Architecture without Land.

Access to land, secured with land tenure as development strategy in critical neighbourhoods, in South Africa.

by Amy Elizabeth Leibbrandt

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in the
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Course Coordinator:
Prof Arthur Barker

Study leader:
Prof Arthur Barker

Declaration
In accordance with Regulation 4(c) 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.

Amy Elizabeth Leibbrandt
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For Lizzie Sakura Lindeque

Thank you

I would like to thank those hereunder for the support, guidance and advice given freely to me in order to achieve excellence in not only completing this dissertation but in nurturing my creativity and knowledge:

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Land First

"Without land, there is no freedom or dignity. We want Land First because **it is the basis of our freedom, our identity, our spiritual well-being, our economic development and culture.** The land of Africans was stolen and this theft has rendered us landless in our own land."

– Black First Land First (BFL, 2017)

Project Function:
Appropriation of Land

Project Location:
Roberts Avenue, Westbury, Johannesburg, 2092

GPS coordinates:
S 26.183190; E 27.974521

Client:
Community Land Trust (CLT)

Theoretical Premise:
The dissertation considers the project within the contemporary South African context and history of land.   It utilises adaptable and transportable structure thinking combined with open building and resilient city development.

Architecture Approach:
The dissertation considers Architecture as a method to effect social change, articulating the dialogue between stability and change within an urban setting

Abstract

Architecture without Land postulates the role of architecture without the promise of the ownership of land. It investigates the provision of land, secured with land tenure, as a development strategy in critical neighbourhoods, specifically Westbury, Johannesburg. It is situated within the urban land question and opportunity of land, characterised by continual redevelopment within strict urban boundaries and multiplicity of use, and addresses the fragments of apartheid city planning, particularly the question of ownership of land.

Title deeds are not always practical or appropriate solutions. Fixed ownership could stagnate the process of continual redevelopment of land and hence of the social development in a low income neighbourhood. The opportunity of land tenure, as opposed to ownership, aids flexibility and appropriation by tenants including the continual redevelopment of a site. Tenure of land, allows the tenant organisation to expand, insert or subtract their built manifestation in relationship to their economic conditions, reducing inefficient land use.

This approach responds to change in mainly two ways; internal changeability (Architecture host to change) and external changeability (Land host to change). Land host to change; orders the permanent (stable) built fabric, predetermining structure, service and external space. Tenant dependency on stable built fabric (architecture as method) is articulated in a scale understanding of facility and connection (service point). This interaction is expressed in use of space, fit-out, infill and/or insert with the condition of easy removal at end of use.

Access to land and space are vital to the project as poverty is deeply spatial and ownership of land intertwined with the legacy of apartheid. This dissertation will focus on the appropriation of land, tested with social infrastructure such as early childhood development, mothers training, shisa nyama, a medical unit supported by affordable rental housing, hosted in a 66m by 36m land parcel, supporting compact city development and densification in the suburb of Westbury Johannesburg.
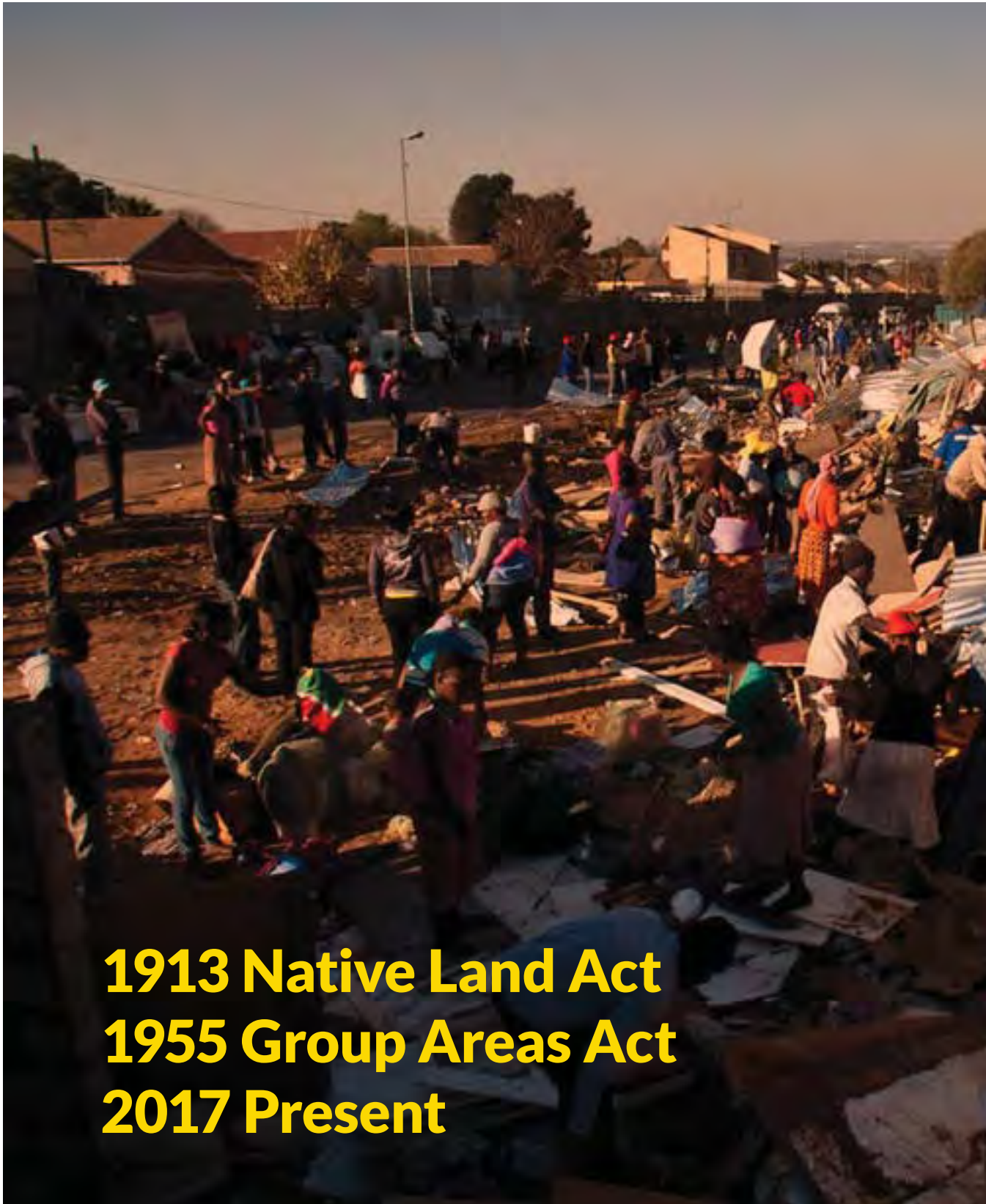
1913 Native Land Act
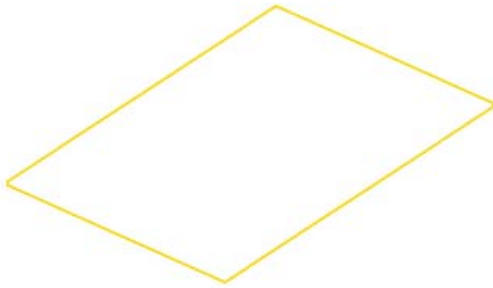# 1955 Group Areas Act
2017 Present

Fig 1.1 The Johannesburg Metro Police department (JMPD) evicted residents of Marlboro, despite a court ruling to the contrary on 22 August 2012 (Parker, 2012)
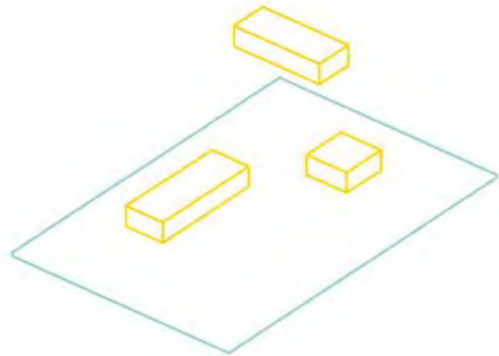
Contents
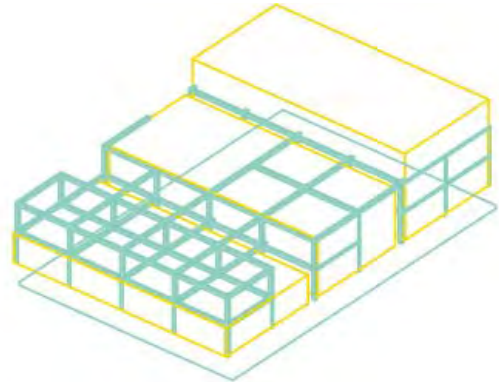
3

Architecture

4
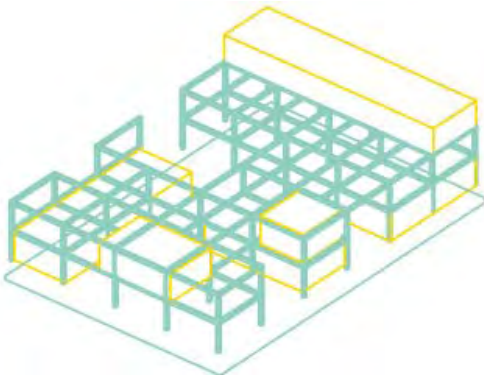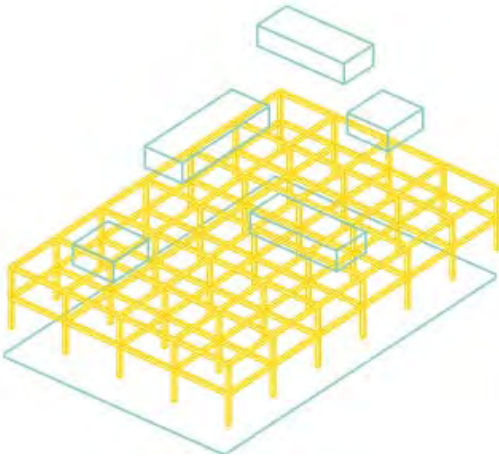
Development strategies

7

Technology

8

Conclusion

Fig 1.2 Structure of dissertation (Author, 2017)

Fig 1.3 19 July 2017, Squatters evicted from Fattis Mansions, Johannesburg, South Africa (Abdulla, 2017).

Chapter 1

The question of land

1.1 The question of urban land

'cleaning up' Johannesburg - 2017:
Inner City to Wembley Stadium.

Herman Mashaba, City of Johannesburg Mayor, as part of the inner-city crime fighting project, has warned illegal land and building occupants of eviction within the coming months. The Socio-Economic Right Institute of South Africa (SERI) stated raids on hijacked buildings are not addressing core issues of poverty (Lindeque, 2017).

The typology of evictions in Johannesburg is characterized by violence, theft and scattered belongings occupying the streets. Residents claim that not all those living in hijacked buildings are illegal foreigner nationals. Evicted residents have since 2015 been displaced to Wembley Stadium. The stadium is host to 700 individuals living in tents with limited sanitation, no health care, and limited access to education while struggling with basic dietary needs (Modise, 2017).

On 2 June 2017 the Red Ants accompanied by Johannesburg Metro Police Department (JMPD) officers, evicted residents of the Bekezela informal settlement in Newtown, Johannesburg. Residents fought back, after being forced onto Carr Street with no warning of the eviction and with no time to collect legal documentation and belongings from their homes. The Passenger Rail Agency of South Africa (PRASA) owns the land which the residents illegally occupied (Lujabe, 2017). The legality of the action initiated by PRASA was under dispute in Gauteng High

Court. The court ruled that the evictees must be reinstated, however trauma and destruction had already occurred (Haffejee, 2017).

Fig 1.5 Evicted resident, 02 June 2017, Bekezela Informal Settlement (Lujabe, 2017)

Fig 1.4 Wembley Stadium, Johannesburg (Modise, 2017)
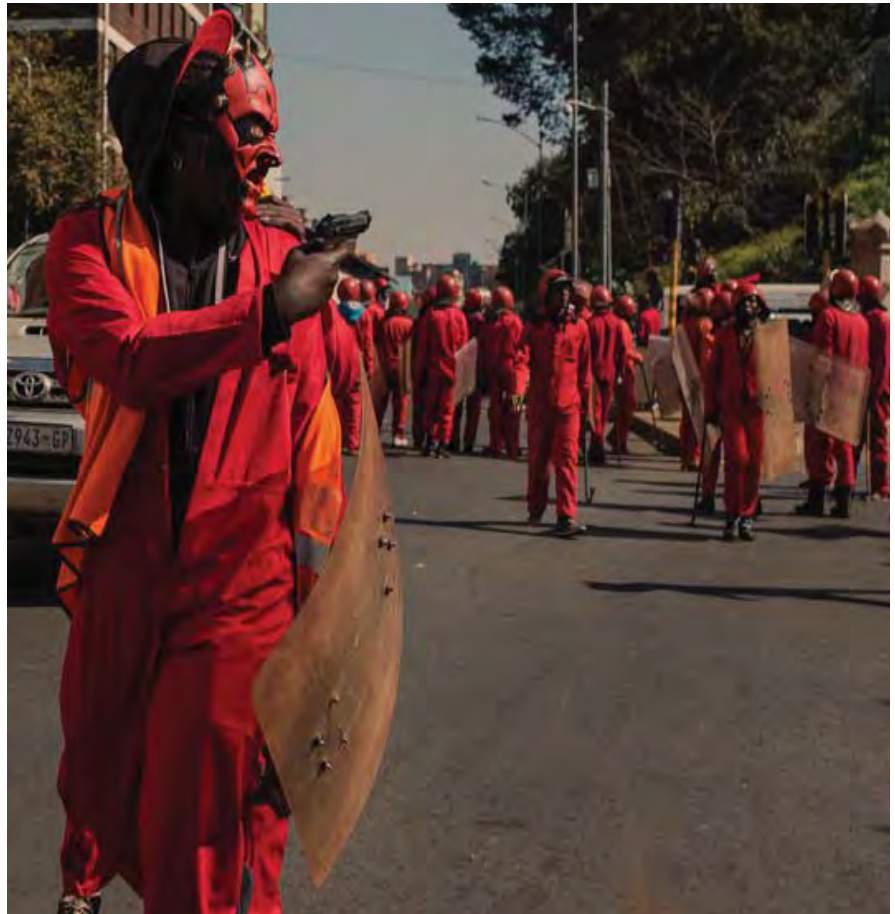
Fig 1.6 Eviction Anxiety, June 2017, Bekezela Informal Settlement (Haffejee, 2017)

1.2 Security of Land Tenure

It could be argued that the condition of hijacked buildings in inner city Johannesburg is a result of the lack of provision of well-located affordable land and the backlog of housing within South Africa. The living conditions of hijacked buildings are unacceptable with residents living in fear, exposed to crime, and violence specifically from the drug industry. Improvements to these buildings are a basic human right and are needed for the development of Johannesburg's urban environment. It is a contested debate to whom ownership of development should be awarded to; the illegal resident (barely surviving) or the registered building owner or the city authority. Should upgrade occur the current illegal residents will not be able to afford housing in the inner city

for

Fig 1.7 Living conditions of a typically hijacked buildings,Hillbrow, Johannesburg (Wessels, 2015)

people.

access + dignified space

Opport

Land:

cunity of

Continual redevelopment within strict urban boundary and multiplicity of land use.

To foster

Secure access to land.
Resilient compact city development, reducing urban sprawl and inefficient land use.
A Legal framework for economic opportunity and capacity building.

1.3 Project Function: Appropriation of land

Westbury Clinic

Land parcel owned by City of Johannesburg
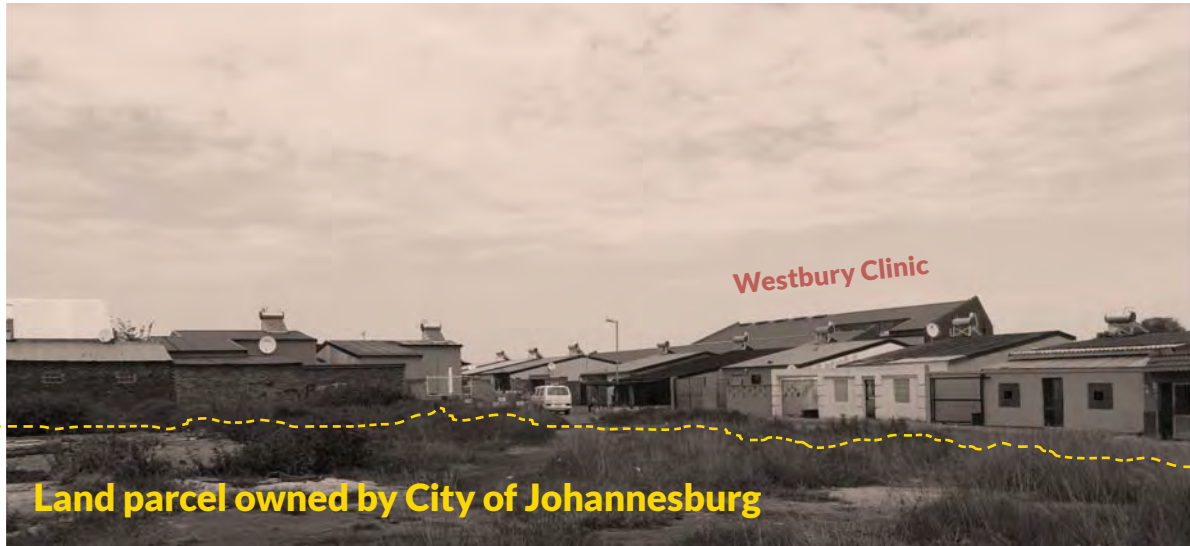
Fig 1.8 Land parcel owned by City of Johannesburg, land parcel investigated in this dissertation (author, 2017)

1.3.1. Ground and Land

Ground is the physical geographical host to urban dialogue such as public and private ownership, impromptu and planned development, disadvantaged and privileged people (Frampton, 2012: 6).

Land is the political entity of ownership within boundaries. Ownership of space could be legal or territorial (claiming space such as the street corner vendor, hijacked buildings or land invasions). This muddles the clarity of the urban land question. The urban land question is précis to the right to the land, use of the land and benefit of land, that is who has the right to the land (ownership)? Who has the right to use the land? And who benefits from the land and improvements to it?

1.3.2. Stability and Change

Definition of permanence or temporality, limits the understanding of various conditions within the built fabric, specifically to adaptability and the urban condition. This is better defined by stability and change. Stability refers to stable built fabric, less likely to change, but has the potential to change or be manipulated (not absolute fixed and permanent). Change refers to the shift between tenants, function and appropriation, yet the scale of change could be daily, 5 years or 50 years (not necessarily temporary).

1 Infrastructure as base

3 Additions to infrastructure

2 Infrastructure as support

4 Manipulation of infrastructure

Fig 1.9 Westbury urban upgrades (2015) edited by author (Local Studio, 2015) | Fig 1.10 Westbury urban upgrades (2015) edited by author (Local Studio, 2015) | Fig 1.11 Westbury urban upgrades (2015) edited by author (author, 2017) | Fig 1.112 Westbury urban upgrades (2015) edited by author (author, 2017)

1.3.3. Appropriate and Infrastructure

Appropriation of infrastructure is encouraged and vital to the success of the development strategy; the project positions itself within responses visible in Westbury. Westbury is a clear example of a critical neighbourhood which is defined as one of critical stage of development with the condition of high densification within the context of a low socio-economic society with little or few prospects of upliftment. The relationship between infrastructure and use is visible in the responses to the urban upgrades in Westbury in 2014 with four approaches. The idea of 'infrastructure as base' explains the initial interaction, which is, the tenant uses infrastructure as is. 'Infrastructure as support' highlights the dialogue of working next to infrastructure, utilizing it, to better position users in the urban environment. 'Additions to infrastructure' extends existing infrastructure. 'Manipulation of infrastructure' consists of physical alterations to stable built fabric such as addition (refer to subchapter 6.1)

1.4 The question of the architect

This dissertation is the culmination of the experiences and knowledge gained by the author over a period of the last four years.

Architecture should not have a single voice; it is the combination, the conflicts, the negotiations that contributes to an intriguing conversation reflective of society.

The role of an architect within the development of a community can have profound impacts and influences. Items that should be considered are:

Architecture: the challenger. Architecture has a social responsibility to highlight the weaknesses of society, investigate and respond to these challenges.

Architecture: the colonialist. Here the social architect is seen in the context of colonialism one of whose stated intentions is to 'help the people'. The 'social' architects states that 'I want to help the people', but in reality the focus is more on the architect (and research produced) and less on the upliftment of the people. The so-called social architects often become anti-architects, or social engineers, stating 'if architecture is not the answer, don't do architecture'. This is dangerous, for they are not trained as policy makers, or social workers or social engineers, increasing the risk of unintended damages as good intentions have limited value. The architect or architecture on its own is not a solution.

Architecture: the researcher. The architect's relationships with residents and the involvement of the public in the participation of any project are central to the understanding of the given context and identifying areas of greatest impact. A general approach could be to focus development on home owners of newly built masonry homes compared to home owners of tin shacks. Masonry homes represent economic opportunity and the beginnings of economic stability as explained by Jhono Bennett, (1:1 Agency of Engagement). It is important to realise that it is not the architects' context, but that architects should support the development. The development must be sustainable without the architect.

Thireshen Govender of UrbanWorks, during the author's internship, explained the importance of working within legal frameworks for long term sustainability, as critical neighbourhoods do not exist in a vacuum and social aid from public and private resources occur within a process and must comply with all legal requirements. This is as a result of both public and private social aid donors needing to account to their stakeholders as to their actions and decisions. Further it is best to focus resources on community actors such as the Imbizo Shisa Nyama (isiZulu words meaning to call someone to braai or cook meat over an open flame: a restaurant on Busy Corner in Ivory Park), enabling the business owner to contribute to the local neighbourhood, in so doing keeping financial resources within the neighbourhood.

The approach to architecture, must be contextual, and the same approach must be able to be applied in various environments, whether Thembisa or Sandton. The principles of a sensitive spatial understanding such as well-defined public spaces and the architecture's relationship to the urban environment should be followed. Thomas Chapman, Local Studio, encourages architects to find the hairdresser who needs a salon, the baker that needs an oven and the educator that needs a classroom

to provide support instead of introduction an unrelated project.

Architecture as method: The successful upliftment of a community must integrate all aspects of architecture by the utilisation of the skills and knowledge of the architect to support a project led by community actors and associations. Residents are seriously impacted and hence are responsible for social change. In critical neighbourhoods the architect is not the leading voice, but can only be the technical support. This was practically illustrated on a Change by Design workshop presented by ASF-UK (Architecture Sans Frontières – UK) and DAG (Development Action Group- a leading NGO in the urban sector based in Cape Town), and attended by author at Cape Town, June 2017.

1.5 The question of the dissertation

The following is an explanation of the process of development of the project leading to this dissertation:

1.5.1. The author's early Introduction to Westbury (Mid 2015)

The author's introduction to Westbury was in 2015, part of the Local Studio team, assisting on projects within Westbury.

Sunshine was unfolding upon an array of spectacles; children playing on the sidewalks, the continuous flow of pedestrians and the "ooms kuiering" (elders visiting) on the street corner. A community where neighbours knew each other's struggles, vices and virtues. A low socio-economic community where poverty was rife yet still a vibrant community.

The author's introduction to the site and its temporality was with the opening ceremony of the Reid Foundation (a local NGO supporting child with special needs development and founded by Shawn Constant). Towards the end of the day, the author stood on the street edge at the Dorcas Center (a local community center) on Roberts Avenue, observing an afternoon wedding across the street within a white tent church placed on a barren piece of land. The bride arrived in a blue convertible and entered the white tent to the accompaniment of a Sam Smith song. The ladies next to the author stated that it was the brides' fifth wedding. Earlier that day, the same tent housed the ceremonial rituals of a funeral. The tensile structure illustrates a built manifestation of temporality.

