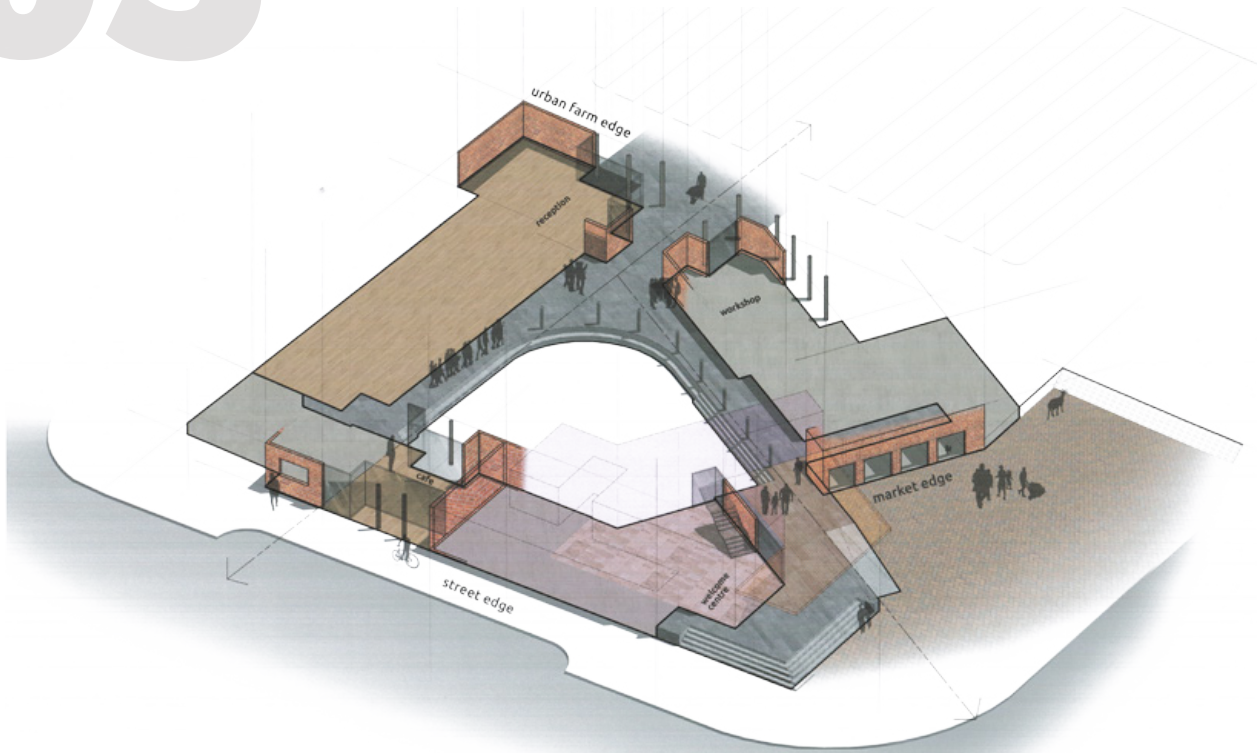


>> Figure 58  
Initial Scheme Massing Study



>> Figure 59  
Initial Scheme Threshold Diagram (1:400).

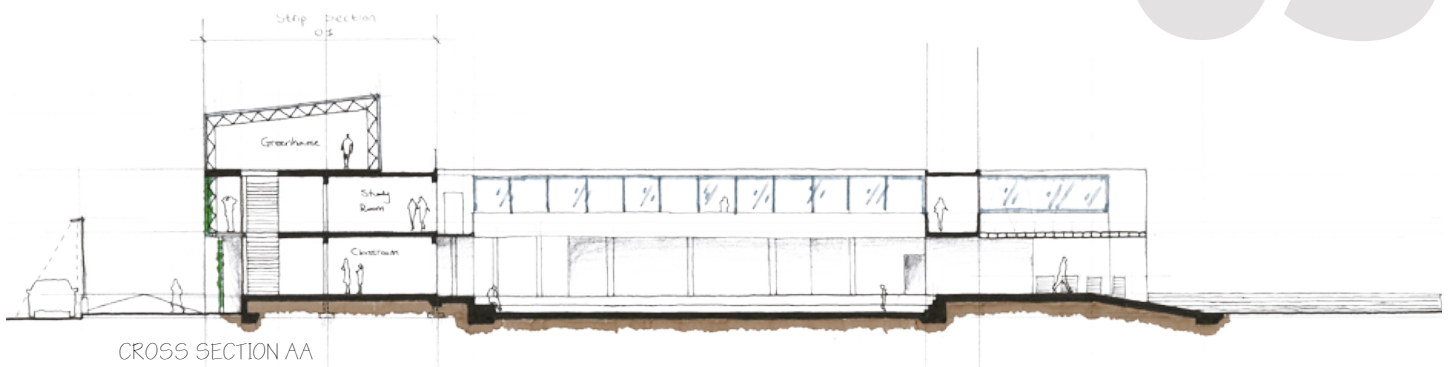
# 03



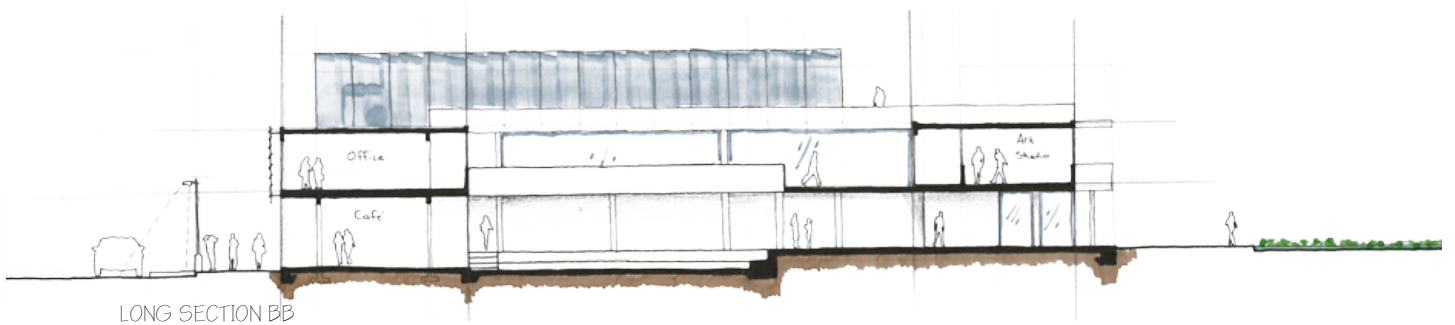
>> Figure 60  
Initial Scheme Threshold Study



>> Figure 61  
Initial Scheme Floor Plans (1:1000)

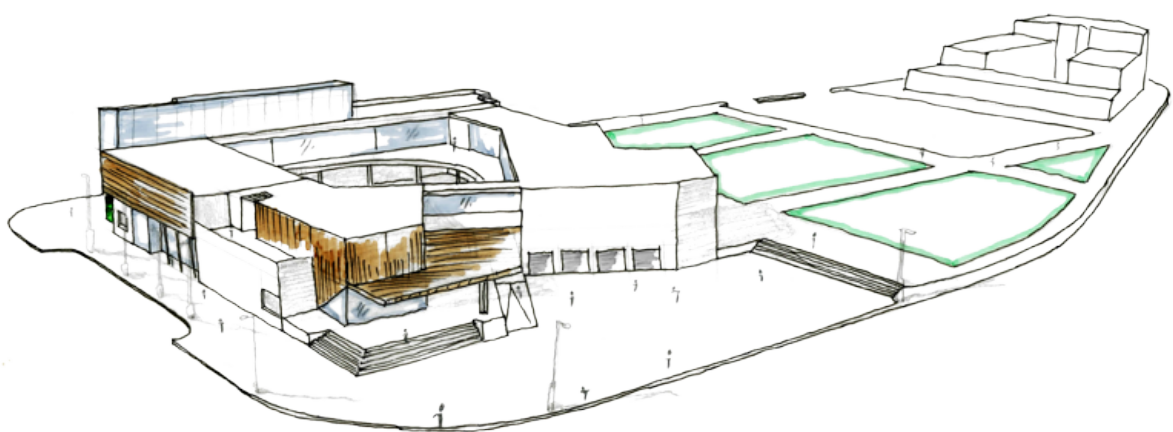


CROSS SECTION AA



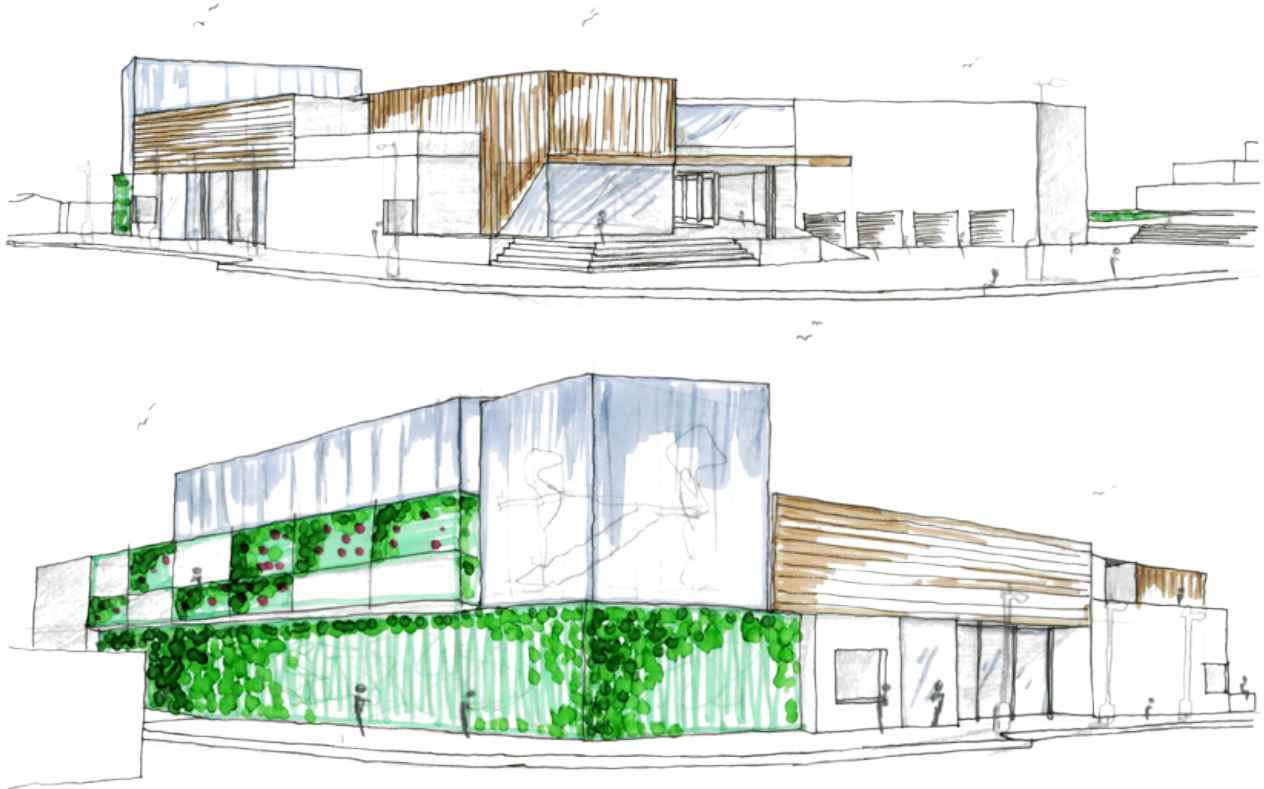
LONG SECTION BB

>> Figure 62  
Initial Scheme Sections (1:400)



>> Figure 63  
Initial Scheme Site Perspective

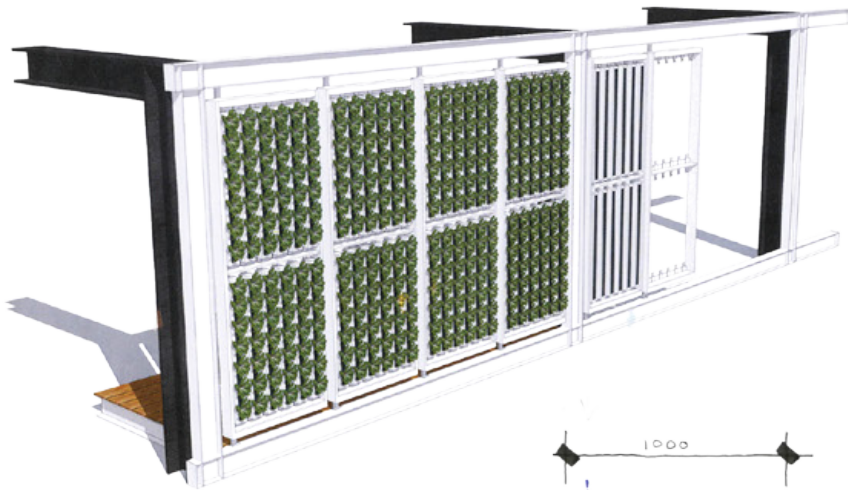
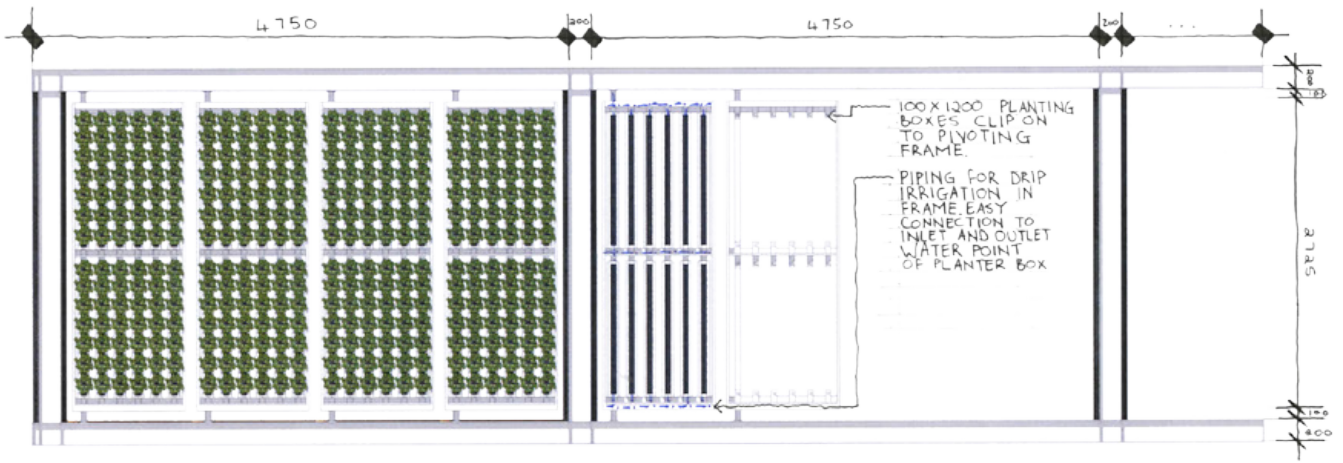
# 03



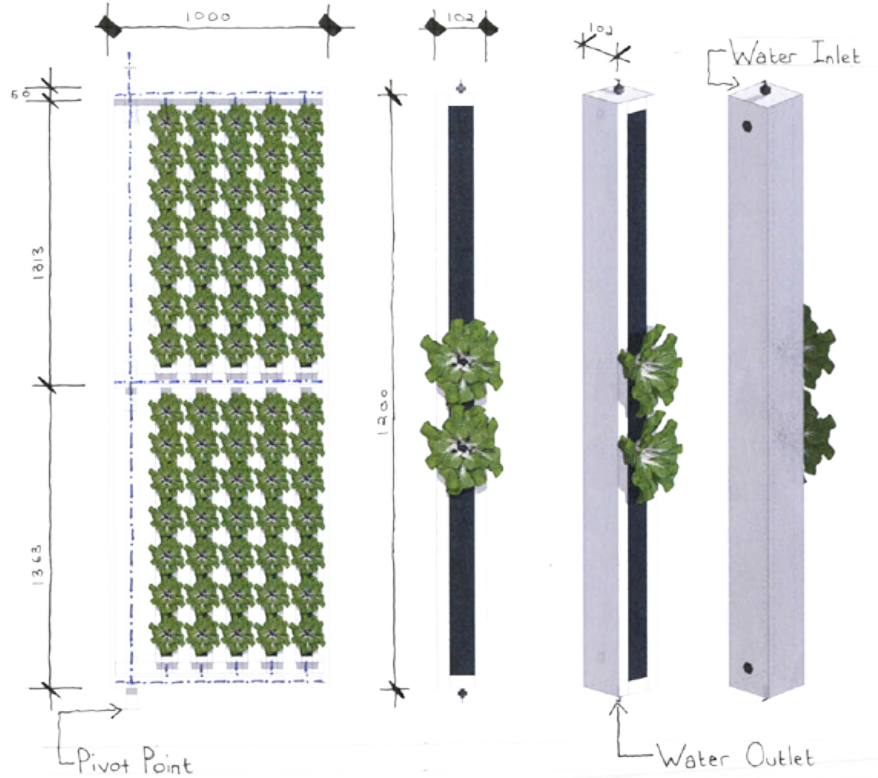
>> Figure 64  
Initial Scheme Perspectives

