

The right to food is a basic human right.
_World Hunger Notes

RE[GROW]TH

a connection of the socio-
economic divide

Toni Lisa Mclagan



RE[GROW]TH

a connection of the socio-economic divide

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Project Summary

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gastronomic quarter.



For my parents Rob & Sandy,
Thank you for constantly believing
in me.

With special thanks to:

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Dr. Carin Combrinck,
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I would not be here without you.

In accordance with Regulation 4(e) of the General Regulations (G.57) for dissertations and theses, I declare that this thesis, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

I further state that no part of my thesis has already been, or is currently being, submitted for any such degree, diploma or other qualification.

I further declare that this thesis is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

Toni Lisa Mclagan
2016

ABSTRAK

her[groei]

Die verhandeling is gerig op die toenemende globale kwessie van ons land se voedselonsekerheid en die faktore wat daartoe bydra.

Dit ondersoek die rol wat argitektuur kan speel as 'n sistemiese instrument (in die vorm van 'n gastronomiese kwartaal) vir die her[groei] van 'n hoogs omstrede kwessie. Deur die identifisering van globale en plaaslike omstandighede word voedselsekerheid bemagtiging ontwikkel deur die integrasie van sosio-ekonomiese stelsels wat optree as punte van akupunktuur om kontekstuele omstandighede te verbeter.

Deur 'n nuut gevormde argitektoniese benadering waardeur kos en die toeganklikheid daarvan die basis vorm van sosiale inklusiwiteit, word verskeie mense in die samelewing bemagtig deur van plaaslike ondersteuning gebruik te maak. Plaaslike ondersteuning is van kardinale belang vir die groei en bemagtiging van 'n gemeenskap, wat 'n positiewe impak op die algehele stedelike moraliteit of weefsel het deur die voorsiening van 'n meer inklusiewe omgewing vir die bemagtiging van daardie gemeenskap.

*How wonderful it is that nobody need
wait a single moment before starting to
improve the world.*

_Anne Frank

ABSTRACT

re[grow]th

This dissertation addresses the intensifying global issue of food insecurity within our country and the contributing factors thereof.

It investigates the role architecture can play as a systemic tool (in the form of a gastronomic quarter) to facilitate the re[grow]th of a highly contested site. By identifying and drawing from global and local issues, new solutions, developed through the integration of socio-economic systems, act as points of acupuncture. These points aim to improve contextual conditions through food network empowerment.

Through a newly informed architectural approach various people within society are enabled through local means of support. It is food and the accessibility thereof that forms the basis of the socially inclined space. Local support is essential for community growth and empowerment, which in turn, positively impacts the overall urban fabric through the provision of a more inclusive environment.

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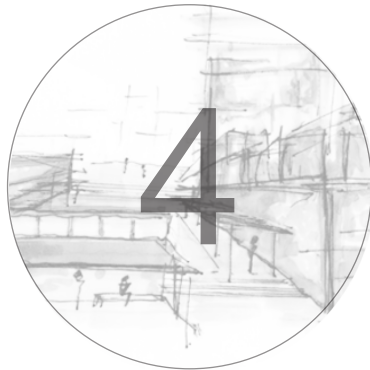
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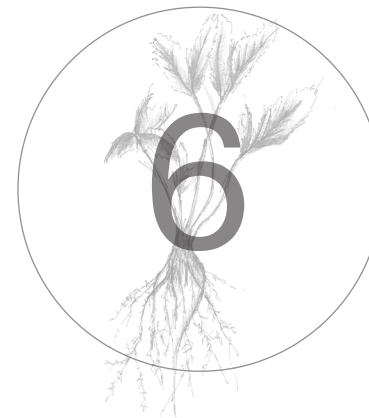


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RE[GROW]TH

introduction



1.

his narrative

It's uncomfortably warm, the taxi is full and everyone is quiet. The trip is long and takes a lot from the pocket. The taxi comes to a halt; he climbs out and heads towards the bustling trade. The colours are bright and there is a constant hum of activity. His job didn't pay well; he can only afford the basics this week. He focuses on only that which will survive the trip home and the heat that will settle until next week's trip.

He greets the familiar faces; they grow loud and animated as they relay their stories of the week while he chooses from the selection in front of him. He takes all that his money allows and heads back towards the street filled with enough spirit to last the wait for the next taxi.

her narrative

The kids will finish school soon. She rushes to her car and speeds over to the supermarket to buy food for dinner. She walks up and down the aisle contemplating what to make for dinner. The produce isn't fresh and the selection is poor. The prices have all increased and the frustration sets in. Eventually the selection is made.

She waits in line to pay, the woman at the till gives a half-hearted smile as part of her duty. Card. Slip. Signature. There is no further interaction other than the mumbles of thanks and the moan of store music in the background.

their narrative

His taxi stops along side her car. They take no notice of each other but both are contemplating their purchase and wishing they could have more. He seeks quantity, she seeks quality, and they both seek options. The light changes colour and they part ways. He climbs off the taxi and walks to his home. She parks in the garage and carries the groceries inside.

They put their food down in the kitchen and unpack, separated only by a small wall and intangible social barrier.

1a LOCALITY

a site specific approach

This dissertation follows a site-specific approach, based on the author's normative position, which states that architecture is a powerful tool that can aid in social transformation. It should be mindful of social conditions, be used to integrate communities and reveal possible points of healing within the current condition of contestation.

3.

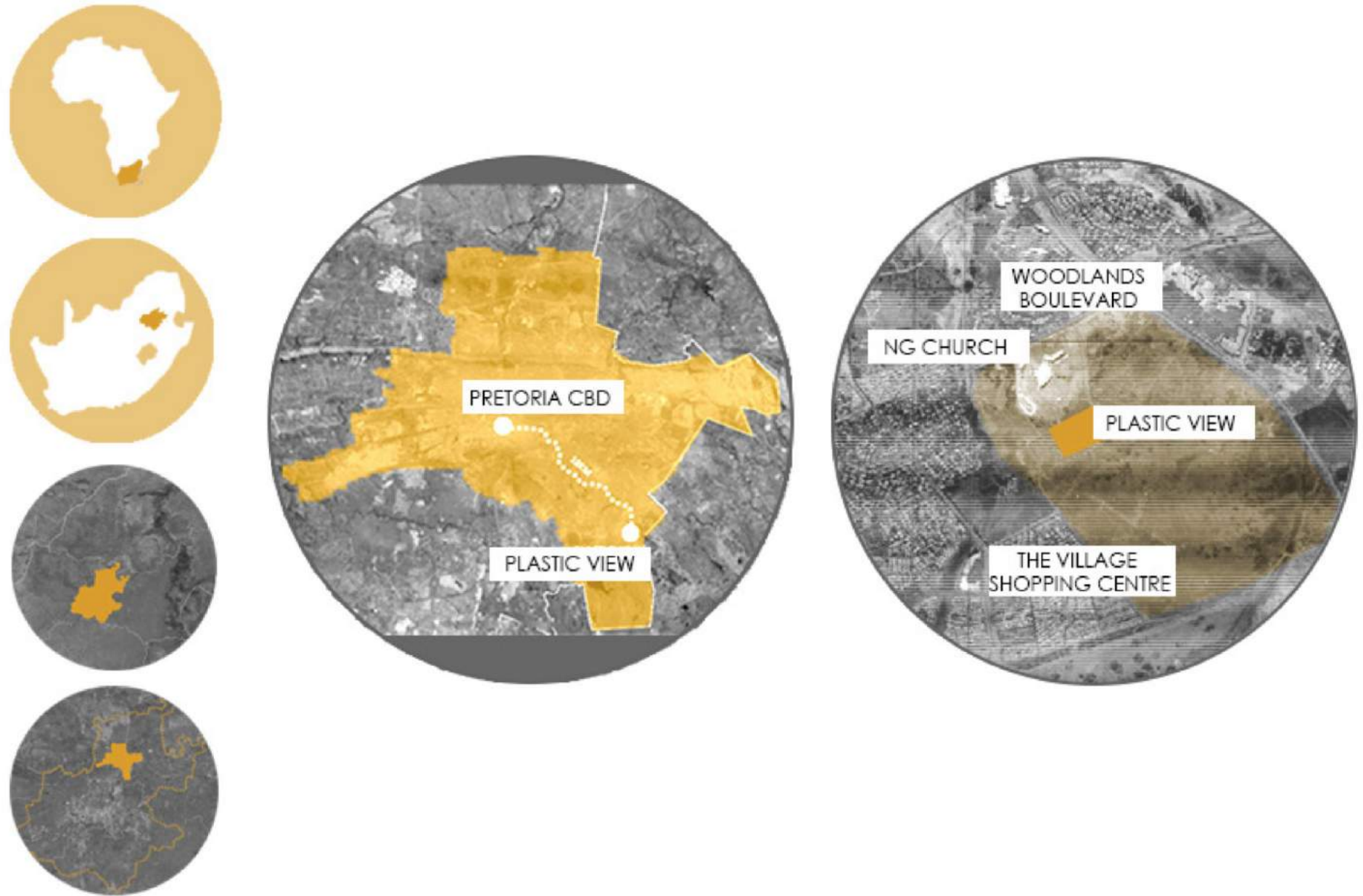
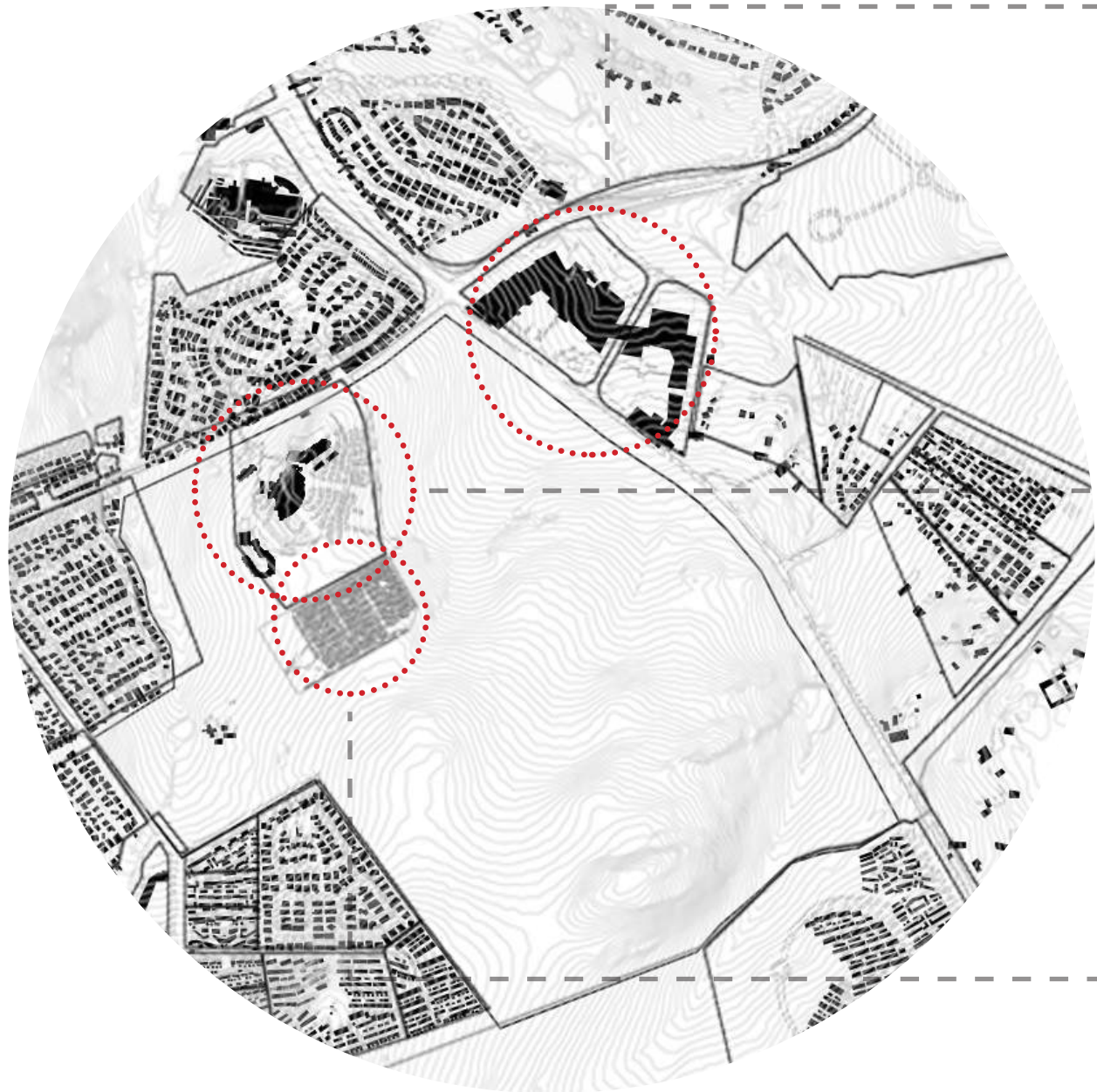


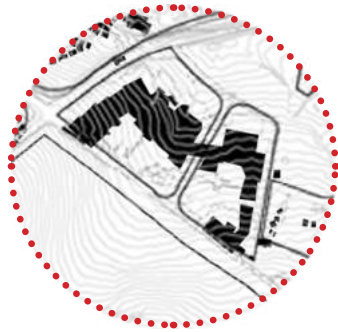
Figure 1 : Locality images. Google Maps. (MArch)Prof and Up Hons 2016)



contextual focus

The focus of this dissertation is an informal settlement called Woodlane Village, informally known as Plastic View, situated to the East of Pretoria in Moreleta Park. The settlement sits on a vacant piece of land just below Moreleta Park Gemeente, a Dutch Reformed church, opposite Woodlands Boulevard shopping mall, and is in close proximity to the Pretoria East hospital and Parkview shopping centre.

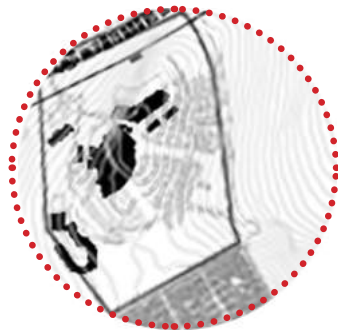
Figure 2 : A contextual introduction to Plastic View's locality. MArch(Prof) 2016.



WOODLANDS
BOULEVARD



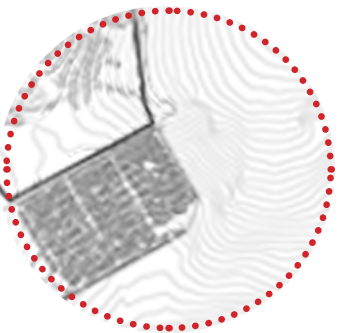
Figure 3 : Elevational context images. Woodlands Boulevard (UP Arch Hons 2016)



MORELETA
GEMEENTE



Figure 4 : Elevational context images. NG Moreleta Gemeente. (UP Arch Hons 2016)



PLASTIC VIEW



Figure 5 : Plastic View (Author 2016)

b CONTEXTUAL CONFLICT the history of Plastic View

The community of Plastic View has experienced an unstable history. There is evidence of the origins of Plastic View that date back to 2001, which grew organically up until 2009. As is common with most informal settlements, this community was constantly at risk of eviction from local the police force and the municipality; a pressure that was heightened by the surrounding land property value market and gated estates. In an attempt to not draw any attention and reduce their risk of eviction, the small community sought shelter in amongst the vegetation rather than erecting informal housing.

A local NPO, Tswelopele Step by Step, founded by Denise and Colin Dredge in 2003, recognised this community and the threats they were being exposed to and began to offer support and resources to the community of Plastic

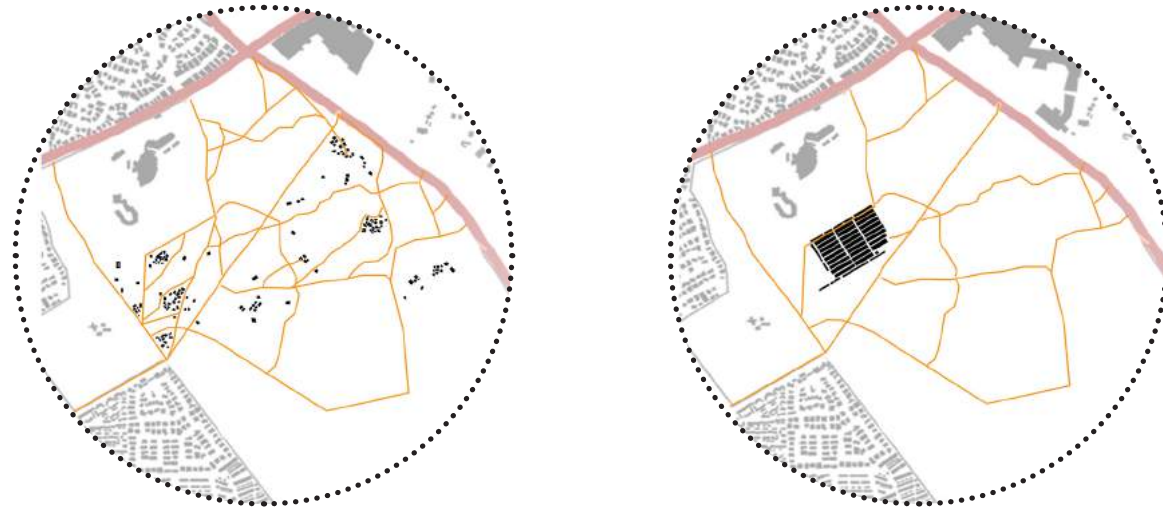


Figure 6 : Development of settlement from its establishment in 2008, to its present day confinement. Author 2016. (Base image courtesy of Google maps)

View (Dredge 2013:2).

Due to this support and the persistence of the settlement, evidence of the establishment of temporary informal shelters then began to manifest from 2005. In 2009, after numerous violent and unlawful attacks on the community, Tswelopele made it possible to better support and protect the community by re-organising them into a consolidated and contained settlement, referred to as Woodlane Village, adjacent to the Moreleta Park Gemeente's boundary fence (Dredge 2013:18). (Note: Despite this formally given name, this dissertation will still refer to the settlement as its more commonly known name, Plastic View).

In March 2015, when the municipality threatened to sell this land, including the site on which Plastic View is found for development at a public auction, Tswelopele contacted Lawyers for Human Rights and initiated a court case against the government with regard to this auction (National 2015). Together with Lawyers for Human Rights, the residents of Plastic View won this court case and halted the sale of the land that they are currently occupying (Mudzuli 2015).

However, despite this progression, the government has yet to recognise this settlement in terms of service provision and access to amenities, which is a direct contradiction of the principles laid out in the Bill of Rights (Chapter Two of the Constitution of South Africa 1997).

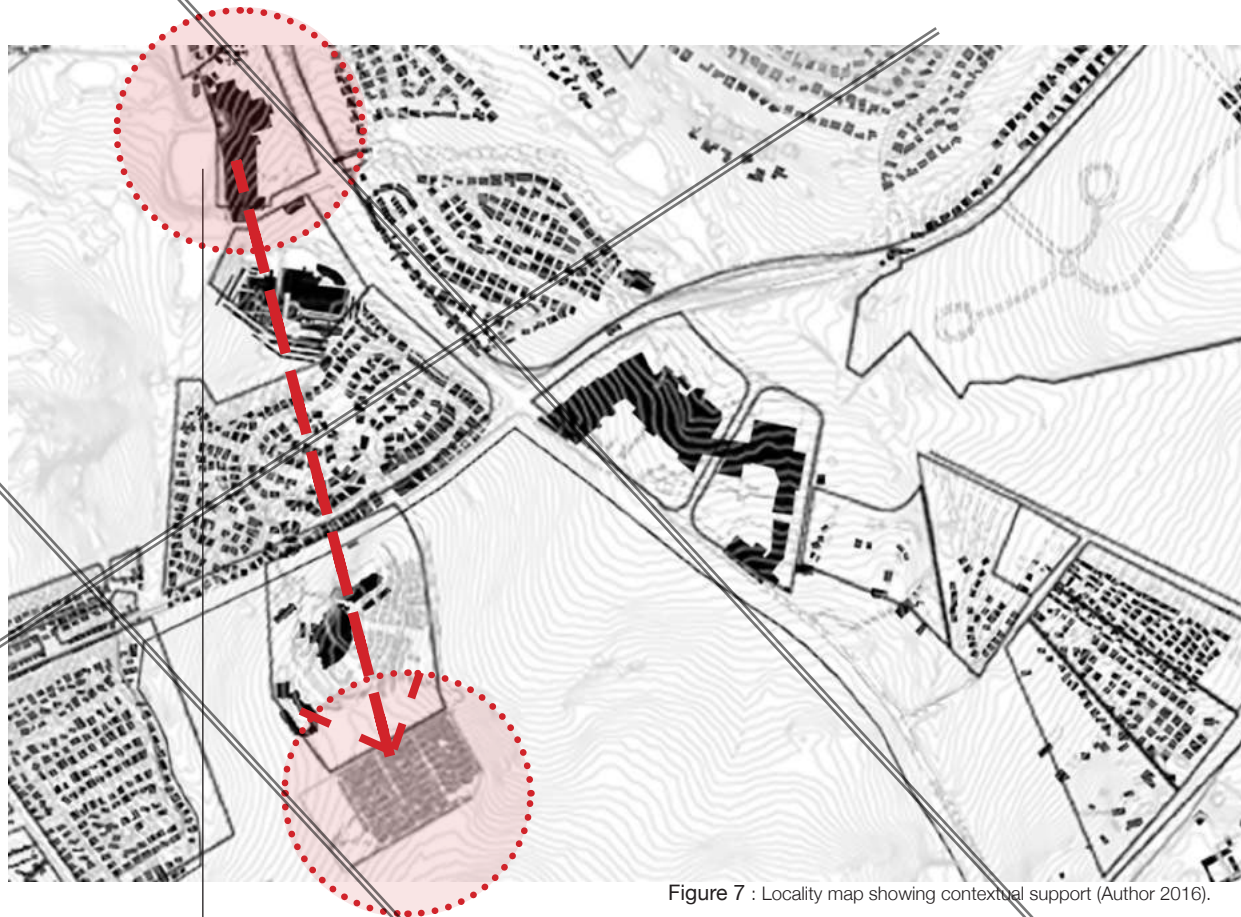


Figure 7 : Locality map showing contextual support (Author 2016).

PLASTIC VIEW

PARKVIEW CENTRE

community support

Whilst many residents in the surrounding gated communities are very opposed to this settlement, the community of Plastic View continues to receive support and resources from Tswelopele and a number of programmes, managed by the Moreleta Park Gemeente. These programmes include a primary school funded by the Pure Hope foundation which provides education and feeding schemes to Grade Four on the Church grounds as well as a skills and development training program that assists community members in gaining domestic help experience (UP MProf 2016).

As a part of Woolworths support programme initiative to address food security, edible surplus food, that is past its *Sell By* date but before the *Best Before* and *Use By* dates, is distributed and donated from the stores to communities in need via structured charity organisations (Woolworths 2016).

Woolworths Food, Parkview Shopping Centre, plays a large role in supporting Pure Hope's feeding scheme. The donated food is delivered to and stored at the Moreleta Gemeente and rationed over the week as meals for the children attending the school. This is one of few links that Plastic View has with the surrounding area.

As a result of the above context, one can see that the community of Plastic View exists in a very controversial situation as an island within the larger urban fabric, supported by a portion of our society, whilst also ignored by the other portion (M(Prof) Research 2016). The social barrier thus becomes prominent, as the residents of Plastic View remain excluded socially and economically.

research & mapping

In order to gain a better contextual understanding of the community and the contested site on which it is found, the initial research question for UP Arch M(Prof) research group focusing on this site began with the acknowledgement of the history of urban settlement patterns in South Africa and how this informed the current patterns.

This research and analysis proved to be important in terms of understanding the development of principles and spatial patterns of sustainable cities, highlighted by Alexander (1964), and how Plastic View sits within this criteria.

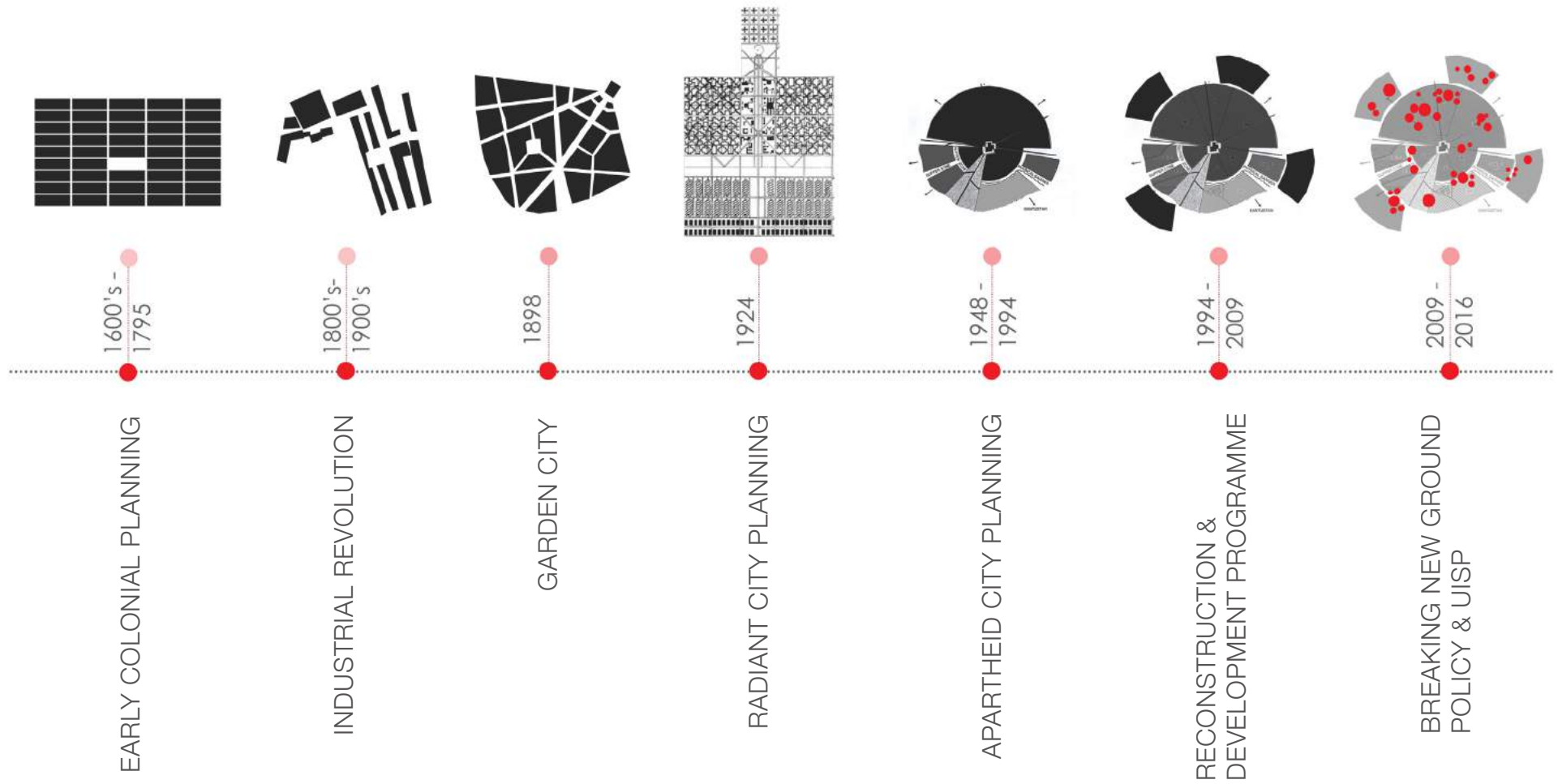


Figure 8 : Timeline of urban planning approaches in South Africa (UP MArch (Prof) 2016).

BREAKING NEW GROUND POLICY PRINCIPLES:

- _Multicultural communities
- _Upgrading all informal settlements by 2015
- _Sustainable housing solutions
- _Access to basic needs and amenities
- _Promoting densification and integration
- _Creating economic opportunities

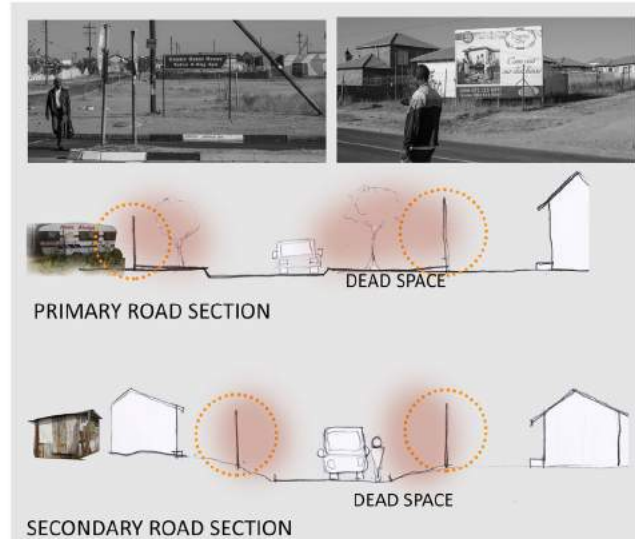


Figure 9 :Cosmo City precedent study. Challenges of Implementing BNG Policy, 2013.

RESULTS IN COSMO CITY:

- _Segregated communities
- _Informal activity happening-backyard shacks
- _Standard RDP model-not sustainable
- _Access to basic needs and amenities is limited
- _Stil has a very high unemployment rate

THE CONSTITUTION south africa

The most recent and influential informant on the research originates in the Democratic Constitutional Law of South Africa (1996), specifically the Bill of Rights in Chapter Two of this constitution (SA 1996: 5-20), and the Breaking New Ground policy (2004) put forward by the South African government as a reaction to the Apartheid era of urban planning. There are other secondary informants such as the Upgrading Informal Settlements Programme (UISP) (Fieuw 2014) and the 2030 vision for the National Development Plan (NDP) (RSA 2012) that also fall under South African Governmental policies.

Within the constitution and policy stated above, the common theme is the recognition of South Africa's

fragmented and complex urban environment, and the response towards creating more cohesive, multi cultural, sustainable communities where all residents of South Africa have the right of equal access to basic amenities such as food, health and education (SA 1996: 5-20).

Despite the promising principles put forward by the South African government, the implementation of this into South African society remains tentative. For example, in the case of Cosmo City where all the principles stated in the Breaking New Ground Policy, 2004 were intended to be satisfied. However, the outcome was a segregated community. As a result of the unsustainable RDP model being implemented, informal backyard housing

solutions emerged as a method of income generation the unemployed within the community. Access to the aforementioned basic amenities is limited as a consequence (Myambo 2014).

Further evidence of the lack of implementation of these policies is intensified by the number of informal settlements emerging around areas of opportunity within the urban fabric (UP Arch (MProf) 2016). For example, more specific to site location, the development of the Menlyn area has led to the opportunity for jobs for many who do not live within close proximity and has thus led to increased informal growth in the surrounding areas.

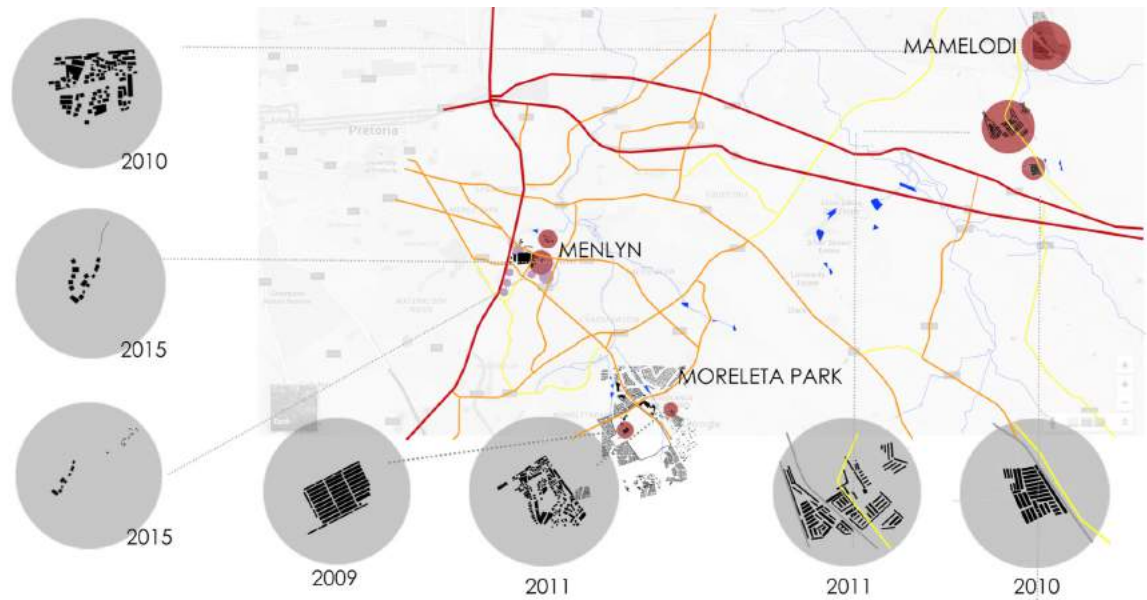


Figure 10 : These illustrations depicts the density, size and location of the informal settlements in Pretoria East mapped by the UP Arch M(Prof) research group 2016 to support the arguments made on the previous page (UP MArch(Prof) 2016). Map courtesy of Google Maps.

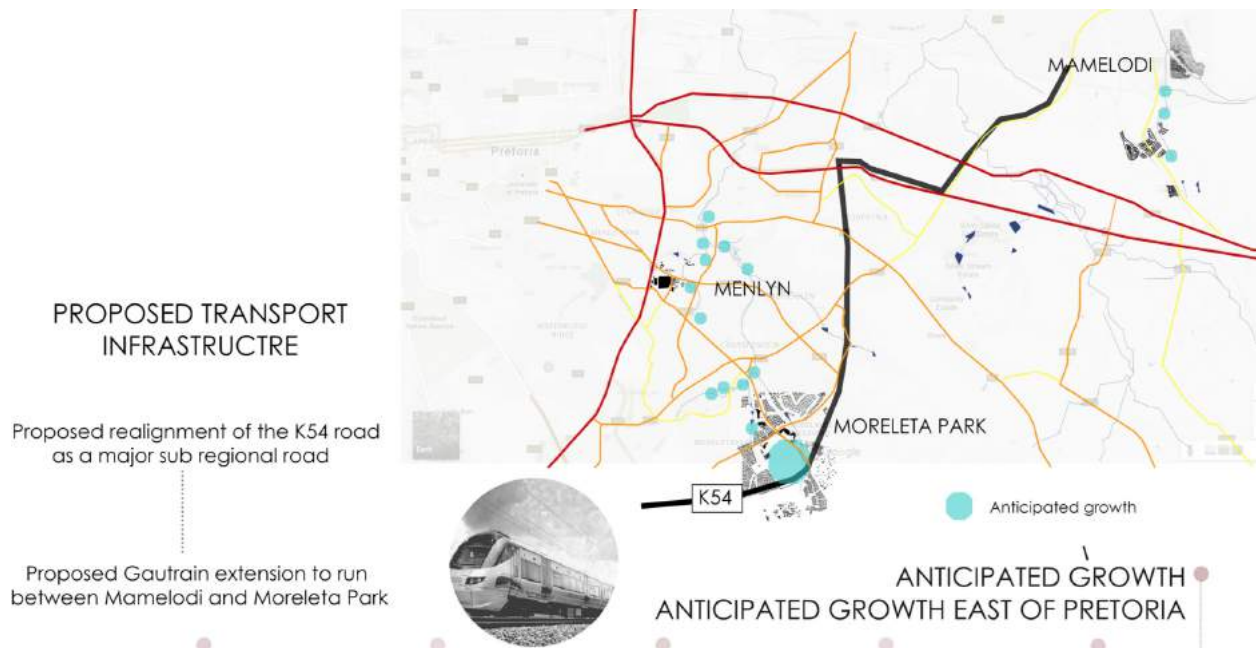
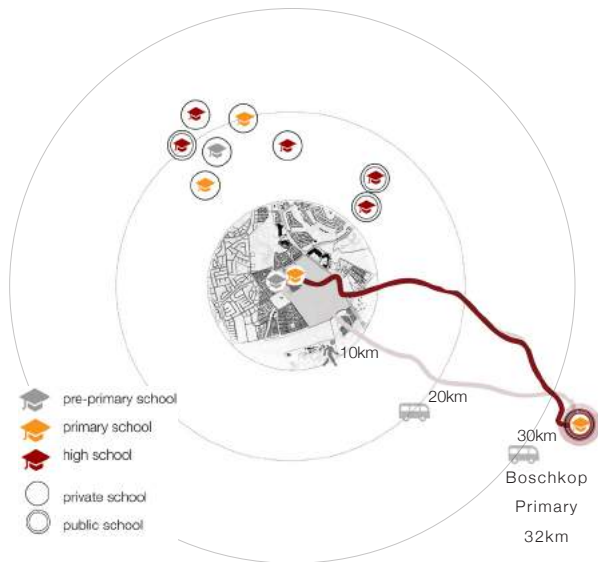


Figure 11 : Location

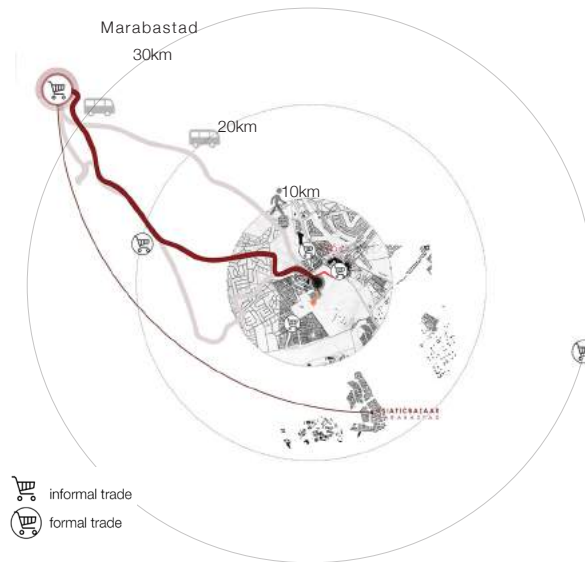
Due to future proposals the corridor within which Plastic View is situated, is seen as a significant region of urbanisation for the future development of Pretoria. The newly proposed main road, K54, adjacent to Plastic View, and the extension to the Gautrain route through Pretoria East to Mamelodi will allow for many more opportunities and thus accelerate growth of the area.



EDUCATIONAL FACILITIES

Figure 12 : various levels of education_macro scale MArch(Prof) 2016)

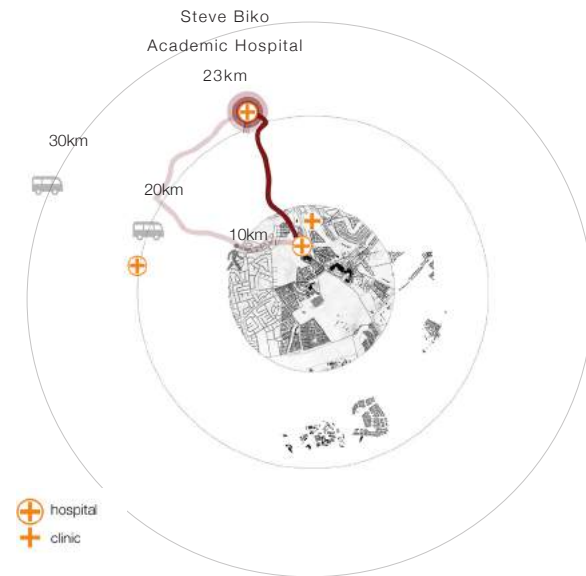
In keeping with the principles put forward in the Bill of Rights 1997, the Breaking New Ground Policy 2004, and on a more global scale, the UN Charter (1945), one of the mapping exercises conducted in alliance with the University of Pretoria's Honours research group also working on this site, was the mapping of the basic amenities situated around the site.



FOOD AVAILABILITY

Figure 13 : greater food network_macro scale MArch(Prof) 2016)

This mapping was conducted through a desktop research approach in addition to a number of site visits and interviews with the Plastic View community members in order to better understand this community's access to the basic amenities of food, health and education within the area.

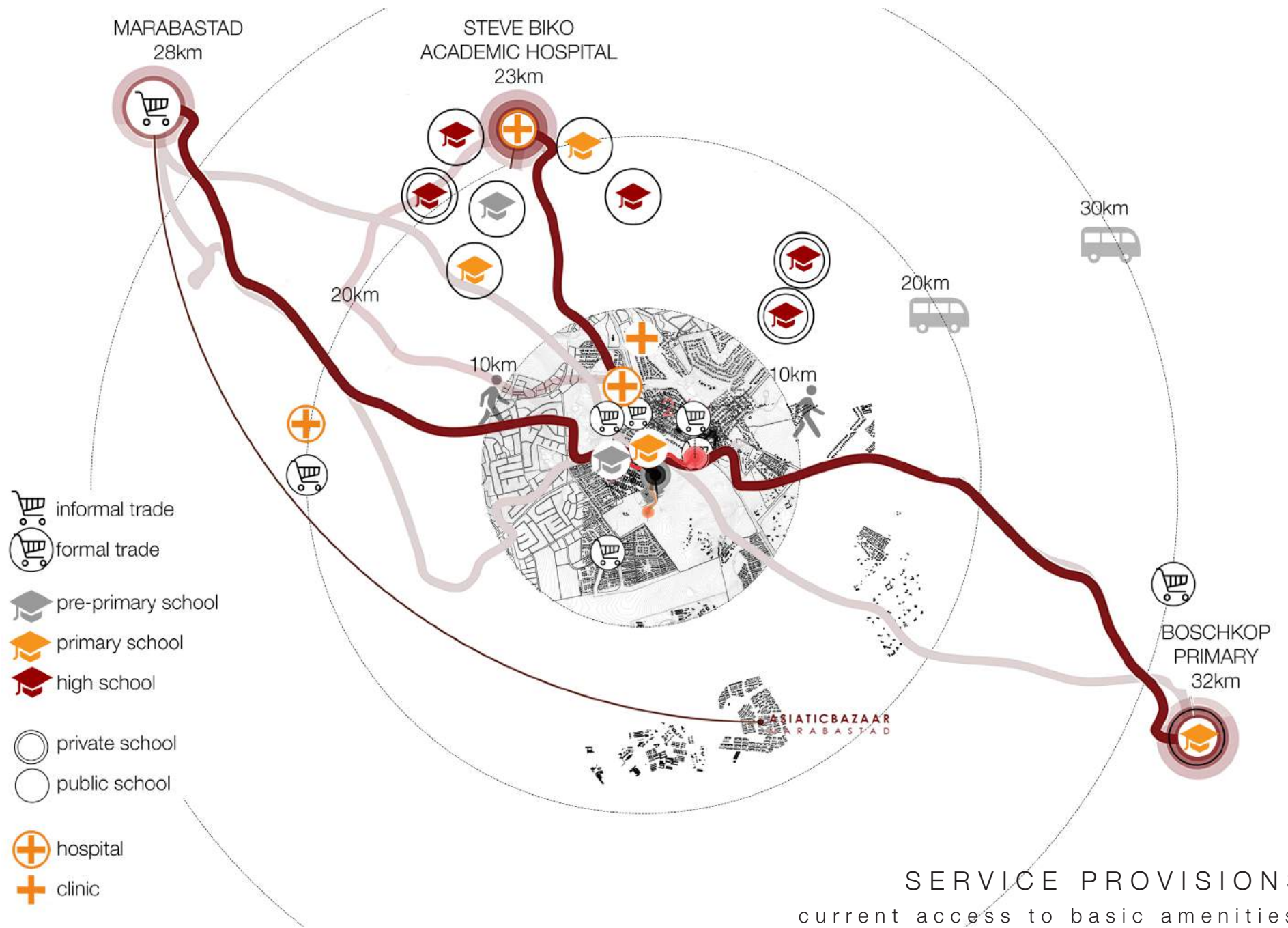


HEALTH SECURITY

Figure 14 : public and private health care_macro scale (MArch(Prof) 2016)

Access to these basic amenities was considered through both the public and private sectors of service provision.

The results of this mapping show that although access to food, health and education from the Plastic View site is easily accessible within the private sector, accessibility to these amenities in the public sector is limited, as illustrated in the images above.



SERVICE PROVISIONS
current access to basic amenities 14.
Figure 15 : current access to basic ammenities (MArch(prof)2016)

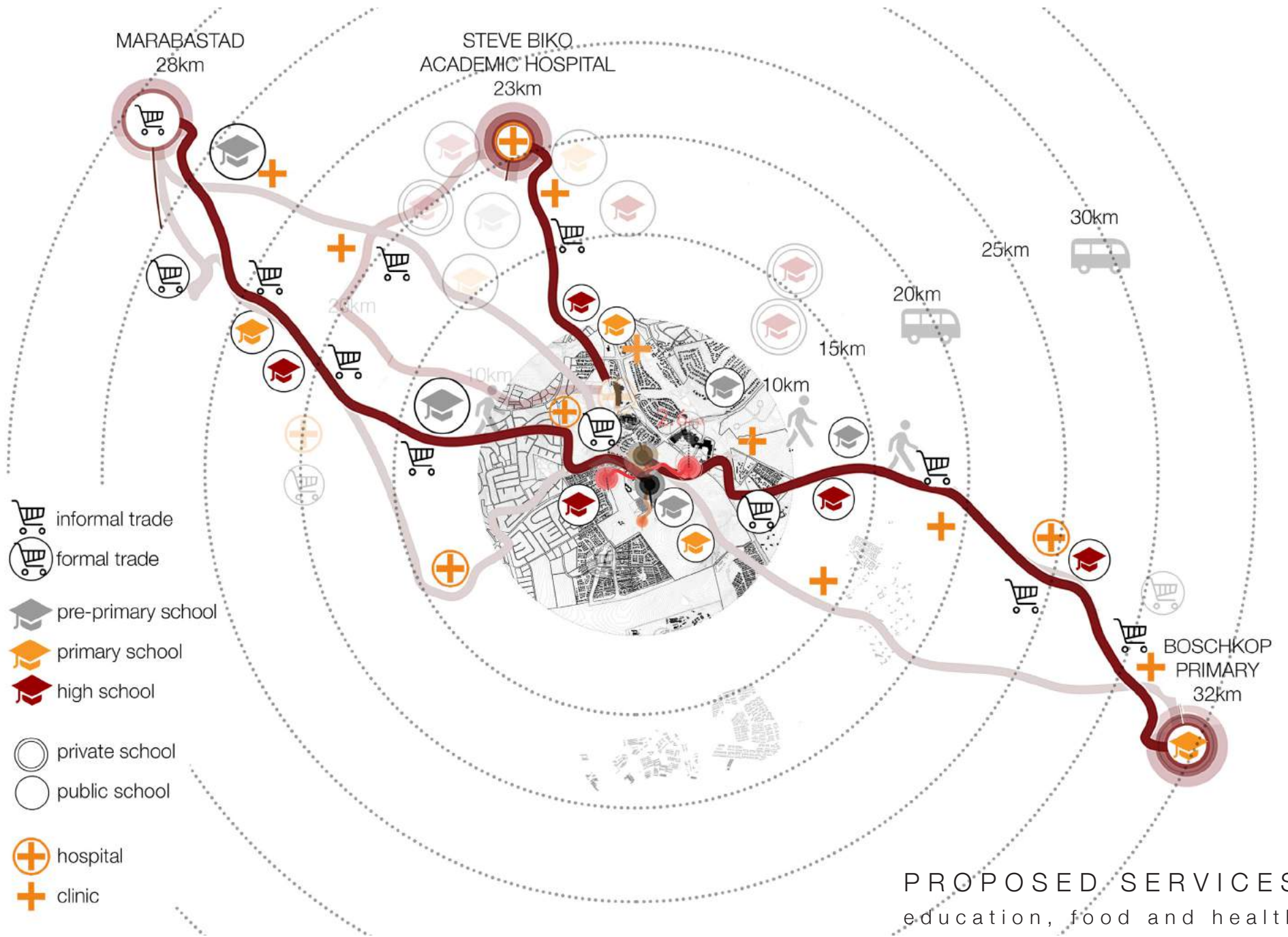
the urban intention

As a result of the research conducted up to date it is proven that the implementation of the principles forward by governmental policies and programmes, such as the Breaking New Ground (BNG) policy, are not evident in the case of the community of Plastic View. Due to the number of broken service provision networks across both the private and public sectors of our society, Plastic View has become a site that sits as an island of contestation in amongst the fragmented urban fabric in which it is found.

Therefore, the urban intention of the Masters research group working on the Plastic View site, is to propose an urban vision that explores the spatial consequence of policy intentions such as BNG, in order to stitch this fragmented urban network and minimise the gap between public and private sector service provision within our urban society: transforming Plastic View from a site of contestation, into a site of conciliation through the establishment of ancillary facilities as well as multiple housing density and types that cater, socially and economically, for the large variety of people in the area.

BNG PRINCIPLES

- Integrating subsidised, rental and bonded housing
- Providing municipal engineering services at a higher level and being applied consistently throughout the township
- Providing ancillary facilities such as schools, clinics and commercial opportunities
- Combining different housing densities and types, ranging from single-stand units to double storey units and row houses.



PROPOSED SERVICES
education, food and health₁₆.
Figure 16 : Location

C

CONCEPTUAL VISION

theoretical informants

In order to translate the urban intention into an urban vision which improves the spatial implementation of principles put forward by the current governmental policies, the MArch(Prof) research group unanimously adopted an approach which has recognised the need for a paradigm shift in terms of the planning procedures conducted in the South African urban context from a neoliberal view, to an ecological world view.

The neoliberal approach, currently in place, to urban planning is seen as a reaction to the apartheid era

17.

that included principles of equality but the lack of spatial implementation of these principles, such as Cosmo City, has done little to correct spatial inequalities within society.

The neoliberal approach suggests equality and social justice and yet it is governed by a market orientated mentality, which means that the individuals right to the city is often dependent on their claim of ownership to property determined by their socio-economic status. The suggestion is therefore to shift from a neoliberal approach to urban implementation, to that of an ecological worldview.

Theorists such as Salat (2011) and Steyn (2005) have adopted the ecological worldview approach and have published a number of principles, which became highly influential on the urban conceptual vision and approach to this dissertation.

Salat advocates that there is a large advantage of viewing the city and its urban fabric through a metaphorical lens of a leaf. The structure of a leaf illustrates a resilient living system that is adaptable through its multi-connectivity and interconnected network of systems (Salat 2011:18).

SUSTAINABLE URBAN TRANSFORMATIONS

1-Heterogenous communities, mixed densities



2-Pedestrian & bicycle oriented streets. Green space & public spaces.



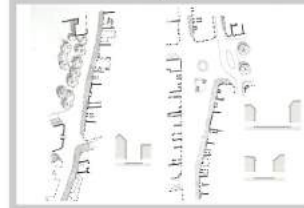
3-Streetscapes become activity corridors throughout the site. Boulevard typology



SERGE SALAT

Architect, Designer and Urban Planner

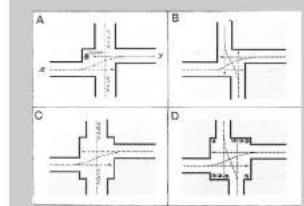
1-Street layouts a



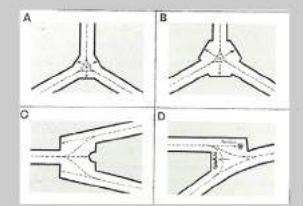
2- Street layouts b



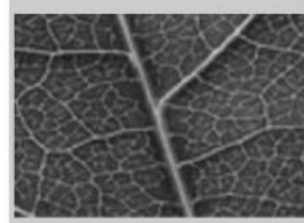
3-Proposed street intersections a



4-Proposed street intersections b



5-Resilient urban fabric taking the structure of a leaf



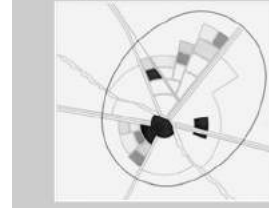
6-Urban layout aims to connect all networks



GERALD STEYN

Architectural Professor at TUT

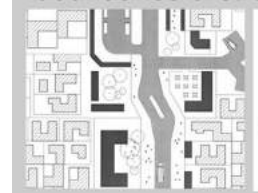
1-Medium-sized compact cities



2-Urban villages in superblocks



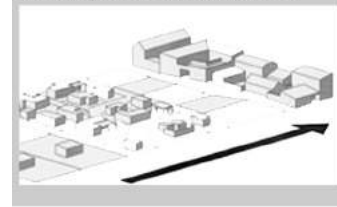
3-Appropriate boundaries & streets



4-Mixed-use main streets



5-Medium density, robust with courtyards, walkable



6-Small-scale and local/self-help and semi-skilled

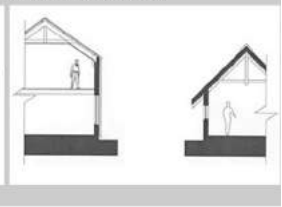


Figure 17 : Urban theoretical informants (UP Arch (MProf) 2016). Individual image resources from left to right: (GWASstudio 2007), (Salat 2011) & (Steyn 2005)

steyn & salat theory

In order to achieve a multi-connected and interconnected network of systems, Salat (2011:400-401) suggests, through various precedent studies, the following characteristics; streetscapes becoming a stage for activity which create fluctuating energy nodes within the urban context, high density, mixed use communities, pedestrian and bicycle oriented environments, the provision of public space, self sufficient districts made up of heterogeneous communities and a strong recognition of the existing conditions on site.

An example of these principles being adapted to the local context is Thorntree View, in Soshanguve, by Holm Jordaan Architects (figure...). The success of this project lies in the intention to strengthen existing nodes of activity. From these nodes, community specific spaces were focused on and further developed. Buildings consist of

heterogenous, mixed density communities face onto and activate the street edge. Thus Thorntree View becomes an inclusive environment that connects and empowers the local context.

Gerald Steyn, the author of Patterns for People Friendly Neighbourhoods (2005), gives a more contextual slant to this view. Having conducted research in Mamelodi, Steyn states that due to urban sprawl and spatial and social fragmentation, our urban fabric has become unsustainable.

Steyn's (2005) response to this observation concludes that although a sustainable African neighbourhood would certainly differ from a European one in terms of character and appearance, such as the ones Salat (2011) considers, the basic ordering principles and characteristics would

essentially be the same (Steyn 2005). Namely compact, walkable, mixed use environments with a high level of economic self-sufficiency.

Using these principles as basic informants for the conceptual urban vision, the framework proposal for this dissertation was then initiated by considering an existing, formal framework proposal for the development of the Plastic View site by StudioMAS Architects.

By viewing this formal proposal through the lens of the theoretical approaches listed above, specifically focusing on accessibility, heterogeneity and consideration for the existing conditions on site, the MArch(Prof) research group critically assessed this proposal and slightly altered areas within it accordingly in order to reach the ecological worldview approach of the urban vision used in this dissertation.

Thorntree View, Soshanguve

application of Salat's principles

principles

- Designing community specific spaces
- Enriching the existing
- Making connections between existing nodes and the surrounding context
- Heterogenous communities

response to social issues

- A community lead process
- An appreciation of the context and its characteristics
- Understanding the way place was used
- High concentration of energy and density along activity corridors

importance of public space

- Multifunctional
- Breaks between buildings
- Results in ownership over courtyard spaces and positive surveillance

lessons for the South African context

- Understand the characteristics and spatial conditions of the site in order to strengthen existing networks.
- Using building footprints to define activities and public squares
- Public and private green spaces



Figure 18 : Thorntree View Precedent images. (GWA Studio 2007)

t h e o r e t i c a l o v e r v i e w

Through the aforementioned theoretical research, the importance to create social interconnected environments is highlighted multiple times. Community living is important and thus should be reflected in community layouts and planning in order to highlight and reflect this.

Heterogeneous communities create opportunities for a variety of people and thus can aid in the break down of socio-economic barriers. As demonstrated in Thorntree View, a community led process and appreciation of the context allows for a effective spatial implementation, which in turn leads to a positive interactive environment.

The most successful communities are those that are multi-functional and pedestrian orientated as it allows for equal opportunity amongst all individuals. The urban vision thus aims to take on these principles in order to create a resilient and integrative environment that serves the diverse range of individuals present within the context.

21.

Based on research and important principles, a conceptual collage (figure...) was created to highlight important aspects being aimed for within the urban space. The collage illustrates a multi-functional mixed-density public space that incorporates economic and social aspects in order to maintain a successful urban environment.



Figure 19 : Conceptual collage_mixed density and multifunctional space (Author 2016)



Figure 20 : Urban site vision plan (MArch(Prof) 2016)

URBAN VISION framework analysis

Due to the vast scale the site was delimited to the development of the proposed high activity access boulevards that connect the main suggested nodes of activity. Access roads are envisioned as high density, mixed use activity corridors throughout the immediate urban fabric, which aim to encourage existing energy present around the site to manifest centrally.

It is from the main access roads that the individual dissertation proposals branch off, contributing to the mixed density, heterogeneity and energy of these boulevards.

23.

The individual proposals will have a strong focus on the accessibility of basic service amenities to the community found within this framework, which is influenced by the study of South African policies such as Breaking New Ground. These policies speak of the importance of ancillary facilities within range of various housing types and densities that cater for the various socio-economic conditions and community members. Each proposal thus focuses on service provision, its accommodation of and influence on the immediate community.



Figure 21 : Zoom in of boulevard_Urban site vision plan (MArch(Prof) 2016)

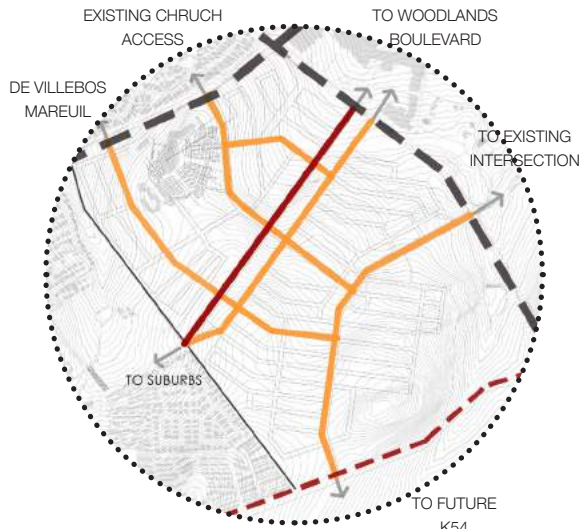


Figure 22 : Urban framework accessibility (MArch(Prof) 2016)

HIERARCHY OF ACCESS

The framework consists of one main vehicular access route and a few secondary routes that are vehicular and/or pedestrian.

- MAIN ROUTES
- CONNECTING ROUTES
- EXISTING ROUTES

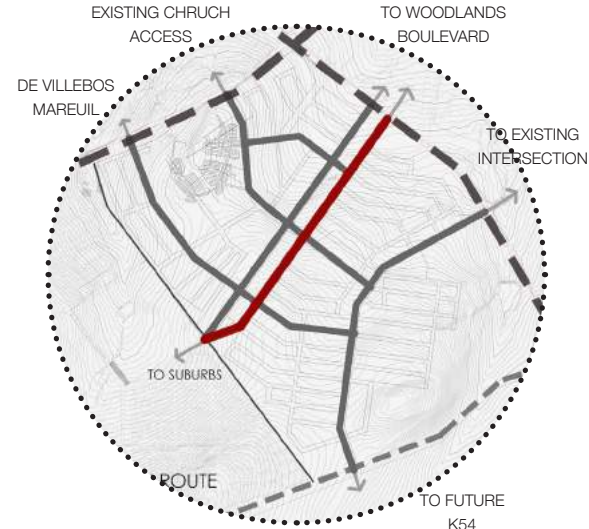


Figure 23 :Urban framework pedestrian route (MArch(Prof) 2016)

PEDESTRIAN ROUTE

The conceptual framework includes a main route designated only to pedestrians, parallel to the vehicular road, in order to encourage an accessible and walkable community such as Steyn (2005) and Salat (2011) propose.

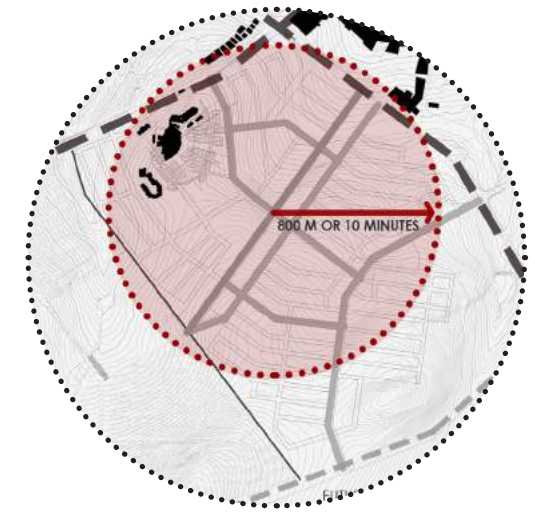


Figure 24 : Urban framework pedestrian radius (MArch(Prof) 2016)

PEDESTRIAN RADIUS

It is important to incorporate facilities within the 800m radius. This ensures a maximum walking time of 10 minutes and thus encourages community members to walk as there is no need for transport.

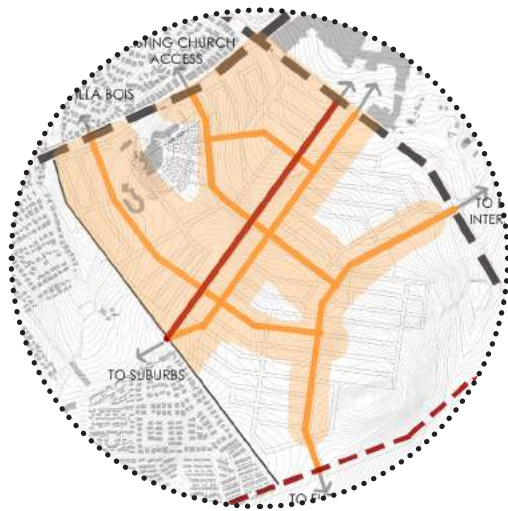


Figure 25 : Urban framework density increase (MArch(Prof) 2016)

INCREASED DENSITY

Due to the pedestrian nature of the site the streets become activated and thus become important social nodes.

- MAIN ROUTES
- CONNECTING ROUTES
- EXISTING ROUTES
- INCREASE IN DENSITY

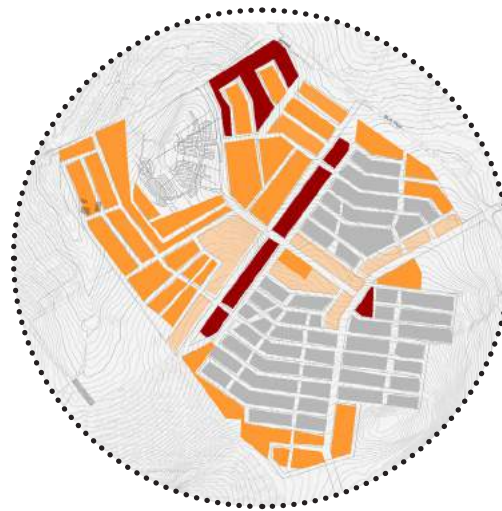


Figure 26 : Urban framework density (MArch(Prof) 2016)

DENSITY HETEROGENIETY

Mixed-use high-density buildings on the street edge cater for a variety of residents and thus increase and maintain the energy present on the streets.

- HIGHEST DENSITY
- HIGH-MEDIUM DENSITY
- MEDIUM DENSITY
- LOW DENSITY



Figure 27 : Urban framework density and accessibility (MArch(Prof) 2016)

DENSITY & ACCESSIBILITY

The variation of density aids in catering for various income and social groups. Due to the unaccessible nature of the gated communities, the site focused on being highly accessible, mainly to pedestrians in order to develop the community.