1.5.2. Mid 2016

During the author's study at the University of Pretoria Honours programme, (a continuation from the under graduate programme interests), the author investigated the adaptability of structures to accommodate changes within the context of the urban condition in a state of continual flux. The house is the most adaptable structure and not an open shed, because space use and the balance of privacy generally translated into small rooms connected with passages to larger rooms. Change requires anchor points such as permanent fixed structures, to guide and host future development.

1.6. Research method 2017

The research that was completed was ordered through an understanding of the context of land and a dialogue between stability and change. A qualitative research methodology combined with design research was followed. The study acknowledges subjectivity of majority of literature due to sensitivity required when discussing land.

Research was obtained from observations, interactions, interpreting raw data to draw connections defining interconnected data (Groat, 2013:246). Qualitative researchers investigate objects and processes in the daily and contextual setting defined as 'natural setting' to interpret the subject matters' meaning to residents (Groat 2013:218). This was accompanied with other techniques such as mapping, photo documentations and observations with prolonged contact (Groat, 2013: 221) visible in author's interactions with Westbury since 2015 as professional, volunteer and student.

The approach to the question of land is research led supported by public opinion.

Consideration was given to manifestations of political parties, news articles and research from

NGO's regarding contemporary context. Ideas and theories of land were tested with, community members, NGO's and international participants and facilitators of Change by Design 2017 Cape Town Workshop hosted by ASF-UK and DAG. Visits to the Westbury site and informal discussions with residents were conducted under the guidance of Shawn Constant, Reid Foundation and community actor. Thomas Chapman and Neil Klug were consulted regarding the conditions of Westbury from an architect's, urban designer and town planners' perspective. The 2017 Westbury Ward Councilor's second quarterly public meeting for ward 69 provided an insight to the relationship of residents and local authority. Assisting the Local Studio team during Mandela day with the upgrade of an ECD (Early Childhood Development) in Westbury provided further insight into the local context.

The dialogue between stability and change during this project was research led and was influenced by considerations of understanding the principles of historical precedents, current precedents and conditions of adaptability, open building, transportable structures in addition to the context of South African backyarders, temporary relocation areas, tested with critical design iterations.

The research consists of two main questions, both positioned with project intention of 'architecture as method' to effect social change and spatial transformation.

 1: What is the ability of architecture to enhance appropriation of land?
2: Can architecture increase opportunities that can be accommodated within systems of land tenure?

Argument
Use 1
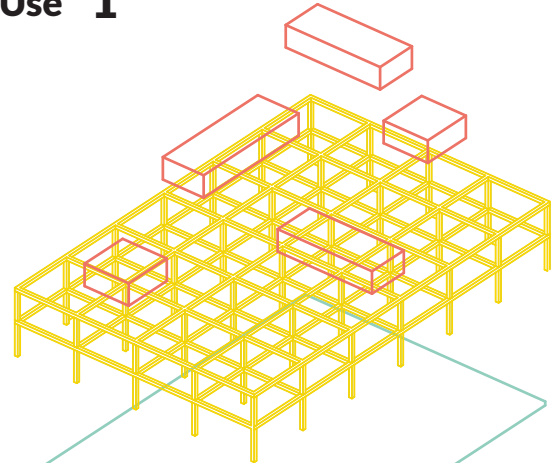
Architecture 2

Land 3

Research method

Land 1

Architecture 2

Use 3

1.7. Delimitations

Architecture is viewed as a method for social aid and not a solution in itself. The research does not intend to directly solve the larger social issues of Westbury or other critical neighbourhoods, such as gangsterism, the drug industry, teenage pregnancy, dog fighting or the self-perception of being a problematic community (Klug, 2017:50). The project solely focuses on the opportunity of land and by addressing this it will indirectly address some of the abovementioned issues.

The project provides the following delimitations:
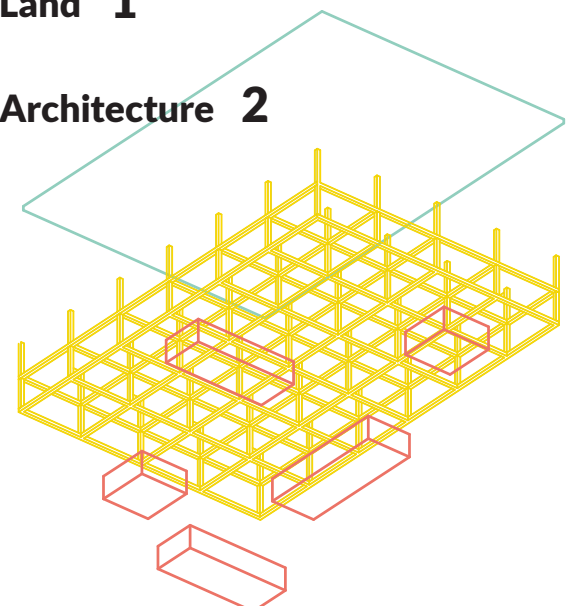The land development strategy is catered for by the land ownership by a Community Land Trust (CLT) (refer to paragraph 2.7) and not a private developer or city authority. This provides a legal ownership framework addressing the local culture visible in Westbury of encroachment on municipal land, and providing an alternative to practices such as illegal renting out of municipal land.

The appropriation of land is developed with the inclusion of a social infrastructure namely; early childhood development, mothers training for home based care, a small scale medical unit as extension of the ECD, a shisa nyama and affordable rental housing and commercial premises.

1.8. Limitations

The development of the development strategy is limited to the learning acquired from the project site (refer to the conclusion), and understanding of South African land issues obtained from literature reviews. The strategy should be further tested within various critical neighbourhoods other than Westbury.

The historical context of the site and its conditions were obtained through informal discussion with community members and local architects with anecdotal evidence based from historical photographical material.

1.9. Assumptions

The social issue of theft will be addressed with community ownership of the project facility, the location of the project within neighbour urban structure, good management of the facility, public activities and housing within the facility, providing a 24-hour use and placement of project within the urban fabric. Street visibility (eyes on the street) is an objective to be incorporated in the design and is addressed with the placement of programmes.

Fig 2.1 Johannesburg, South Africa (Google Earth, 2017)

Chapter 2

The opportunity of Land.

2 The opportunity of land

The opportunity of land is characterised by a process of continual redevelopment within strict urban boundaries and a multiplicity of use. Land Tenure strengthens this process, enabling a shared authorship with the opportunity of land division into parcels. This supports the development of resilient livelihoods in critical neighbourhoods, which are areas of scarce resources and rapid change. Land tenure as a development strategy reinforces compact city planning, reduces risk of urban sprawl, wasteful use of building stock, and prevents single and inefficient land uses.

It is vital that development is rooted in context to establish an integrated process driven by the residents' needs while providing a legal platform for capacity building.

Development is often politically coupled with the 'not in my backyard' syndrome, leading to traditional methods of development no longer supporting resilient city ideology. Development of land must enable sustainable livelihood and neighbourhood development; basic service delivery is not sufficient. South African urban dwellers are confronted with spatial, social and economic fragmentation, with the urban poor often excluded from resources. Urban sprawl and wasteful land use burden city structures, which is especially relevant to critical neighbourhoods often located on peri-urban edges. The government development agenda intends to provide infrastructure, improving own-revenue sources for financial independence, restructuring urban spatial form to improve efficient land use practises and sustainable integration (Brown-Luthango, 2014:1-8).

Government socio-economic policy frameworks such as the Reconstruction and Development Programme (RDP) have promoted the 'one house one site' approach, often following reductive design, becoming a numbers game. This establishes mono-functional and sameness spaces resulting in low density areas lacking in well-defined urban space, hindering the basics of urban life (Low, 2005).

David Dewar (2005:244) argues that the land crisis is driven by higher income residents seeking private amenities, city authorities seeking affordable land for low cost housing and illegal land invasions, all resulting in urban sprawl generating high levels of traffic. The cost of movement, time and financial resources, intensify the developmental issues of poverty, unemployment and inequality. Urban sprawl is economically inefficient and mitigates against economic growth. The location of land is central to the urban land question in relationship economic opportunities.

2.1 Keep off the land[1]

Policing of urban land is a serious concern in the South African context, visible with the establishment of the Anti-Land Invasion Unit (ALIU) in 2009 by the City of Cape Town, the Red Ant Security Relocation and Eviction Services, portrayed by the media as conducting violent evictions (Bennie & Monaheng, 2017) and lately both the Economic Freedom Fighters (EFF) and the Black First Land First movement (BLF) (Mngxitama, 2015) . The City of Cape Town maintains that land invasion is a threat to city planning and development. Kramer and Booi (2014:12) argue that policing of land invasion is a result of thoughtless planning, failing to address urban densification, ineffective upgrading of informal settlements and the lack of provision of well-located housing.

The urban land question is a contested debate in South Africa deeply rooted in our history, visible in the 1913 Native Land Act, the 1955 forced removals of Sophiatown (Group Areas Act), Johannesburg and lately evictions by government and private developers.

This chapter intends to explore the relationship between the development of land and architecture. As expressed in this dissertation, access to land is largely governed by ownership and city planning policy, architecture by economics and construction methods and development by resilient thinking and pro-poor strategies. The dissertation focuses exclusively on land forces between city authority and community omitting the private developer.

Fig 2.2 (above) Black First Land First march (BLF, 2017)
Fig 2.3 EFF members at Mpumalanga premier David Mabuza delivering his State of the Province address (Sopa) (Lowvelder, 2016)

1 (Kramer & Booi, 2014)

2.2 Urban Land Question

Access to land and land based resources are vital for generating economic opportunities, reducing inequality and the development of sustainable livelihoods. The land question is predominantly focused on the allocation and ownership of land, including the right and use thereof. Ownership often becomes political, particularly if the obtainment of ownership is challenged. The land question is dominant in the current political climate of South Africa, although current discussions are focussed on rural land reform, overlooking urban land. Spatial transformation is fundamental to this discussion, but is challenged by decisions around whom the rightful owners are and to whom land should be restored (Joseph, 2014:3).

Sbu Zikode (Joseph, 2014: 2) questioned the meaning of being 'free' in an indictment against the post-apartheid government in July 2014. He stated that " Freedom remained a dream for those in cities without access to land and its benefits". Pusch Comey[2] (2015) maintains that the lack of land severly obstructs economic development.

It is important to note various scales of the urban land question in South Africa such as land invasions of vacant public land in Khayelitsha or quiet encroachments onto municipal land. Imizamo Yethu Educare crèche in Vukuzenzele, Cape Town cares for 31 children and receives a R15 grant per child per day from the Department of Social Development. The grant is essential for the provision of meals. The crèche must be re-registered every five years to continue receiving the grant. Part of the registration process is the requirement of a formal council approved building plan. However, the crèche encroached onto a municipal road reserve, consequently failing to obtain an approved plan, leading to the termination of the grant subsidy and benefits from formal city structures (Schermbrucker, 2017). Land is therefore deeply rooted in policy and quiet encroachment has a noticeable effect on formal social aid.

Land hosts all human activities, excluding space travel. Land use is mainly divided into residential (most debated form of ownership), commercial, religious, industrial, service (roads and infrastructure), open space and waste lands including dumping grounds (Pithouse, 2014). Each category is further divided; for instance, residential encompasses single dwelling units, rural and urban units, council housing, social housing, transitional housing, RDP[3] /BNG[4] housing and informal settlement units (ASF-UK & DAG, 2017).

Land use management require legal compliance for cohesive development. Town Planning Schemes determine regulations which control development and potential land uses, manifested in zoning, density restrictions, building lines and other council regulations. Local council's development policy is known as Regional Spatial Development Framework (RSDF). The document is used as guiding strategy for land use and development. If the development or application to change regulations such as zoning is not aligned with the RSDF it is unlikely to be approved (Johannesburg Development Agency, 2017).

2 Pusch Commey is an associate editor of New African Magazine since 1999 is a Barrister of the High Court of South Africa
3 RDP: Reconstruction and Development Programme
4 BNG: Breaking New Ground

2.3 Development of spatial planning and land use in South Africa

Land use policy should enable all residents equitable access to services and livelihood opportunities, but in South Africa there has been a biased development and allocation of resources (Commey, 2015); the result of segregated spatial planning.

The Native Land Act, South Africa, no 27 of 1913, prohibited the black African populations from ownership of land, limiting owners to 7% of land reserves, severely hindering livelihoods and their cultural dependence on land such as farming (Hendler, 2014:3). The Group Areas Act of 1950, integral to the development of Apartheid, provided the legal framework for systematic and enforced segregation with the control of land transfers, immovable property and occupation. Events include the forced removals of residents in Sophiatown, Johannesburg 1955, and District Six, Cape Town in 1966 erasing a once crowded racially diverse neighbourhood with a distinct character (South African History Online, SAHO, 2016).

Paul Hendler (2014:5) argues that the 1976 Soweto student protest prompted a nationwide resistance against the apartheid political systems. Officials attempted to restructure the system with the introduction of a private housing market, reforming the labour market and selectively upgrading township infrastructure, such as Westbury in Johannesburg, part of the so-called coloured townships of the Western Areas in Johannesburg. Post 1994, apartheid spatial planning and land use management regulations were removed to enable efficient urban land markets.

Economic difficulties have hindered residents 'access to land', resulting in public protest regarding social inequalities. The majority of housing projects in South Africa, delivered by the government pre- and post-1994 were built on peripheral urban land, which is the cheapest land, but is distance wise far from economic opportunities (Hendler, 2014:7).

Access to land is not sufficient and it must extend towards access to well-located, affordable and serviced land. Joseph, Magni and Maree (2014:3) maintain that this is a catalyst for urban spatial transformation.

Fig 2.4 Westbury apartment blocks, photograph by Dave Southwood (Local Studio, 2017)

2.4 Case study area: Westbury, Johannesburg

Westbury[5] and similar areas like Kensington, Factreton and Maitland (KFM)[6] in Cape Town share characteristics, such as poverty, lack of safety, gangsterism issues and a shared history of racial segregation with limited urban land development.   Global South Urbanism determines place as relational geography instead of physical location; for instance, issues investigated in Westbury are linked to issues in KFM, contributing to the larger discussion of urban land (Mabin, 2014:22). Westbury and KFM are well located in city infrastructure.

Westbury was developed on municipal land under the control of local government, whereas its neighbours Sophiatown and Newclare were developed by private developers (Chapman, 2013:22).

The western areas of Johannesburg were perceived as the service area of the city with the establishment of the municipal sewage works in 1887, south of the main east-west transport route, now called Ontdekkers/Main Road. Sophiatown and Newclare were originally declared as white only suburbs, but due to the proximity to the sewage works, land was sold to the black population after the blanket restrictions were lifted allowing the black population to own land in new suburbs. This established the western areas as a non-white area. Authorities thus overlooked zoning and density restrictions, resulting in organic growth (Chapman, 2013:23). Westbury, then Western Native Township, was established as the first black municipal township on the grounds of the former sewage works. As a result, the area experienced heightened levels of control and observation from the police with reference to Newclare (Goodhew, 1990:1-2; Chapman 2013:25). Ownership and development of land had both a positive and negative influence on the governance of the neighbourhoods.

Violent evictions, under the Group Areas Act in Sophiatown (1955) relocated and displaced the former black populations of Sophiatown and Westbury. Sophiatown was 'cleared' to provide space for the poor white Afrikaners and so-called poor coloured residents displaced from other areas in Johannesburg to Westbury (Chapman, 2013:27), This restricted ownership to coloured residents; if a business owner from a different race, wanted to trade in Westbury, they required a nominee arrangement with a local coloured resident (Klug, 2017:29).

Westbury was completely redesigned in 1985, possibly as an attempt by then Apartheid government to gain favour.   The Westbury residents strongly opposed the urban renewal scheme   by LTA Grinaker and consequently they appointed PlanAct[7] to develop the area. PlanAct was sued by the Johannesburg City Council and the SA Institute of Architects for improper conduct, for working on a project where professionals were already appointed. The council won the court case and LTA continued with the profit driven development, replacing the strict urban grid with an organic form . The new urban structure removed private backyards, reducing stand size space, consolidating pedestrian and vehicular movement, consequentially increasing the number of residential units (Chapman, 2013:29).

5 Westbury is 6km west from Johannesburg inner city (Klug,2017:5)
6 KFM is 9km east from Cape Town inner city
7 PlanAct a built environment NGO

Lupton (2005:70) states that the trafficable play-court, a result of the consolidation of pedestrian and vehicular movement, violates the traditional concept of the backyard. The backyard is relocated to the public realm; a backyard is used to host daily activities such as laundry, secure play areas for toddlers, storage and vegetable gardens. In contrast the trafficable play-court integrates traffic and child focussed activities in the same space.

An Enhanced Extended Discount Benefit Scheme (EEDBS) transferred pre-1994 rental housing to first time ownership . (Chapman, 2013:29; Klug, 2017:8-9; Lupton 1992: 70 cited in Klug, 2017). The majority of Westbury housing stock was social housing and residents paid subsidized rent to the local council and in most cases the City Council became the landlord (Lupton, 2005). With the dismantling of Apartheid, all rent collection systems were stopped, along with the provision of basic services such as electricity and refuse collection (Chapman, 2013:29).

Fig 2.5 (below) Westbury, trafficable play-court (author, 2017)

trafficable play-court,
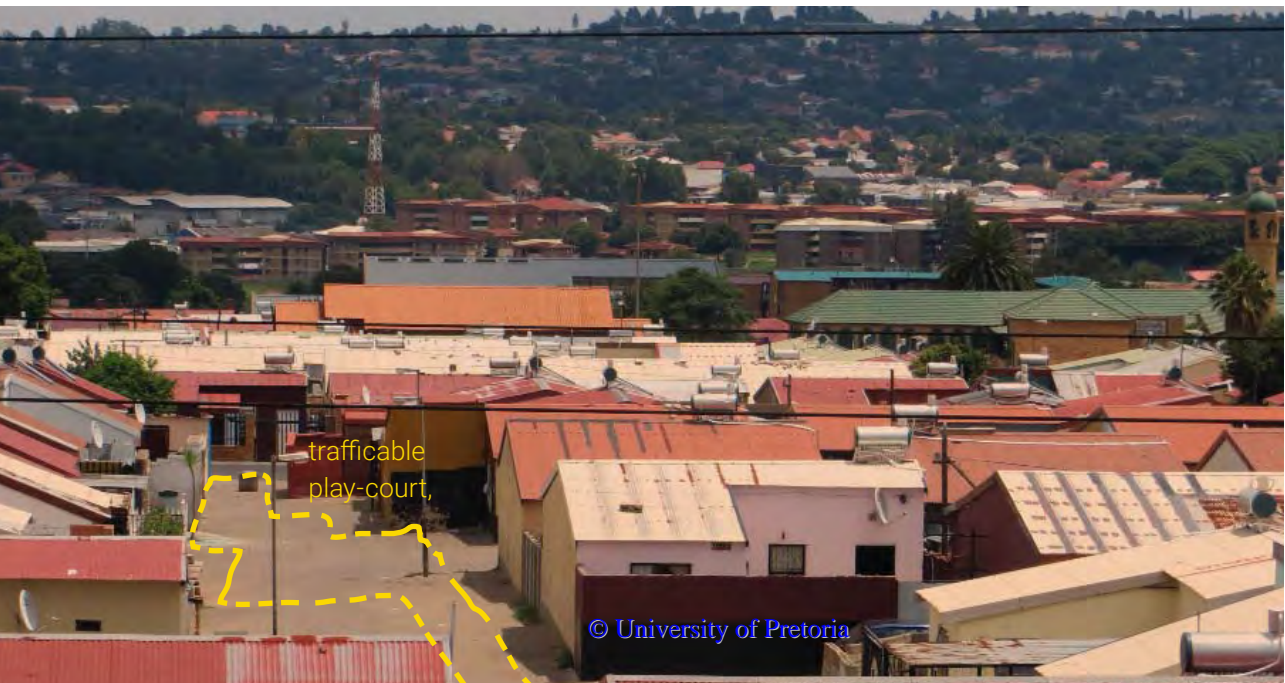
1962

2017

Fig 2.6 (above) 1962 Westbury (Chapman, 2008) | Fig 2.7 (below) 2017 Westbury (Google Earth, 2017)

2.5 Transit Orientated Development (TOD)

Since 1985 little development has occurred in Westbury until the recent Corridors of Freedom Project (CoF), 2014. The project aims to mend spatial injustice fragmentation of the apartheid city. This included a pedestrian bridge and park on the Empire-Perth Road BRT (Bus Rapid Transit) route and urban upgrades of Steytler and Kretzschmar Streets, designed by Iyer and Local Studio (2014-2015). Other development projects include: Westbury Clinic (2016), and JDA (Johannesburg Development Agency) is in the planning phase for the redevelopment of the urban blocks dominated by apartment walk-ups (Chapman 2017; ENCA, 2016).

Transit Orientated Development (TOD) is the current development model in Johannesburg and Cape Town, implemented via the CoF, Johannesburg, and Voortrekker Road-, Metro South East- and Symphony Way Corridor, Cape Town. The intention of TOD is to use public transport routes and stations as catalysts for densification of land use along the corridors, particularly residential use with the support of office, retail and recreational land use (Johannesburg Development Agency , 2014). Minister of Transport Joe Maswanganyi publicly acknowledged in July 2017 that BRT buses are underutilized, stating that the project is a R15-billion flop with commuters favouring taxis and ordinary buses. He continued that the system is under review with upgraded transport stations risking becoming white elephants (Mabena, 2017). This is visible in the context of Westbury with majority of residents favouring walking and taxis as primary mode of transport. High unemployment restricts movement and crime increased along the BRT route due to the route becoming a perceived indicator of people with employment, consequently financial gains (Klug 2017:18).

Westbury and KFM are located within recent TOD corridors, respectively the Empire-Perth Corridor, CoF, Johannesburg and the Voortrekker Corridor, Cape Town. The site investigated in Westbury is currently owned by the City of Johannesburg and can be rented for 9 years 11 months (Constant, 2016). The site is located in a strong civic node, with the presence of a recreational hall for public meetings, a library, various NGO's and churches.

KFM coalition, previously the KFM backyarders association advocates for vacant public land utilisation particularly on a site adjacent to the Railway Station at Century City which is planned to be used for social housing aimed at reducing the demand for housing (ASF-UK, DAG, 2017). The City of Cape Town is in the planning phase of a so-called radical project to provide well-located affordable housing opportunities. The City of Cape Town identified 11 sites in areas such Salt River, Woodstock and the inner city to unlock government owned land for residential land development. The aim of the project is to address apartheid city planning, forced removals and gentrification (Herron, 2017; Stanley 2017).
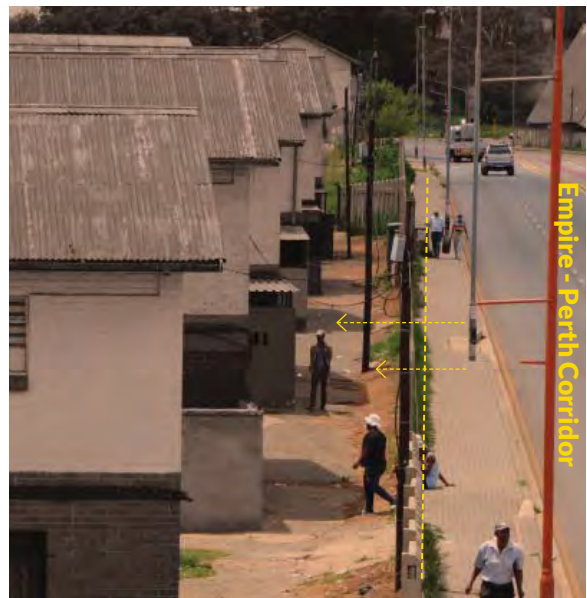

Fig 2.8 WW 2 Council Housing next to BRT route and pedestrian bridge
(author, 2017)

Fig 2.9 Westbury Pedestrian Bridge at Union station (Chapman, 2017)

2.6 Local Land Question

Westbury is amid development and upgrades and is a well located neighbourhood defined as a previously disadvantaged area in a critical state of development with future development either strengthening the existing neighbourhood or consumed by monotonous private developments. The local land question revolves around the following difficulties and opportunities:

Problems:
•Increased risk of gentrification and displacement, as a potential consequence of recent developments with Westbury's proximity to the city centre with increased land value (Klug, 2017:20).
•Residents being uneducated about land value, and hence selling owned property well under the market price for drugs during a weekend of parties (Chapman, 2017).
•Ownership of the Westbury pedestrian bridge and park is uncertain resulting in lack of maintenance or management of the asset, increasing the risk of urban decay and poor land management (Chapman, 2017).