>> Figure 65  
Perspective Cross Section (1:200)

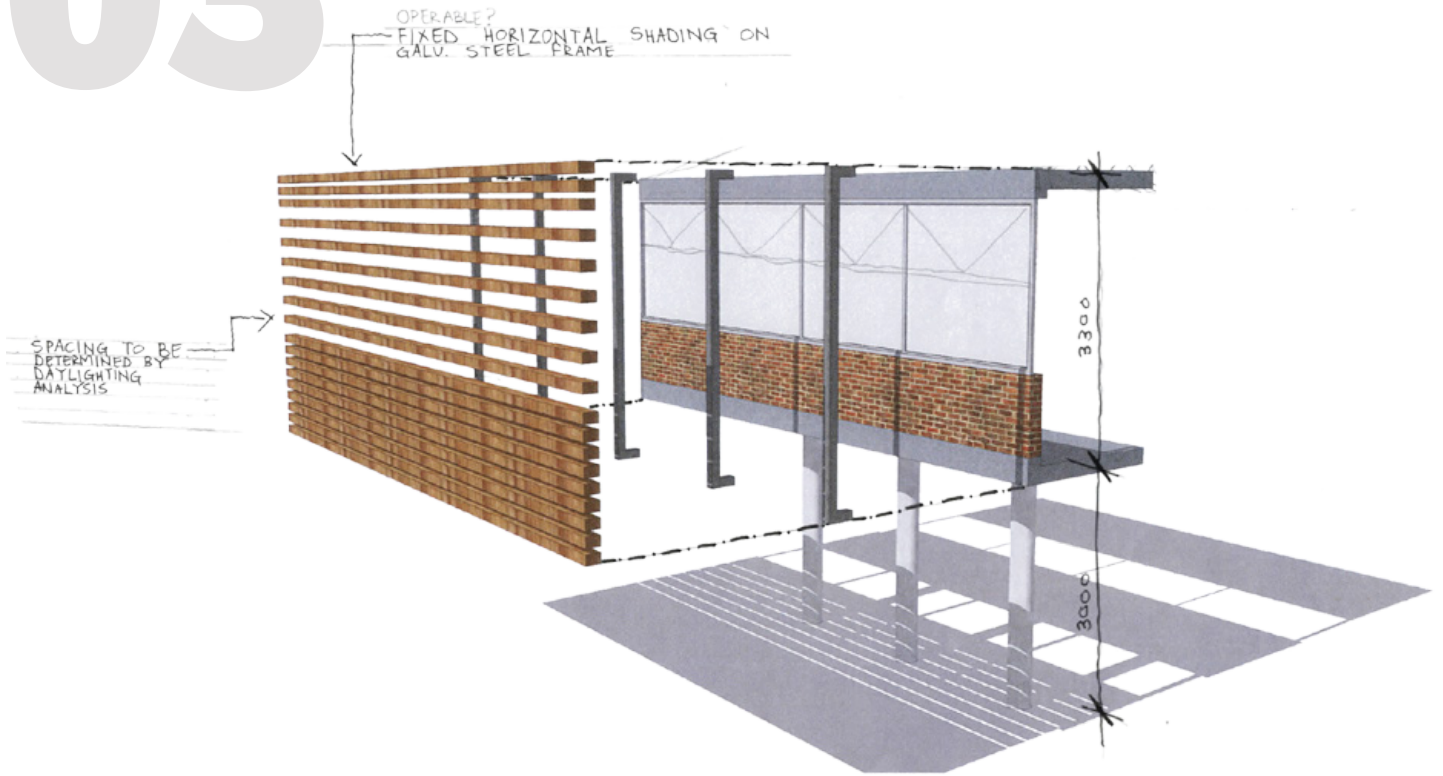




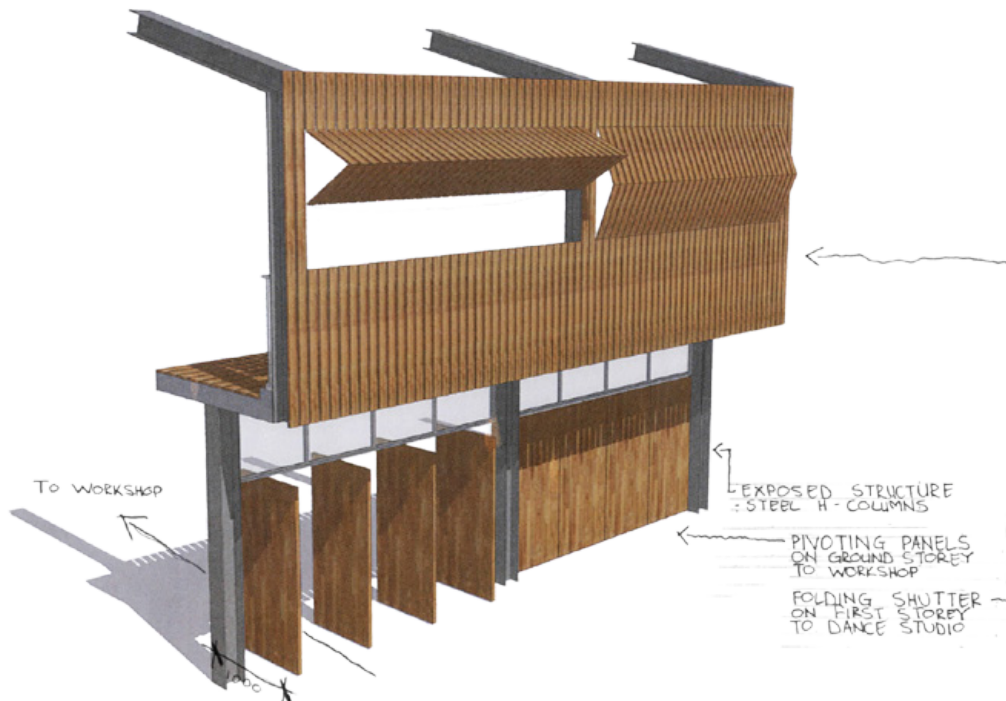
>> Figure 66  
Vertical Farm Facade System (North)



# 03



>> Figure 67  
Office Facade System (West)



>> Figure 68  
Studio Facade System (East)

### 3.4.2 SPATIAL ARRANGEMENTS

The development of the architectural proposition called for a revision and simplification of form. The proposition synthesizes the original diagram of the courtyard typology with the geometry of the initial scheme (Figure 69). This produces a multi-valent architecture that accommodates a clear structural order, whilst maintaining the conditions of the key social thresholds that have been developed (Figure 70 to 85).

### 3.4.3 STRUCTURE

The structural systems employed in the building calls for simple robust construction (Figure 86). Concrete floor slabs on load-bearing brick walls characterises the building, with structural and material variety derived from the dynamic building envelope elements. Short structural spans within the building allows for column free spaces, aiding in their spatial flexibility, whilst columns are utilized in exterior spaces, delineating circulation spaces.

There are four dynamic building envelope conditions. The northern envelope (vertical garden - Figure 87) addresses the residential edge. The eastern envelope (art - Figure 88) addresses the urban garden and public space. The eastern and western envelope (performance/offices - Figure 89) addresses the street. The retractable roof envelope (courtyard - Figure 90) addresses the adaptability of the central public space. Each envelope condition has its own social and environmental response.

### 3.4.4 SUSTAINABILITY

The key sustainability strategies employed in the design address issues of daylighting, ventilation and water usage (Figures 91 and 92). The fundamental daylighting considerations concern lighting conditions within the office and education spaces, whereas the ventilation considerations engage with the performance spaces.

The daylighting strategy (Figures 79 and 80) based off of solar studies looks to mitigate glare and solar heat gain through responsive building envelope conditions,

# 03

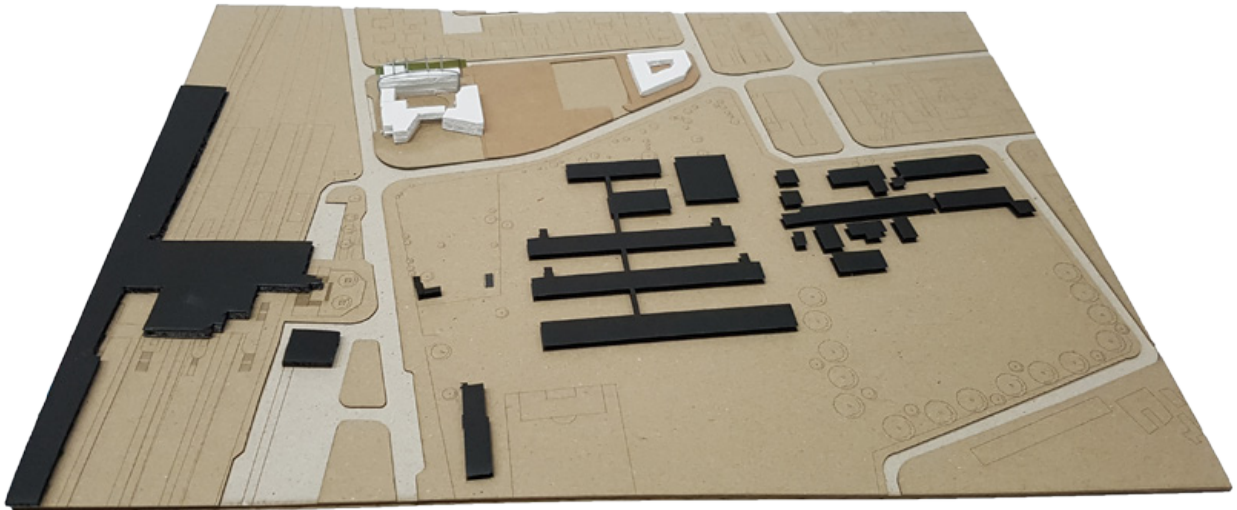
by way of solar shading devices and practical material conditions. Vertical operable shading fins are implemented on the eastern (to the studio spaces) and western elevations (to the offices).

The ventilation strategy explores the building envelope design as well as programmatic placement in order to optimize natural ventilation. The performance spaces of the Dance and Art studios, as well as the workshop are positioned on the eastern edge, making use of the south easterly winds.

The integration of urban agriculture within the buildings programme calls for a considered response to water usage, ensuring the urban resilience of the system. The design makes use of rainwater harvesting and reuse of water (from wash hand basins and showers) as a method of reducing water demand in the building. Potable water is stored in two 2200L water tanks, which will provide sufficient water volumes for daily use in showers and wash hand basins in relation to the projected population demand. This water is then reclaimed and used for flushing toilets. Low flow sanitary fixtures are also utilised in order to reduce water consumption within the building.

Water for usage on the urban farm as well as the vertical farm is sourced from boreholes as well as two 2200L rainwater collection tanks. The vertical farm uses a system of drip irrigation, reclaiming and filtering the water from each growth tower. This water is then recirculated through the vertical farm system, maintaining an irrigation loop, ensuring that the water demand for the vertical farm is lowered.

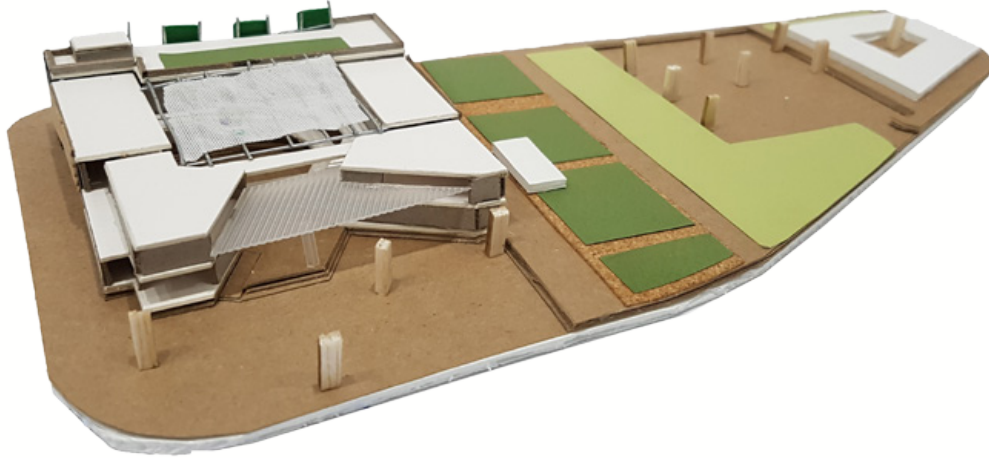
Beyond physical sustainability, the architectural proposition also bears a social sustainability. The programmatic adaptability ensures that the building is able to respond to fluctuating social conditions. This establishes longevity of the project.



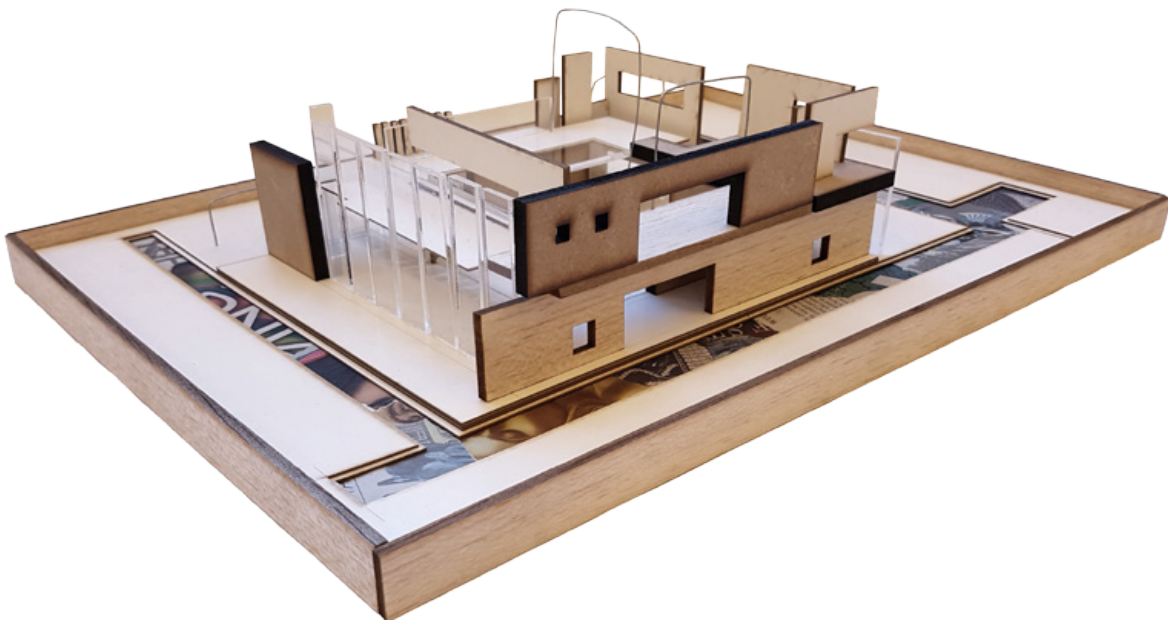
Synthesis between the simple courtyard typology and the geometry of the initial scheme. This approach maintained the strong entry thresholds, whilst providing a simpler form from which to resolve structural and building envelope issues that arose in the initial scheme.