- NO ACCESS
- DOUBLE SECURITY CLEARANCE
- SECURITY CLEARANCE
- OPEN DURING DAY
- OPEN NIGHT AND DAY
- HIGHEST DENSITY
- HIGH-MEDIUM DENSITY
- MEDIUM DENSITY
- LOW DENSITY



Figure 28 : Urban framework recreational space (MArch(Prof) 2016)

RECREATIONAL SPACE

Sizeable open space has been provisioned as a response to the many gated estates in the surrounding area.

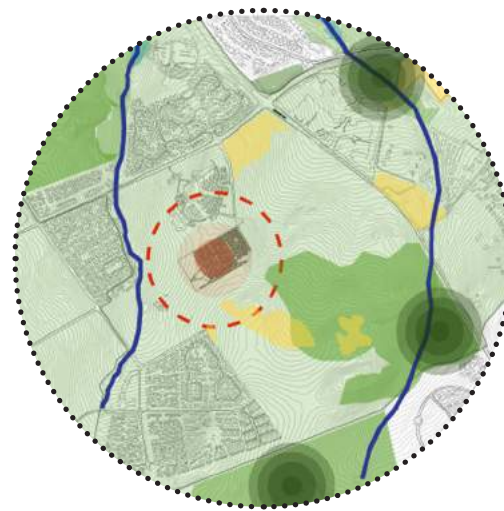


Figure 29 : Urban framework ecological mapping (MArch(Prof) 2016)

ECOLOGICAL SENSITIVITY

There is a high sensitivity area at the bottom right where the K54 meets Garsfontein road. The Philadelphia spruit runs through a rich biodiversity area, bottom right, where the proposed K54 would meet Garsfontein road. The watershed has a large ecosystemic effect and thus is important to respect the spruit that runs through site.

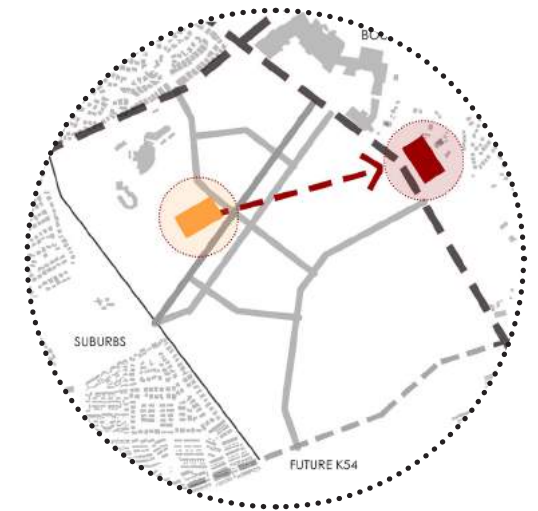
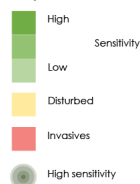


Figure 30 : Urban framework relocation (MArch(Prof) 2016)

SETTLEMENT RELOCATION

The municipality's current proposal includes relocating the residents of Plastic View across the street to the North East of the site (Tlhabye 2015).

The conceptual framework caters for the transfer as well as providing low-income housing as an option for current residents.

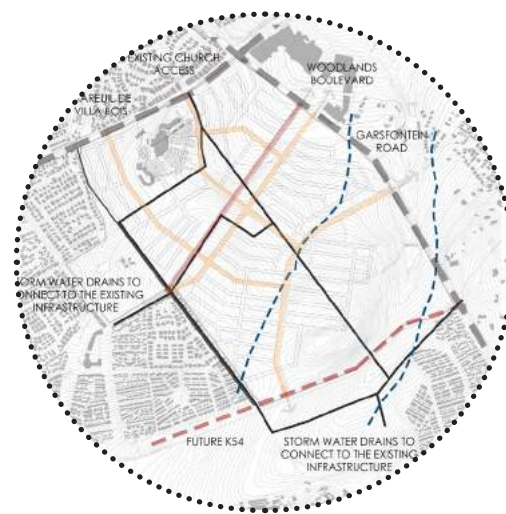
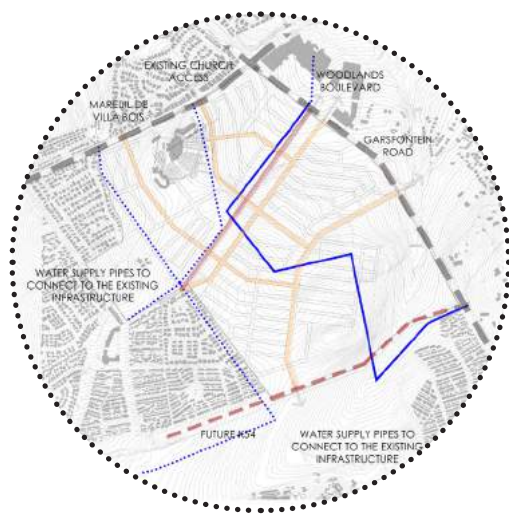


Figure 31 : Urban framework municipal connections (MArch(Prof) 2016)

MUNICIPAL WATER SUPPLY

- NEW WATER SUPPLY PIPES
- EXISTING WATER SUPPLY PIPES

STORM WATER DRAINAGE

- STORM WATER DRAINS
- - - - NATURAL WATER COURSE

SEWER RETICULATION

- NEW SEWER LINES
- EXISTING SEWER LINES



Figure 32 : Urban Vision Perspective (MArch(Prof) 2016)

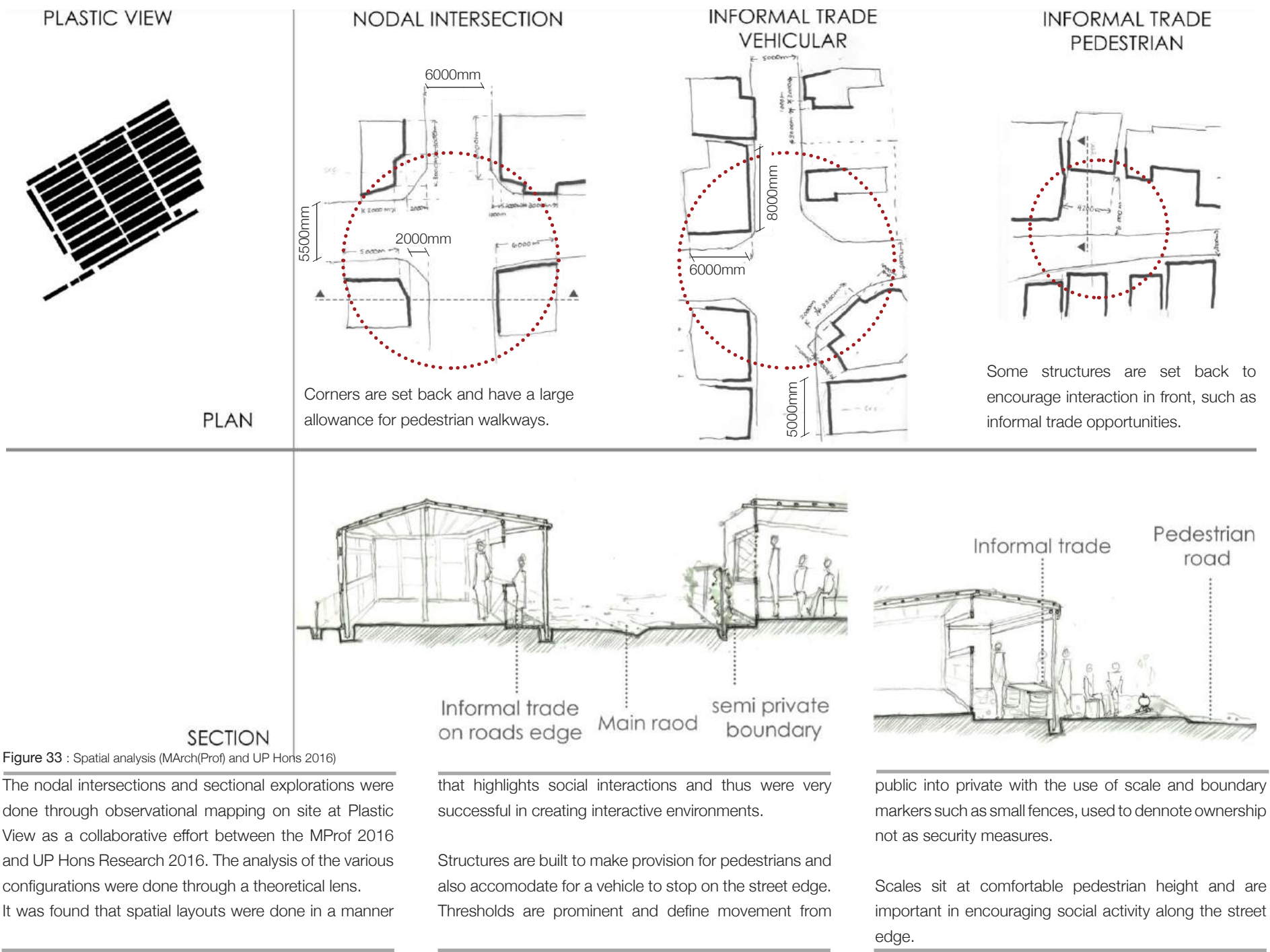


Figure 33 : Spatial analysis (MArch(Prof) and UP Hons 2016)

The nodal intersections and sectional explorations were done through observational mapping on site at Plastic View as a collaborative effort between the MProf 2016 and UP Hons Research 2016. The analysis of the various configurations were done through a theoretical lens. It was found that spatial layouts were done in a manner

that highlights social interactions and thus were very successful in creating interactive environments.

Structures are built to make provision for pedestrians and also accommodate for a vehicle to stop on the street edge. Thresholds are prominent and define movement from

public into private with the use of scale and boundary markers such as small fences, used to denote ownership not as security measures.

Scales sit at comfortable pedestrian height and are important in encouraging social activity along the street edge.

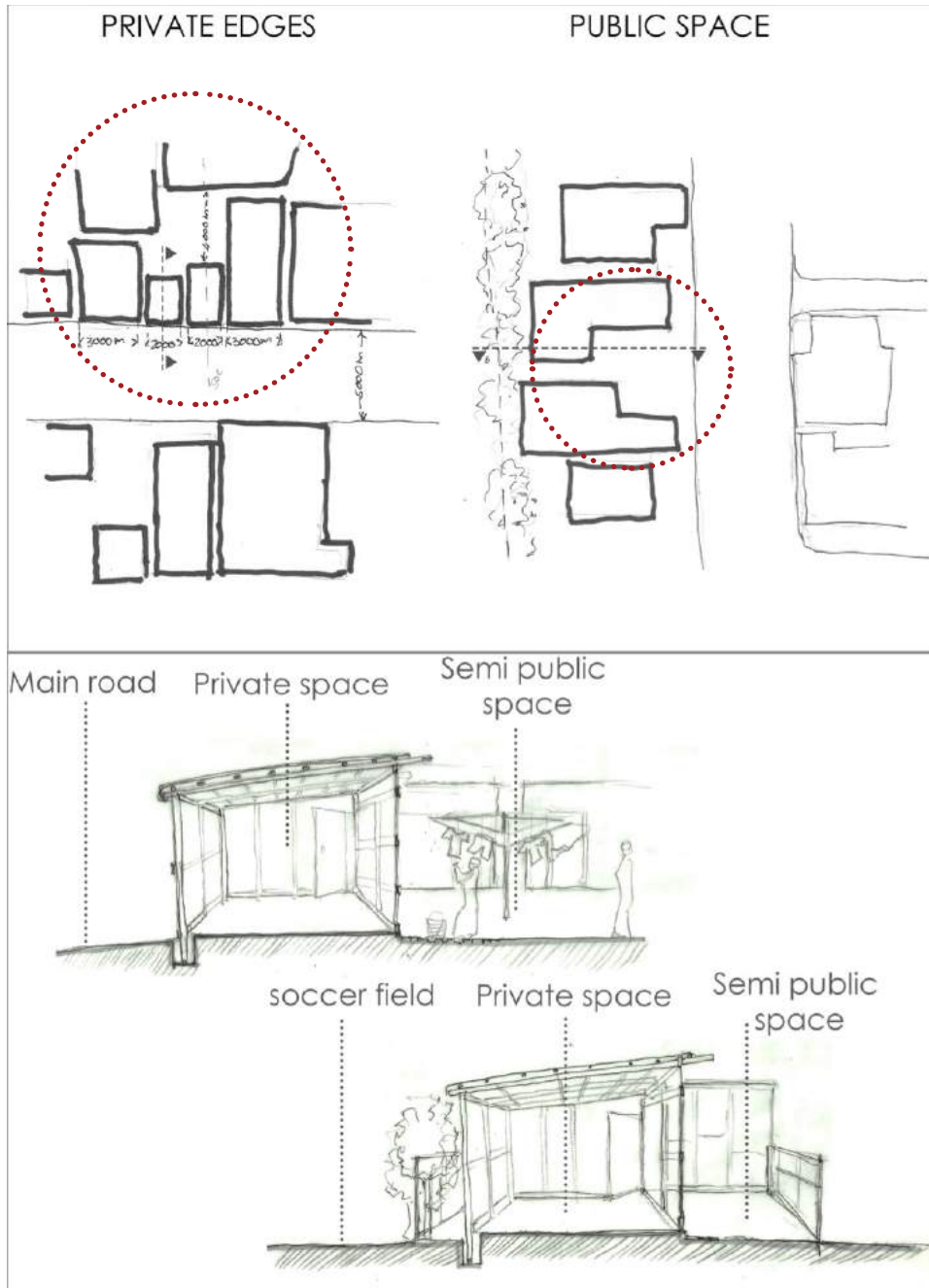


Figure 34 : Spatial analysis (MArch(Prof) and UP Hons 2016)



Figure 35 : Spatial analysis photographs from Plastic View (MArch(Prof) and UP Hons 2016)

spatial layout informants Plastic View



translation of spatial layout analysis into urban framework

Influence was taken from the spatial layout of Plastic View whereby informal trade is situated on the corner of vehicular roads but is set back from the street edge. This allows for a safe distance from vehicular traffic as well as giving the opportunity for vehicles to stop.

Informal trade and vehicular road intersection.

Spatial patterns allow for public spaces to be accommodated in between buildings. This breaks up facades that sit along the street and allow for a more interactive relationship with the street edge.

Public space.

Some residential edges are more private but accommodate public space through courtyards between the buildings.

Private edges.



Figure 37 : Urban framework: spatial analysis conceptual collage exploration (MArch (Prof) 2016)

VIBRANT MAIN ROAD



Figure 38 : Urban framework: spatial analysis conceptual sketch exploration (MArch (Prof) 2016)

PUBLIC EDGE CONDITIONS



Figure 39 : Urban framework: materiality analysis (MArch (Prof) and UP Hons 2016)

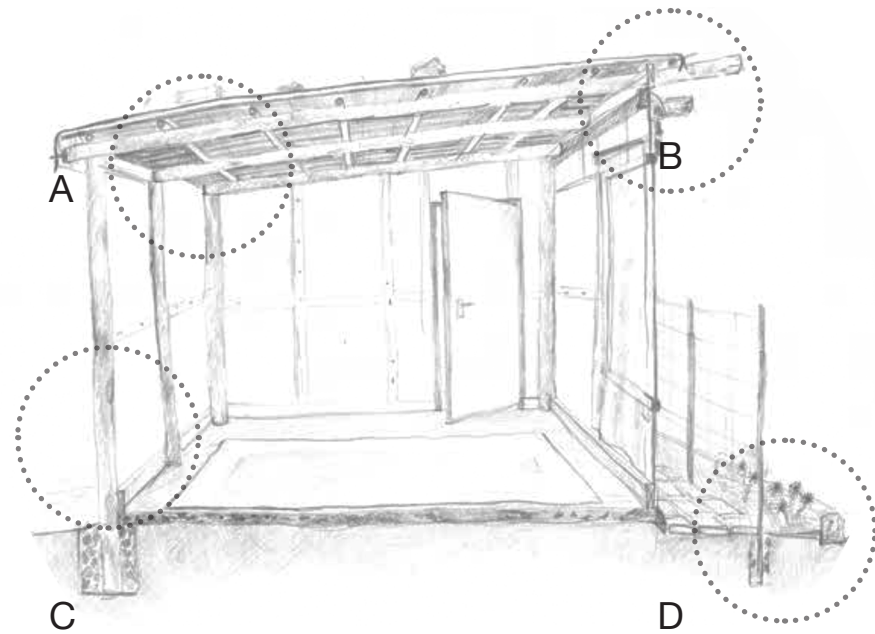


Figure 40 : Urban framework: materiality and structure analysis (UP Hons 2016)



A

TIMBER SUPPORTS



B

PLASTIC SHEETING



C

CORRUGATED
STEEL SHEETS



D

BRICK & STONES

33. Figure 41 : Urban framework: materiality analysis photographs (MArch (Prof) and UP Hons 2016)

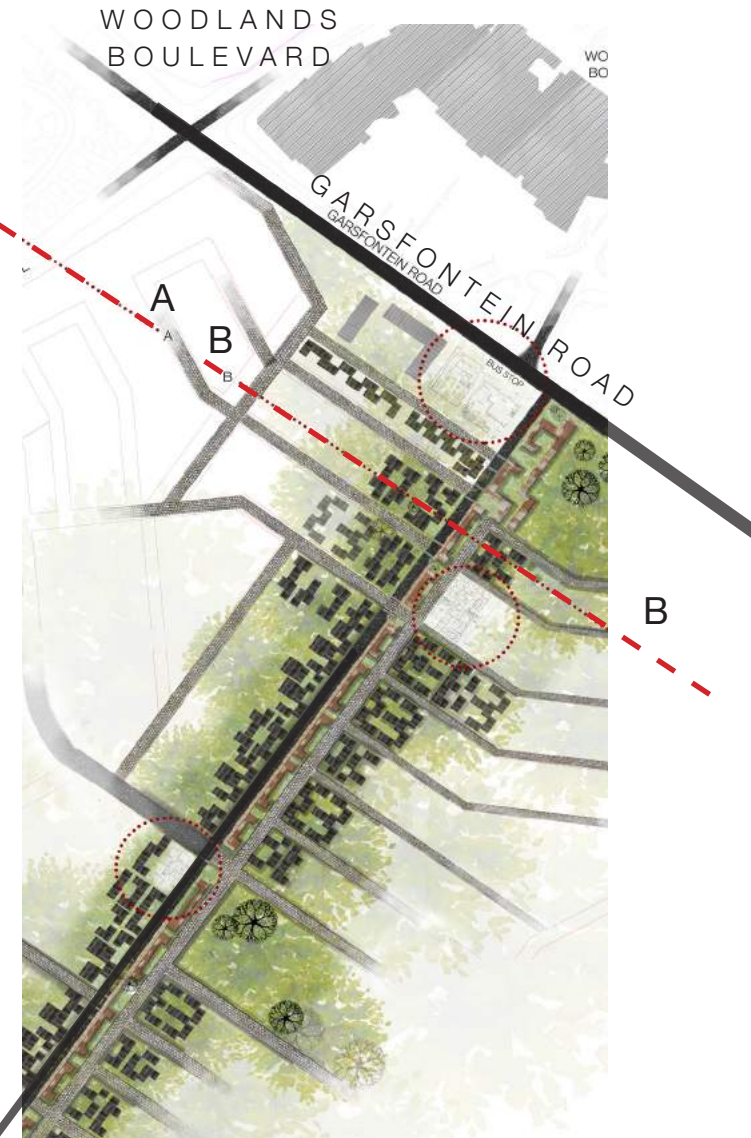
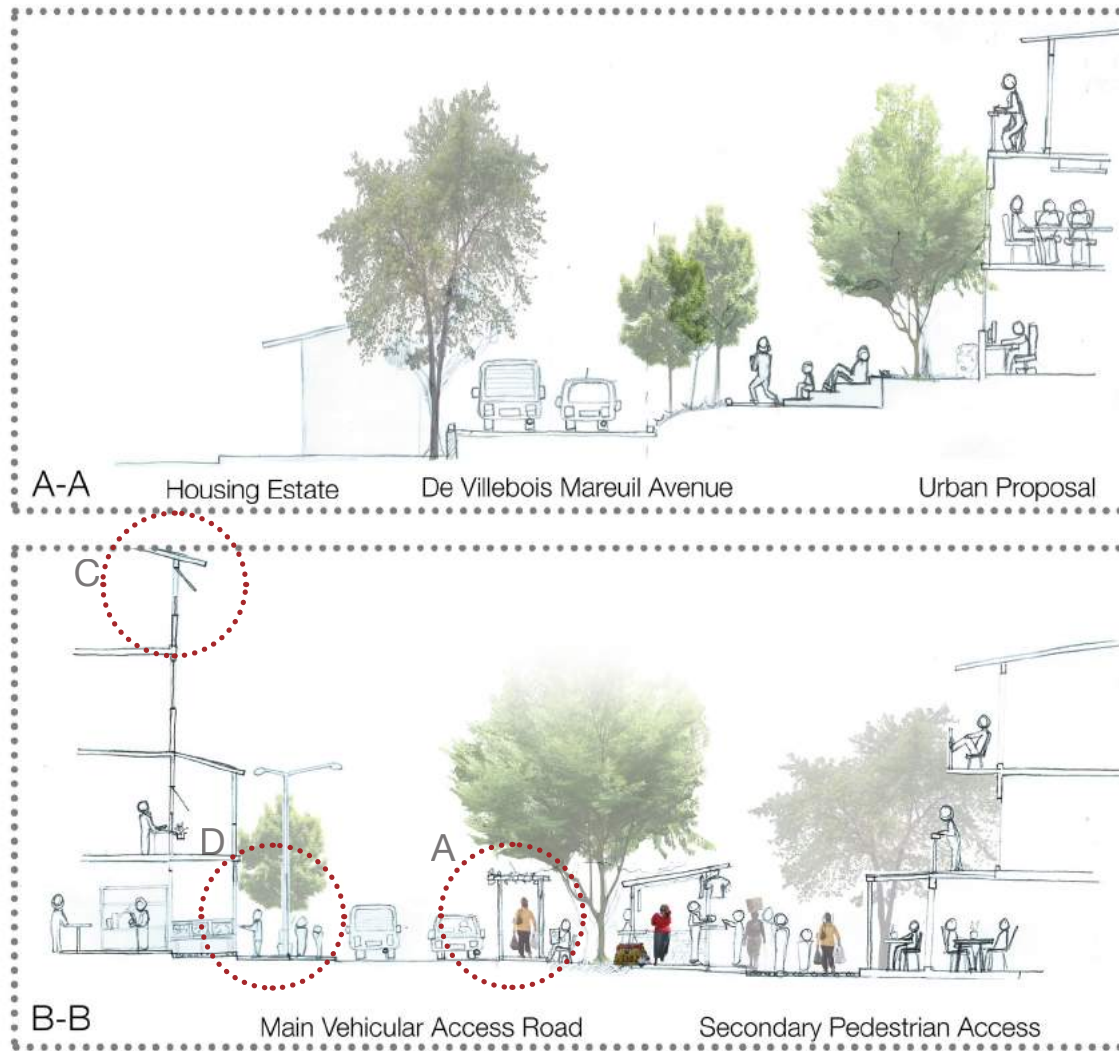


Figure 42 : Urban framework: materiality and structure implementation (MArch (Prof) 2016)

materiality informants

Due to the impermanent nature of the dwellings within Plastic View the predominant materials include recycled brick, old plastic and corrugated sheeting and timber offcuts.

In order to translate this contextual language, similar materials were used within the urban framework, with the addition of other, more permanent, materials such as steel and concrete.

urban proposal sections

Sections taken through the urban framework proposal that illustrate spatial considerations and pedestrian/street relationships. Thresholds, such as level change and vegetation, are important to define space.



35.

Figure 43 : Urban framework: conceptual collage (MArch (Prof) 2016)



urban framework

The analysis of the edge conditions on site within Plastic View informed the development of the urban conceptual vision.

In order for this framework to be successful it is vital that the design of public spaces implements principles that sustain social interactions as well as promote a cohesive community.

d

INDIVIDUAL RESEARCH

urban proposal

Due to the current food system network being made up of processes sitting in isolation, food accessibility is limited and has consequently supplemented to the decline of food secure environments.

Urban Issue

The urban issue for Plastic View is that the site is an island of contestation in amongst the fragmented urban fabric in which it is found. The reason for the fragmentation being due to the number of broken service provision networks across both the private and public sectors of our society.

Branching off from this larger urban issue, the individual proposal discussed in this dissertation focuses on the inequality of access to food for the community members of Plastic View. Falling in the low-income bracket, many residents of Plastic View cannot afford the commercial food prices within the vicinity and thus choose to travel further in order for more affordable prices (M(Prof) and BArch (Hons) research 2016).

Having conducted a desktop research study, as well as interviews with the community during numerous site visits, a collaborative mapping effort between the University of Pretoria's M(Prof) and BArch (Hons) research 2016 groups produced documented evidence of the food services within the vicinity of Plastic View.

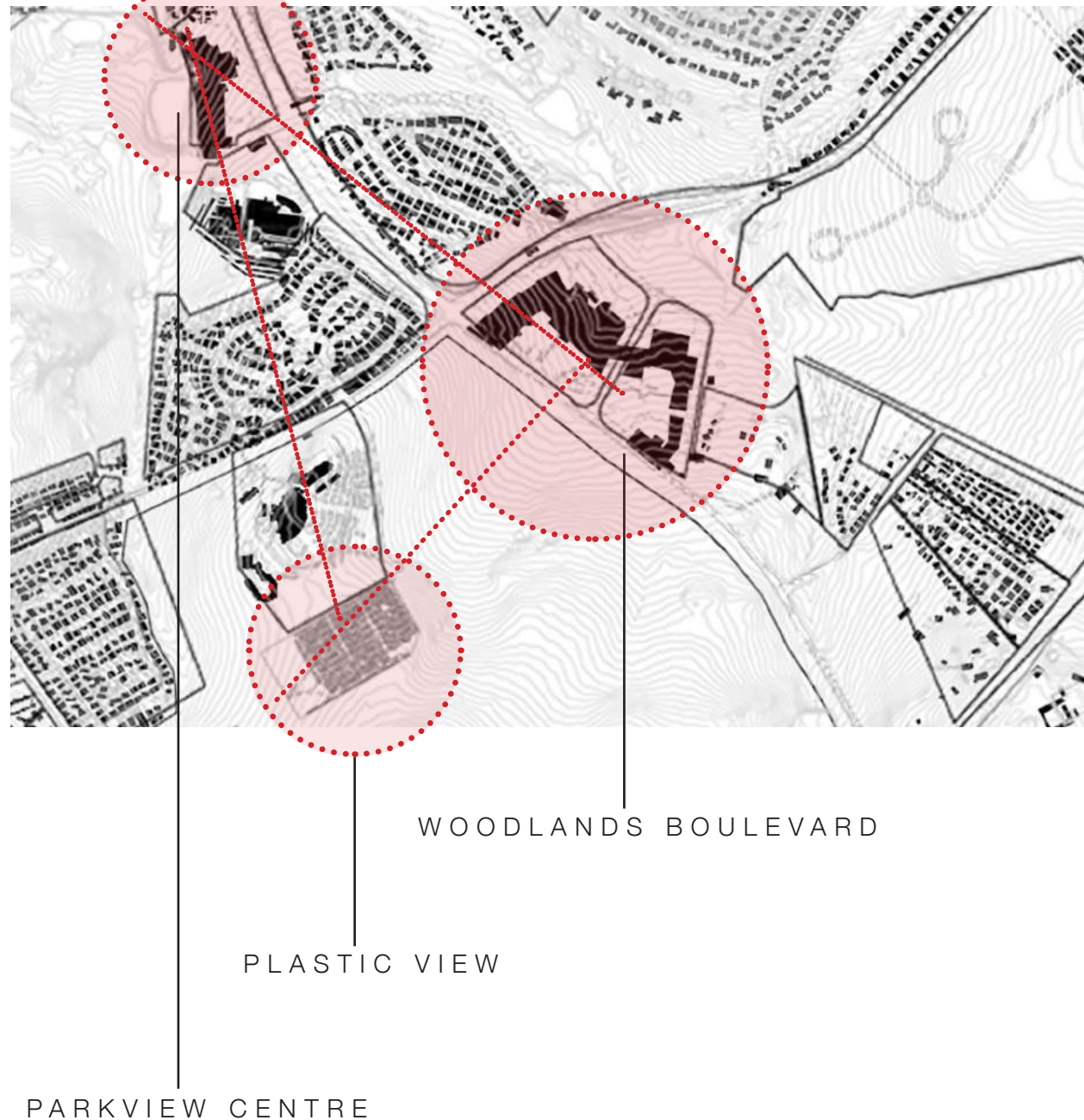


Figure 44 : Identification of trading opportunities (Author 2016)

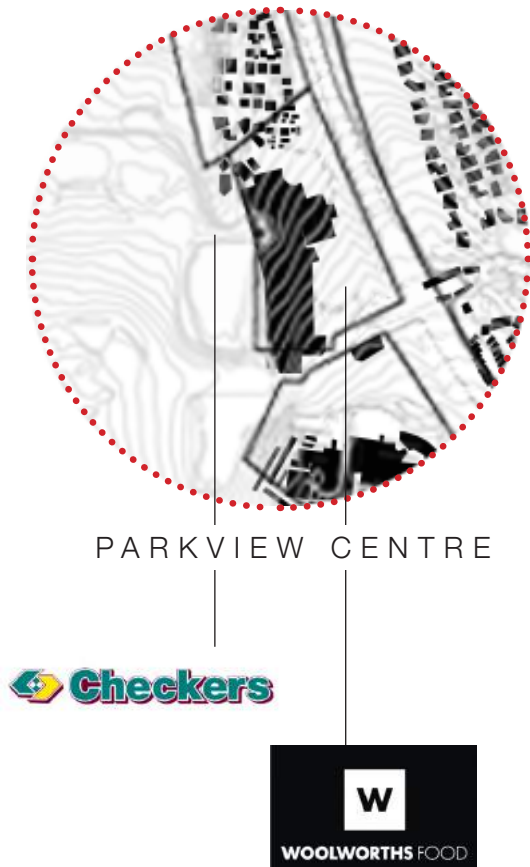


Figure 45 : Identification of food retail within Parkview Centre (Author 2016)

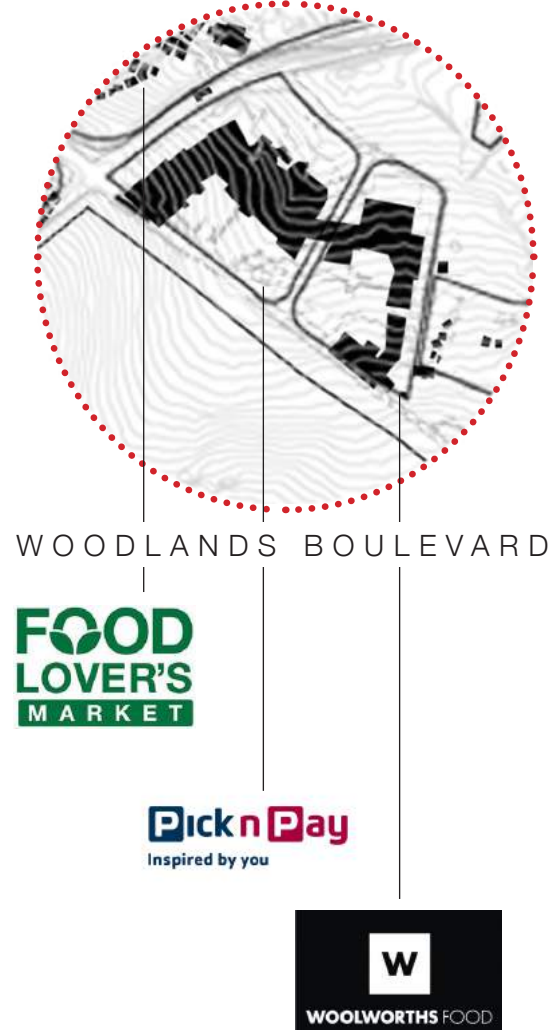


Figure 46 : Identification of food retail within Woodlands Boulevard (Author 2016)



With the food network in mind while mapping, a large socio-economic barrier presents itself on site, one that continually increases due to food insecurity and accessibility. Food services within the vicinity are predominantly accessible to medium-high income residents. The shops in the area are supermarkets and franchises that get their produce from large scale distributors and thus become costly compared to local production.

This mapping evidence was an important informant for the urban issue proposed by the individual component of this dissertation, namely how one may minimise the socio-economic gap between food accessibility. Breaking New Ground (2004), the government's sustainable human settlement plan, promotes densification and integration as key objectives to *integrate previously excluded groups into the city and the benefits it offers, and to ensure the development of integrated, functional and environmentally sustainable human settlements, towns and cities* (Tonkin 2008: 19). It is important to consider the BNG plan in order to combat issues related to food accessibility on site.

Local informants

There are many spaza shops (informal tuck shops) within Plastic View itself. The owners open up shop daily but will correlate a day to take off, usually a Tuesday, in order to share a taxi to Marabastad. Marabastad is a business area near the city centre of Pretoria., South Africa, and is the nearest distribution point for shop owners to buy stock. Due to this being a weekly occurrence, as much produce as the budget allows, and space that the taxi permits, is bought in order to last until the following week. The twenty-eight-kilometre trip works out cheaper than walking across the road to Woodlands Boulevard (BArch(Hons) Research 2016). Without proper storage facilities and refrigeration stock usually won't include much fresh produce. Due to the spaza shops being the easiest to access, residents of Plastic View utilise these regularly and thus do not get the proper nutritious meal they need due to lack of selection (BArch(Hons) Research 2016).

Some residents of Plastic View have started growing their own food. Through observation it was apparent that a few residents within the settlement had started to grow their own crops yet it was unclear whether they were for their own consumption or for income purposes (BArch(Hons) Research 2016). Whether food is being grown, cooked or sold within the settlement it is clear that accessibility to healthy affordable food is limited.

The importance of food and the initiative taken by many residents brings about opportunity to introduce larger scale agriculture, allowing for the localisation of the food



Figure 47 : Identification of food retail within Plastic View (Author 2016)

SMALL TUCKSHOP

This small spaza shop was one of the more private ones and only sold a few treats, such as crisps, sweets and cooldrink.



Figure 48 : Identification of food retail within Plastic View (Author 2016)

OUTDOOR COOKING

Informal cooking areas set up. Residents can buy pap and various pieces of chicken.



Figure 49 : Identification of food retail within Plastic View (Author 2016)

OUTDOOR COOKING

A small portable braai set up, for personal use as well as for daily income.



Figure 50 : Identification of food retail within Plastic View (Author 2016)

FRUIT AND VEG

A small selection of fruit and vegetables is available. These need to be sold quickly as they do not last long in such environments without storage or refrigeration.



Figure 51 : Identification of crop growth within Plastic View (Author 2016)

CROP GROWTH

A few residents within Plastic View have started growing their own crops alongside their dwelling.

importance of informal trade

Although challenging to quantify, it is estimated that the informal sector in developed countries make up 10-20% of the collective outputs and 30-50% of developing countries. The informal sector is not only important for the local economy but is a method through which to achieving a more sustainable city. This is due to informal trade increasing economic activity density, improving the efficiency of urban services and systems such as public transport (Gibberd 2016:1).

Informal trade, while improving local resilience due to it's increased diversity, provides convenient and local access to goods and services needed for everyday life.

Even though informal trade makes a significant contribution to the local economy and employment creation, it is not usually supported by government or acknowledged in policy other than through restrictive means, such as fines for illegal trading (Gibberd 2016:1). Urban planning and design, in many developing countries, are still based on western standards that disregard the informal economy (Perera & Amin 1996:3).

Informal trade can be a flexible resource, a means of attaining income for migrants whilst looking for other, more formal, job opportunities (Banerjee 1983:402). This

is demonstrated in informal settlements where many of the Spaza shops, an informal business run from a room in a shack or small house where customers stand outside and purchase basic groceries and everyday small household items over a counter (Von Broembsen (2008:1), are run by those unable to find formal employment (UP M(prof) Research 2016). In terms of creating livelihood opportunities and strategies, informal trade has played a significant role (Gibberd 2016:3). The growth of the informal economy through trade can be attributed to its ability to cater products that are more affordable and appropriate to the poorer households.

An illustration of this is the daily access of small quantities of fresh fruit, vegetables and meat at affordable prices to households that do not have refrigeration (Gibberd 2016:10). Instead of disrupting informal trade, a development path should be put into place that allows for informal traders to progress into larger formal traders (Chong & Gradstein 2007). This growth should be supported by councils, which provide incentives such as improved facilities, marketing, tax exemptions and access to basic services such as drainage, electricity and water (Daniels 2004:508).

Usually sold at spaza shops and by other informal traders

are sweets, crisps, carbonated drinks and boiled eggs. With the exception of the latter, these low cost items contain a large amount of sugar and salt and thus do not promote any sort of healthy lifestyle and packaging of the items result in litter (Gibberd 2016:10). Councils should support the trade by supporting access to healthier options as well as local manufacture of the drinks and snacks. Recyclable packaging and reusable containers should form part of this manufacturing process also aiding in job creation.

Not all produce sold is unhealthy. Some traders are a valuable source of nutritional low cost food. Food sold includes spinach, cabbages, tomatoes, bananas, oranges and low cost meat such as chicken feet and heads, fresh fish and dried beans. Traders as such require easily cleanable surfaces, where produce can be prepared and displayed as well as trolleys and storage opportunities for after hours (Gibberd 2016:11).

Overall, the conducted study shows that informal trade provides access that is both convenient and valuable in terms of good and services to local communities. It particularly plays a large role for the low-income receivers as it caters for them directly through a more affordable means than formal trading outlets (Ligthelm 2006).



Figure 52 : Informal takeaway (Author 2016)

2 FOOD [IN]SECURITY

A global issue

Due to the increasing alarm surrounding the increase of food prices and regional shortages based on the decline of resources, the issue of food waste and its notable contribution to food insecurity has been brought to attention (Joubert 2012:92). The significant increase in the price of food, which is contributing to the reduction of food secure environments, is a result of the increasing drought and the substantial food wastage, throughout the food system.

As Carolyn Steel points out in *Hungry City*, even the middle-income bracket is on the receiving end of an efficient but extremely fragile food supply chain and are being affected by the price increase. This is not only a national issue but also a global one. The global food crisis has been creeping steadily towards the centre of the world's attention since a confluence of events that pushed 2008's food prices to levels that triggered riots in many cities around the world (Joubert 2012: 92). The effects of El Nino and the constant waste of produce have only magnified this crisis.

A sustainable community food system is a collaborative network that integrates sustainable food production, processing, storage, distribution, preparation, consumption and waste management in order to enhance the environmental, economic and social health of a particular place (asi.ucdavis.edu). Each of these processes has a specific role in the contribution of food environments and the sustainability thereof.

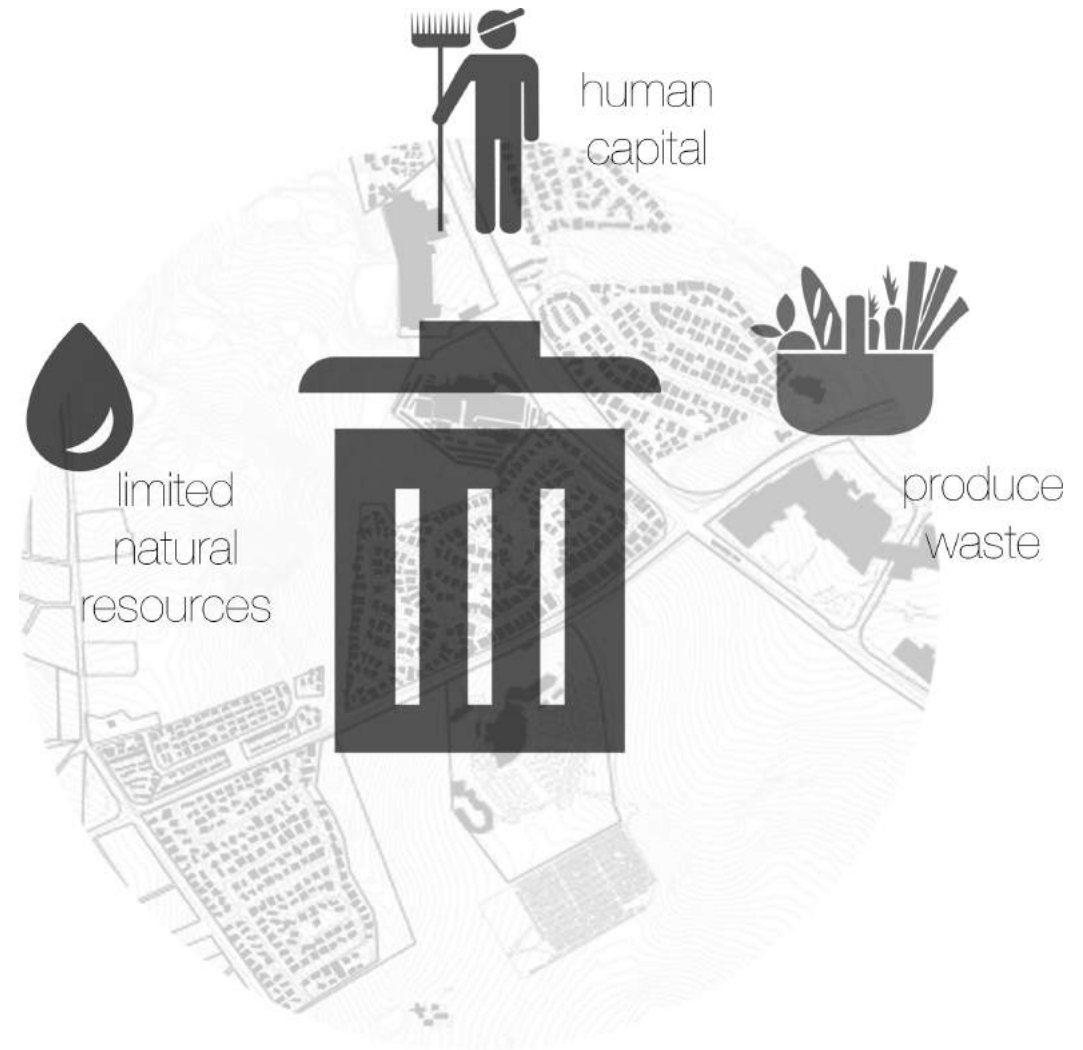


Figure 53 : Wasted resources infographic (Author 2016)

food security and sovereignty

The United Nations Food and Agriculture Organisation's (FAO) definition of food security is when *all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy lifestyle* (Food and Agriculture Organisation (FAO) 2002).

Food sovereignty is the expanded definition of food security, which encompasses the importance of accessibility. The right to food should, at the very least, include *an available, adequate, dependable and sustainable food supply and an assured ability to acquire*

nutritious and culturally accepted foods through normal food distribution channels (Riches 1999:203).

National food security is largely about the commercial farmers and what they manage to harvest each year as well as how much is imported and exported and whether or not we get food aid or not. This however, happens within the global context. The nation's farmers are impacted by natural fluctuations in regional weather, soil degradation, government land reform policy, price of oil, local market forces etc (Joubert 2012:6).

At a community level, food security focuses on access to food. According to Labadarios (2009), it refers to a situation where the people in a community can get hold of a *safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximises community self-reliance and social justice* (Joubert 2012:6).

A community's degree of food security has as much to do with whether it is located close enough to shops and informal traders, as it has to do with whether people have enough money to buy the food once they are standing in the checkout queue (Joubert 2012:6).

WASTE[D RESOURCES] finite reserves

The considerable increase in waste across the spectrum has largely contributed to the increase in price thus decreasing accessibility resulting in the overall decline in food security. Wastage in terms of the food system is not limited to food waste but includes resources and human capital that contribute to each of the processes throughout the system.

In terms of wasted resources

- The nutrients used for the soil to grow produce
 - Scarce water to grow the crops
 - Labour and equipment used to plough fertilise and sow the produce
 - Diesel used to harvest the crop,
 - Energy spent on processing and transporting ship the food,
 - The ever-shrinking atmospheric space used to soak up all the greenhouse gas emissions.
- (Joubert 2012: 94)

Many of the previously mentioned are finite resources, such as oil reserves, potassium for fertilising, and it uses environmental systems – water generation, waste sinks, the carbon mopped up by the atmosphere, all of which are not necessarily taken into the cost calculation (Joubert 2012:94).

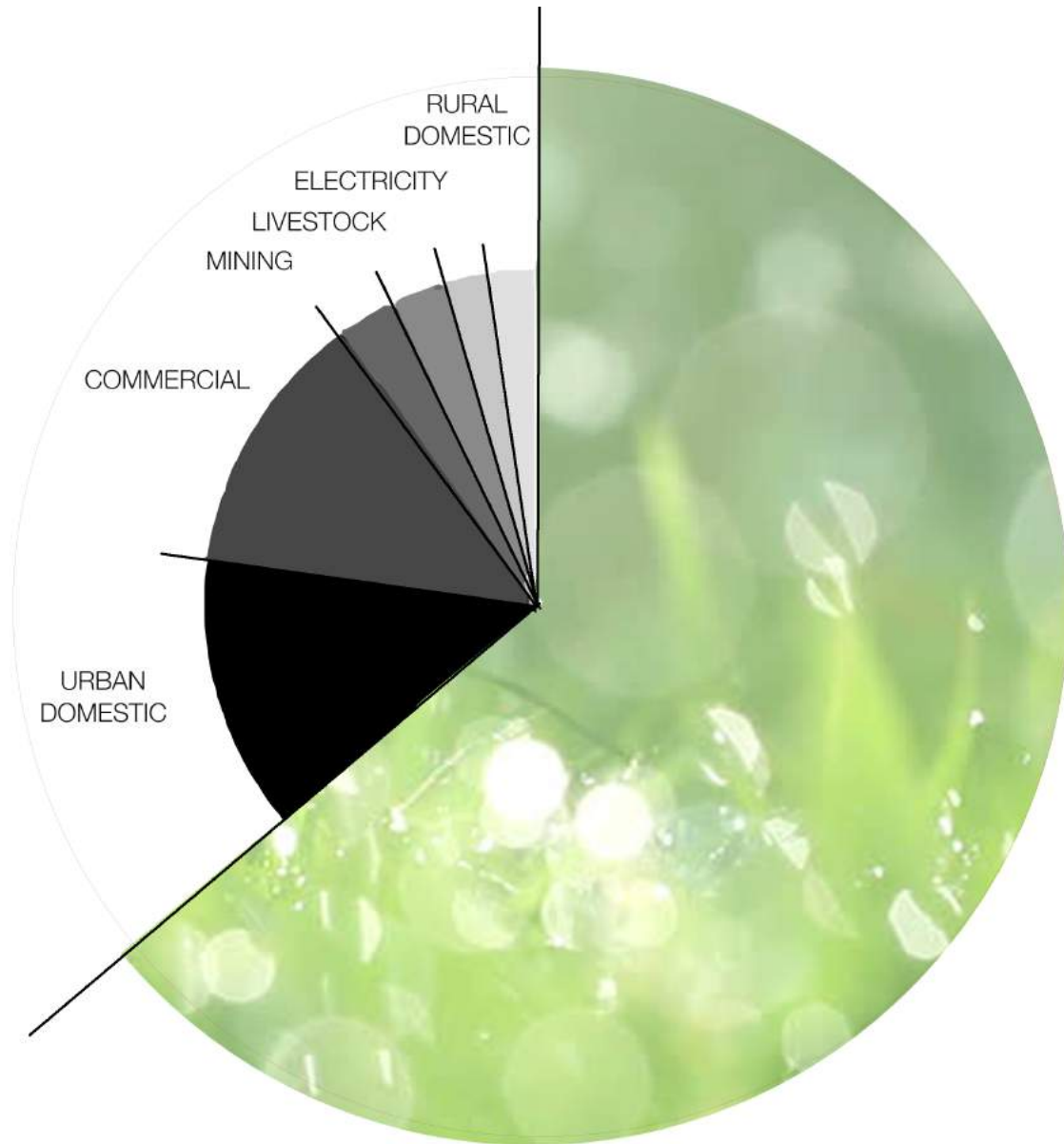


Figure 54 : Waste[d resources] statistic graphically represented (Author 2016)

63%

IRRIGATION

South Africa is one of the world's most water-scarce countries and is characterised by exceptionally variable rainfall, over time and geographically (Goldblatt 2010:10). The current drought being faced, in an already water-scarce country, is not only affecting households but is having a significant impact on the farmers trying to produce for the country (Essa 2015:1).

Water availability is the single most important factor that limits agricultural production in South Africa (Goldblatt 2010:10). Only 12% of the country is suitable for 'rain-fed' crop production which in itself is already a big challenge of farming (Goldblatt 2010:10). Without sufficient access to water, many farms are struggling to provide adequate agricultural conditions in order to sustain their produce.

The substantial decrease of these conditions that has led to drought emergencies being declared in most

According to OCHA: Office for the Coordination of Humanitarian Affairs (2016), South African provinces and a decline in food security and sovereignty is a direct result of the El Nino weather phenomenon. There are predictions that suggest climate change will bring more infrequent, yet more intense, rainfall thus lessening the county's arable land and intensifying agricultural unpredictability (Goldblatt 2010:10).

El Nino is the name given to a weather pattern associated with a continual period of warming in the central and eastern tropical Pacific, which can trigger climate extremes in parts of the world. This naturally occurring phenomenon that occurs every two to seven years (Aljazeera 2016), has resulted in the southern parts of Africa being more dry than usual, with South Africa experiencing its lowest rainfall in over fifty years (Mashego 2016).

This intense drought has already had a significant impact on harvests and food security throughout southern Africa as farming regions are experiencing large delays in planting due to the extremely dry agricultural conditions that hinder early crop development and pasture re-growth.

Irrigation is already of particular concern as it is already the largest use of water in South Africa (Goldblatt 2010:11) as seen in figure... The total water loss as a result of food waste in South Africa is equivalent to 22% total water use for crop production (Oelofse 2013: 4). Water thus becomes the most important factor to consider within the dissertation in terms of food production, as it is a significant limiting factor and runs in strong correlation to food waste. This highlights the need to find alternative solutions and a method through which water usage is more effective and sustainable.

64%

FOOD WASTE SOUTH AFRICA

Of all the food produced globally each year, 1.3 billion tonnes, approximately two thirds, of it does not make it into someone's stomach. This occurs in the context of a world where 1 billion people are still undernourished, and who could be fed with just a fraction of the food that rich countries throw away, according to Stuart (2009). Food waste, however, is not limited to retail and consumption, 30-50% of food produced is wasted before reaching consumers (Oelofse 2013:2).



Figure 55 : Food waste in South Africa graphically represented (Author 2016)

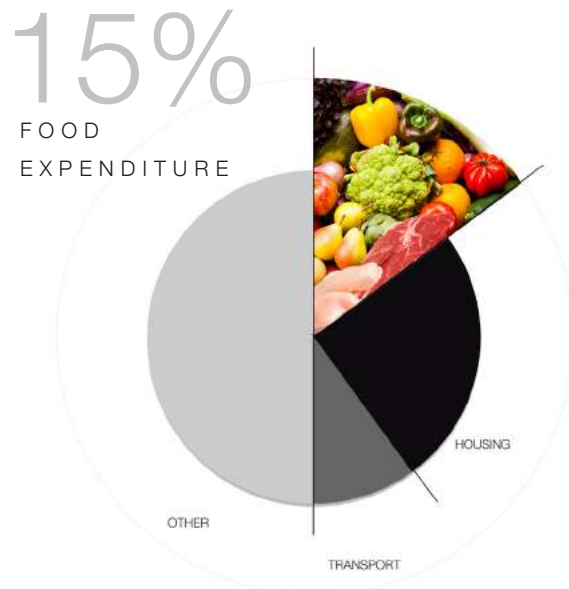


Figure 56 : Families in South Africa_overall average budget expenditure (Author 2016)

Food is handled at all stages throughout the food process, from being cleaned, sorted, graded, packed and unpacked, loaded and unloaded, put into the store and taken out again (Aragrande & Argenti 2001). The farther the food travels and the more it is handled, the greater the decline in freshness and the loss of nutrients thus amounting to a larger percentage of food waste (White 2011:23). Not only is the handling of the produce costing more in terms of food wastage but also the different processes

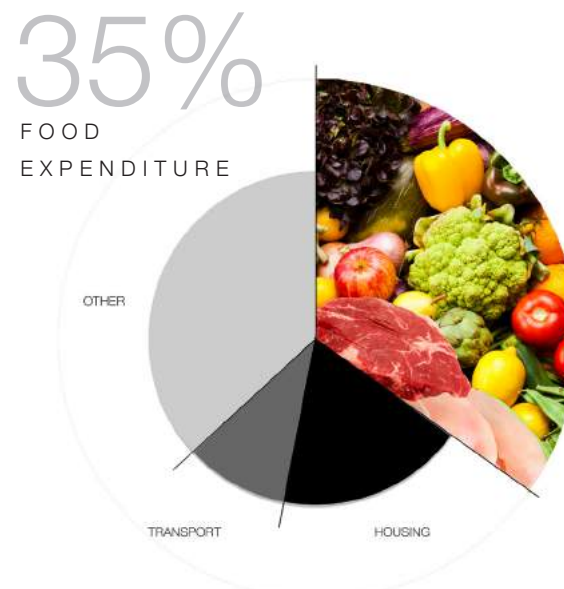


Figure 57 : Families in South Africa: Poorest 10% of Population budget expenditure (Author 2016)

in between the farmer and the consumer increase the cost due to a greater number of parties being involved.

Although a large percentage of South Africans reside in the informal sector, food security is not limited to lower income groups, who spend approximately 35% of their income on food, but is also having a profound effect on those in the middle-upper class (Pereira 2014:9). More than 60% of South Africa's

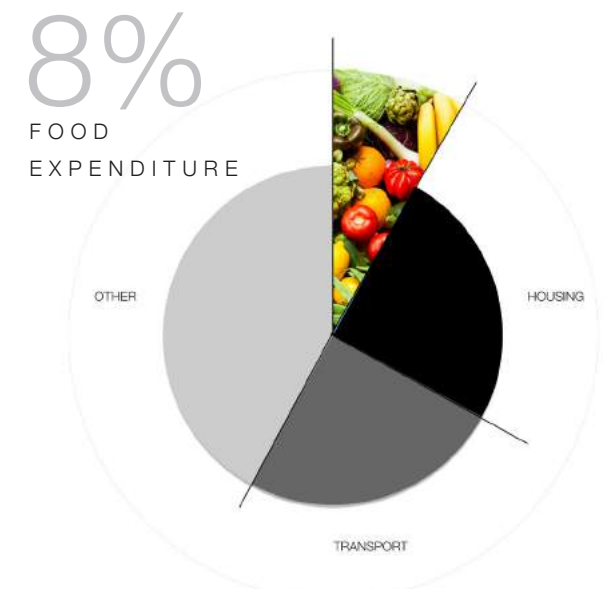


Figure 58 : Families in South Africa: Richest 10% of Population budget expenditure (Author 2016)

population live in urban areas and with the rural population increasingly relying on purchasing their food, the role of formal and informal food retailers in providing ease of access to food is becoming progressively recognised.

Supermarkets have been able to expand into lower income areas by beating the cost and quality of small retailers and local wholesalers in most of their product offerings (Pereira 2014:9).

The FAO (2011) study, conducted by the Swedish Institute and Biotechnology, divides discarded food into two categories.

- **Food Loss:** All the food that goes into bin between farmer and retailer – essentially at production, processing, storage, distribution and preparation
- **Food Waste:** Everything lost between retailer and consumer. (Joubert 2012:92)
- **Food Wastage:** encompasses both food loss and food waste (Bond et al., 2013)



Figure 59 : European food production and waste (Author 2016)

For every European or North American, about 900kg is produced per person per year. Of that 900kg, 280-300kg is lost as food waste (Joubert 2012:93).



Figure 60 : Sub-Saharan Africa food production and waste (Author 2016)

In sub-Saharan Africa, 460kg of food is produced per person per year and of that 120kg per person is wasted (Joubert 2012:93).

In developing countries, unlike developed countries where most food is wasted to the dinner plate, 40% of the total food wastage is lost as food waste (during harvesting, post-harvest, production and transportation) (Joubert 2012:93).



Figure 61 : Developing countries: food loss vs food waste (Author 2016)

Waste is reduced in developing countries as a poorer consumer who will buy only what they need (unlike wealthier consumers who tend to buy much more than they need) and less food goes to waste.

It is estimated that only 6kg of food gets wasted per capita in sub-Saharan Africa per annum (Joubert 2012:93).

*If we can reduce food loss and wastage, we won't need to produce so much more.
A lot of food is lost between the farmers' field and the dinner table – in food storage,
transport, food processing, retail ... and in our kitchens (Goldblatt 2010: 4).*



the idaho plate method

The Idaho Plate Method works in regards to portion control whereby the determinant is how much each of the major food groups should occupy on an individuals plate. The figure on the right (...) shows the portions of food groups for lunch and dinner. One quarter of the plate should be starch, another quarter protein and half the plate should be vegetables. The plate should be paired with a side portion of fruit and milk or yoghurt (Brown 2001).

Although the Idaho plate method was designed for diabetics, it has immense value in showing the importance of the various food groups in any healthy diet (Cox 2011).

Vegetables, being the largest portion, are a necessity for good nutrition. It is the access thereof that vital for all individuals, especially those in lower income communities where fruit and vegetables are the hardest to come by due to lack of resources (local informants page 39).



Figure 62 : The Idaho Plate Method graphically represented (Author 2016)

conclusion

Due to the reduced production, availability and as a result of the drought, food prices have risen dramatically across Southern Africa (Aljazeera 2016). Poorer households will bear most of the brunt due to a third of their income going to food, more than three times the proportion that wealthier families spend (Jansen van Vuuren 2015:1). This is expected to intensify social tension in a country where one in four South Africans are unemployed and protests regularly erupt across townships because of the absence of adequate services provided by the government, such as water and sanitation (Jansen van Vuuren 2015:1). However, the concern not only lies with the consumers as smallholders rely on their crops to feed their own families as well on the income generated to support their livelihoods (Aljazeera 2016).

Both food security and food sovereignty should be equally present in the lives of every citizen, as stated in Chapter Two, section 27, in the Bill of Rights (Constitution of the Republic of South Africa 1996:11), everyone has the right to have access to sufficient food and water. This right, however, has been hindered by the lack of resources available and has a significant impact on both the rich and the especially the poor (Essa 2015:1). A further contributor is waste. Waste, in this instance, does not only refer to food wastage but also human capital and already scarce resources, such as water. The biggest hurdle to a food secure environment in poor communities is access to food, rather than if there is enough food (Joubert 2012:184). Thus the only way to combat food insecurity is to ensure equal social and economic access to a food system which limits the wastage of food that prevents individuals maintaining a sufficient (and healthy) diet, such as suggested in the Idaho Plate Method.

The overall intention of this dissertation is to address sustainable food security through the optimisation of the food systems by reducing waste and empowering local production.

ARCHITECTURAL ISSUE

isolation of food system processes

Food is supplied to any urban area through a variety of food supply and distribution systems (FSDSs). FSDSs are complex systems whereby a series of functions such as production, handling, storage, transport, processing, packaging, wholesaling and retailing are integrated with one another to enable food needs to be met within the cities. These functions are performed by different agents within the food system and include food producers, importers, transporters, wholesalers, retailers, processors, shopkeepers, street vendors, service providers, packaging suppliers and public institutions. In addition to these agents there is also a private association of traders, shopkeepers and consumers (Van der Merwe 2011:2).

Traditionally, the production, retail and consumption of food produce were central and integrated into the public realm. These days, however, food spaces are generally designed as segregated domains, which do not allow for any connection to the urban context in an organic manner (Mand & Cilliers 2010:1). There has been a detrimental impact on the vitality of public spaces due to designs such as shopping malls, which incorporate food spaces as exclusive privatised enclaves.

The various processes being separated by highways largely contribute to the isolation between the systems. Due to food centred activities being pushed to the edge, food has to be transported into the urban centre. Production happens out of town and distribution centres sit on major arterial roads. Here the food is stored but still needs to be packed up and transported yet again to retailers.



Figure 63 : Large scale food delivery as an isolating factor (Author 2016)

The constant need for transport due to removed food centred environments and the seclusion of the processes within the system has enabled spatial and economic transformations that reinforce unsustainable and unconvivial approaches to urban development that fit a car-dependent, low-density, mono-functional land use pattern (Parham 2005).



supermarkets & malls

Keeping our cities well nourished and adequately fed is not just about producing more food – it is about making sure everyone has regular and reliable access to good, wholesome food, and that these are the foods that they choose when they do have access.

_(Joubert 2012:181)

In ancient times, trading and shopping activities took place in open public spaces. These open spaces included other urban and public functions and activities of the city.

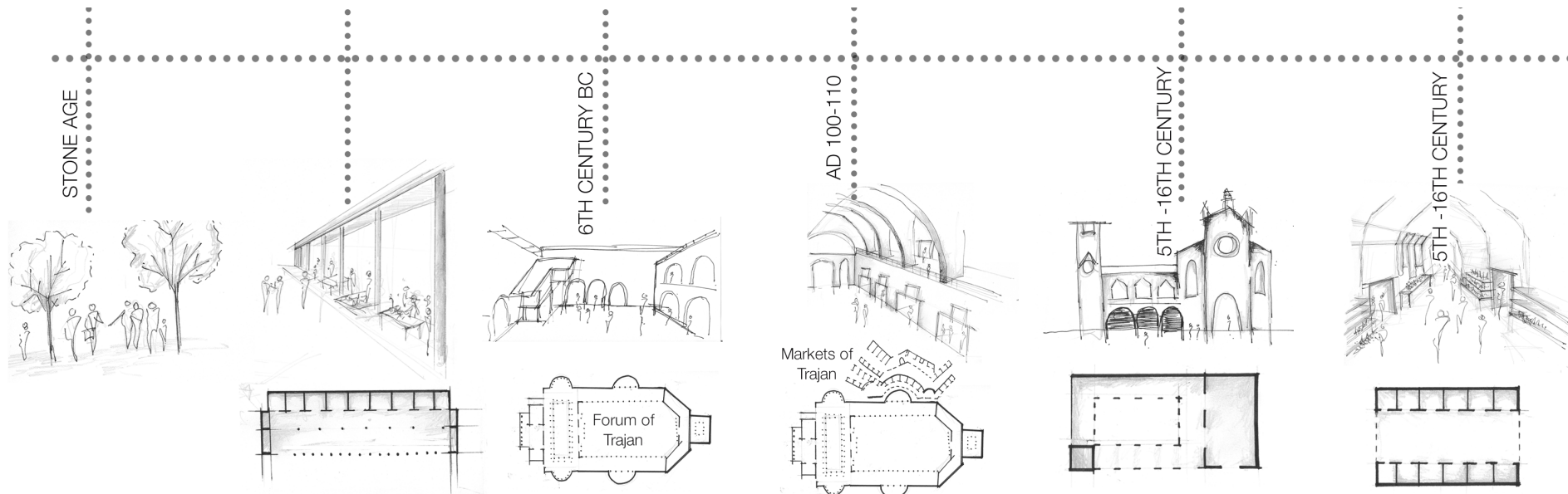
Centuries later shopping takes place in an enclosed mall which separates urbanity and shopping activities from one another. These malls are fully enclosed, environmentally controlled consumption driven spaces which have re-interpreted the urban fabric to simulate a city image and a street like atmosphere indoors. Within the closed off centre, a new city like typology is created where people eat, shop and entertain.

Existing shopping malls are opening that integrate with the urban fabric. *De-malling* is a regeneration trend where malls are not only seen as a building issue but also an urban one that needs to be addressed (Kocalili 2010:5).

Shopping malls, supermarkets and informal food hawkers occurs mainly in middle-income areas. Supermarkets dominate high-income areas and hawkers continue to dominate low-income areas (Crush & Frayne 2010:2).

The growing power and reach of shopping malls and supermarkets globally have, however, had significant negative impacts on food availability for the urban poor. By encouraging greater dependence on larger retail outlets many local markets and smaller shops, aimed at the low-income consumers, have been eradicated due to being unable to compete (Crush & Frayne 2010:7).