Opportunities:
•The potential for sustainable livelihood development instead of static public funded white elephants.
•Densification within strict boundaries, strengthening a compact city, reducing peri-urban conditions and urban sprawl (Applegath, 2012).

Main Road/Ontdekkers Main East - West Access route, Inner City to Krugersdorp

Sophiatown

Westbury

Newclare

Empire Perth Corridor, Corridors of Freedom

Soweto

University of Johannesburg

Egoli Gas works

University of Witwatersrand

Brixton tower

Constitutional Hill

Brixton Cemetery

Braamfontein

Hillbrow

Railway

Newtown

Westbury to Inner City 10 minute drive (Klug 2017)

Inner City

Fig 2.10 Johannesburg, South Africa (Google Earth, 2017)

2.7 Land Tenure

Cape Town Municipality has recently amended a bylaw to allow the automatic right to build a second dwelling on almost any property, provided that the zoning is single residential, rural or agricultural. This can be described as an approach of sectionalism and subdivision of land to meet the housing demand. The expansion of the city is limited by the lack of available land, and hence this bylaw allows the property owner to unlock the value of land, by selling or leasing the second dwelling, benefiting from an excellent return on invested capital, supporting compact city development. Limits applicable are the minimum subdivision size, the position of the existing house (there are limited division opportunities if the existing house is centrally placed). The property owner must still comply with other bylaws and restrictions of property title deed (Private Property, 2017). The bylaw is an appropriate approach to overall economic development and the urban land question. Title deeds and sectionalism of property rights are anchor points of individual development, but limited in collective development.

In 2011 1,5 million homeowners of the RDP scheme had inaccurate or outdated title deeds, and 5 million homeowners lived in RDP houses with no title deeds. Nearly 60% of South Africans live on land or dwellings held outside the land titling system. The organisation of title deeds is problematic because of limited land use, development and public investment or constraint by elite capture. Tenure insecurity is a key legacy of apartheid city planning. Insecurity of land results, not as conventionally perceived as result of lack of title deed, but the lack of formal legal and governance structures, coupled with the vulnerability of the poor (the Conversation, 2017).

Ownership (title deeds) is central to South African land question. Well located-land is scarce and cannot satisfy the demand, as it is not realistic to extend title deeds to all in any reasonable time period. Individual title deeds stagnate the process of continual redevelopment and limits development to single uses with the risk of inefficient land use.

Mono-functional static land parcels do not respond to shifting needs without capital investment and risk becoming white elephants, symbols of wasted financial resources. This results in decreased quality of urban space. South African cities cannot support numerous white elephants as land is a finite resource and efficiency is crucial for urban functionality (Joseph, 2014:7). Gentrification and displacement are major threats to the livelihoods of the urban poor. Locating them on the periphery of the city does not align with the intentions of a compact resilient city. The urban poor cannot easily resist these threats as the affordability of land is out of reach, resulting in the lack of benefits from the land.

Land Tenure mediates between land required by the urban poor and land the urban poor can afford, yet still with the provision of infrastructure. The risk of gentrification, uneducated residents, urban decay, unstable provincial land parcels motivates for the removal of land from the market as a protection measure, consequently removing its value. Land tenure is often unstable and informal, exploiting the urban poor and foreign nationals. Secure land tenure is an urgent need in the South African context, reducing economic and social vulnerability (Archilles, et al., 2016). The general perception is that government is slow with informal settlement upgrades often opting for a top down approach. A common concern of the community in terms

of private developers is the quality of work, as the perception is that development is driven by profit at the cost of quality as demonstrated in the 1985 redevelopment of Westbury. Further private developers cannot provide basic services as it is the responsibility of the municipality (ASF-UK, DAG, 2017).

Land reform is the redistribution and restructuring of ownership (Joseph, 2014:4). Community Land Trust (CLT) is a community non-governmental organisation, consisting of a tripartite governance of residents, city council and professionals (Klug, 2017:53). CLT's enables residents of low and middle-income to rent decent housing, establish small business and sustainable urban agriculture. The duration of lease is determined by the CLT which governs overall land use. CLT is the middle ground approach between grassroots and top down developmental. The main purpose of a CLT is providing access to land for previously excluded residents, empowering them through involvement, to address the risk of urban decay and lack of urban management. CLT ensures affordability and secure land tenure (Zhang, 2012:5). Klug (2017:53) states that "CLTs balance the needs of individuals to access land and maintain security of tenure, with a community's need to maintain affordability, economic diversity and local access to essential services".

Land trust and land banking are distinctly differently approaches to the urban land question. A land trust is a method of active capacity building, whereas land banking is an approach of safekeeping reserves until the need arises. Land banking enables regions, governments, municipalities to remove abandoned properties from the market to either convert them with a new productive land use or reserve for long term planning. Land banking is often the approach when there is a failure in property market demand (Alexander, 2009:4).

A successful South African example of a land trust is the Bafokeng nation who occupied the Rustenburg belt in South Africa as farmers until European migration interfered and encroached. In 1925, the world's largest platinum group of metals were discovered on the Bafokeng lands. German missionaries helped the Bafokeng, during the time of the 1913 Native Land Act, to set up a land trust on behalf of the community, which they could fully reclaim at the end of apartheid. The Bafokeng were involved in a land battle with Impala Platinum Holding Corporation in the 1990's. Impala settled and the Bafokeng won 22% of Platinum royalties in 1999, which they converted into equity. The Bafokeng is the largest shareholder in Impala Platinum Holdings, with assets of approximately $4 billion (Commey, 2014).

2.8 South African context: stability and change

Backyarders rent land from home owners, living on someone else's land their whole lives, often shared with other backyarders resulting in overcrowding. They are habitually not taken seriously, such as in Khayelitsha where backyarders inquired about land ownership next to the Magistrates Court. When with no response was received the backyarders started occupying the vacant land. The City of Cape Town then obtained an interdict against residents occupying the land. The land is planned for gap housing, catering for household incomes of more than R3500 and less than R15000, which excludes backyarders (Furlong, 2017). Backyard units are usually a Wendy house or free-standing timber structures cladded with sheet metal. Backyarders are currently exploited with high rentals, lack of secure tenure and lack access to basic service, and are hence forced to use the home owners' facilities (ASF-UK, DAG, 2017)

The City of Cape Town developed a city policy for backyarders with a focus on provision of infrastructure. The application of this policy is visible in bigger municipal connections from the main service line to one erven, accommodating multiple households, included with the provision of spilt power prepaid meters and water connections (Pretorius & Baliso, 2017:2).

Blikkiesdorp (left), Delft in Cape Town is 25km from the city centre, and is hidden from tourists. Originally a Temporary Relocation Area (TRA), and currently consists of 1600-2000 households, with residents living in tin shacks for the past 10 years. The urban structure reminds residents of a concentration camp, with a strict urban grid, lack of vegetation and no defined public space. The City of Cape Town moved residents to Blikkiesdorp, which was set up as emergency housing in 2008, to 'clean'

the streets for the 2010 football World Cup. This has a striking familiarity with the current cleaning up in Johannesburg, where residents are relocated to Wembley Stadium. Residents explain the Blikkiesdorp structures are leaking with four families sharing one tap and one toilet in unhygienic conditions. (Bohatch & Hendricks, 2017).

With the current high demand for land use in South Africa it becomes almost impossible for any temporary housing development not to become permanent. The current TRA model is unacceptable in the South African condition; temporality does not excuse undefined and undignified spatial conditions. Blikkiesdorp once temporary a location now permanent, showcases the importance that temporary architecture must prescribe to dignified spatial thought, to be designed considering permanence as a potential spatial condition.

Fig 21 Blikkiesdorp, Cape Town (South African Townships By Drone , 2015)

2.9 Change: Architecture and land tenure

Architecture without land postulates the role of architecture without the permanent ownership of land. Nomadic structures were predominantly used before the settlement of civilisation and can be viewed as early examples of architecture without land. The notion of movable and adaptable architecture originated in the 1960's, and was influenced by cybernetics, artificial intelligence and information technology. ¬ The main themes include building responsiveness, visible in James Graham Ballard's 1962 description of a psychotropic house that responded to and learnt from the occupants, infrastructure projects, and high technology such as in 1975 when Nicholas Negroponte argued for the integration of computer between building and environmental conscious projects; similar to Jean Nouvel's Institut du Monde Arabe, first large-scale building to have adaptive responsive façade in 1989 (Kolarevic, 2015:3).

2.9.1. Infrastructure Projects

Cedric Price[8] adopted notions of cybernetics to articulate the concept of anticipatory architecture demonstrated in the Fun Palace, arguing for time based interventions. The Fun Palace is dependent on structure and technology, allowing the public control of the environment with variations in space to size, shape, lighting and accessibility supported by a fixed structure. "The Fun Palaces is a continual process of construction, dismantling and reassembly" (Kolarevic, 2015:3).

Yona Friedman[9] (1964) argued that architecture as infrastructure must strengthen urban growth. He suggested a 6m by 6m grid to allow for multiple functions. Villa Spatiale is a manifestation of infrastructure for compact urban growth, elevated above past areas of the city, retaining land use as a post war critique of unwanted expansion and urban sprawl. The intention is to expand the city within boundaries limiting demolition. Friedman motivates for simple technology, multiplicity of space, and mobile architecture designed by the occupant. Friedman motivates for design for opportunity enabled by a flexible environment coupled with technology with a minimum departure of skeleton infrastructure to encourage participation and appropriation (Pinder, 2011: 175).

Ron Herron, part of the Archigram[10] group, in 1964 imagined the Walking City, a mobile robotic structure to move to where its resources are needed (Kolarevic, 2015:3), comprised of independent living pods that would walk, connect and dock to replenish resources (Pinder, 2011:165).
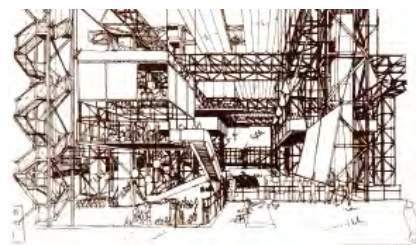
Fig 2.12 Fun Palace by Cedric Price (Kolarevic, 2015:3).
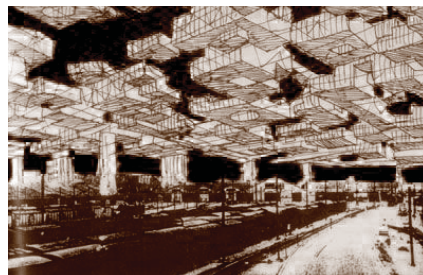
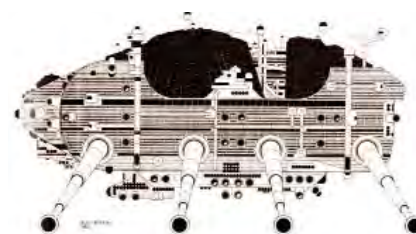Fig 2.13 Villa Spatiale by Yona Friedman (Pinder, 2011: 175)

Fig 2.14 Walking City by Ron Herron (Pinder, 2011:165)

Fig 2.15 (Top image) Medical airstream trailers (caravan) ((NY Times , 2011)
Fig 2.16 (Second image) Antarctic architecture (Grozdanic, 2014)
Fig 2.17 (Third image) Protest camp in Hong Kong 2014 (Langfitt, 2014)
Fig 2.18 (Bottom image) Makoko Floating School (Frearson)

Robert Kronenburg (2008:8) stresses the link between transportation and development of mobile structures expressed in three ways:

One piece: Simplest transportable building, one piece for instant use, the transport method is integrated into the permanent structure such a mobile home. This limits the building size.

Prefabricated: Prefabricated elements in factory conditions assembled on site.

Modular: Modular components, the most flexible and adaptable for a wide range of compositions, often dry construction.

Examples of transportable structures are the caravan, emergency and protest camps, Antarctic architecture, space stations, festivals (for instance Afrikaburn), informal settlements, traveling exhibitions or floating structures such as the Makoko Floating School, Lagos in Nigeria (Frearson, 2016).   Positioned within a given approach, namely one piece, prefabricated and modular, the structure is articulated as pneumatic, tensile, and framed or panel construction (Kronenburg, 2008:9). Prefabricated and modular construction could reduce construction time and transportation costs (Pringle, 2006).

End of life use is crucial for the sustainability transportable architecture. Micheal Braungrat defined three types of products namely consumables, services and undesirables. It can be argued that transportable architecture aligns itself to the thinking of a product of service. A product of services would not be sold but licenced to the user, users could sell license at end of use, return the product back to its manufacturer for recycling, eliminating waste, continuing past initial product life (Mcdonough, 1999:407). It is vital particularly

with transportable structures to consider end of use and recycling of the built form. Kendall (1999:15) maintains majority of the fit-out level is discarded during the process of reconfiguration, for instance office carpets and furniture.

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2.10 Stability: Resilient African Cities

Transportable structures struggle to function without 'access to land' and the protection thereof in urban conditions. Temporality is limited without anchors of stability. The work of Price, Friedman and Herron motivates for plug-in host structures as infrastructure to strengthen the process of change. The backyarder city policy of Cape Town emphasises the importance of serviced land, and the Cape Town property bylaw highlights the opportunity of multiplicity of land.

The impact of development should be considered on various scales namely city, neighbourhood and dwelling scale[11] . Union BRT station, Westbury, part of the transit orientated development (TOD) model functions on a city scale, connecting Westbury to the inner city. Yet, at neighbourhood scale there are flaws such as the reinforcement of the existing trunk road which strengthens the spatial segregation of Westbury and Coronationville. According to a resident the BRT route is the "worst to walk on", along with increased crime (Klug, 2017). A key intention of TOD is densification; densification implies a new 'community' (ASF-UK, DAG, 2017). The increase of occupants in an area with high unemployment and overcrowding is problematic. It could be argued that development should not increase density especially housing without the active support of increased economic opportunities and sustainable livelihoods. Capacity building could be a model of preparation for densification. The condition of critical neighbourhoods motivates for pro-poor development, prioritising the needs of the urban poor with suitable protection, such as access to land based on affordability and not land value. Poverty is deeply spatial, a child living in an informal settlement such as Blikkiesdorp or Factreton (KFM), Cape Town often shares the single room dwelling with a large extended family, consequently living in conditions of overcrowding. Limited space at home encourages the child to occupy the street till bedtime. The child is exposed to gangsterism and gang violence. Public space is often lost to the perception and reality of crime. Yet, consideration is needed with the framing of an issue such as overcrowding. During discussions, one unconsciously speaks about exclusion and eviction, yet it is important to consider the structure of the problem statement. The lack of space, access to land and well-defined active public space is problematic (ASF-UK, DAG, 2017). Access to land and space are crucial to address issues regarding critical neighbourhoods and poverty. Land and space are the basics of living, yet in South Africa these are severely hindered by the country's history.

Secure land and serviced land are not sufficient for sustainable and resilient development. Adaptive land use approaches are essential to resilient city planning. It is vital to redirect future growth with strategic planning, due to the difficulty to retrofit or 'fix' spatial issues such as Blikkiesdorp (Lasser, 2015:19). Resilient development is essential for the composition of a compact city, reducing urban sprawl and inefficient land use. David Salt[12] defines resilience as the ability to absorb change, and that resilient built forms enhance dynamic fluctuations of the urban environment. Craig Applegath[13] (2012:3) explains the attributes of resilience as flexibility, diversity, redundancy, decentralisation, decoupling and environmental integration. Density and flexibilty respond to the local land question of Westbury with development intention of strict urban boundaries, supporting compact and resilient city thought

11 ASF-UK methodology (ASF-UK,DAG,2107) | 12 Editor of Decision Point, the monthly magazine of the Environmental Decisions Group. | 13 Founder of Resilientcity.org

(refer to 2.6).

Designing for density and growth aligns to resilient city ideology; density reduces the cost per person, particularly capital cost of infrastructure, urban and building management. Density is a keystone for resilience with energy reduction and local urban food production. Other approaches include modular and hardened infrastructure with integrated metabolism. Modular built form eases the process of flexibility, namely addition, subtraction, replacement and rearrangement. Integrated metabolism is the integration of currently separate systems such as water, sewage, and power, achieved by by-product feedback into the larger network, for instance organic waste as compost and recycling of water (Applegath, 2012:11-16). Urban resilience provides a contextual and integrative method to enhance positive properties of various city systems with the understanding of the ability of cities to prepare for and adapt to change such as climate change, collapse of economic, cultural and political systems (Peres & Du Plessis, 2014) or change on a daily scale such as informal appropriation, or change of tenants.

Density reduces the cost per person, particularly capital cost of infrastructure, urban and building management.

2.11 Appropriation of land

Multiplicity of land use within adaptable and flexible structures is crucial for resilient built forms. The inability of built fabric to be changeable provides no long-term security of development (Sarkis, 2009). Cumberlidge and Musgrave (2007: 174) describe the city in flux influenced by migration and environmental destruction as "change is the key experience of urbanism". Flexible built form embedded in context enables a shared authorship encouraging differences replacing single utopian visions.

Kronenburg (2008:10) defines flexible built fabric as "fluid architecture that becomes complete once people inhabit it and use it". Kronenburg identifies four key factors which characterize flexible architecture, namely adaptation, mobility, transformation and interaction.

Hashim Sarkis (2009:97-98) argues that flexible form must be able to accommodate time based changes in shape, scale, function and identity. He describes changes reflected in built form is a result of change in land use, attitude to public life, working and living conditions. Flexibility manifest in built environment in four design approaches;

Expandability: the ability of form to expand, accommodating the growth of organisation expressed with the change of boundary.
Versatility: the ability of form to accommodate a variety of land use in the same spatial constraints.
Convertibility: the ability of form to be physically transformed in shape, size and opacity, expressed in the kinetic facet of architecture.
Fluidity: the ability of form to evolve with changes in context, identity and function such as the High Line project in New York.

Both, stability and flux are integral realities of contemporary built fabric. Open building supports stability and fluidity. Open building ideology acknowledges the construction process as rooted in the everyday. Stephen Kendall states that this is achieved by allowance of a level of intervention articulated in spatial conditions for occupation and a level of time expressed in a base building and fit-outs (Kendall, 2006), the interface becomes an important design characteristic.

Kendell discusses that open building enables a shared authorship; built fabric becomes a result of an on-going design process. Access to land sites (stable built fabric) support the notion of continual redevelopment and land tenure by following characteristics of open buildings. Open buildings separate systems into levels, as defined by Stephen Kendall namely, urban level (tissue), support level (base structure), and infill level (fit-out) with the furniture level (furnishings) which function independent, yet interconnected with a hierarchy of physical components. Fit-out or infill is the physical manifestation of the process to appropriation and negotiations of space for habitable environment suited to land use (Kendall, 2006).

2.11.1. The idea of the unfinished[14] : Openness as typology

Theme parks are planned and finished before opening; causing a sense of discomfort due to the lack of authenticity and the condition of 'finished' excluding appropriation. Neighbourhood growth is severely limited if appropriation and adaptability of built fabric is limited. Architecture must leave space for opportunity. Process is a key with the built environment developing into a conduit of social processes (Cumberlidge, 2007: 20).

Open buildings support the argument of Yona Friedman for simple technology namely 'click-together' components. These components reuse value are higher in relation to traditional connections destroyed or damaged in the disassembly process. Characteristic of an open product is its ability to be compatible amongst various manufactures, for instance light bulbs (Kendall, 1999:14). Schneider (2005:161) maintains the need for technology logic of construction and configuration with clarity between stability and change. Modernist construction technology of prefabricated elements with the separation into systems and sub-systems ease the process of change. Walter Segal states "standardisation in itself I have tried to do all my working life. But in building it is only significant if you do not standardise but use standardised things". Segal motivated for design that empowers the humble layman builder (Schneider, 2005: 163). Simple technology is vital for adaptability and sustainability of the project.

The opportunity of tenure aids flexibility and appropriation by tenants included with the continual redevelopment of the site. Tenure of land, allows the tenant organisation to expand, insert or subtract their built manifestation in relationship to their economic conditions, reducing inefficient land use. Livelihood and capacity building is the centre of development, intends to address stringent economic condition of residents in critical neighbourhoods, such as SMME (Small, Micro, Medium-sized Enterprises). Economics of land must be recognised (Joseph, 2014). The flexible community led redevelopment of pro-poor approaches establishes a resilient urban condition and reduces the risk of static public funded white elephants, supporting SMME's capacity building

Land as a shared and finite resource with the main attribute of spatial transformation, contributes to sustainable livelihood development on civic land, translated to tenure (changeability and stable built fabric approach). This establish the basis for continuous redevelopment, managed by the community land trust, mediating between community and city authority forces with the protection of the land, maintaining accessibility and affordability of land. The shift of ownership from city ownership to community land trust enables development and management of land as integral to the processes of the neighbourhood. Key factors of the access to land and land tenure approach are changeability and multiplicity of use and to foster economic opportunity as preparation for future development. It is important to note that both stability and flux are integral realities of contemporary built fabric and should be incorporated in the design.