>> *Figure 69*  
*Synthesized Massing Study Model*

# 03



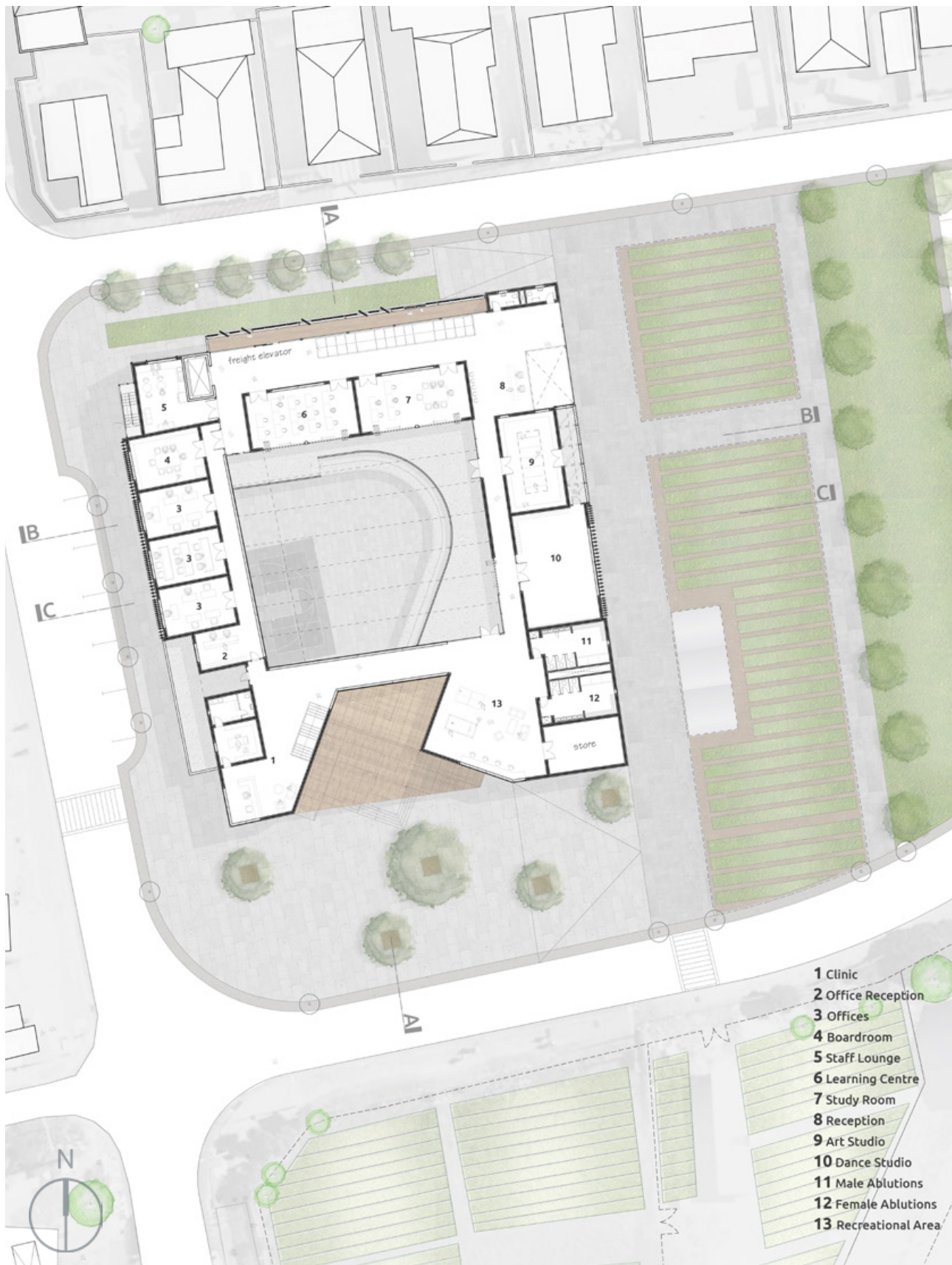
>> *Figure 70*  
*Concept Synthesis Study Model*



>> *Figure 71*  
*Layering Study Model*



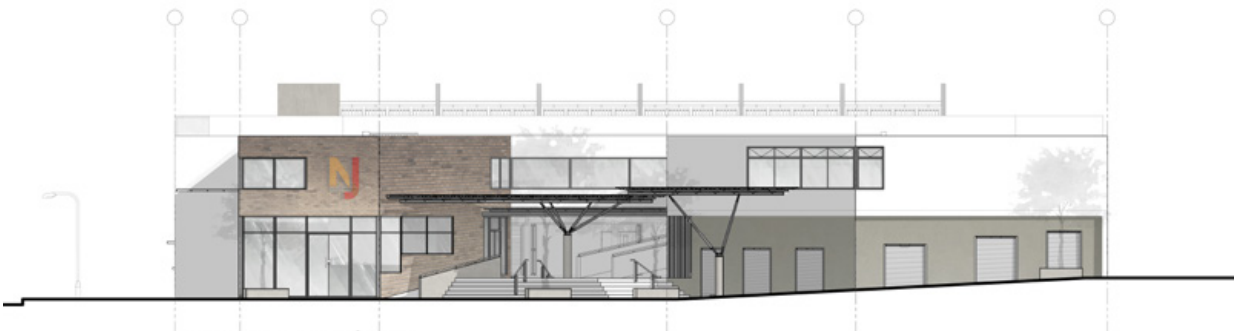
>> Figure 72  
Ground Storey Spatial Configuration (1:500)



>> Figure 73  
 First Storey Spatial Configuration (1:500)



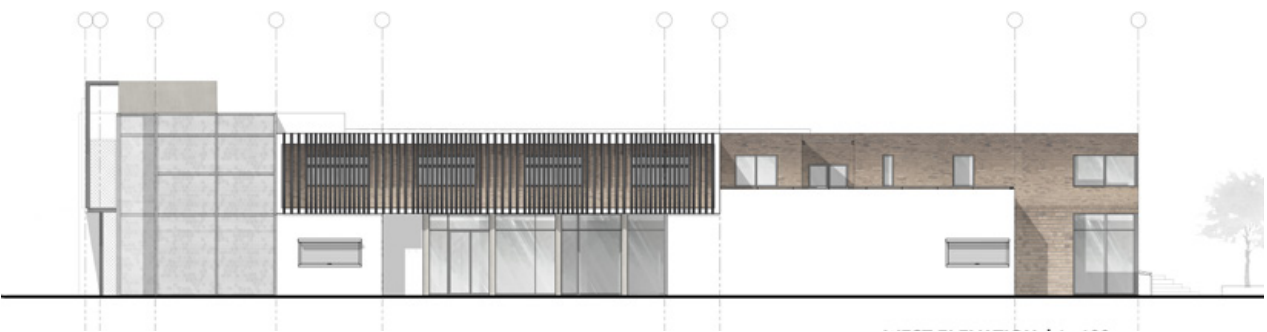
>> Figure 74  
North Elevation (1:500)



>> Figure 75  
South Elevation (1:500)

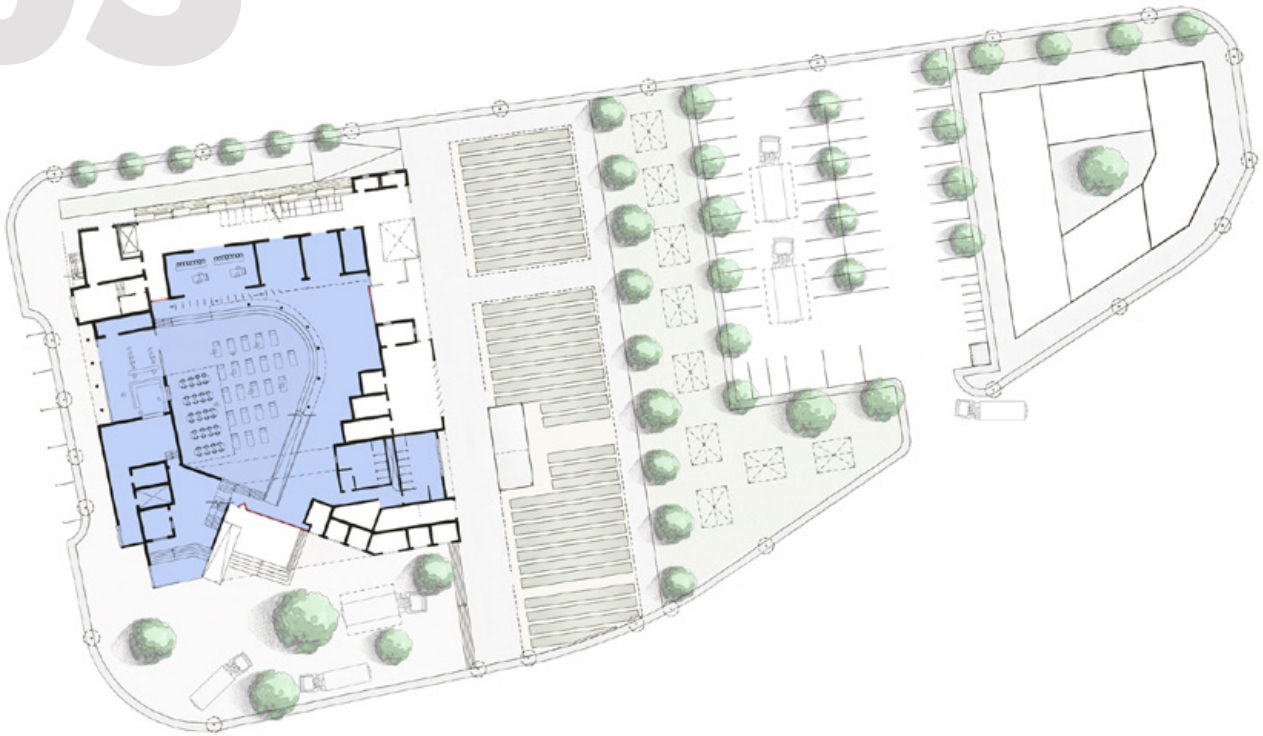


>> Figure 76  
East Elevation (1:500)

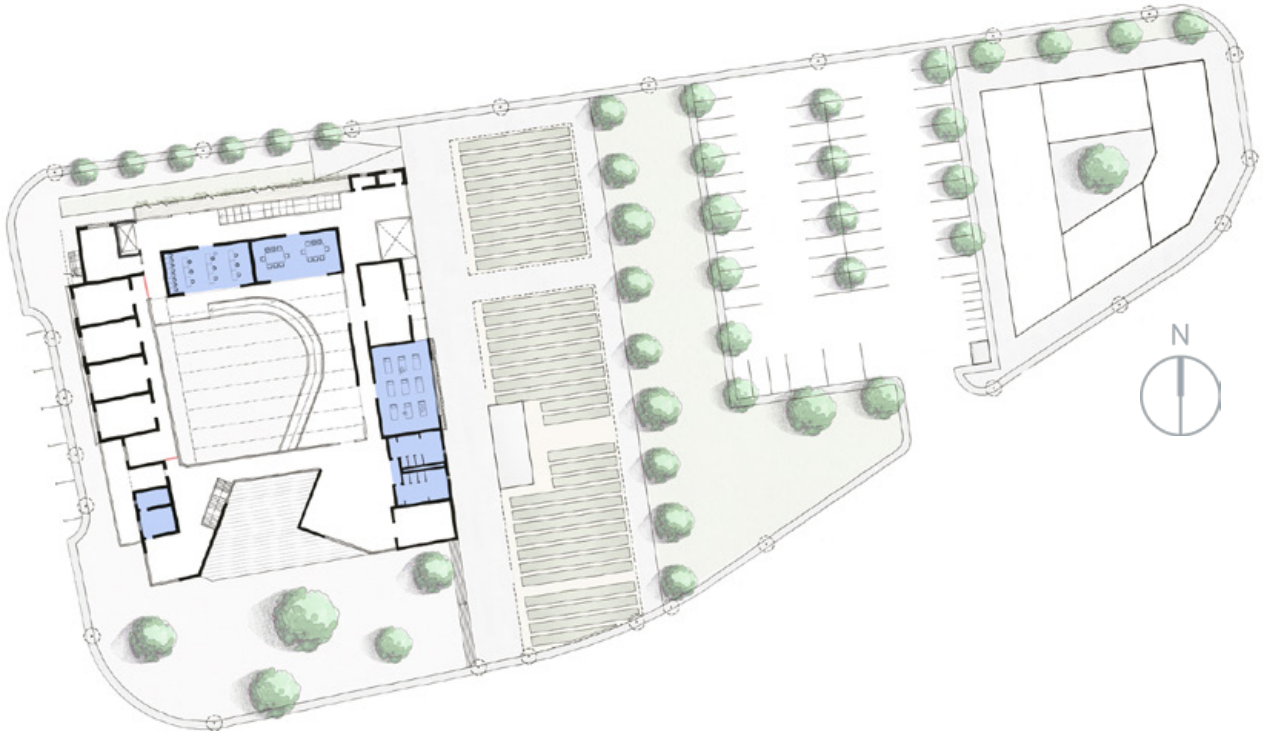


>> Figure 77  
West Elevation (1:500)

# 03



ground storey



first storey

>> Figure 78  
Disaster Relief Configuration (1:1000)

### 3.4.5 ARCHITECTURAL SYNTHESIS

The architectural proposition is characterised by a layered spatial ordering system. This concept is illustrated in Figure 57 (pg. 74). This layered system informs the spatial arrangements within the building.

As illustrated in Figures 71, 72 and 73, the ordering system consists of a 2m 'active zone' that encloses the perimeter of the building. This zone accommodates the active building envelope elements that engage with the surrounding public spaces and social complexity of the site. Elements of security, expression and adaptability define this threshold.

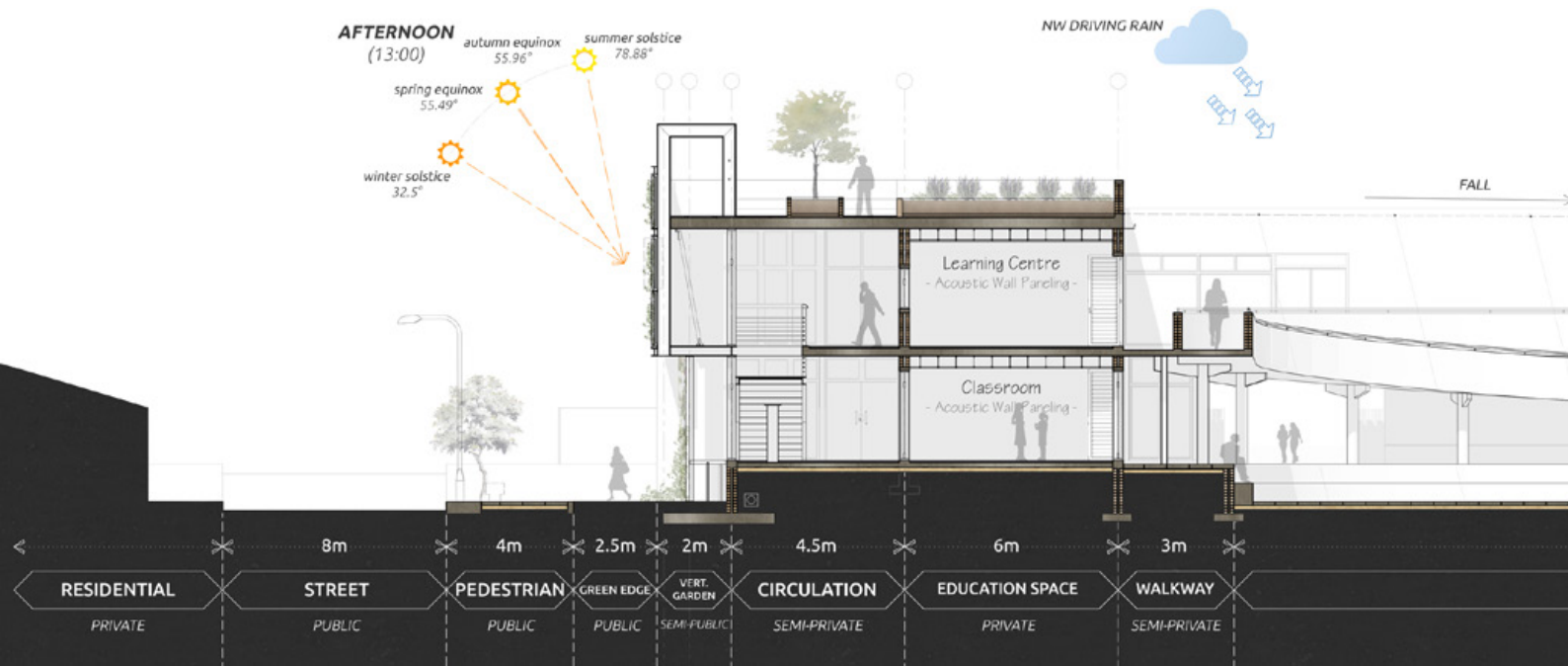
The internal layers consist of programmatic cores flanked by circulation spaces. Public spaces of the site and courtyard flank these internal layers, expressing the urban, architectural and detail thresholds of the scheme.