Mall designs offers no interactive edges to the public realm. It is surrounded by car parks and highways and offers no incentive for visitors to arrive by foot, creating a desolate environment along the streets surrounding the perimeter of the mall with a few planters in attempt to soften the monotonous facades (McMorrough 2001:195). Enclosed shopping malls separate shopping space from the city visually, physically and socially (Kocalili 2010:16).



PRE-HISTORIC

Communication was done through trade.

Earliest record of trading took place in gathering spaces (Coleman 2007:19).

STONE AGE

Exchange of flint and obsidian. This trading allowed for urbanisation progress in the Neo-lithic ages. The obsidian trade grew so much that the whole city became a market place in function (Jacobs 1969).

GREEK AGORA

Open 'place of assembly'.

Located on the crossings of main roads of the city and surrounded by public buildings.

Most important function of the space: daily communication as well as informal and formal assembly (Mumford 1961).

Merchants spread their wares under the colonnades of the Stoa, which was purposely designated for their activity (Kocaili 2010:25).

Genesis of modern urban space (Rubenstein 1992:2).

FORUM

Market place of an ancient Roman city.

Similar to the Greek Agora, major cities of the Roman period formed open spaces as centre of the civic life.

Forum was a rectangular courtyard surrounded by shops, located on the axis between the basilica and capitol.

Shops were temporary. Shopping took place in both the buildings and the forum space (Coleman 2007:19)

Forum Holitorium: vegetable, herbs and oil market (Kocaili 2010:28).

TRAJAN'S MARKET

First collection of defined shops.

Important milestone in evolution of shopping places.

A new image for urban design was created through revolutionary complex of vaulted spaces for commercial and social purposes.

First example of shops being undercover and arranged on more than one level (Coleman 2007:20).

MEDIEVAL MARKET HALL AND TOWN HALL

Europe

The heart of trading and business activity of the city.

Located along market square in the centre of town.

First floor was used for administration. The ground floor remained open between columns and was used as an extension to the market. The stores were temporary. After a while the ground floor was arranged into a group of small shops.

The beginning of defined shop spaces which led to shop lined streets (Coleman 2007:21).

EASTERN BAZAAR

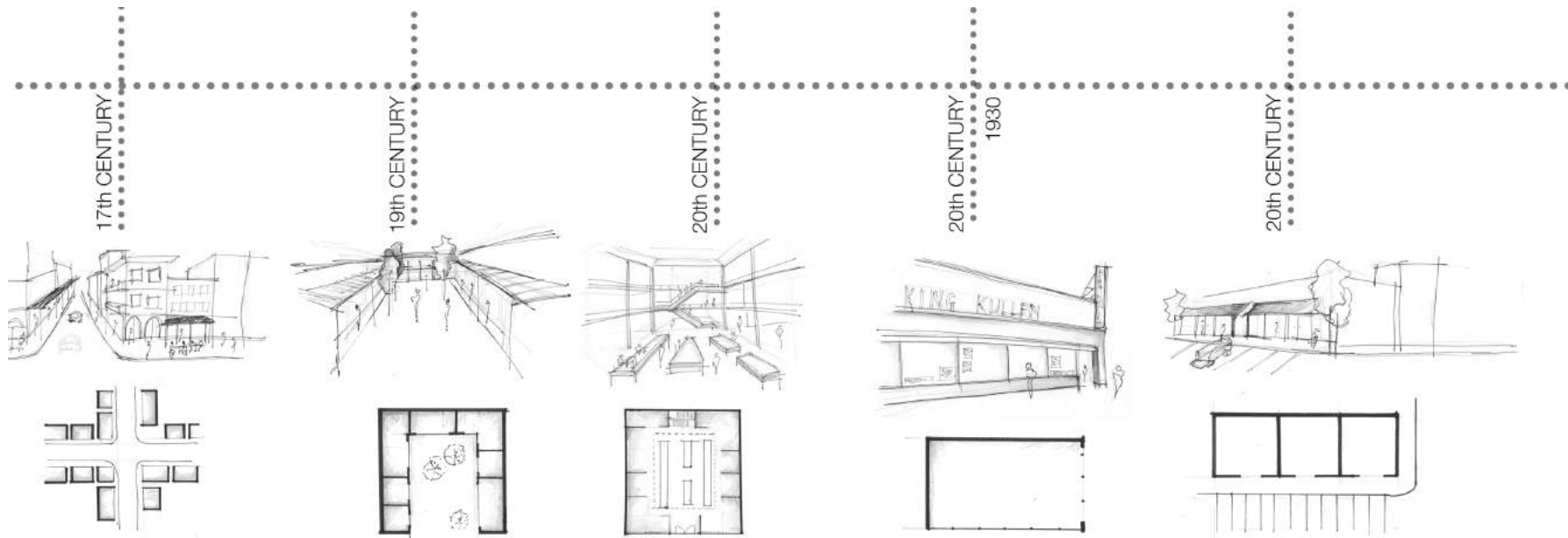
First generation of planned buildings.

Europe markets generally arranged shops to face outwards onto the squares and streets.

Eastern bazaar's generally look inward with the shops facing into a covered street or interior space (Coleman 2007:25).

Beginning of control from exterior conditions.

Grand Bazaar of Istanbul.



SHOPPING STREET
Europe

Market places spacially insufficient for evolving trade (Koolhaas 2001:30).

Ground floors transformed into shops (Beddington 1991:2). The central streets lined with shops, pubs and coffee shops. (Coleman 2007:26).

Important to the evolution of arcades (Coleman 2007:26).

Separation of the vehicular and pedestrian traffic. A more comfortable and safe concept of shopping preceding present shopping malls (Rubenstein 1992:14).

19th century

The market structure was based on open courtyards surrounded by arcade lined stalls and shops.

ARCADE
Milestone in the evolution of shopping. First European building planned to accommodate a variety of shops (Coleman 2007:30).

INDUSTRIAL REVOLUTION
Technical inventions lead to the highlight of vertical movement in public (Kocaili 2010:29).

MID 20th CENTURY

Shopping centre department stores become inward looking boxes (Coleman 2007:38-39).

Chain stores become more popular than department stores (Coleman 2009:39).

SUPERMARKET

1930 first supermarket. New York (Kocaili 2010:64).

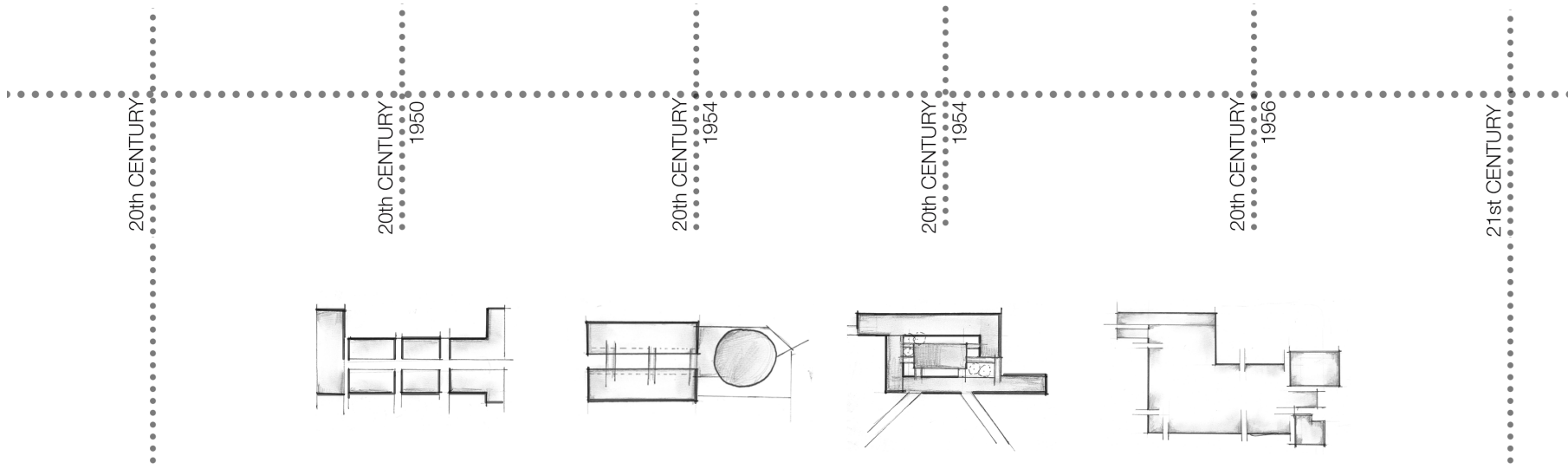
Due to new road systems, food system industrialisation (processing, packaging, networks and warehouses) and the development of refrigeration supermarkets grow in success.

Convenient access to highways. Free parking. (Coleman 2007:40)

STRIP MALL

Car friendly. Collection of several stores located in the same building that share a common parking lot.

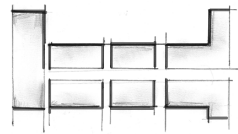
Sitting on major intersections with fewer stores. Open market plan (Kocaili 2010:67).



SHOPPING MALL

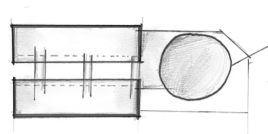
Mid 20th Century (USA)
Increased population and urbanities seeing to escape urban conditions (Coleman 2007:42)

Evolution in environmental engineering. Advanced lighting, airconditioning and ventilation facilitated development of enclosed malls (Beddington 1991:3)



OPEN AIR SUBURBAN SHOPPING MALL

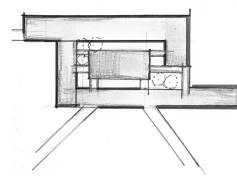
1950
First open air mall. Shops arranged either side of long linear pedestrianised walkway (Coleman 2007:42).



SHOPPING MALL

1954
Morris Ketchum Shopper's world (Koolhaas 2001:34). Dumbbell Plan.

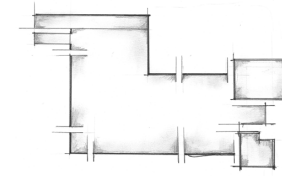
Department store anchors are connected by an outdoor pedestrian mall.



SHOPPING MALL

1954
Victor Gruen Northland Shopping Centre

Cluster of shops around a central department store. 3x pedestrianised streets.



SHOPPING MALL

1956
Southdale

First fully enclosed and environmentally controlled shopping mall (Koolhaas 2001:34)

Southdale expanded the role of a mall as a social and community centre. Many events could be held and thus new forms of civic life (Crawford 2002:25).

Recent focus is turned towards town centre development.

Open and covered street spaces are trendy.

Urban public space quality of shopping places is becoming more important.

Environmental awareness has increased in social pressure to ensure facilities are more sustainable.

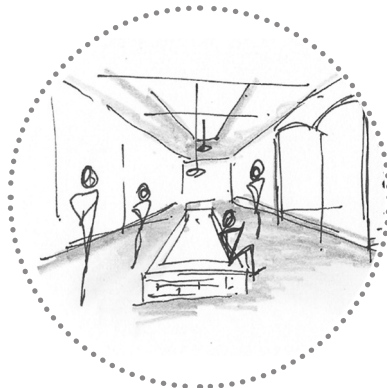


Figure 65 : Sketch of the interior of a typical shopping mall (Author 2016)



Figure 66 : Trading at the Asiatic Bazaar (Author 2016)

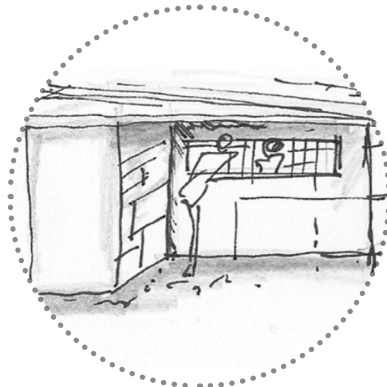


Figure 67 : Informal retail in Plastic View (Author 2016)

woodlands boulevard

Through the development analysis of shopping malls, Woodlands Boulevard in this instance and much like many other centres, is a fully enclosed and environmentally controlled shopping mall. It makes no attempt in engaging with the surrounding context and existing patterns of the area. The area is clearly zoned with very little diversity and amalgamation between the different zones. The mall and its enclosed nature speaks to the language of the gated communities and thus contributes to the overall loss of urban public space.

The zoning seen is a manifestation of Modernist principles, which proposed a segmented and sterile city where dining and shopping were hidden in interior spaces and agricultural production occurred in distant locations (Franck 2005:10). In recent years, a revival of food-centered spaces in cities around the world has tried to re-establish a sustainable connection between food and urban space (Mand & Cilliers 2012:1).

Within the mall, the once preferred internalised food courts have now made way for cafes and restaurant clusters scattered throughout the mall to offer the customer more variety and increase diversity (Coleman 2006: 304). This, however, still does not address the issues of the lack of urban integration and has yet to encourage lingering social interactions due to the fast pace consumerist nature of the mall.

formal vs informal

In South Africa, the small businesses that are central to growth and employment opportunities are threatened by the shopping malls. Since the end of the 1990s property developers built shopping malls closer to townships and informal settlements, which began to exploit the market and energy potential surrounding informal trade (Kohler 2010). The dynamics of informal trade have since been altered and although the formal centres are situated conveniently; they lack the energy exchange and social interaction surrounding informal trade.

Similar to Parham, Steel (2009: 110) believes that although some food-centred urban spaces or marketplaces are nostalgic or superficial, they generate authentic life. When food creates and shapes spaces within a city, the spaces develop a quality that transcends the predictable shop and restaurant chains that form the support of commercial functions.

It is important to note that although the modernist approach has been taken up in terms of food, the success of farmers' markets around the world indicates that people have not lost their appetite for encounters with food in the city. At the same time it acts as a manifestation of our overwhelming disconnection with food (Steel 2009:111) since visiting a weekly fresh produce market is no longer a routine but an activity that only occurs on special occasions.

Joburg Market

Joburg Market, formally known as Johannesburg Fresh Produce Market, is a central destination for producers, shopkeepers, informal traders and many others who form part of the average 10 000 people who come together daily.

Large farm trucks offload produce at speed while deals are being made between produce agents and vehicles. Cars, bakkies, vans and taxi's are filled with all sorts of produce ranging from potatoes, bananas, onions, chillies, lettuces, cabbages, apples and tomatoes. There are a few who will just leave with a box of two.

The market is supplied by approximately 5000 farmers, making it the largest fresh produce market in the world in terms of volume. The Tshwane Fresh Produce Market, at half the size, is the country's second-biggest (Sherry 2012).

The substantial support that this market receives shows the value of affordable and accessible fresh produce to a variety of individuals.

The market has regenerated the area due to the constant influx of activity and vibrant nature of traders negotiating throughout the space. This demonstrates, that infrastructure is not necessary to allow for a successful producer-consumer relationship.



Figure 68 : Tshwane Fresh Produce Market (Tshwane)



Figure 70 : Interior of Woodlands Boulevard (LP Architects)



Figure 69 : Exterior of Joburg Market (Sherry 2012)

In comparison, the interior of a mall does not promote engagement between producer and consumer. As illustrated above, the space lacks the energy created by social interaction and negotiation.

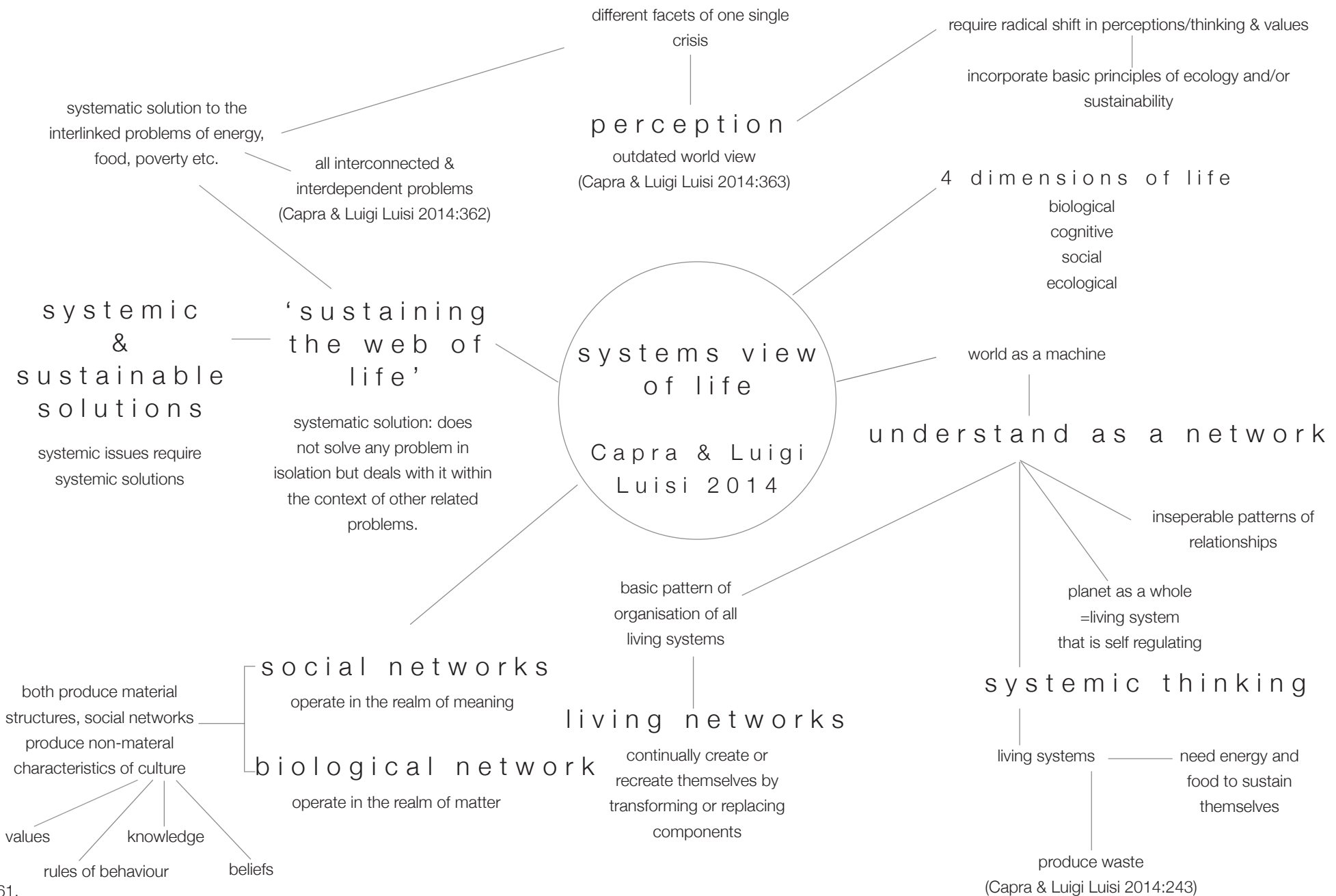
Informal trading opportunities (figure 70) surround the Joburg market adding to the social and economic aspect of the site as they provide for a different income bracket.

development interpretation

In ancient market places, shopping environments were defined as public space and urban areas that did not only serve for trade but were important for communication and participation. As seen through the analysis, throughout the ages markets progressively advanced into more formal and enclosed spaces, supermarkets and malls, in order to increase environmental control. Although the enclosed spaces can host a variety of functions, they do not contribute to external conditions and have thus led to the decrease in quality of urban spaces (Kocaili 2010:155).

Therefore, there is a need for a physical urban regeneration and interpretation of a shopping centre that successfully accommodates social and economic activity through the basis of sustainable and environmental awareness (Kocaili 2010:152). It is essential to develop and merge a new typology of shopping centres into the urban fabric that provides the space and opportunities for participation in modern community life that the ancient Greek Agora, the Medieval Market Place and Town Squares provided for communities in the past (Kocaili 2010:5).

Informal settlements, such as Plastic View, have a positive impact on the community in regards to public space due to social and environmental interaction surrounding trade. This is a good base to start development for an improved trading hub.



61. Figure 71 : Graphical representation of the systems view of life (Capra & Luigi Luisi 2014) (Author 2016)

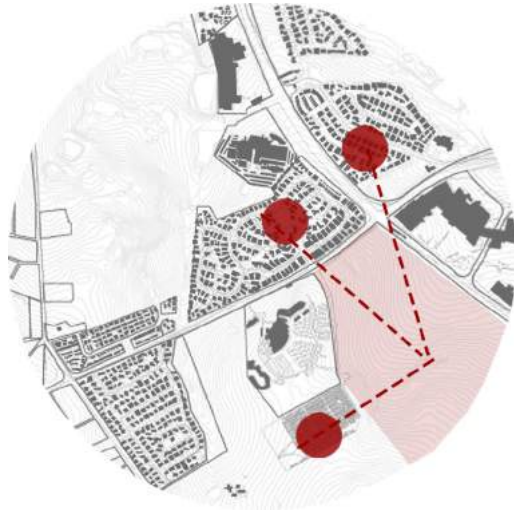


Figure 72 : Drawing in energy and resources from gated communities (Author 2016)

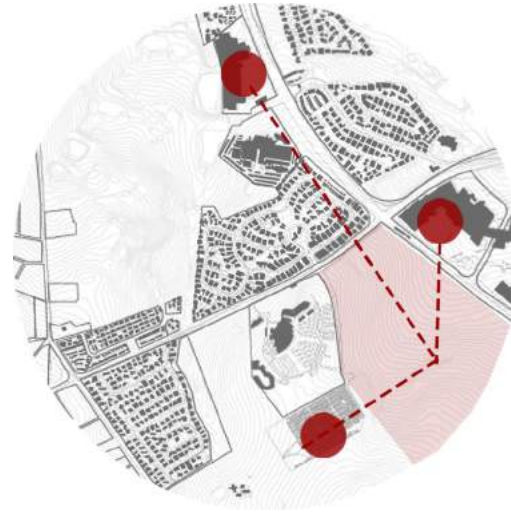


Figure 73 :Drawing in energy from enclosed malls, shopping centres and informal trade from Plastic View onto proposed site (Author 2016)

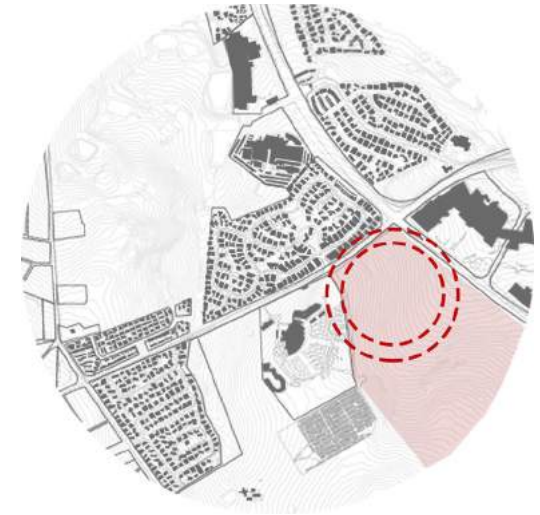


Figure 74 :Amalgamation of energy and resources onto the new site to create an integrated community (Author 2016)

ARCHITECTURAL INTENTION a systemic approach

*Caballero, Epidemiologic Reviews in 2007 writes:
The built environment represents the working and living conditions collectively created by societies and is a key determinant of opportunities and restriction to food consumption and physical activity.*

(Joubert 2012:184)

Capra and Luigi Luisi (2014) describe the importance of an ecological world view, that it is important to see parts as integrated wholes and not to isolate them from the overall issues at hand. With a systems view in mind, essential properties of a system are properties of a whole that none of the parts have.

The properties of a whole stem from relationships and interactions between the various parts and are destroyed when the system as a whole is broken down, theoretically or physically, into isolated elements (Capra & Luigi Luisi 2014:65).

The intention is thus to use an architectural intervention by means of a systemic approach, whereby each system of the food process holds essential properties of the whole food network. A systemic solution entails that no problem can be solved within isolation but deals with the issue within the context of other interrelated problems (Capra & Luigi Luisi 2014)

The systemic approach will highlight the importance of localised food-centred urban spaces as a large part of the food network and thus enable the generation of an accessible, economical and socially sustainable response to the way in which the food system integrates with the city.

3

SITE SELECTION

urban intention

The overall urban intention to stitch the fragmented urban fabric through the provision of adequate service delivery for basic needs is achieved through creating a variety of service provision networks that interlink with one another. Resolving the urban issues of inaccessibility due to limited infrastructure and urban fragmentation will aid in creating inclusive environments and reduce the growing inequalities of access to economic and social opportunities. In order to accomplish the intention the urban framework suggests a large increase in density that would enable the networks to function.

architectural intention

Throughout the food system the main architectural implication is isolation of the individual processes and lack of integration into the urban fabric. The consequences, increase in food prices, resources and human capital has led to the decrease in access to food and thus a serious decline in food security.

In order to combat these consequences, the food system needs to be reassessed as a whole in order to effectively integrate the systems into the urban fabric and allow for various activities to centre around food. Hamdi (2004), in his book *Small Change: About the art of practice and the limits of planning in cities*, writes about communities of place. He states that although communities are spatial

it is of more importance that communities within cities should be spatially considered in regards to porous systems and networks.

Therefore the ideal location to initiate this gastronomic node would be one that focuses on the underlying reason for the decline in food security: accessibility. Hamdi (2004), also writes about communities of place. He emphasises that place is important and should assume more importance over space. Security and accessibility of a place should take priority over identity, especially when considering the elderly, disabled or vulnerable (Hamdi 2004:70).

The selected site should allow for an architectural intervention that will facilitate the integration of urban, spatial, environmental and social aspects by addressing the current issues found throughout the food system.

In *A Pattern Language* (1977), Christopher Alexander, suggests that instead of trying to build from scratch we are better off growing good places and spaces. The chosen site should allow for the project to be built on to an already initiated energy transfer that is seen as a positively active space. The chosen site is thus the bus stop implemented within the urban vision, as it will be a strong base to grow the gastronomic centre.

the selection

The bus stop allows for an integral approach to the gastronomic quarter that already facilitates the movement and accessibility of surrounding residents and users. The relationship between place and its identity needs to favour community empowerment where as spatial sense of community can change over time (Hamdi 2004:70). By incorporating the bus stop into the scheme it provides a destination, a strong sense of place, which enables the immediate community and encourages them to activate the space through socio-economic means.

65.

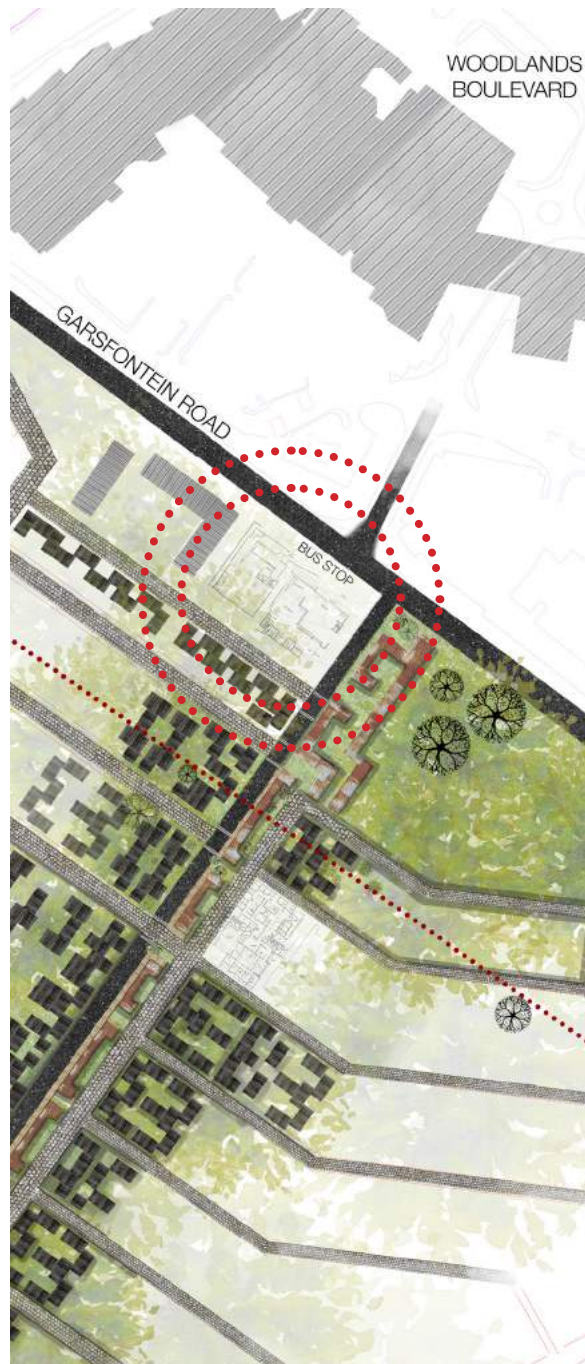


Figure 75 : Position of site within urban vision (Author 2016)



Figure 76 : Mixed-use high density photo collage (MArch(prof)2016)

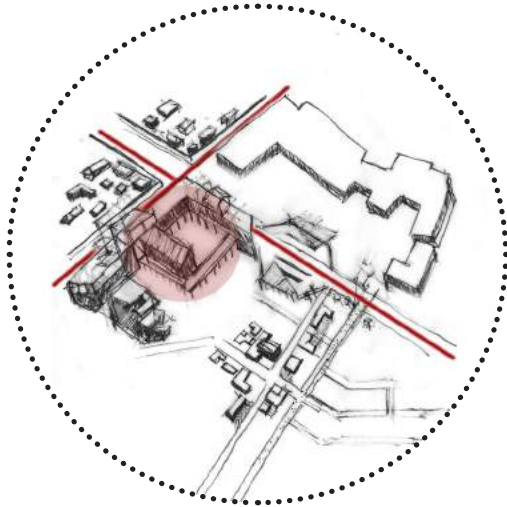


Figure 77 : Position of mixed-use high-density building (Author 2016)

MIXED-USE HIGH-DENSITY

To the North of the site the urban vision suggests a mixed-use high-density urban centre that facilitates offices, coffee shops and retail opportunities.

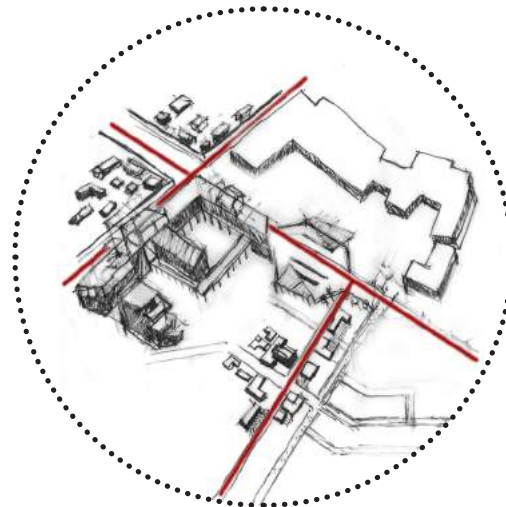


Figure 78 : Position of main vehicular routes (Author 2016)

VEHICULAR TRAFFIC

South of the site is the main vehicular road that intersects the site as a whole thus providing an opportunity for public interaction and the influx of high intensity energy into the site.

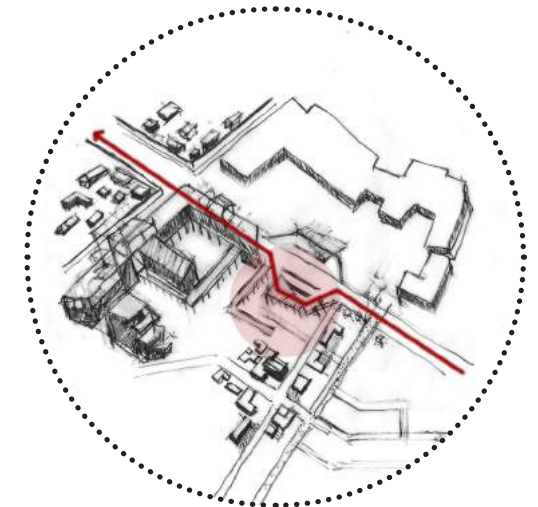


Figure 79 : Position of bus stop (Author 2016)

PUBLIC TRANSPORT

The bus stop creates a destination and a means of filtering energy into site.

It will be used frequently as it is in close proximity of Woodlands Boulevard, high-density urban centre and the surrounding medium-high density residential units. The units are throughout the framework and this bus stop, being on the main street, becomes an important node of access.

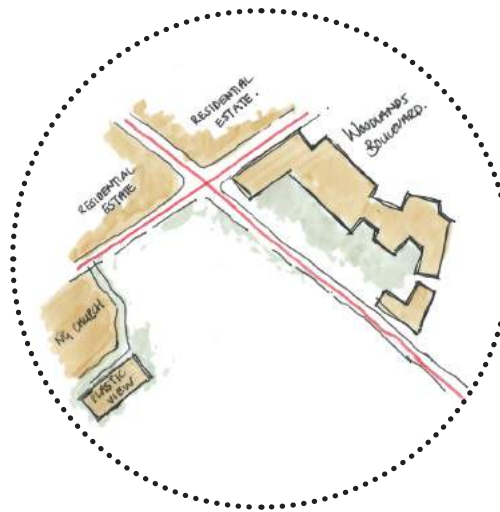


Figure 80 : Energy within site boundaries (Author 2016)

SITE AS IT STANDS

Energy is contained within the gated estates and Woodlands Boulevard. Majority of the site sits deprived of energy making it more emphasised as an island.

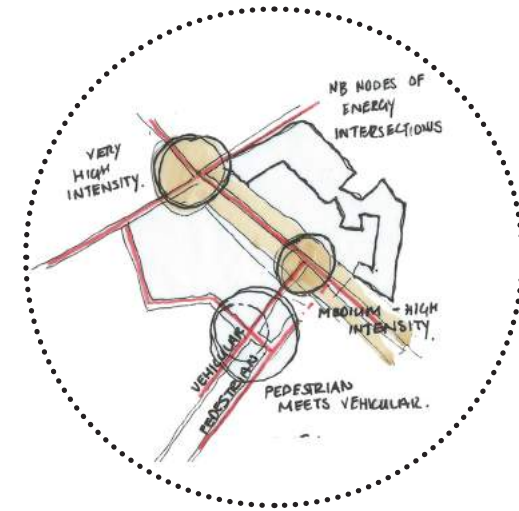


Figure 81 : Vital energy nodes within the site (Author 2016)

IMPORTANT ENERGY NODES

Prominent nodes of energy, excluding the mall and estates, are the vehicular intersections as well as where the pedestrian and vehicular routes meet as they allow for exchange of energy.

ENERGY FLOW site vision

Energy is important to consider due to the site being isolated from service provision and basic amenities. Woodlands Boulevard and the gated communities contain energy within their infrastructure.

It becomes crucial to enable the site through an intervention that does not only retain energy but also releases it throughout the rest of the urban development in order to create a successful destination for socio-economic development.

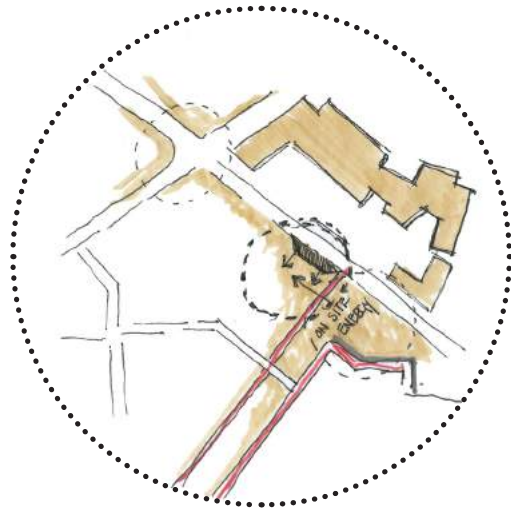


Figure 82 :Energy surrounding bus stop (Author 2016)

NEW NODE_BUS STOP

The newly proposed bus stop becomes a new source of energy. It allows for energy to be transferred onto the site directly.

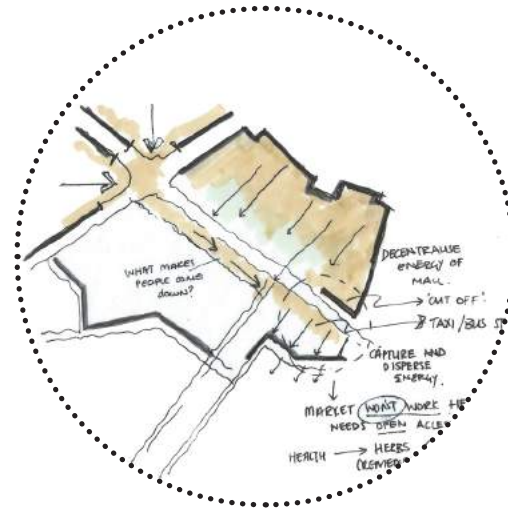


Figure 83 :Potential energy release (Author 2016)

ENERGY RELEASE

The bus stop encourages energy release from Woodlands Boulevard as well as the gated communities.

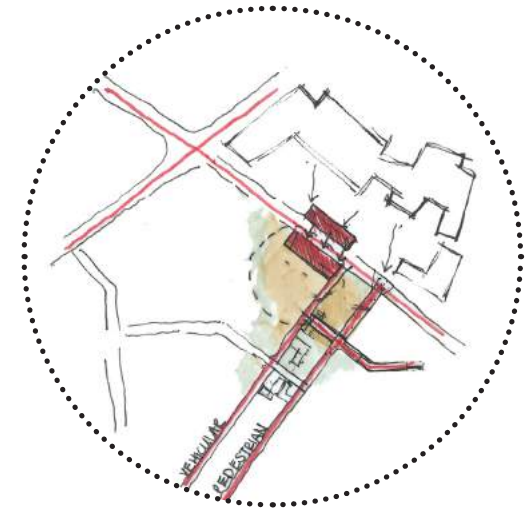


Figure 84 :Potential energy transfer (Author 2016)

ENERGY TRANSFER

Through the transfer of energy from the mall and the bus stop it is important to add infrastructure and services to retain the energy within the site. As a site selection, this node is important to develop in order to fully activate the site.

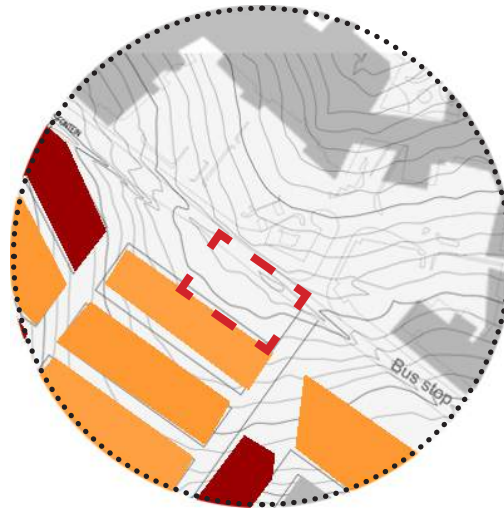


Figure 85 : Residential density on chosen site (MArch (Prof) 2016)

DENSITY

The site is predominately surrounded by medium-high density residential units. These consist of 3-5 storey walk up units.

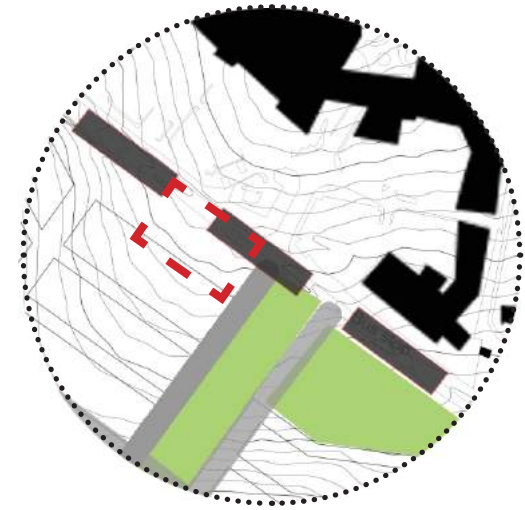
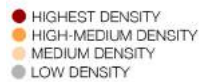


Figure 86 : Environmental reservation on chosen site (MArch (Prof) 2016)

ENVIRONMENTAL AREA

The chosen site sits alongside the reserved environmental area. This space has been intentionally left open for recreational use and to counteract the enclosed nature of surrounding housing estates.

spatial analysis
decentralise. localise. empower.

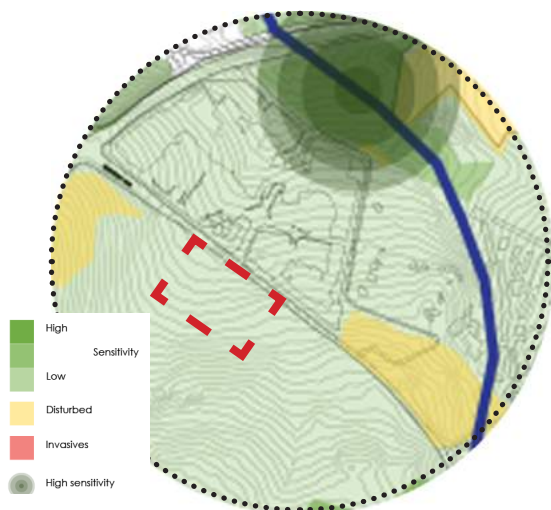


Figure 87 : Ecological sensitivity (MArch (Prof) 2016)

WATERSHED

The selected site is situated on a watershed, an area of land from which all water drains, running downhill, to a shared destination. Development on such a site needs to be approached sensitively as to maintain the site in its natural condition.

Conversion from predominantly vegetated land use to urban uses may result in tremendous reductions in watershed's absorption capacity. The proposed design thus needs to utilise and manage water usage on site effectively (Srinivas 2016).

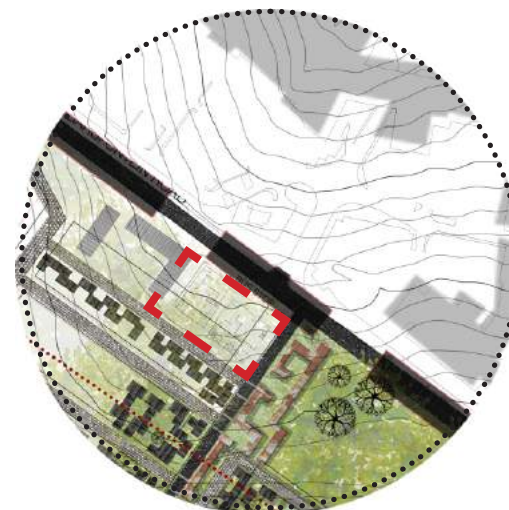


Figure 88 : Confines of chosen site (Author 2016)

SPATIAL CONSIDERATIONS

Due to restrictions set by the urban framework, the site sits between a mixed-use multifunctional centre, medium-high density residential units and the greenbelt.

The size of the site sits at roughly 1000m².

In order to accommodate existing conditions and the urban framework proposal, the architectural design needs to adhere to the various densities and restrictions.

Due to the watershed and space available on site on which to build, alternatives to agricultural land production need to be considered.

4 CONCEPTUAL APPROACH

decentralise. localise. empower.

enabling communities through local and sustainable
socio-economic systems

In order to place focus on immediate communities and bring about more opportunities food systems need to be centralised and released from a single point of control. By breaking down one large system into multiple small systems that are sustained within their immediate context more economic prospects become available for locals. Instead of relying on exports and systems that are very centralised, each community should be involved with a smaller decentralised model that enables the community as a whole and promotes holistic thinking.

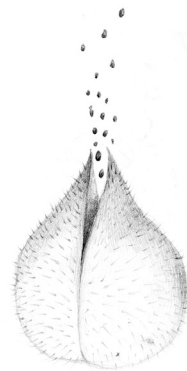


Figure 89 : Conceptual sketches (Author 2016)

DECENTRALISE

The aim is to enable local points of urban acupuncture that encourage communities to get involved with urban agriculture and realise the value in locally grown crops and products. Easier access to food allows for a more food secure environment. Through local production and increase of job opportunities money is able to stay within the community and in turn aids in the advancement of local resources.

LOCALISE

In order to activate points of acupuncture reliance must fall on more systematic thinking and creating an environment through which everything is integrative on an immediate scale. Thus limiting the waste of resources and encouraging a holistic approach (Capra & Luigi Luisi) allowing for communities to prosper without needing external assistance or reliance on larger networks.

EMPOWER

To effectively enable the immediate community a space and system needs to be created that brings together and empowers society as well as individuals and local initiatives through local support and increased economic opportunity. By allowing individuals to gain confidence in their urban environment future prospects encourage socio-economic growth.

the moshav

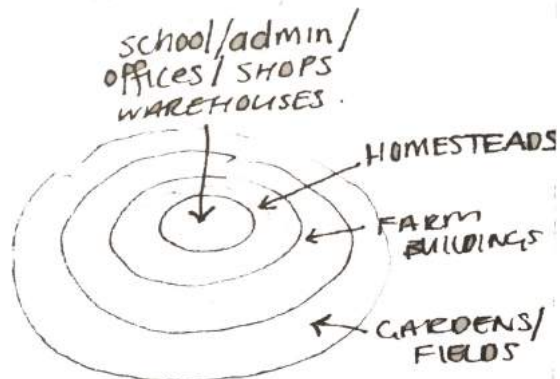


Figure 90 :The Moshav conceptual layout (Author 2016)

The concept of the Moshav, a cooperative Workers' Settlement, developed in 1919 and was formulated that year in a publication by E. L. Yaffe. In 1921, Yaffe and the young women and men who shared his visions, began to initiate a new type of agricultural settlement. It was thought that the kibbutz, everything is communal and shared, was limiting in terms of personal initiative and a sense of achievement due to the social structure thereof. Thus, Yaffe and his team were inspired to create a new type of farmer that belonged to a socially just society as a foundation for a free nation (Israel Philatelic Federation 2016).

The aim was to establish a society that built on the family as the fundamental unit, in which each family unit would have the same opportunities within a structure of social guidelines based on the following four principles:

- national land
- self-labor
- mutual assistance
- co-operative marketing and buying.



Figure 91 :The Moshav urban layout (amusingplanet.com)

Unlike the kibbutz, within the moshav you provide for your family first and excess goes to the community.

urban farming revolution cuba havana

Cuba was cut off from trade with the Soviet Bloc in 1989 due to the collapse of the Soviet Union. Cuba was reliant on the Soviet Union for chemical imports for fertilisers and pesticides. Owing to the drop in oil availability, limiting farming machinery use, the small island struggled to produce and export sugar and citrus fruits in order to gain critical imports such as corn, cereals and meat that had become the Cuban staple diet (Clouse 2014). The result was an economic crisis that quickly led to a food crisis. Residents lost up to 1/3 of their daily calories.

In response, the Cuban government promoted urban agriculture at various scales, which initiated the beginning of Cuba's Green Revolution System of Agriculture (McKibben 2005:62). The idea behind the revolution was to provide local, affordable and accessible foodshed (like a watershed that feeds water into a specific area, a foodshed is a geographic region that produces the food that a particular population depends upon) that includes organic farming methods, production of useful edible crops and peasant labour (Clouse 2014).

The systematic approach meant that all landscapes had to be rethought out to ensure maximum productivity. Food production infrastructure has since been woven into the existing urban fabric, ranging from backyards to large peri-urban farms, in order to introduce food production into the city (Clouse 2014).

The Cuban government also supports the urban growing efforts through other programmes such as training and support, hosting subsidised agricultural stores, pesticide labs and compost sites. This top-down state support and ground-up citizen participation has led to over 35000ha of land being effectively used for urban agriculture (Koont 2009:1).

conclusion

Cuba's Green Revolution stands out as one of the most successful examples of urban agriculture in the world. The urban farming incorporates grassroots organising, shared educational and technical support and the appropriation of public space to be utilised for growing. Cuba's model is affordable, comprehensive, accessible and organic and should thus be implemented in other areas to help combat food insecurity (Clouse 2014).

In order to decentralise, localise and empower, members within the community need to be able to provide for themselves and satisfy their needs to be able to contribute to the overall growth of society. The moshav initiates the concept of developing personal initiative and thus is a good basis from which to theoretically initiate this dissertation from a conceptual point.



Figure 92 : Cuba Havana urban agriculture initiatives (Clouse 2014).

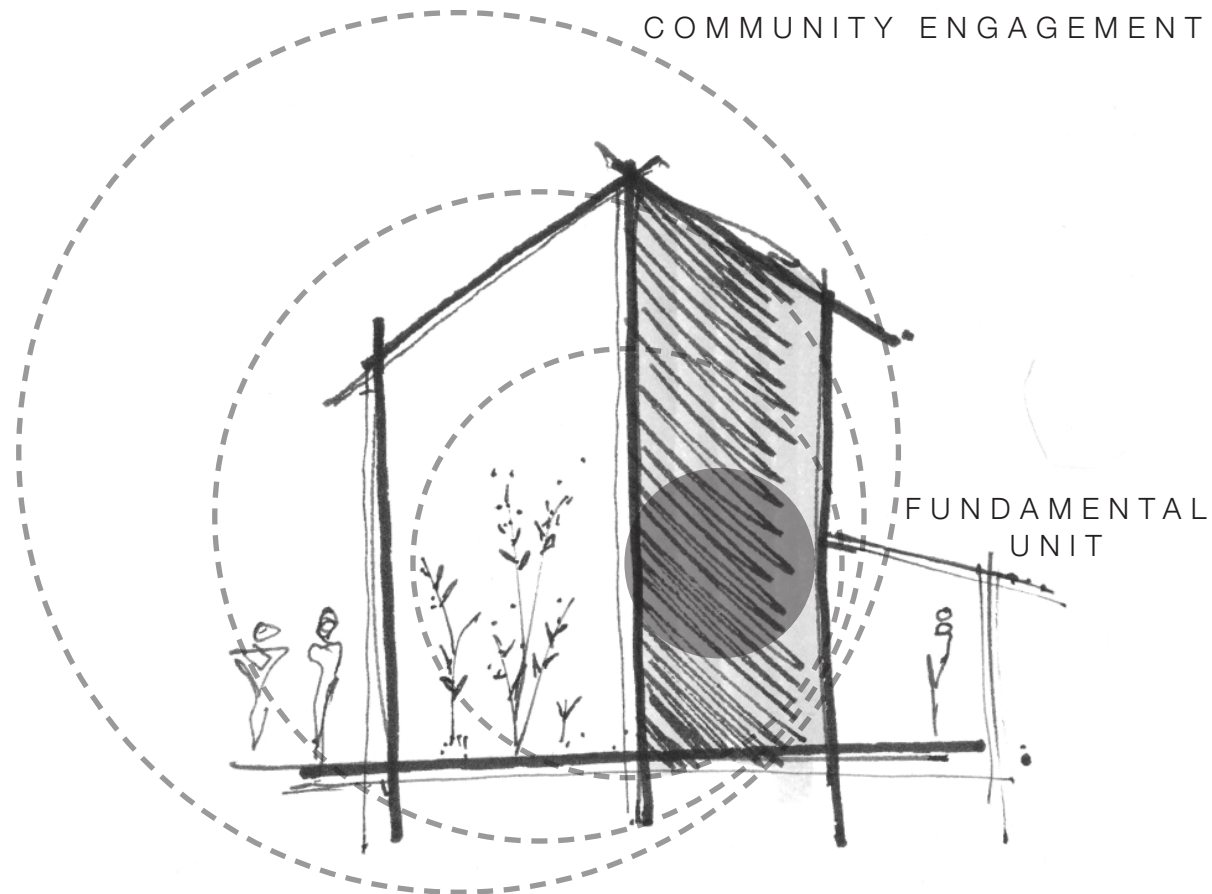


Figure 93 : Cuba Havana urban agriculture initiatives (Clouse 2014).



75.

Figure 94 : Conceptual collage_community orientated food production (Author 2016)



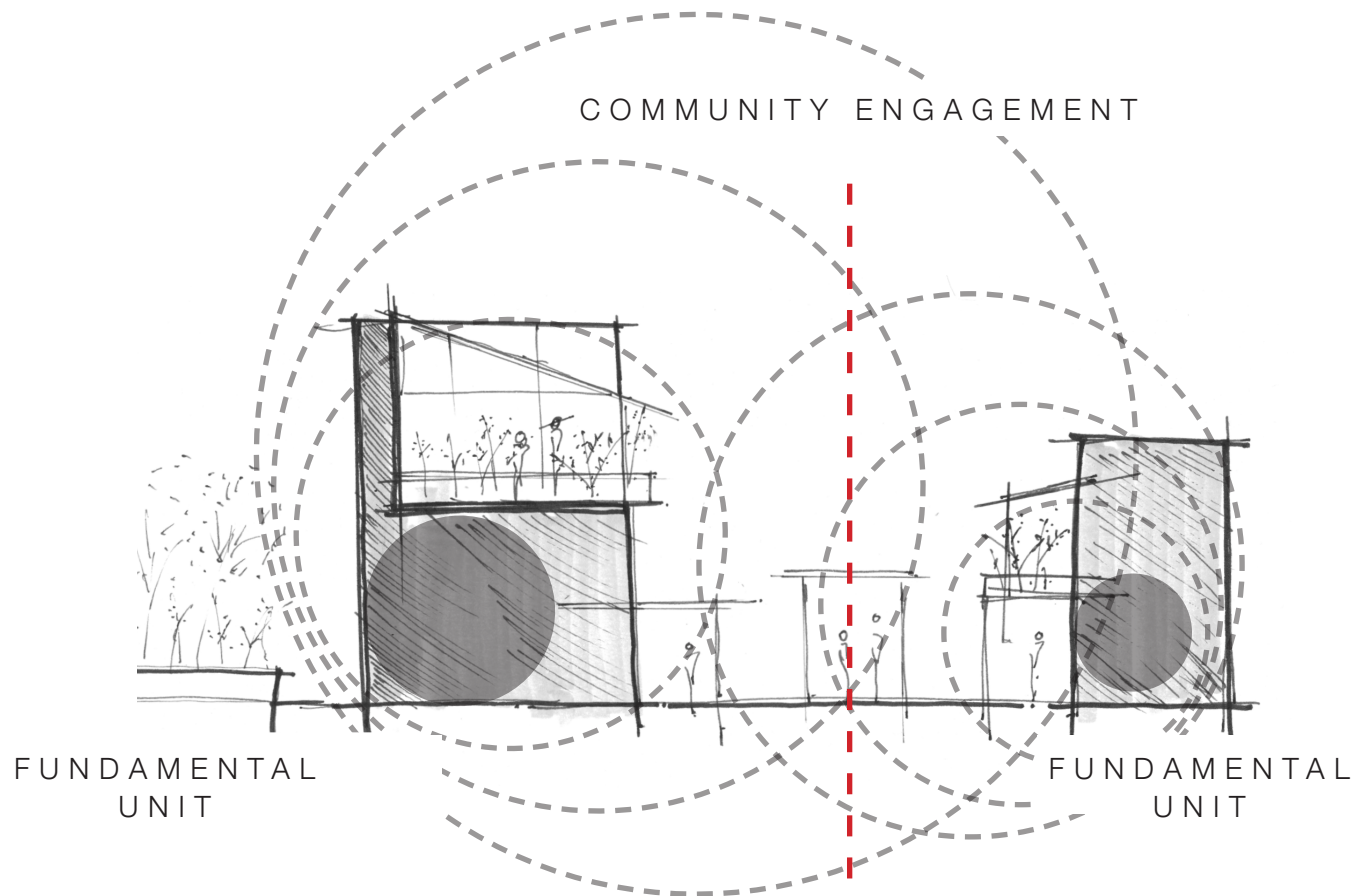
The conceptual collage of the greenhouse (figure...) was created with the concept of the Moshav in mind. The idea is to create a structure that encompasses a variety of functions that are sustainable within a community.

The residential unit sits within the greenhouse structure and forms the fundamental unit from which everything radiates. Production is the responsibility of the residents but is not limited to them. Communal participation is encouraged which aims to revive social interactions and create a sense of local support. Residents take only what is needed and the excess is provided to the community.

Figure 95 : Conceptual diagram_community orientated food production based on the Moshav (Author 2016)



77. Figure 96 : Conceptual collage_community orientated food retail and trading opportunities (Author 2016)



With more of an influence from Cuba Havana, the conceptual collage (figure...) focuses more on the integration of food production into the existing urban fabric.

Due to lack of open ground for agricultural means, the use of vertical infrastructure becomes very effective. The utilisation of balconies for food growth is a valuable use of space and also allows for ownership over the production.

Individuals would be encouraged to sell excess fruit and vegetables within the local community, thus following a similar concept of the Moshav. This enables local and affordable access to food as well as a successful integration of the urban environment.

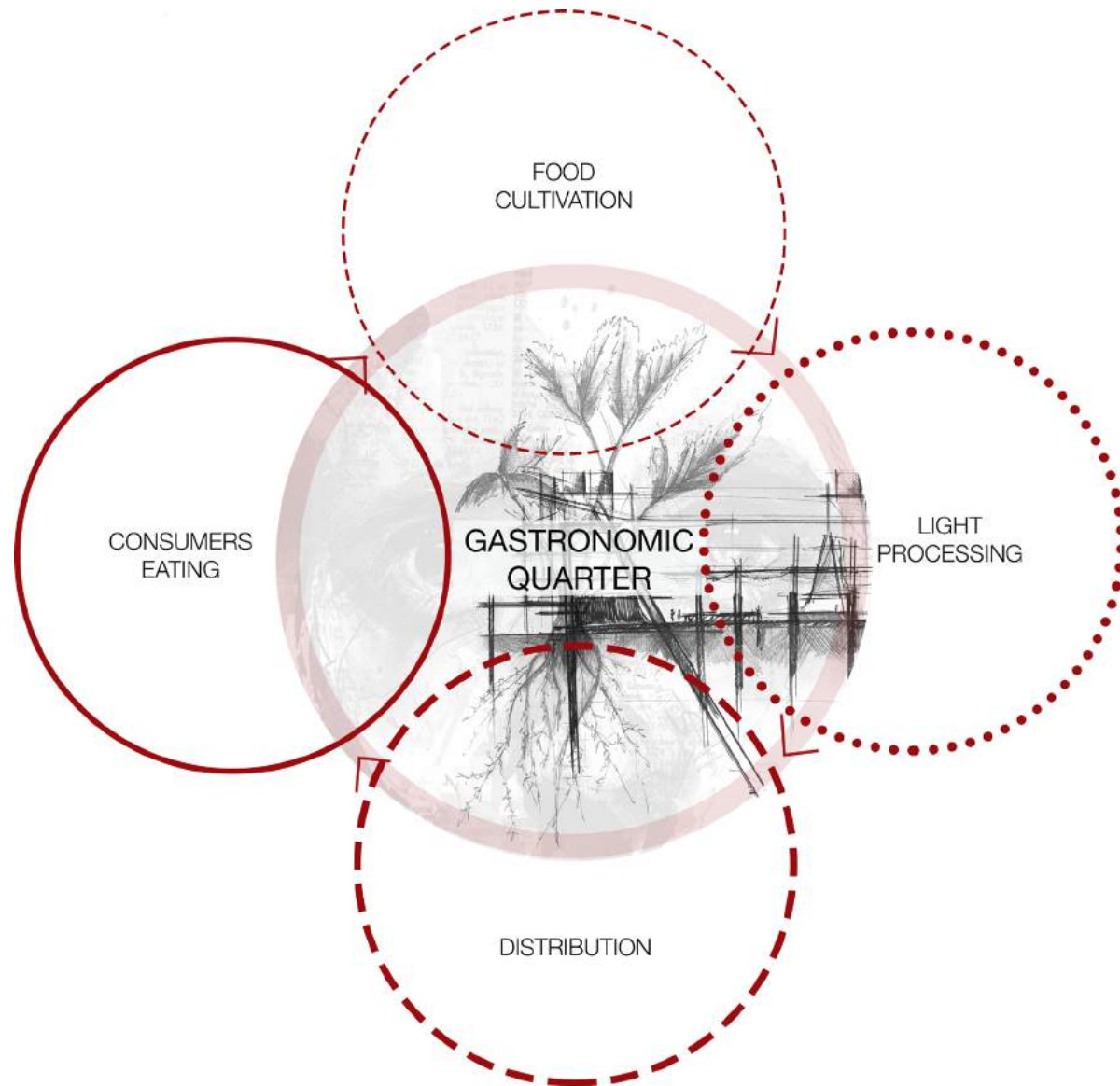
Figure 97 : Conceptual diagram_community orientated food production based on the principles of Cuba Havana (Author 2016)

PROGRAMME

a gastronomic quarter

The primary cause of food insecurity, amid the urban populations, is not production but accessibility. In urban regions, accessibility is based on the individual or collective household's ability to afford food, which in turn centers on the income of the household, the location of food outlets and the price of the food (Crush & Frayne 2011). Spatial implications of the food system and the various processes that make it up have resulted in social, economic and environmental implications that add to the decrease of accessibility and thus have had large consequences with regard to food security and the decline thereof.

Building a city up and not out allows for shorter travel distances, easier access to public transport, discourages single car ownership and occupancy. Denser cities are easier to service as moving and storing food in and around a tightly packed city is cheaper than doing so in a wide, sprawling one and so it should aid in the lowering of food prices. A family that lives closer to key nodes such as transport, shops, schools and the job market will have more expendable income which allows for a better quality of life (Joubert 2012:184).



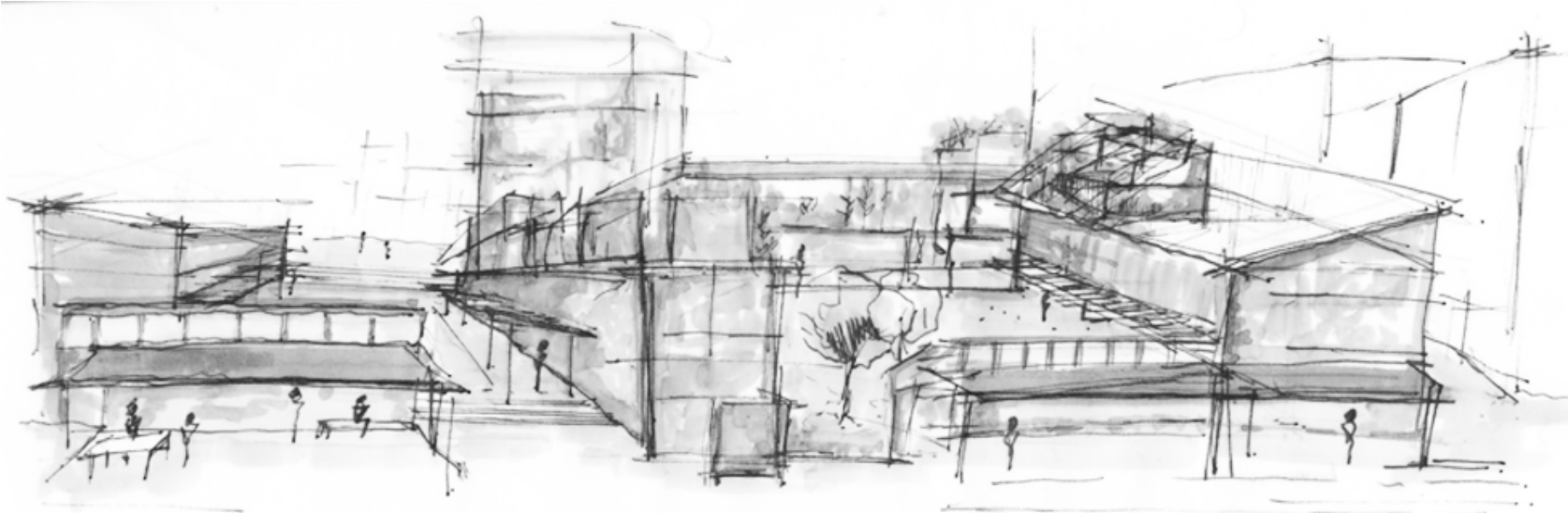


Figure 98 : Conceptual design sketch (Author 2016)

main programme

The programme aims to reconnect the site to the surrounding area through a food centred environment, otherwise known as a gastronomic quarter. A successful gastronomic quarter consists of a series of well-configured outdoor spaces that demonstrate an appropriate level of enclosure (Parham 2005:91). These spaces act as positive and vital connections to the urban fabric through the use of edges and change in scene.