14 (Cumberlidge, 2007:18)

Land as a shared and finite resource with the main attribute of spatial transformation, contributes to sustainable livelihood development on civic land, translated to tenure
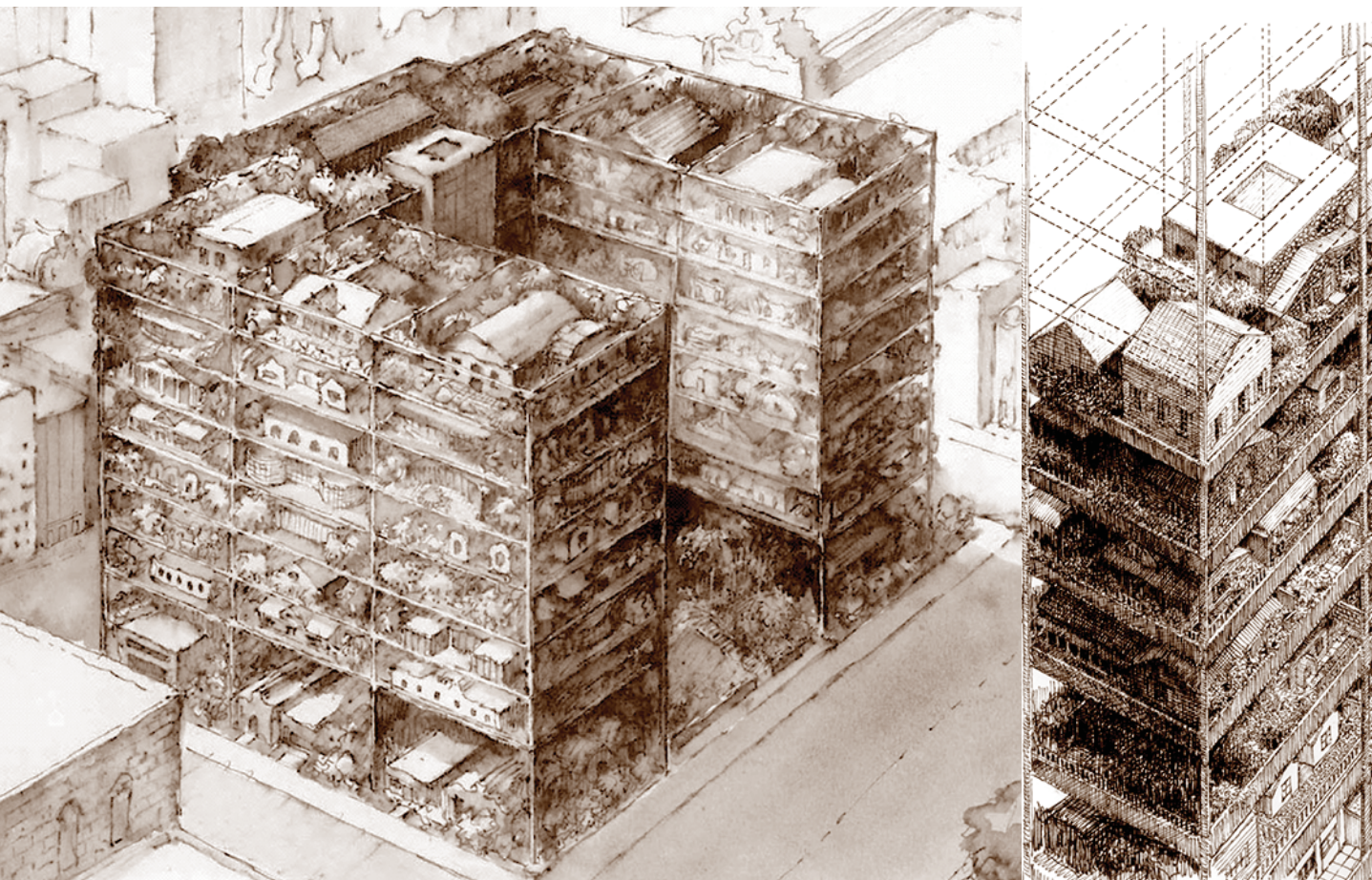
Fig 3.1 The high-rise homes project (1981) by James Wines (Ilaria, 2016:3)

Chapter 3

Architecture

3.1 Land and Change

Land as is, cannot sustainably support the opportunity of land; this is visible in land invasions and the land parcel being investigated. The land is owned by the City of Johannesburg and can only be rented for a duration of 9 years 11 months, an example of land tenure within an urban setting. The parcel is currently vacant, but has never been open public land. Previously it hosted SPCA offices with horses grazing on the site and Westbury lease office (social housing rent), which was torched during public protest (Constant and Chapman, 2017). The parcel is historically part of the shared central facilities of Westbury (Chapman, 2008:20).

In 2015, the site hosted a marquee church which was later removed. The church was situated towards to the back of the site, removed from the street and not contributing to the urban edge with no services or public seating. The experience and rituals of the church were limited with no privacy and security for events such as weddings or funerals. The church was not grounded in the urban condition, with lack of space use, failing to respond to conditions of density and multiplicity of use. The site hosts no memory of the church. Temporal structures in urban conditions are floating objects often dislocated from context. Temporality limits future interactions and development due to insecurity and lack of anchor points.

Architecture mediates between land and use, articulated in stable and changeable built fabric. Torre David, Venezuela is an uncompleted concrete frame office building, which became an unintended open building host to 3000 residents. Residents built their homes between columns, only requiring walls, as the floor and roof is provided. The tower is a vertical composition of urban life and a framework for organic form such

the appropriation of the lobby to a basketball court and each floor having a barber, church and other services (Baan, 2013).

The high-rise homes project (1981) by James Wines (SITE, New York) proposed an alternative to typical apartment block typologies following characteristics of open building. The project multiplies use of land with each level being treated as a new site. Both examples, Torre David and 1981 High-rise homes project, follow the notion of a dominant structural grid and the provision of horizontal levels, each level treated as flexible with housing and streets. The structure of high-rise homes consists of steel and concrete with the building form being rectangular or u shaped to maximise natural light (Ilaria, 2016:3).

Skyscrapers such as the high-rise home projects are examples of architecture without ground, creating artificial land with an unlimited number of 'sites' (depended on structural system), on a single urban land parcel (Koolhaas, 1994: 85 – 89).

Architecture without ground enhances architecture without land

1958

Fig 3.2 Westbury 1958 photograph (Chapman, 2008: 20)

Fig 3.3 (top image) Westbury aerial photograph 1937 (Chapman, 2013) | Fig 3.4 (bottom image) Westbury aerial photograph 1962 (Chapman,2013)

Fig 3.5 (left) Torra David (Baan, 2013) | Fig 3.6 (right) Torra David (Baan, 2013)

3.2 Stable Built Fabric

Open system structures order development and stable built fabric, and they predict future changeability by encouraging and limiting development. Basic typologies are a shed, bridge or column system. The shed is a fixed outer structure with free interior movement, typically translated as a single roof above smaller changeable structures (build under), limiting development both vertically and horizontally. The bridge orders change around it, an axis for development, (build around). This typology wastes space with limited access and removing activities from the ground plan, ignoring the urban environment, further limiting development. Column systems (build with) are both appropriate and flexible, with the potential to extend to meet development requirements. A column system supports symbiotic relationships between stability and change, whereas shed and bridge typologies cultivates parasitic relationships.

Shed, build under
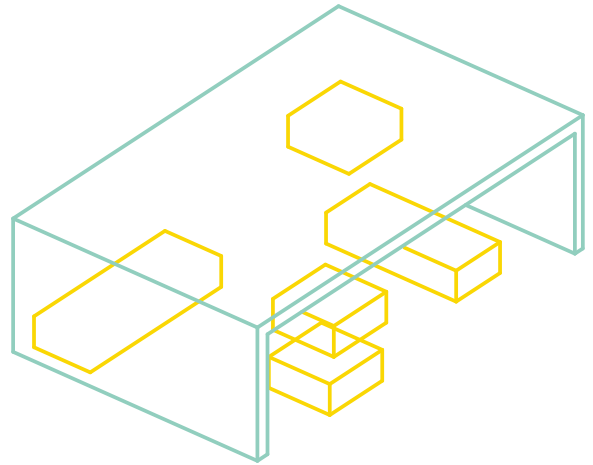
Bridge, build around
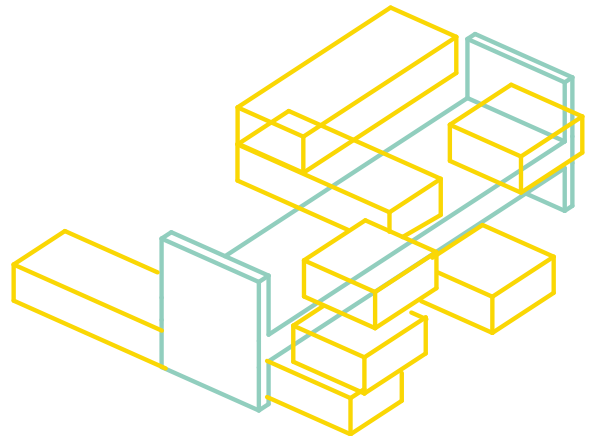
Column, build with
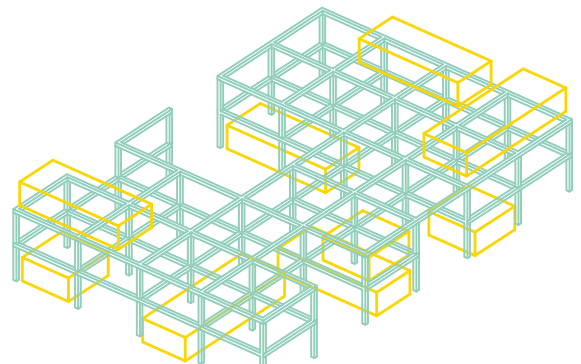
Fig 3.7 Diagram of structural systems (author, 2017)

Westbury built fabric scale
will determine the scale of the
project.

Housing typology 1
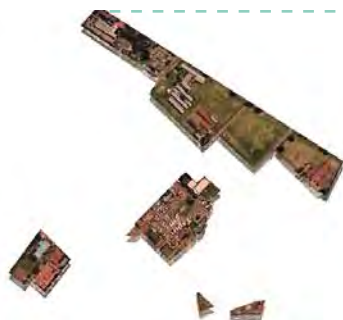
Social infrastructure

Housing typology 2

Fig 3.8 Illustration of Westbury built fabric scale (Google earth, University, 2018)

Roberts Avenue

Rec Hall steps back from street edge, hidden behind vegetation

10 m
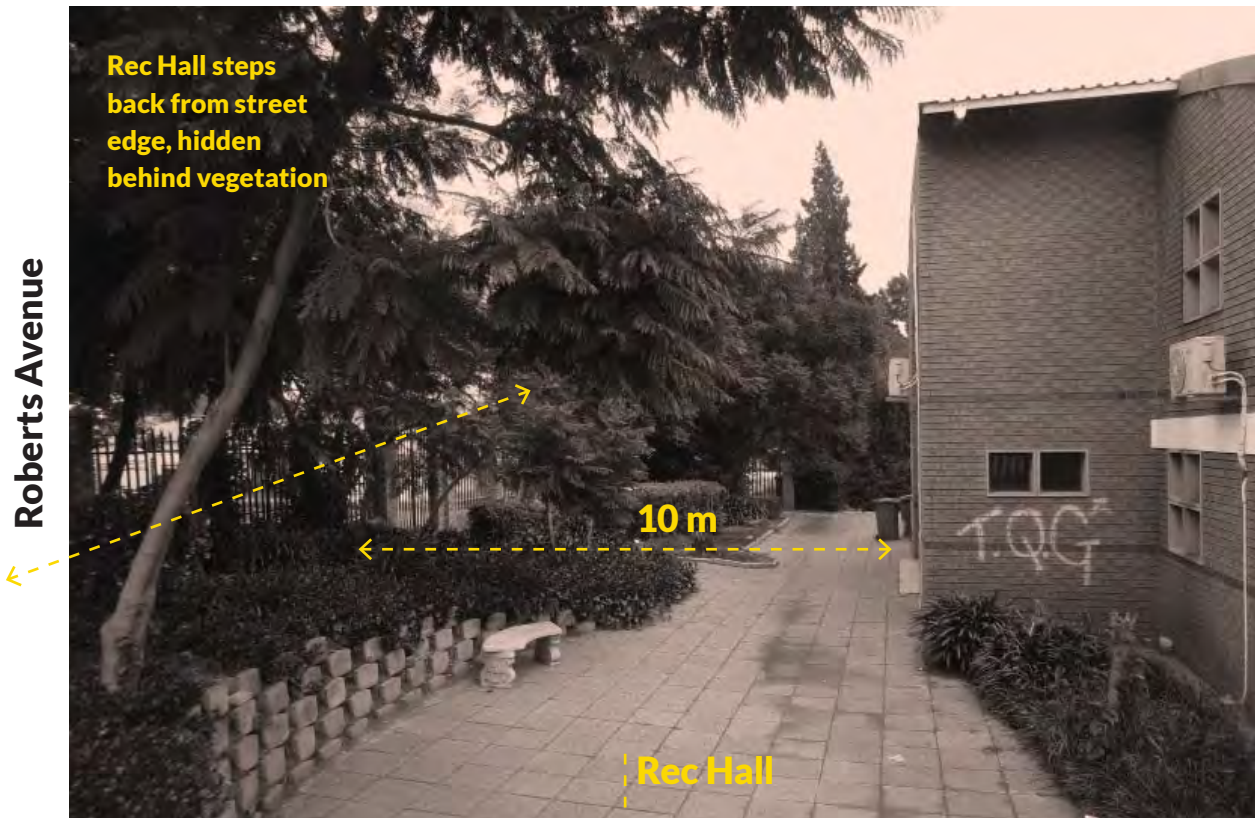
Rec Hall

Social infrastructure

Fig 3.9 Westbury Recreational Hall (Rec Hall) (author, 2017) | Social infrastructure map (Google Earth edited by author, 2017)

Housing typology 1, single unit residential (including backyarders)

Fig 3.12 a-c (top) Housing typology 1, small scale residential (author, 2017) (bottom) Westbury housing typology 1 map (Google Earth edited by author, 2017)

A

B

Housing 2, 3/4 walk-ups apartment blocks

Fig 3.14 a-b (top) Housing typology 2, walk-ups (a - author,2017, b - author, 2017) (bottom) Westbury housing typology 2 map (Google Earth edited by author, 2017)

Fig 3.16 Site context (author, 2017)

The scale of the structure is defined by current context and the potential of future development. Westbury's' built fabric generally comprises of single dwelling residential units, 4-storey Le Corbusier type walk-ups (Chapman, 2013:29) and social infrastructure. A scale of three levels best mediates between existing built fabric and the potential of future development. Existing built fabric surrounding the site comprises of single one storey residential units and social infrastructure, such as the Recreation Hall, typically one to two storeys, higher buildings step back from the urban edge.

Future development, if high-rise, would likely be four storey walk-ups, based on past development in Westbury, tendencies in South African development as a four storey does not require a lift (extra legislation) and best contributes to the urban environment.

Existing condition
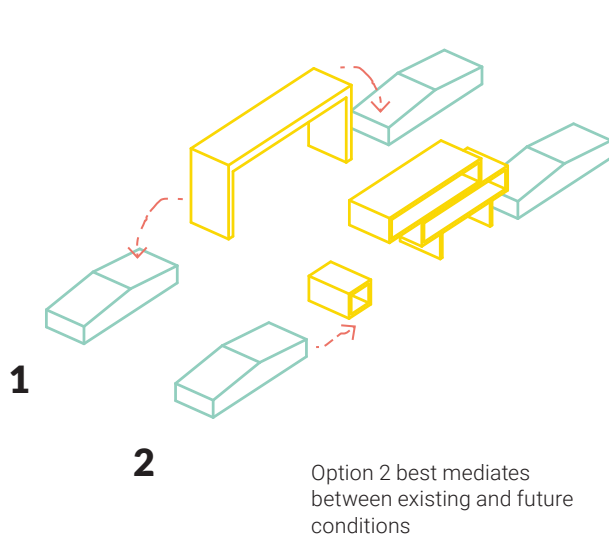
Potential future condition

1

2

Option 2 best mediates between existing and future conditions

1

2

Fig. 3.17 Diagram of scale of development in existing site conditions (author, 2017) Fig. 3.18 Diagram of scale of development in potential future site conditions (author, 2017)
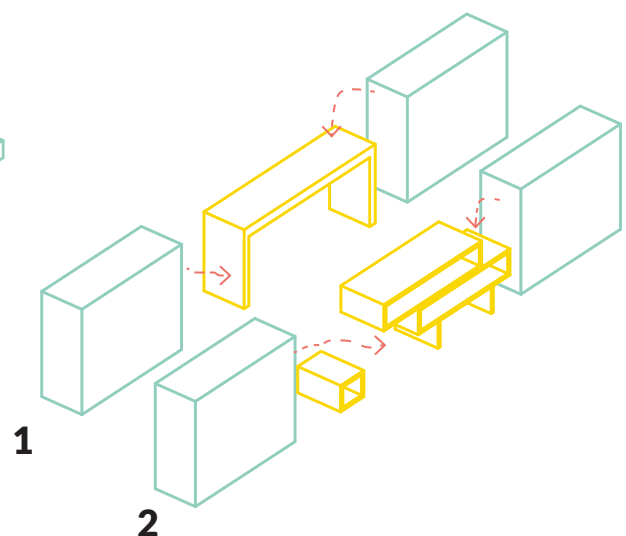
Structure logic is accommodated with a 6m by 6m column grid, accounting for material efficiency of a 300mm module and flexibility as expressed by Yona Friedman in Ville Spatiale (Pinder, 2011: 175). The grid allows a level of freedom from past architecture included with the definition of control and decontrol (Koolhaas,1994:20). Koolhaas (1994:20) writes the grid allows the city to be simultaneously ordered and fluid, "a metropolis of rigid chaos". Owing to the strict grid, "human occupancy can only be established at the expense of another" (Koolhaas, 1994:20). Smitich and Warke (2014:185) describe the grid as the anticipation of event that strengthen flexibility. The beam system is articulated in a 3m by 6m grid to best accommodate visiting structures, reducing span, allowing for increased potential of interaction, acknowledging various economic capabilities.
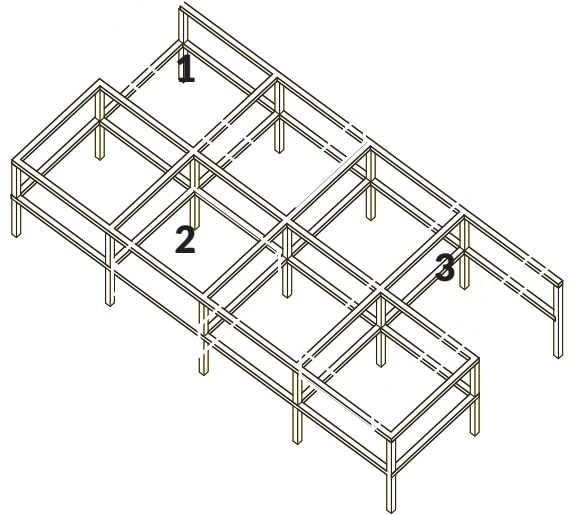
Tenant dependency on structure is characterized by the organisations' economic capability, articulated in a scaled understanding of facility and connection (service point). This dependency is expressed in use of space, fit-out, infill and/or insert with the condition of easy removal at end of use. An interesting test is to consider transport methods, typical to critical neighbourhoods, as a driver for architecture. For instance, the use of a trolley or public transport limits the construction to lightweight compact tensile structures and is heavily dependent of stable built fabric. A 'bakkie' (LDV or Light Delivery Vehicle) or a moving truck increase opportunity of transportable structures, with increase in size, materiality and construction method. The structural system is a combination of facilities such as public ablutions (masonry construction) and steel structural column grid.

6m by 6m grid

6m by 3m grid
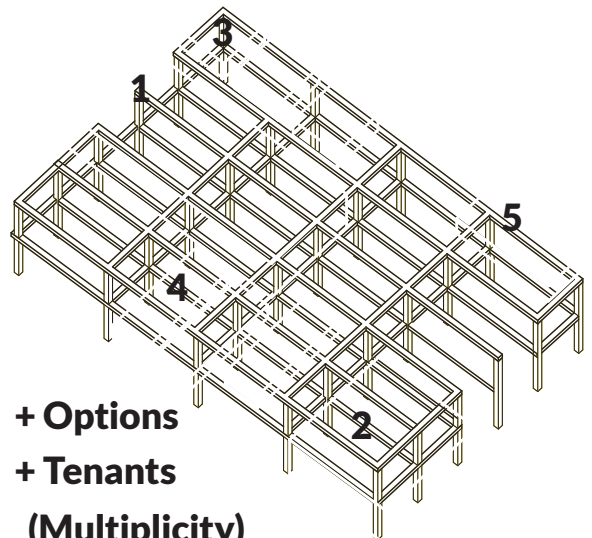
+ Options
+ Tenants
(Multiplicity)

Fig 3.19 Diagram of grid 6m by 6m (author, 2017) | Fig 3.20 Diagram of grid 6m by 3m (author, 2017)

3.3 Service

Services such as power, water and sewage are ordered with a hierarchy of a central spine, combined with the main circulation route in the length of the site, with secondary services lines running perpendicular, like an urban block, encouraging development along these lines to maintain system logic. Service connections and lines can be expanded. The project motivates limited service development to these predetermined lines. It is not realistic, effective or logic to grid the entire land parcel with services. Like all buildings, services should be consolidated and grouped to reduce material use, cost, and maintenance and limit the risk of failure. **The restriction of services to a central point enhances flexibility.** Designing for change requires limits and anchor points to guide future development. Dewar (1990) writes the uncontrolled sprawling settlement typology hinders efficient provision of services, such as utility, transport and a vibrant local economy. A form of order and control is needed to ensure the stable built fabric doesn't follow typical typologies of informal settlements.

The strategy predetermines structure, service and external space.

Central spine service line

Main development service line

Secondary service line

existing municipal connection

Main development service line

Fig 3.21 Diagram of hierarchy of service lines (author,2017)   © University of Pretoria