The positioning of the programmatic cores is defined by their relationship to the surrounding public spaces. The education spaces, coupled with the vertical garden system, in the northern wing of the building (on both ground and first storey) bear a direct connection to the courtyard allowing for spatial and programmatic overlap. In contrast, the workshop and studio spaces of the eastern wing (on ground and first storey respectively) bear a direct connection to the central public space of the site and are separated from the courtyard via a circulation space. This is done to create an engagement with the public space and the activity of the eastern edge, as well as to regulate acoustic conditions between these studio spaces and the education spaces. The western edge is activated through the kiosk and cafe spaces that draw in activity.

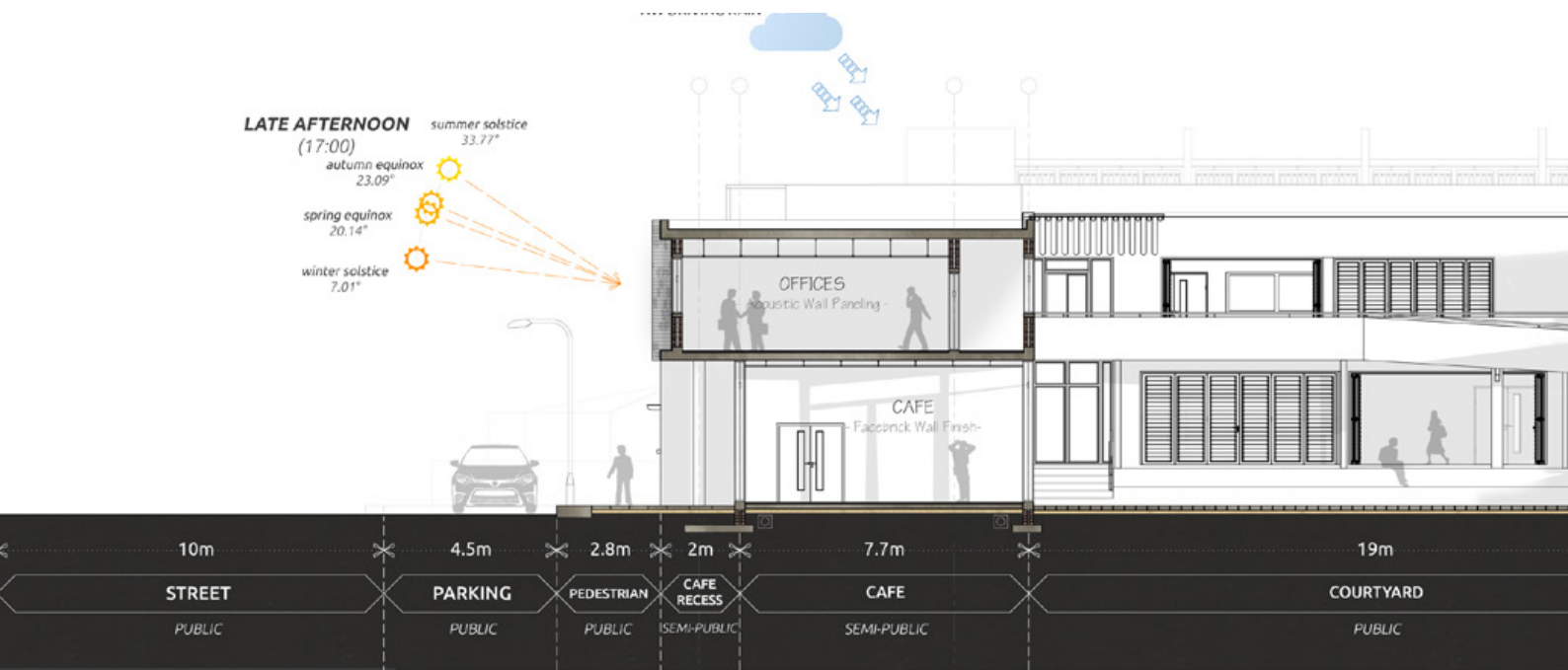
The southern edge (Figure 81) is defined by a key access threshold that communicates circulation through and within the building. This diagonal geometry expresses access through the building, creating a continuous sight line from the market and train station. The circulation elements (staircases and ramps) are located within this 'band'. The secondary access point on the eastern edge (Figure 82) of the building connects to this primary access point, and makes use of varying scale and recesses to open to the public spaces.

The building envelope (Figures 74 to 77) look to integrate the expression of robust materials that are contextually appropriate with the dynamic adaptive facade elements. These elements express the imageability, programmatic complexity and conditions of security of the building.

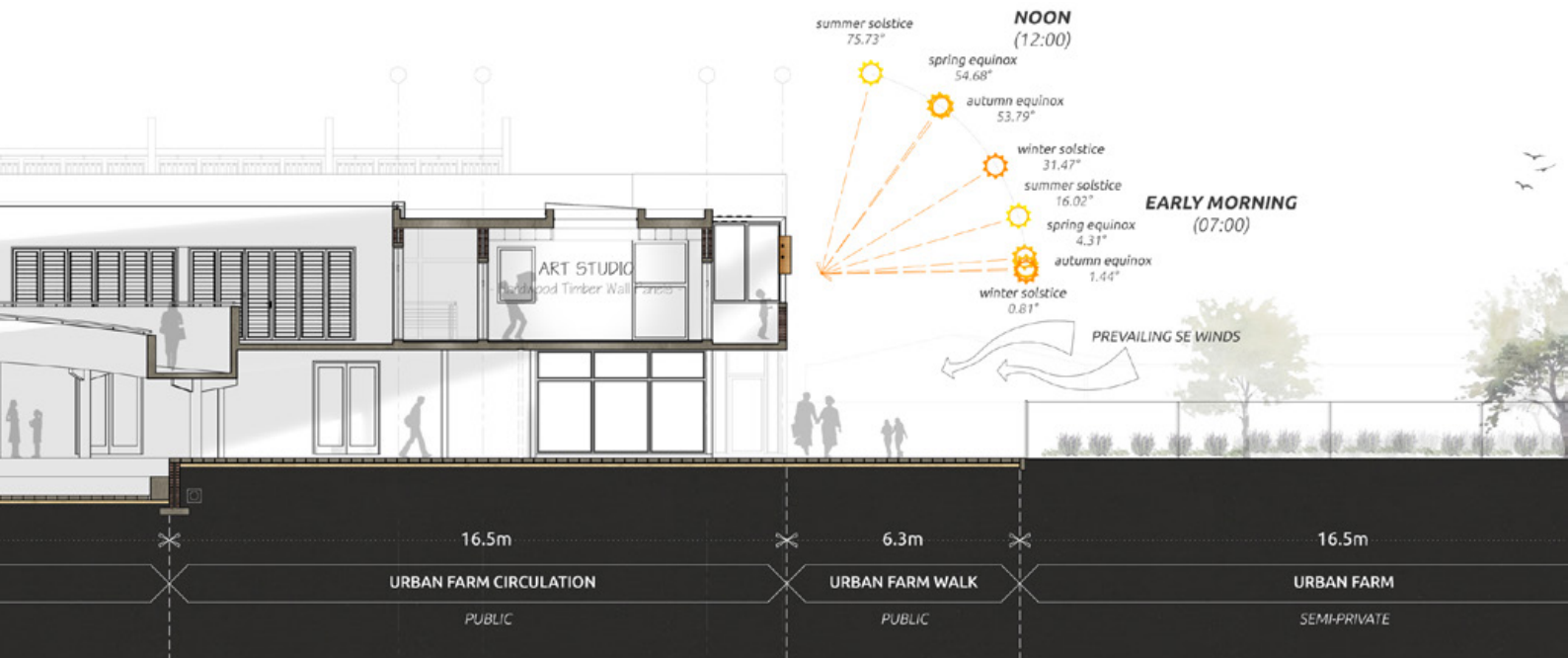
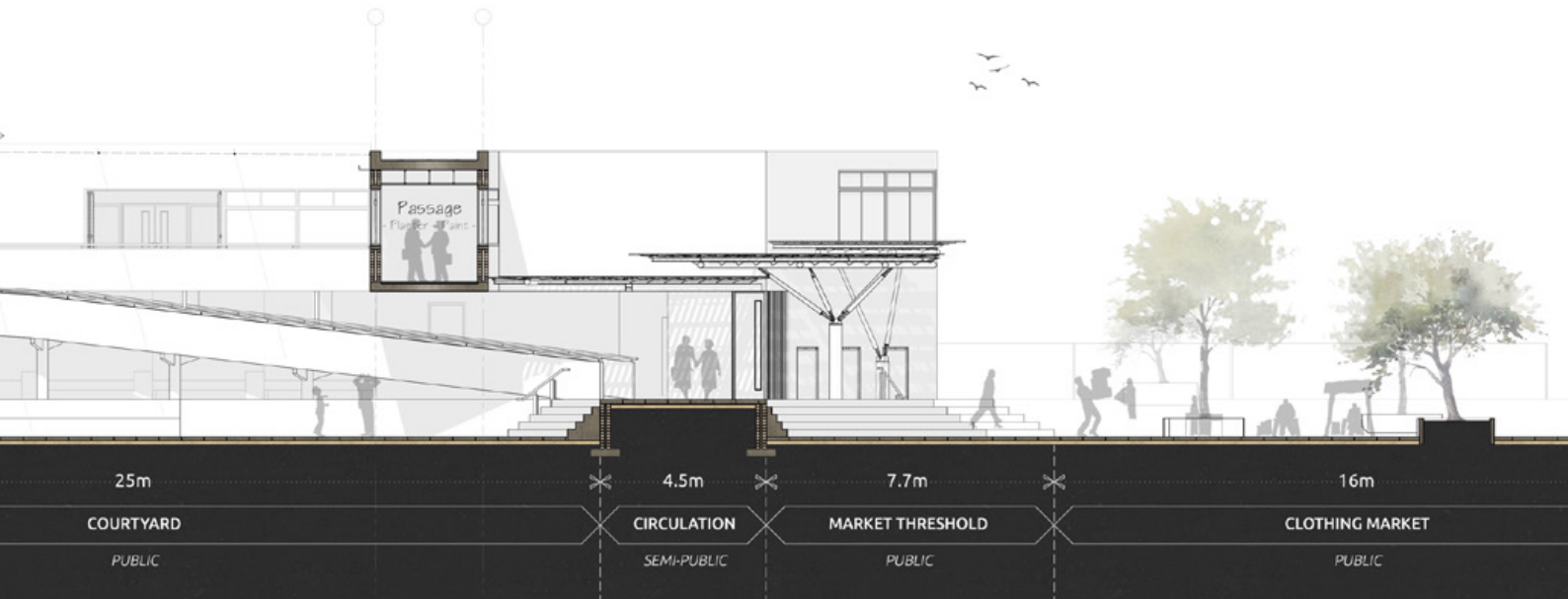
# 03



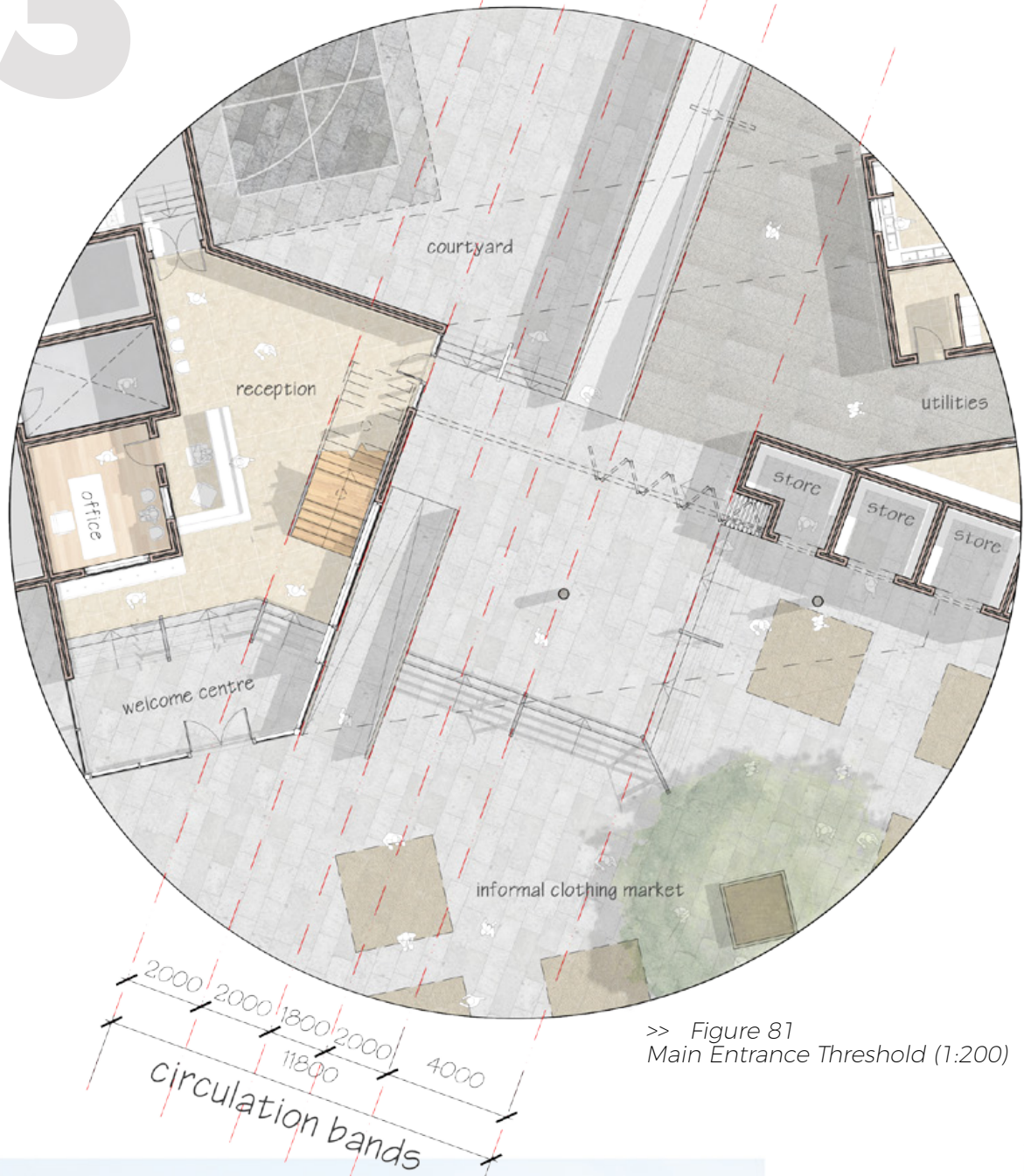
>> Figure 79  
Section AA (1:200)



>> Figure 80  
Section BB (1:200)