The conditions of a successful gastronomic quarter relate back to the historical and traditional conditioning of cities whereby food environments demonstrated a strong marked sense of place that exhibited a healthy relationship between the form of the spaces and its various social, economic and environmental functions (Parham 2005:91).

In this instance the gastronomic quarter will aid in shortening the food chain, which will keep capital in local business and reduce middleman costs thus positively altering the economic viability of the area (Feagan 2007). Local economies thus benefit from the localised systems and allow for positive growth of new local businesses (Halweil 2002:35). The shortened food system allows for better food to be provided to the consumer as nutrients are retained and less produce is wasted via transport damage making the food more accessible in terms of costs.

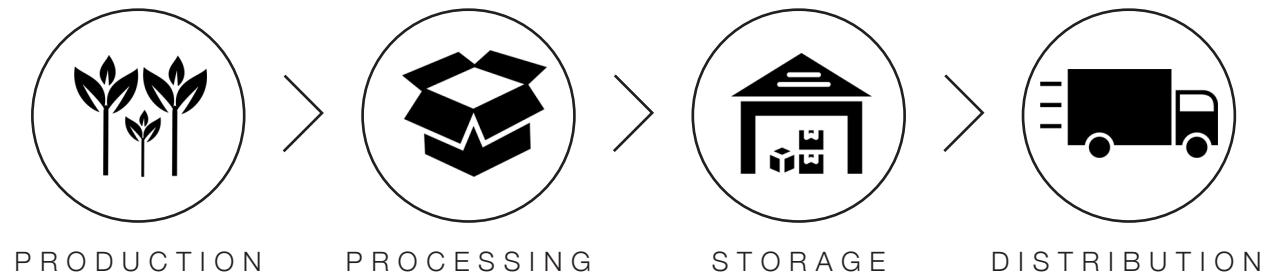
The localised space intends to include all systems and processes present in the food system in order to improve food security through the limitation of waste and the improvement of accessibility, thus aiding in transcending the socio-economic barrier present on site.

The food centred environment will bridge the large gap between the small scale and large scale distribution, a gap that needs to consider a pedestrian friendly interface that allows for much needed interaction on such an isolated site. Developments in trade can be seen as the catalyst for the regeneration of physically, socially and economically neglected areas that can contribute to new social networks (Kohler 2010). By limiting outsourced energy and localising resources, this site has the potential to improve food security and sovereignty through an architectural model that bridges the gap between formal and informal trade.

The entire food system network will take place within the designed gastronomic quarter and will have sub programmes that will support and enhance the food centred environment.

SUB-PROGRAMMES the food network

Sub programmes that support the food system and help create a healthy social environment include local businesses such as cafes, restaurants, outdoor retail spaces and cooking facilities that encourage interaction and socialisation.



current food production process

Growing the plants to be harvested.

Cleaning, sorting and packaging of fresh produce

Storage of produce for transport

Transportation of food from farm/processing plant to food service facility

proposed food production process

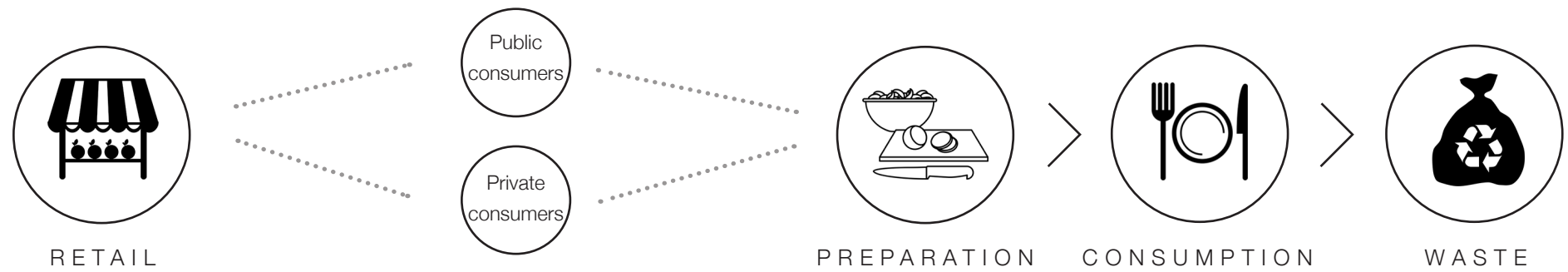
On site: Hydroponics greenhouse.

On site: no heavy or excessive packaging required.

On site: daily harvesting deems long term storage unnecessary.

On site: minimal food miles travelled. Option of daily fresh produce to be delivered via bicycle

Figure 99 : Food network system graphical representation (Author 2016)



current food production process

Restaurants, cafe's, juice bars & / Shops and markets

Public: Restaurant preparation
Private: home preparation

Public: restaurant consumer consumption.
Private: home consumption.

Public: management unique to system.
Private: trash

proposed food production process

On site: variety of restaurants, juice bars, cafes etc that use the fresh produce & / On site: daily fresh produce market.

On site: commercial food preparation exposed to consumers.

On site: singular outdoor eating area for all consumption.

On site: worm farm for leftovers and organic waste from public and private.

SUB-PROGRAMME

production



Due to the environmental conditions on site (previously mentioned in chapter 2 under Ecological Sensitivity) and the proposed urban vision of the site being vertically favourable to increase the density, an alternative to traditional means of land agriculture was researched and considered.

In order to ensure daily fresh produce, the basis of the gastronomic quarter, the food production system needs to run at optimal efficiency within the given conditions present.

Subsequent to site selection and analysis (page 82) there is insufficient horizontal space for agricultural plantations. The nature of the site also promotes vertical growth in order to increase density.

Thus, a greenhouse is the chosen method of production due to the opportunity they provide in optimising production within smaller areas and their ability to be built up vertically.

Within the context of South Africa there are multiple issues that can be resolved effectively through the utilisation of greenhouses in plant and food cultivation (figure 5). These include water conservation, soil conservation and energy conservation (Sydow 2010: 10), all of which are present within the context of the design proposal (site analysis p69-70).

SOUTH AFRICAN GREENHOUSE AND CROP PRODUCTION

ENERGY CONSERVATION

The climate conditions in South Africa are ideal for most crops and plants to be cultivated year round.

Ample natural sunlight makes supplemental lighting unnecessary for protected crops (Sydow 2010: 13).

Greenhouses within our context can take full advantage of solar light and radiation to maximize the crop yield without making use of additional energy sources.



SOIL CONSERVATION

Due to the need to build vertically, soilless media becomes an appropriate option to avoid the excessive loads that soil would place on the structure.

The prevention of soil borne diseases are creating an increasing demand for soilless media (Thomas 2012: 65).

Soilless media systems are thus important to consider within this context (to be discussed on page 91: hydroponics and aquaponics).



WATER CONSERVATION

Water conservation is considered the most important aspect of consideration due to the vast amounts of irrigation needed for crops (waste[d resources] p45) and the site falling on a watershed (site analysis p70).

Vertical agriculture limits ground water access, protected crops within a greenhouse are not exposed to rainfall (Sydow 2010: 11).

Soilless media and hydroponics growing systems are more effective within controlled environments, such as greenhouses, to achieve humidity and avoid water loss due to evaporation.



Figure 5: Diagram illustrating Relevance and Opportunities for using Greenhouses for Plant Cultivation. (Sydow 2010: 10).

gauteng agro-processing strategy

The Gauteng Agro-processing is a strategic intervention framework including recommended interventions to be undertaken in support of agro-processing development (Agriculture and Rural Development 2015:29).

The Gauteng Provincial Government, in the Gauteng Employment Growth and Development Strategy of 2009 set out a vision for the Province of *An inclusive and sustainable Gauteng City- Region that promotes a developmental and equitable society* (Agriculture and Rural Development 2015:29).

This vision is mirrored in the Gauteng City Region Economic Development Plan (2015), which envisages propelling the *Gauteng City Region into a seamlessly integrated, socially cohesive, economically inclusive region underpinned by a smart, innovation-driven, knowledge-based and green industrial and economic development* (Agriculture and Rural Development 2015:29).

In order to support the vision, steps have been taken to ensure an integrated city-region that characterised by social cohesion and economic inclusion.

The steps taken are done so through a programme of radical *Transformation, Modernisation and Reindustrialisation* of Gauteng (Agriculture and Rural Development 2015:29).

Economically, the transformation includes the creation of employment that centres around economic inclusion. This means that there is increased focus on bringing township enterprises and cooperatives into the mainstream economy (Agriculture and Rural Development 2015:29).

key challenges

Small-scale farmers, more often than not, have limited access to formal markets. This is a result of poor marketing infrastructure, inadequate access to market information and extension services as well as high transportation and transaction costs.

Many imbalances exist within the agro-processing industry. The sector is controlled by a few large players that own substantial proportions of the market share, with a number of small players who own insignificant proportion (Agriculture and Rural Development 2015:24).

South Africa is a net importer of processed agriculture, forestry and fisheries products, and an exporter of raw materials. These raw materials have the potential to be processed within South Africa for the local economy to benefit from the value addition. The processing thereof will lead to a direct decrease in the importation of processed goods.

agri-park guidelines

- One Agri-Park per District (44)
- Agri-parks must be farmer controlled.
- Agri-parks must be the catalyst around which rural industrialization will take place.
- Agri-parks must be supported by government (10 years) to ensure economic sustainability.
- Strengthen partnership between government and private sector stakeholders to ensure increased access to services (water, energy, transport) and production on the one hand, while developing existing and create new markets to strengthen and expand value-chains in-line with APAP.
- Maximise benefit to existing state land with agricultural

potential in the provinces, where possible.

- Maximise access to markets to all farmers, with a bias to emerging farmers and rural communities.
- Maximise the use of high value agricultural land (high production capability).
- Maximise use of existing agro-processing, bulk and logistics infrastructure, including having availability of water, energy and roads.
- Support growing-towns and revitalisation of rural towns, in terms of high economic growth, high population growth over past 10 years and promote rural urban linkages (Agriculture and Rural Development 2015:24).

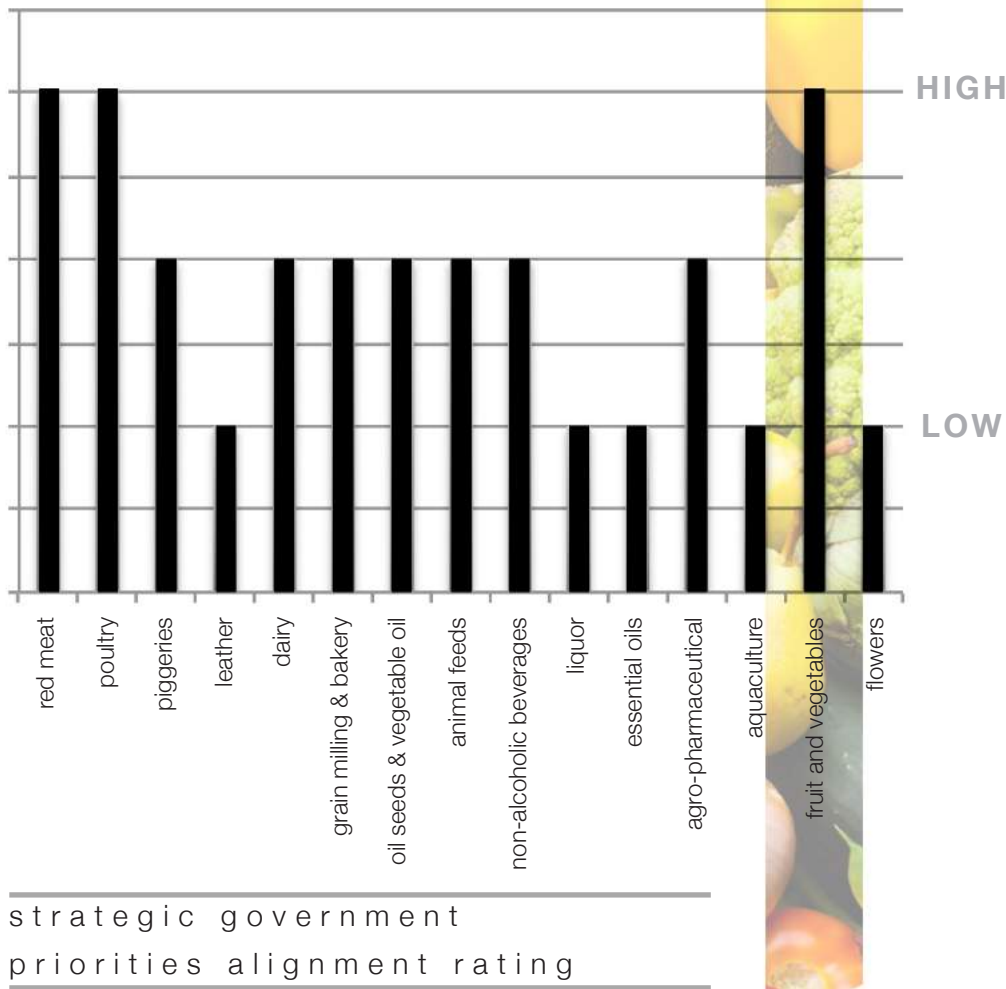
agri-park application

The implementation of the Gauteng Agro-Processing Strategy will improve market access and linkages as well as benefit the food system network as a whole, making it more accessible to a wider range of individuals. The strategy will aid in the promotion of social cohesion through the support of a mutually beneficial co-operation.

The strategy includes the implementation of Agri-parks, a networked innovation system of agro-production, processing, logistics, marketing, training and extension services, located in a District Municipality (Agriculture and Rural Development 2015:22).

The Agro Processing Strategy and Agri-parks implementation provide a good argument for the development of a new agricultural approach that aims to assist in the economic inclusion of all individuals.

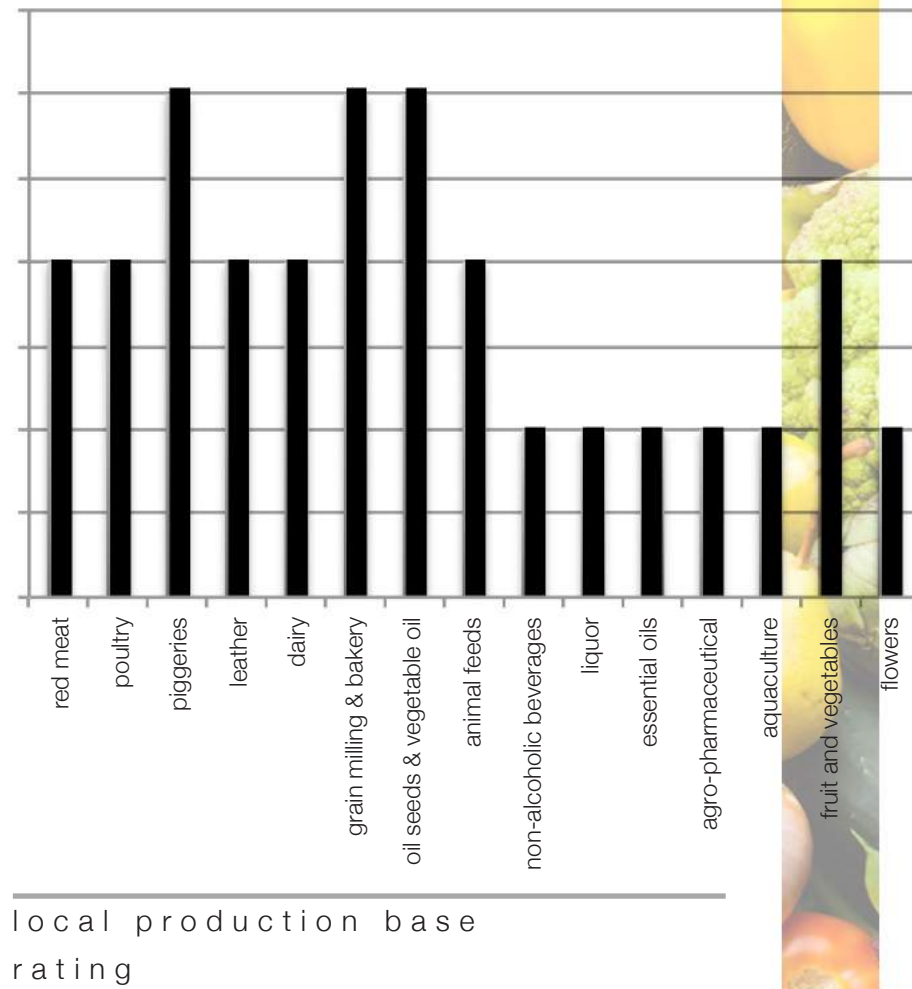
This is an effective premise to base the design proposal and its initiative to reconnect agriculture to the urban fabric.



strategic government
priorities alignment rating

This table illustrates the scores of various industries in terms of aligning with government priorities. The results indicated that the red meat, poultry and the fruit and vegetables achieved the highest scores (Agriculture and Rural Development 2015:26).

Figure 100 : Government priorities_graphical representation (Author 2016)

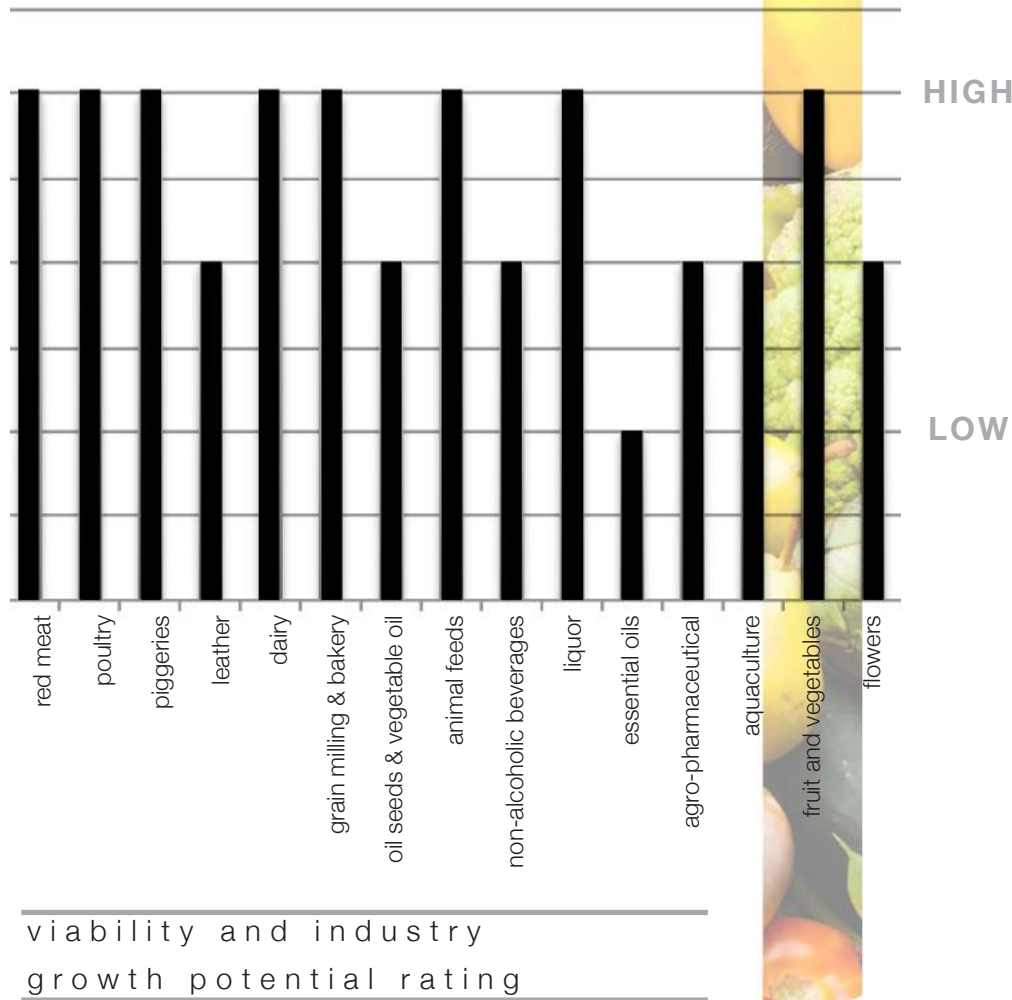


local production base
rating

The second evaluation was based on the criterion of the presence of a local production or an existing base within the Province, or a good source of inputs from outside the Province.

The presence of a local production base demonstrates easy access to primary products required as inputs and results in lower transport costs, thus contributing to the viability of the industry (Agriculture and Rural Development 2015:26).

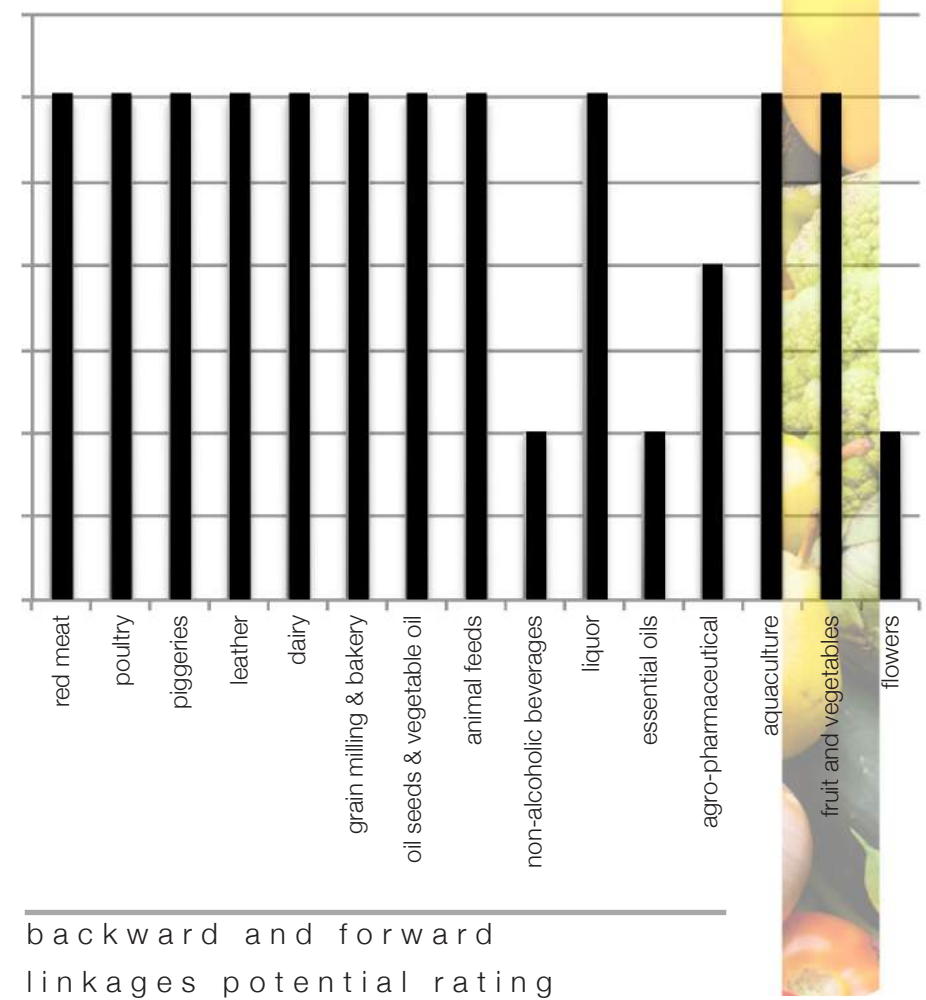
Figure 101 : local production base_graphical representation (Author 2016)



viability and industry
growth potential rating

The third evaluation criterion was evaluated the viability and growth potential of each industry, based on the following considerations:

- Existing viability of the industry
- Potential for growth and expansion of the industry
- Growing demand for the product
- Existence of an unsaturated market space
- Potential for exports
- Presence of current development initiatives (Agriculture and Rural Development 2015:27).

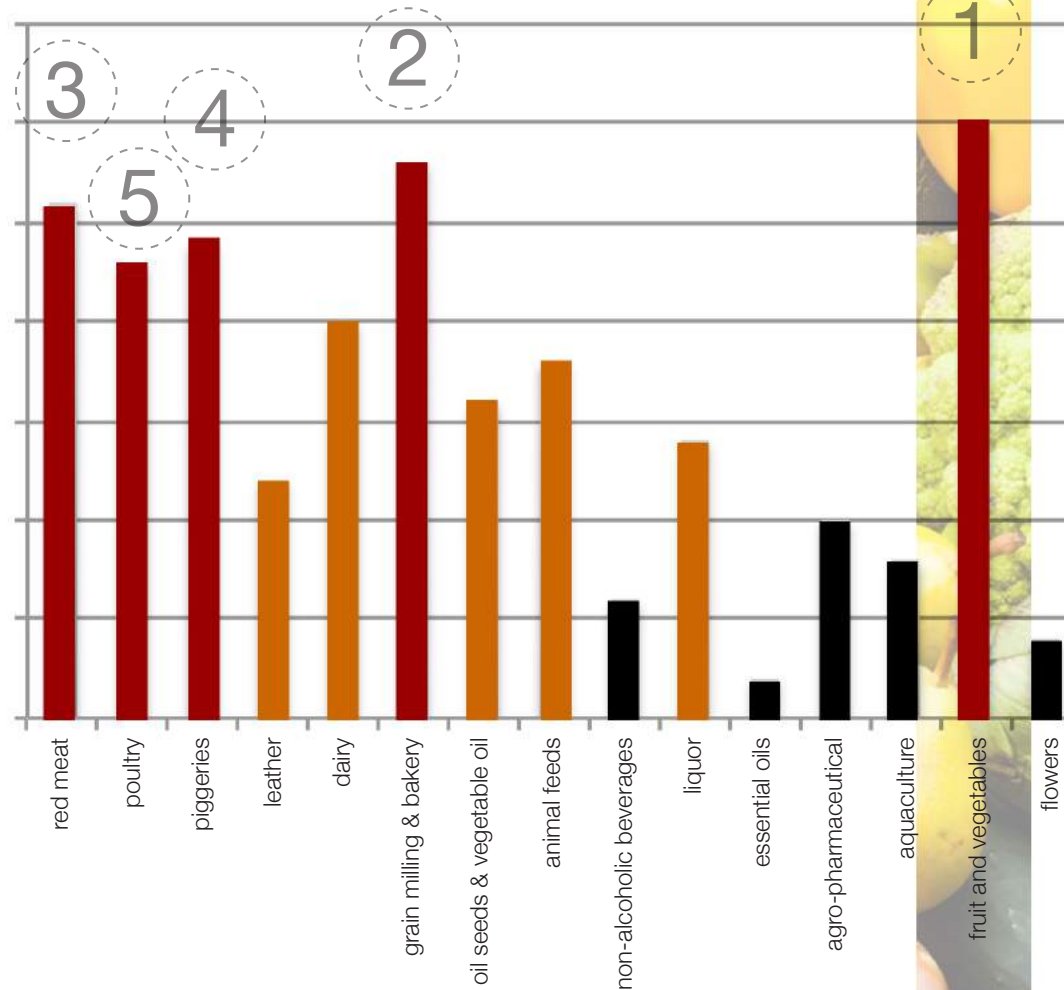


backward and forward
linkages potential rating

The final factor considered in the prioritisation framework evaluated the potential of each industry to strengthen backward and forward linkages.

This refers to the extent that the industry could be catalytic in terms of creating new opportunities, and the potential to enhance primary production (Agriculture and Rural Development 2015:27).

Figure 102 : linkages potential rating_graphical representation (Author 2016)



- First Order Priorities/
high priority
- Second Order Priorities/
medium priority
- Third Order Priorities/
low priority

o p p o r t u n i t y a n a l y s i s r e s u l t s

Based on the evaluation framework and the scoring results presented above, the various industries were ranked in terms of the opportunities for development they offer (Agriculture and Rural Development 2015:28).

Figure 103 : opportunity analysis results_ graphical representation (Author 2016)

conclusion

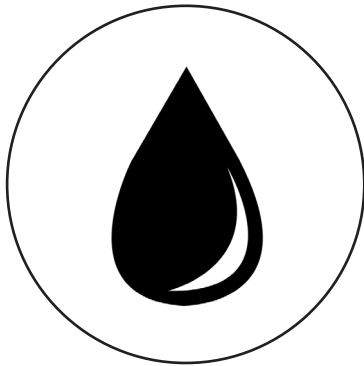
Through the following analysis, it is clear that the production and processing of fruit and vegetables hold the most potential within the food production system.

Fruit and vegetables, first order priority and low in local base production, thus provide an essential opportunity to enable and develop a community through food production.

It is this analysis, as well as the Idaho Plate Method (page 43) that has formed the basis for fruit and vegetable production within the dissertation.

SUB-PROGRAMME

hydroponics & aquaponics



With regards to the greenhouse, hydroponics allow for the control and conservation of water usage. Due to the site sitting on a watershed there is importance in considering the ecosystemic effect that large-scale crop production would have on the area.

Subsequent to research, greenhouses were the chosen method due to the opportunity they provide to optimise production within smaller areas.

Hydroponics is the cultivation of crops by suspending their roots into nutrient rich water solutions rather than in soil (FAO 2014:2). Crop production through soilless means has many advantages, which include:

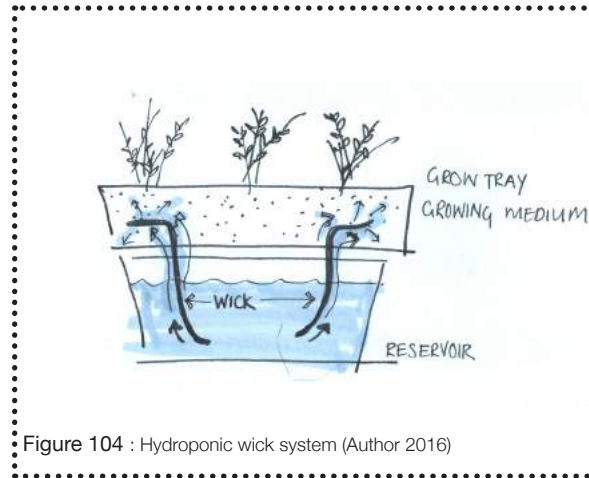


Figure 104 : Hydroponic wick system (Author 2016)

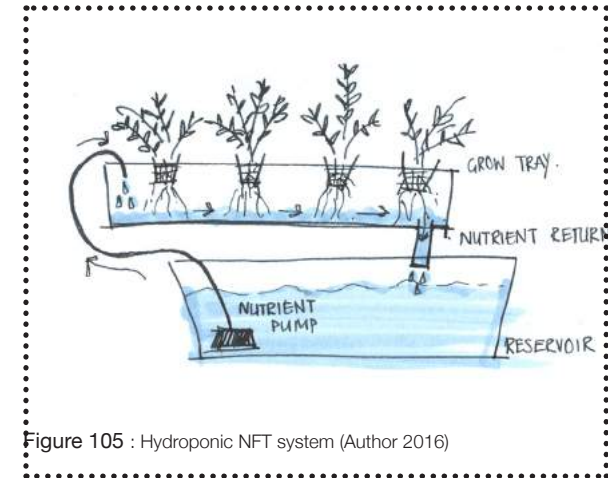


Figure 105 : Hydroponic NFT system (Author 2016)

- Crops are of high quality and do not need much washing
- High yields of vegetables can be produced in limited areas due to the environment being able to be optimal for crop production.
- Water use is efficient due to water loss being limited.
- Good for water-scarce environments
- Soil diseases are no longer an issue and the preparation of soil and weeding are no longer issues (FAO 2014:3).

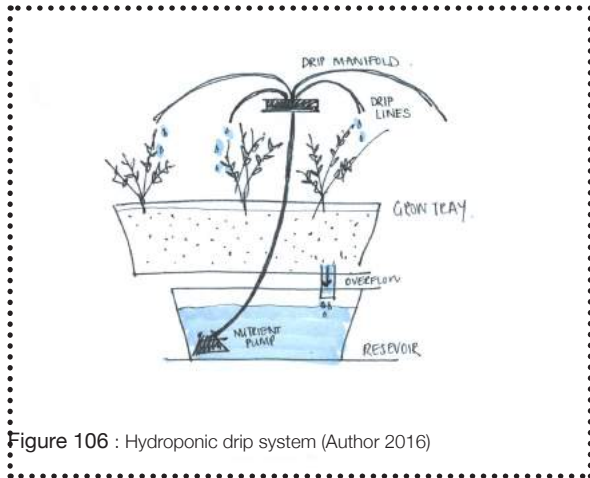


Figure 106 : Hydroponic drip system (Author 2016)

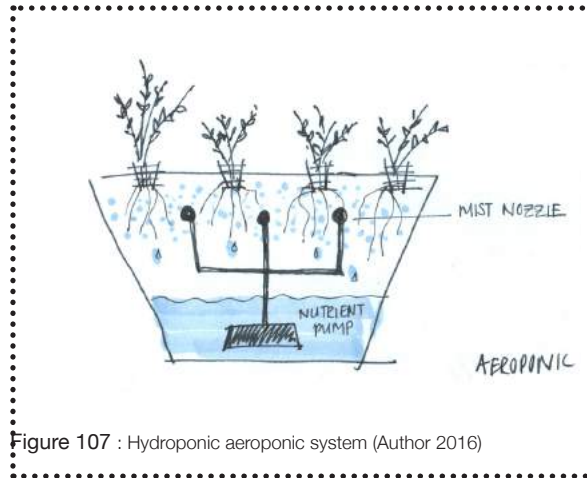


Figure 107 : Hydroponic aeroponic system (Author 2016)

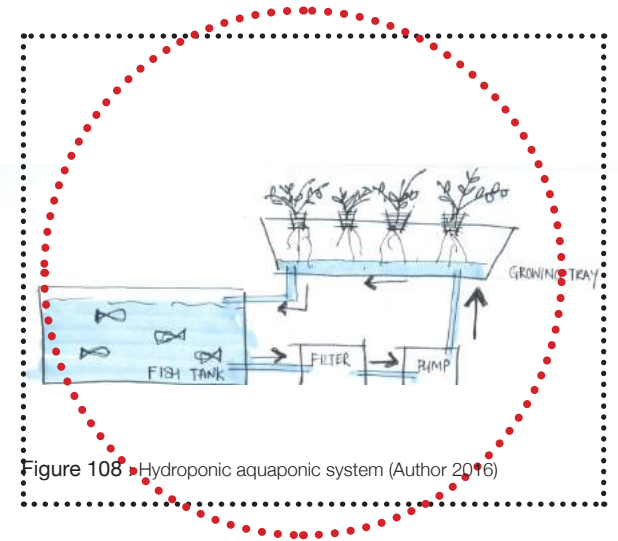
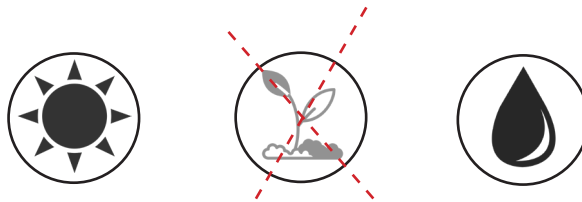


Figure 108 : Hydroponic aquaponic system (Author 2016)

Aquaponics is the incorporation of an aquaculture system into a hydroponic system for plant production (Rakocy & Hargreaves). The fish waste is an organic source of food for the plants and the plants naturally filter the water for the fish.

Microbes within the growing medium convert the ammonia from the fish waste into nitrites and then into nitrates which is utilised by the plants as nutrients. Aquaponics was considered in terms of being able to naturally adjust the PH of the water and thus no artificial additives are required, lessening expenses as well being able to harvest the fish to be sold as protein (FAO 2014:4).



SUB-PROGRAMME

public consumer retail



Market and informal trade become important additions to the scheme. The market makes provision for fresh produce to be sold on site daily and thus makes it easily accessible for those in the surrounding area.

It is thus important to make the provisions for traders to situate themselves on site and contribute to energy of the space. This provision creates the opportunity for residents of Plastic View who previously owned spaza shops to carry on and earn their daily income.

Through the following analysis of local markets it was apparent that spaces should be multi functional and have interesting configurations that encourage consumers to walk around to gain the full experience. The markets within the interior of the space will sell the fresh produce grown and harvested on site but will also allow for local farmers to sell their produce and products.

GUGULETHU CENTRAL MEAT MARKET

Western Cape, South Africa
1997

CS Studio Architects

The aim of the project was to solve the issue of informal traders by providing a covered area for the market. The market, forming a gathering point, has become a very significant public space for the area.

The space accommodates a variety of functions such as spaza shops, offices, public toilets and indoor braai areas. The market is rustic and has roller shutter doors to keep the area secure at night. Stainless steel tables and sinks are provided and the roof, which resembles a giant wave, becomes iconic and encases the whole area thus allowing for the restaurant and informal activity to take place within the same space.

By creating one space that allows for variety activities it allows for a positive and vibrant space that caters for a variety of people and their needs. The market has empowered the growth of the area due to becoming an important resource for the locals, which has resulted in many local residents starting up small businesses. This is what makes for a successful urban environment. It is not just the activities available but also the spaces created and people coming together in one space.

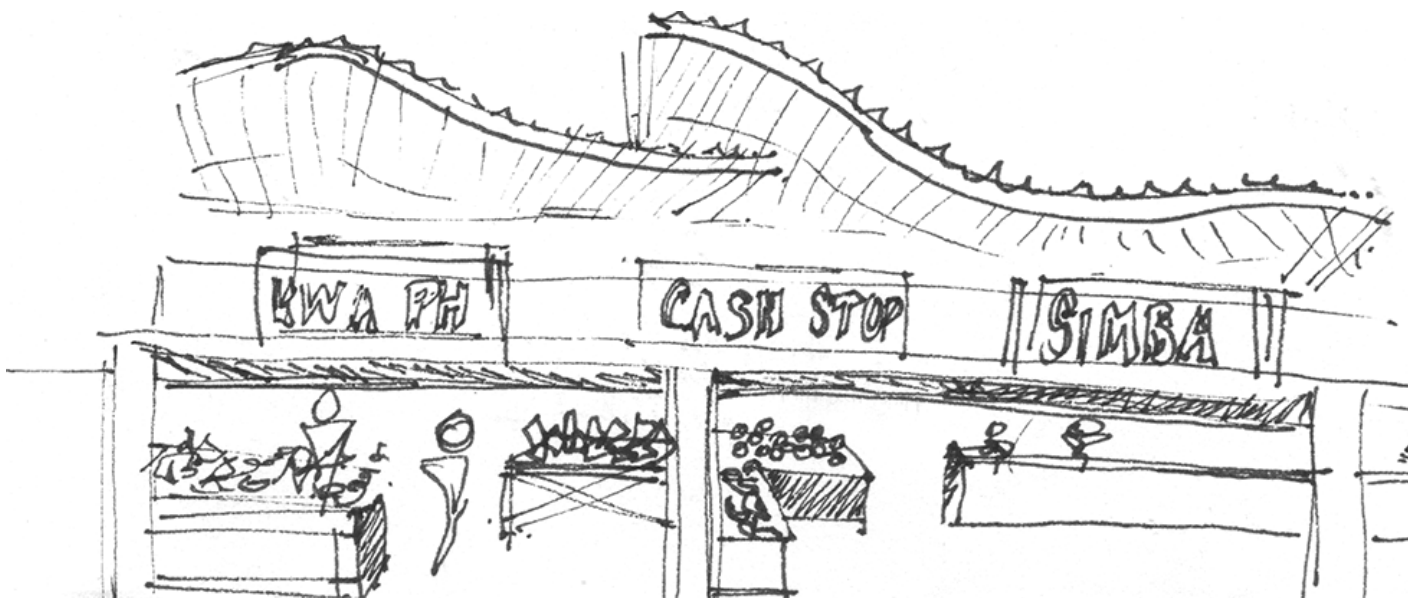


Figure 109 : Gugulethu central meat market sketch (Author 2016)



BOEREMARK

Pioneer Museum
Silverton, South Africa

Boeremark, loosely translated as Farmer's Market, is a fresh produce market that started around 23 years ago as a small market place where small local farmers were able to sell their produce to their consumers directly. The market has now expanded and draws in producers from as far as Mpumalanga and Limpopo.

This extremely successful market is held weekly every Saturday morning from 5:00am to 9:30am. The variety of stalls sells fresh produce, plants, hand crafted items and home made food.

Boeremark attracts a very loyal, wide-ranging customer base. The success of the market stems from customers being able to select their own produce at affordable prices as well as it being a beautiful setting and child friendly. Seating is arranged socially and movable chairs allow for a variety of interactions.

Figure 110 : Boeremark photo collage (Author 2016)

HAZELWOOD FOOD MARKET

Menlo Park, South Africa



The Hazelwood Food Market is held weekly, every Saturday, from 8am until to 2pm. The market offers organic vegetables, handmade cheeses and pestos, flowers, food items and much more. The aim of Hazelwood market is to facilitate a space where locals can buy fresh produce straight from the farmer.

The market started in 2009 with merely 18 stalls and is now sitting at 70 stalls and a long waiting line. There is one communal seating area under a canopy of trees. Jungle gyms are provided for children although most kids play in amongst the trees.

comparison critique

When comparing the two local precedents, theoretical and personal experience critique, it was interesting how much more vibrant and energised Boeremark was, even though it was an early morning affair. Boeremark was more economically and socially inclusive and its more informal style allowed for more interactions between consumer and producer.

A few stalls were present at both markets, although slightly more costly at Hazelwood. Boeremark concentrated more on the consumer and their experience, placing small fires for people to stand and socialise around as well as having a handful of musicians scattered playing for the public. Hazelwood was more confronting and organised. There was not much interaction between consumer and producer due to informal nature in which the stalls were set up.

Figure 111 : Hazelwood food market photo collage (Author 2016)

Camillo Sitte public space theory

Camillo Sitte (1889) in his book, *City Planning according to Artistic Principles*, stated his concern for new modern buildings becoming backdrops for poor public spaces and the importance that lay within the architecture and the buildings and thus neglected surrounding spaces. He claimed that public spaces were vital to cities, when designed properly, in order to form a setting for daily activities and support surrounding buildings and their functions.

Key principles for public spaces include:

- having an enclosed nature in order to restrict views and keep attention within the space
- keeping the centres of the various public squares free and open to allow for ease of communication lines
- ensuring public spaces contain various scales of suitable proportions to allow for the understanding of the space and the extent thereof (Sydney 2012).

97.

Boeremark and Hazelwood

In terms of Boeremark and Hazelwood food market it became apparent that a more informal set up encourages conversation. The informal layout, such as Boeremark, makes provisions for all stall types, (tables, carpets, crates or matts) and includes moveable seating. The set up is done so that it is not in a linear fashion but rather encourages people to maneuver through the space.

Hazelwood was set up in an orderly fashion which allowed people to view all the stalls from one spot and thus did not encourage them to wander around as much.

Natural shade, in both instances, was better received than umbrellas in terms of a social setting. The trees also provided entertainment for active children.

With regards to Sitte (1889), Boeremark was a more successful precedent due to the way in which it was set up. It created spaces between stalls that encouraged social interaction and made various focal points through the use of successful public draw cards, such as musical entertainment and moveable seating.

New Market Hall Granada, Spain

The New market hall in Granada, Spain, uses a Modernist architectural expression for structural elements and materials that sensitively relate, in terms of placement, permeability and scale, to the surrounding older urban fabric.

Avoiding the building as the focal point, the market provides a new edge to the existing outdoor area, which has, through sensitive renovation, been strengthened as an urban element. The addition uses similar materials to create a well-enclosed, walkable space around the building. Human scaled streets are paved and filled with street furniture that enrich ones daily shopping experience.

The market hall forms one side of a sheltered outdoor space. This active urban square is a foreground to the market hall's façade used for produce deliveries and market stalls and incorporates simple landscaping and various opportunities for seating. External connectivity to the market is strengthened through public transport connections to the rest of the city. Thus the market successfully reconnects the city with food-based relationships allowing for sustainable social places.

The market Testaccio, Rome

The market at Testaccio, Rome, takes up a city block in an area configured by a strong rectilinear grid of streets. The semi-enclosed building, without any architectural significance, is an energetic and active market space. Medium to high-density residential and mixed-use units sustain the local support for the market.

The local mixed-use building typology is usually three to eight storeys and has multiple entry points. At street level sit the shops, cafes, small workshops and offices. The contiguous buildings allow for strong edges and thus reinforce enclosure and aid in contributing to suitable height-to-width ratios in the streets neighbouring the market.

successful criteria

Successful quarters like Testaccio and central Granada have created locations that are highly accessible, which encourages a variety of people that are able to arrive by numerous modes of transport other than cars. Boeremark, unfortunately, does not provide this opportunity.

However, all three urban spaces are highly permeable and reinforce their human scale through the absence of large service vehicles. In both Granada and Testaccio, the internal connectivity relates in density and texture to the surrounding urban fabric, while external connectivity is enhanced by public transport links to the rest of the city. Where as at Boeremark, the density is created within the space through a variety of impermanent and permanent structures.

waste management



Vermiculture is the culture and process of using earthworms to decompose organic food waste and turn it into a nutrient-rich material that is capable of supplying necessary nutrients to help sustain plant growth. This method is simple, effective, convenient, and noiseless. It saves water, energy, landfills, and helps rebuild the soil (Maher 2016).

In order to ensure that the food system is holistically considered an effective waste management needs to be applied. Due to food waste being such a large contributing factor to food insecurity it is important to dispose of it properly and ensure that it can give back to the environment. Through vermiculture, organic waste can be turned into vermicompost and either sold back to the community or used in community gardens (Munroe 2005).

Another by-product of vermiculture is worm tea, the liquid concentrate of worm compost, which is a good source of nutrients plants and allows for the microorganisms that live in the worm castings to be a part of a rounded and

balanced feeding system (Maher 2016).

Raised bins, windrows, are fed from the top twice a week and harvested from the bottom once a week.

5 essentials of worm farming include:

- Hospitable living environment “bedding”. The bedding needs to have: high absorbency, good bulking potential and low protein.
- Good food source. Worms require half their body weight of food daily. Fresh food scraps (not high in fat waste). Root vegetables take longer to be consumed. Pre-composted food wastes speeds up curing process. Manure is also a good food source. Biosolids, human waste, excellent nutrition and product destroy human pathogens.
- Adequate moisture. Lack of moisture kills worms. Average worm weight increased with moisture content.
- Adequate aeration
- Protection from temperature extremes. In winter temperature should be kept above 15 degrees Celsius and within the mid 20’s in summer (Munroe 2005).



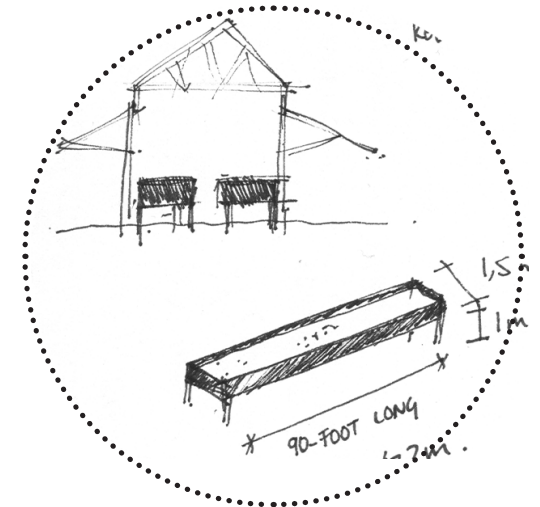


Figure 112 : Window sketch and dimensioning (Author 2016)

EXPLORING WINDOW S



Figure 113 : Worm photo edited by Author (Maher 2016)

VERMICULTURE EARTHWORMS

5 DESIGN DEVELOPMENT

iterations & analysis

In order to achieve a social relationship with food the design concept of decentralise, localise and empower physically manifests itself as a route. The food system is designed to move in one direction with the pedestrian route in the other.

The nodes at which these routes meet become interaction points, which empower the relationship between pedestrian and food. Bringing the food process and its various systems to public attention in attempt for individuals to gain an understanding of the energies put into food production and the outcome thereof, potentially limiting waste through a greater appreciation of food. Encouraging people and food to come together thus encouraging socio-economic opportunity.

It is important that these nodes are designed in a manner that encourages lingering social interactions and a variety of activities to take place, surrounding food and it's functions. The design of this gastronomic quarter is considered as a permanent fixture in the community that will focus on food and its encompassing multi-functional programmes, at a systematic, economic and social level. Emphasis is, however, placed on the production of food and the integration thereof into its following processes especially at a social level in order to ensure a sustainable food system.

Design development is thus critiqued throughout its various stages based on its economic, social and urban contributions to the site as well as the sustainability of resources.

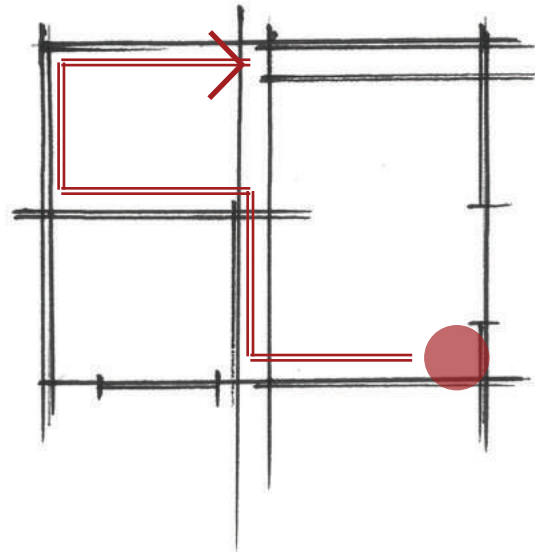


Figure 114 : Food production and processing movement (Author 2016)

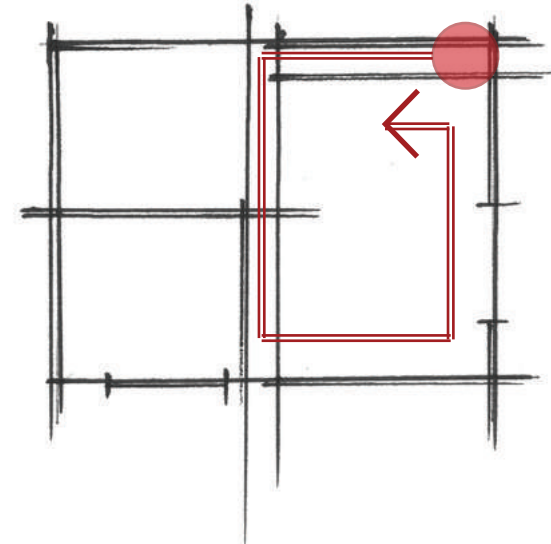


Figure 115 : Pedestrian traffic movement (Author 2016)

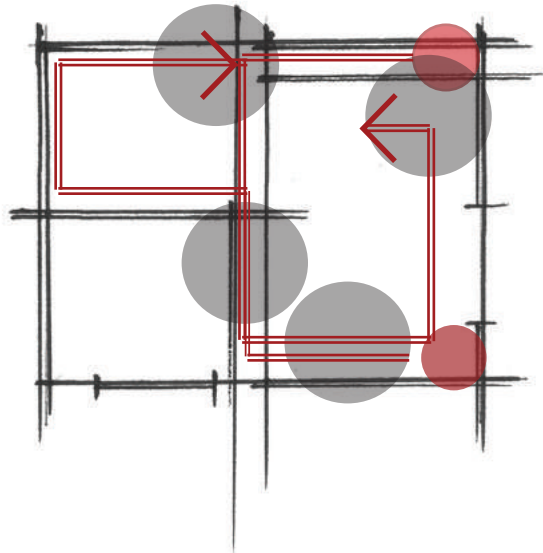


Figure 116 : Points of interaction between food and people (Author 2016)

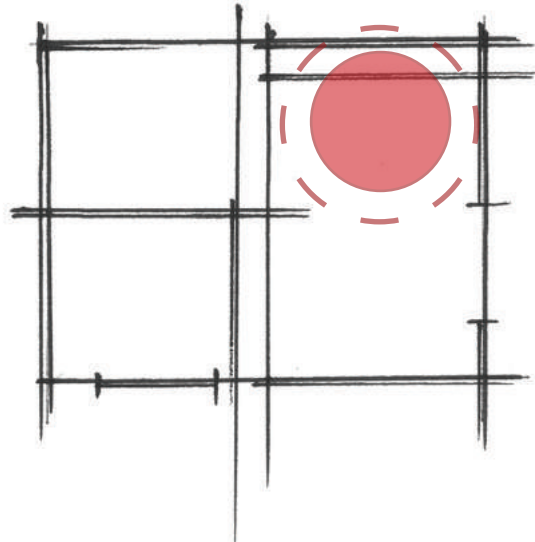


Figure 117 : Where both systems come together (Author 2016)

PUBLIC SPACES

seating

One of the most important provisions to ensure a successful public space is being able to have sufficient sitting opportunities (Shaftoe 2008:92).

People tend to sit most where there are places to sit. (Whyte 1988:110).

By designing a space that is suitable to a variety of people it is important to cater for the various social groups in terms of seating. Accessible, comfortable and well-maintained seating is crucial to successful place making (Project for Public Spaces). Social comfort aids in facilitating social interactions and activities.

Throughout the design, the desire is to create spaces that serve multi-functional purposes. Seating becomes an important focus as it serves as a fundamental node of interaction.

William H Whyte (1980) in his book and accompanying video, *The Social Life of Small Urban Spaces*, speaks about techniques that aid in transforming public spaces around the world into community places and making cities more liveable.

Due to this project taking on the role of a gastronomic quarter, it is important to ensure successful social spaces that allow for interactions not only amongst people themselves but between people and food.

The main principles, to be applied, that come across within Whyte's (1980) book will enable the design to take on a social yet functional role that will ensure the success and sustainability of the space as a whole.

- Sitting spaces should be built into design and not an afterthought.
 - Relationship to the street_ there should always be a strong link to street scape
 - People like to sit in sun and shade and so this should not be a ruling factor. Absence of light, however, is bad.
 - Water is a good interactive element and can mask traffic sounds.
 - Trees provide a micro-climate and prevent glare by providing a canopy. They are also attractive and make spaces feel comfortable.
 - Food is important_a place with activity needs food as it attracts people through social function and collection.
-



DUALITY

Whyte suggests that in addition to benches and chairs, choice should be incorporated into the design by maximizing the seating possibilities in the inherent features of the place. This means making ledges or surfaces usable for multiple purposes such as tables and seating (Whyte1988:28).

Stairs should be low and accessible but at a height that still allows for it to be recognised as a seating opportunity. Corner stairs allow for a more social space.



SHELTER

People like to take shelter from the bright sunlight as well as winds. Innovative approaches such as partial screening, total enclosure and vegetation as barrier bring interest to a space.

Multi-functioning seating allows for interesting spaces such as planters doubling as seating. Seating that stands alone should be two backsides deep in order to allow for multiple manners of seating.



VANTAGE POINTS

People like to sit close to activity without always having to be involved. Thus seating should be located within view of the action without being in the flow of pedestrian traffic. Seating opportunities should allow users to choose the direction they would like to face.

Different places or locations within the same area, such as in the sun, in the shade, in groups, alone, close to activity, or somewhat removed from activity cater for a variety of user preferences.



MOVEABILITY

Allows for the social ritual of moving seating around and creates opportunity for more interaction as people will place the chairs in a way that suits them best.

Figure 118 : Images of seating opportunities taken from *Convivial Urban Spaces: Creating Effective Public Places*. (Shaftoe 2008)

ITERATIONS

model development

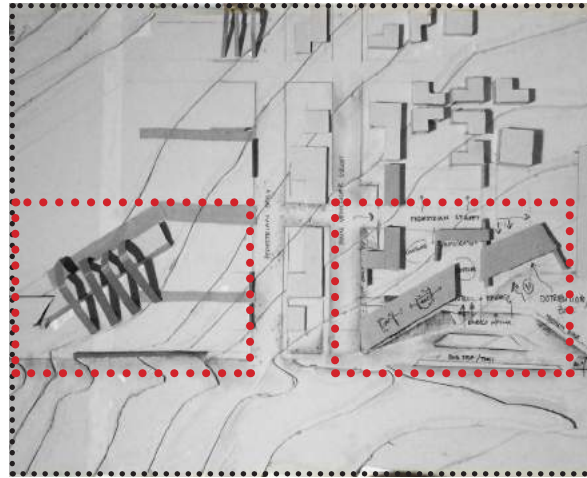
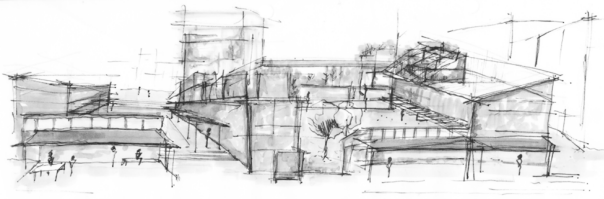
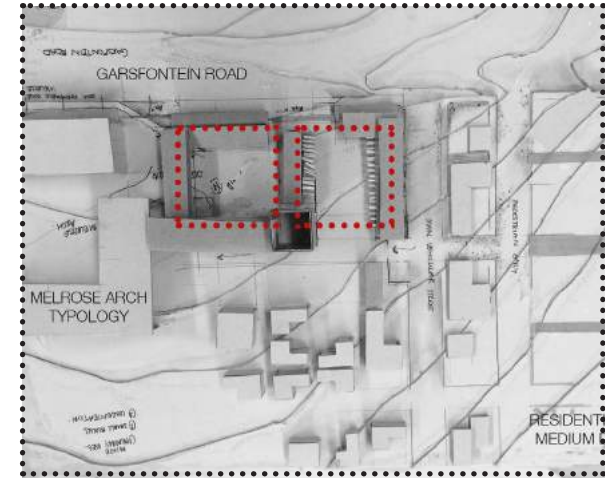


Figure 119 : Model iterations (Author 2016)

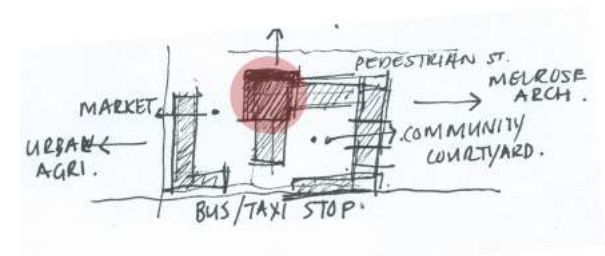
The initial design started as a market place and a production unit as two separate entities that were opposite each other over the main vehicular road.

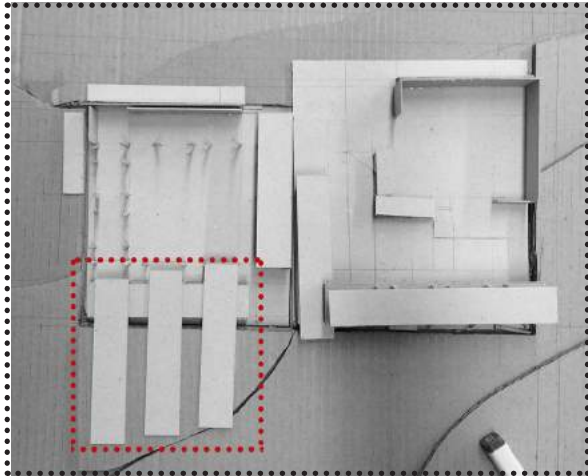
Through research and the intention to localise the food system, the design was changed to accommodate both on one site.



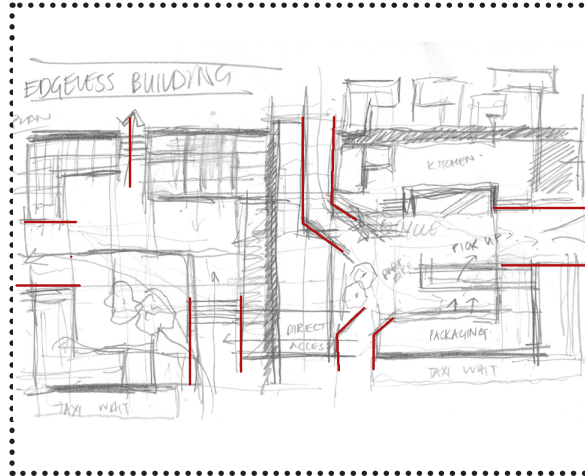
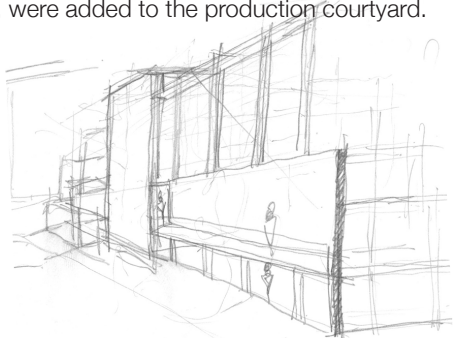
The two courtyards allow for functional separation of production processes and social activities.

The main core is for food production and systemic functions.

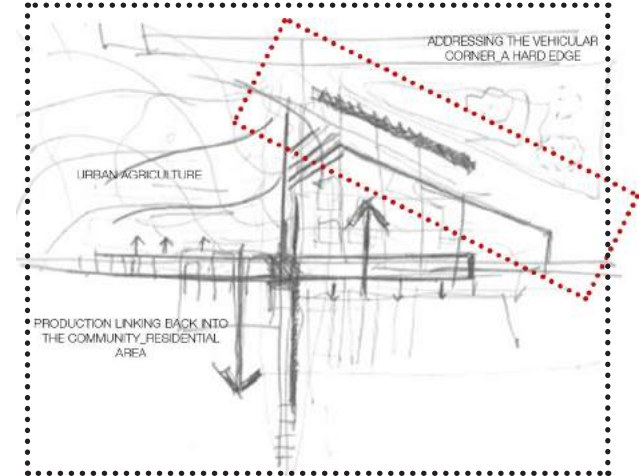




As a theoretical and practical model, the Moshav creates a space whereby 3 programmes, social, production and housing, overlap. The addition of a housing typology, live-work units, were added to the production courtyard.

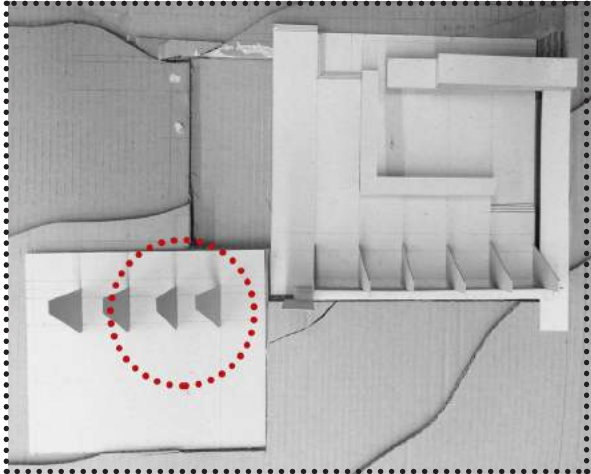


Following the principles of Camillo Sitte (as discussed on...), the decision was made to enclose the courtyards with limited entry points in order to keep attention within the space. Centres of the courtyards were kept fairly open to allow for activities as well as a good line of site from all sides.