1

2

3

4

5
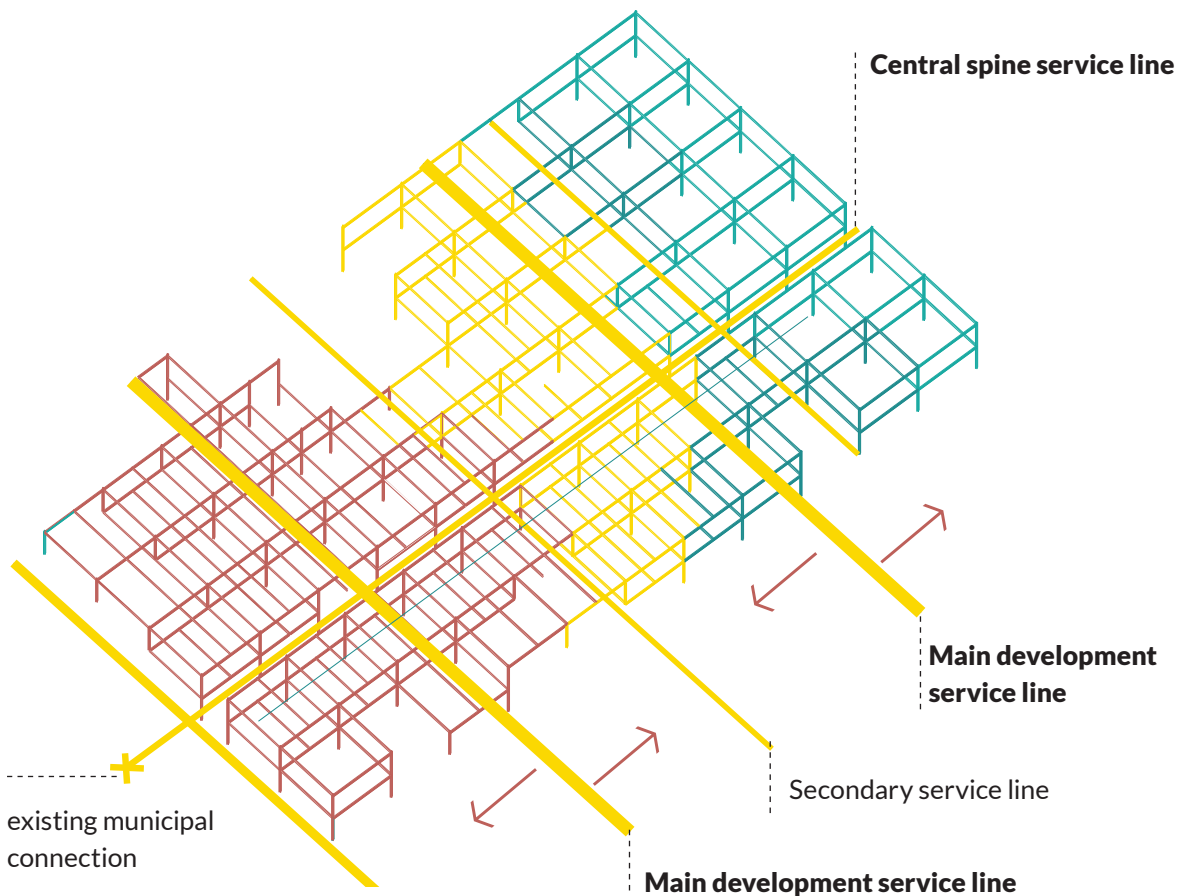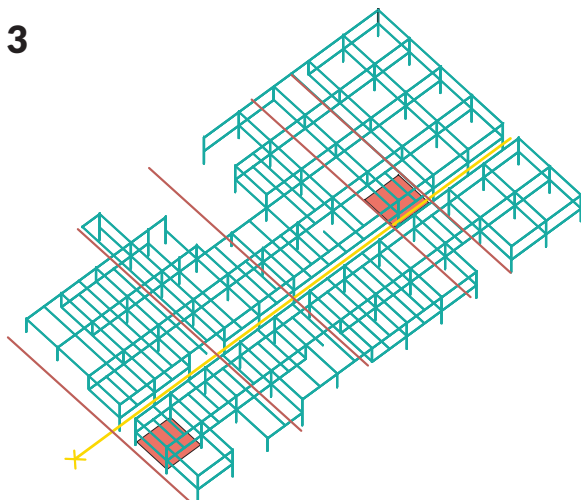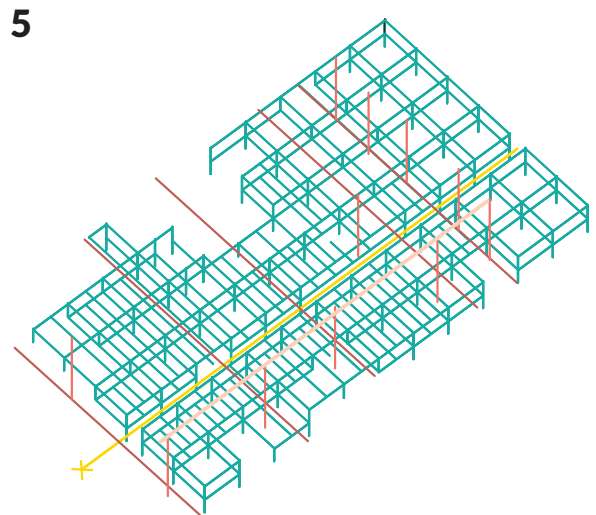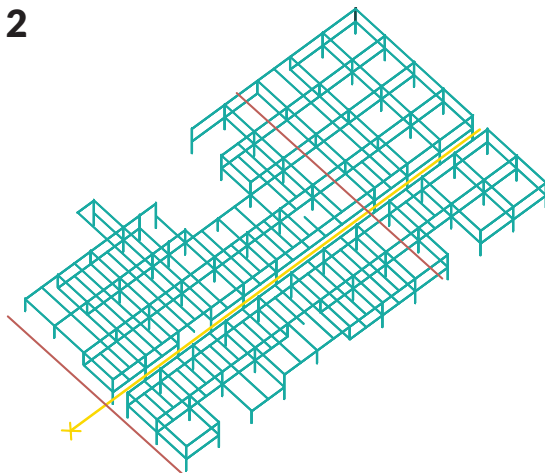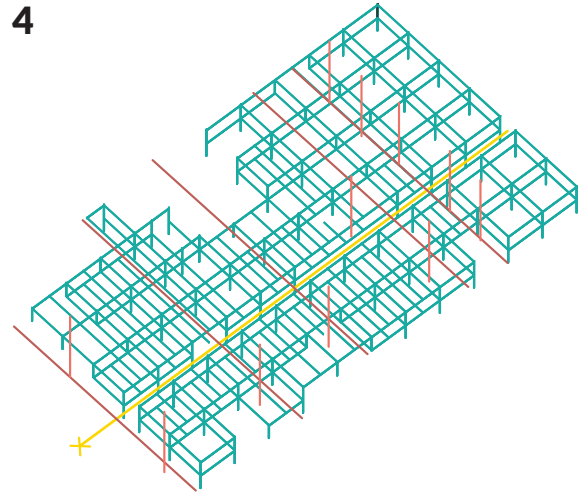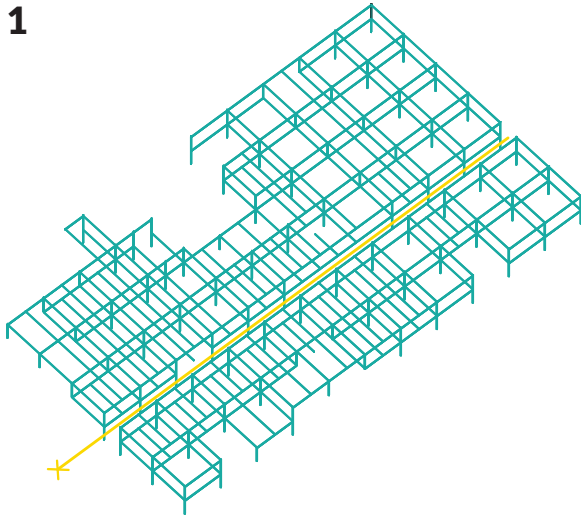
Initial development will be the establishment of the central service spine (1). Secondary service lines will determine the boundary of service development, running perpendicular to the central spine (2). Following this, will be the provision of underground water tanks for grey water recycling and rainwater harvesting (3). Vertical connections and the consolidation of services from upper levels will be the last phase of development before redevelopment (4 + 5).

Figure 5.6 Diagram of phased development of service (author, 2017)

3.4 Boundary

The provision alone of a structural grid and services cannot sustainably host the urban condition. Boundary is required to effectively ground the project acknowledging layers of dependency. The urban condition therefore becomes a construct of a strict boundary, strengthening compact city ideology. Compact city development increases investment in utility and social infrastructure contributing to a level of convenience and service (Dewar, 2004:300). The compaction of urban form is vital for improving performance and operations; the single house on one plot consumes space (Dewar, 2004:209). Stable built form reinforces boundary with facilities as anchor point, namely acting as interface between public and development and the interface between development and existing built fabric. Secondary boundaries of the project are perforated and flexible, in a continual negotiation of space between Community Land Trust (CLT), tenant and neighbourhood, shifting dependent on need, such as lending space to the urban environment.

Westbury as a neighbourhood is accessible, as life mostly occurs in the streets, which is supported by the high unemployment rate and potentially the organic street layout of 1985. The street layout provides a layering of space and is internally focussed, providing privacy from exterior onlookers, the internal workings of Westbury is hidden from the rest of Johannesburg.

Layers of spatial definition
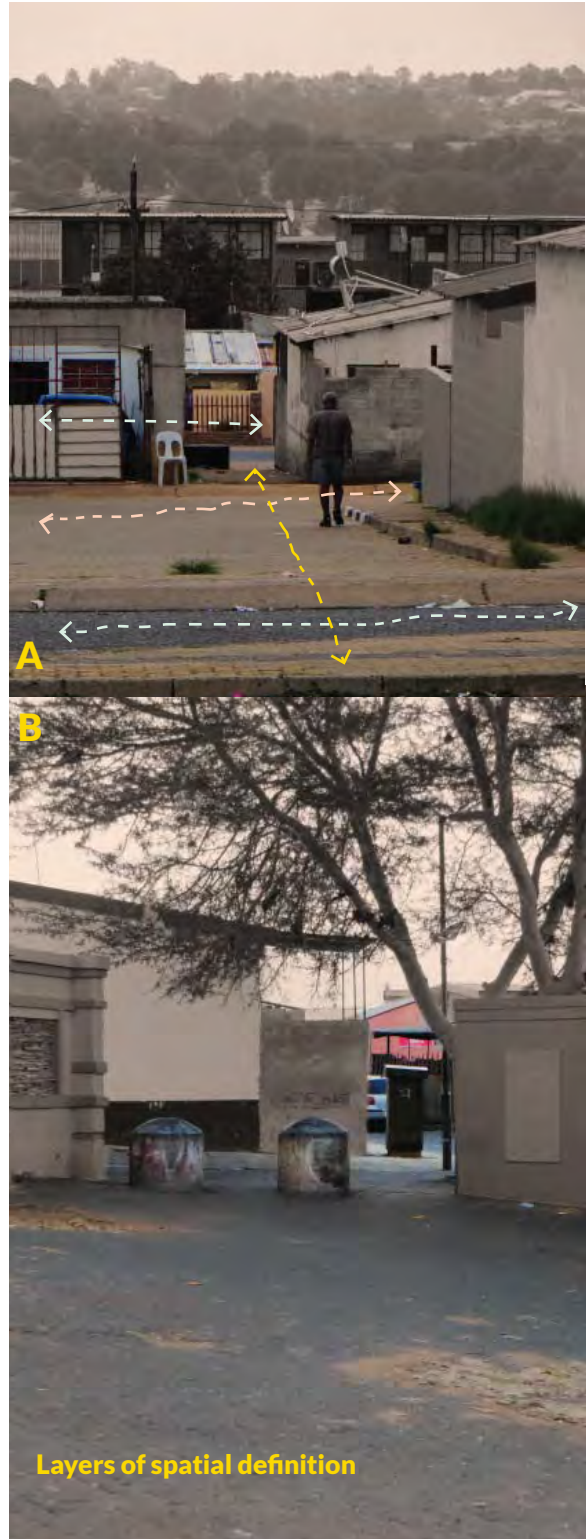
ig 3.23 a-d Westbury accessibility (a-c, author, 2017; d, Brecher, 2017)

CoF Pedestrian
Bridge and Park

AFRIKA SUPERMARKET

Eastern Edge of Westbury

Westbury

C

D

what happens around the corner?

1985 redevelopment

" Ek kan nie sien nie"
(I can't see)

The **stoep** or circulation, becomes transition space between public and internal space. Important nodes of interaction, visible with **appropriation of space** such as washing and seating.

Located in the civic precinct of Westbury, the project responds to layers of accessibility in Westbury, acknowledging and supporting existing functions surrounding the site such as the Dorcas Center (on an adjacent site), the recreational hall, the butcher, take away, general shop, eye clinic, library and situated in the larger urban block Westbury clinic, supporting 500 000 patients from Westbury and surrounding neighbourhoods, a mosque and various churches. The project directly responds to the Dorcas Center with a public square of 12m by 12m (stable use), combined with open land neighbouring the site (change use), dominated by sport, crafting space for teenagers, supporting the after school and holiday programme of Women of Vision, currently residing in the Dorcas Center. Women of Vision supports women exposed to domestic violence and manages a no fee early childhood resource unit, namely Little Sunshine.

The site boundary is articulated with three conditions namely 'public interface' (1), 'a lingering spot' (2) and 'keep walking', (3) differentiating between speed of movement and temporality of use. Both 'public interface' and 'a lingering spot' allows informal appropriation such as tuck shops. The behaviour of 'public interface' is loud and busy whereas 'a lingering spot' is a quiet zone for discussion and place for homework supported with the provision Wi-Fi. Like the internal workings, the project encourages and limits appropriation within the urban edge; these concentrates activities supporting a vibrant urban condition. 'Keep walking' provides solely a visual connection, supporting 'eyes on the street'.

Low (2005) writes a choice of diversity of space accommodating individual needs contribute to the urban environment. The urban infill of Elangeni Albert Street Social Housing by Savage and Dodd Architects attains diversity and density with opportunities and choices for occupants such as the home becoming an extension of work.

1 Public interface

2 Lingering spot

3 Keep walking

Appropriation

Stable built fabric
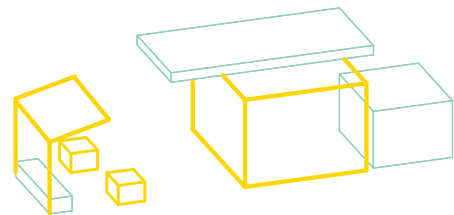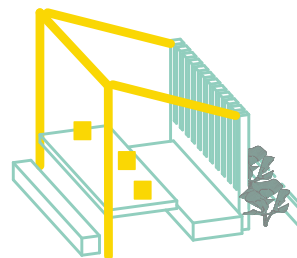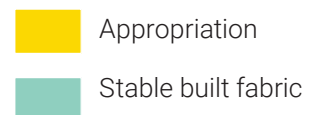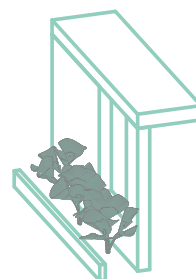
Fig 3.24 Project boundary conditions (author, 2017)

Library **Rec Hall** **Dorcas Centre**

Ebrahim and Sons

Daycare

Westbury clinic

Potentially drug rehab (planning phase)

2178 m²

Church **Eye clinic** **Mosque** **General store**

Fig 3.25 Site context (Google Earth edited by author, 2017)

Loud sound

Slow movement

1 Public edge

12m by 12 m square

4 Facility open to the public

Quiet sound **Slow movement**

Lingering spot **Slow movement**

Quiet sound

Lingering spot

5

Internal outdoor space to strengthen the exterior activity

2

Lingering spot

2

Keep walking **Fast movement**

3

Keep walking **Fast movement**

Lingering spot

Slow movement

Quiet sound

3

5

Internal outdoor space to strengthen the exterior activity

5

5

Lingering spot **Slow movement**

Quiet sound

2

Boundary diagram

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Initial proposed boundary condition

Ignoring and
overshadowing
existing built fabric

Limited spatial definition
and privacy

Proposed boundary condition

Internal privacy

Public edge
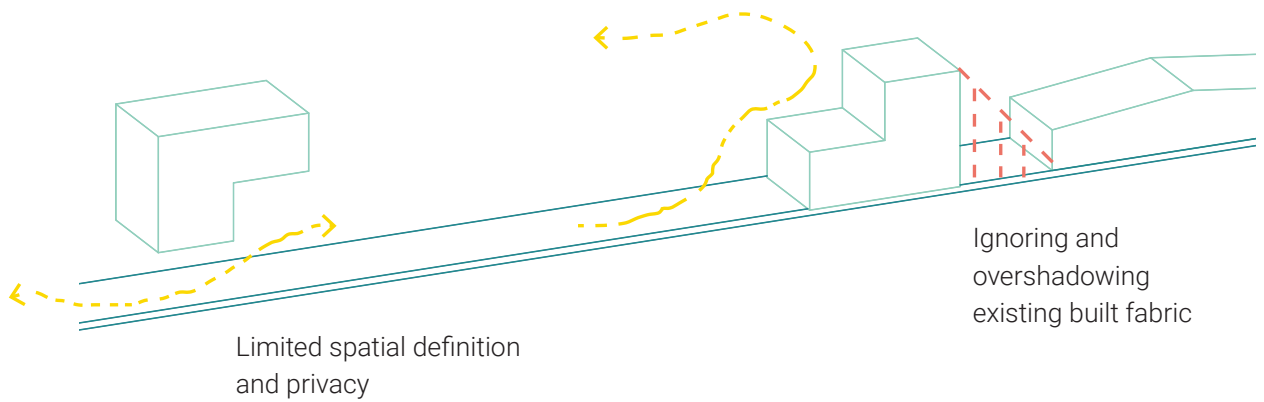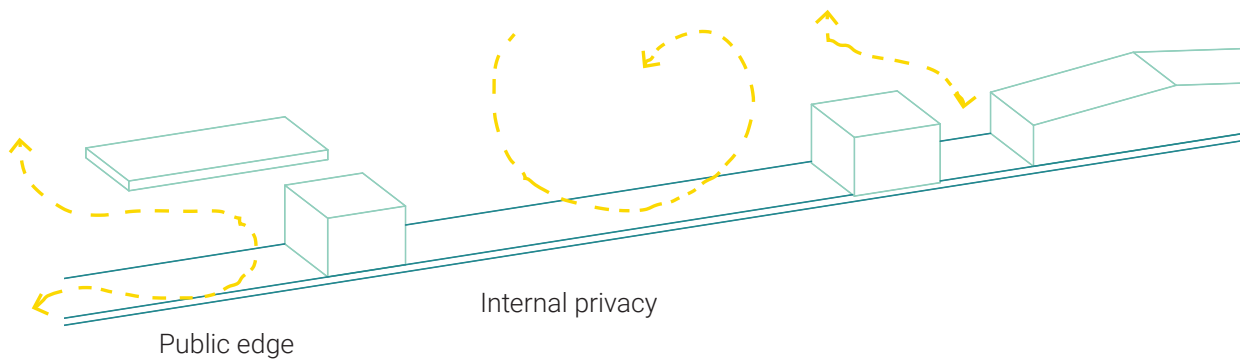
Fig 3.26 (left) Project plan of boundary conditions (author, 2017) | Fig 3.27 (above) Overall boundary strategy (author, 2017)
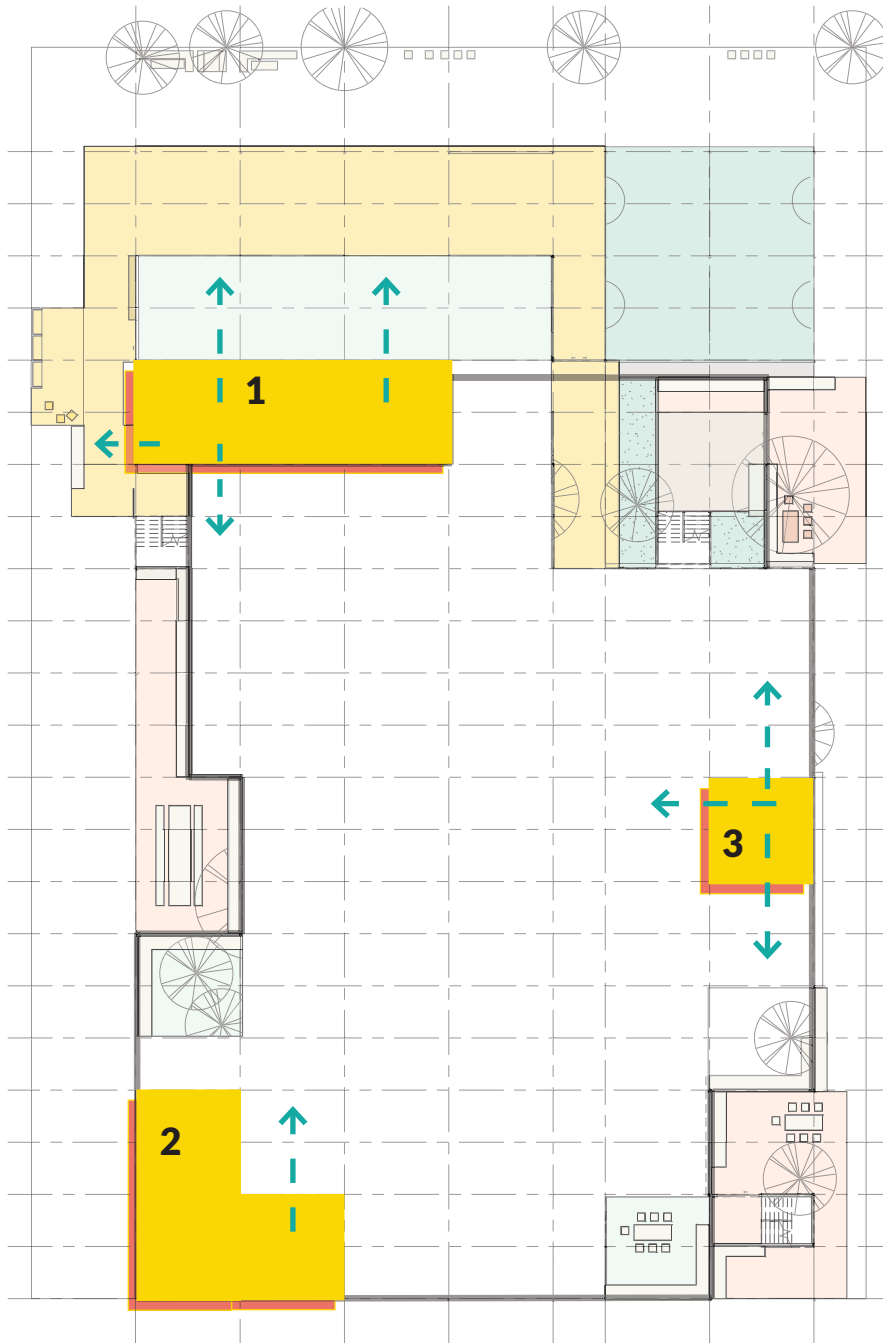
Fig 3.28 (above) Project plan of stable facilities (author, 2017) | Fig 3.29 (right) Westbury map highlighting high-streets (Google Earth edited by author, 2017)

3.5. Internal Space,

commonality in architecture with the option of choice

Designing for change, acknowledges the design of the unknown, although there is commonality in architecture, regardless of use, best expressed in the house typology. Any use requires a front door, a lobby, living areas, service areas (backdoors) and private areas such as bedrooms.

The design of internal space of the project is ordered along this thinking with predetermined zones of use, such as a public edge, public- and private individual areas, with public- and private collective areas. The project is initially grounded with three service areas acting as anchor points for land use. Uses such as early childhood development would be hosted in private collective areas, whereas social aid, medical aid or administration in public or private individual areas. A restaurant, retail outlets or other economic opportunity would be located within the public edge strengthening the existing economic structure of Robert Avenue.

The third economic street in Westbury, Steytler and Kretzhmar Streets could be considered as high streets in Westbury, filled with commercial activity opposite to most of Westbury which is predominantly residential with a few home businesses. Roberts Avenue could be argued as the third high street, yet on a smaller scale, filled with pedestrian traffic, hosts a general store and Ebrahim and Sons stores, namely a butchery, grocery and take away. Ebrahim and Sons was initially located in Sophiatown, and became part of the forced removals in 1955, with the owner relocating to Lenasia. The sons opened a vegetable shop in 1987 in Westbury, but required a nominee arrangement with a local coloured resident. Apartheid legislation restricted ownership of 'other' races than 'coloured' (Klug, 2017:29).