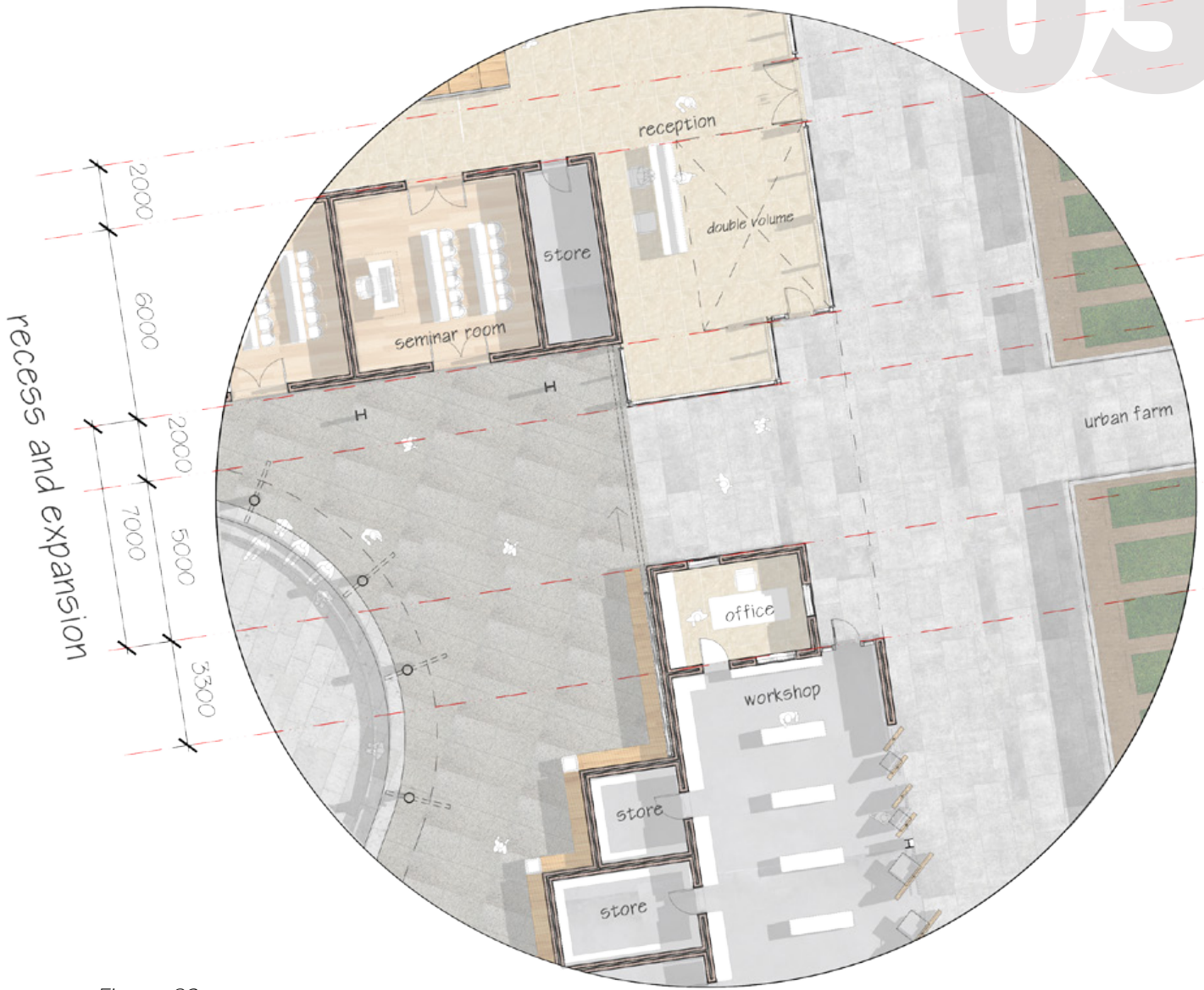


# 03



>> Figure 81  
Main Entrance Threshold (1:200)



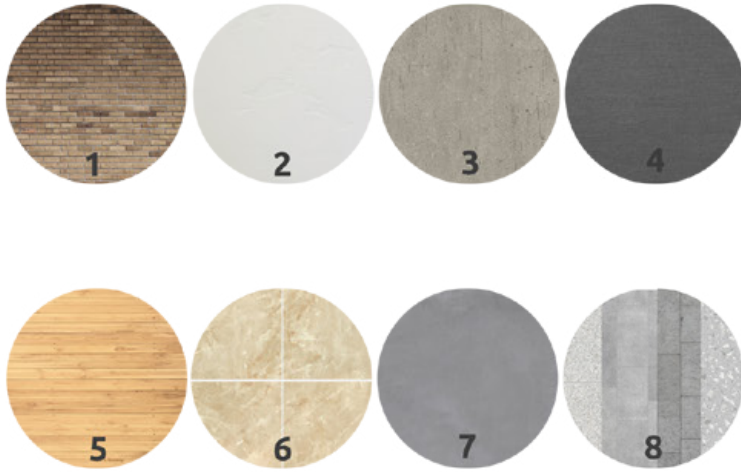


>> Figure 82  
Urban Farm Entrance Threshold (1:200)



>> Figure 83  
Section CC (1:200)

# 03



1 Sand Lime Load Bearing Brickwork

2 Plaster and Painted Wall Finish

3 Off-Shutter Concrete Finish

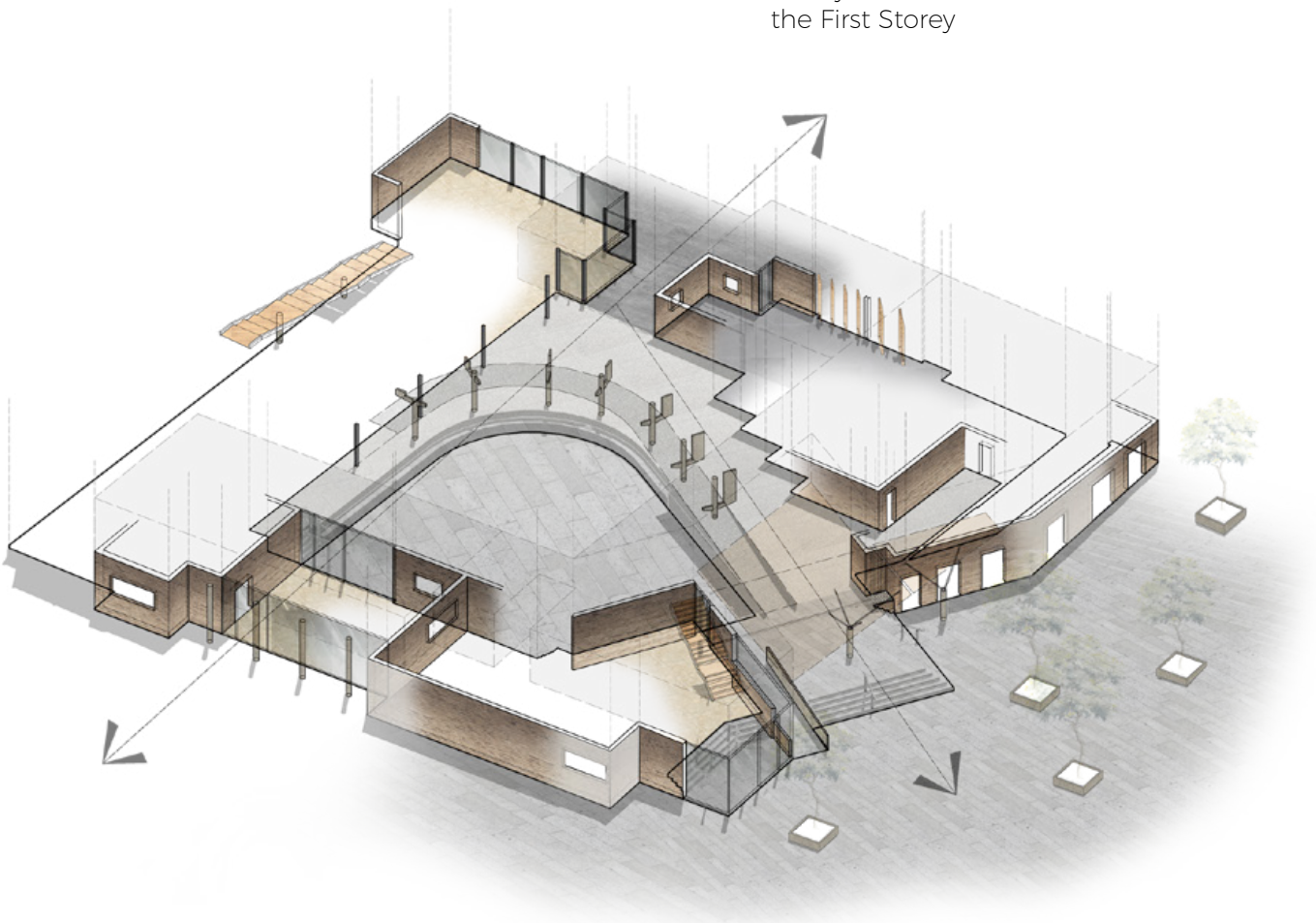
4 Galvanized Steel Structural Members Painted Dark Grey

5 Treated Pine, Balau and Ashwood Timber for Staircases, Decking and Eastern Facade

6 Off-white Ceramic Tiles for Interior Floor Finishes

7 Polished Screed Floor Finish for Workshop

8 Three Types of Terrazzo Pavers on Ground Storey, Polished Terrazzo Exterior Floor Finish on the First Storey

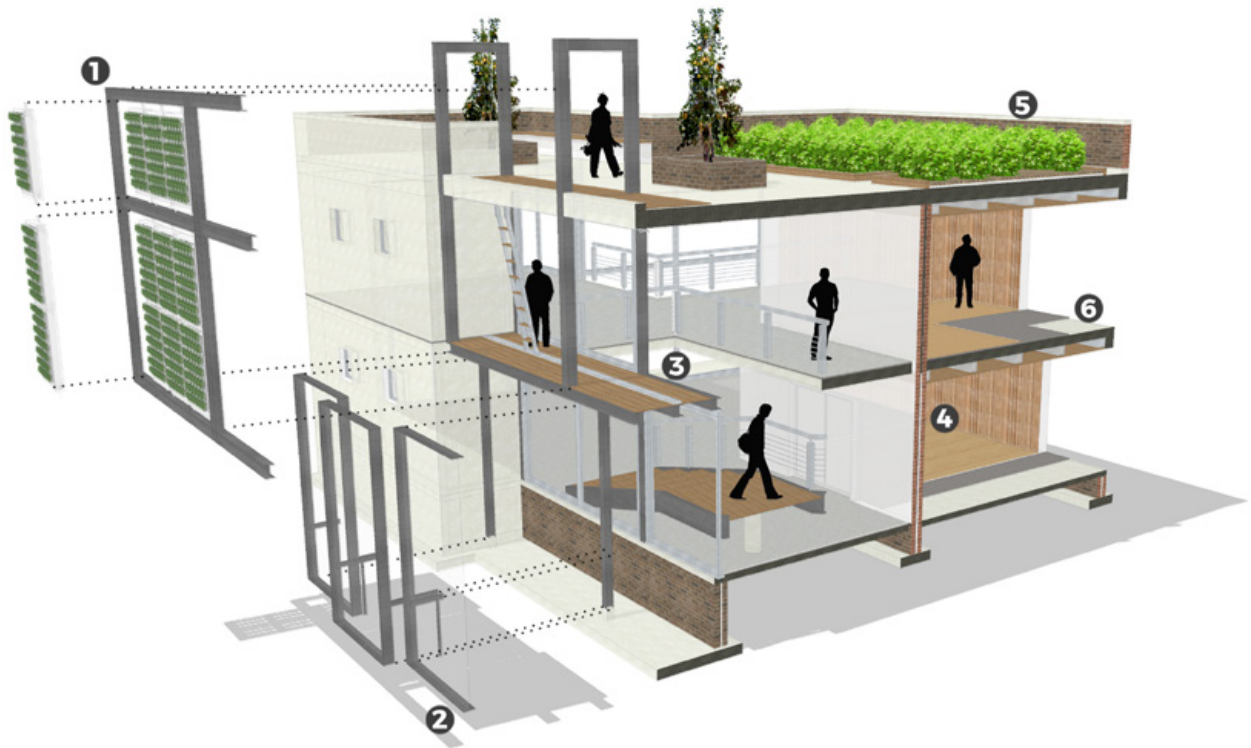


>> Figure 84  
Key Entry Thresholds and Materiality



>> Figure 85  
Key Perspective Views

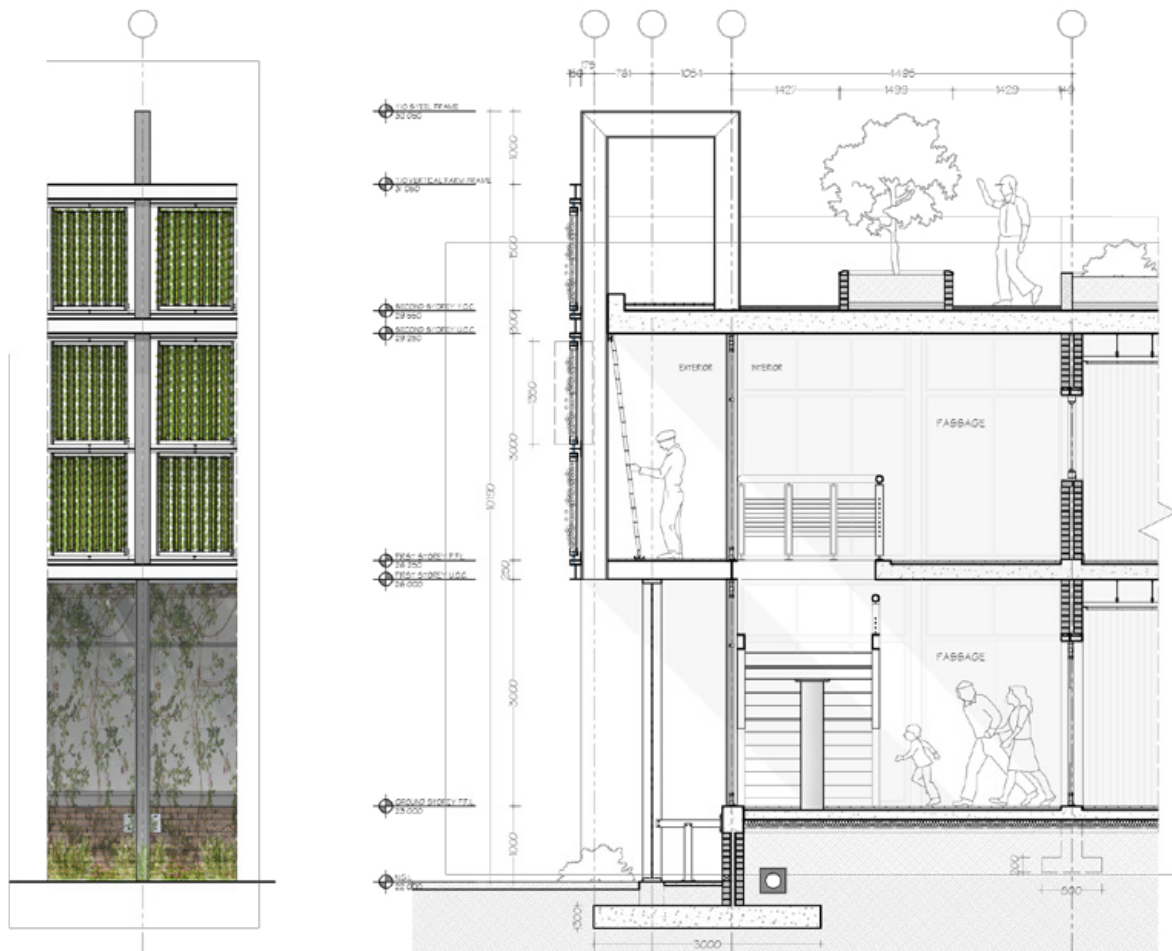
# 03



1. Vertical farm growth towers hung in galvanised steel pivoting frame, fixed to steel sub-frame.
2. Galvanised steel mesh trellis for vine growth.
3. Timber decking on galvanised steel I-beams - walkway for access to vertical farm.
4. 280mm load-bearing sand lime masonry wall to 200 x 800mm strip footing.
5. Herb planter box on 300mm reinforced concrete floor slab.
6. 250mm reinforced concrete floor slab on load-bearing brick walls.

The proposal employs a hybrid structural system of load bearing sand lime brick walls and concrete slabs and columns in part. The use of these robust materials are appropriate for the context. Expression and contrast of material and structure is achieved through the various facade conditions, in which different structural systems and material palettes are used. As illustrated above, the solid form of the plastered brickwork is broken by the lightweight steel structure of the vertical farm.