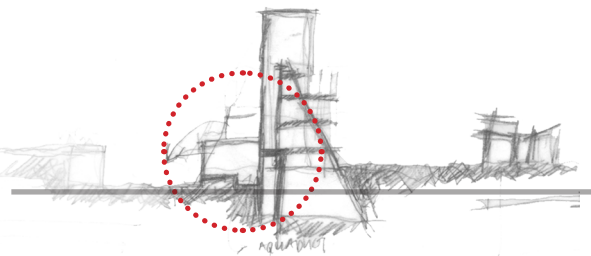


The two courtyards alongside one another made for a very rigid design. The decision was made to create a more dynamic building that addressed both sides of the design with regards to interactive edges through the repositioning of the courtyards. This also allowed for better control of the bus stop corner

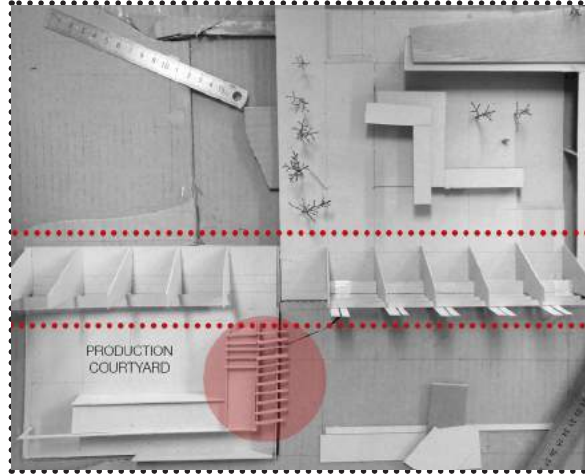
The production core was reconsidered as a singular element and used as a device that feeds into both courtyards,



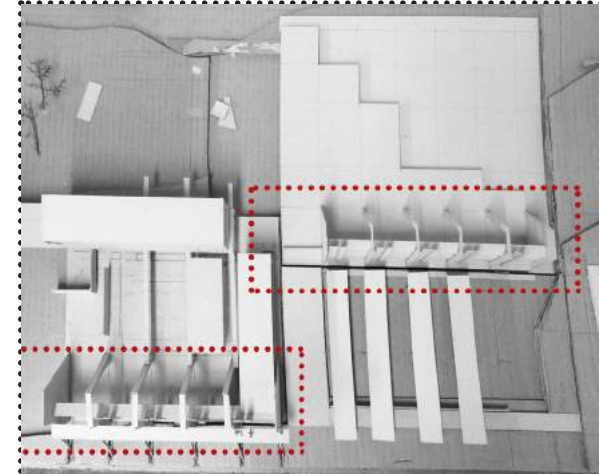
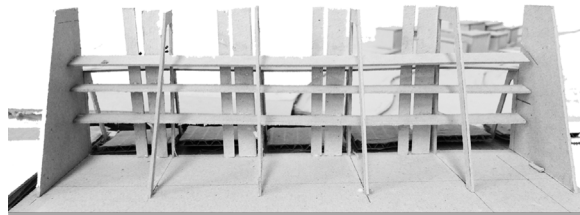
With the greenhouses facing into each courtyard the back of them created hard edges that did not allow for lively spaces to develop. Due to the size of the greenhouses there was a lack of human scale present making the spaces unapproachable. Camillo Sitte (1889), describes the importance of a variety of scales that create thresholds and interactive spaces.



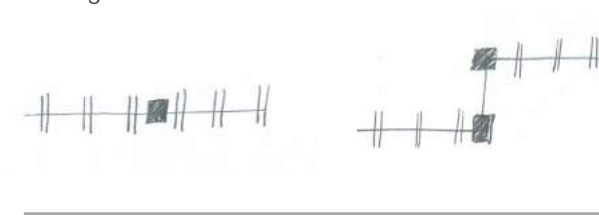
107.

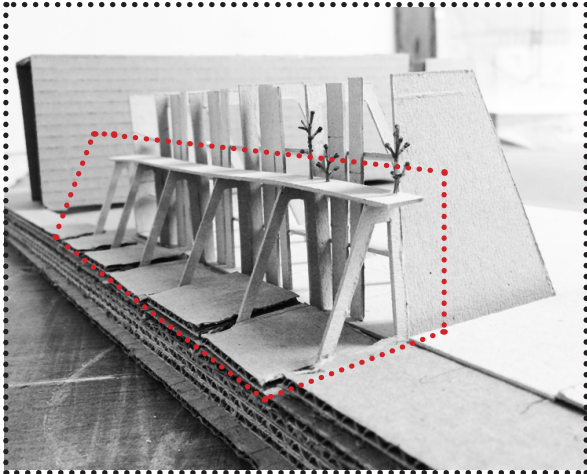


Production courtyard aligning to the production core. The element made up of the greenhouses, spatially, creates a very strong element in the urban fabric that divides the spaces quite harshly. Due to the proposed urban fabric being made up a variety of separate mixed density buildings it does not fit in as a single element.



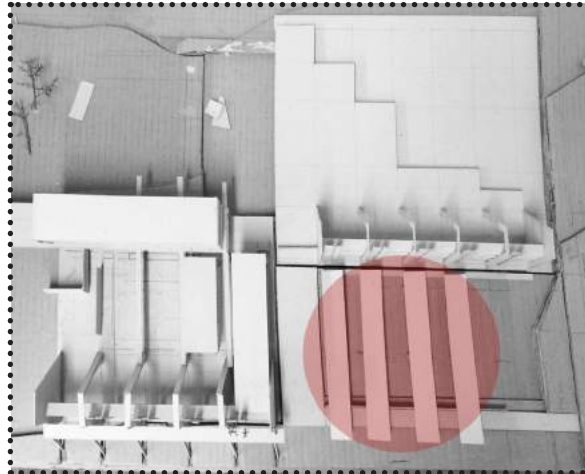
Splitting up the production core allowed for a better use of scale. The element is no longer over empowering and provides the opportunity for multi functional breaks between buildings such as Salat (2011), suggests. The reason for this being to break down the scale and prevent elements becoming too strong for the urban fabric, such as the greenhouses.





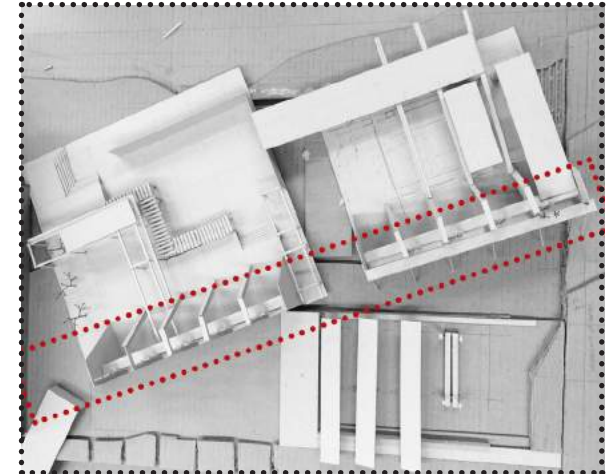
In order to combat the back of the production becoming a dead space, a scaled down version of the shape was attached to the back of the large structure to create a space for social interaction through a change in scale.

This structure effectively addresses the public edge and activates the urban fabric across from the residential buildings. The space could potentially be used for informal trade or just as a seating opportunity.



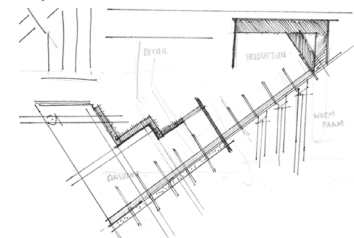
The addition of vermi-culture highlights Capra and Luigi Luisi's (2014) notion of a closed loop system. To ensure an ecosystemic approach, the design needs to include all aspects of the food production network, from production to waste management, on site.

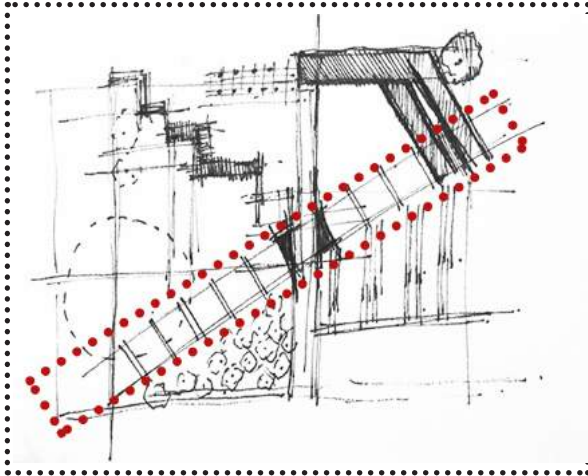
All organic waste on site, and from surrounding residential units, gets collected and sent to the worm farm. In turn the worm farm produces worm tea and compost for surrounding community gardens.



Experimenting with the orientation of the production core/ greenhouse facing direct north at 35 degrees.

After the conduction of a solar study it was noted that due to the structure not much sunlight was lost and thus it was not necessary to re-orientate the whole design.

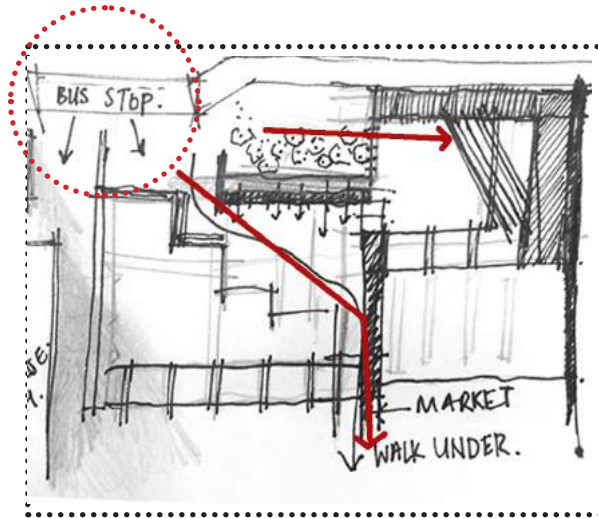




Before completely disregarding the shift in orientation, it was experimented with by keeping the courtyards in their original direction and just adjusting the production core.

Spatially the diagonal made for more dynamic spaces and an improved flow of movement from one courtyard into the next.

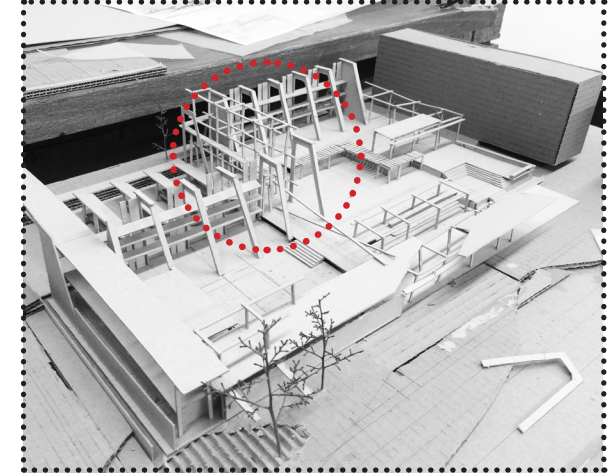
Systematically solar panels would be more effective facing true north and could sit within the structure. Space behind the production core works well for vermi-culture but not for urban agriculture due to shadows.



In the urban context the diagonal proved to be too overpowering thus it was disregarded and the courtyards were kept in line with the urban fabric. The courtyards were switched around to ensure better movement through the space.

The courtyard configuration incorporated the full enclosed loop that Capra and Luigi Luisi (2014) speak of.

The bus stop was moved away from the high activity edge in order to draw activity into and through the heart of the site.



Development of a structure to support the water tanks that supply the hydroponic system. The structure is also utilised as a means of connectivity between the two production cores and supports walkways between the two as well as creating a pedestrian threshold below.

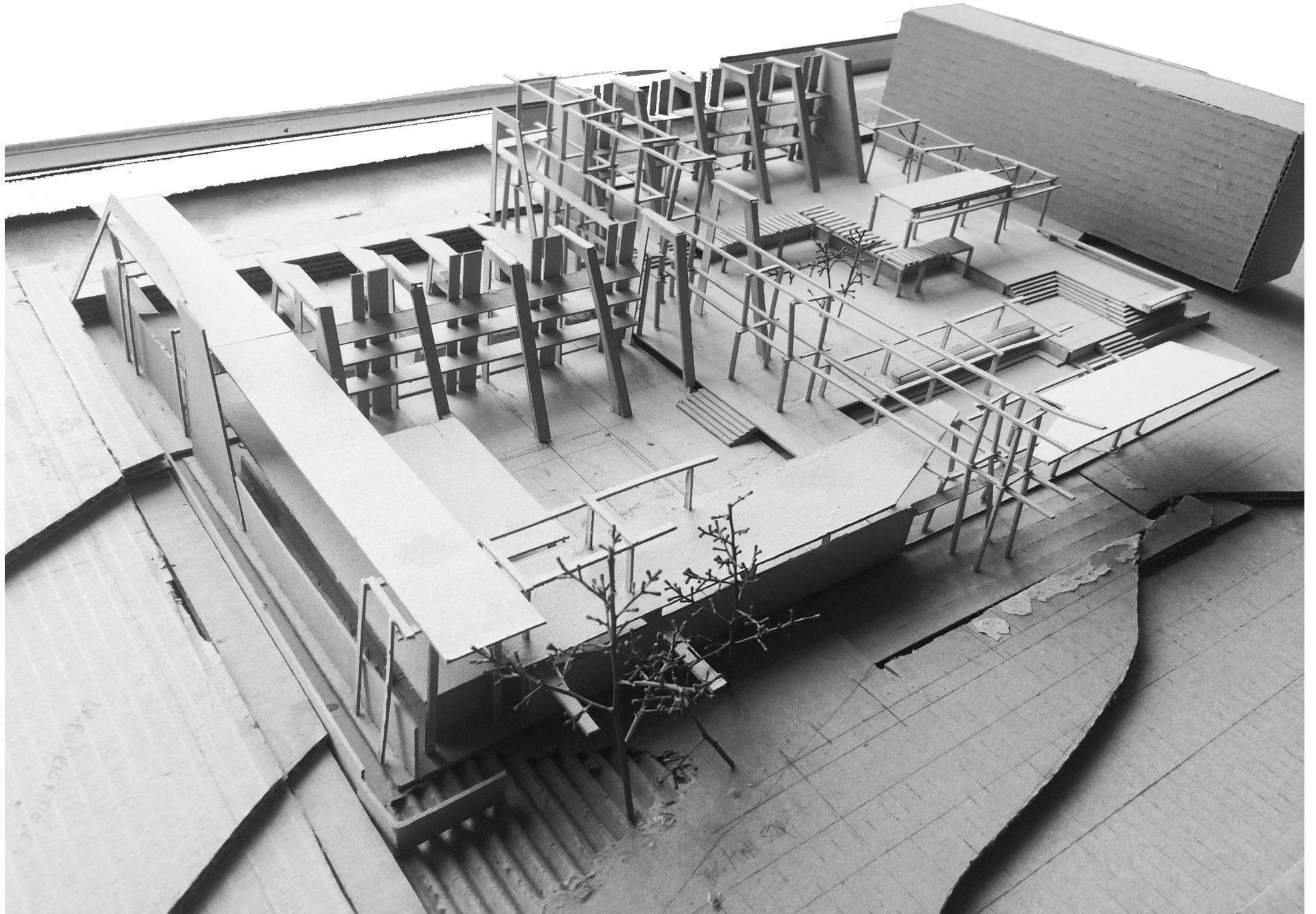
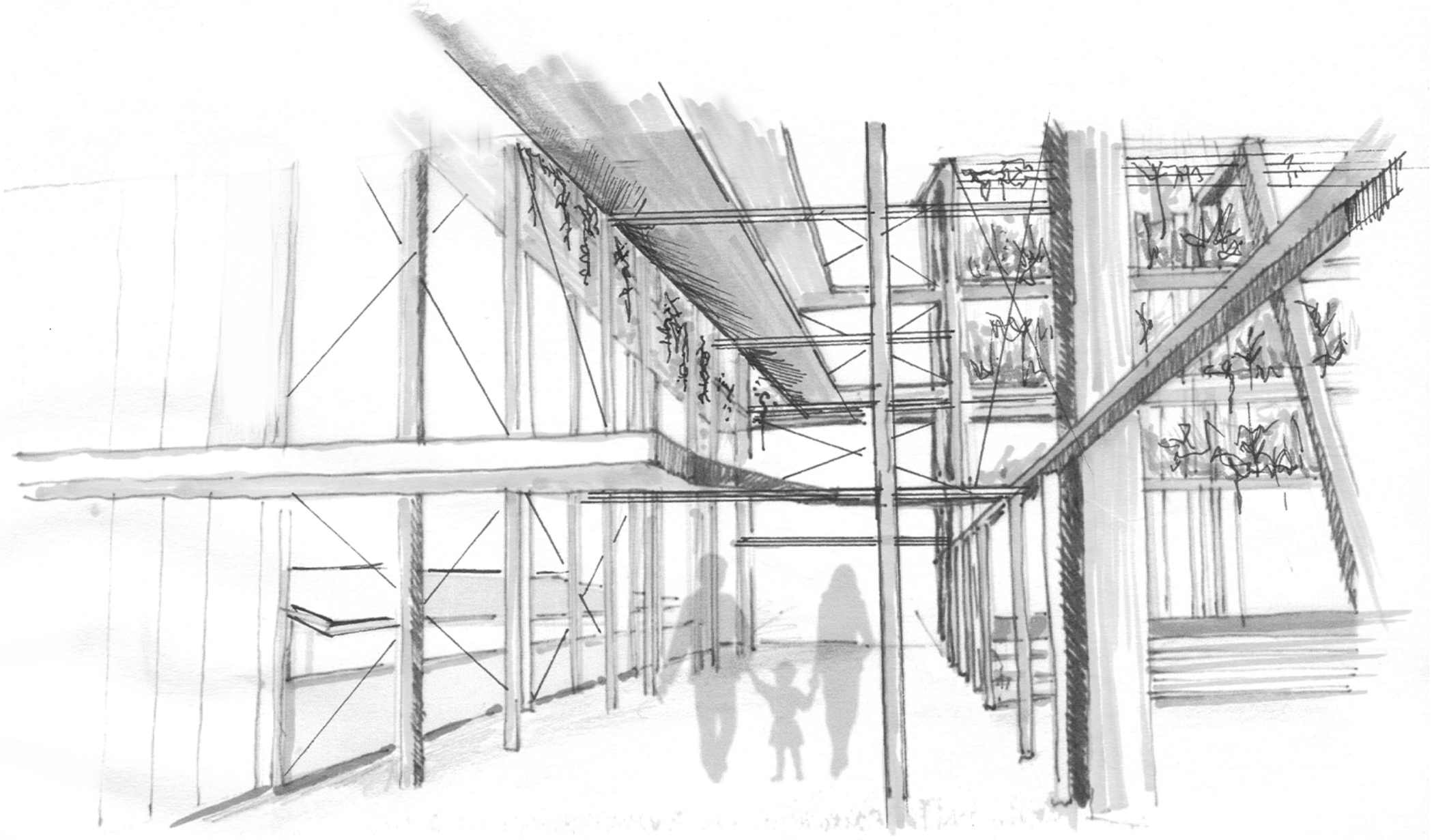
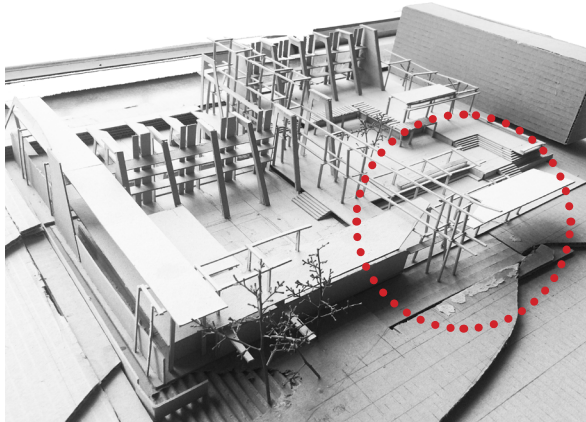


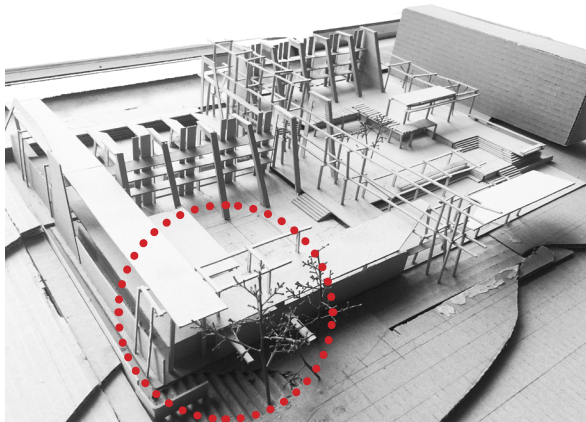
Figure 120 : June final exam model (Author 2016)



109. Figure 121 : Perspective from underneath water towers (Author 2016)

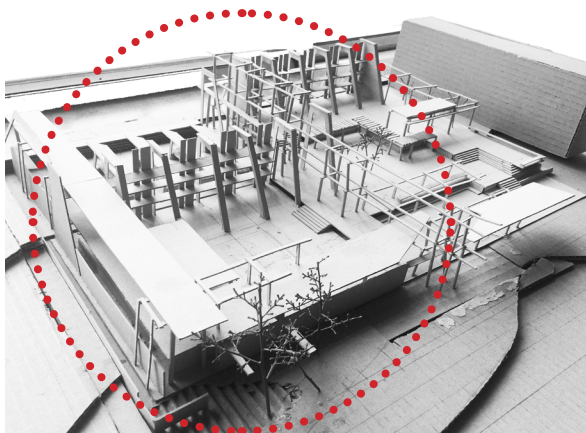


The structure supporting the water tower stopped very abruptly and needed to be reconsidered in terms of function.



The production courtyard, situated on the vehicular street, was too overpowering and created an unapproachable street edge.

The edge was also very dead and needed to facilitate a variety of functions in order to maintain social and urban interactions.



The courtyards needed to be reconsidered in terms of positioning. The corner, due to pedestrian and vehicular traffic, is an important node of high activity and thus needs to enable continuous energy transfer.

june critique

There was concern that for a very public space there were too many dead edges that made the space unapproachable. The bus stop was too far removed and should be kept on the corner to maintain the high activity edge. Due to the bus stop being the first point of acupuncture, it is vital to consider its positioning and the growth that would stem from it.

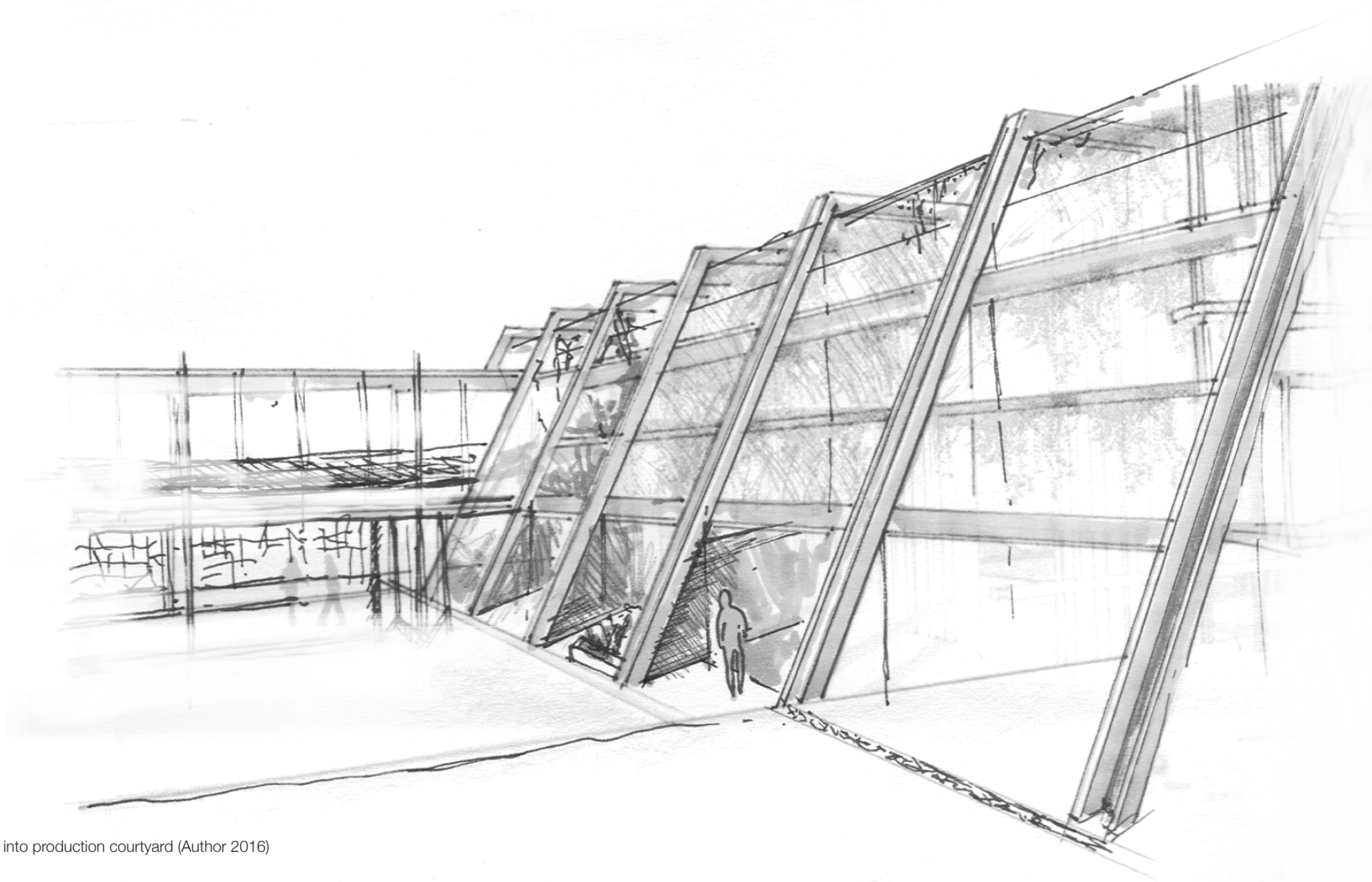
The structure supporting the water towers seemed excessive without any other function. What could it become?

In regards to the comment of the bus stop being removed from the active edge, it was questioned whether the courtyards themselves should swap in order to keep the highly pedestrianised courtyard as an active node.

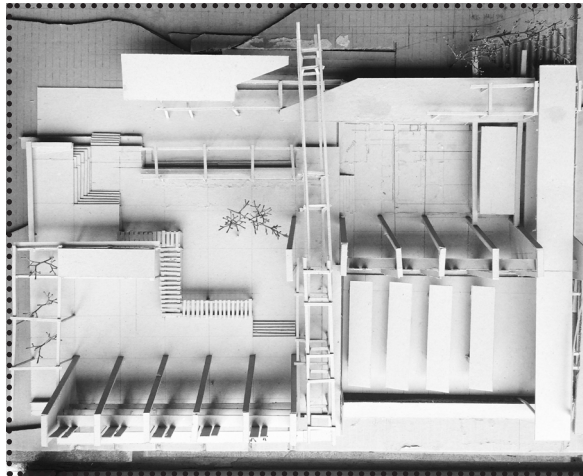
Overall the critique focused on ensuring and reconsidering aspects that lost energy and the social aspect that is vital to a successful gastronomic quarter.

DESIGN REFINEMENT

iterations



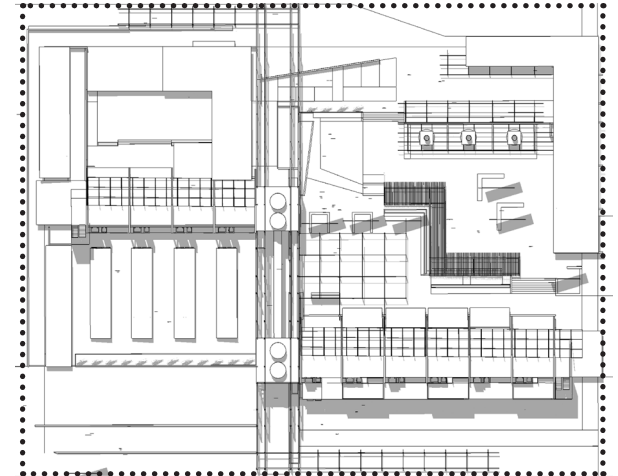
111. Figure 122 : Perspective looking into production courtyard (Author 2016)



June 2016

Based on critique from the June exams the plan was reconsidered in terms of the courtyards and the functions thereof.

Instead of rebuilding the model, the decision was made to build the model on SketchUp in order to allow for changes to be quicker and easier.

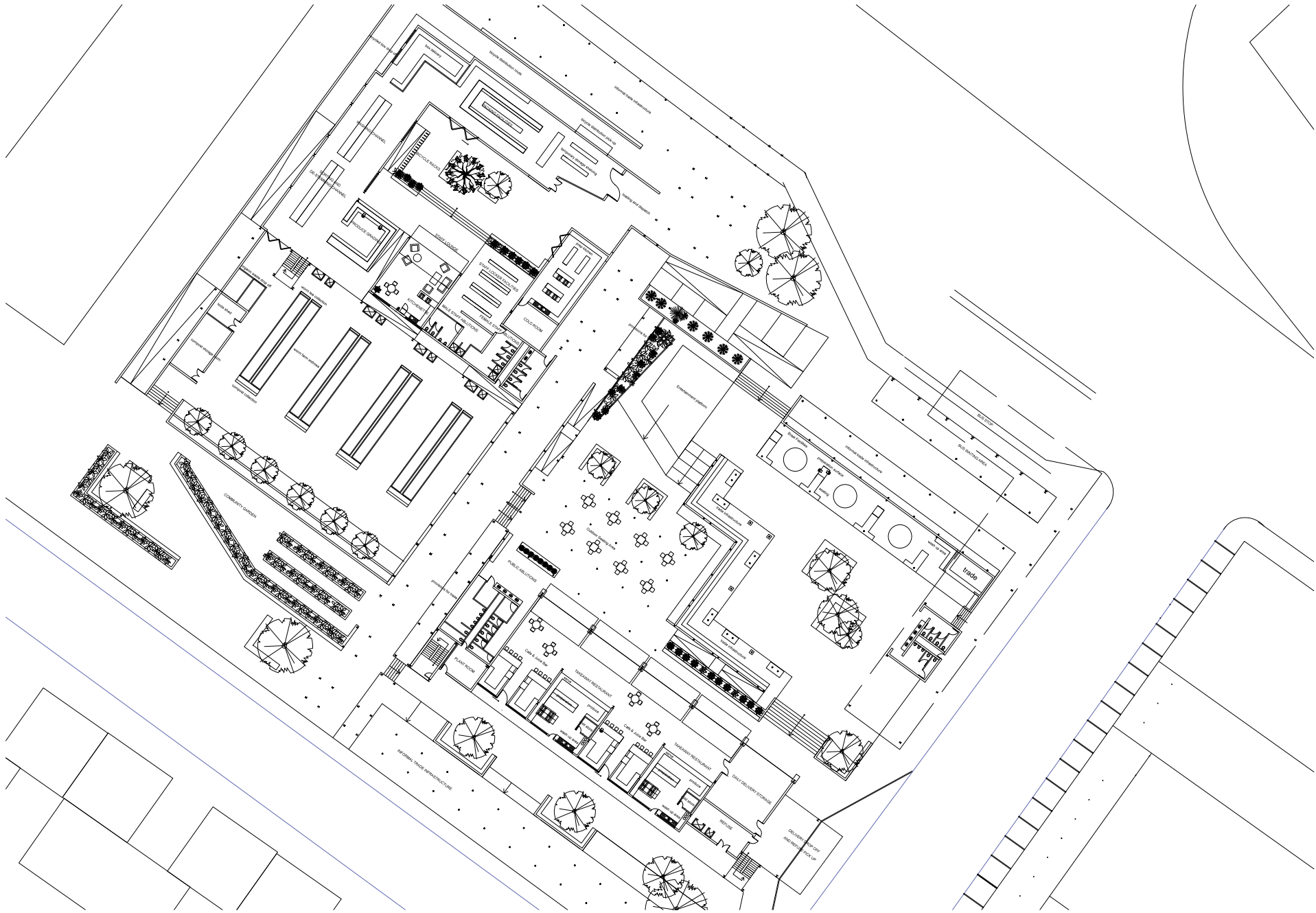


September 2016

The plan has developed extensively with a lot more focus on ensuring that every edge is active and contributes to the urban fabric.

The courtyards were swapped around and mirrored in order to maintain the high activity within the space.

The water tower support structure has developed into a multi-functional element. It decreases in scale and becomes a platform for informal trade.



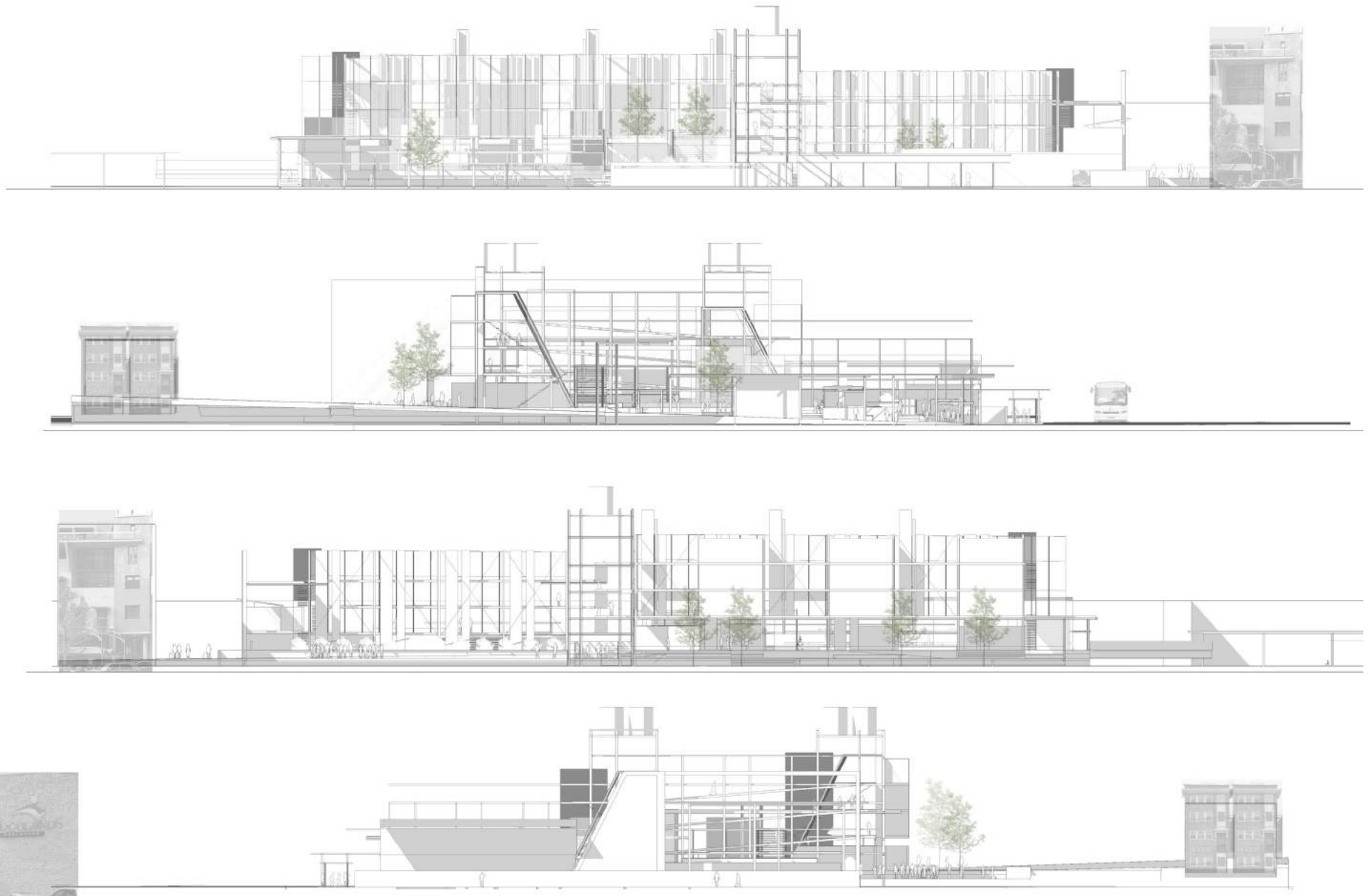


Figure 123 : September crit elevations (Author 2016)

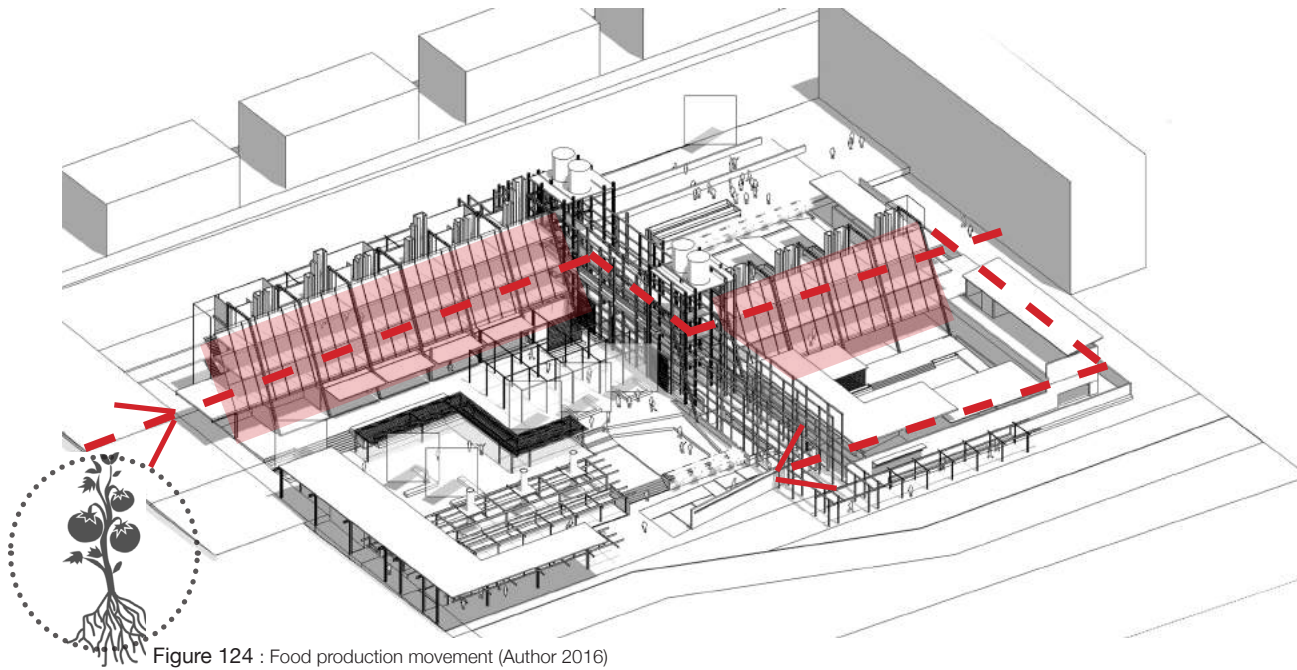


Figure 124 : Food production movement (Author 2016)

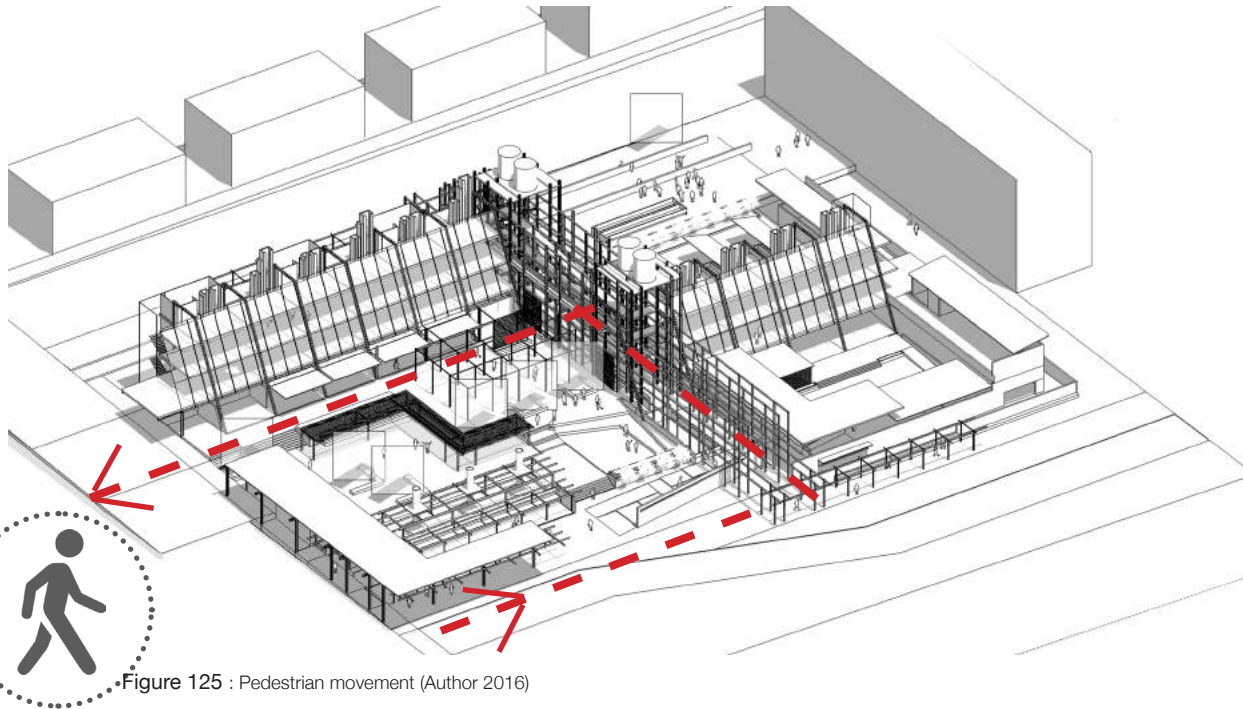
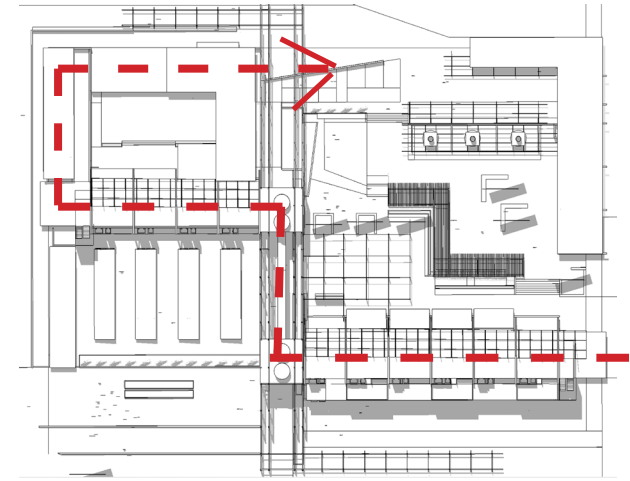
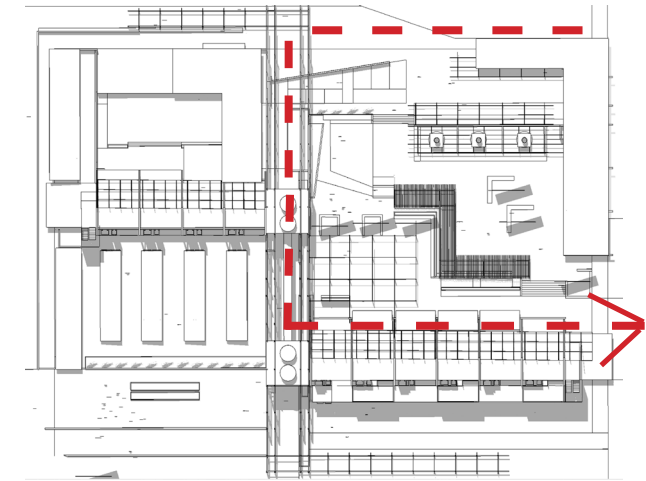


Figure 125 : Pedestrian movement (Author 2016)



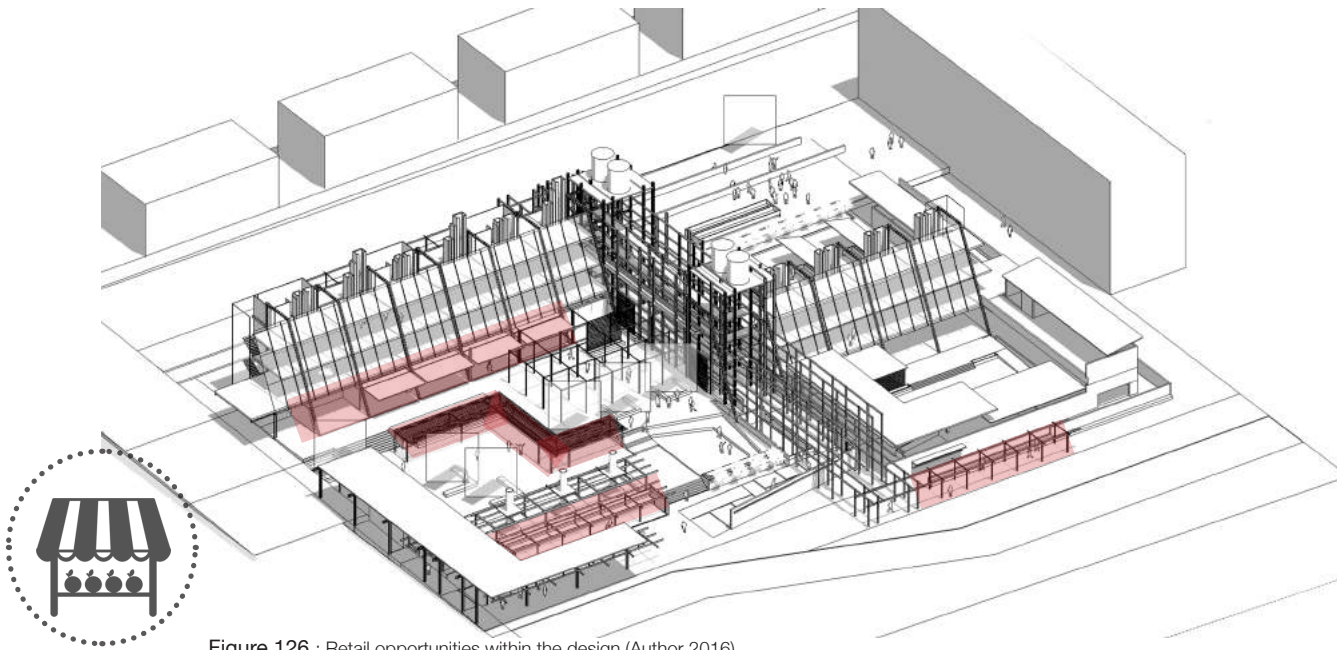


Figure 126 : Retail opportunities within the design (Author 2016)

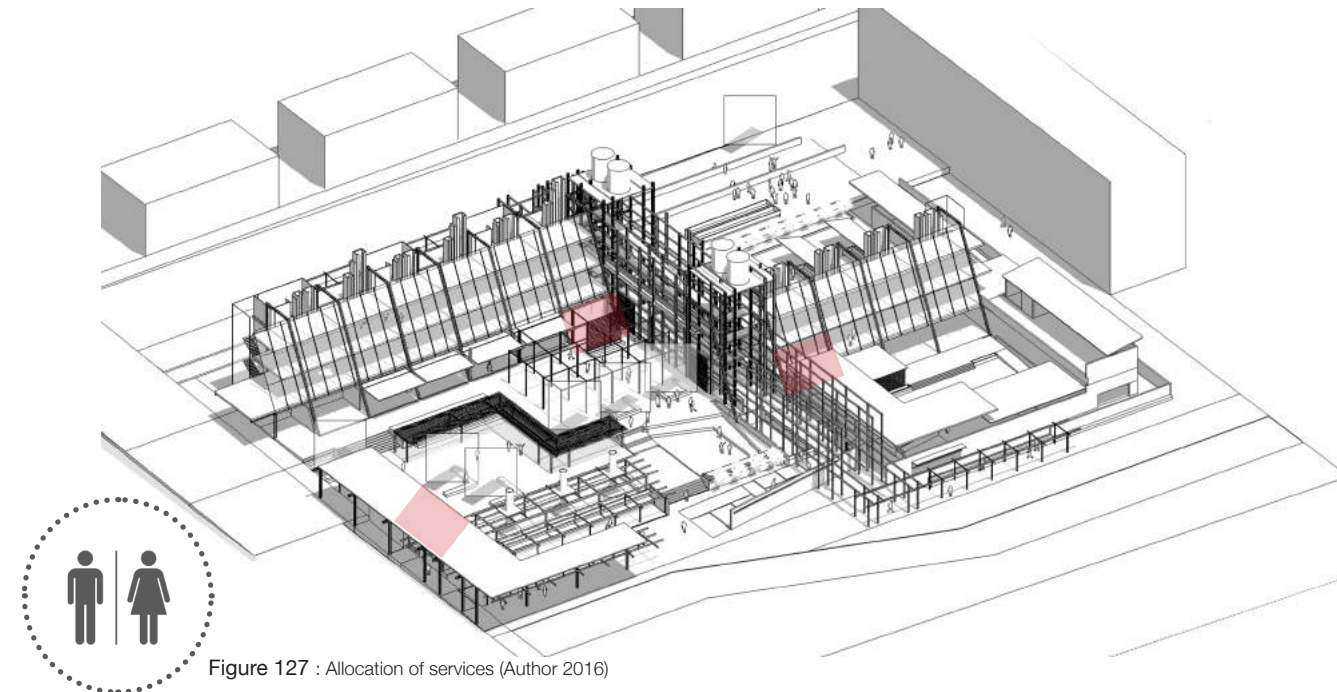
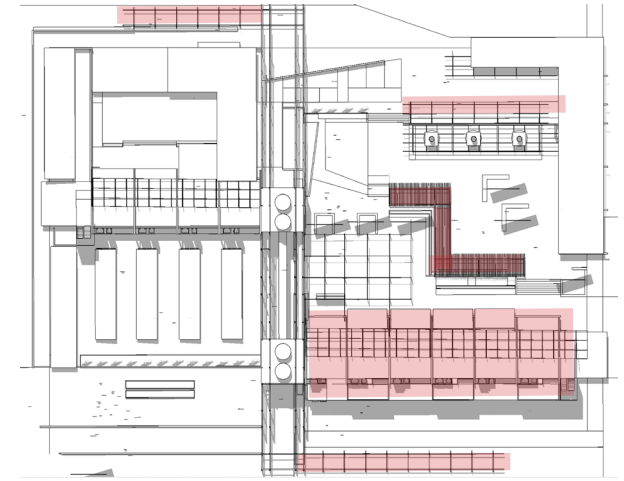


Figure 127 : Allocation of services (Author 2016)

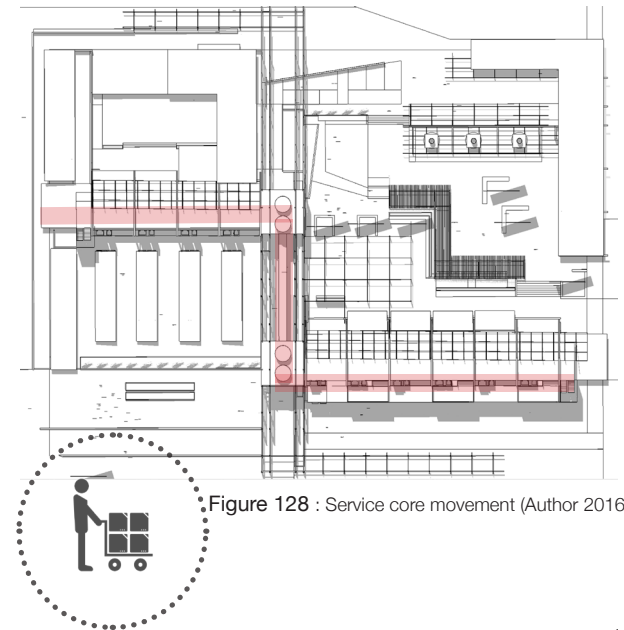
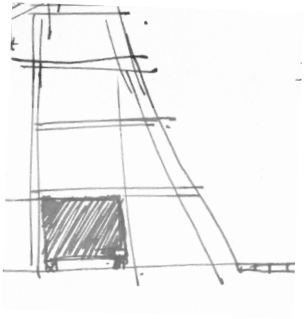


Figure 128 : Service core movement (Author 2016)

restaurants



The production courtyard, situated on the vehicular street, was too overpowering and created an unapproachable street edge.

The edge was also very dead and needed to facilitate a variety of functions in order to maintain social and urban interactions.



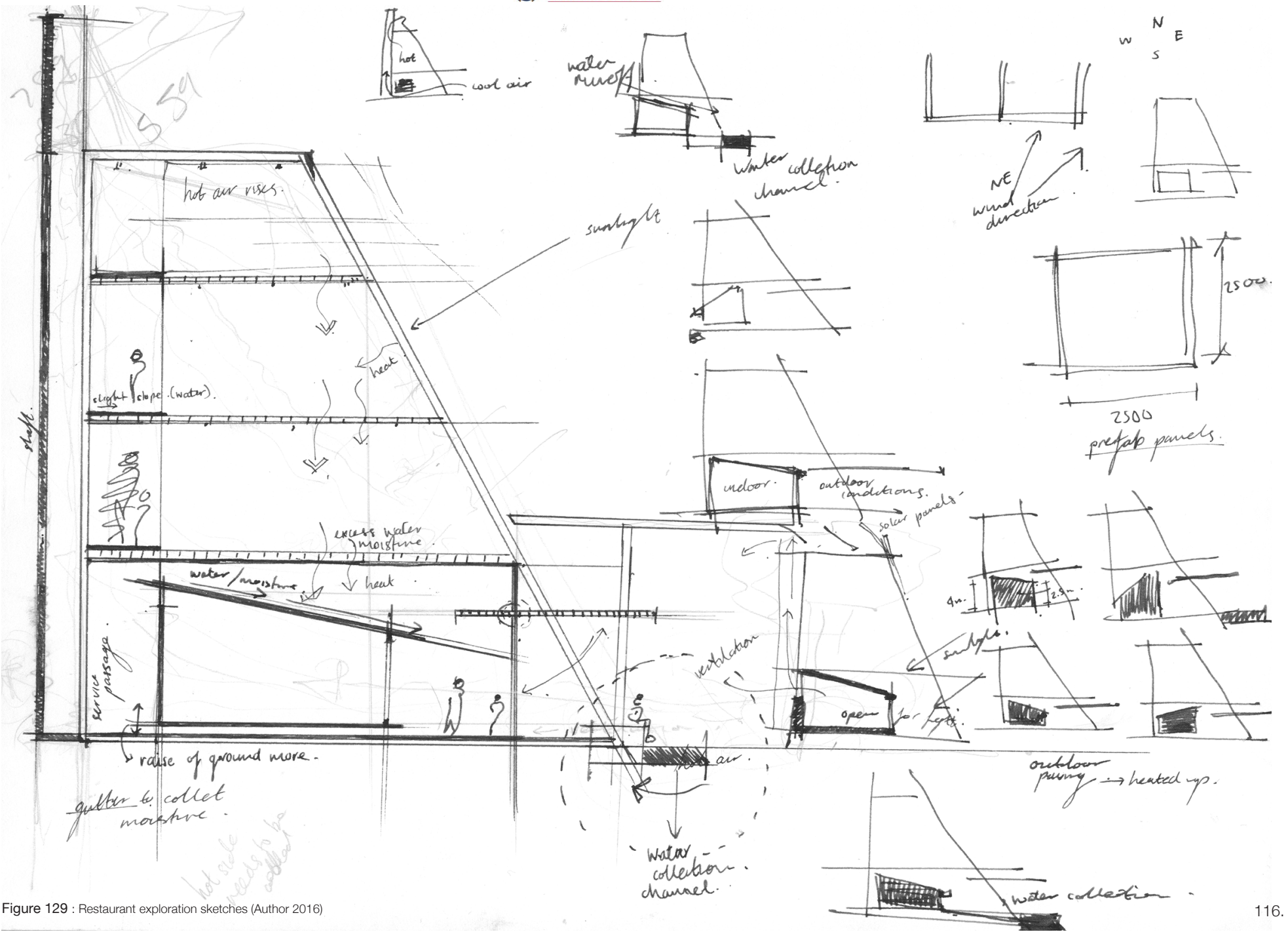
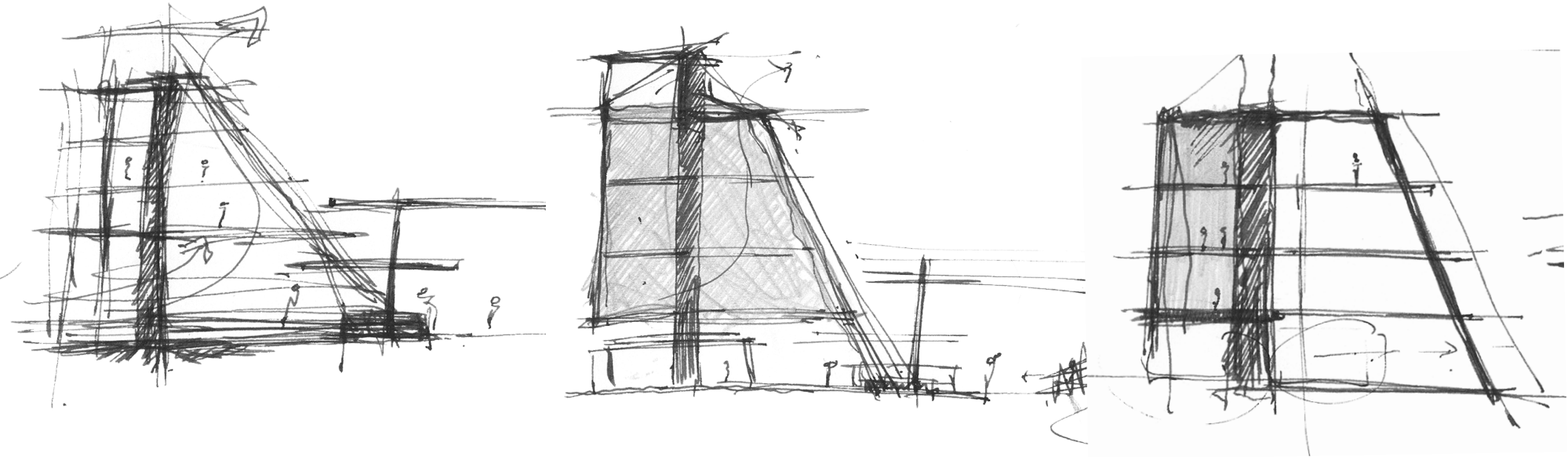
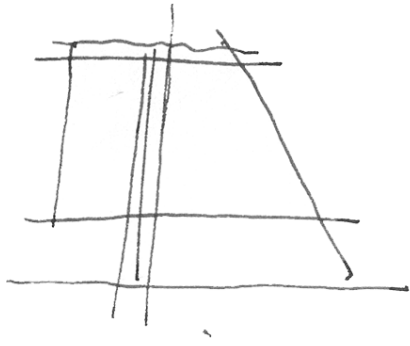
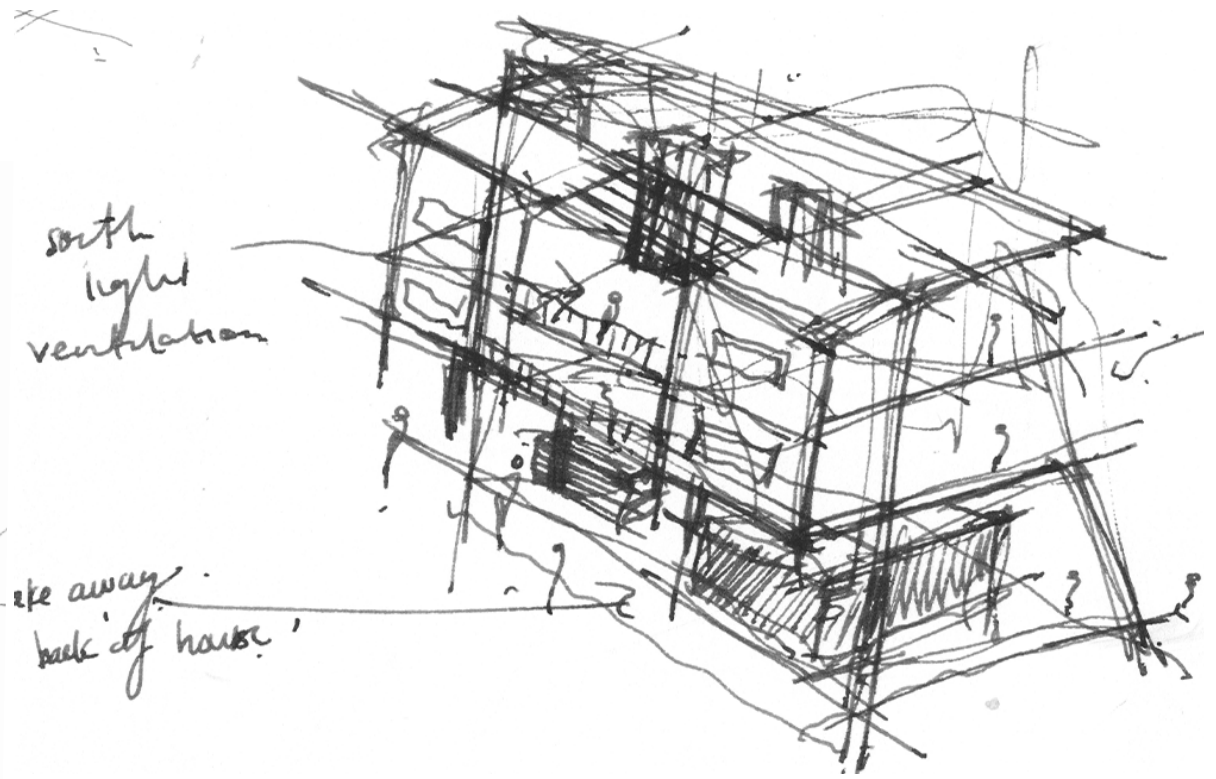
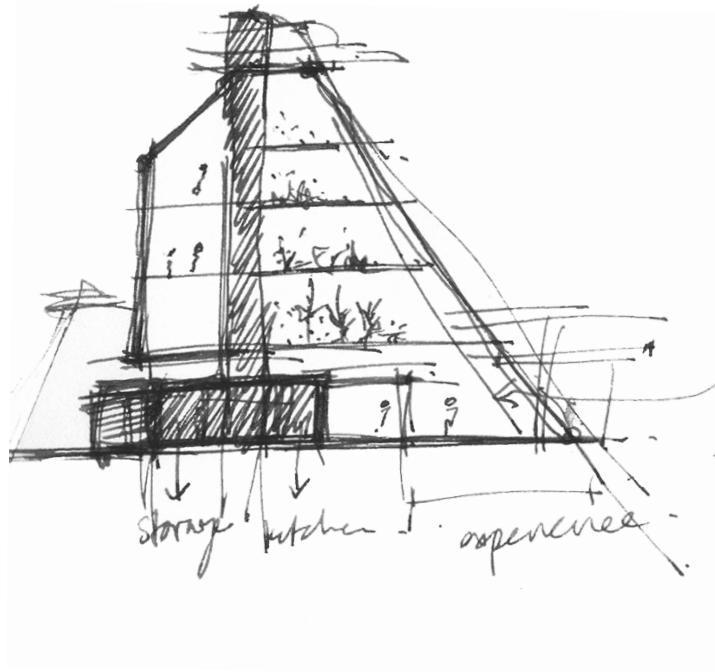


Figure 129 : Restaurant exploration sketches (Author 2016)

accommodation addition

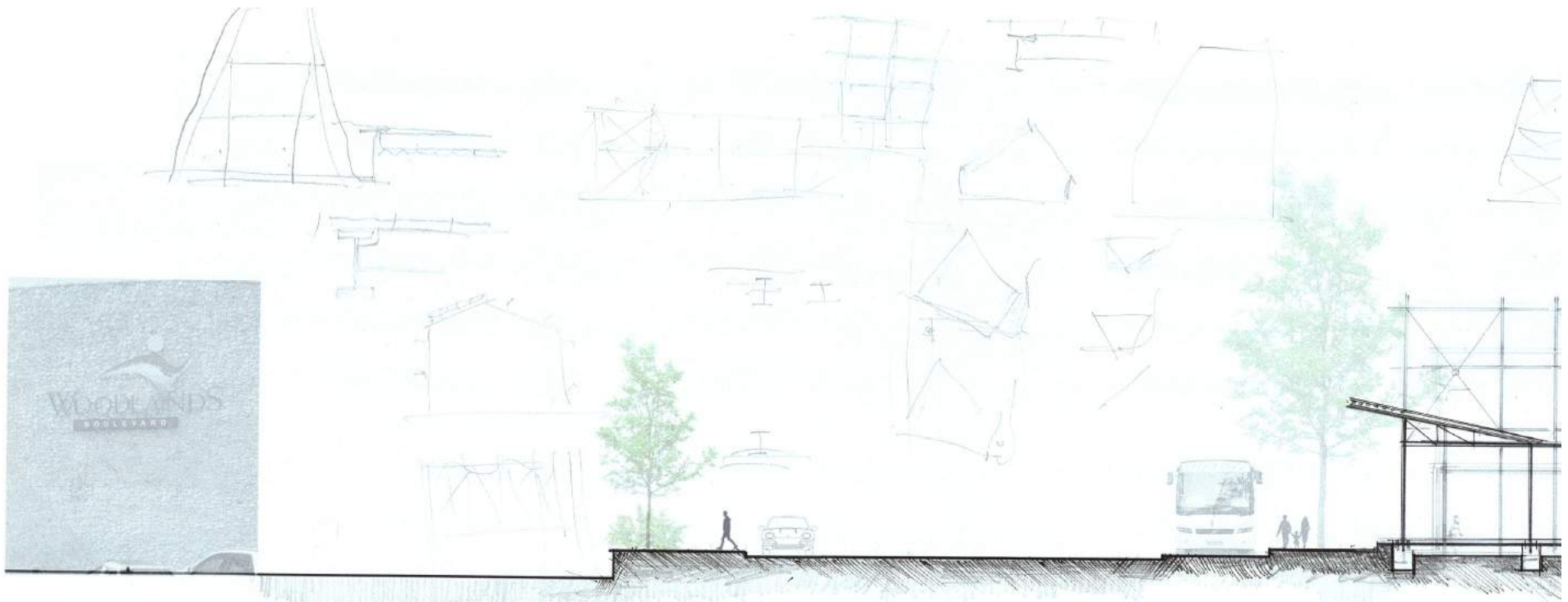


117. Figure 130 :Accommodation exploration and development sketches (Author 2016)



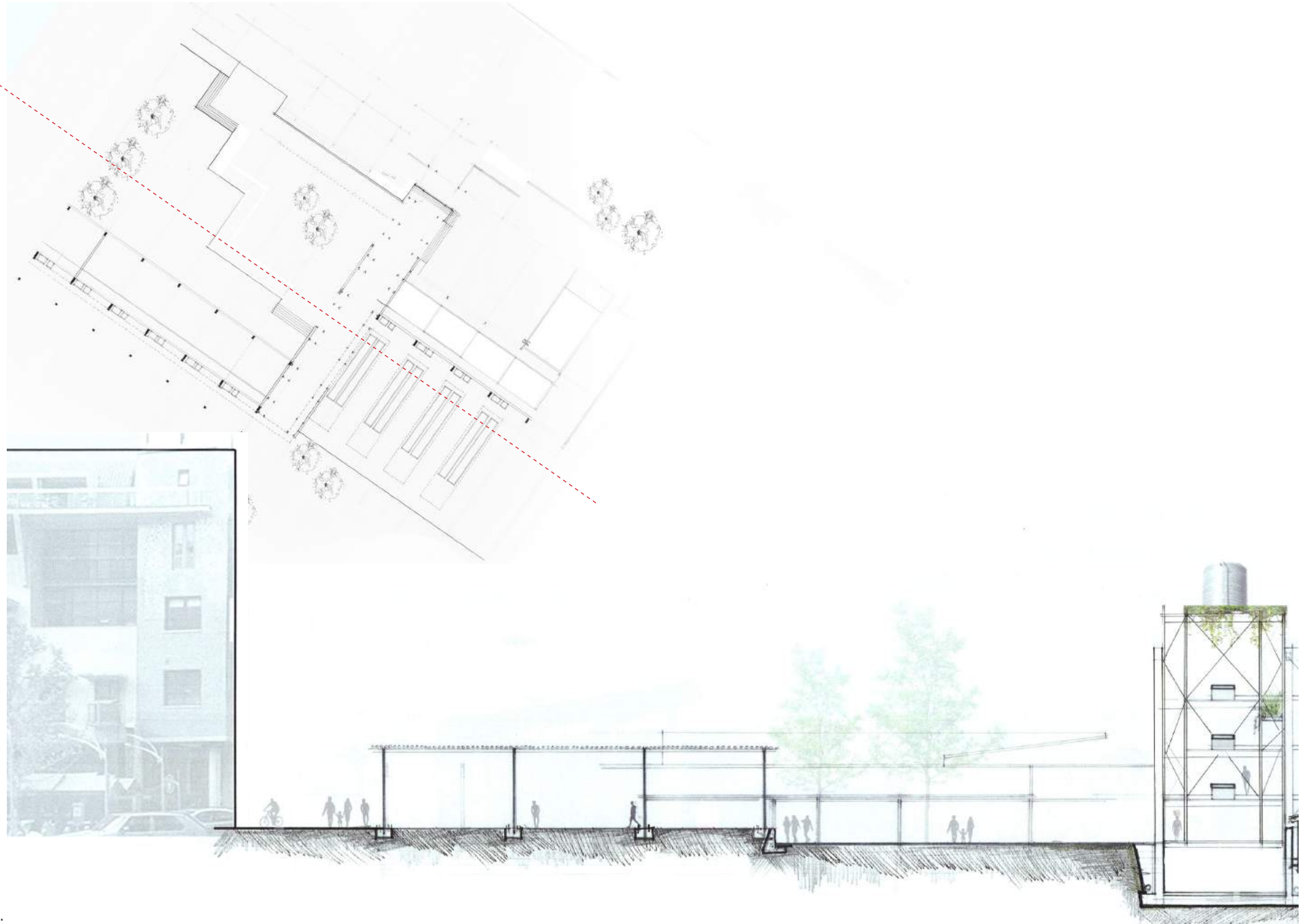
6 TECHNOLOGICAL DEVELOPMENT

iterations & analysis





SECTION AA



june critique

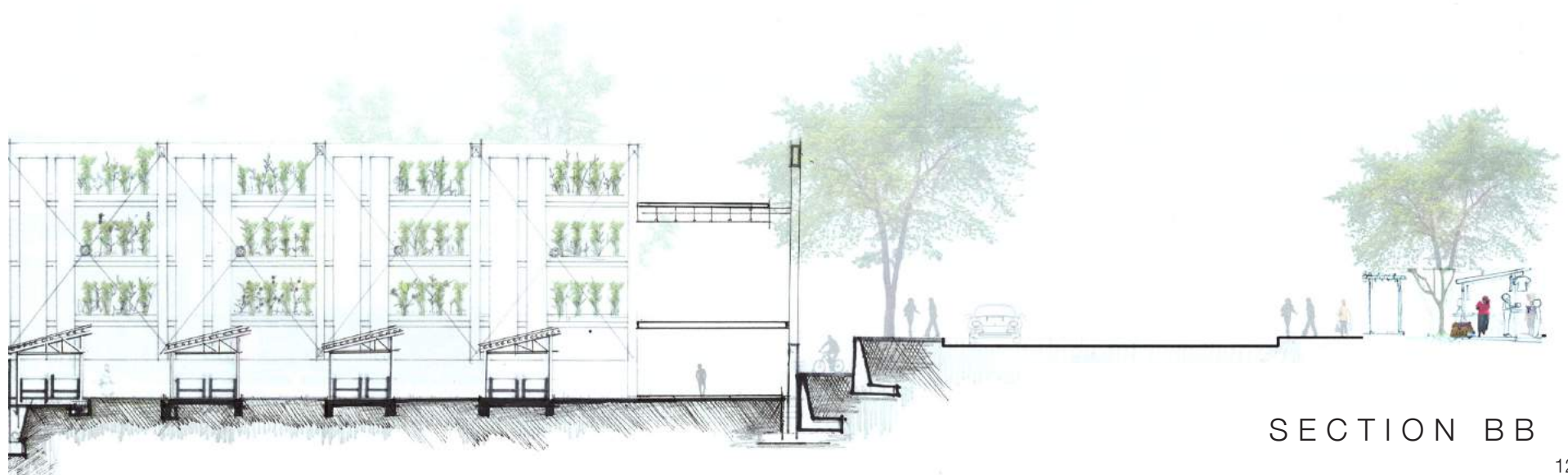
Sections are still very diagrammatic and require a better understanding.