1 Public

3 Public individual

2 Public collective

3 Public individual

6 Circulation

5 Private individual

Private **5** individual

4 Private collective
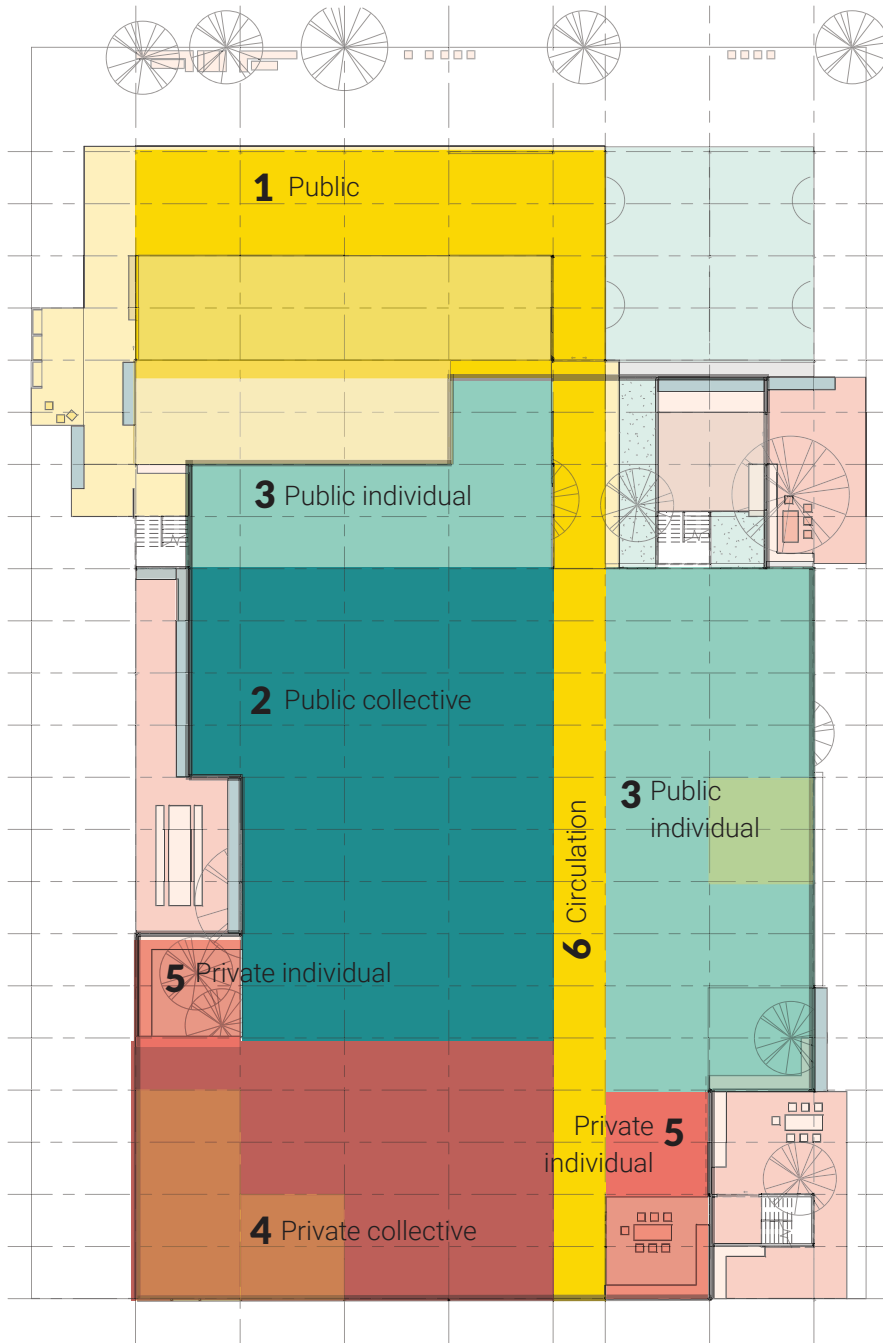
Fig 3.30 (above) Internal spatial definition (author, 2017) I Fig 3.31 (right) Plan of Vele Secondary school (East Coast Architects, 2005)

MASTER PLAN

1 CLASSROOMS (17)
2 CIENCE LABS (2)
3 MEDIA CENTRE
4 RESOURCE CENTRE
5 HALL
6 ADMINISTRATION
7 ABLUTTIONS
8 KITCHEN
9 SAFE COURTYARDS
10 FOOD GARDENS
11 BOTANICAL GARDENS
12 SPORTS FIELDS
13 WATER
14 RENEWABLE ENERGY
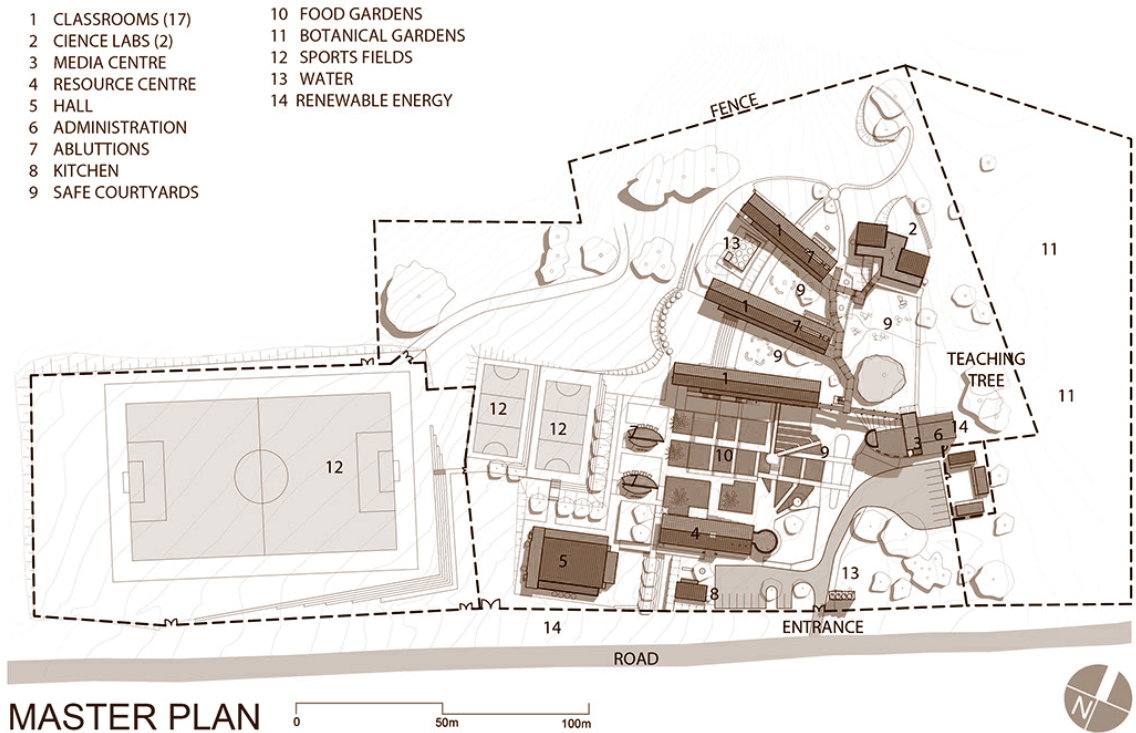
Vele Secondary School by East Coast Architects and Usasazo Secondary School by Heinrich Wolff Architects, both have an active street edge contributing to the urban environment with facilities to be used by the public, such as the design intention of the classrooms of Usasazo on the urban edge which are used for entrepreneurial teaching with a public interface (Wolff Architects, 2003). Vele Secondary School accommodates public afterhours use, with private functions located to the back of site. Spaces between structures become shared and common areas of interaction (East Coast Architects, 2005). Semi-public outdoor space becomes important nodes of interactions visible in Wesbank Primary School, (built in 1999-2000 in Kuilsriver, Western Cape by Carin Smuts Architects). The design intention of Wesbank Primary School is the provision of diversity of space while providing public infrastructure. Classroom rooms define an internal play square, a part of various outdoor spaces hosting distinct outdoor activities (CS Studio Architects, 2000)
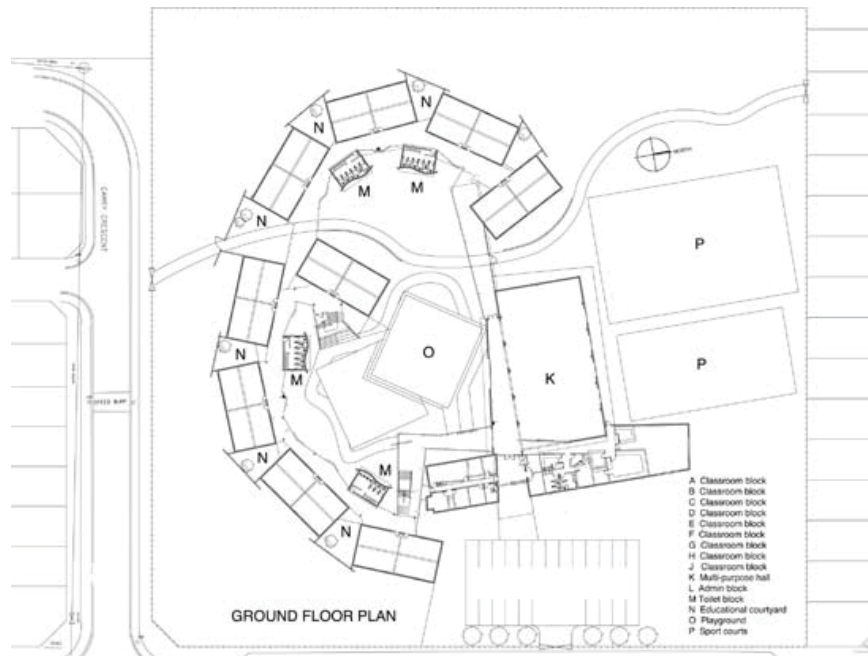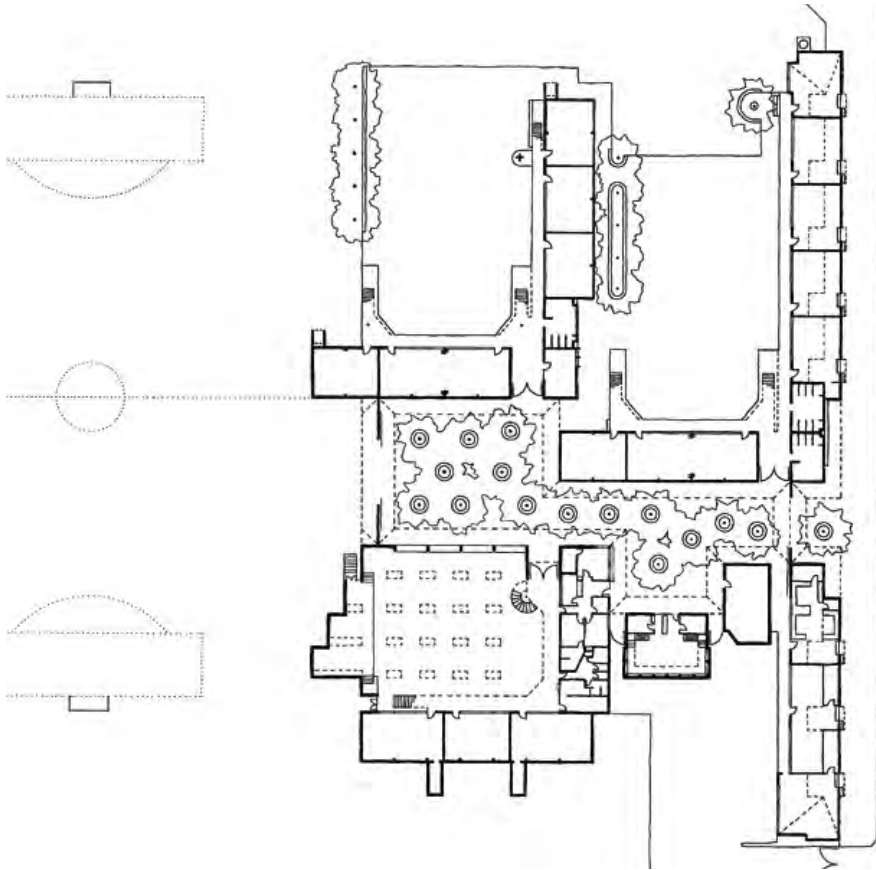
GROUND FLOOR PLAN

A Classroom block
B Classroom block
C Classroom block
D Classroom block
E Classroom block
F Classroom block
G Classroom block
H Classroom block
J Classroom block
K Multi-purpose hall
L Admin block
M Toilet block
N Educational courtyard
O Playground
P Sport courts

The central semi-public space, in the historical precedent of Sophiatown housing typology (pre-1955), was often tribe-specific and host to rituals, "the dynamic of this invisible semi-public space parallel to the street enhanced the pedestrian experience in Sophiatown" (Chapman,2008:38). The Sophiatown housing typology accommodated multiple families on one land parcel, supporting project intention of multiplicity of use and boundary development. The home owner would build to the front of the land, establishing the public edge. Later additions consisted of masonry construction on the back of the site, establishing the back boundary and defining the central yard. The yard is activated by edge buildings supporting project intention of strict urban boundary and internal redevelopment. The central yard provided access to the rooms; sanitation was shared, like contemporary backyarders. Once the site has been saturated with permanent structures the owner would build informal rooms responding to the housing need, between the two permanent boundaries. Once filled the land could host 20 families (Chapman, 2008:37).

The project has a central formal pathway with informal shared outdoor spaces of interaction such the Sophiatown central yard and spaces in Wesbank primary school and Vele Secondary School. The common outdoor space becomes vital to the project and defined as 'the backyard', which in Westbury is often dull, hard landscape deprived of activity and vegetation probably a result of the 1985 redevelopment.
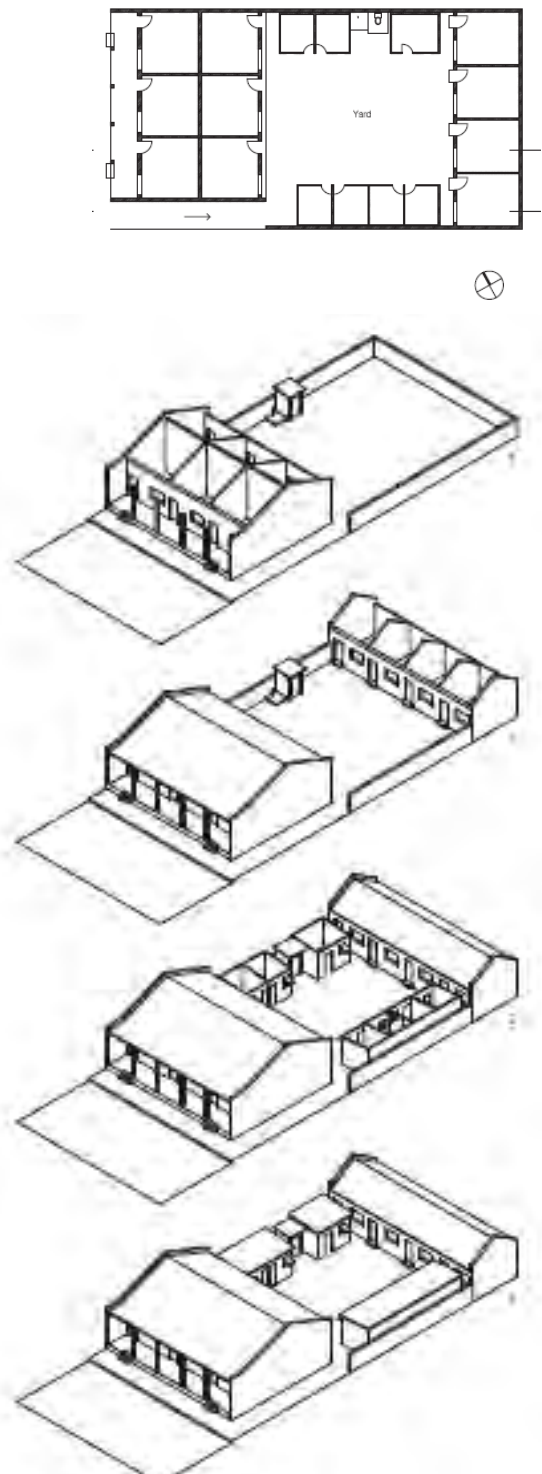
Fig 3.34 Pre-1955 Sophiatown housing typology (Chapman, 2008:37)

3.6 The Backyard, no development zone

The backyard (courtyards within the projects) provides shared outdoor space, accessibility and potential of temporary use which doesn't require built fabric. These no-development zones are predetermined breaks within the structure, as it is not sustainable to fill the entire land parcel. Every 18m of the land is a 6m backyard break, acting as a courtyard to allow for day-lighting and ventilation. On the first level the no development zone increases to a width of 9m, the built fabric steps back. The no development zone can tolerate encroachment to a maximum of 1,5m but restricts to one side. The spaces are dominated with deciduous trees and vegetation shifting with climatic conditions.

Secunda, Mpumalanga, South Africa has green belts predetermined and integrated in the urban fabric and can be viewed as an example of abovementioned no development areas. The areas are activated by people walking, riding bicycles, fishing and model steam trains becoming common areas of meetings. These strips are breaks in the urban fabric, authority owned land, limiting development.

Existing difficulty

how does the other side look?

CoF Bridge

New wall part of CoF development (2015), because it was constructed by the City of Johannesburg, the wall legalize existing encroachment.

Who builds the project has an impact. Authority (legal) against resident (encroachment), comes down to ownership of land.

Westbury backyard

Fig 3.35 Typical Westbury backyard (author,2017) | Fig 3.36 New Westbury on CoF side (author,2017)

Fig 3.37 (top left) Diagram of project backyard (no development zone) (author, 2017) | Fig 3.38 (middle left) Vele Secondary School outdoor space (East Coast Architects, 2017) | Fig 3.39 (top right) Site plan of no development zone (author, 2017) | Fig 3.40 Secunda map (Google map edited by author, 2017)

3.7 Summary

Internal and external space use and appropriation are key to the sustainability of the project, included with the transition and relationship between the two conditions, such as locating courtyards (the backyard) in the interior of the site adjacent to the lingering spots (external space) to strengthen and support visibility, concentrated activity and social relationships between tenant and neighbourhood. Yet separation of space is needed such as an ECD (early childhood development) must not be open to the public and activities should be concentrated for a vibrant local urban condition.

Proposed boundary condition

Internal privacy

Public edge

Formal circulation routes

Vertical Circulation

Main circulation

1 Public edge

4 Facility open to the public

Public individual
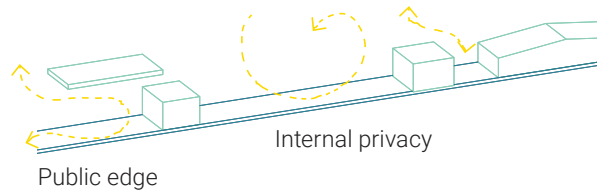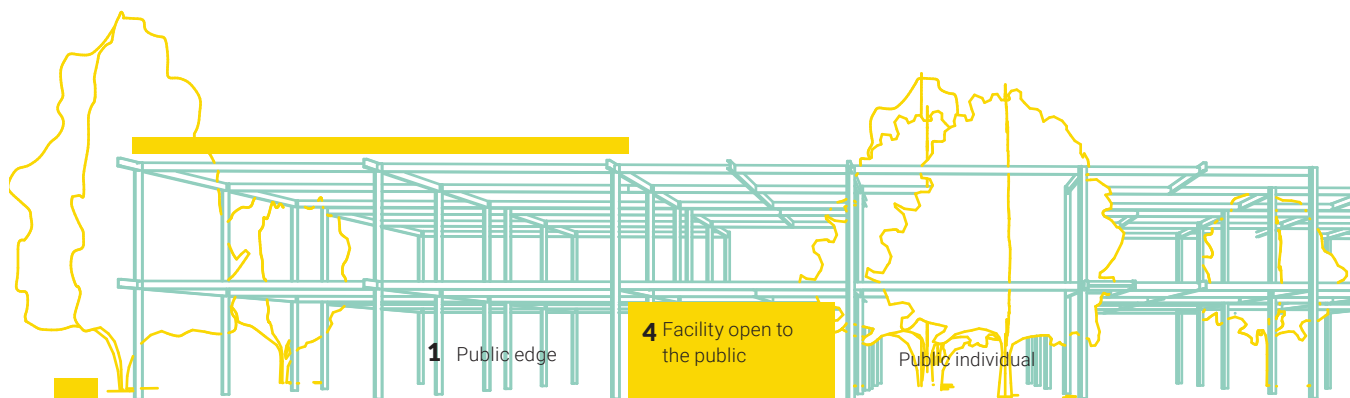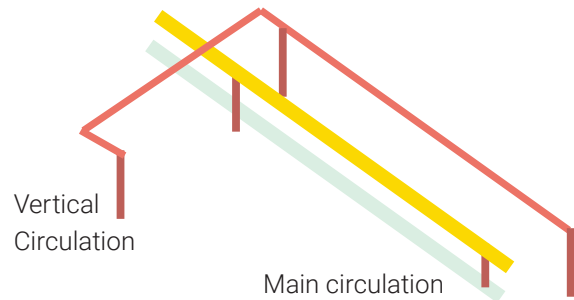
Fig 3.41 (top right) Site boundary condition (author, 2017) | Fig 3.42 (middle right) Formal circulation routes (author, 2017) | Fig 3.43 (below) Section of stable built fabric (author, 2017) | Fig 3.44 (right) Space use internal and external (author, 2017)

External Space

1 Public edge

12m by 12 m square

4 Facility open to the public

5

Internal outdoor space to strengthen the exterior activity

Lingering spot

2

Keep walking

5 Internal outdoor space to strengthen the exterior activity

3

5

5

Internal Space

1 Public

3 Public individual

3 Public individual

Circulation **6**

5 Private individual

Private **5** individual

4 Private collective

Public collective

Private collective

Fig 4.1 Proposed areas for development strategies in Westbury (Google Earth edited by author, 2017)

Chapter 4

Development strategies

Urban fabric of Westbury

Fig 4.2 (above) Westbury map indicating open space and built fabric (Urban vision group edited by author, 2017) | Fig 4.3 (top left) Westbury map indicating built fabric (Urban vision group edited by author, 2017) | Fig 4.4 (bottom right) Westbury map indicating street grid (Urban vision group edited by author, 2017)

The absence of built fabric showcases the impact and fragmentation of apartheid city planning, with buffer zones of open space and industrial land uses to separate neighbourhoods

Industrial land use as buffer

Newclare

Sophiatown

Westbury

The organic street grid, implemented with the 1985 redevelopment of Westbury, is confusing and disorientating, unlike the previously orthogonal street grid similar to Sophiatown and Newclare.

Westbury has land open to develop, this potential development can reduce the negative spatial conditions such as between the walk-ups or the buffer zones, or a few spots within the urban boundary.

Green space

developed green space

under-developed green space

urban blocks
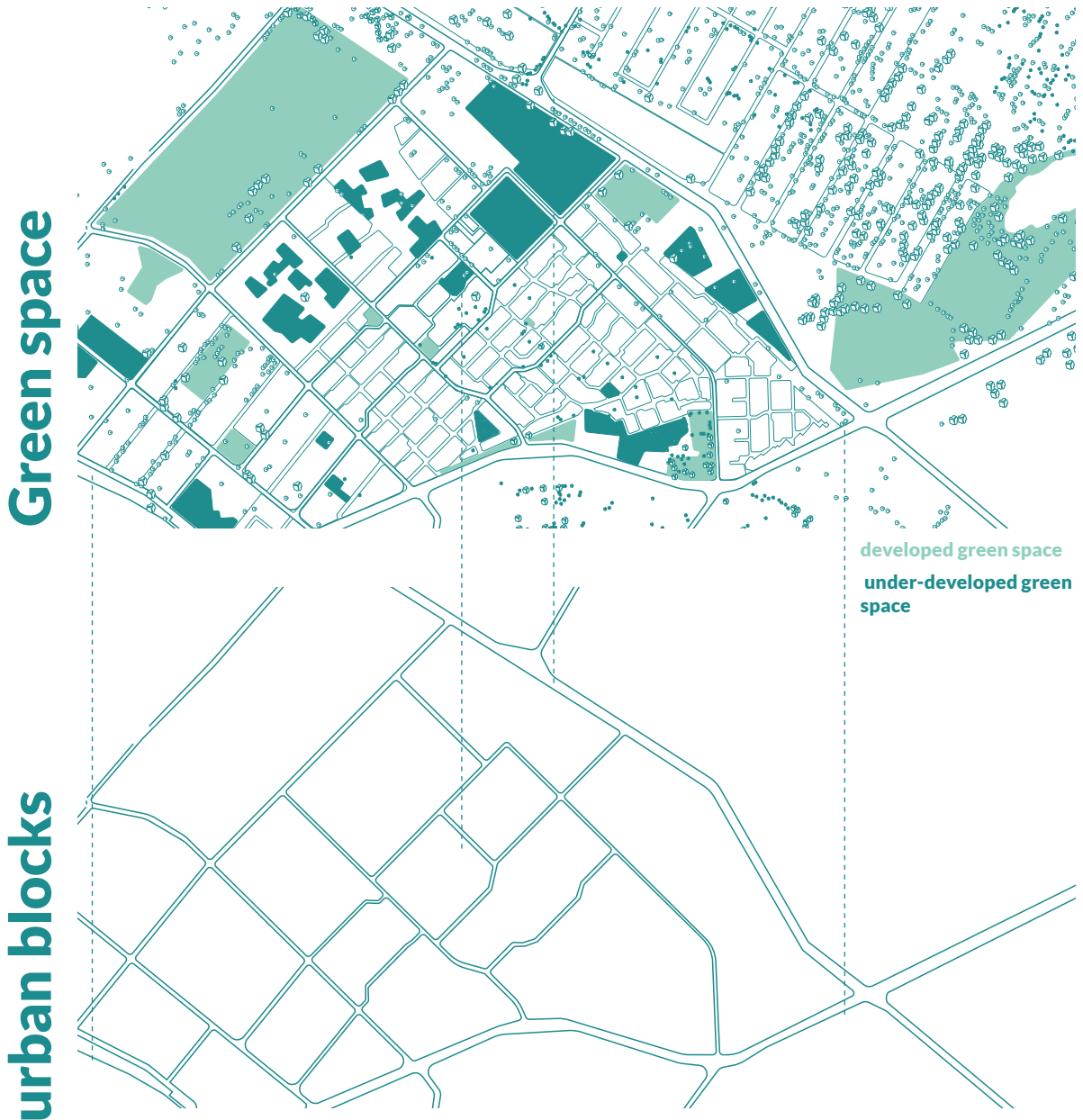
There are no clear sight lines from exterior to the internal working of Westbury, illustrating Westbury as an island and hidden from the city

Fig 4.5 (top) Westbury map indicating green space, both developed and underdeveloped (Urban vision group edited by author, 2017) | Fig 4.6 (bottom) Westbury map indicating urban blocks (Urban vision group edited by author, 2017)

The desire lines highlights the absence of formal surfaces, mostly between the walk-up blocks and underdeveloped land. Desire line 1 showcases the need to physically link Westbury with Sophiatown. Desire line group of 2 and 3 highlights the a main pedestrian route, past the Rec Hall, library and Dorcas Centre.