>> *Figure 86*  
*Structural Perspective Section*

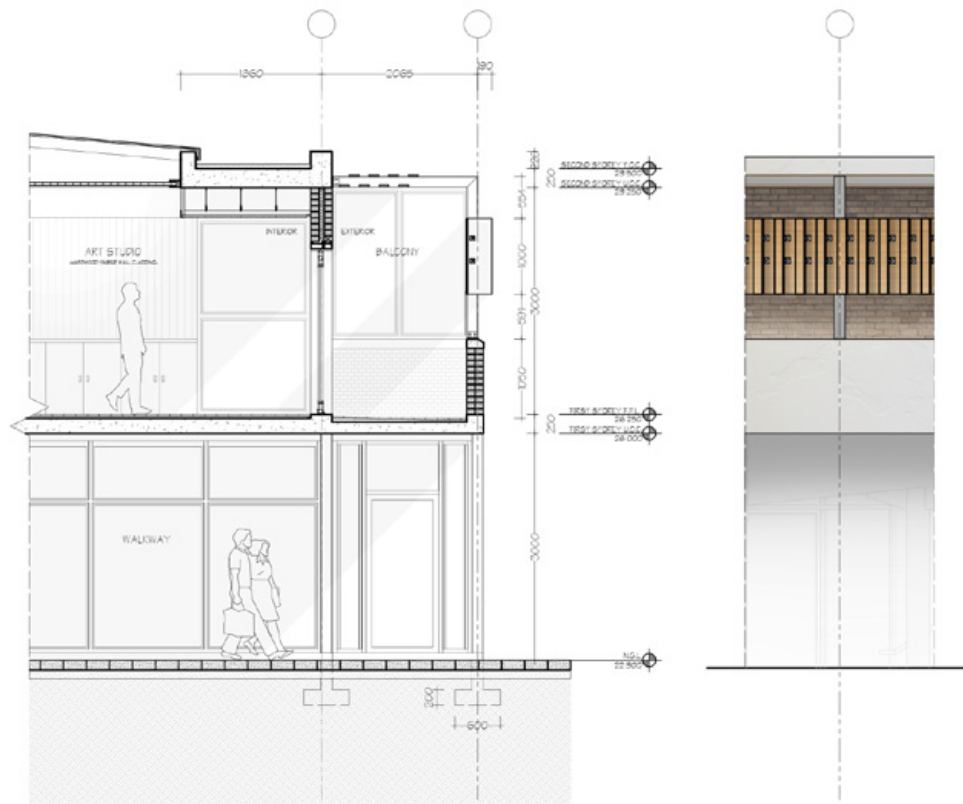


The urban farm extends vertically on the northern facade, utilising the optimal daylighting conditions. The section and part elevation above illustrates the structural system as well as expression of material. The Northern facade (which addresses a residential edge) is primarily expressed through lightweight construction of steel and timber. The vertical farm, which features a herb garden and vine trellis on the ground storey, and vertical farm growth towers (made of 1m x 110 mm diameter PVC piping) in operable pivoting frames on the upper floors, provides a dynamism to the elevation. The seasonal nature of farming means that the facade will constantly be in flux.

The modular nature of the vertical farm ensures that a large variety of produce can be grown according to season or demand. These modules can be removed to allow direct light into the interior spaces of the building.

>> Figure 87  
Northern Facade Detail Study (1:100)

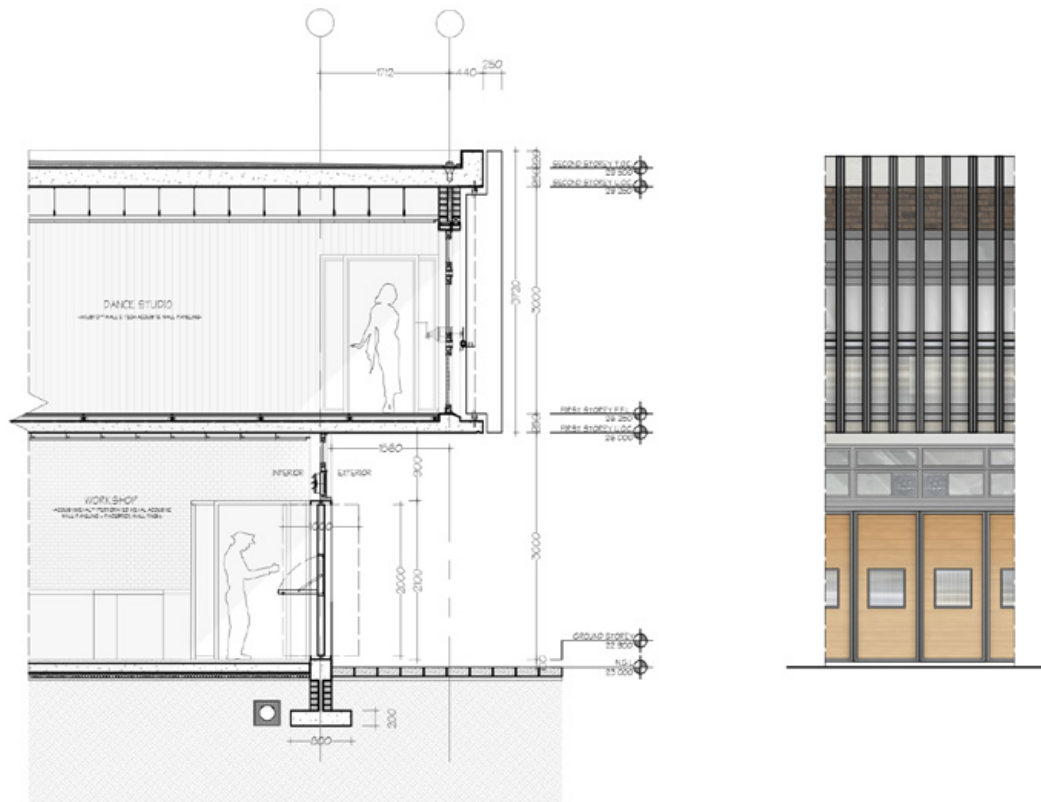
# 03



The eastern facade (art studio) engages with the central public space of the site. It regulates daylighting conditions through the implementation of fixed vertical shading elements with specific S-shaped profiles informed by the solar study. The profiles and spacing of elements allows for the blocking of direct summer sunlight and the penetration of direct winter sunlight. The facade condition communicates the variance in activity within the building through its layered edge condition (this can be seen holistically in Figure 76, pg.87).

As can be seen in the above section and part elevation, the structure and materiality of the elevation is where the dynamism of the envelope is expressed. The solidity of the load-bearing brick structure is contrasted by the lightweight timber shading device (combining steel and timber, carrying through the material expression of the northern elevation) on the upper storey.

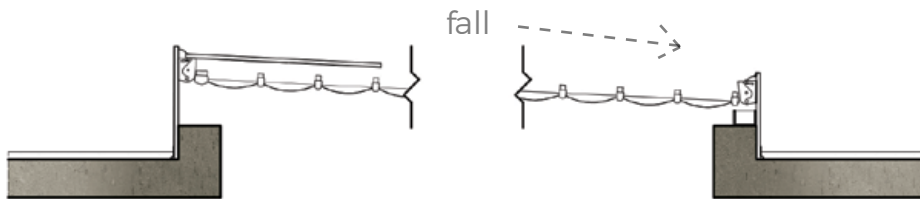
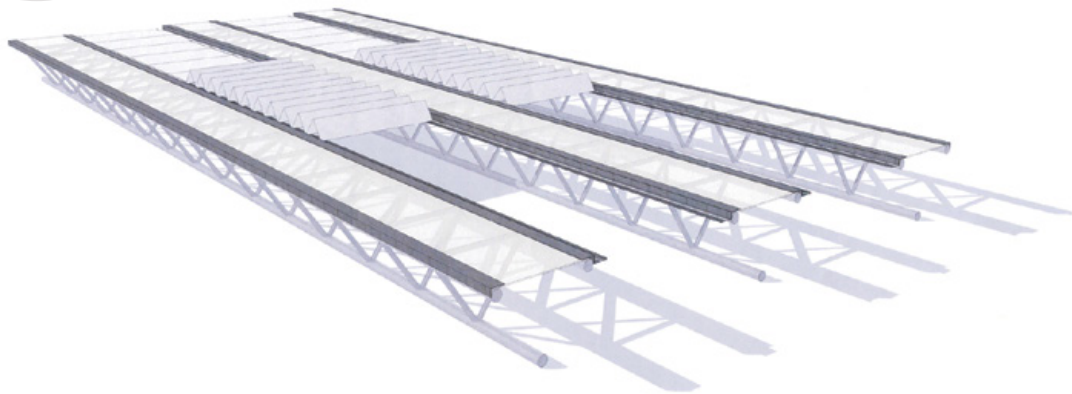
>> Figure 88  
Eastern Facade Detail Study - Art Studio(1:100)



The eastern facade (dance studio), has a unique envelope treatment on the ground storey, and a facade system that is replicated on the Western facade on the upper storey. On the ground storey, a series of composite timber hinged panels in pivoting steel frames allows the activity of the workshop to spill out into the public realm. Built in workbenches provide further functionality to the facade treatment. The first storey facade employs operable vertical aluminium shading fins that allow for the regulation of daylighting conditions to the interior spaces. The sizing and spacing of the shading fins is determined through mitigating direct eastern and western sunlight (daylighting conditions during the summer and winter solstices as well as the autumn and spring equinoxes were tested); this eliminates glare and solar heat gain in the respective spaces. The operability of the facade allows for user based control, both in terms of shading (through operation of the fins) as well as in terms of air flow (through openings).

>> Figure 89  
Eastern Facade Detail Study - Dance Studio (1:100)

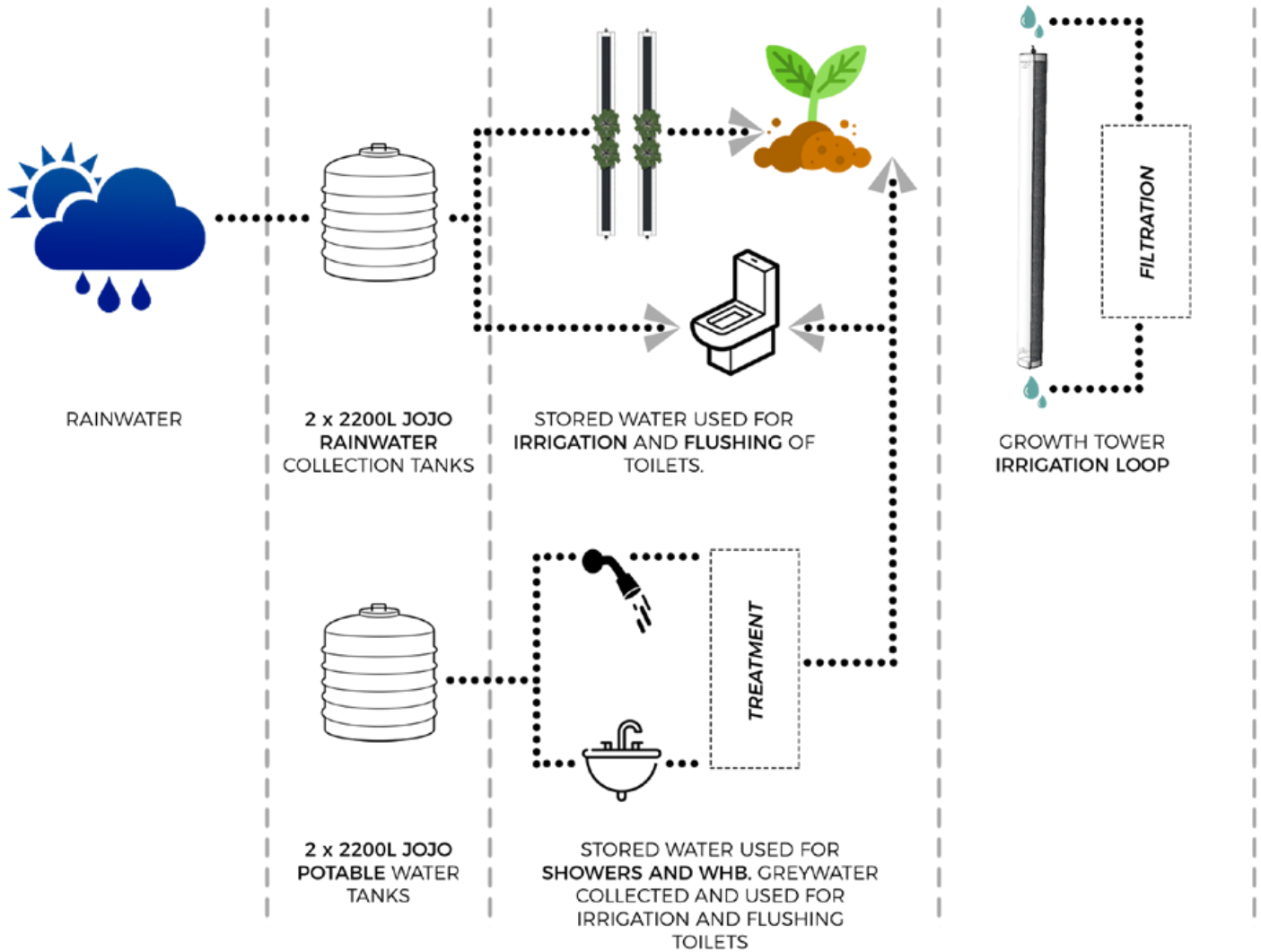
# 03



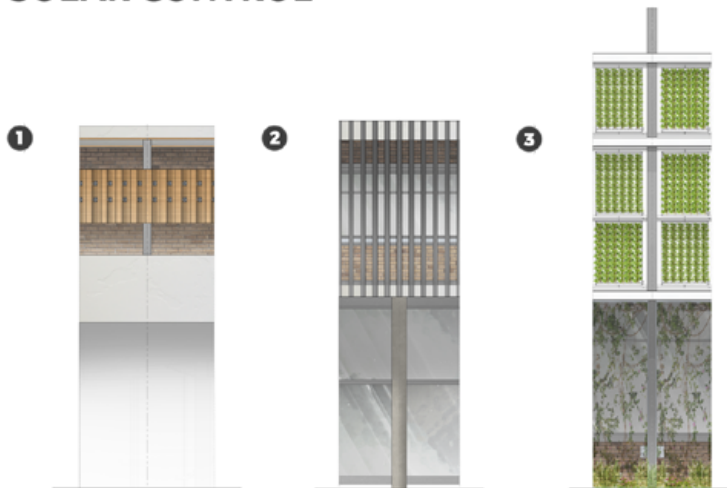
The courtyard roof structure (a retractable canvas roof on steel cable guides), is an element which speaks to the adaptability of the architectural proposition. To be utilised during adverse weather conditions, or during a disaster situation, the roof can fully enclose and protect the courtyard from climatic conditions. The initial structural study (top image) explored the use of space trusses with separate bays of retractable canvas roof, however, logistically, this design was not practical as there were too many points of failure. The current scheme (middle image) proposes a simple cable structure, spanning the length of the courtyard and anchored behind the upstand of each roof slab. This allows for the drainage of the retractable roof onto the flanking roof slabs ensuring that central courtyard space is sheltered from adverse weather conditions. The lower image illustrates a precedent of this system.