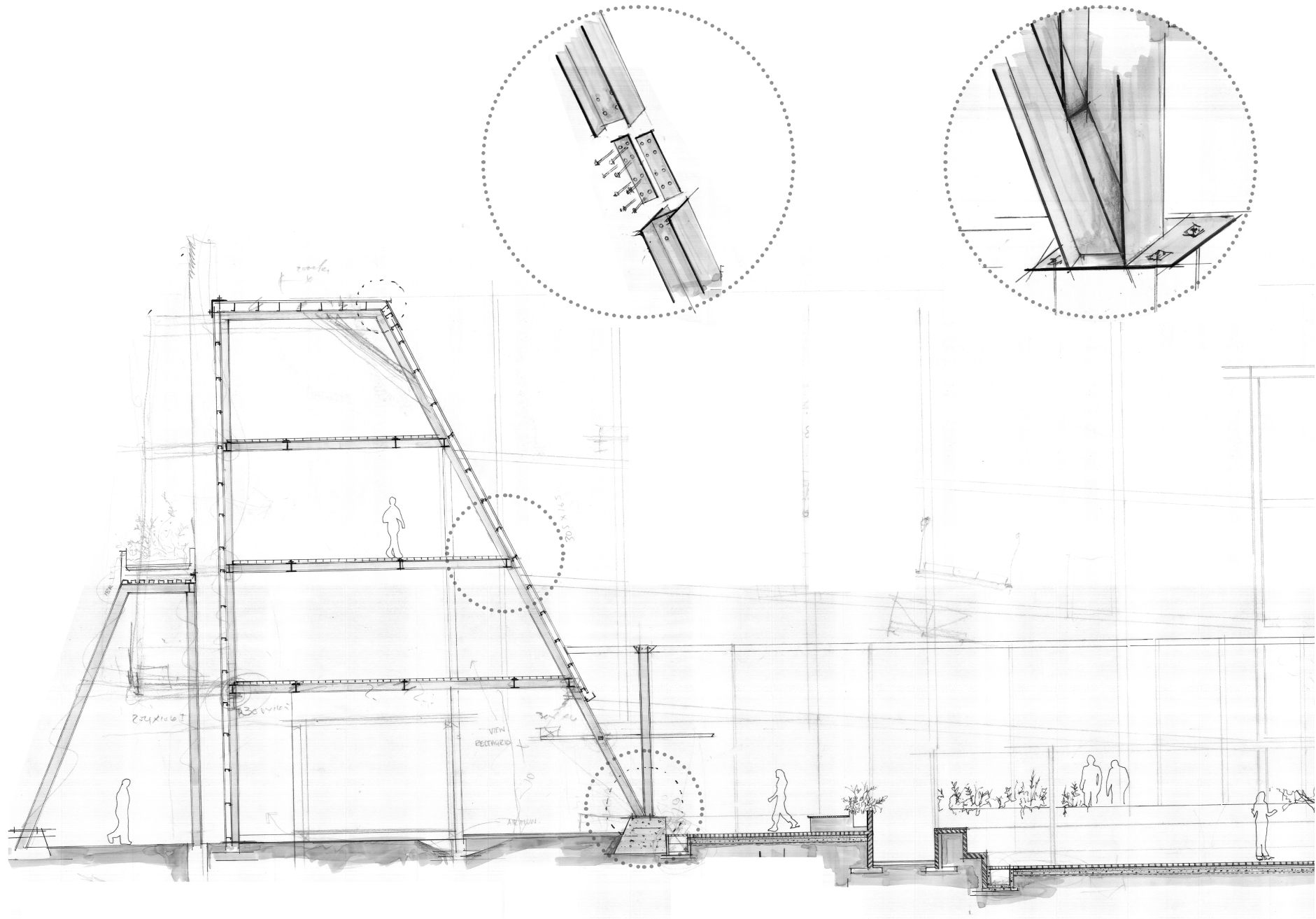
Materiality is lacking and needs to be represented within the sections clearly.

More context is required.

The design is about social interactions and this needs to be represented throughout the section.

Consider section choice and make sure it displays the conceptual and design intention.





september critique

Experiment with more materials.

Rethink conceptual focus in regards to technical investigation.

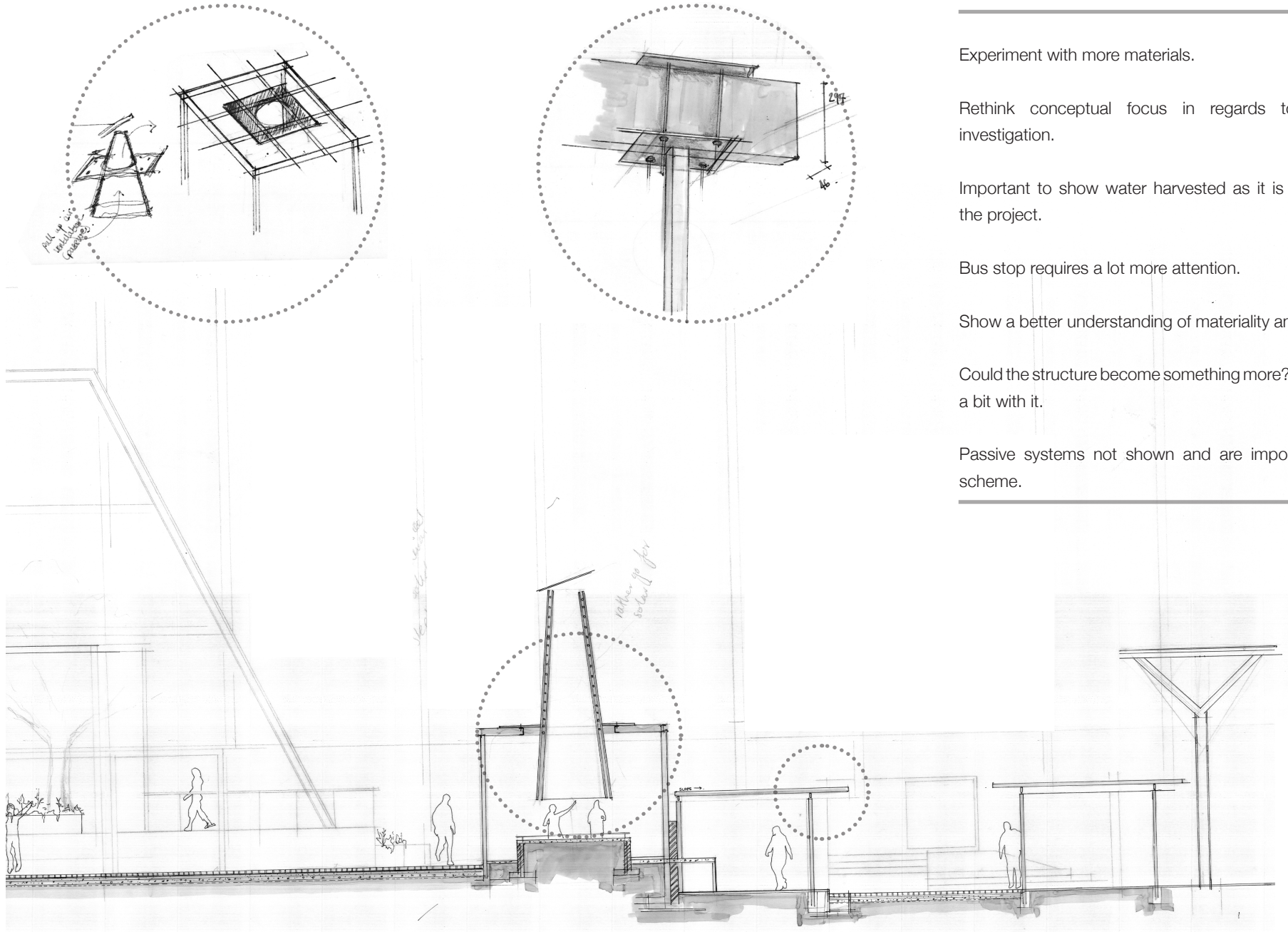
Important to show water harvested as it is essential to the project.

Bus stop requires a lot more attention.

Show a better understanding of materiality and structure.

Could the structure become something more? Experiment a bit with it.

Passive systems not shown and are important to the scheme.



RE[GROW]TH

REVISED TECHNICAL CONCEPT

from the ground up

Due to the nature of the site it is important to develop the language through a contextual manner which highlights the over-arching idea of social, economical and physical re[grow]th. Dual functionality becomes a large consideration in order to create adaptable and less restricted contextual and functional conditions.

The aim is to find a balance through structural means that promotes both ends of the spectrum, informal and formal, by merging the high tech demands of the food production system with the innovative low tech solutions found within the context in order to create a resilient and empowering socio-economic space.

Owing to the space being a highly interactive one the structure needs to be resilient in order to endure a variety of conditions and activities. From the ground up, the structures will transition from a heavy robust nature, such as the roots of a plant, to a more sensitive and temporal one, such as the leaves, with regards to both materiality and structure.

The structure, stem of the plant, thus facilitates the amalgamation of the two contrasting construction notions and how together they contribute to the overall wellbeing of the space.

IMPERMANENCE

GROWTH

GROUNDED

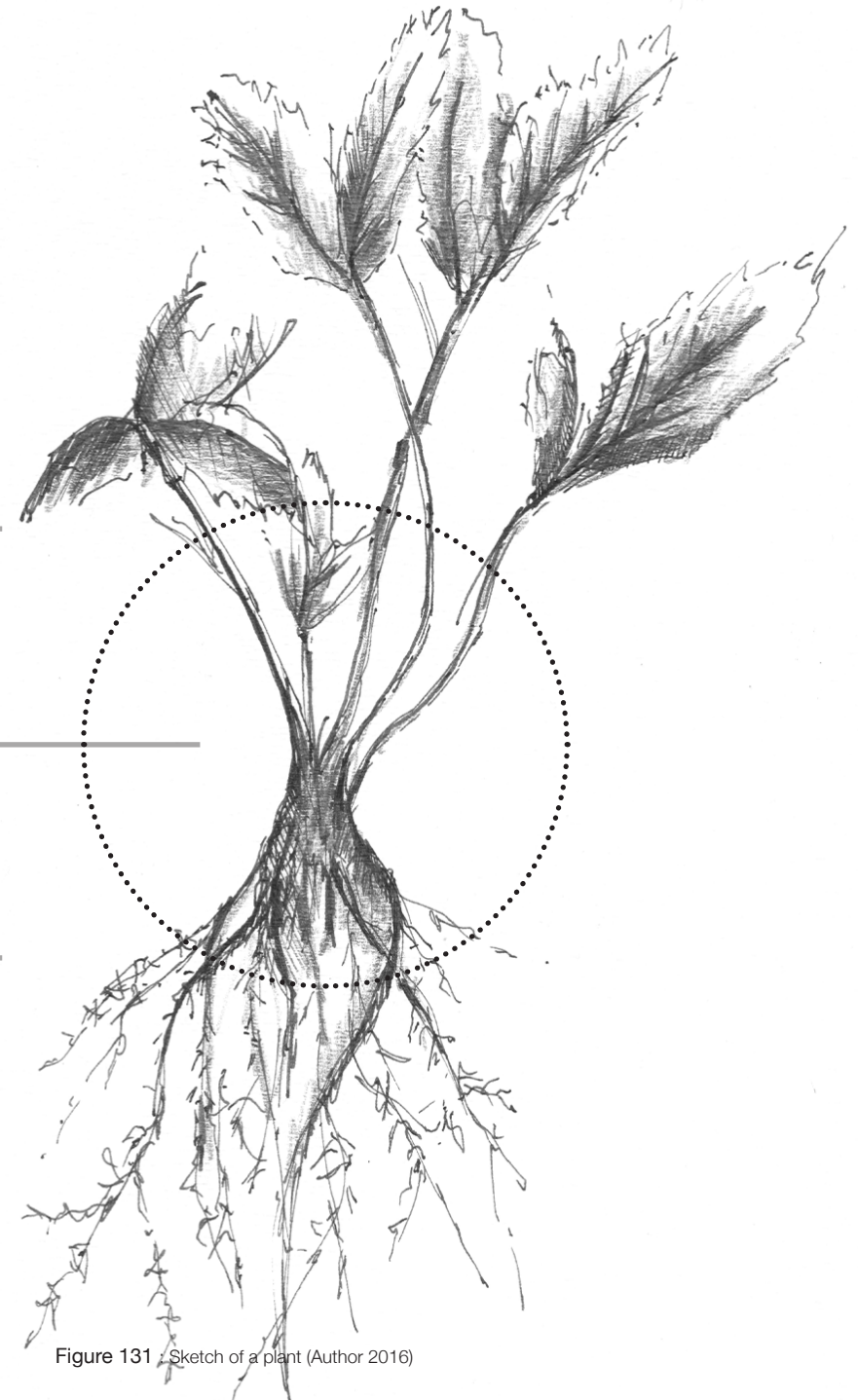
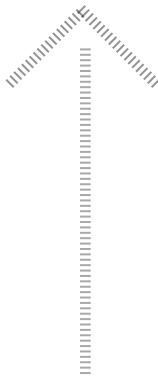


Figure 131 Sketch of a plant (Author 2016)

temporary construction
informal (plastic view)



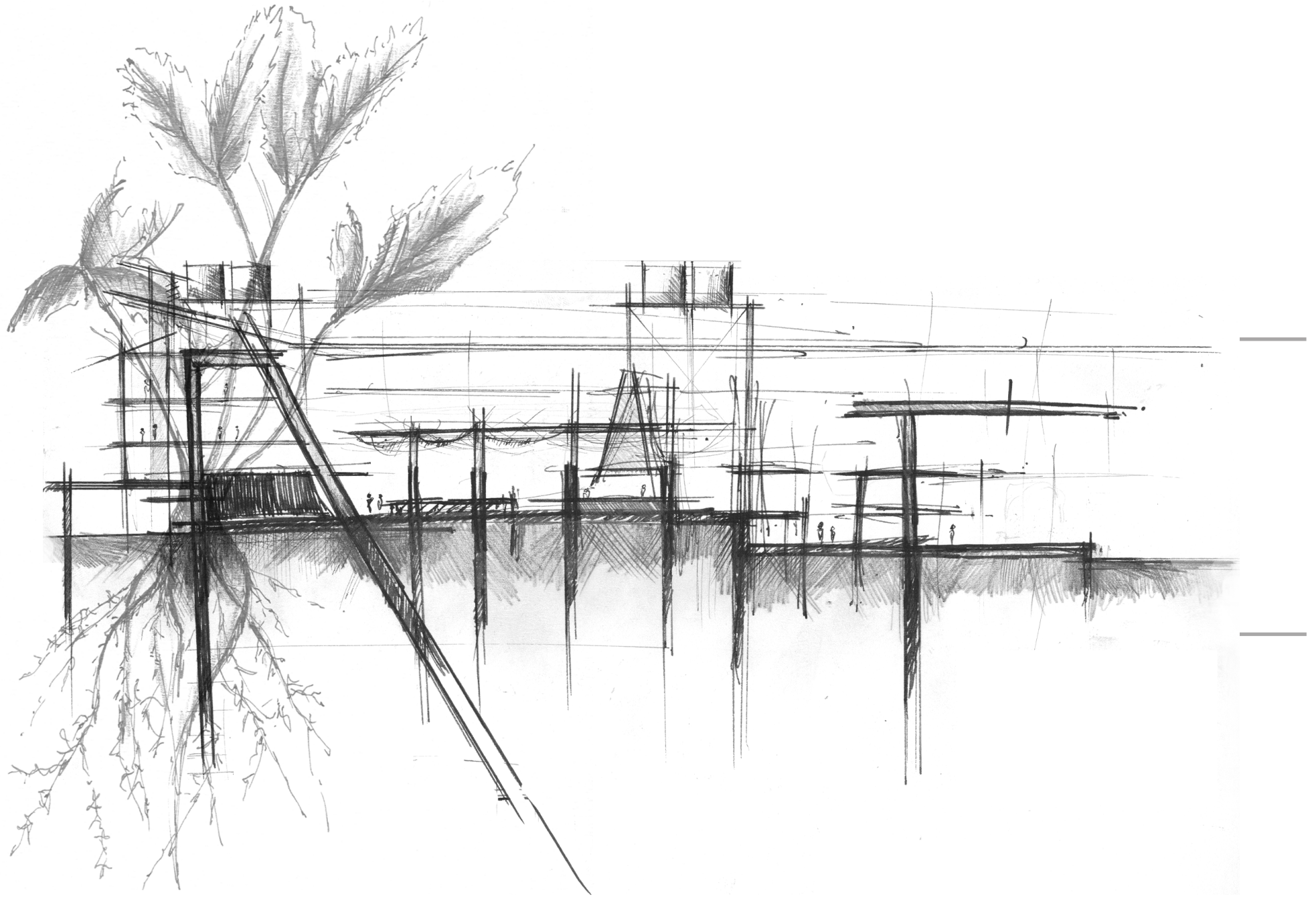
L I G H T

permanent construction
formal (woodlands boulevard)



H E A V Y





TECHNICAL TRANSLATION:

fragile
mono-functional

small vs large scale tectonics
delicate connections

LIGHT

AMALGAMATION

TECHNICAL TRANSLATION:

robust
dual-functionality

fine vs large grain stereotomics
sturdy connections

HEAVY

MATERIALITY

from the ground up

The concept is reflected in the material palette which predominately includes plastic, steel and brick. The aim is to play the materials off of one another in order to emphasise their differences as well as demonstrate the manner in which they can be integrated. The brick and plastic are more contextual and readily available where as the steel is not as prominent, especially within the settlement. The palette includes the merging of man-made and natural elements allowing for a successful connection to the urban fabric.

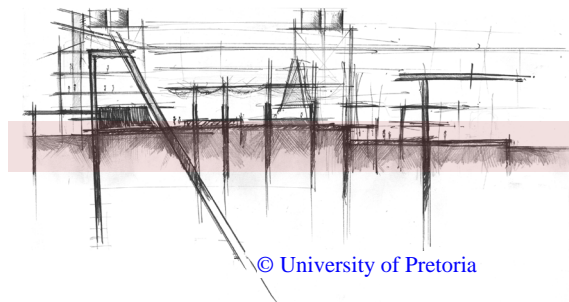
The overall intention of the scheme, to optimise food systems through the reduction of waste, is carried through into the construction. Due to steel being such a heavy element, the investigation and use of recycled materials where deemed appropriate, is validated.



Figure 132 : On site materiality photos (Author 2016)

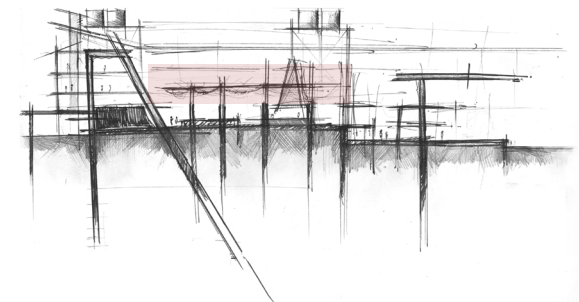
RECYCLABLE BRICKS

Along side Plastic View is a large dumpsite consisting of bricks and pieces thereof. The bricks are discarded as it is forbidden for residents of Plastic View to build anything permanent. They are, however, used for purposes such as paving and the definition of property boundaries.



PLASTIC SHEETING

Plastic sheeting is the most predominant material used in Plastic View.





CORROGATED SHEETING

Corrugated sheeting is a commonly used material throughout the informal settlement. Discarded sheets are found and recycled into walls and roofs.



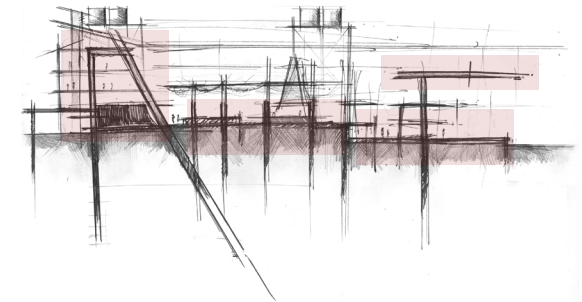
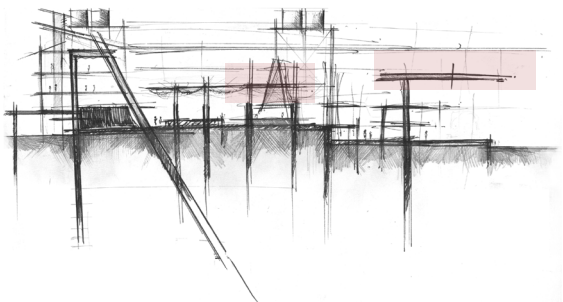
TIMBER

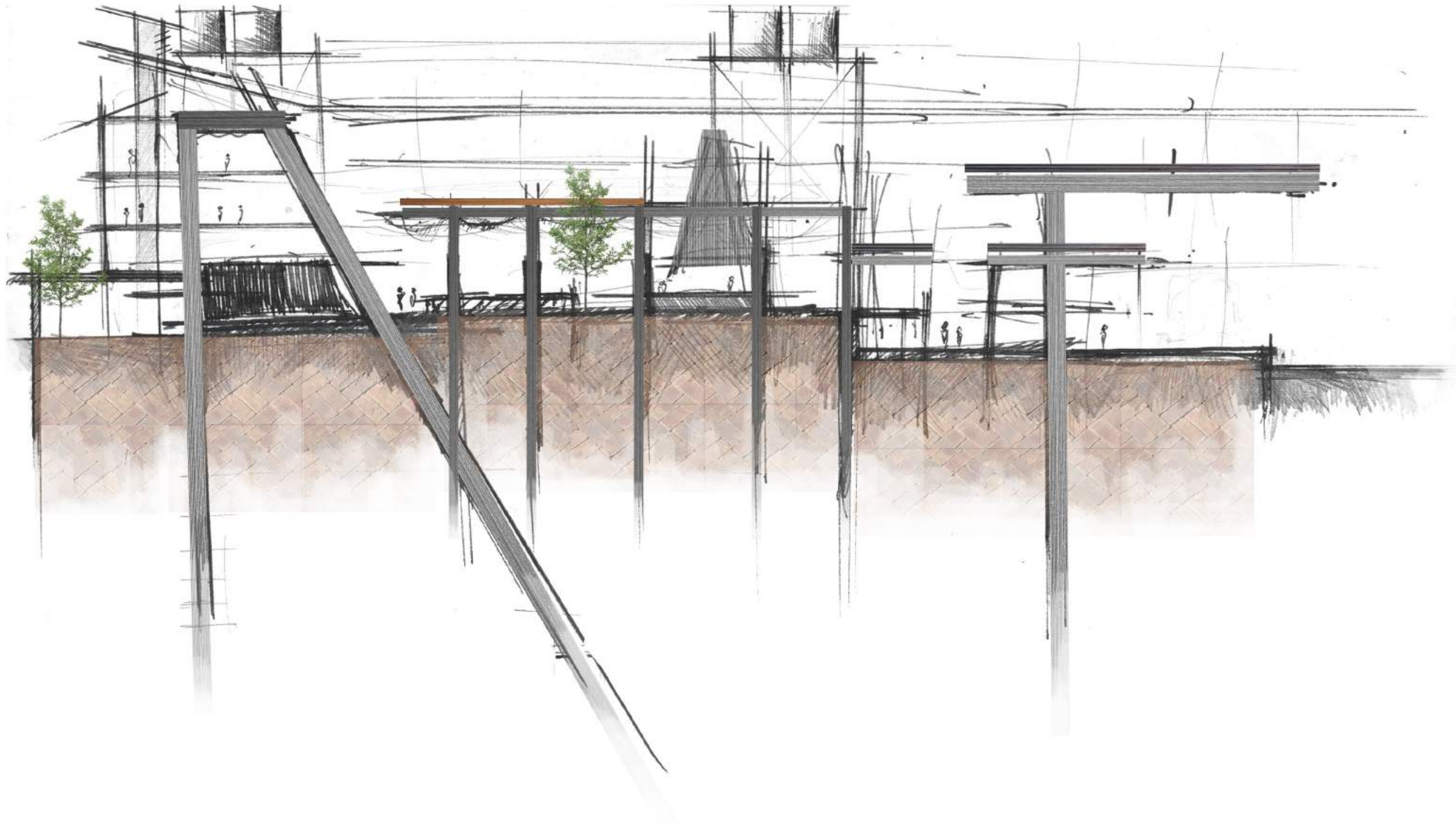
Discarded timber offcuts are used structurally used to build the small dwellings.



STEEL

Steel elements are used to highlight new technology and changes within the context. It also aids in acknowledging structural elements present in Woodlands Boulevard.

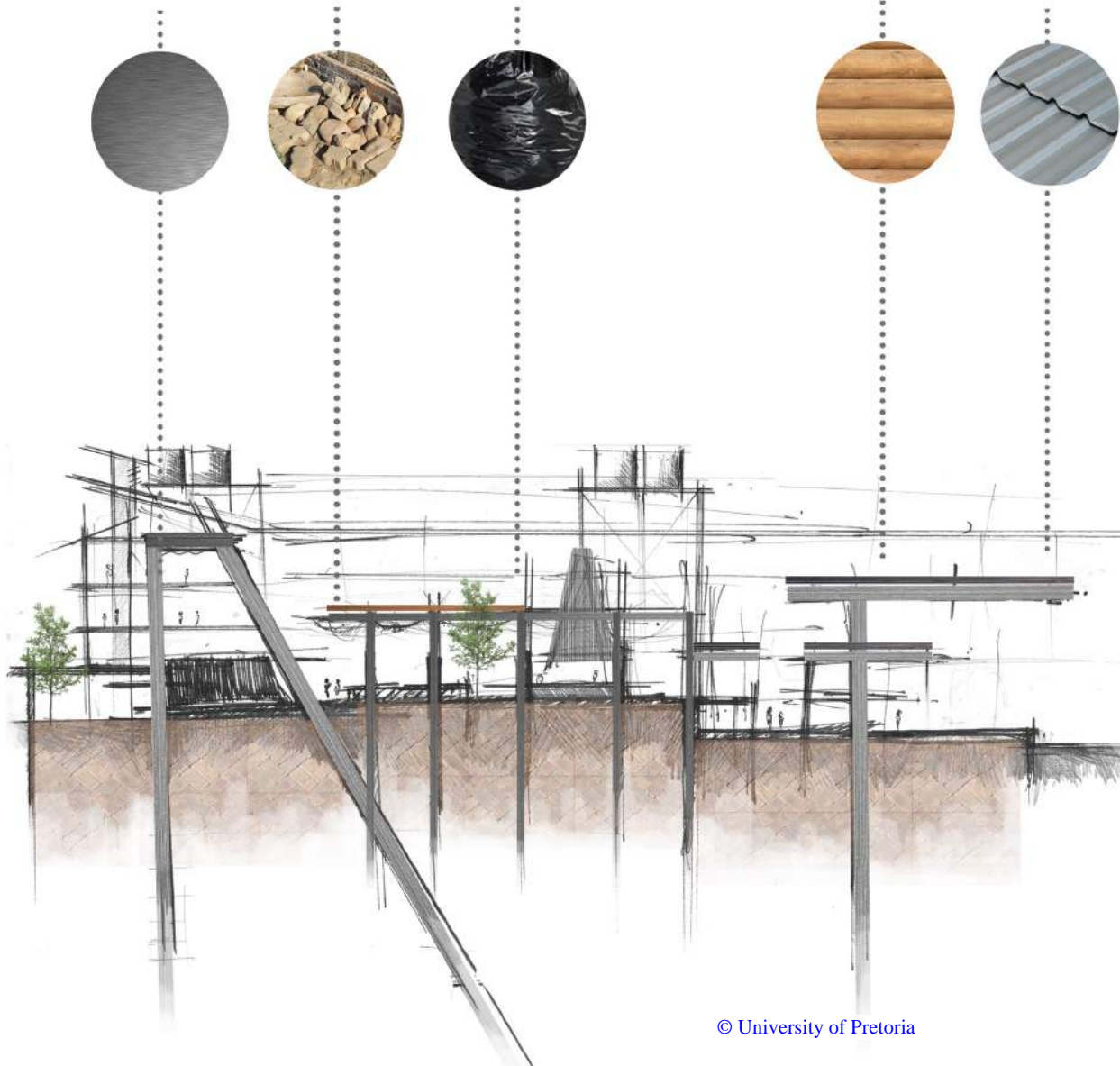




CONTEXTUAL MATERIALITY
INFLUENCE



IMPLEMENTED MATERIALITY



SUSTAINABILITY

from the ground up

The design is built upon the requirement to optimise systems through the reduction of waste and thus it is only appropriate that the design conceptually reflects this.

Conceptually, the design aims to incorporate the variety of materials on site in a manner that enhances their differences but displays them in a manner that allows them to stand on their own.

With regards to sustainability, an investigation into composite materials was done in order to compensate for the large amount of steel being used. The project thus uses the contextual material influence but explores other means by which to represent these materials.

92%

UNRECYCLED PLASTIC WASTE_GLOBALLY

300 million tonnes of plastic is discarded annually on a global scale of which only 8% is recycled. A sizeable contributing factor, in terms of food production, is the packaging used. The plastic packaging reduces food waste as it keeps products fresher for longer periods of time, improves transport efficiency and reduces packaging mass.

The steadily increasing amount of plastic waste is raising awareness and strengthening the demand for a more sustainable packaging material as well as the need to recycle the substantial amount of plastic waste already available (Gourmelon 2015).



Figure 133 : Unrecycled plastic waste at a global scale (Author 2016)



PLASTIC RECYCLING

the lack thereof

Plastics are durable, lightweight and inexpensive materials, which enables them to be easily moulded into a large variety of products. As a result of this, plastic production, over the past 60 years, has increased remarkably (Thompson et al 2009a).

Approximately 4 per cent of the global gas and oil production, a non-renewable resource, is spent as feedstock for plastic production and an additional 3-4 per cent is used for the energy needed for the manufacture thereof (Dvorak, Hopewell & Kosior 2009).

Due to the levels at which plastics are currently used and produced, which far outweighs the disposal, has created many environmental issues that has led to the usage of plastics being unsustainable (Thompson et al 2009b). As a result of the durable nature of the plastics, significant quantities of rejected plastics are gathering as debris within the landfills and in worldwide natural habitats.

There are as many as 7 types of plastic, however, only 3 types of plastic (1-3) are commonly processed due to high processing expenses, safety concerns and toxicity of the other 4 (Indiegogo 2016).



BYFUSION_PLASTIC BRICKS

100% recycled

Peter Lewis is the engineer-inventor of ByFusion, a 100% modular technology platform that converts all the various types of plastic waste into neat blocks called RePlast, that are a new alternative material for building (Chowdhury 2016).

The process is an eco-friendly, non-toxic and low carbon emission method to upcycle discarded plastic into a new usable product and the machine itself is modular and can easily be transported to wherever it is needed (ByFusion 2016).

As a building material, RePlast blocks are 100% recycled due to the machine is able to process all 7 types of plastic. The ByFusion technology allows for the production of blocks with the same sizing and dimensions of common concrete blocks that are designed to accommodate a large variety of development, infrastructure and construction projects.

Blocks range from 3.5 -12kg of plastic depending on the use for the brick and approximately 7000 bricks can be produced daily. The bricks are configured in order to stack like lego blocks, which eliminate the need for

adhesives or mortar and thus represent a new approach to sustainable construction (DiStasio 2016). The bricks can be covered by chicken mesh and plastered for desired effects.

With technology as such and the devastating increase in pollution and waste it seems only fitting to incorporate RePlast as a building material or this project. Plastic can be used straight from landfills and can also be collected from the oceans and coastlines diverting millions of tons of the plastic waste from the landfills (Chowdhury 2016).



Figure 135 : plastic waste (ByFusion 2016)

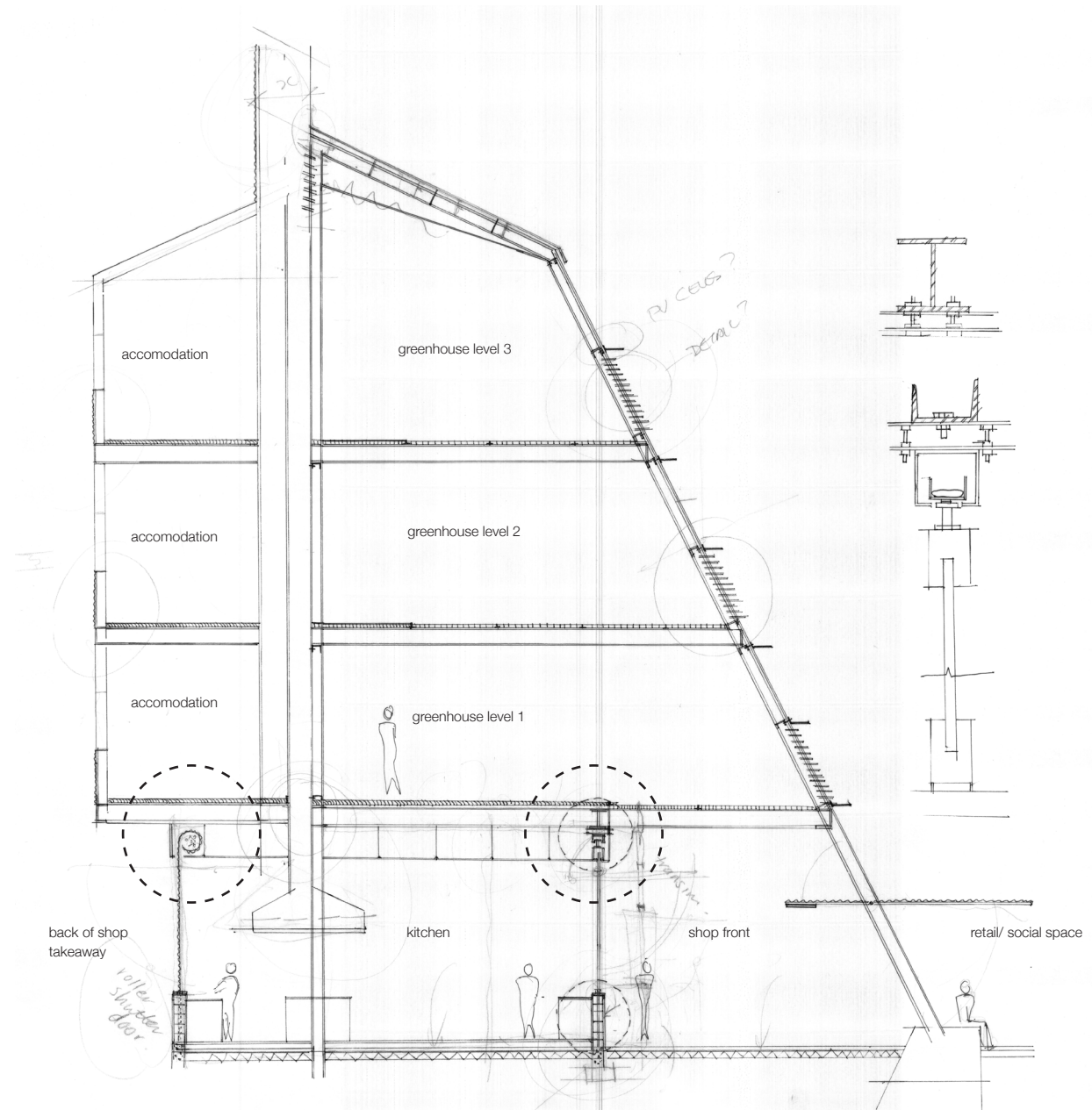


Figure 136 : ByFusion bricks (ByFusion 2016)



Figure 134 : ByFusion bricks manufacturing (ByFusion 2016)

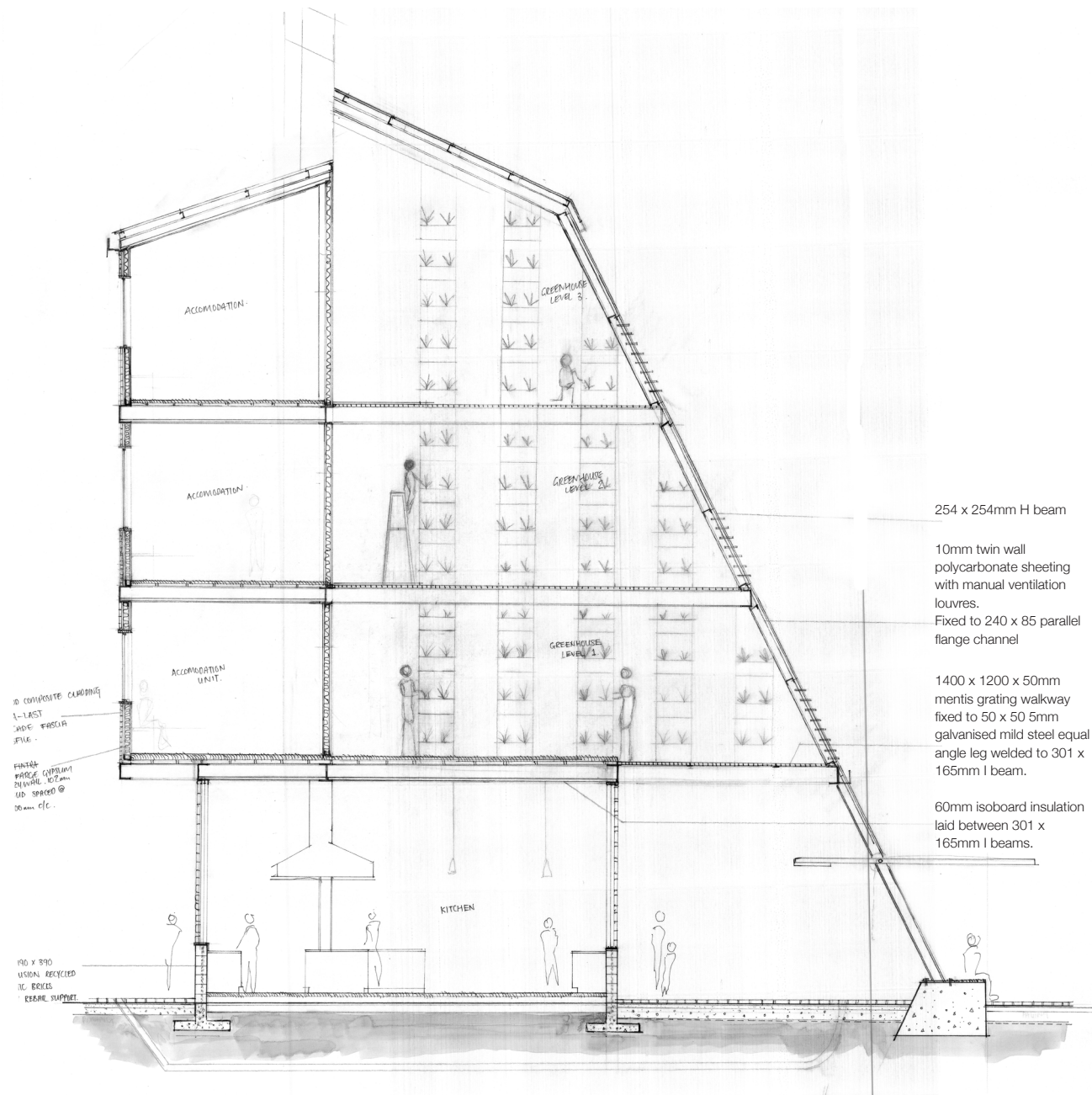
- 95% lower greenhouse gas emission than concrete block.
- Better sound and thermal insulation capabilities than a concrete block.
- Flexible manufacturing process. Various sizes, shapes and colours.
- Cost effective to build and scale.
- Streamlined processing. No sorting or pre-washing required. Plastic gets shovelled straight into the machine for the process to begin.



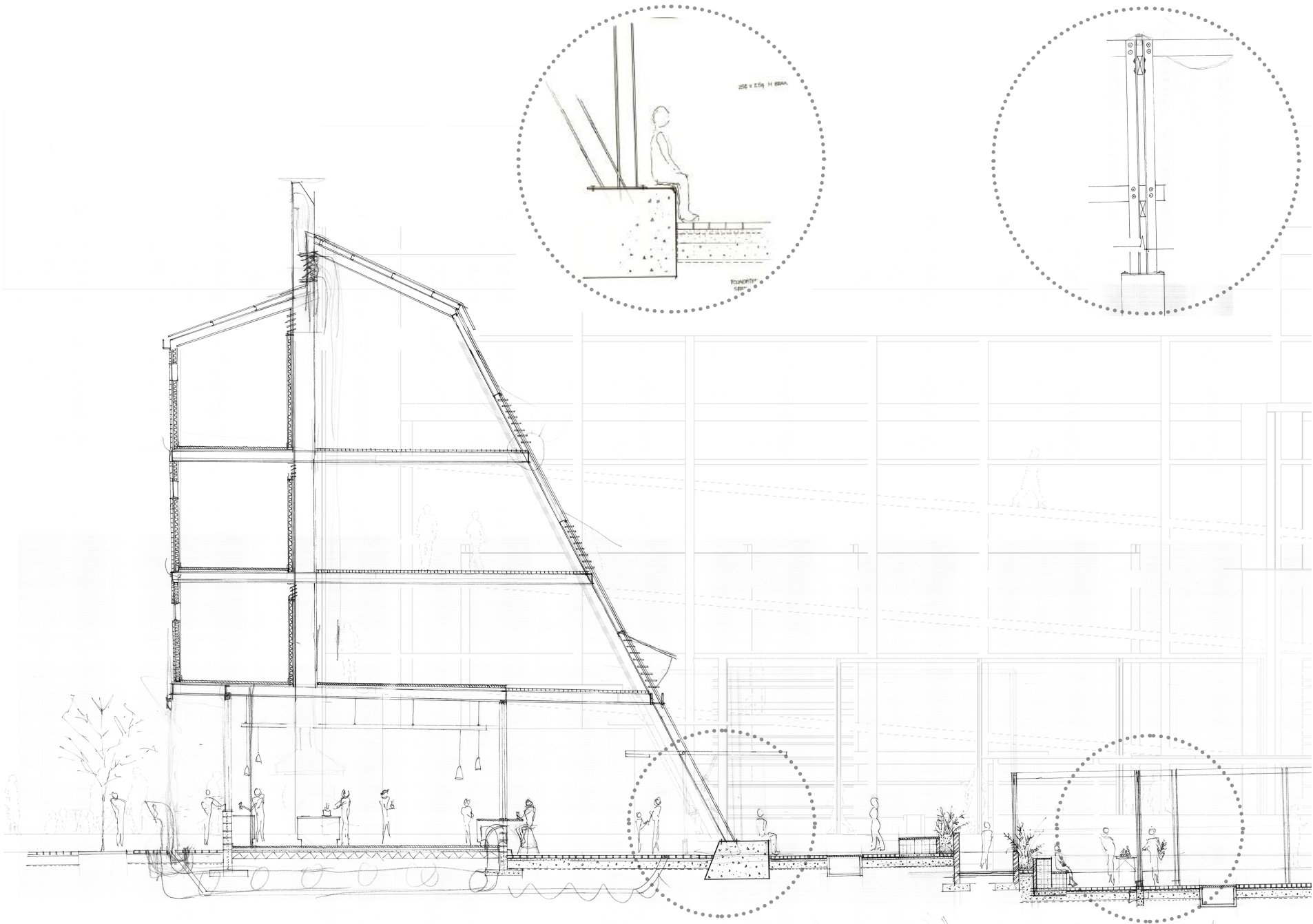
greenhouse development

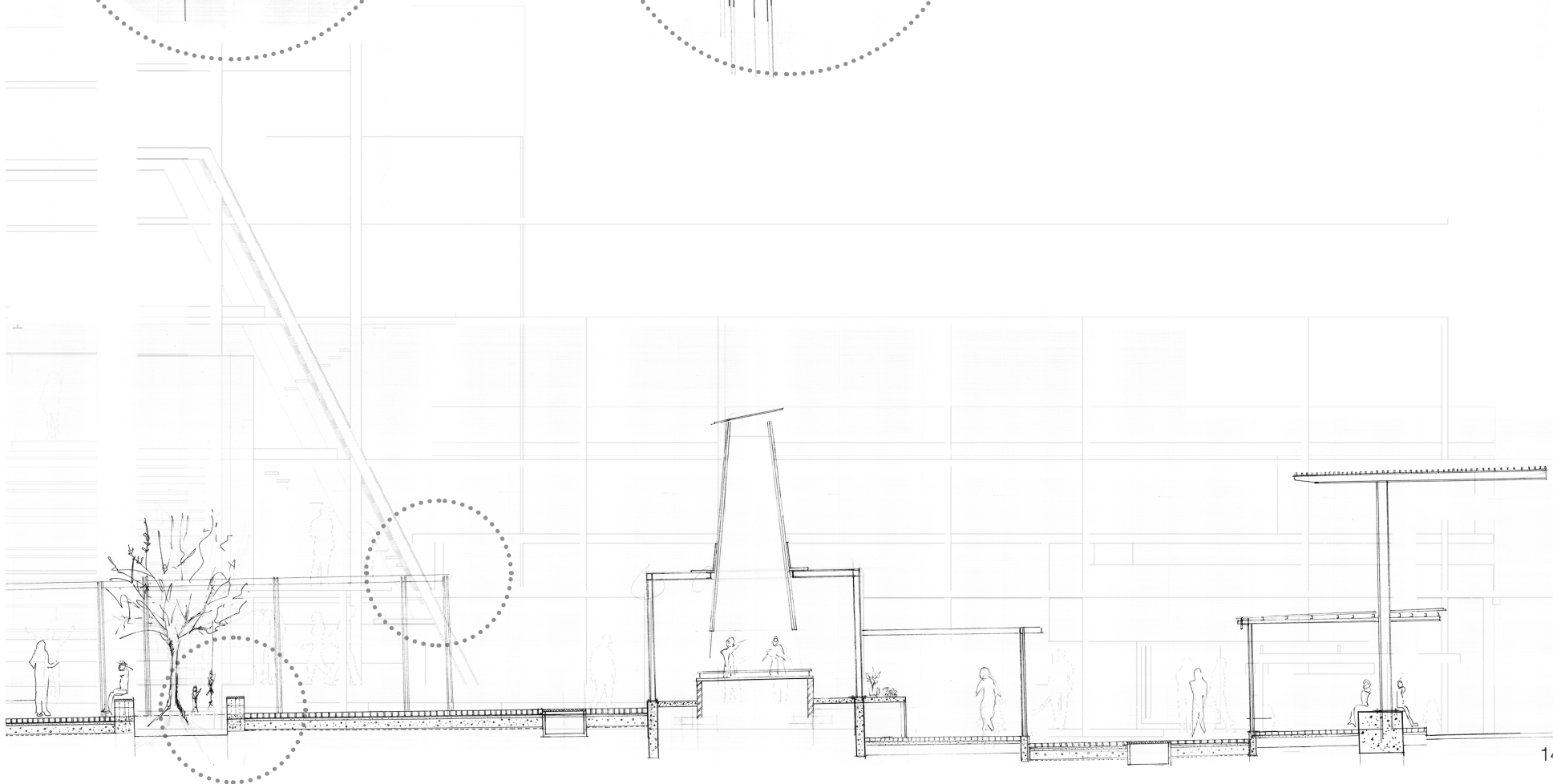
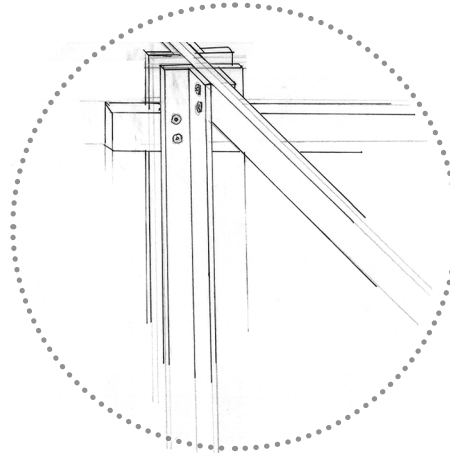
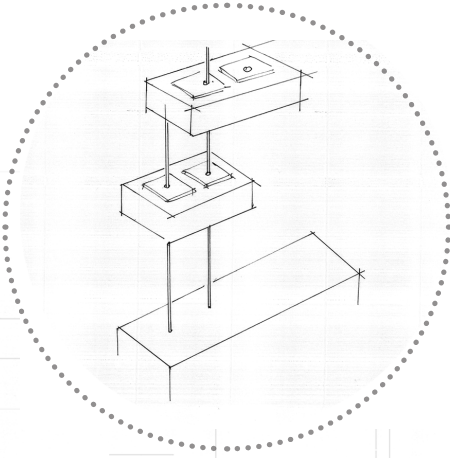
The greenhouse, the focal point of production, is the most technically advanced aspect of the design with regards to its materiality and hydroponic system within.

In order to develop the production core on a more human scale the materiality used on ground floor will be contextual as well as robust.



The greenhouse is more simplified in terms of materiality. The roller shutter doors make way for large sliding windows that enable the ground floor to open up fully and allow for movement within and through the space



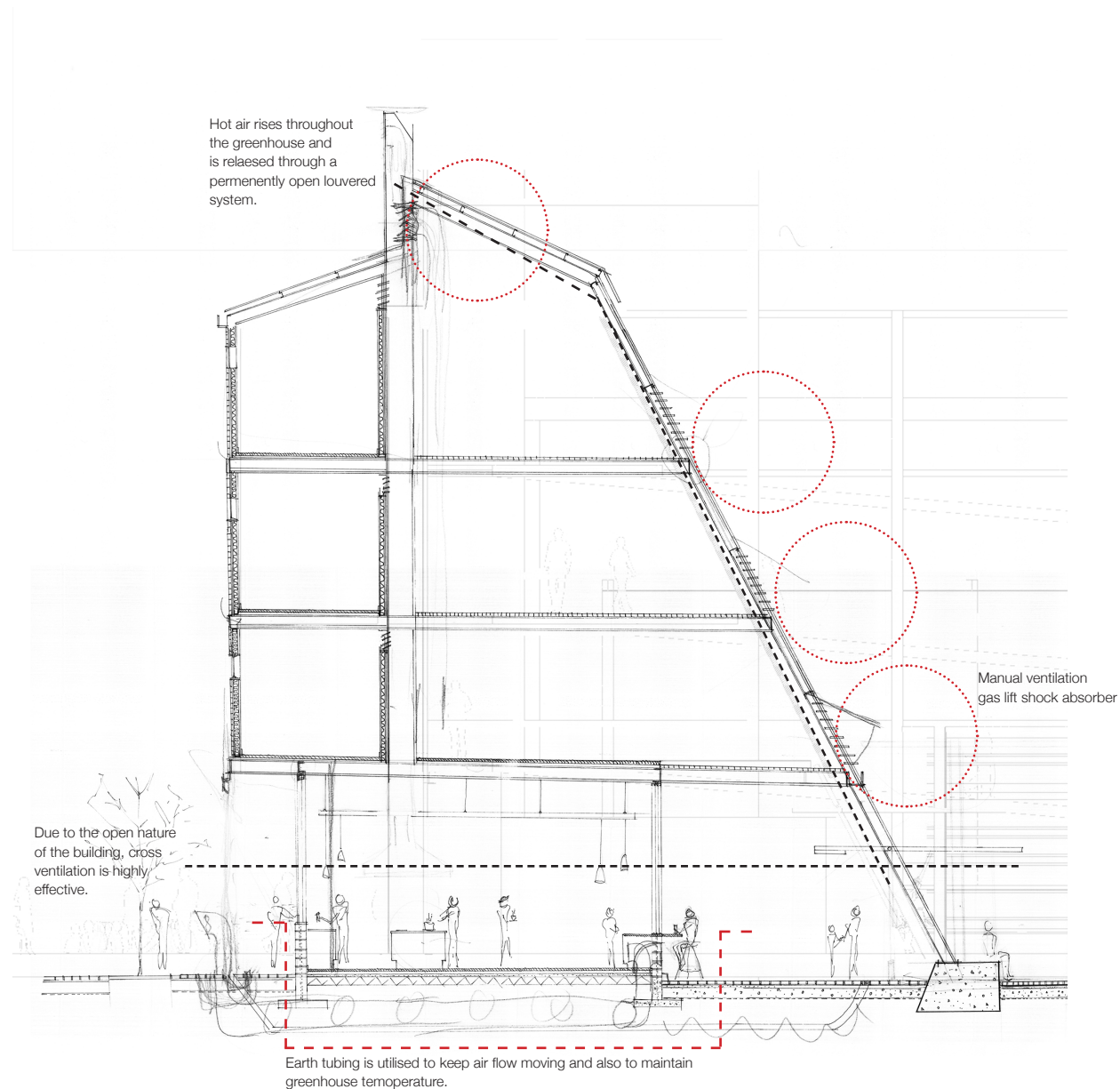


SUSTAINABILITY

from the ground up

Sustainable systems are integrated into the design process to allow for the building to fit within its context.

Due to the context and nature of the design, sustainability is a large issue. Large water and energy requirements must be met and thus rainwater harvesting and passive energy systems are a large focus.