Pedestrian movement

desire lines

1

2

3

4

To Krugersdorp

Vehicular movement

Local taxi routes

Local taxi routes

Local taxi routes

Main road

BRT route

To Soweto

Empire -Perth Corridor

To the inner city
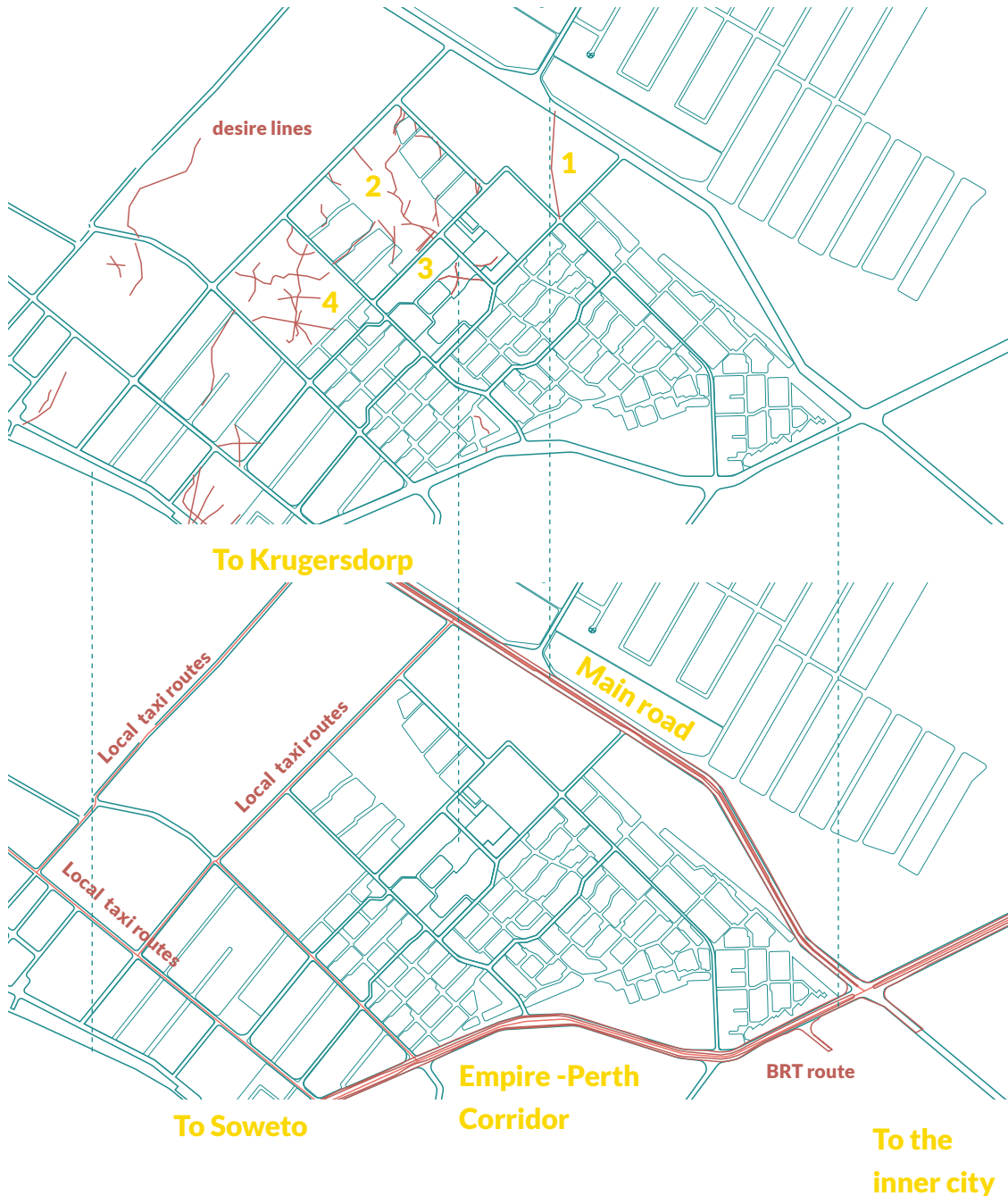
Fig 4.4 (top) Westbury map indicating pedestrian movement (Urban vision group edited by author, 2017) | Fig 4.4 (bottom) Westbury map indicating vehicular movement (Urban vision group edited by author, 2017)

4 Development strategies in Westbury

Fig 4.7 Westbury map (Urban vision group edited by author, 2017)

Westbury as a neighbourhood is an artefact of prominent development strategies of City of Johannesburg over a long period of time. It was the first black municipal township developed in 1918, impacted by the 1955 apartheid city planning development (buffer development and restriction of ownership of land), redeveloped in 1985 and recently the developments (2014) such as the Transit Orientated Development (TOD) namely the Empire-Perth Corridor of Freedom.

Prior to 1955, a fence with 3 vehicular entrances separated Westbury from Sophiatown (Chapman, 2008:21). Post-1955, aligned with apartheid city planning, buffers of open space with a minimum width of 30m were defined, separating Westbury from its neighbours although at certain widths the buffer exceeds 100m (Chapman: 2013:11). The 1985 Redevelopment left Westbury fragmented along with the introduction of a disorientated grid. Recent development such as the Corridors of Freedom (CoF) project, which is Transit Orientated Development, aims to utilise public transport routes and stations as a

catalyst for densification along these corridors supporting local economic development with office, retail and recreational land uses. Westbury is located on the Empire-Perth corridor (Johannesburg Development Agency, 2014). Johannesburg Development Agency is in the planning phase for further development in Westbury.

An urban framework of development and densification strategies is articulated in three main approaches, namely restructuring of urban space, integration of urban space and change of urban space addressing key issues visible in Westbury.

Fig 4.8 (top right) Westbury aerial photograph 1937 (Chapman, 2013) | Fig 4.9 (middle right)Westbury aerial photograph 1962 (Chapman, 2013) | Fig 4.10 (bottom right) Westbury map (Google Earth, 2017)

1937

1962

2017

Sophiatown

Similar
street grid to
Sophiatown

Destruction of
Sophiatown

Additions of
Stadium

Fence between
Westbury and
Sophiatown

Fuel Road
Coronationville

Industrial buffer zone

Walk-ups

Green space
buffer zone

1985 Organic
street grid

Empire-Perth
Corridor (CoF)

1 Restructuring

2 Integration

3 Change

Fig 4.11 (top) Westbury map indicate focus areas for restructuring of urban form (Google Earth edited by author, 2017) | Fig 4.12 (middle) Westbury map indicate focus areas for integration of urban form (Google Earth edited by author, 2017) | Fig 4.13 (bottom) Westbury map indicate focus areas for change of urban form (Google Earth edited by author, 2017)

4.1 Restructuring of urban space

The following is a précis of associated research work, titled Transition, conducted by Marcus van der Hoven a fellow student in this study programme.

This urban strategy investigates the restructuring of urban space to strengthen local identity and defensibility of the social and built environment. A focus on the urban blocks within Westbury with medium density apartments seemly randomly places. The development is placed between layers of existing urban form and social activity, allowing the process of reconstruction to minimise displacement of current residents. This strategy considers social housing as primarily land use with a phased approach of repetition, investigating the dialogue between resident, architecture and infrastructure.
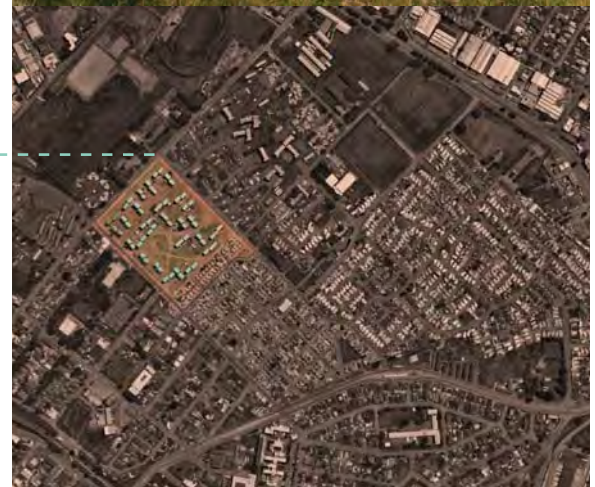
Fig 4.14 (top) Spatial definition of housing typology 2 (Brecher, 2017) | Fig 4.15 (middle) Spatial definition of housing typology 2 (Brecher, 2017) | Fig 4.11 (bottom) Westbury map indicate focus areas for restructuring of urban form (Google Earth edited by author, 2017)

4.2 Integration of urban space

The following is a précis of associated research work, titled Poly-otter Architecture, conducted by Emma Brecher a fellow student in this study programme.

This urban strategy investigates the isolated nature of Westbury, considering it as an island within the City of Johannesburg. Development focus area is located between the underdeveloped buffer zones and the internal fragmentation of Westbury. The scale if a typical edge urban block in Westbury guides the scale of development such as a network of buildings opposed to isolated architectural projects to achieve sustainable, accessible and interconnected urban environments. This strategy considers both tenure and ownership housing along with commercial activities as main land use. The strategy further investigates the opportunity of free hold ownership to expand with tenure housing or commercial activity, for household income enhancing local economic development.

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Fig 4.16 (top) CoF Pedestrian bridge and park (author, 2017) | Fig 4.16 (middle) Housing typology 1 (author, 2017) | Fig 4.12 (bottom) Westbury map indicate focus areas for integration of urban form (Google Earth edited by author, 2017)
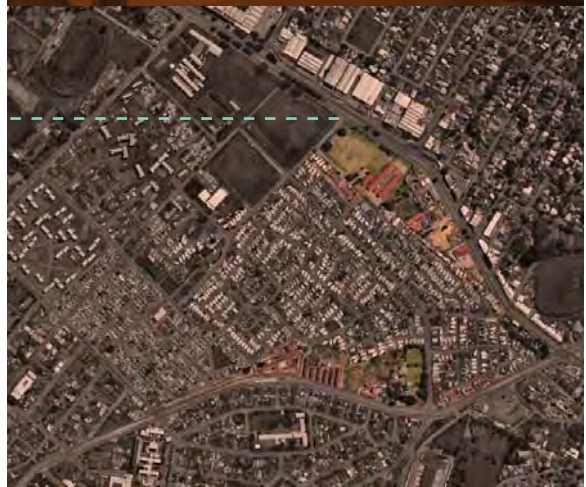
4.3 Change of urban space

Research conducted by author.

This urban strategy is guided by the opportunity of land which is characterised by continual redevelopment within strict urban boundaries (compact urban form) and multiplicity of use. It is a dialogue of stable and changeable built fabric, reducing the risk of inefficient land use. This strategy is positioned within notions of access to land secure with land tenure and a shared infrastructure, encouraging the consolidation of new and existing formal businesses, organisations or social welfare as response to the individualistic and isolated nature of organisations in Westbury, and in so doing strengthening legal economic development. This strategy is tested with social infrastructure and affordable rental housing (refer to 4.5, change of urban space continued).

Fig 4.17 (top) Ebrahim and Sons take away, vegetables and laptop by (Brecher, 2017) | Fig 4.18 (middle) Site with housing typology 1 (author, 2017) | Fig 4.13 (bottom) Westbury map indicate focus areas for change of urban form (Google Earth edited by author, 2017)

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4.4 Collective development strategy

Collectively the three urban approaches reinforce each other, contextually developing and improving Westbury. Each strategy considers densification and growth of Westbury. Development is driven from both scales, namely urban and architecture. The urban strategies focus on the architectures' ability to define the urban environment, the three approaches grounds Westbury's urban fabric and strengthens existing movement routes within Westbury and introducing new pedestrian dominates routes linking Westbury to Sophiatown.

This approach addresses specific issues and opportunities with greater impact, particular to the three sites compared to a generalist top down master-plan. Each strategy encourages users' appropriation and facilitates opportunities for development.
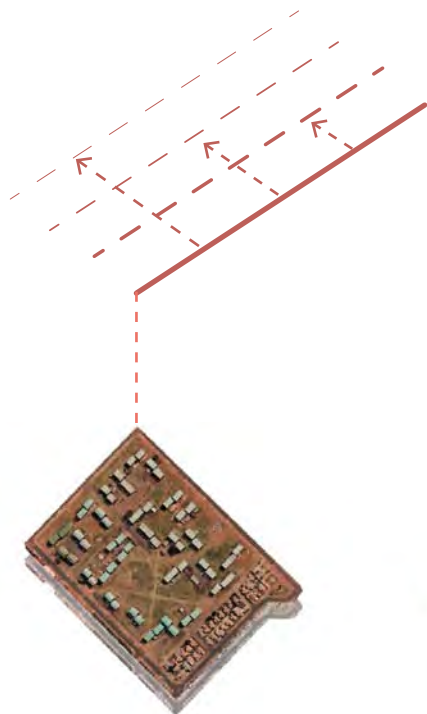
1 Restructuring   **3 Change**   **2 Integration**

Fig 4.19 Diagram of collective urban development strategy (author 2021)

Letter indicate phased approach sequence

Link with Sophiatown

Link with Newclare

Link with Coronationville
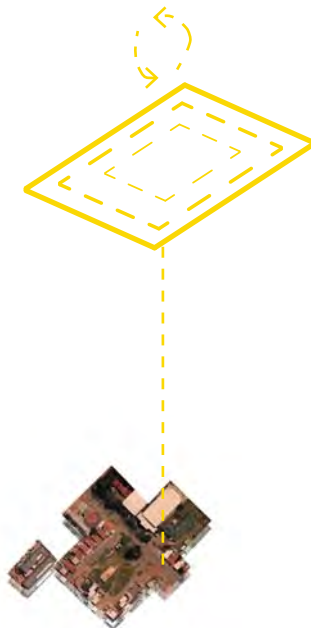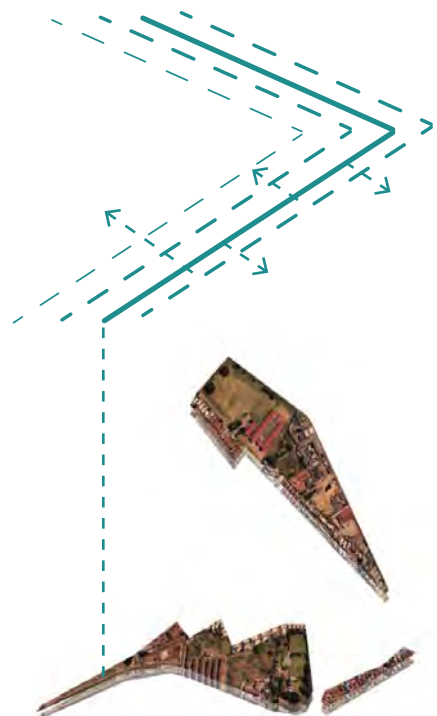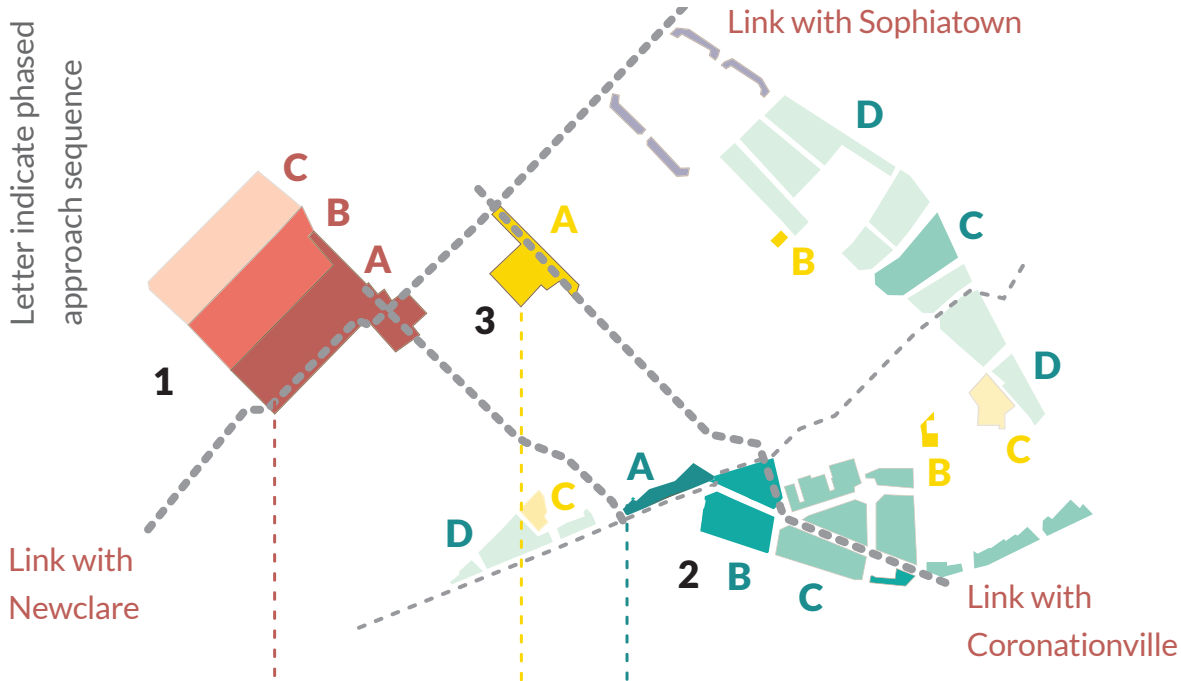
Fig 4.20 Map of collective urban development strategy (Brecht du Toit, 2017)

establish a new route linking Westbury, Sophiatown and Newclare

new link perpendicular to recent urban upgrades

strengthen existing pedestrian movement to the BRT station

Kretzschmar Street: existing high traffic route

Steytler road

The urban strategy, similar to TOD, positions catalytic anchor points (architecture) to strengthen existing routes and establishing potential routes supporting development in Westbury, encouraging appropriation and generating opportunities.

Change of urban space site strategy
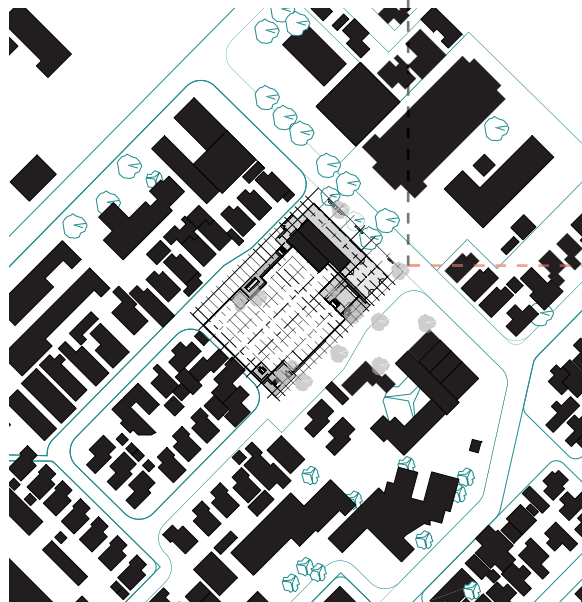
Fig 4.21 (top) Collective urban development strategy existing and proposed routes (author, 2017) | Fig 4.22 (bottom) Change of urban space strategy (author, 2017)| Fig 4.23 (right)Change of urban space strategy indicating external spatial influence (author, 2017)

Architecture without land is a development strategy of land tenure, not a building system, rather an approach of development with the opportunity to be applied on various sites, scales and urban conditions. Air rights could be considered as artificial land, an example of architecture without ground (refer to 1.4.1). Shaun Russell, a researcher at Ndifuna Ukwazi, Cape Town explains government control leverage points, with reference to zoning regulations and bylaws. Housing developers could apply to relax zoning regulations and increase building height limit to six storeys, instead of being limited to three, but are obligated to provide 20% social housing (ASF-UK, DAG, 2017). Potential urban conditions could be an urban park, roofs of existing inner-city buildings, temporary relocation areas and backyards. Each community land trust (CLT) is motivated to be part of a larger city scale network of adaptable, well located, affordable and service land, contributing to the spatial transformation of South African cities supporting compact resilient ideology.

Land tenure as a development strategy may not be an appropriate option in specific conditions such as monuments or burials. A blanket approach across the entire urban fabric is thoughtless. Each land parcel and context should be considered and understood, with learning (refer to conclusion) modified to enhance site conditions such as hierarchy of provision for various building dependencies (insert, infill).

Location and intentions of land use is important and should be aligned with development strategy such as continuous development within strict urban boundary and multiplicity of use of well-located land.

The project should preferably be located in areas where development strategies such as Transit Oriented Development (TOD) are/being/were recently implemented. The CLT has greater impact in the company of other developments due to its own limits and focus such as only providing land tenure, which is both an opportunity and limit.

4.5.1 Change

Boundary edge to be built last - still supportinf the urban condition and ground the project.

1 Build up
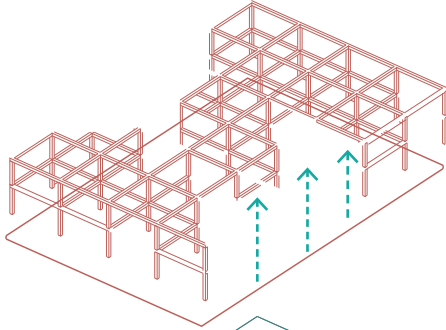
2 Redevelopment of architecture
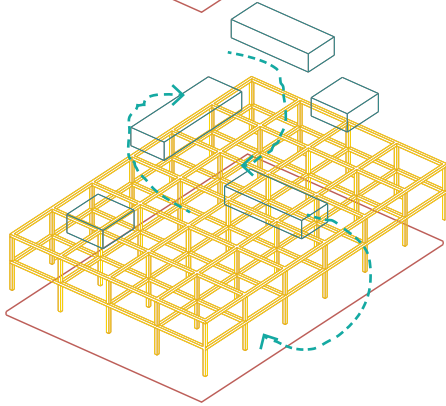
Boundary edge to be removed last - still supporting the urban condition and ground the project

3 Removal
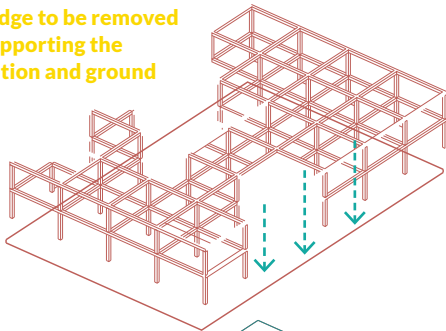
4 Redevelopment of land
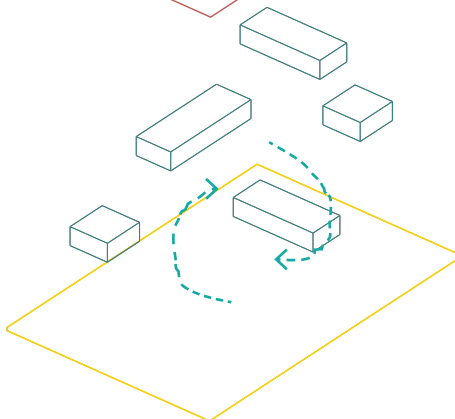
The stages of development are namely the build-up phase, redevelopment of architecture, and finally redevelopment of land (refer to 7.2.1) after removal of the built fabric (disassembly phase). The project focus is on the build-up phase and redevelopment of architecture.