>> *Figure 90*  
*Retractable Roof Detail Study*

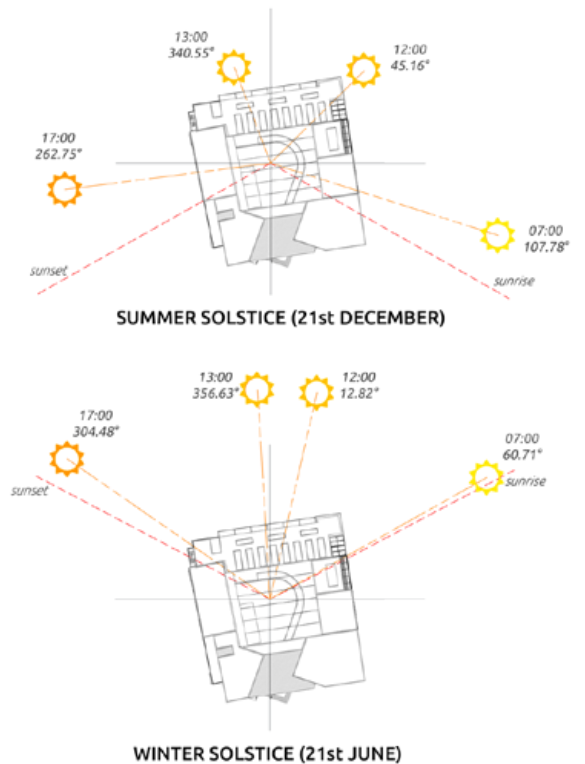
## WATER STRATEGY



## SOLAR CONTROL

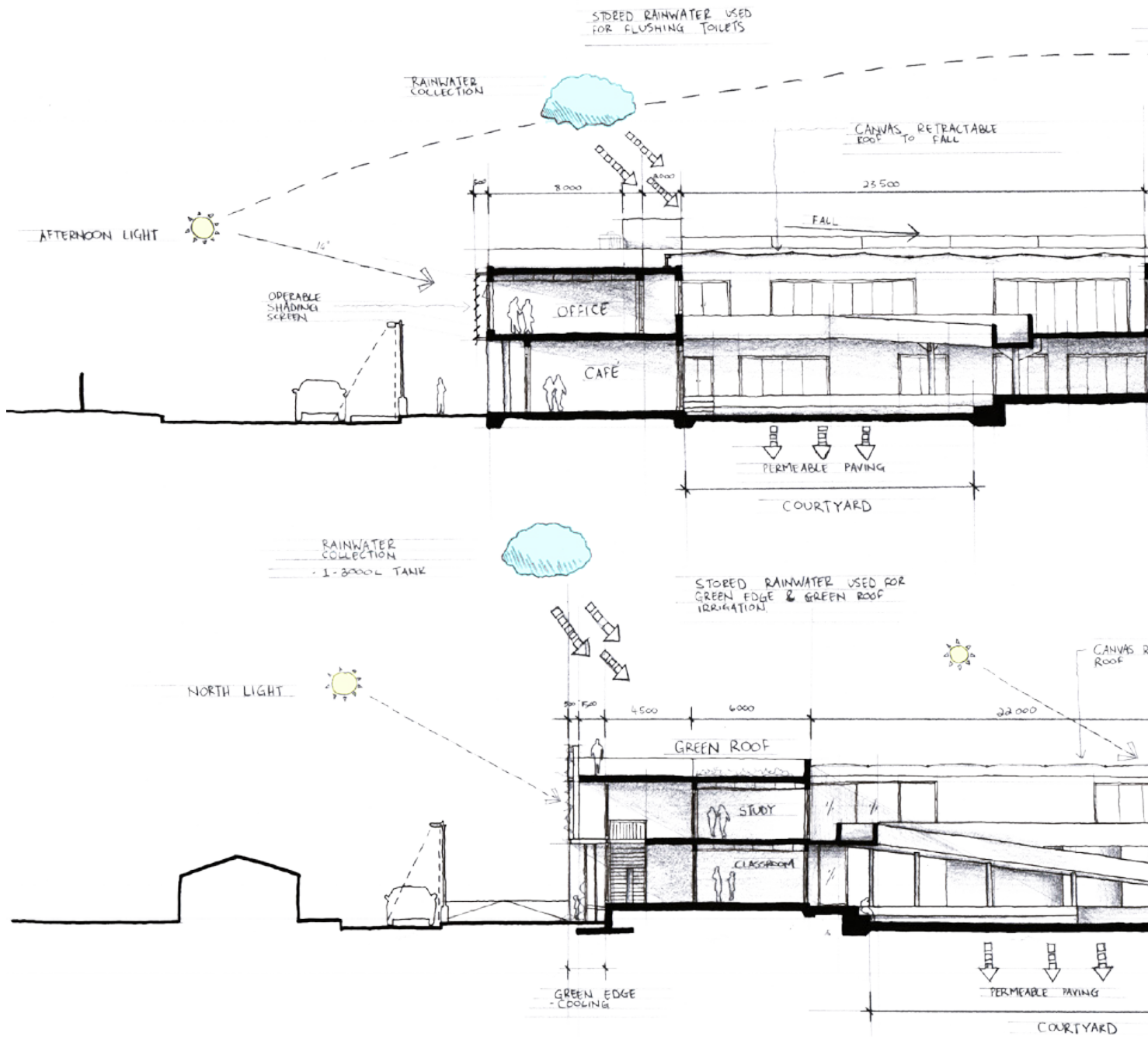


1. FIXED EASTERN FACADE SHADING
2. OPERABLE WESTERN FACADE VERTICAL SHADING
3. NORTHERN FACADE, OPERABLE GREEN EDGE



>> Figure 91  
Sustainability Strategies

# 03



>> Figure 92  
Sustainability Sections



### 3.4.6 DISASTER RELIEF MANAGEMENT

As illustrated in Figure 78 (pg.88), the disaster relief configuration of the proposition makes use of the defined spatial connections in order to achieve the necessary adaptability. The highlighted blue areas in Figure 78 illustrate the key spaces that adopt the disaster relief programme.

On the ground storey, the education spaces and cafe space can open directly to the courtyard. The courtyard (which can be enclosed via the retractable roof) can be used as temporary accommodation, with the surrounding education spaces and cafe space used as triage/treatment and canteen spaces respectively. The adjoining ablutions facility on the eastern wing can also be appropriated for this need. The primary access points to the courtyard (from the southern market space and eastern public space) can be closed off via stacking and hanger style doors, in order to provide safety and security. All access then becomes fully controlled via the reception spaces. On the upper storey, the education, studio and clinic space can be utilised for disaster relief administration, such as caucus and strategic rooms, as well as accommodation for volunteers. The office spaces are able to continue with daily operation and have access control points on both the southern and northern entry points.

The public spaces (recreational lawn, parking lot and market space), can also be used for additional accommodation, triage, and access for disaster relief vehicles.

### 3.4.7 OBJECTIVE

The architectural proposition develops an architecture of defined thresholds and adaptability. This manifests through the spatial arrangements, hierarchies and connections, as well as through the programmatic and building envelope response.

The architectural inquiry engages with the socio-spatial complexities of the precinct, establishing links functionally and spatially. The programme extends the activity of the precinct to the site, whilst offering a functional adaptability that engages with the needs and circumstances of disadvantaged communities.

The engagement of social thresholds across scales produces a proposal with urban and detailed sensibilities, whilst the building envelope serves to accommodate adaptation, regulate the internal - external relationship, and communicate the buildings place in the greater context.

04

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**FINDINGS**

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OUTCOMES OF THE DESIGN DISSERTATION  
INQUIRY

# 04

## FINDINGS

### 4.1 OUTCOMES

---

**W**hat is an architecture of thresholds and adaptability in the context of a disadvantaged community? This is the question that the design dissertation inquiry looked to answer. The inquiry approached this question through issues of spatial organisation and communication.

The design dissertation proposition implements a layered threshold system that defines and communicates spatial hierarchies, order, relationships, circulation and activity. This form of communication is further expressed through the building envelope.

The envelope, being the primary engagement between the community and the building, needs to impart not only a sense of building function, but also its place and identity within the larger context.

This is done through the expression of activity and

access; utilizing conditions of permeability, materiality and scale to express spatial ordering and complexity.

Adaptability is addressed both socially as well as technically. This is done through exploring the adaptability of the social programme, proposing adaptable function; as well as through the manner in which the building adapts spatially and technically.

These findings, although interconnected, are defined in two categories: Social Thresholds and Adaptability.

#### 4.1.1 SOCIAL THRESHOLDS

The design dissertation inquiry deals with varying threshold scales, from the urban scale, to the detail scale. At the urban scale, it delineates a spatial ordering systems, defining the layering of spaces both in the precinct as well as within the building in relation to the urban context and the complexities of the surrounding public spaces.

At the detail scale, it defines conditions of enclosure, access and permeability. These social thresholds, characterise the organisation at the scale of the precinct, building and room.

These conditions manifest as various threshold conditions. At the urban scale, change in level (from the informal clothing market to the entry threshold and courtyard), dimension (definition, expression and spatial experience of the key entry thresholds through the creation of bands of circulation and recesses/expansions) and surface texture (change in type of terrazzo paver between the urban market space and architectural circulation space) signify change in spatial conditions, such as from the public informal market space to semi-public passageway through the building, where the step up onto the plinth and change in surface delineates it as a different spatial condition and degree of privacy.

At the building scale, the visual and physical permeability of the edge conditions communicates this change. The interplay between solid and permeable materials of the building envelope expresses or conceals views, spaces

and activities, with dynamic elements restricting or permitting access. This condition is prevalent on both the exterior and interior façades, engaging matters of security and privacy, such as in the main entry threshold, which is characterised by security elements such as the stacking door that secures the courtyard, as well as the canopy structure that provides a sense of enclosure as one enters the courtyard.

At the scale of the room, the key social threshold conditions are expressed through the outer edges, through the manner in which each space engages with the layer of access and circulation on one end, and the regulation of permeability and comfort on the other. These two conditions determine the interior spatial arrangements and function within the room. An example of this would be the workshop space, which, on its eastern edge, opens up to the urban space, allowing the internal activity to extend to the public realm, whilst the solid western edge engages with practical acoustic considerations to the courtyard.

As a key finding (Figure 93), approaching the design of public buildings through the sequential engagement with these three social threshold scales offers a level of design interrogation that synthesizes issues of scale across the project. Urban design issues of proportion and connection influence the architectural issues of permeability and access. This in turn affects the programmatic issues of function and privacy. This results in an architecture of holistic response.

#### 4.1.2 ADAPTABILITY

The design dissertation inquiry engages with conditions of adaptation both socially and technically. The architectural project identifies a social programme that is relevant to the needs of a disadvantaged community. In a context in which access to resources and facilities are generally quite scarce, the dissertation proposes a public building with dual-programmes in which activity is densified.

The proposition employs two programmatic conditions. The primary condition operates and services various activities, linking to the existing functions in the precinct.

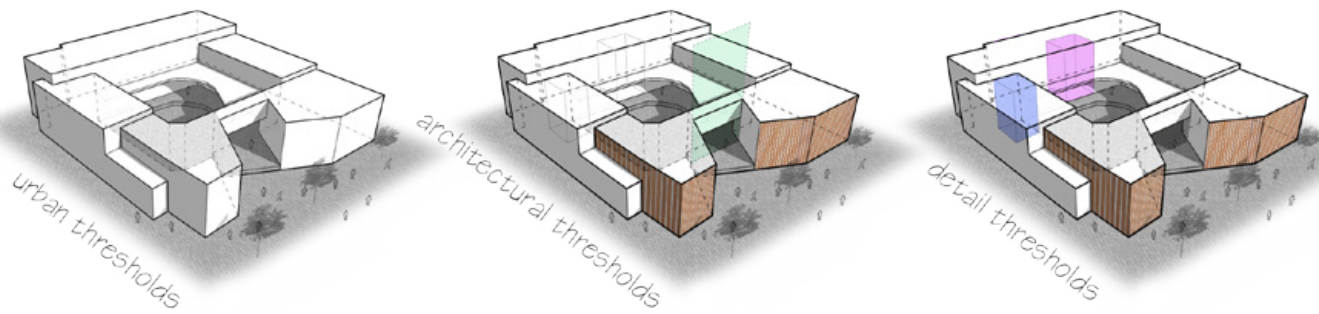
The secondary condition operates during emergencies, adapting the spatial configuration of the building through altering conditions of permeability, access and function. In this way, in conjunction with the threshold conditions that demarcate these adaptable spaces, the building achieves a social adaptation.

Technical adaptation is achieved through responsive edge conditions. These conditions, linked to the architectural and detailed scales of social thresholds regulate access, permeability and communication. These elements, such as the retractable courtyard roof and vertical garden, adapt to functional and environmental shifts. The vertical gardens adaptability is expressed through its response to daylighting as well as to the process of urban farming. The seasonality of produce and action of harvesting provides a dynamism to the northern edge, reflecting direct response to climatic and functional conditions. The courtyard roof provides spatial adaptability, offering a response to programmatic and environmental change. In this way, the design dissertation inquiry utilizes two key themes for technical adaptation – climatic and functional – in which each edge and threshold condition addresses a requirement within these themes.

As key findings (Figure 94), the design dissertation poses two mechanisms of adaptation. The social adaptation proposes that public buildings within disadvantaged communities should be programmatically adaptable, offering the necessary resilience to accommodate diverse activity. The technical adaptation proposes that physical adaptability should be based off the two key themes of climate and function, in which edge conditions address conditions of security, privacy and spatial configuration. In conjunction with the conditions of social thresholds, technical adaptability should facilitate social adaptability.

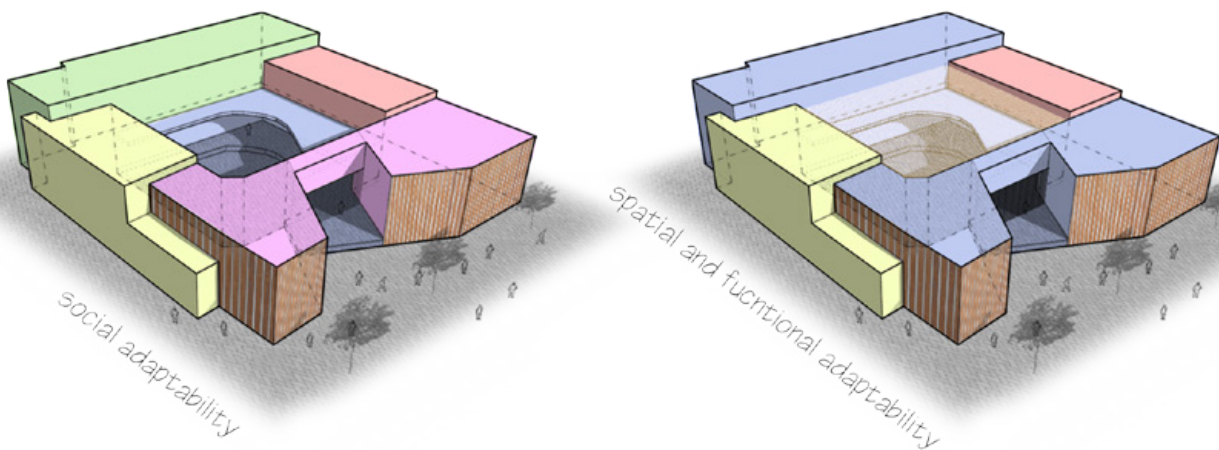
These findings into an architecture of social threshold and adaptability speaks to a process in which the social and technical aspects of design within this context are synthesized and engaged with across scales. It highlights the importance and impact of adaptability and an architecture that communicates its place within the community, in a manner that is both expressive and responsive.

# 04



The above findings diagrams illustrate the synthesis of the various threshold scales, from the urban, to the architectural and detailed scales. Conditions of enclosure, access control, spatial regulation and connection are expressed.

>> Figure 93  
Findings: Social Thresholds



The above findings diagrams illustrate socio-spatial adaptability, in which spatial and programmatic flexibility allows for sections of the proposal to adapt and appropriate a different function, whilst physical conditions of enclosure regulate access and climate.

>> Figure 94  
Findings: Adaptability

## 4.2 CONCLUSION

---

**W**hat is the relationship between the building envelope and the social surface? This question initiated the inquiry into an architecture of adaptability. The transient nature within a context in which the lines between the formal and informal are blurred calls for an architecture that is equipped to manage and accommodate ever-fluctuating social conditions.

Through the progression of the design dissertation inquiry, this exploration developed into an architecture that approaches adaptability through an engagement and formation of an architecture of defined social thresholds. These thresholds serve to order and communicate the spatial complexity of the architecture, responding to the social complexity of the context across the urban, architectural and detail scales. These thresholds grapple with conditions of formality and informality, temporality and permanence, and the fixed and flexible, responding to the socio-spatial practices of the environment. The design dissertation inquiry synthesizes the theoretical with the practical, engaging with analytical as well as pragmatic approaches to design. The design dissertation establishes a responsive architectural inquiry that engages with the precinct across multiple levels. This is achieved through an engagement with key concepts in Defensible Space Theory (Newman, 1996), producing design guidelines relating to social thresholds, spatial ordering and an architecture of legible spatial hierarchies; the development of an architectural programme defined by the socio-spatial complexities of the Nyanga Junction precinct and the interrogation of an architecture of socio-technical adaptability.

This inquiry has produced a development model that looks at how public buildings should be conceived in disadvantaged communities. It proposes a level of integration and adaptation that facilitates both formal and informal activities, promotes livelihoods and engages with the future needs of the community. In a multifaceted context, an architecture is required that reciprocates and facilitates this complexity.