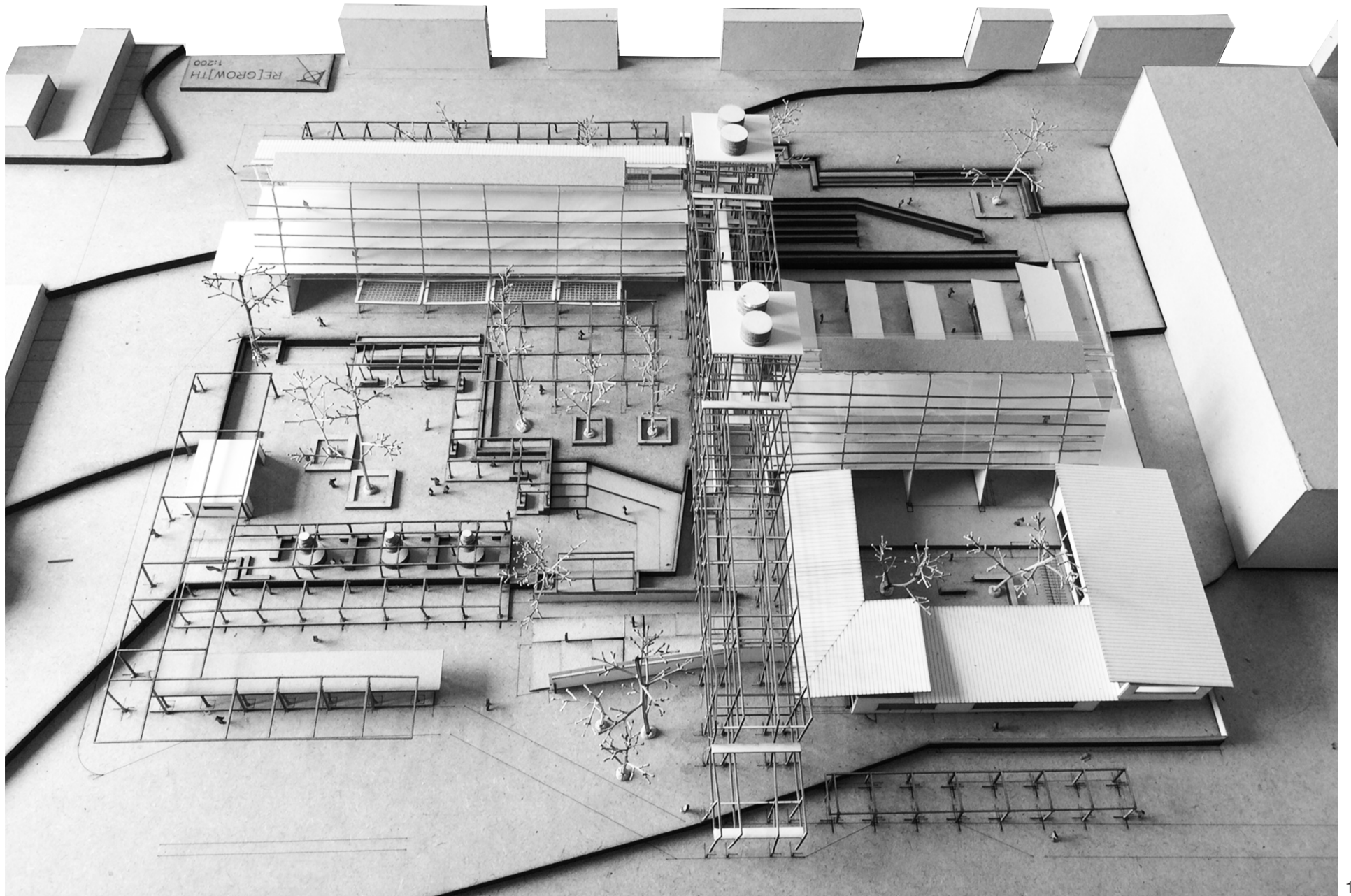
BIODIGESTER SIZE: 20 m³
58,968 kw/h daily

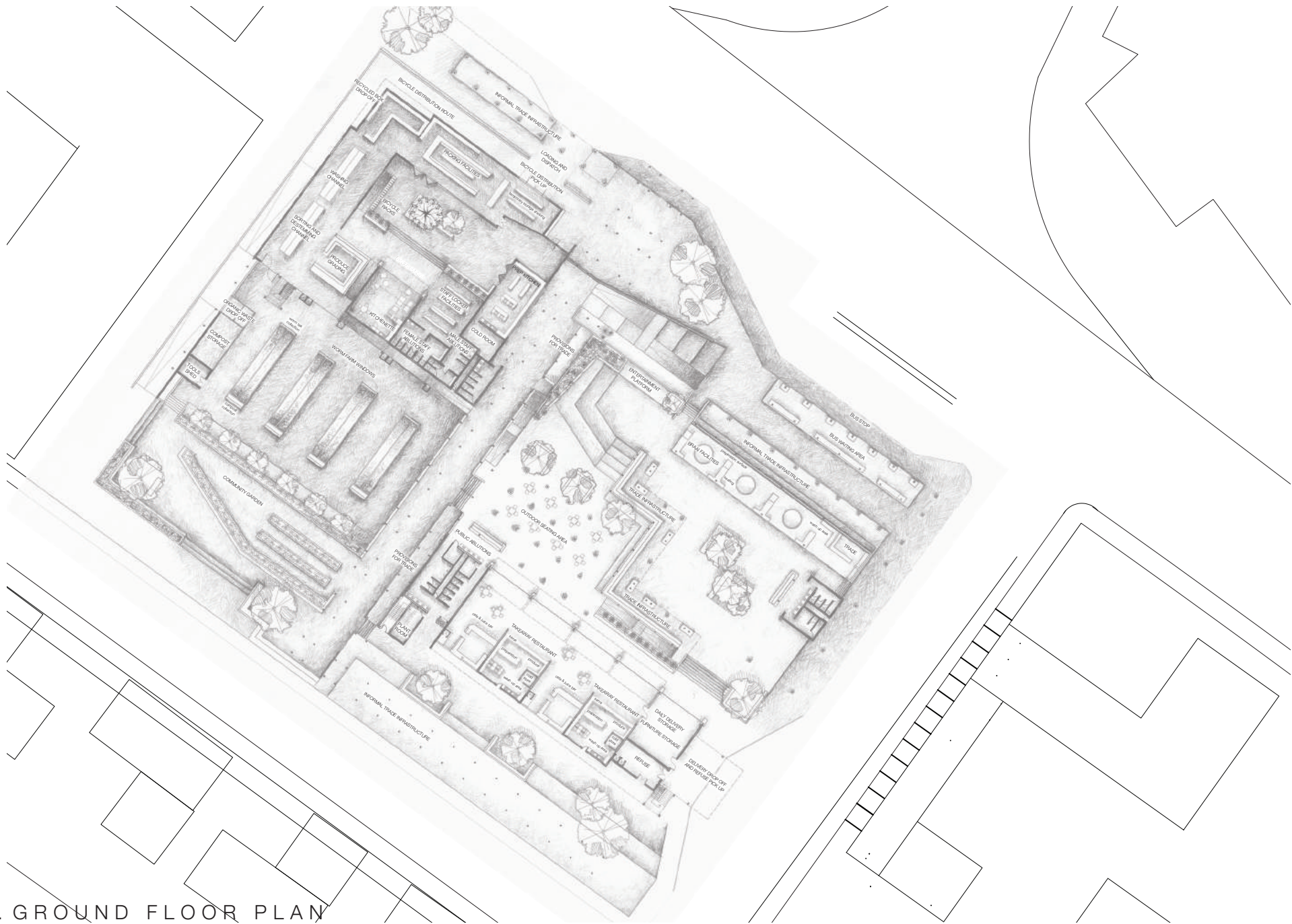


ENERGY SOURCE_ABLUTION FACILITIES

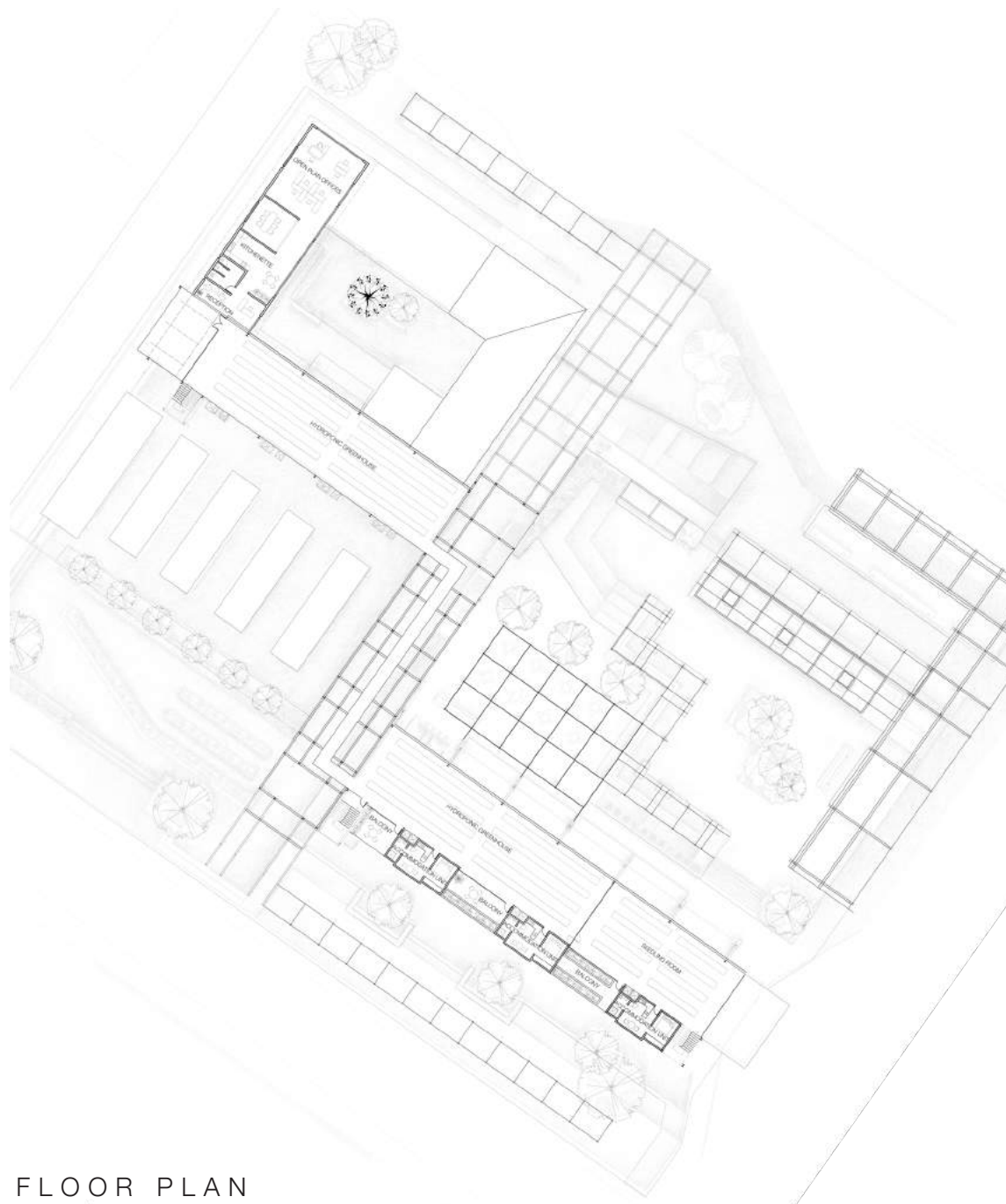
7 FINAL PRESENTATION

design conclusions

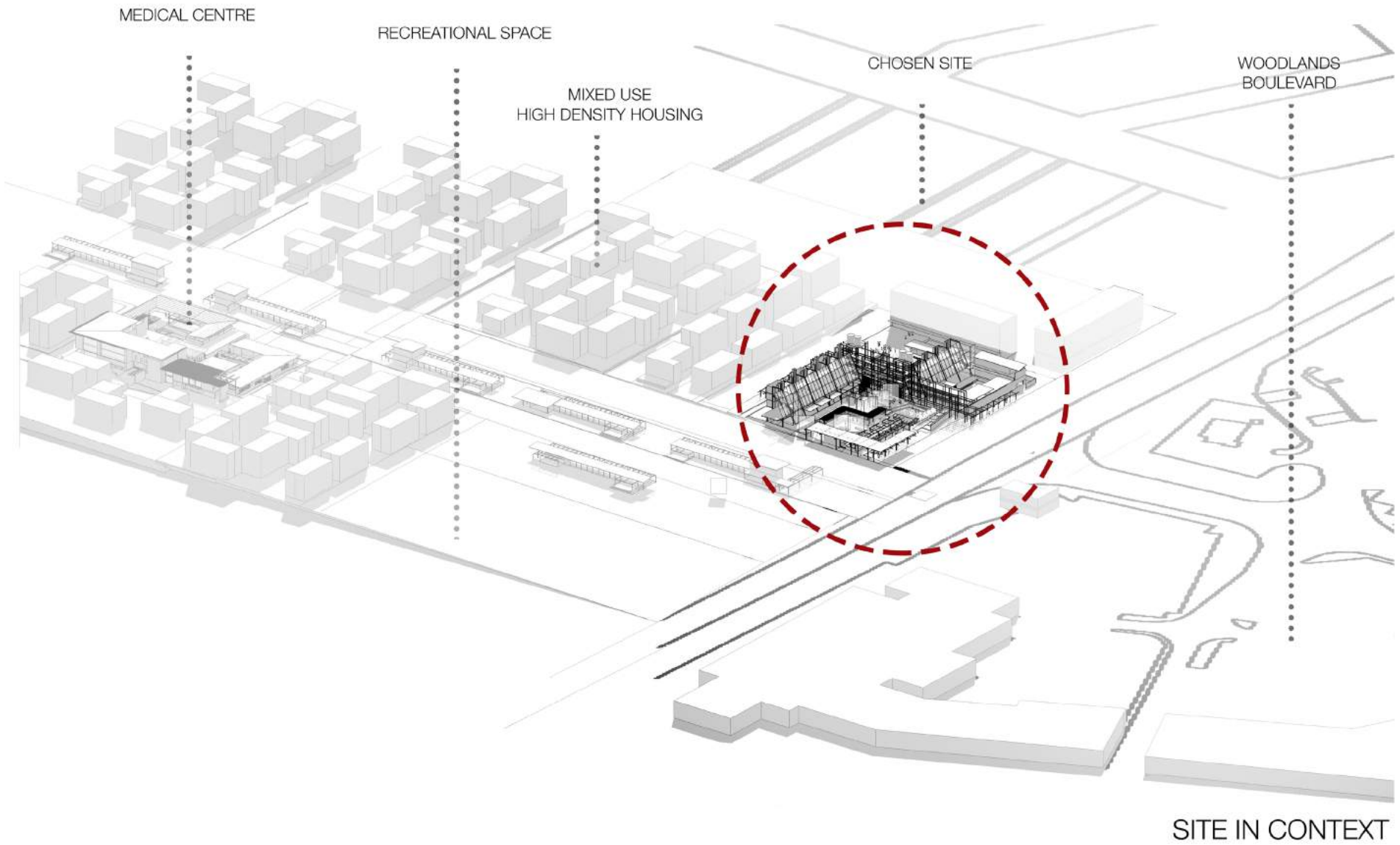


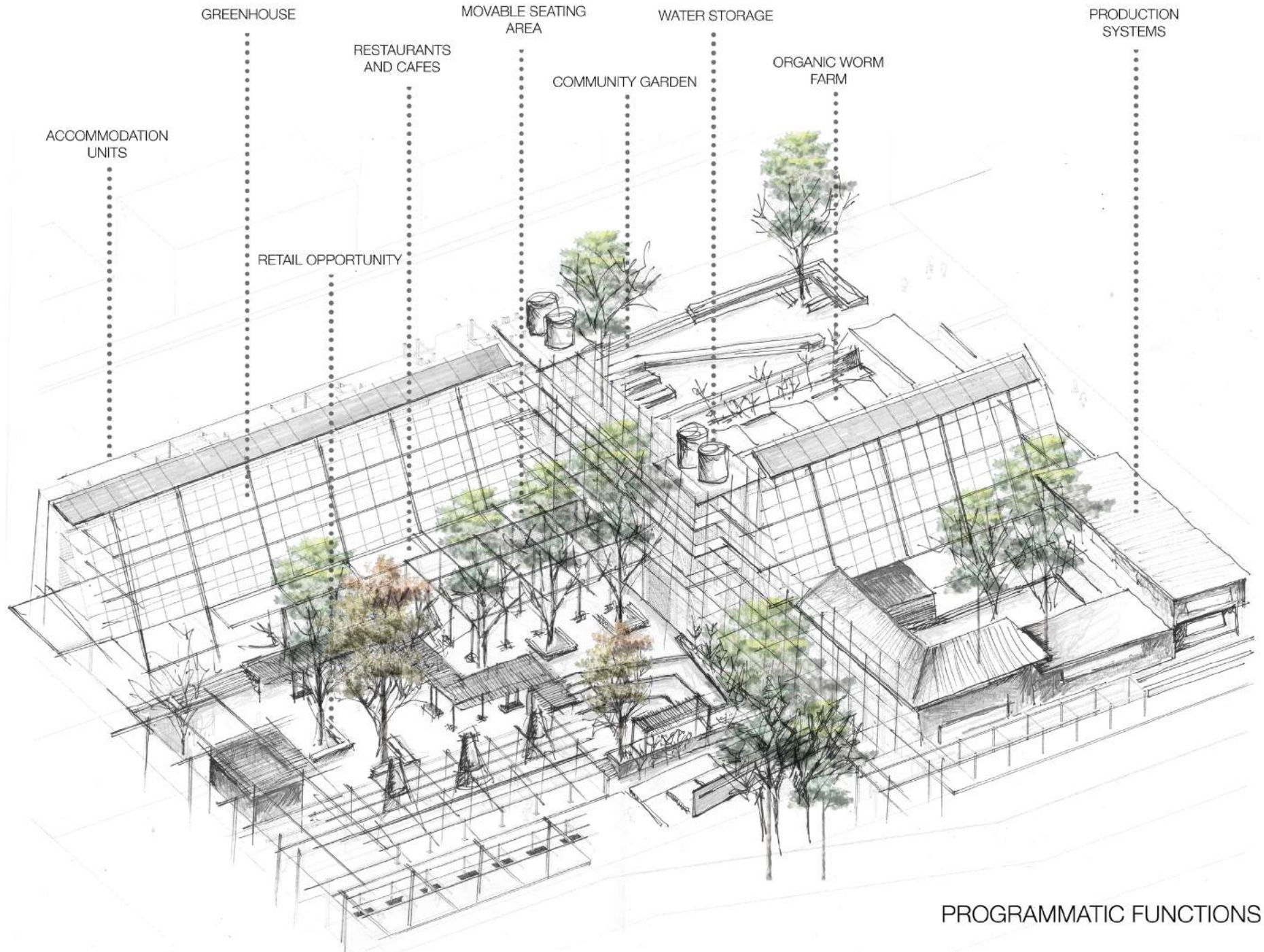


145. GROUND FLOOR PLAN



FIRST FLOOR PLAN







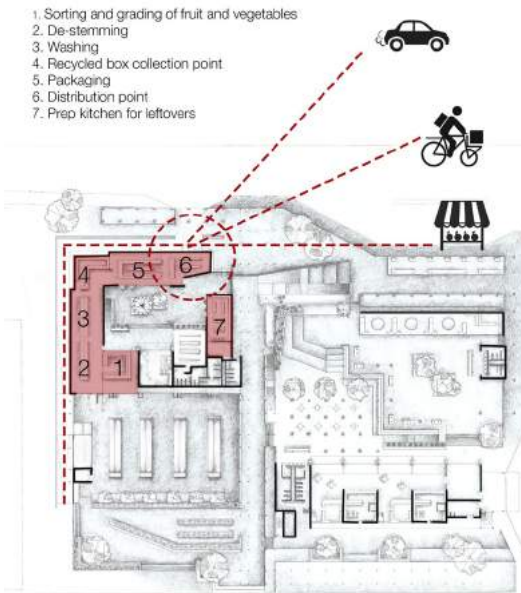
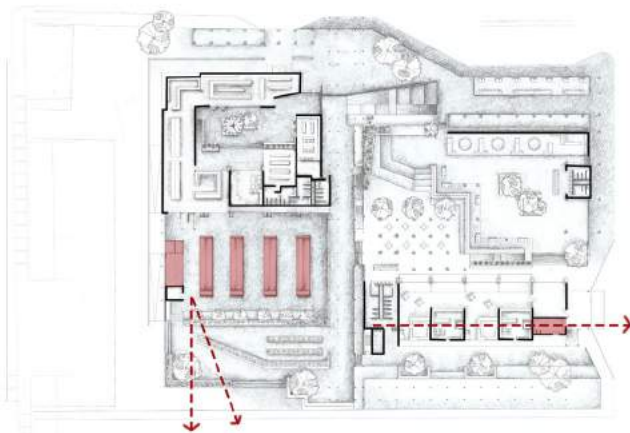
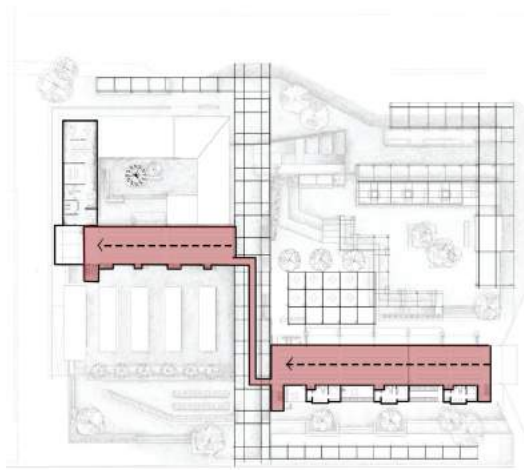
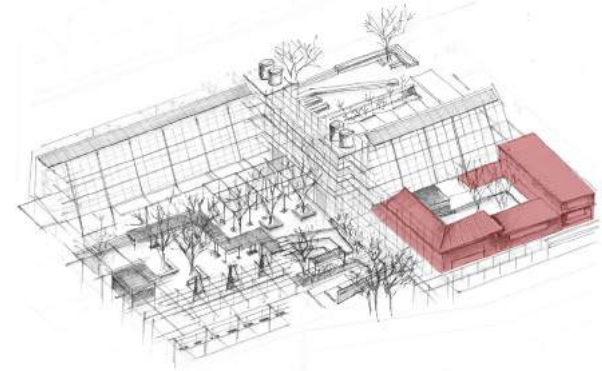
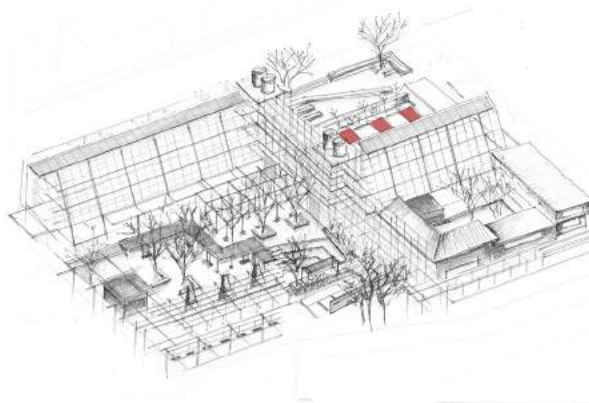
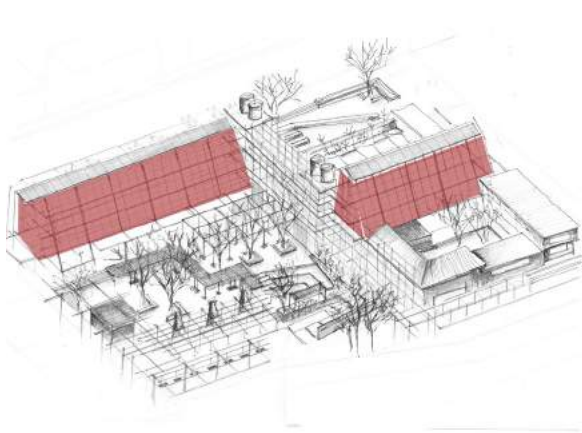
FOOD CULTIVATION



WASTE MANAGEMENT



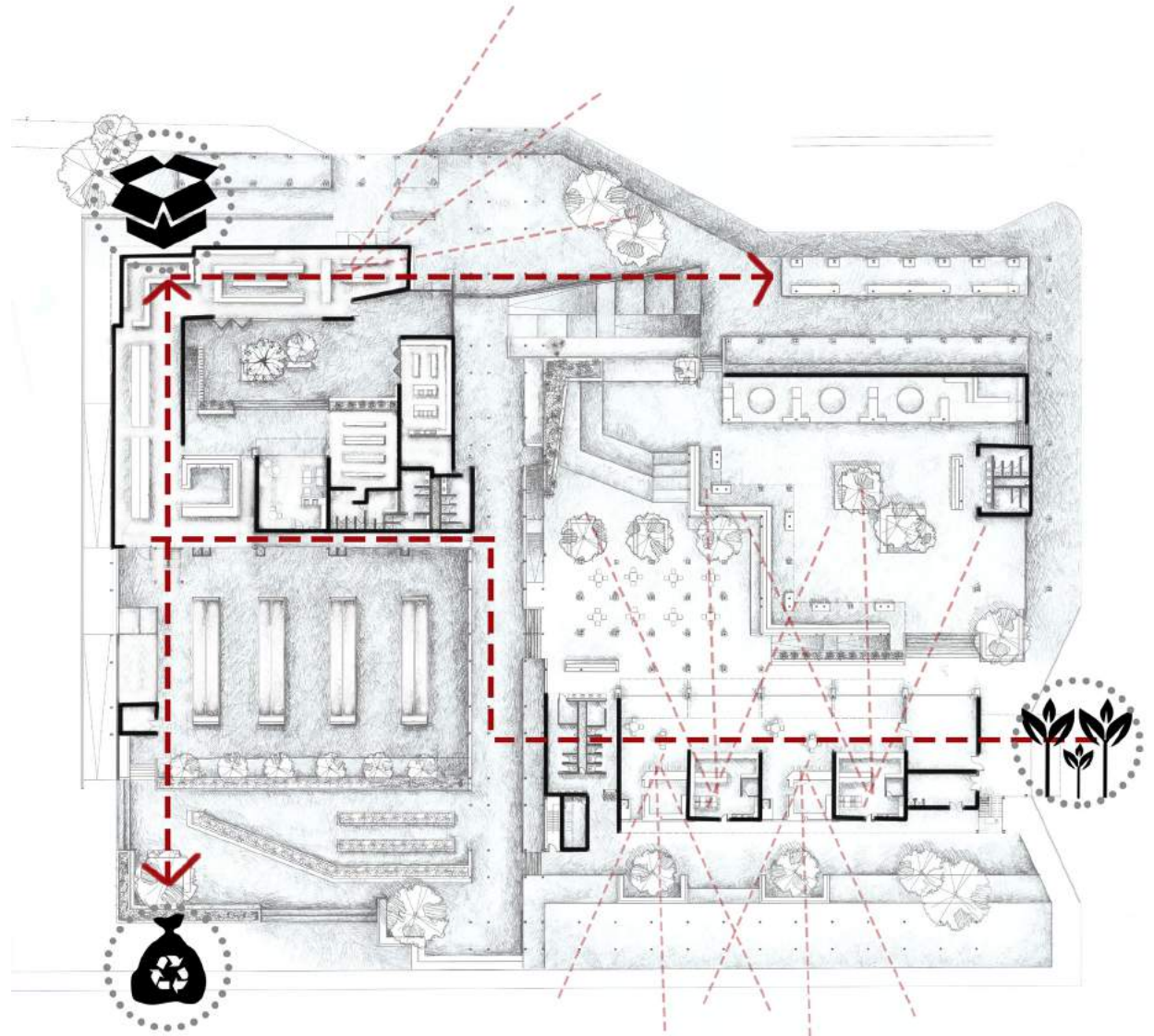
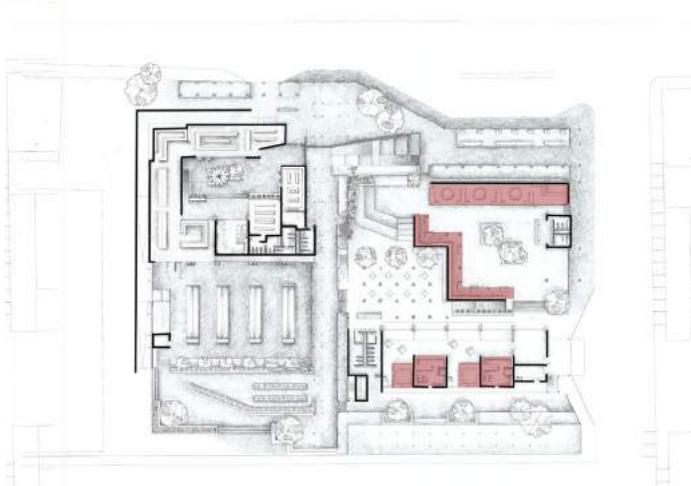
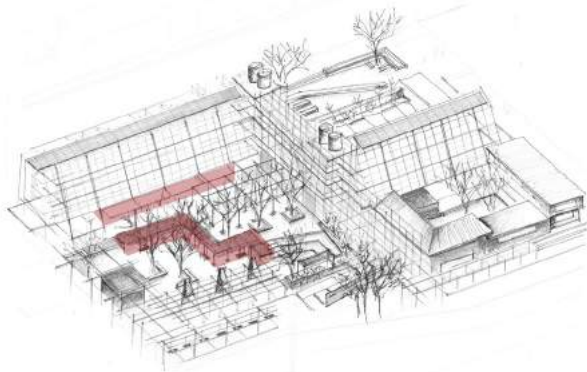
LIGHT PROCESSING



1. Sorting and grading of fruit and vegetables
2. De-stemming
3. Washing
4. Recycled box collection point
5. Packaging
6. Distribution point
7. Prep kitchen for leftovers

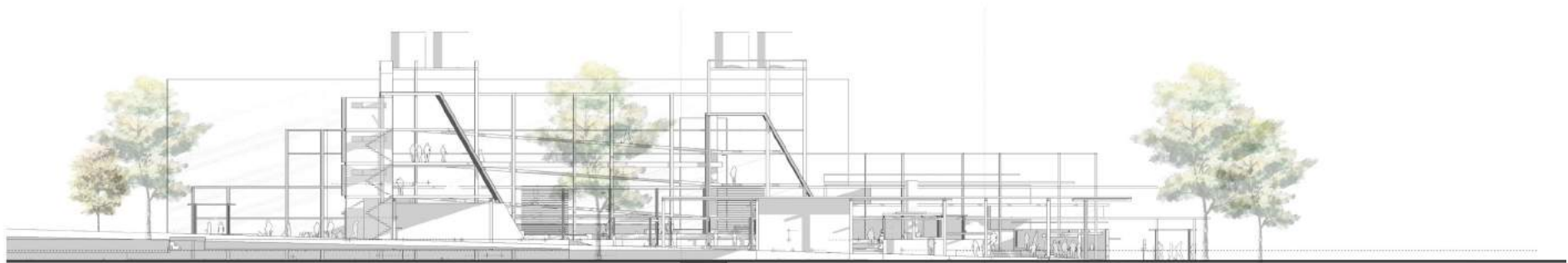


RETAIL AND CONSUMPTION

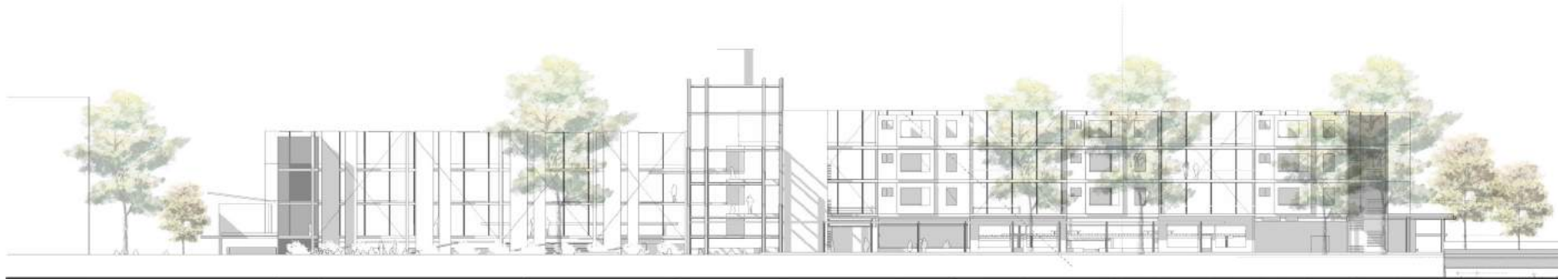




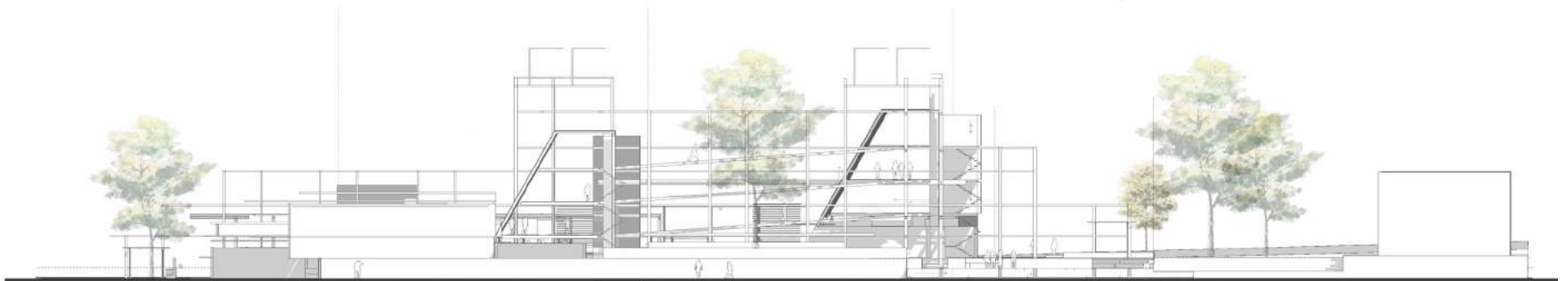
NORTH ELEVATION
1:200



EAST ELEVATION
1:200



SOUTH ELEVATION
1:200



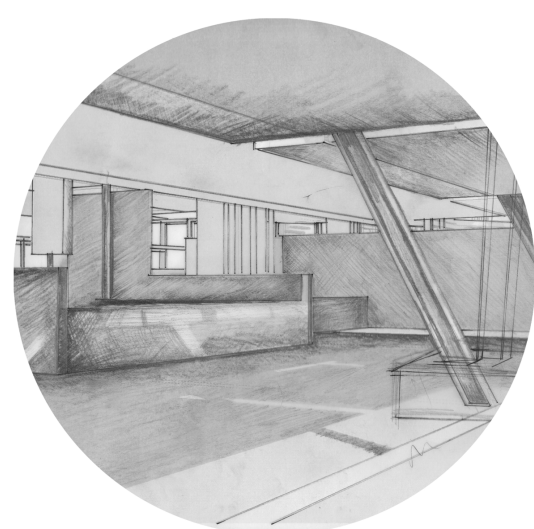
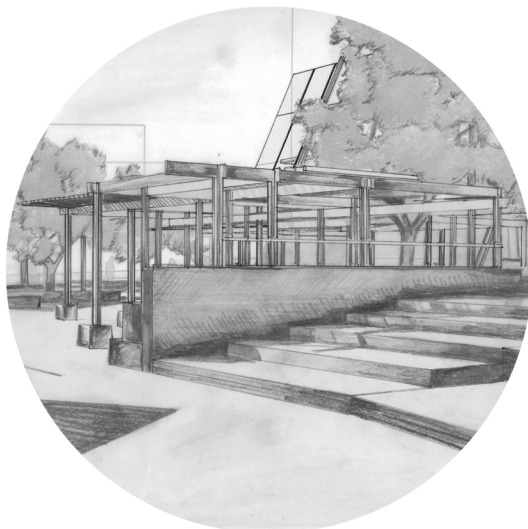
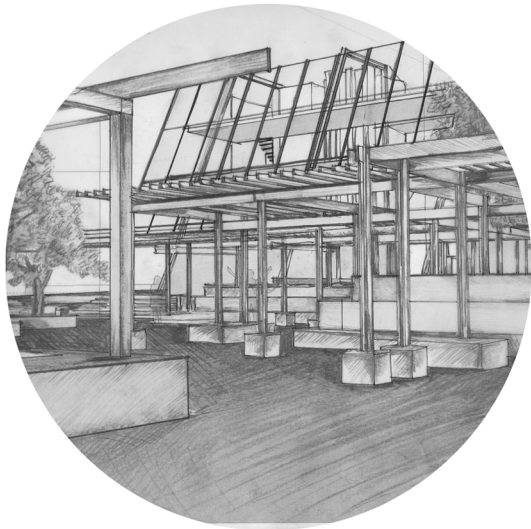
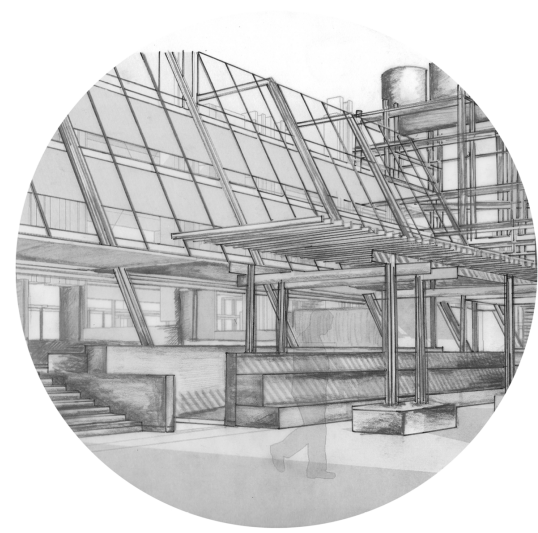
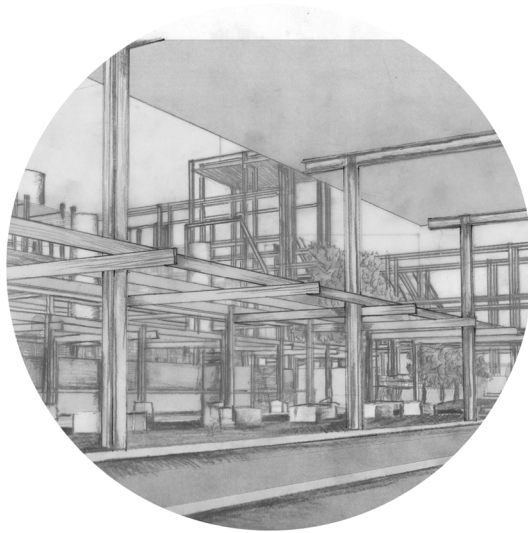
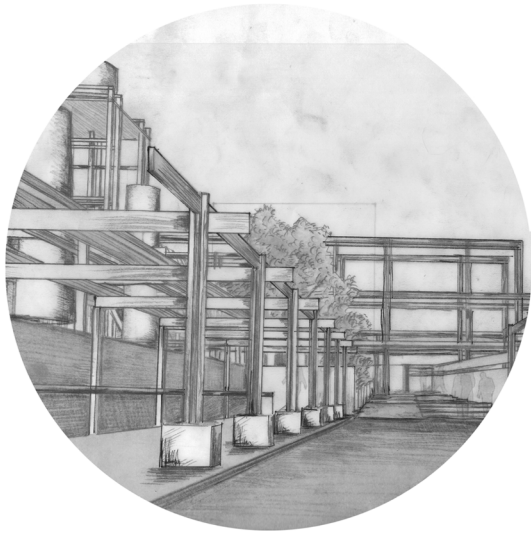
WEST ELEVATION
1:200



Figure 137 : Entrance perspective (Author 2016)



Figure 138 : Accomodation perspective (Author 2016)



155. Figure 139 : Pencil sketch perspectives (Author 2016)



Figure 140 : Integrative walkway perspective (Author 2016)



157.

Figure 141 : Production courtyard (Author 2016)



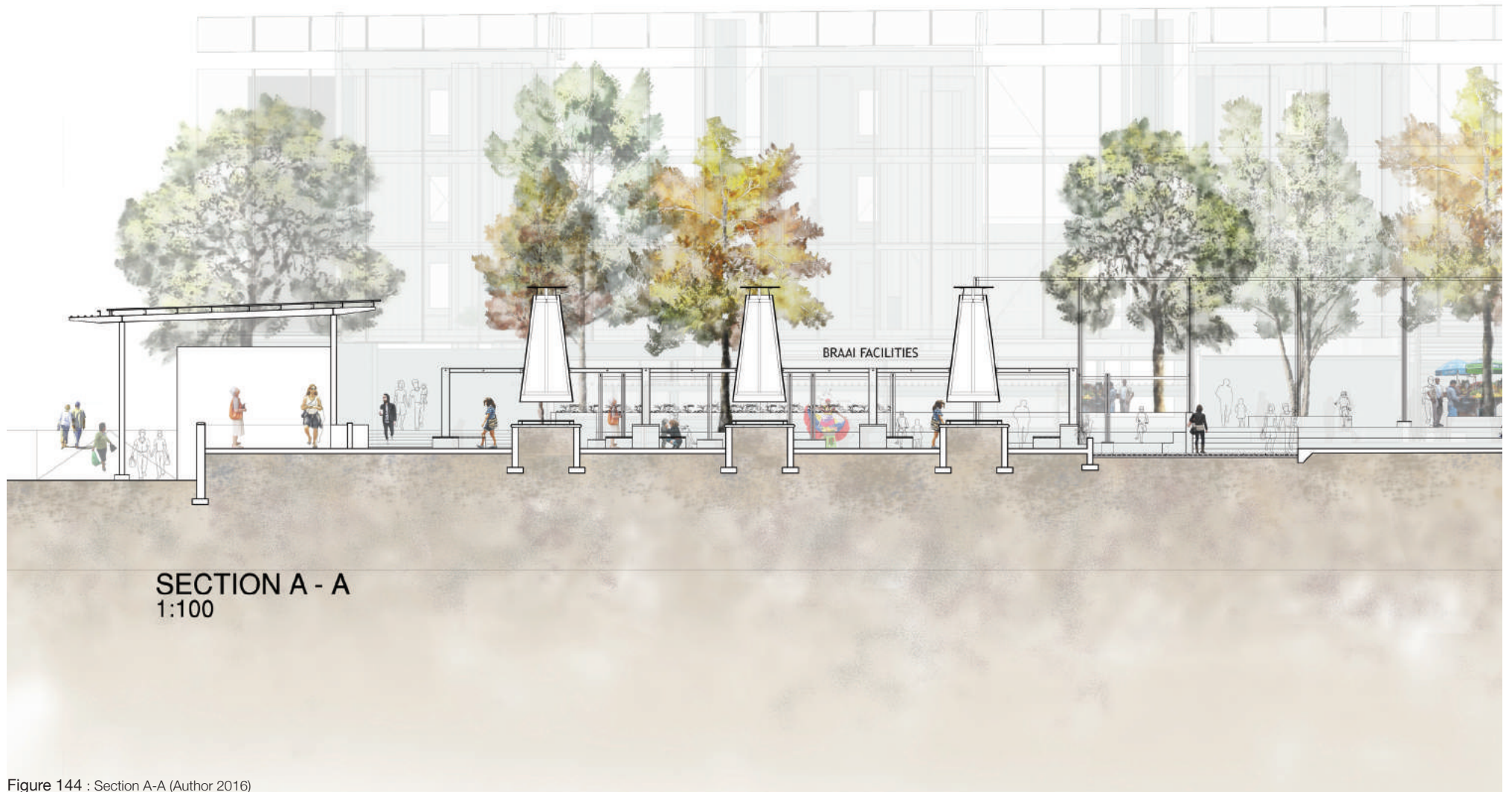
Figure 142 : Inside a greenhouse (Author 2016)



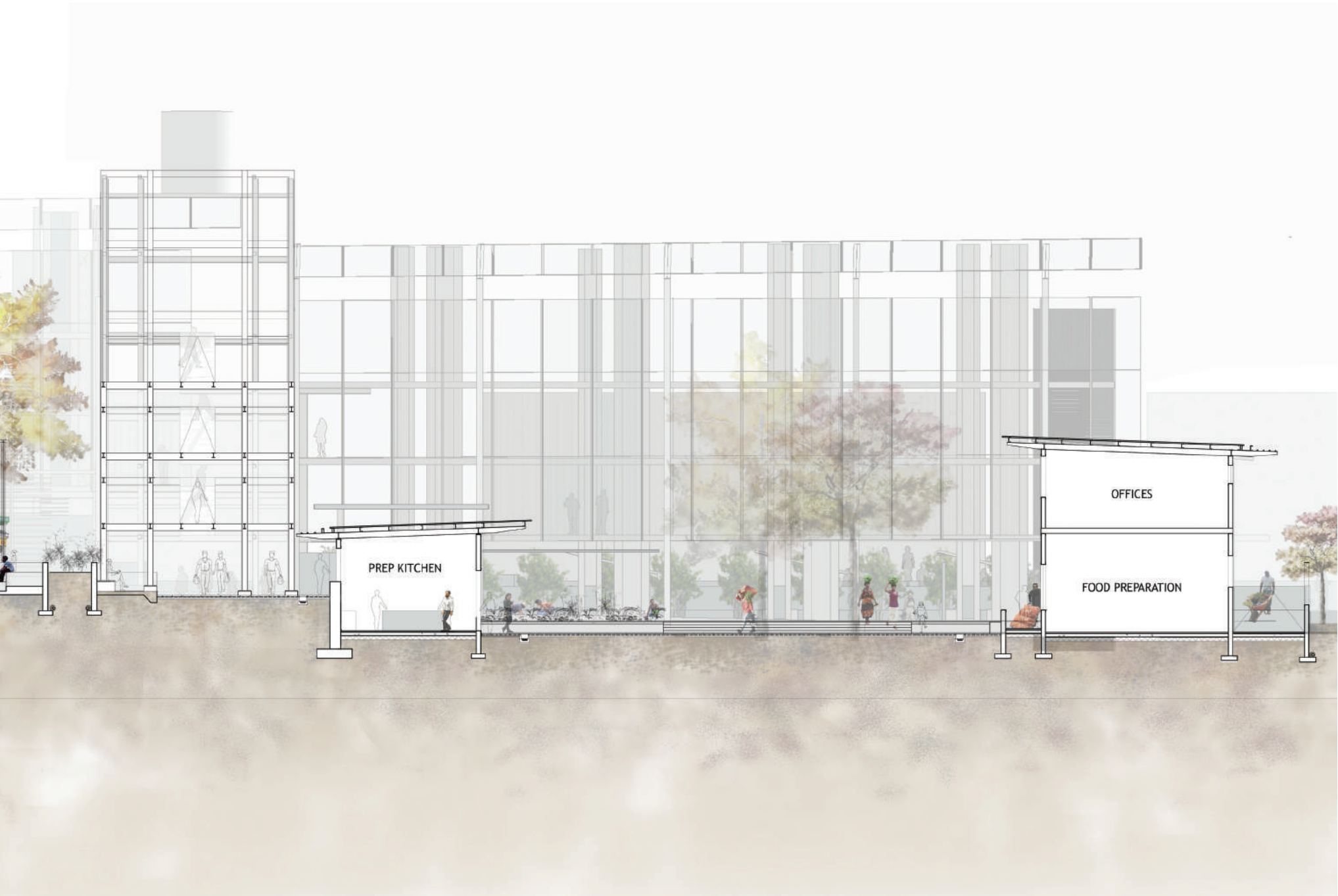
159.

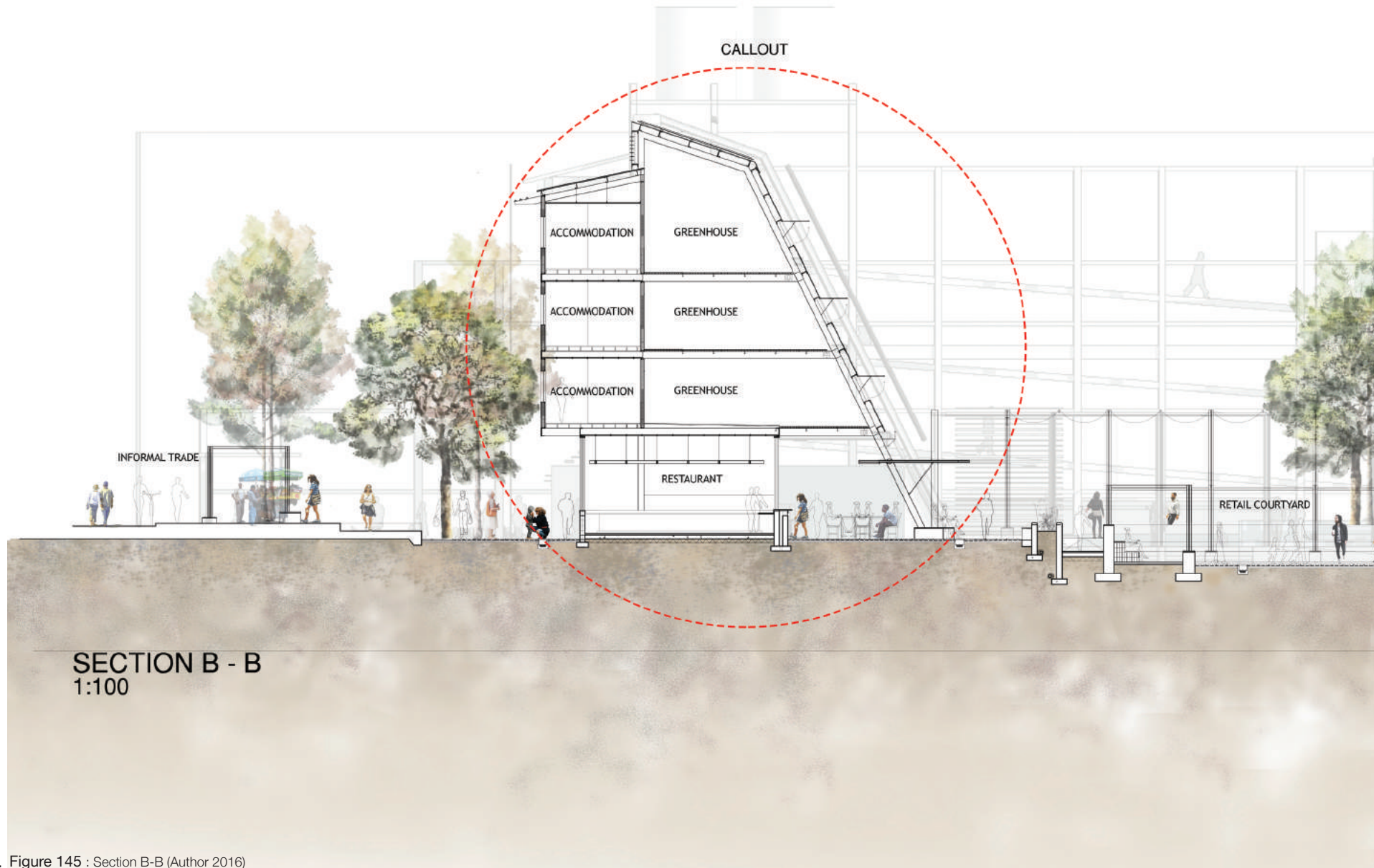
Figure 143 : Seating from within the cafe (Author 2016)



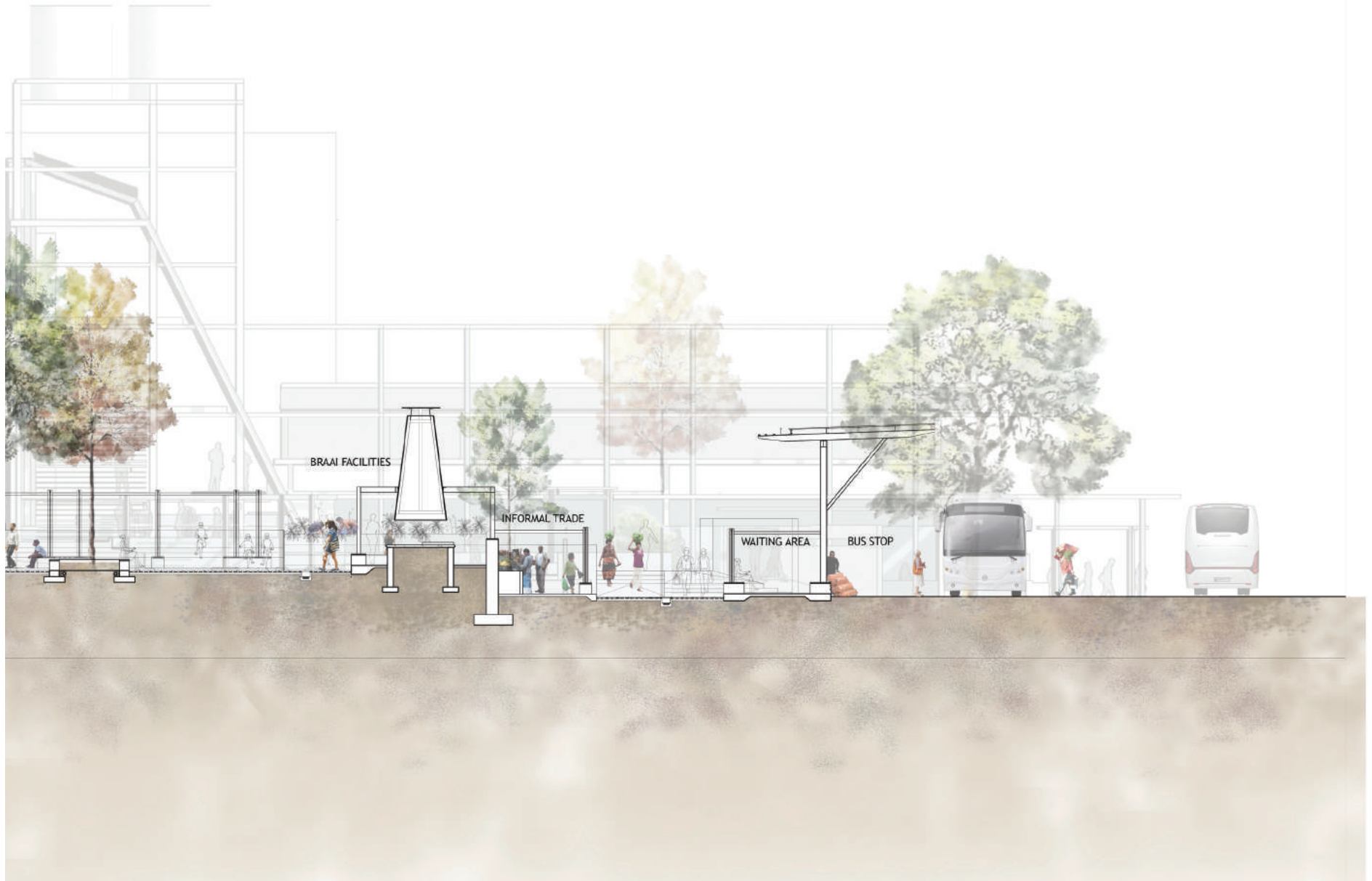


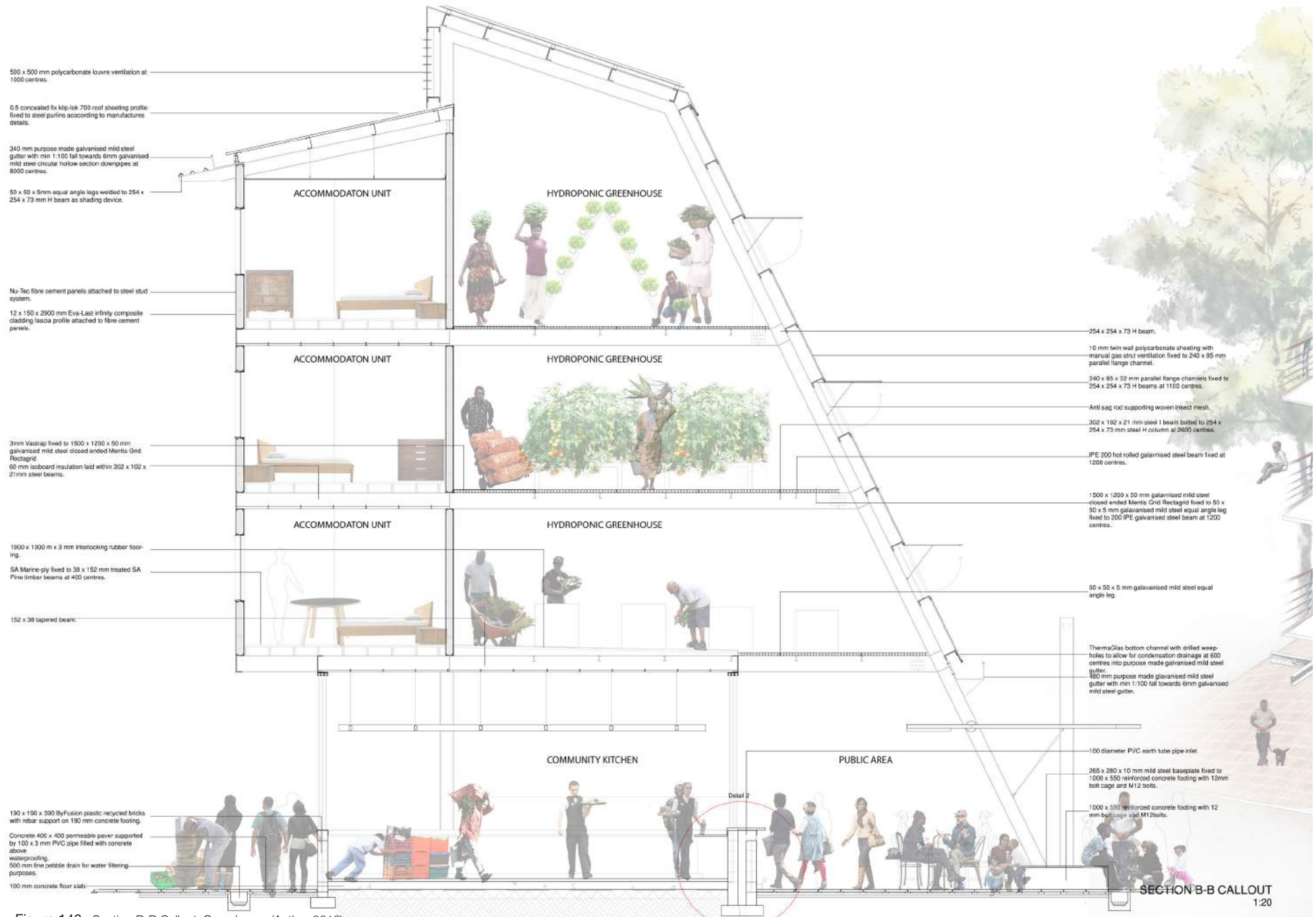
161. Figure 144 : Section A-A (Author 2016)





163. Figure 145 : Section B-B (Author 2016)

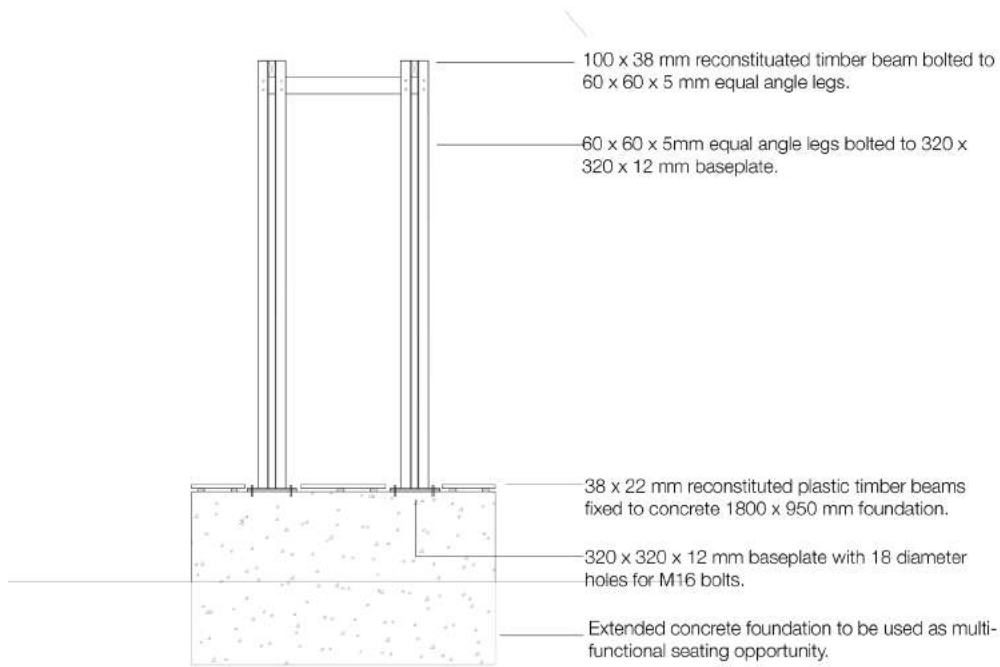




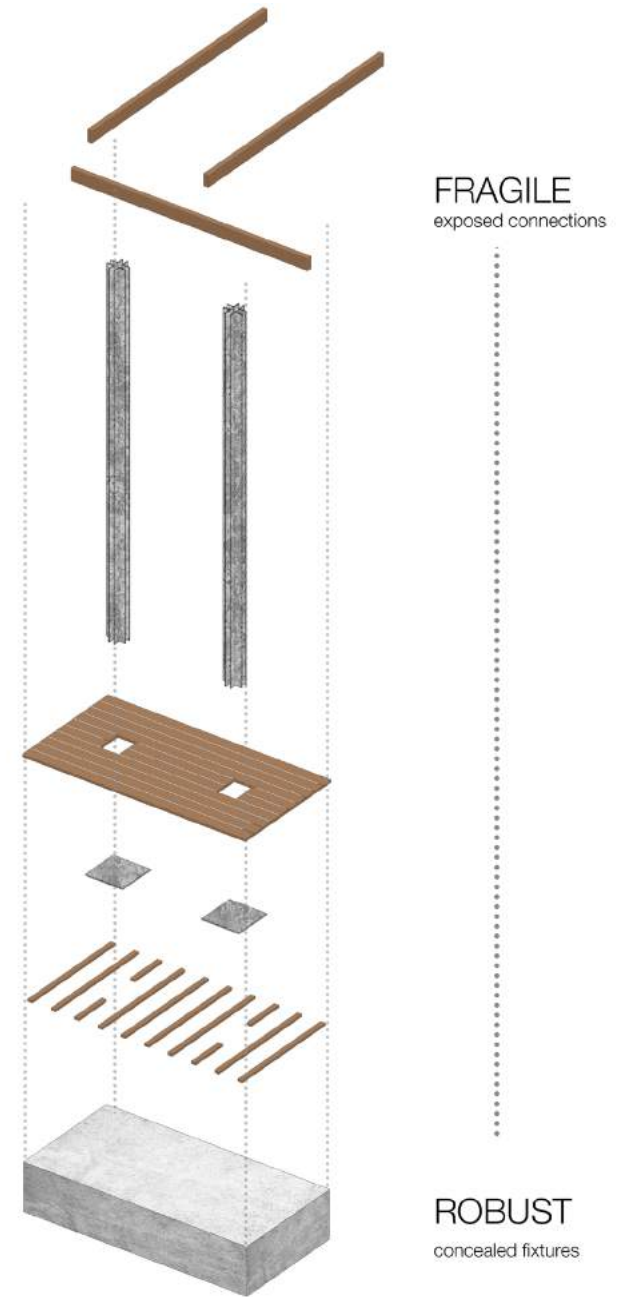
165. Figure 146 : Section B-B Callout_Greenhouse (Author 2016)

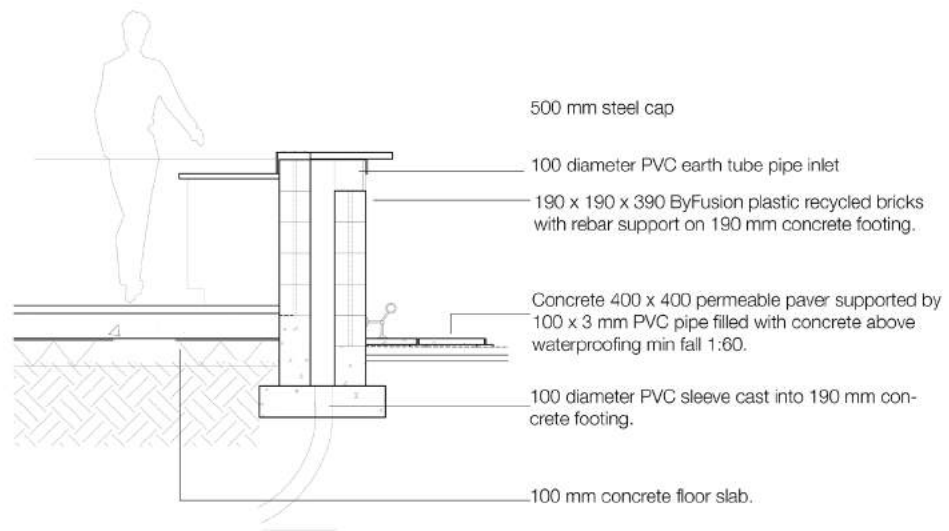


Figure 147 : Sectional perspective (Author 2016)

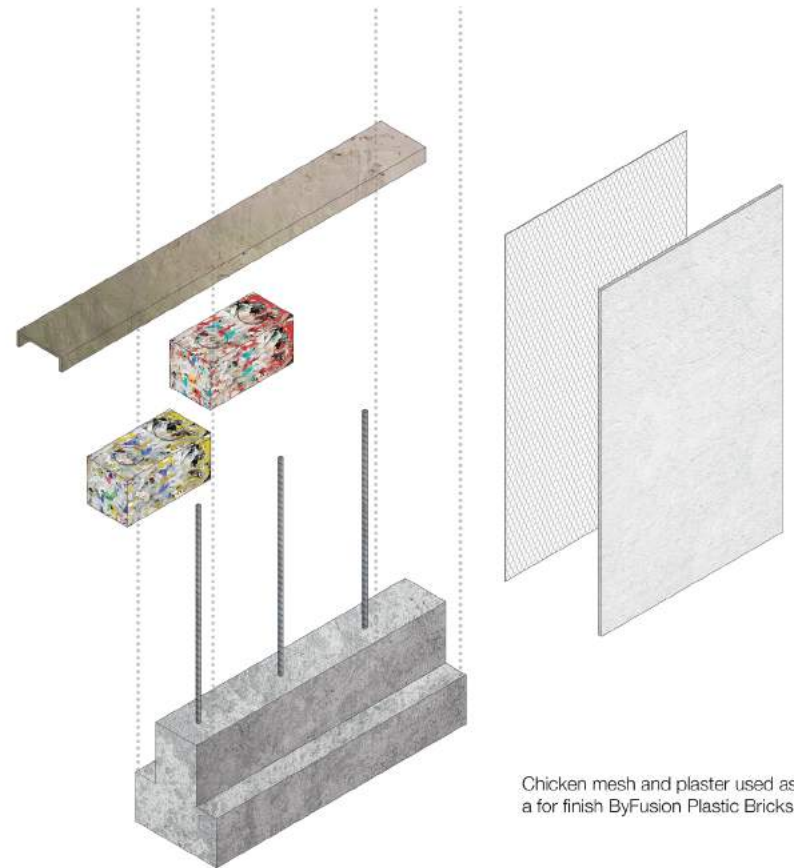


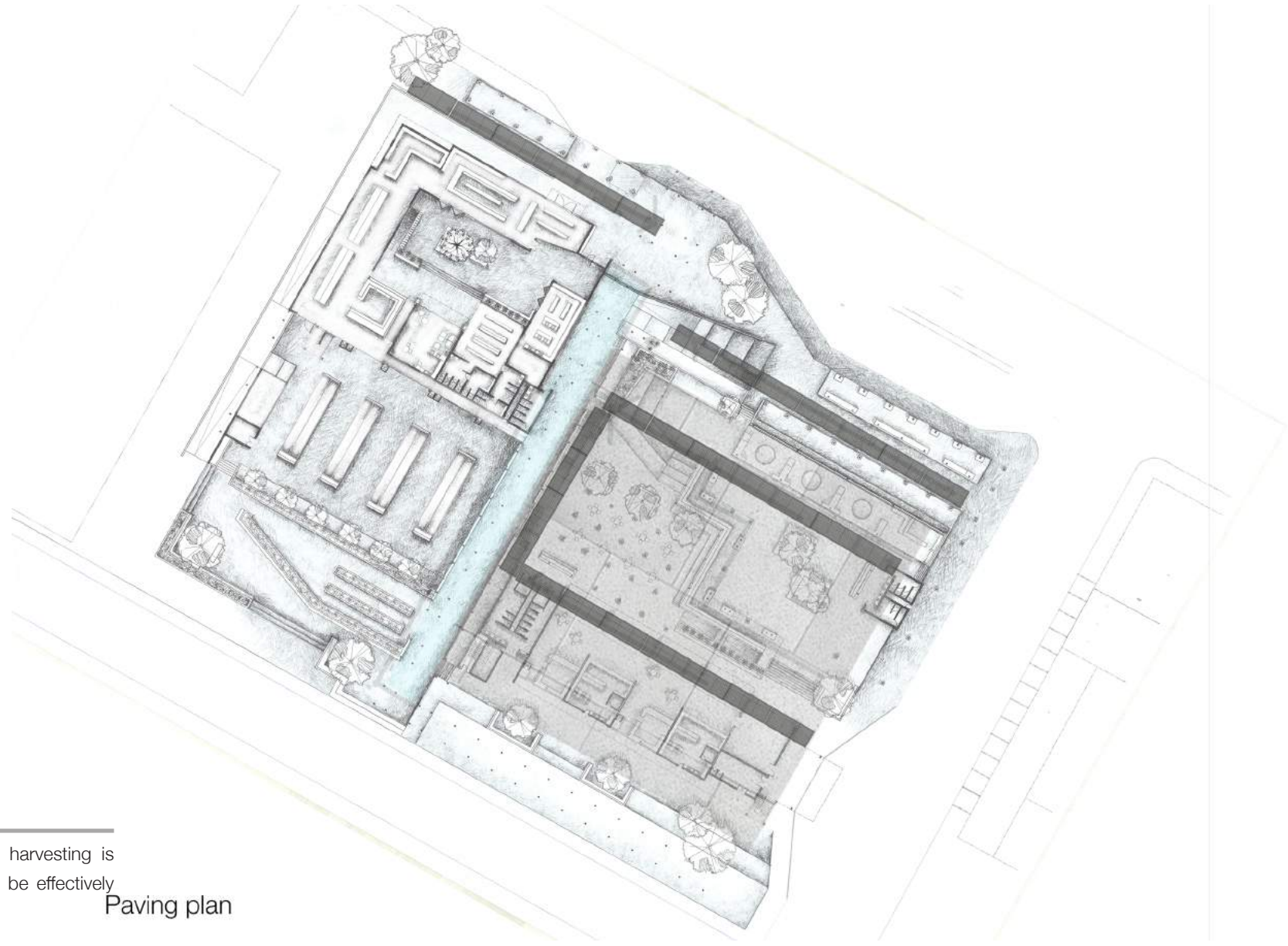
Detail 1.
Equal angle columns on a multifunctional concrete base.





Detail 2.
ByFusion Plastic Brick counter top





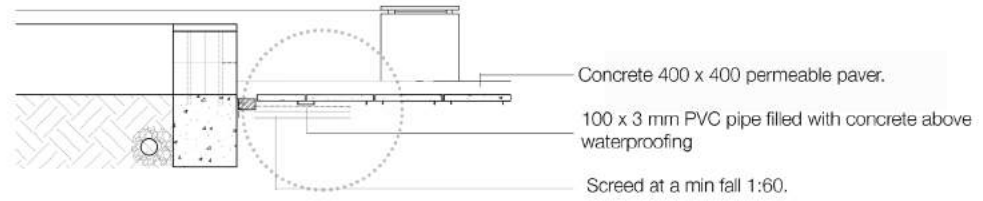
WATER

on site collection

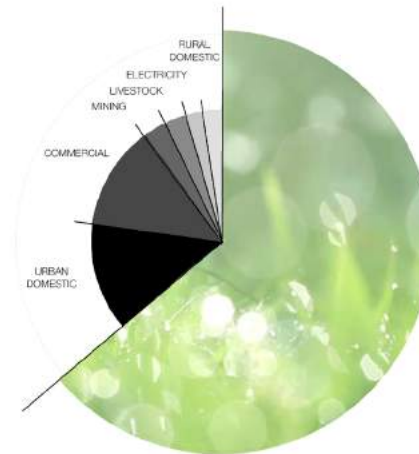
Due to the nature of the project, water harvesting is an important consideration and needs to be effectively collected.

Paving plan

The paving sits at a Min fall of 1:60. Storm water is collected in the main drainage channels and collected in catchment tank.



Detail 3.
Permeable paving for effective water collection



63% water is lost to irrigation thus water collection and the efficient use there of is important.

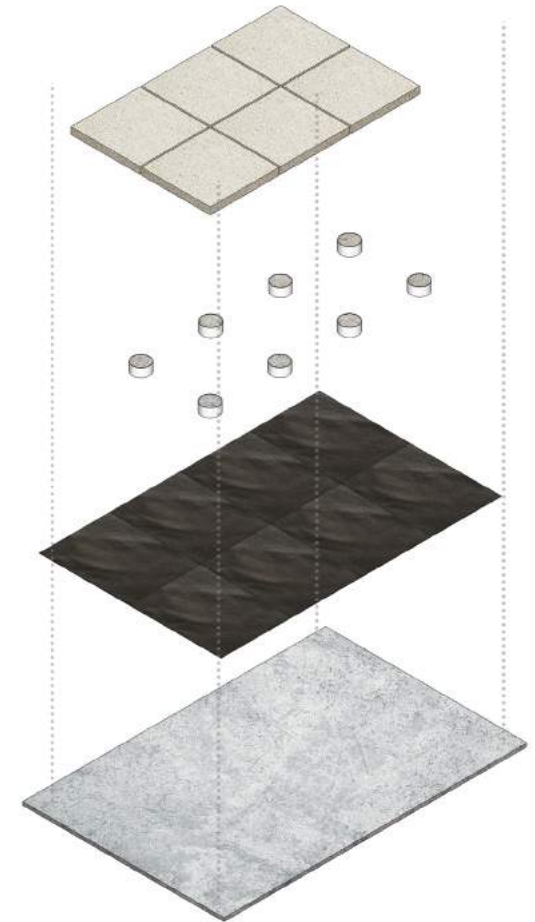
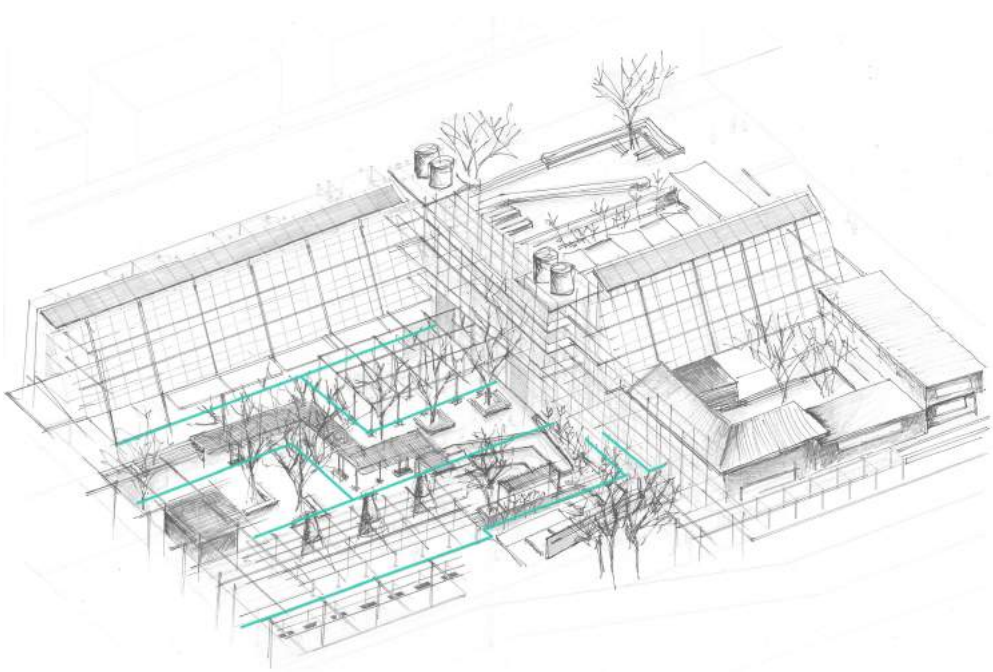
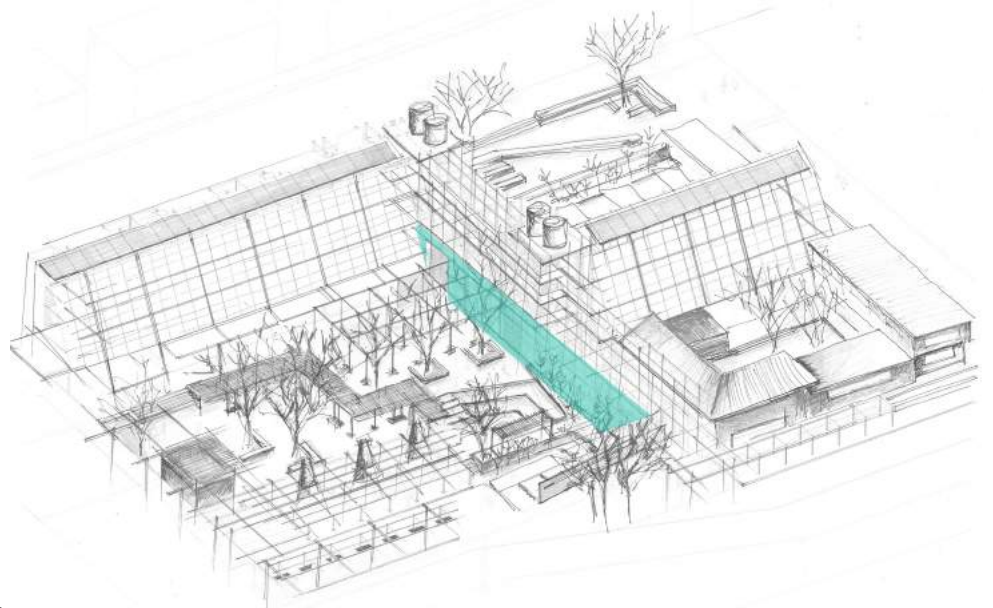


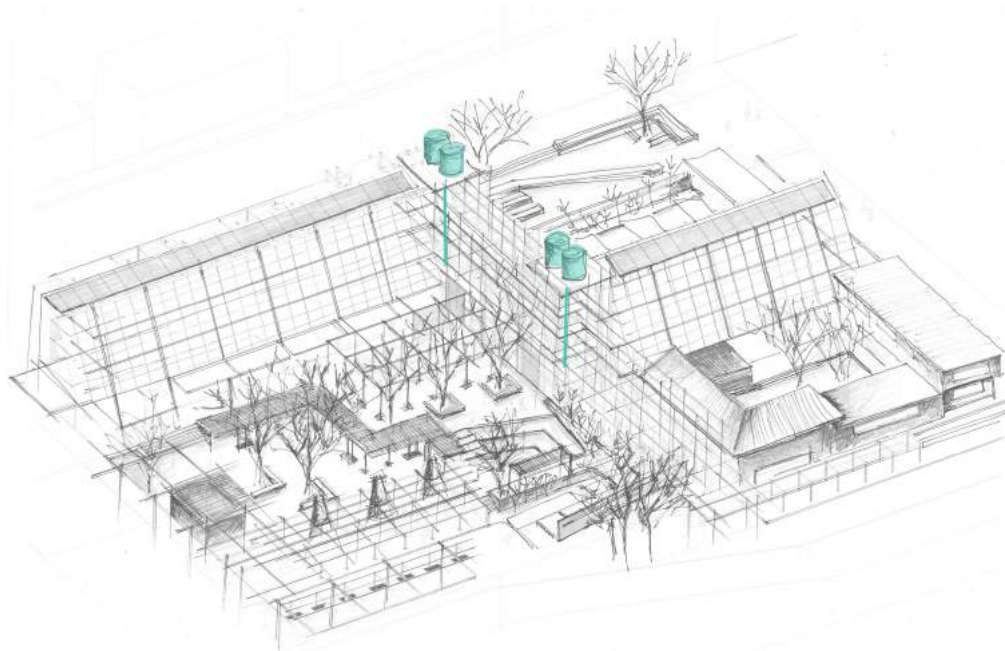
Figure 148 : Paving detail (Author 2016)



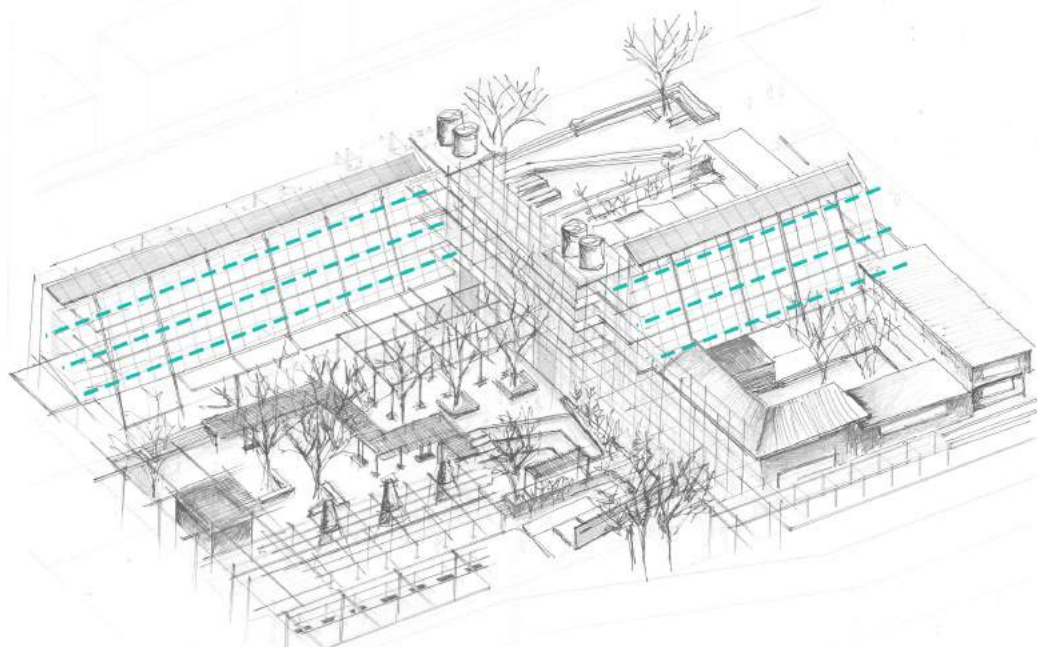
WATER RUNOFF COLLECTION



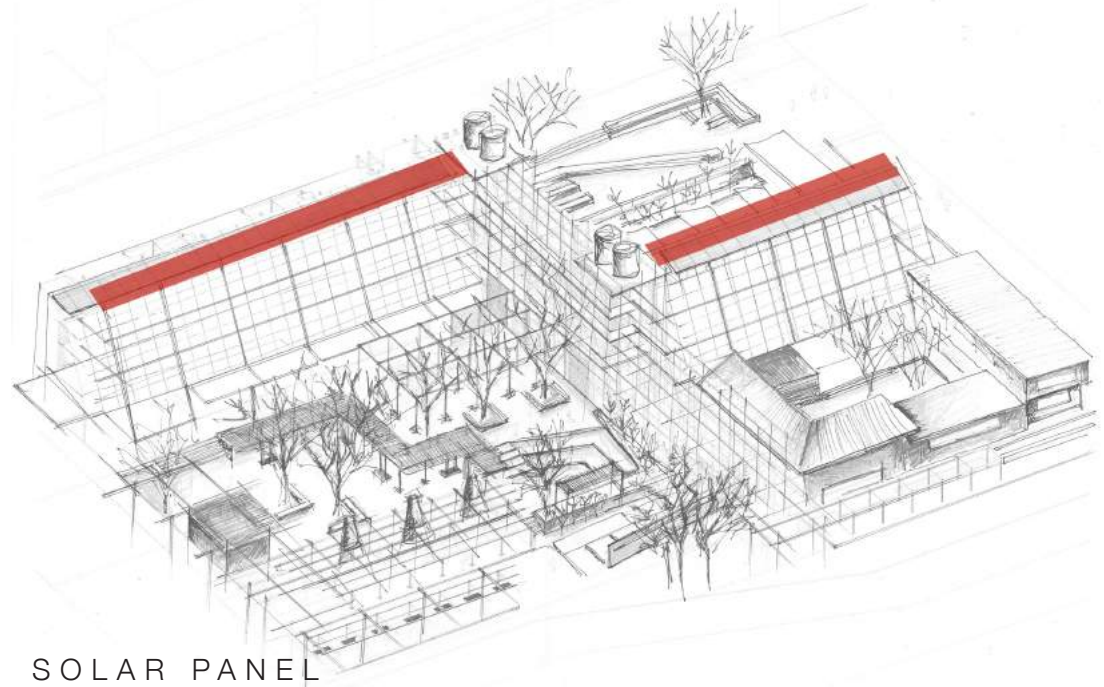
WATER COLLECTION TANK



WATER STORAGE TANKS



HYDROPONIC DISTRIBUTION



SOLAR PANEL

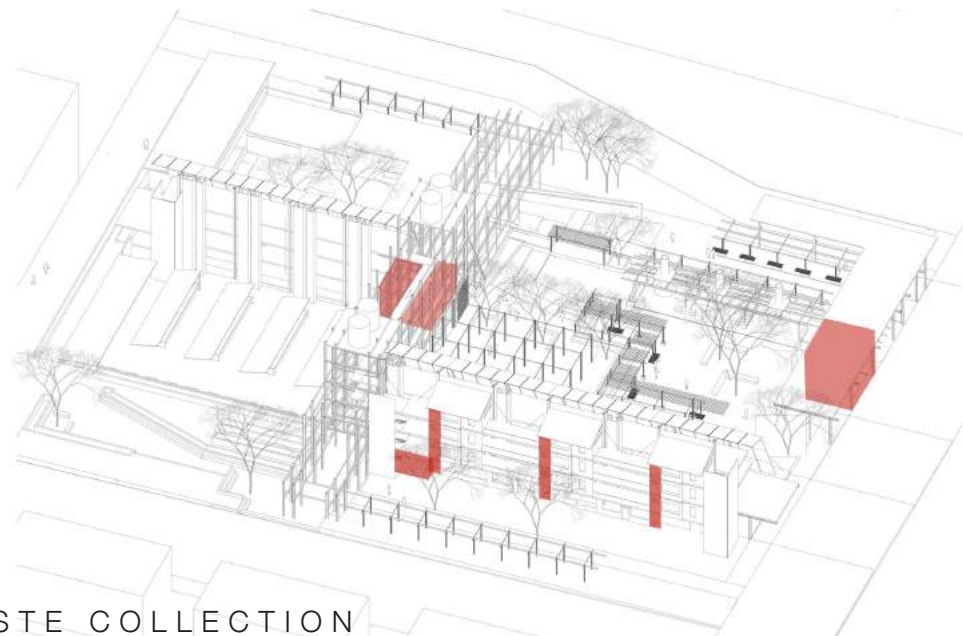
ENERGY

on site

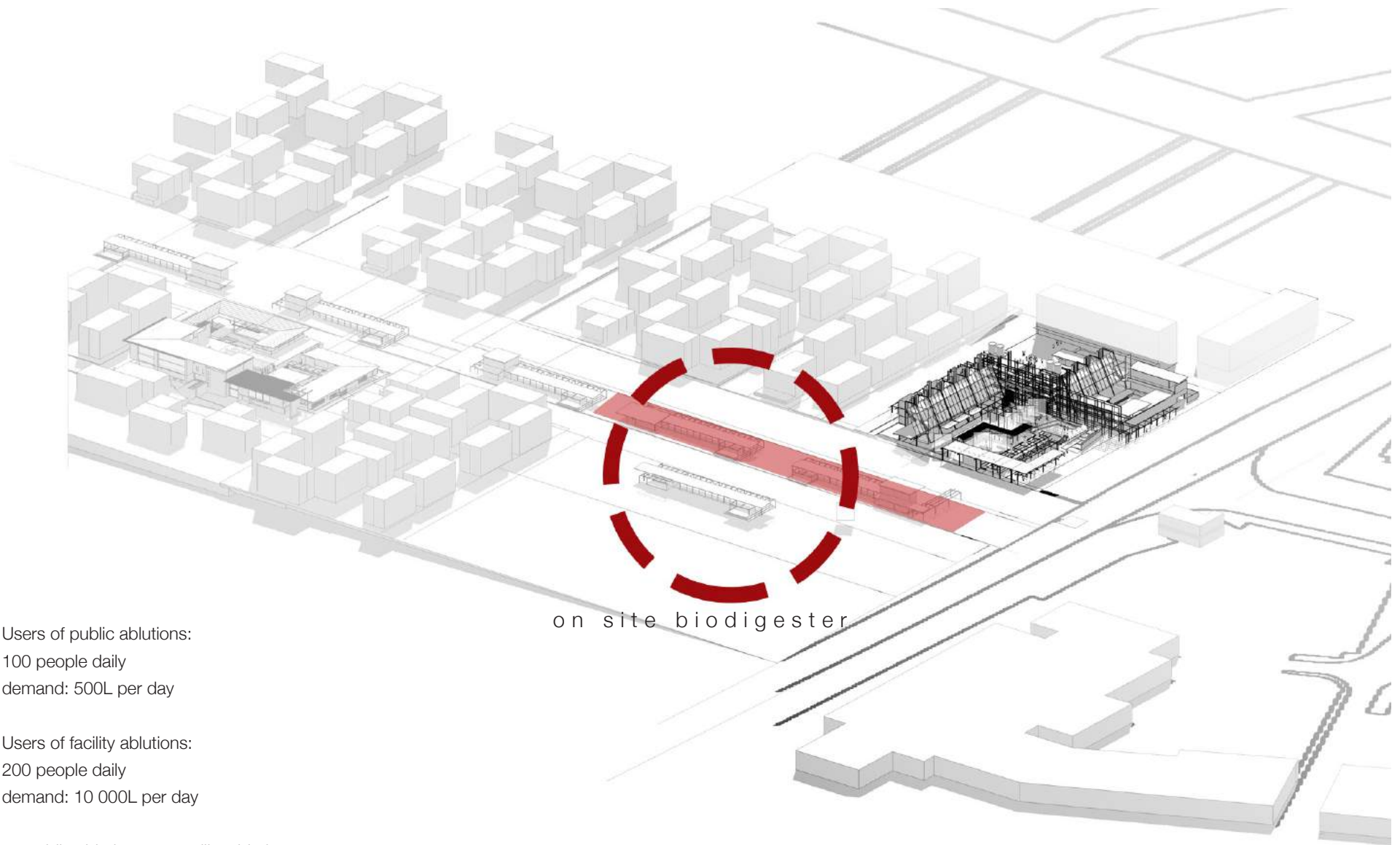
The design incorporates solar panels on the roof of the greenhouse. Solar energy gain from the panels: 357 kwh

Used to heat water for residential units and power lights for office.

A biodigester is used for all human waste on site as well as in the public restrooms from the urban vision. Highlighted are the sources of waste to be used for the biodigester.



WASTE COLLECTION



on site biodigester

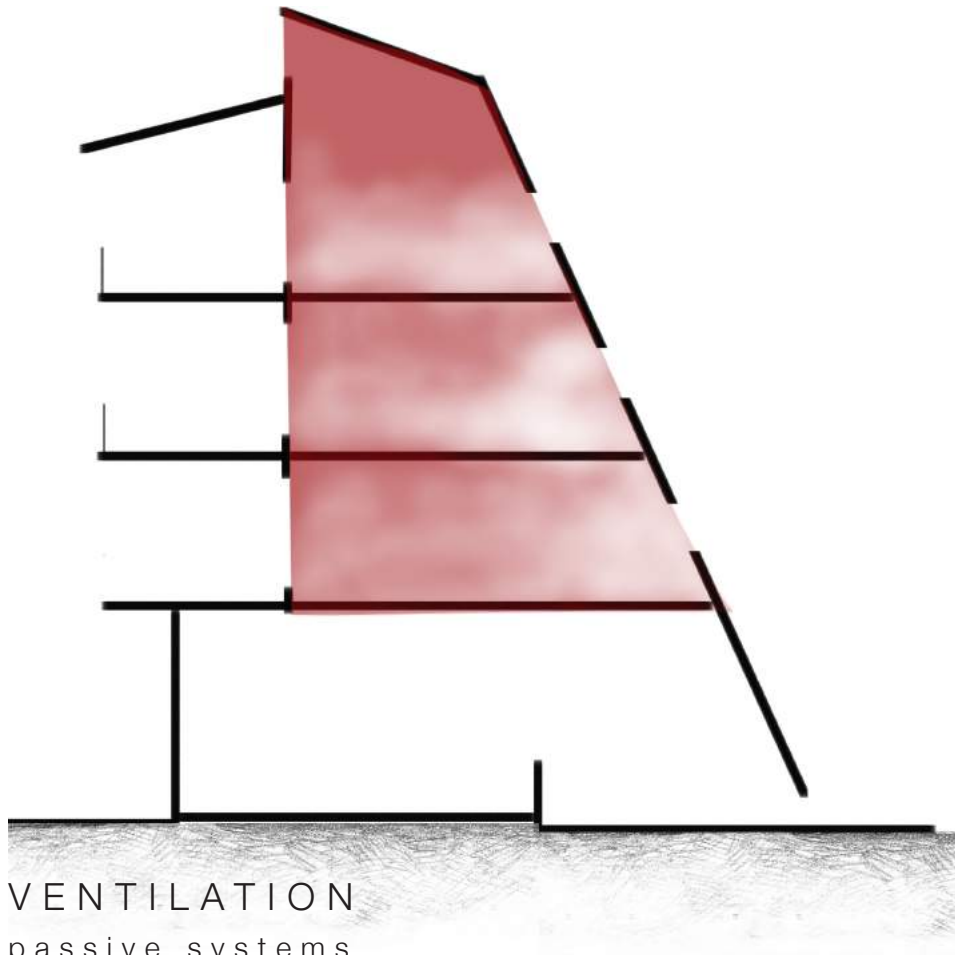
Users of public ablutions:
100 people daily
demand: 500L per day

Users of facility ablutions:
200 people daily
demand: 10 000L per day

20 public ablutions, 32 facility ablutions:
as per urban framework

140 kWh/daily electricity
199 kWh/ daily heat

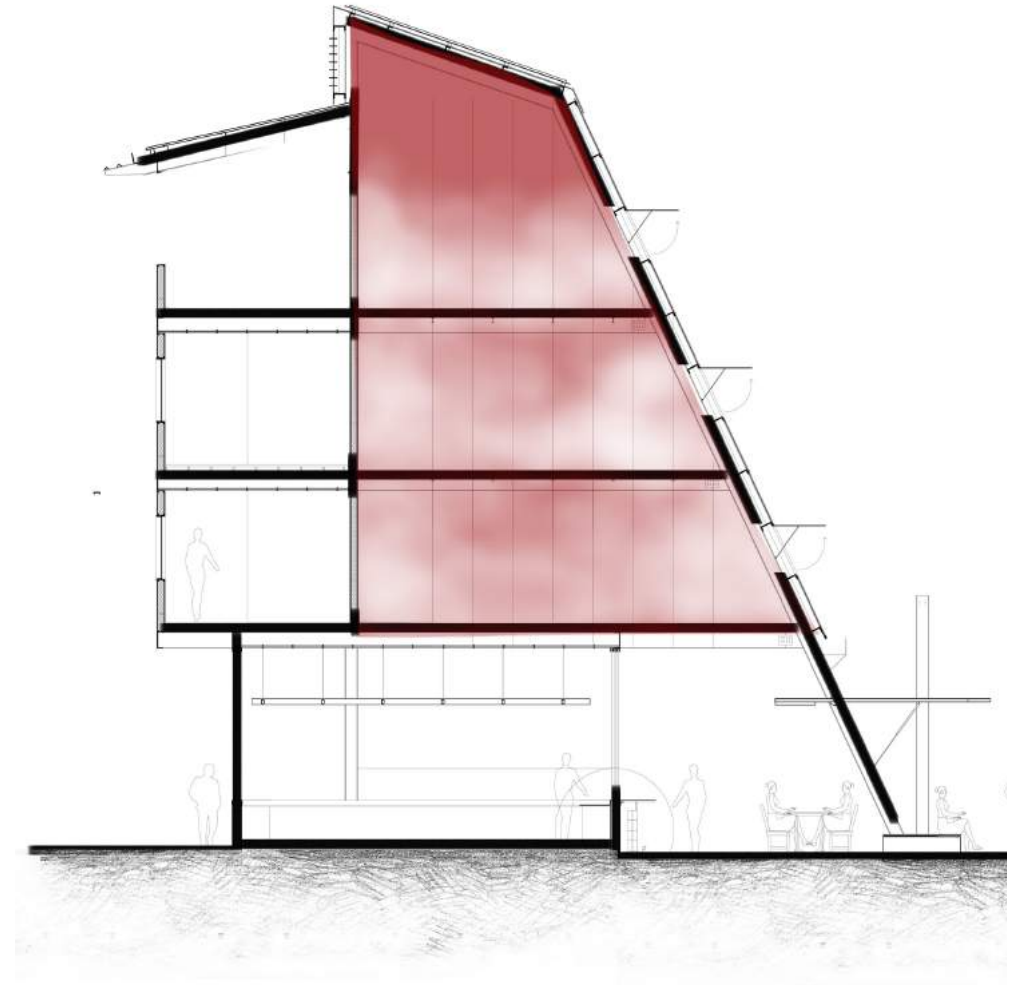
LOUVRE VENTILATION



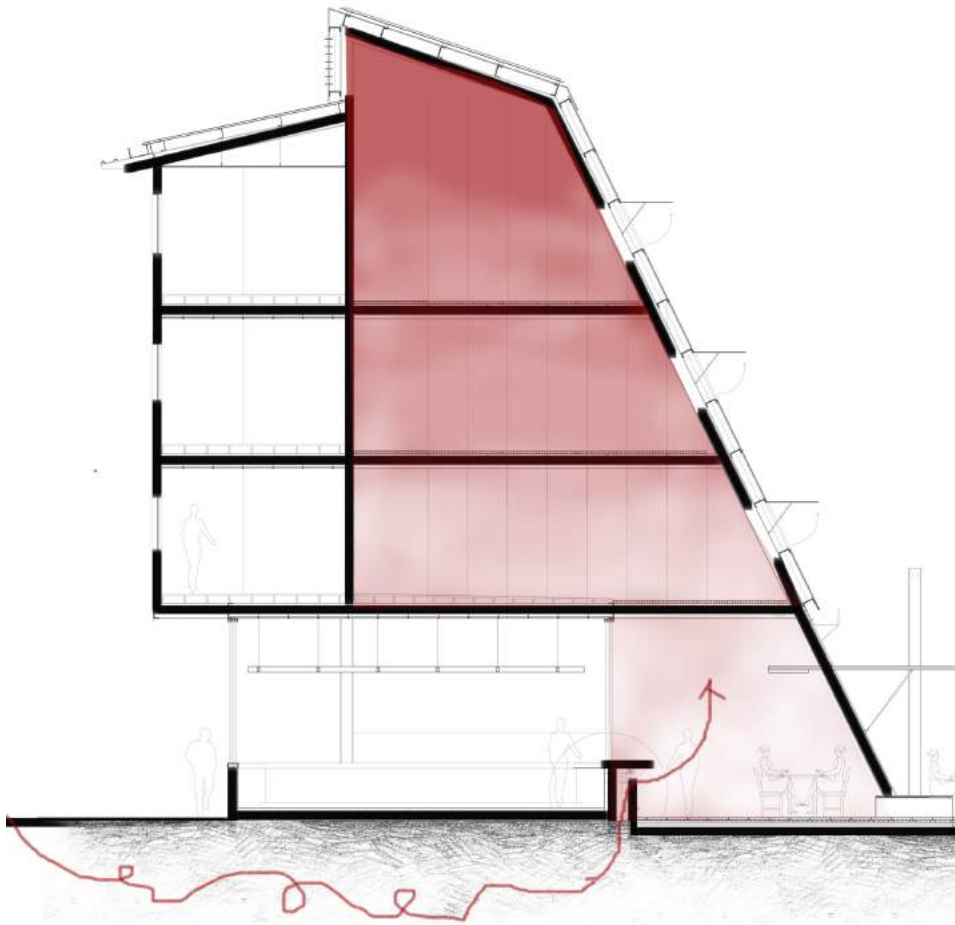
VENTILATION passive systems

Due to the nature of the greenhouse in the South African context, ventilation becomes an important consideration in order to prevent the overheating of the plants within during summer months. Ventilation is also important with regards to restaurants and cafes sitting below the greenhouse.

LOUVRE AND BALCONY VENTILATION



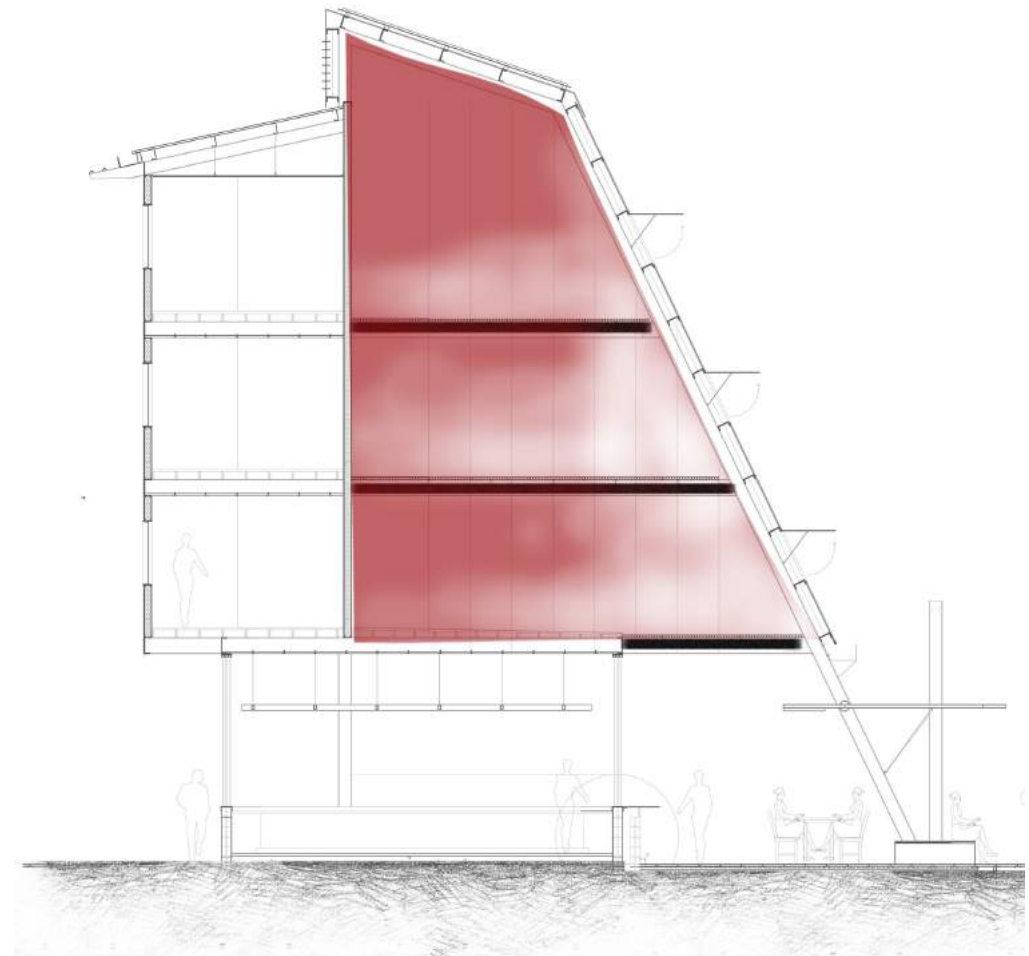
EARTH TUBE VENTILATION



The earth tubing brings in cool air from the inlet on the southern side into the space beneath the greenhouse. This creates the movement of air and enhances passive ventilation.

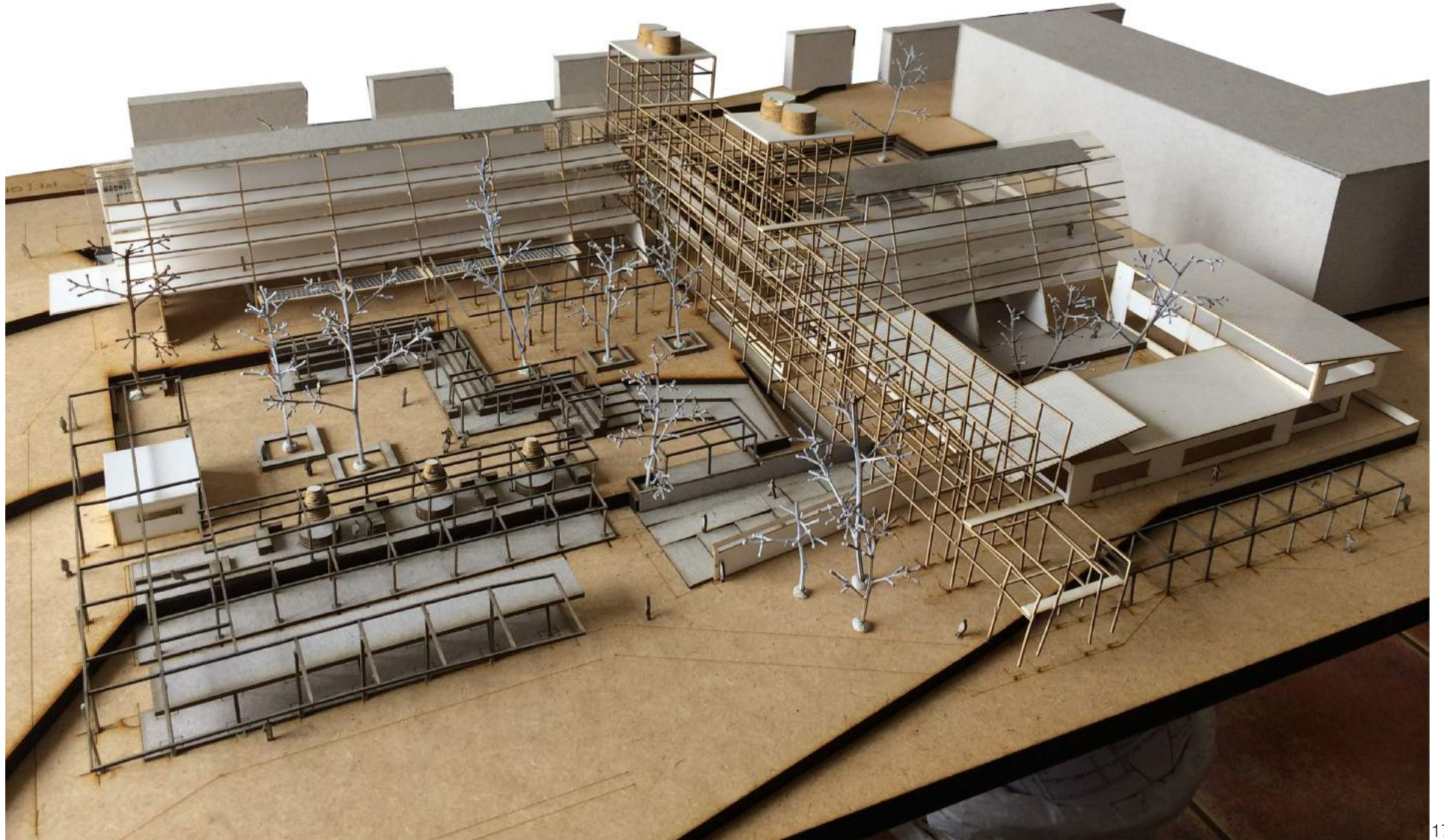
The earth tubing also creates an opportunity in winter, whereby it is used as a method to bring warm air into the building and moderate temperature.

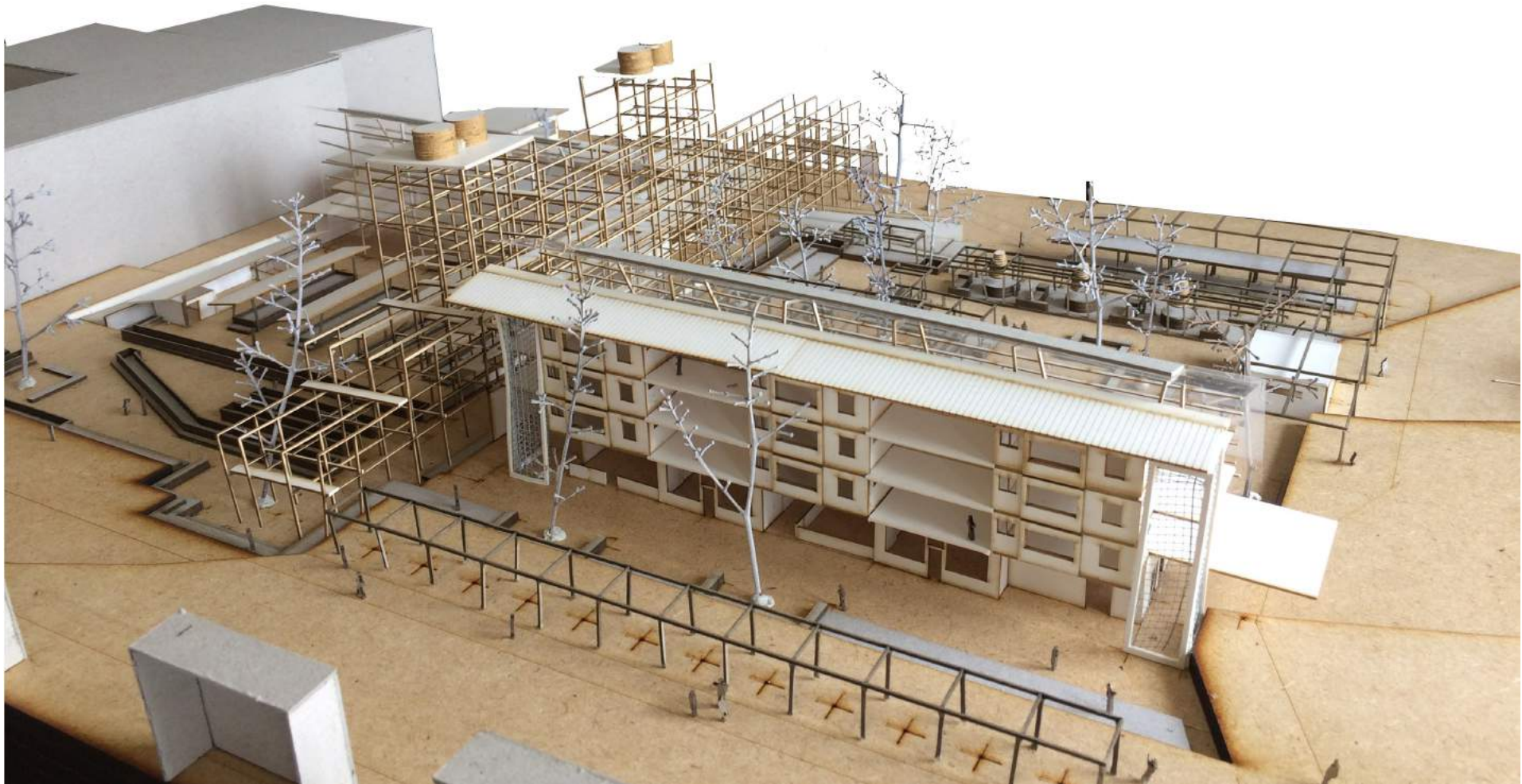
MENTIS GRATING VENTILATION

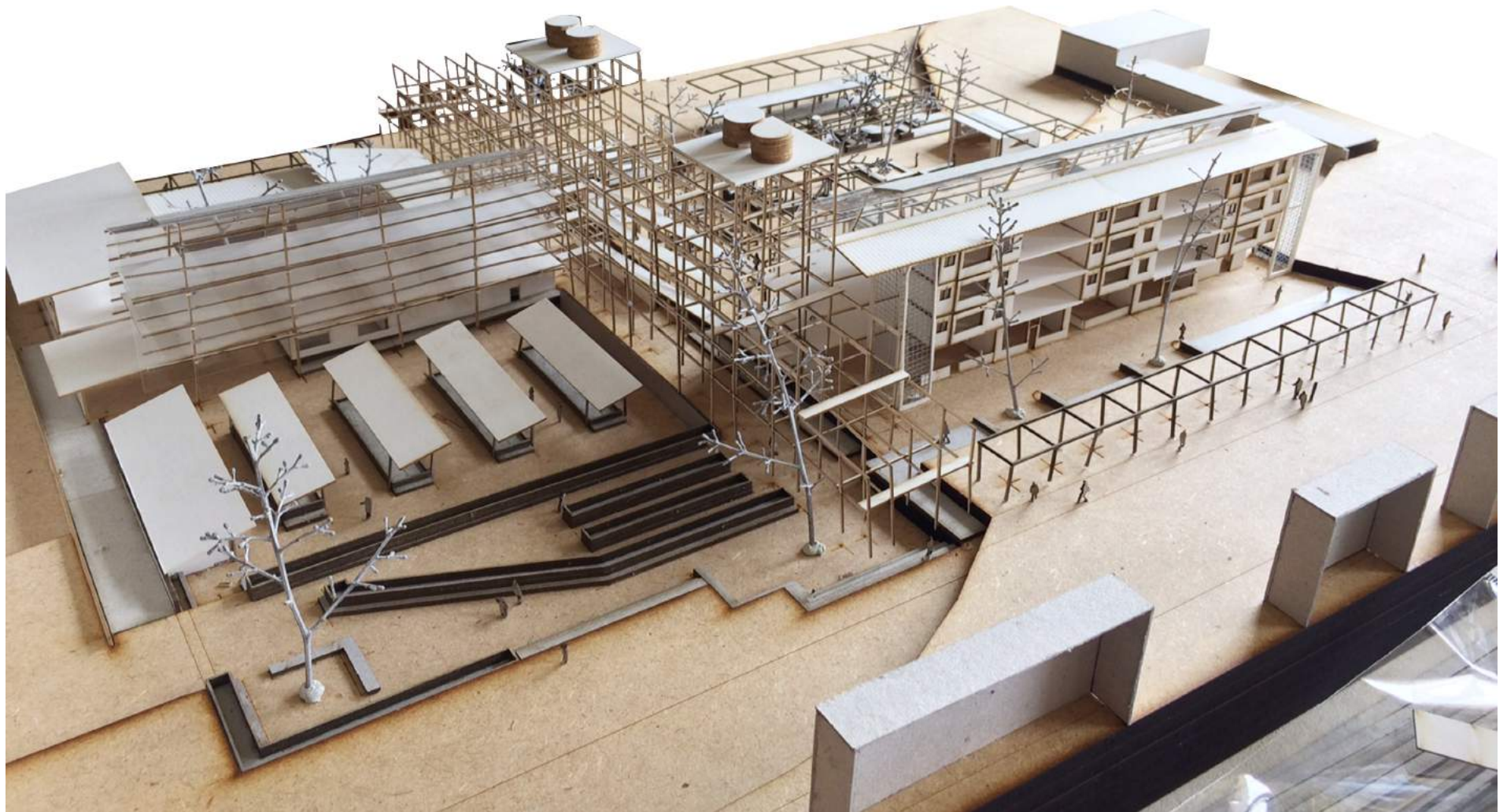


The mentis grating allows for easy flow of air through the floors of the greenhouse and create greater opportunities for passive ventilation.

A GASTRONOMIC QUARTER
final model exploration

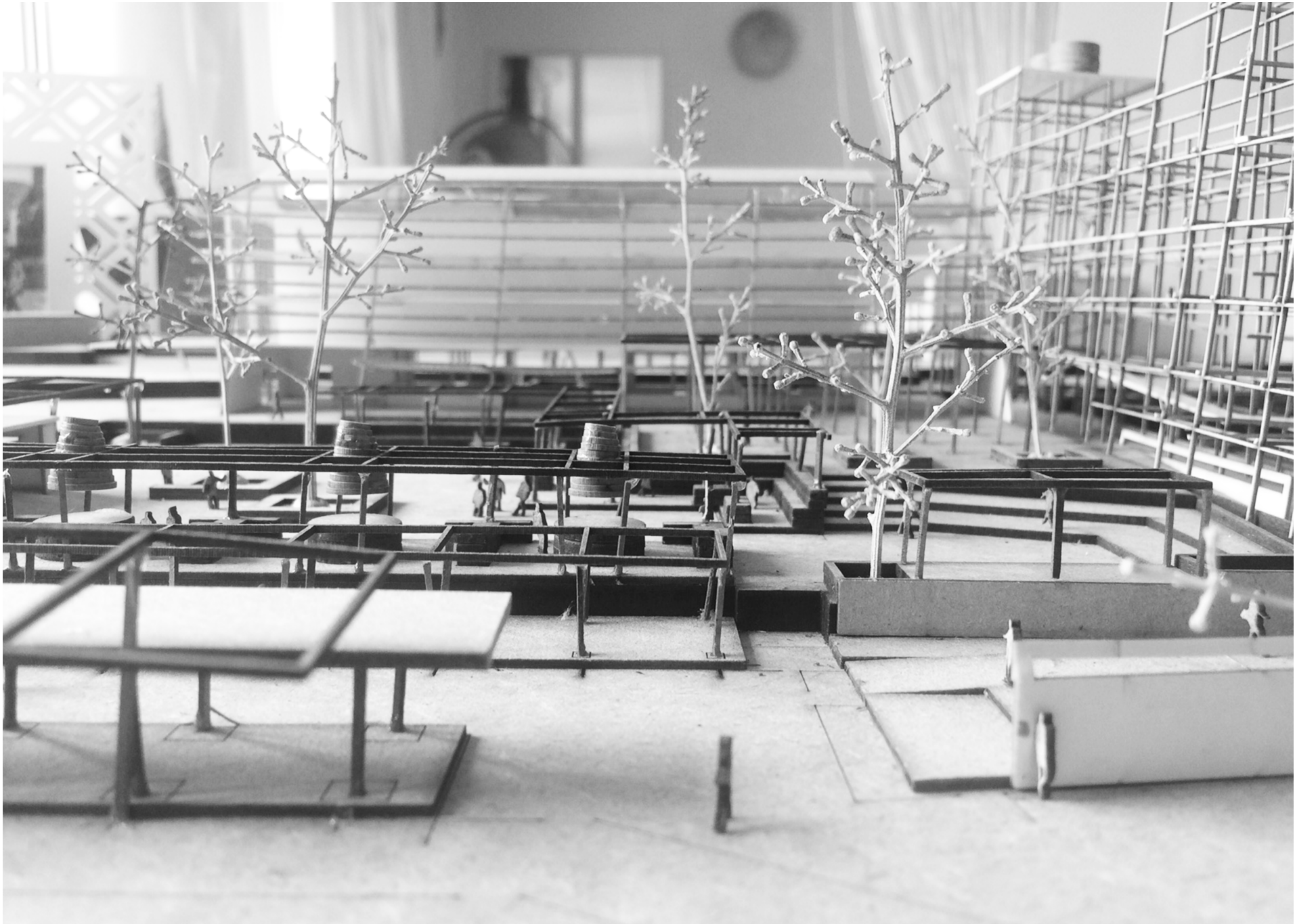


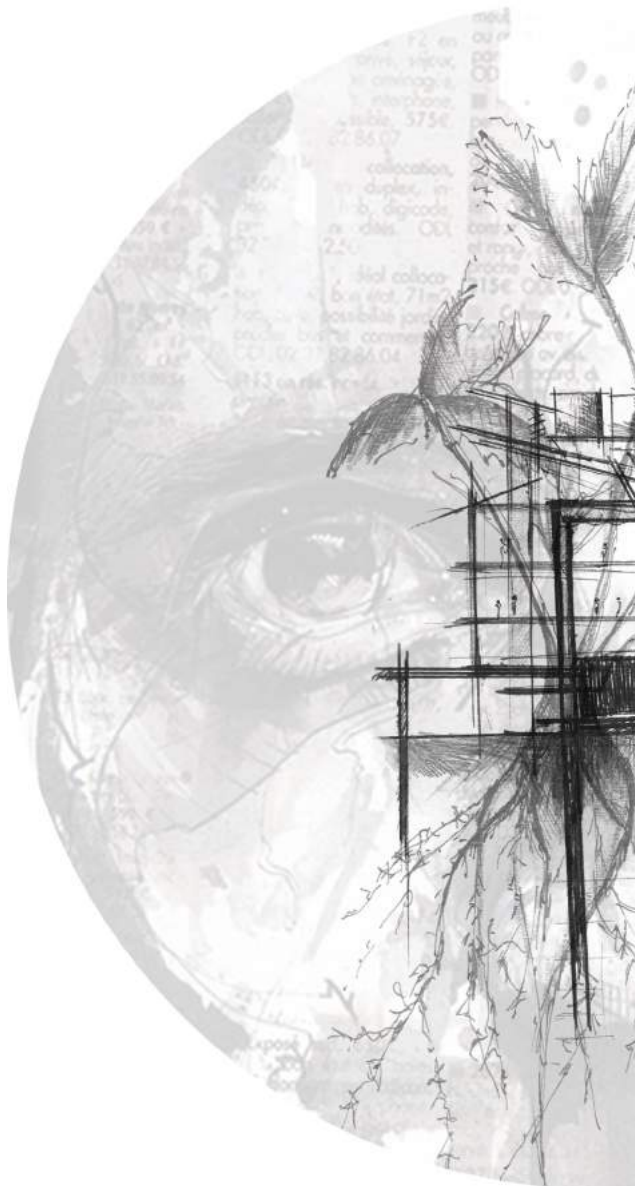












overarching conclusion

This dissertation was an investigation into how architecture could facilitate the regrowth of broken networks that have led to a highly contested site due to the increase of the socio-economic barrier.

The concept of growth is physically manifested in the form of vertical production, through a greenhouse, which sits as beacon within the urban context. It is from this production core that various activities stem and link to the existing urban fabric.

The main programme, a gastronomic quarter, responds directly to the needs on site by not only providing infrastructure that enables the physical growth of food but creating spaces that allow for positive growth in terms of livelihood through economic and social sustainability. Effective incorporation of formal and informal trade, as sub programmes, offers a variety of opportunities for the immediate community and thus creates an overall inclusive environment. Through the localisation of the food network, basic service provision and the multi functionality of the spaces, provisions are made for the ease of adaptability and growth of the intervention.

The intervention responds to the urban scale and density through the transition and variation of scale and density. Transitions and hierarchy of the spaces allow for greater understanding of the food process network and the endless opportunities it provides. Due to the nature of the site and the urban proposal the ease accessibility to food, not only in terms of affordability, was a large consideration. The bus stop being an existing node of energy is an important informant on which to base the design. Successful pedestrian movement is vital to the space in order to maintain energy within the space and aid in encouraging social interactions amongst various economic and social groups.

With regards to interactions, an important aspect of the design is the principle of engagement, using architecture to create a point of acupuncture that facilitates the participation, of people and food, and of people with each other. Through various thresholds, the hierarchy and transition of spaces from one space to another allows for the understanding of the food process network as well as our direct influence thereof.

The theoretical premise of place through systemic approach, as well as the precedents investigated, indicate that social spaces, economic opportunities and food production should be layered to generate community support through a place devoid of intangible barriers. The proposed design therefore functions as a social system, based on the optimisation of the food network, that encompasses various activates and programmes that would generally be isolated from each other.

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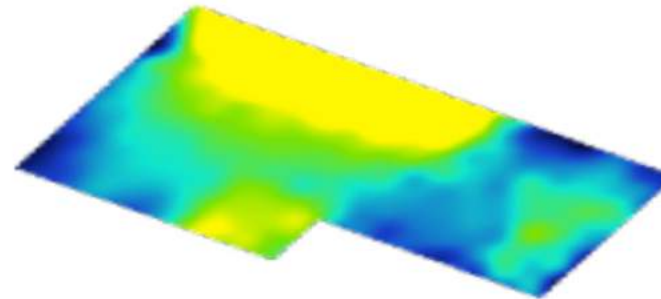
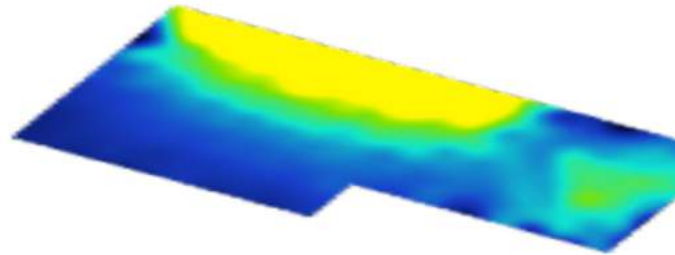
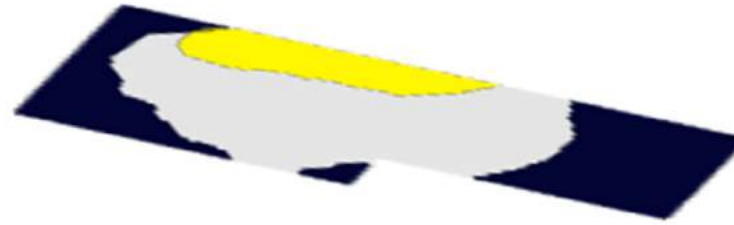
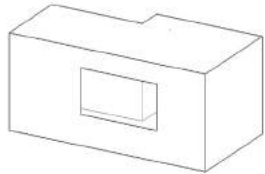
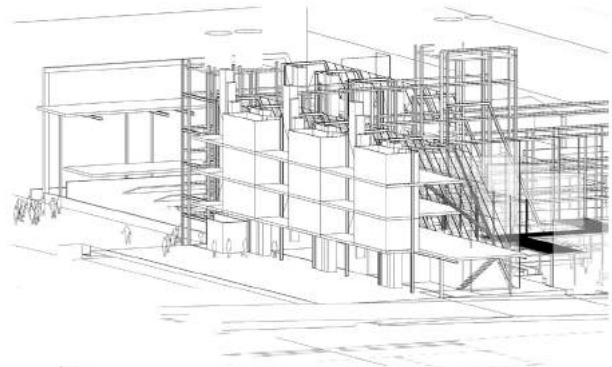
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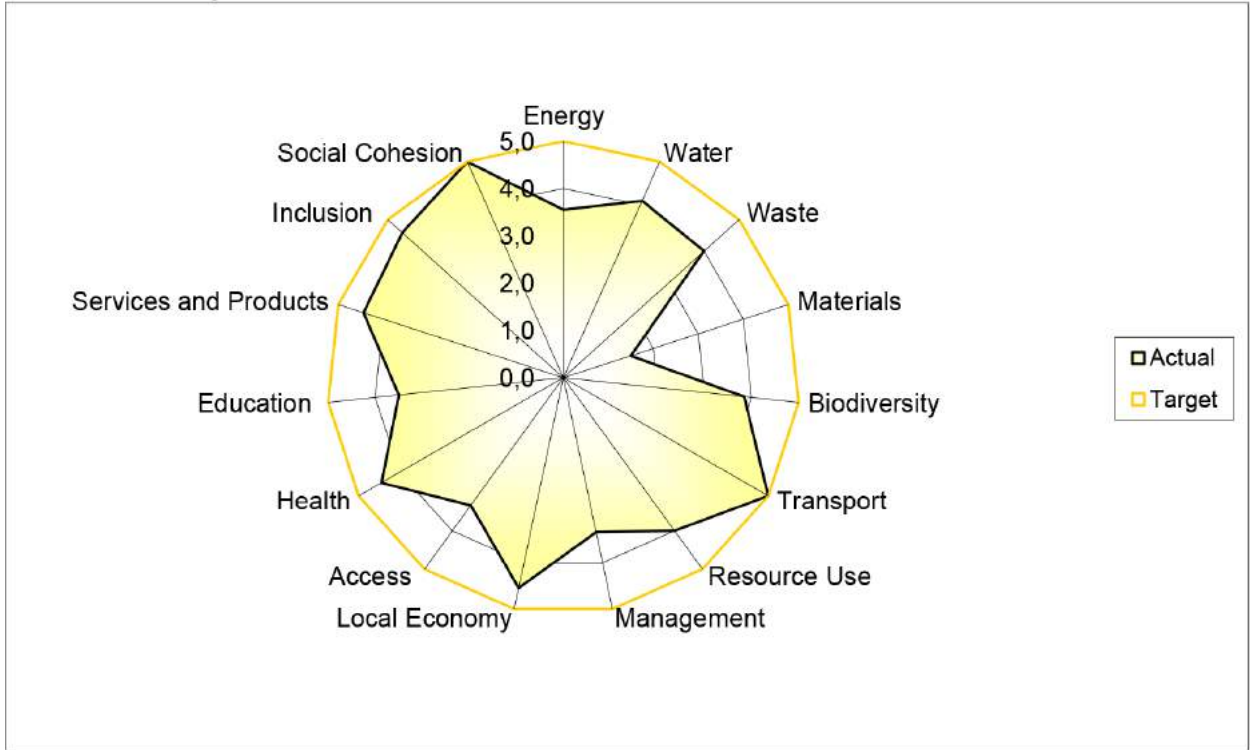


Percentage of Floor Area where Daylight Factor (DF) is measured at 0.85 meters above the floor plate.

Uniformity Ratio: 0.36



SB3 SBAT Graph



SB4 Environmental, Social and Economic Performance	Score
Environmental	3,4
Economic	4,0
Social	4,4
SBAT Rating	3,9

SB5 EF and HDI Factors	Score
EF Factor	3,8
HDI Factor	4,3

SB6 Targets	Percentage
Environmental	68
Economic	81
Social	88