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**TABLE OF FIGURES**

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IMAGE CREDITS

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DESIGN DISSERTATION KEY SOURCES

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**APPENDICES**

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ADDITIONAL DOCUMENTATION

## APPLICATION FORM


**Please Note:**


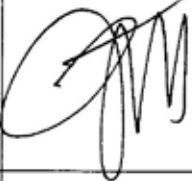
Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analysing data. The objective of submitting this application *prior* to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the **EBE Ethics in Research Handbook** (available from the UCT EBE, Research Ethics website) prior to completing this application form: <http://www.ebe.uct.ac.za/usr/ebe/research/ethics.pdf>

| APPLICANT'S DETAILS  |  |  |
|--|--|--|
| Name of principal researcher, student or external applicant                | Byron Moodley                                |  |
| Department   | Architecture, Planning + Geomatics           |  |
| Preferred email address of applicant:                                      | mdlbyr001@myuct.ac.za                        |  |
| If a Student   | Your Degree:<br>e.g., MSc, PhD, etc.,        | M.Arch (Prof)  |
|  | Name of Supervisor (if supervised):          | Supervisor: F. Carter, for UCT<br>Co-Supervisor: T. Brunette, For Arup Cape Town |
| If this is a research contract, indicate the source of funding/sponsorship |  | -  |
| Project Title  | Adaptive Envelopes: An Architecture of Place |  |

**I hereby undertake to carry out my research in such a way that:**

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

| SIGNED BY   | Full name          | Signature  | Date        |
|---|--------------------|--|-------------|
| Principal Researcher/<br>Student/External applicant | Byron Dean Moodley |  | 10 Apr 2017 |

| APPLICATION APPROVED BY  | Full name         | Signature  | Date        |
|--|-------------------|--|-------------|
| Supervisor (where applicable)  | Francis Carter    |  | 10 Apr 2017 |
| HOD (or delegated nominee)<br>Final authority for all applicants who have answered NO to all questions in Section 1; and for all Undergraduate research (Including Honours). | Prof. T. Berlanda |  | 10 Apr 2017 |
| Chair : Faculty EIR Committee<br>For applicants other than undergraduate students who have answered YES to any of the above questions.                                       |                   |  |             |

## APPLICATION FORM

**Please Note:**

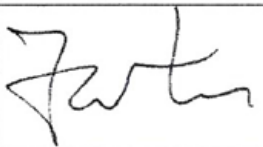
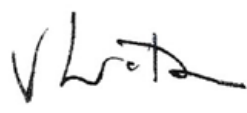

Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analysing data. The objective of submitting this application *prior* to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the **EBE Ethics in Research Handbook** (available from the UCT EBE, Research Ethics website) prior to completing this application form: <http://www.ebe.uct.ac.za/usr/ebe/research/ethics.pdf>

| APPLICANT'S DETAILS  |   |
|--|---|
| Name of principal researcher, student or external applicant                | Francis Carter  |
| Department   | Architecture Planning + Geomatics                                   |
| Preferred email address of applicant:                                      | francis.carter@uct.ac.za  |
| If a Student   | Your Degree:<br>e.g., MSc, PhD, etc.,                               |
|  | Name of Supervisor (if supervised):                                 |
| If this is a research contract, indicate the source of funding/sponsorship |   |
| Project Title  | Gugulethu streets and community buildings spatial and social survey |

**I hereby undertake to carry out my research in such a way that:**

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

| SIGNED BY   | Full name      | Signature | Date        |
|---|----------------|-----------|-------------|
| Principal Researcher/<br>Student/External applicant | Francis Carter |           | 20 Apr 2017 |

| APPLICATION APPROVED BY  | Full name                                   | Signature  | Date                                      |
|--|---|--|---|
| Supervisor (where applicable)  | Francis Carter                              |  | 20 Apr 2017                               |
| HOD (or delegated nominee)<br>Final authority for all applicants who have answered NO to all questions in Section 1; and for all Undergraduate research (Including Honours). | Vanessa Watson<br>Click here to enter text. |  | Click here to enter a date.               |
| Chair : Faculty EIR Committee<br>For applicants other than undergraduate students who have answered YES to any of the above questions.                                       | G. Sithole                                  |  | 2 May 2017<br>Click here to enter a date. |



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UCT Postgraduate programme in professional studies of architecture: M.Arch(Prof)  
 Fields of Play Design Studio - research for design:  
**Adaptive Envelopes: An Architecture of Place**

Student: Byron Moodley (079 691 1876 / mdlbyr001@myuct.ac.za)  
 Supervisor: Francis Carter (021 650 2375 / francis.carter@uct.ac.za)

*Statement to be read out to an interviewee by a student about to undertake an interview for research in the Prof Masters Design Studio 'Fields of Play'.  
 A copy of the form should be given to respondents if they request it.*

April - September 2017

**CONSENT FOR AN ADULT TO BE INTERVIEWED FOR THE PURPOSE OF RESEARCH**

My name is Byron Moodley and I am studying the design of buildings, at the University of Cape Town.

As part of my postgraduate studies to become a professional architect I am doing research on patterns of inhabitation and conditions of social identity in relation to built edges. I would like to ask you some questions about this to help me with my research.

The questions I ask are only for education and research and do not directly benefit you or your community; you will not be compensated for your participation.

I must be careful not to raise expectations, as no improvement to any facilities will result from the interview.

The information which I am gathering will be used in my course and exams, and may also be published in academic journals or exhibitions.

I would like to record the interview, if you agree.

You have a right to refuse to answer any questions. If you want to end the interview at any point you are free to do so.

**Permissions:**

Do you agree to be interviewed, to contribute to this research?

Yes I do:  No I do not:

Do you agree to the interview being recorded?

Yes I do:  No I do not:

Do you give permission for your name, title and photo to be used as a source of information in our research?

Yes I do:  No I do not:

Participant: name: .....

signature: .....

Student: signature: .....

date: .....

# INTERVIEW QUESTIONNAIRE

NYANGA JUNCTION – USER GROUP INTERVIEW

NAME:.....

AGE:.....

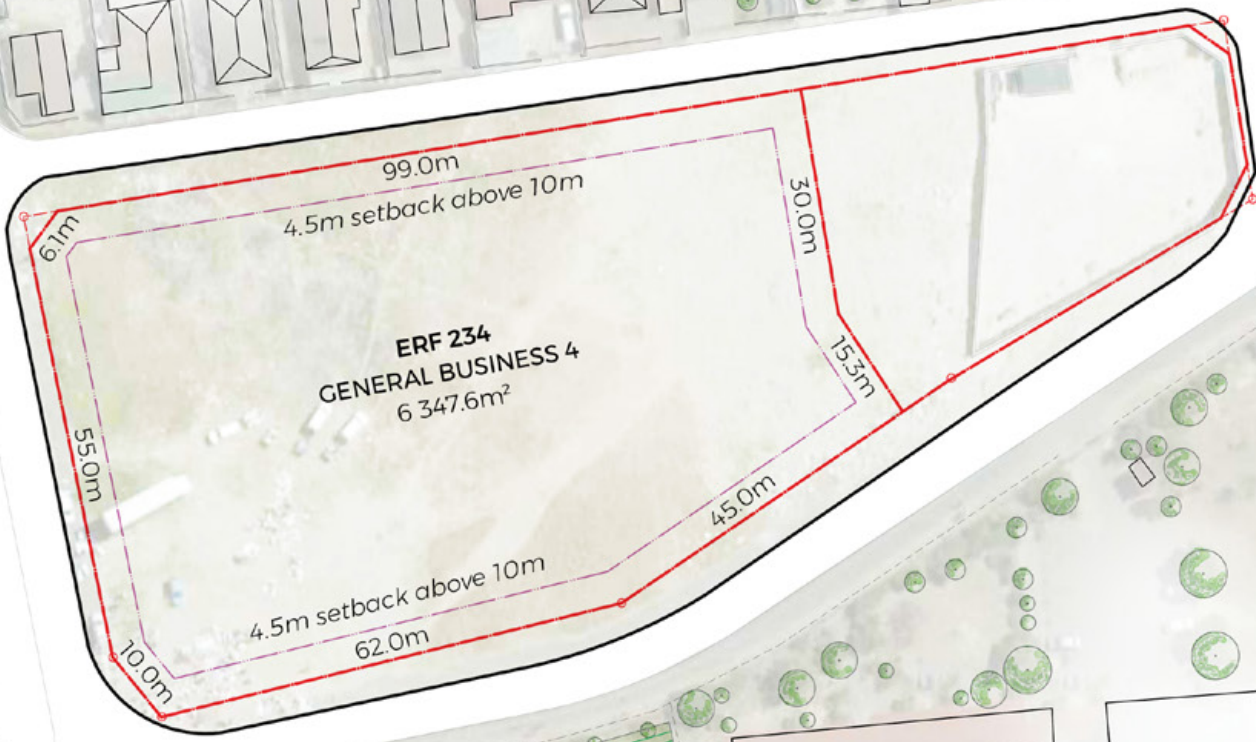
USER GROUP:.....

LOCATION:.....

DATE:.....

## GUIDING QUESTIONS:

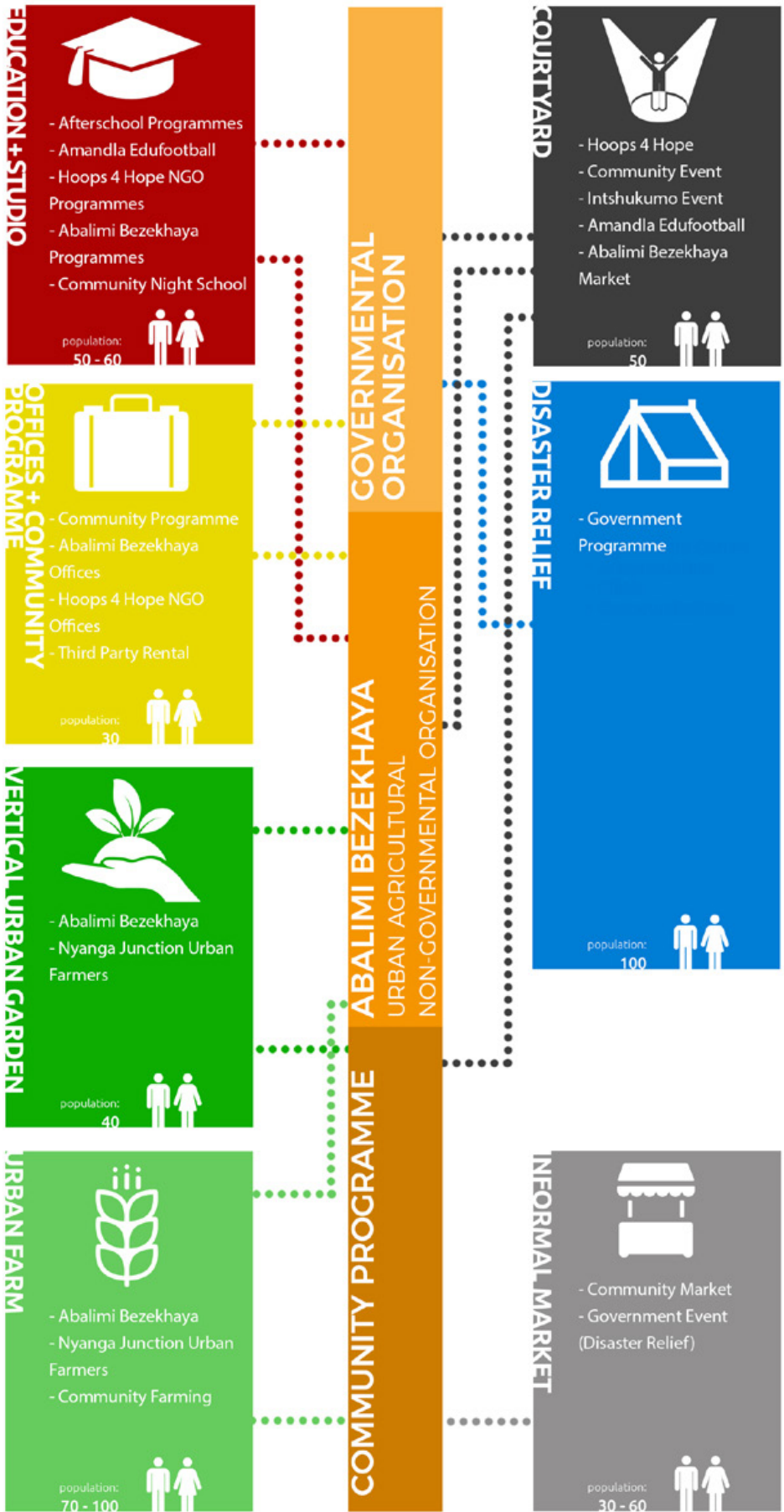
1. Organisationsal
  - *Number of years in role*
  - *Social structures (trader formality/volunteers/independent transport)*
2. Seasonal
  - *Operation in change of season/weather*
3. Facilities
  - *Use of facilities (accessibility/storage/administration/safety)*
  - *Maintenance of facilities (issues)*
  - *Spatial Qualities (comfort/facilitates user activity)*
  - *Co-ordination of facilities use (sharing/booking)*
4. Costs
  - *Rent (cost of using space/cost of storage)*
  - *Equipment or Goods (purchase costs)*
  - *Maintenance costs*
5. Perceptions
  - *Perceptions of area and facilities*
  - *Perception of community*
  - *Perception of safety (concerns)*
6. General
  - *Needs (future development/improvements to facilities)*
  - *Benefits of using space (building adjacencies/public activity)*
  - *Any other comments*
  - *Thanks / Anonymity or use of name*
7. Walkthrough
  - *In-loco inspection*
  - *Discussion of workable and unworkable conditions.*



**ERF 234**  
**GENERAL BUSINESS 4**  
 6 347.6m<sup>2</sup>

| ZONING RESTRICTIONS |   |                            |
|---------------------|---|----------------------------|
| <b>ERF</b>          | 234   |                            |
| <b>ZONING</b>       | GENERAL BUSINESS 4  |                            |
| <b>SITE AREA</b>    | 6 346 m <sup>2</sup>  |                            |
| <b>COVERAGE</b>     | 100 %   | 6 346 m <sup>2</sup>       |
| <b>FLOOR FACTOR</b> | 3.0 x SITE  | 19 038 m <sup>2</sup>      |
| <b>SETBACKS</b>     |   |                            |
| <b>STREET</b>       | 0.0 m (up to 10.0 m Height)   | 4.5 m (10.0 - 25.0 Height) |
|                     | 8.0 m from centreline of street   |                            |
|                     | architectural + sunscreen features may project 250mm beyond building line |                            |
| <b>COMMON</b>       | 0.0 m (up to 10.0 m Height)   | 4.5 m (10.0 - 25.0 Height) |
| <b>HEIGHT</b>       | 25.0 m  |                            |
|                     | (Measured from underside of base level to top of roof)                    |                            |
|                     | no balcony or projection may be less than 2.8m above pavement level       |                            |
| <b>PARKING</b>      | no parking bays closer than 10m to a street boundary                      |                            |





The building usage and ownership is envisioned as a joint venture between government and NGO's such as Abalimi Bezekhaya, Hoops 4 Hope and Amandla Edufootball.

The scheme is seen as being primarily run by Abalimi Bezekhaya, with the NGO using the office spaces as their base of operation in Gugulethu. They can also run programmes out of the education spaces, linking directly to the farm.

The studio spaces may host after school programmes or be rented out.

The disaster relief management aspect of the scheme is government run. The public spaces allow for informal activity such as trade or event - accommodating more loosely based community programme.

## COVER SHEET

**STUDENT NAME:** BYRON MOODLEY

**STUDENT NUMBER:** MDLBYR001

**SUPERVISOR:** FRANCIS CARTER, FOR UCT SCHOOL OF ARCHITECTURE

**CO-SUPERVISOR:** TESSA BRUNETTE, FOR ARUP CAPE TOWN

I hereby grant the University free license to reproduce the above design dissertation in whole or in part, for the purpose of research.

I declare that:

(i) The above design dissertation is my own unaided work, both in conception and execution, and that apart from the normal guidance of my supervisors I have received no assistance apart from that stated below:

*Assistance with building of context models by my cousin (Kelly Govender). Assistance with building of model stand by my brother. (Kaylan Moodley).*.....

(ii) Except as stated below, neither the substance or any part of the design dissertation has been submitted for a degree in this university or any other university:

*N/A*.....

(iii) I am now presenting the design dissertation for examination for the degree of Master of Architecture (Professional).

### PLAGIARISM DECLARATION

1. I know that plagiarism - to use another's work and pretend that it is one's own - is wrong.
2. I have used the Harvard convention for citation and referencing. Each contribution to, and quotation in, this report from the work(s) of other people has been attributed, and has been cited and referenced.
3. This report is my own work.
4. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

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