Fig 4.24 (left) Stages of development (author, 2017)

1 Redevelopment of land
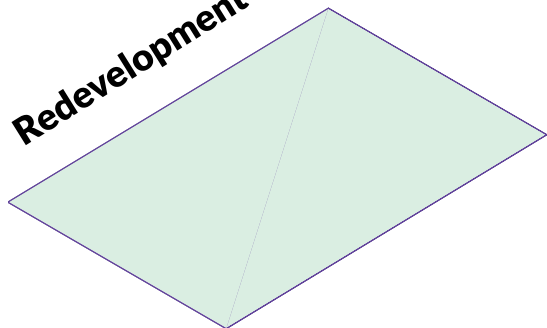
2 Build up
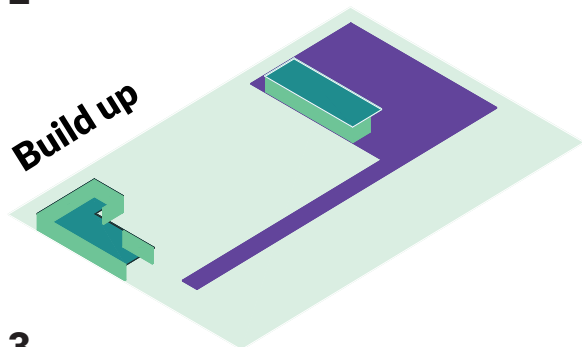
3
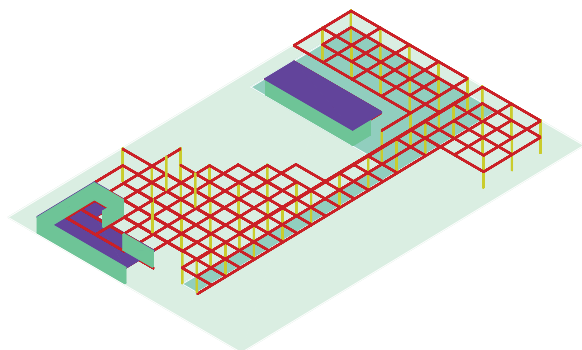
4
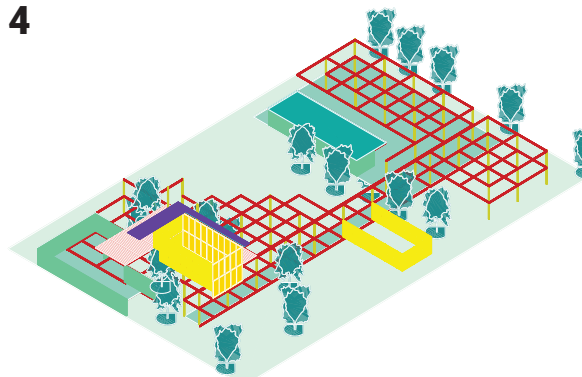
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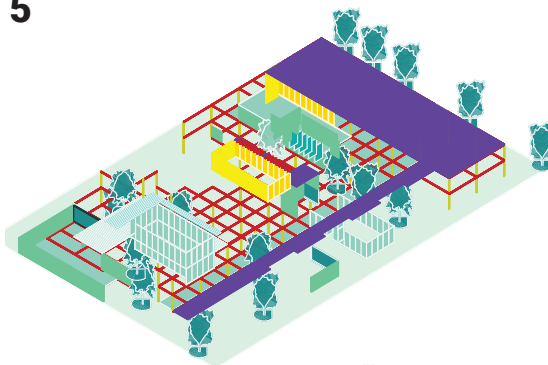
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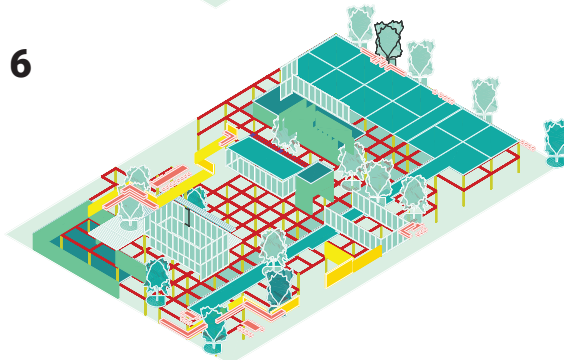
7
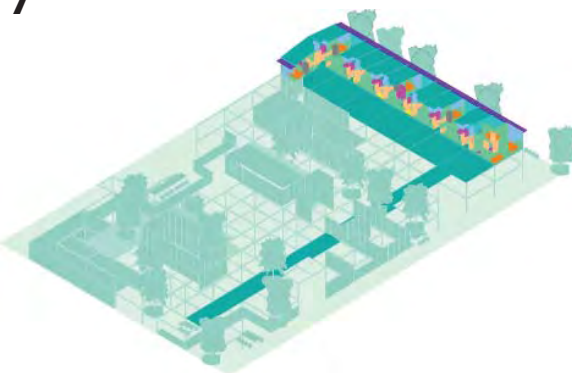
Fig 4.25 Phased development of land parcel (author, 2017)

8

9

10
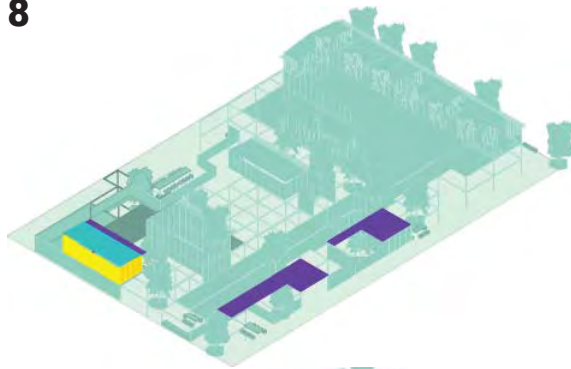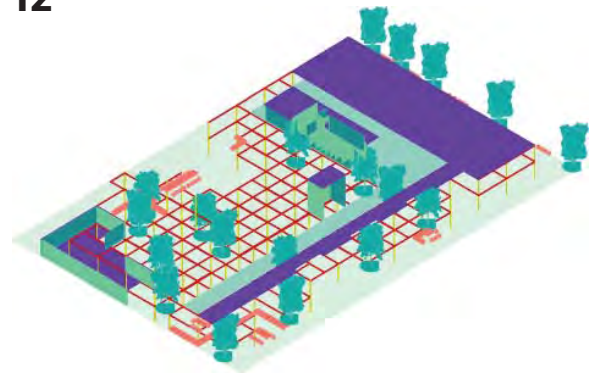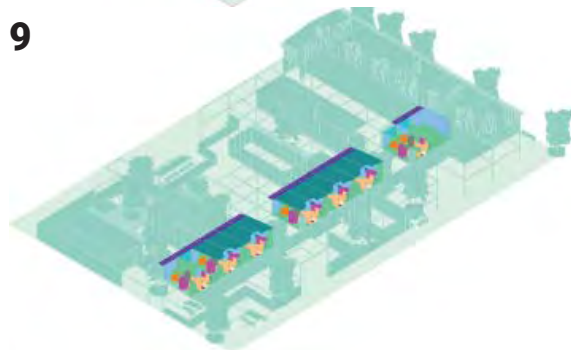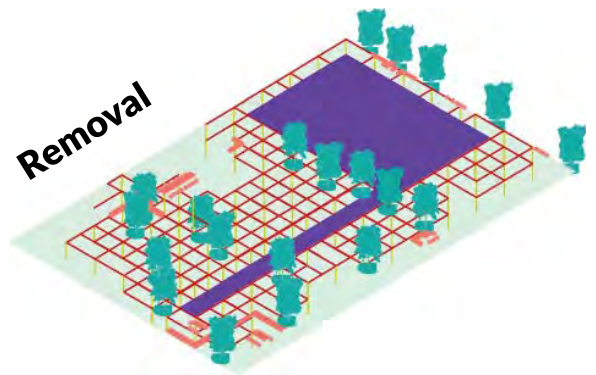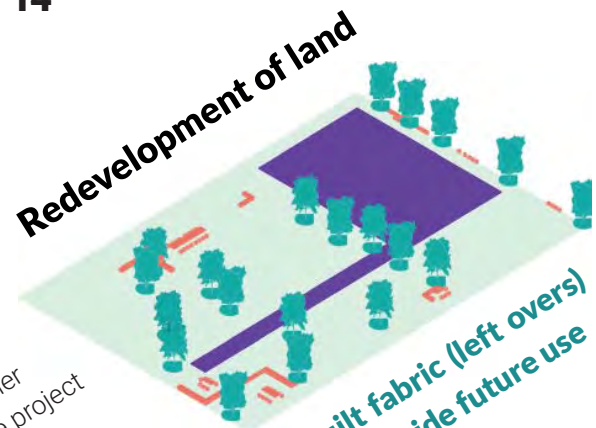
11
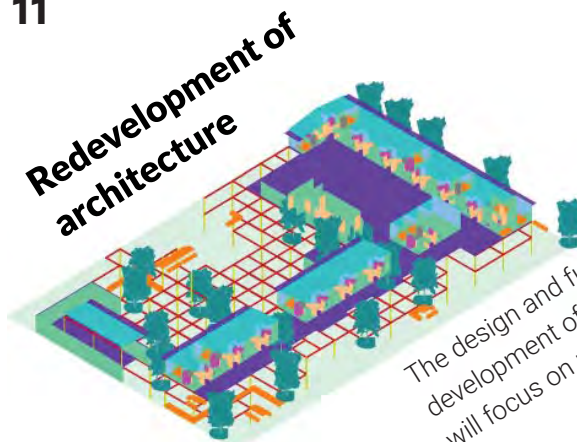
Redevelopment of architecture

The design and further development of the project will focus on phase 11.

12

13

Removal

14

Redevelopment of land

The stable built fabric (left overs) will anchor and guide future use

4.5.2 Potential options

1 Affordable rental housing

Potential options of space use could be:

1 Affordable rental housing addressing demand in South Africa (housing backlog) and overcrowding

2 Urban Agriculture addressing insecurity of food and lack of nutrients with the residents becoming self-reliant

3 Cross programming of ECD,mothers training, medical unit (extension of ECD and partnership with existing Westbury clinic), shisa nyama and housing addressing local economic opportunities.

Fig 4.26 (left) Affordable housing plan (author, 2017) | Fig 4.27 (middle) Urban agriculture (author, 2017 | Fig 4.28 (right) Cross programming (author, 2017)

2 Urban agriculture

3 Cross programming
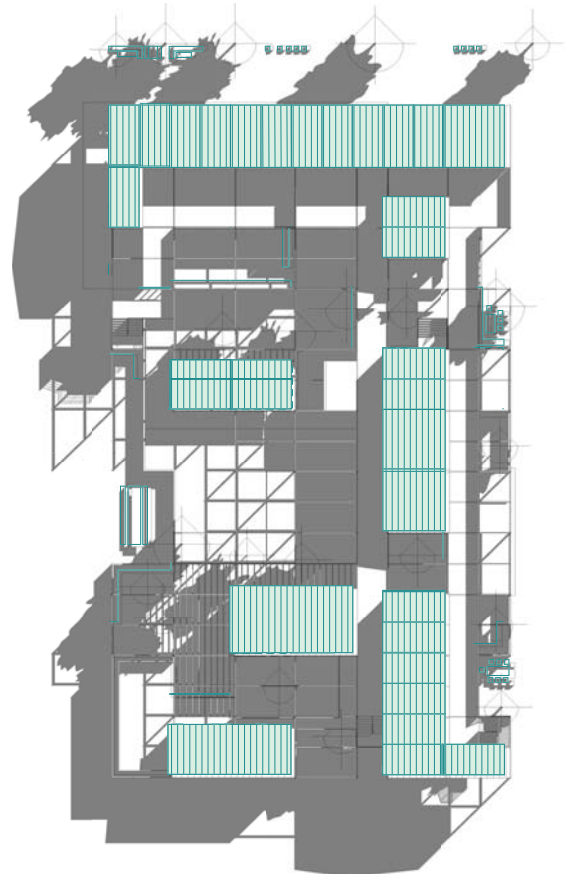
Fig 5.1 (left) Infrastructure as base, Westbury urban upgrades (2015) edited by author (Local Studio, 2015) | Fig 5.2 (right) Manipulation of infrastructure (author, 2017)

Chapter 5

Appropriation of Land

5.1 Economy of land

"Land reforms are ultimately about changing the distribution of wealth in our country," Professor Malcolm Keswell[16]. Land has become integral with the campaign of radical economic transformation, both expected to be main issues during 2019 general elections. In December 2017, the African National Congress (ANC) will elect new leadership, where the topic of land expropriation without compensation will be highly debated as the ANC is divided (Fisher, 2017). Land and financial resources cannot be separated.

Dewar (1976:7) wrote that the urban poverty cycle is aggravating income inequality and almost 40 years later, it is still applicable. He reiterates that is vital to recycle financial resources within a critical neighbourhood (such as Westbury), mostly achieved with informal markets. Tenure security will aid the process of self-help initiatives, such as informal neighbourhood schools, enabling residents to generate income while providing a safe space for children, during which parents seek employment. Effective development encourages people to self-build, not relying on social aid (Dewar, 1979: 14).

The project acknowledges informality and support informal businesses on the urban edge within the lingering spots and public interface, with provision of urban furniture such as tables and chairs (brick masonry) to be easily appropriated becoming spaza shops. The composition of trade in Westbury is: 47,1% residing within formal premises, 25,5% within home businesses and 21,6% on the street as vendors (Klug,2017:22).

The project motivates for formal economic development within the legal frameworks of South Africa and City of Johannesburg, to address land issues such as Imizamo Yethu Educare creche, restricted from formal social aid due to encroachment. Klug (2017:19) highlights key challenges in Westbury as the need to cultivate legitimate economic activity, skills training for youth and better integration of social aid and activities such as NGO's and government social welfare, better linking them with physical development interventions in the city.

Supporting the local land question of sustainable livelihood development, the project motivates for a phased development plan, namely acquiring formal access to land, securing use and stable built fabric with social and economic anchors supported by operational anchors.

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5.2 Land first

Breaking New Ground (BNG)[17] policy (2004) states that access to well-located state owned and parastatal land, deemed suitable for housing is to be transferred to municipalities at no cost (The Housing Development Agency, 2004:14). "Capacity building is critical to the success of the new housing plan" (The Housing Development Agency, 2004:22). Capacity building or skills transfer, often a buzzword for projects in critical neighbourhoods, should be clear on the target groups, mostly focused on residents with local authority frequently forgotten. For a sustainable project, capacity building must also strengthen local municipalities. BNG policy intends to expand the role of local government. Currently private developers have a leading role in housing delivery. BNG policy shifts from private developers with a supply-driven framework to a demand-driven process. This increases the responsibility of the state to determine location and nature of housing, although the private sector is still seen as the primary vehicle for delivery of housing, yet municipalities are to assume overall responsibility for the project in their jurisdictions (The Housing Development Agency, 2004:22). However, Westbury residents mistrust local authorities (Klug, 2017:5). High tensions were visible in the second quarterly meeting of ward 69 Councillor in June 2017. Remnants of top down development were highlighted, visible in a concern raised by a resident: "Jy staan net op, dan val jy in 'n gat" ("just as you get up, you fall into another hole") (just as you get up, you fall into a hole – google translate). This showcases the need for contextual development, between top down and grassroots, between authority and resident.

The Community Land Trust (CLT) concept mediates between resident and local authority, being a tripartite partnership between the local authorities, private professionals and residents. CLT's would support capacity building of both local authority and residents. Klug (2017:54) motivates for capacity building focussed on local entrepreneurship and capital accumulation, although secure land tenure reduces the need for capital. Yet 32,6 % of businesses own their premises whereas 75% of Westbury residents formally own their residential property. Affordability is vital, businesses state that rental cost account for 46.5% of their income with 16.3% for rates and tax and 11.6% for labour cost (Klug, 2017:22).

The project motivates for the current city owned land to be transferred to a Westbury Community Land Trust, as an extension of BNG policy programmes. The CLT will manage the development, reducing demand on local authority structures and maintaining affordable access to land.

Foundations and base facilities such as public ablutions will be constructed first, defining and contributing to the urban condition. Default land use will be public use namely an urban park; it is argued that the CLT will lend land to the urban condition when not in use by tenants or trust. Vacant urban properties are often neglected and overgrown, reducing the quality of urban environment, often a void with limited use, such as the land parcel being investigated. The host structure will be partially constructed depended on available capital and need to support infill with

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17 BNG is an updated version of RDP (Reconstruction and Development programme) housing

Initial site condition

Tenant use (CLT)

Public use

boundary development

CLT lending space
for public use
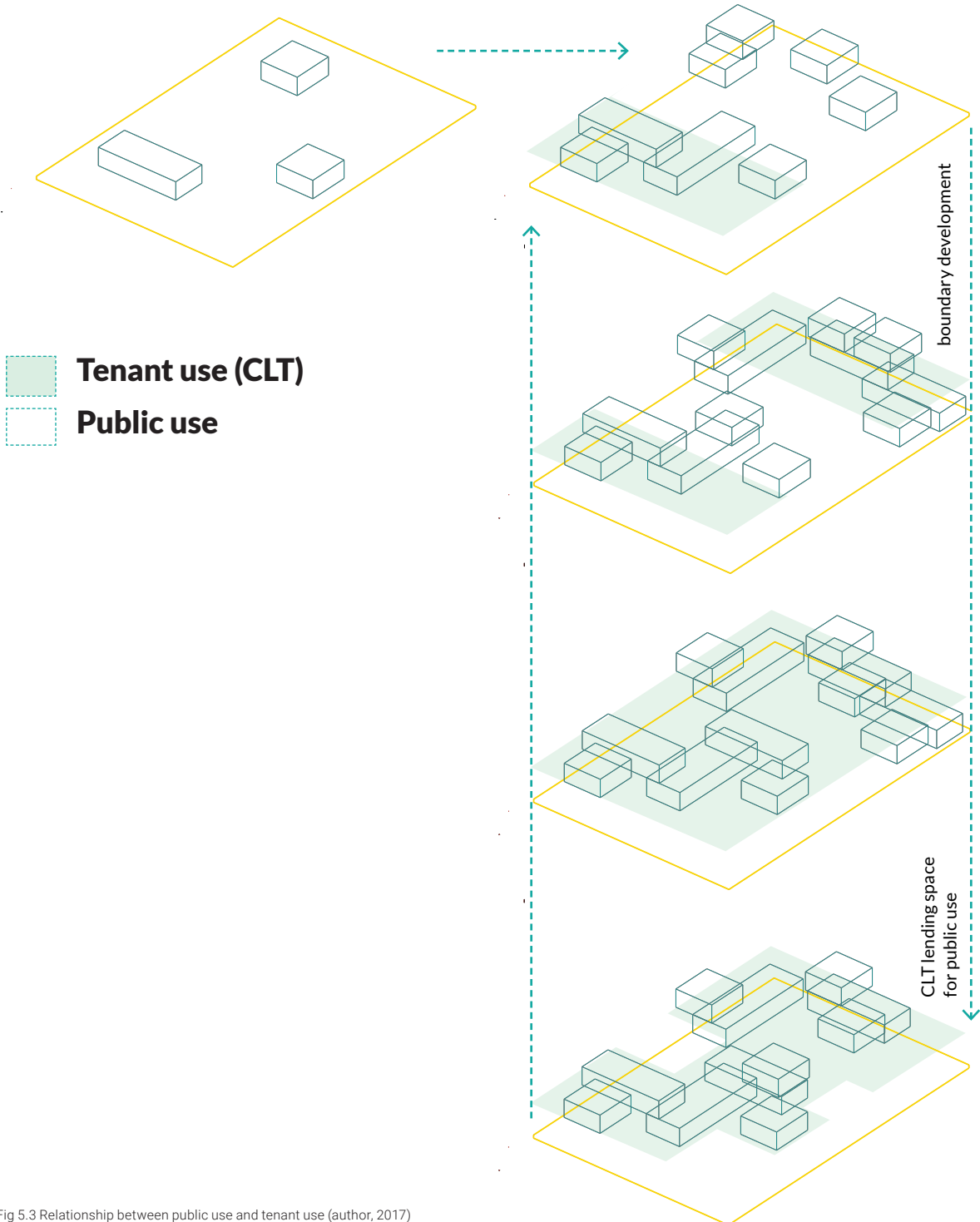
Fig 5.3 Relationship between public use and tenant use (author, 2017)

5.3 Social anchor

Deputy Minister of Cooperative Governance, Andries Nel acknowledged on 21 September 2017 that a quarter of South Africans are residing in a government owned or subsidised housing, particularly the RDP or BNG programmes. He continued stating that numbers are not enough, such as matching housing to land. Focus should be shifted towards defining inclusive urban space and the building blocks of a community such as schools, transport, living, places of work, all hosted in the same space. Government is investigating developing projects with multiple components supported by BNG policy. Current technology methods can only be used to build more single plot houses, not supporting densification (Midday Live, 2017). ANC leadership in government's strategy for delivery of housing has been concentrated in material culture: services have underpinned development, the community has been sacrificed at the expense of a quantifiable and economically utilitarian approach to transformation (Low, 2013:152).

The intention of social anchors is to better integrate existing social aid within Westbury as an approach to transformation (Klug, 2017:19) and secondly to obtain capital for both CLT and social aid through aid programmes supported by government or private industry.

Although 75% of Westbury property is privately owned, living conditions are in some areas, particularly the apartment buildings, ill-defined and harsh. This does not cultivate stimulating environments for children, limiting their development.

We can't change the home, but we can address the day. This statement highlights the potentials of early childhood development (ECD).

Existing home-based day-cares and ECDs in Westbury are generally 2-3 rooms or the lounge with a hard-landscaped backyard. Formal economic development motivates for existing home-based ECDs to relocate to a shared infrastructure such as the CLT in the civic node of Westbury. Most ECDs are internally focused with limited interaction with the urban condition, yet shifts within the urban fabric will occur. An example of a home-based neighbourhood ECD in Westbury cares for about 20 children in a 4.5m by 6m room with a dull backyard from 7:00 till 17:00. The home became an ECD with two bedrooms for the family, limiting the family's space use. The owner explained, she was recently upgraded to an ECD from a day care, this implies more regulations and cost, with her school fees generally R250 per child per month depending on economic capability of the family . Consolidation of existing ECDs will provide a legal framework, where cost and risk is carried collectively supporting growth, returning the home to the family and cultivating a stimulating environment for the child.

Free play within ECDs is essential with a distinct sense of place to stimulate imagination and cognitive mapping. Arvid Bengtsson describes a playground as a small scale urban setting with pathways and squares (Weinstein & David, 1987:190). Context and hierarchy of space is vital and should be unified with a continous space and smooth transitions between areas such as Fuji Kindergarten by Tezuka Architects (Tezuka, 2014). Diversity of space such as public collective or private individual is required for a rich pattern of play. Individual and recollect areas are accomodated for, if a child is unnerved or would like to observe from a distance. Diversity of surface has an important role in the tactile experience, such as grass, concrete and brick paving.

A child requires at least 1,5m2 inside and 2,5m2 for outdoor play, the CLT can host 120 according to square metre available, yet it is motivated for 90 children as initial development.

Additional social anchors such as mother training and a small scale medical unit are extensions of the ECD implemented with a phased approach. The medical unit is to provide support to children with developmental delays and difficulties, providing speech therapy, medical support and physiotherapy, a partnership between CLT and Westbury Clinic recently upgraded to support 500 000 people from Westbury and surrounding areas (Hlatshaneni, 2016). Mothers training will be focused on home base care programmes with majority of training happening in the classroom or medical unit, for instance the trained nurse or physiotherapist will, if possible treat the child in the classroom allowing skill transfer to both teacher and mother. Auxiliary facilities such as discussions rooms and reference materials will be provided. Educating the mother, particularly single mothers, support economic development of the family, resulting in secure fees payment with a stimulating environment for the child, recycling financial resources within Westbury.
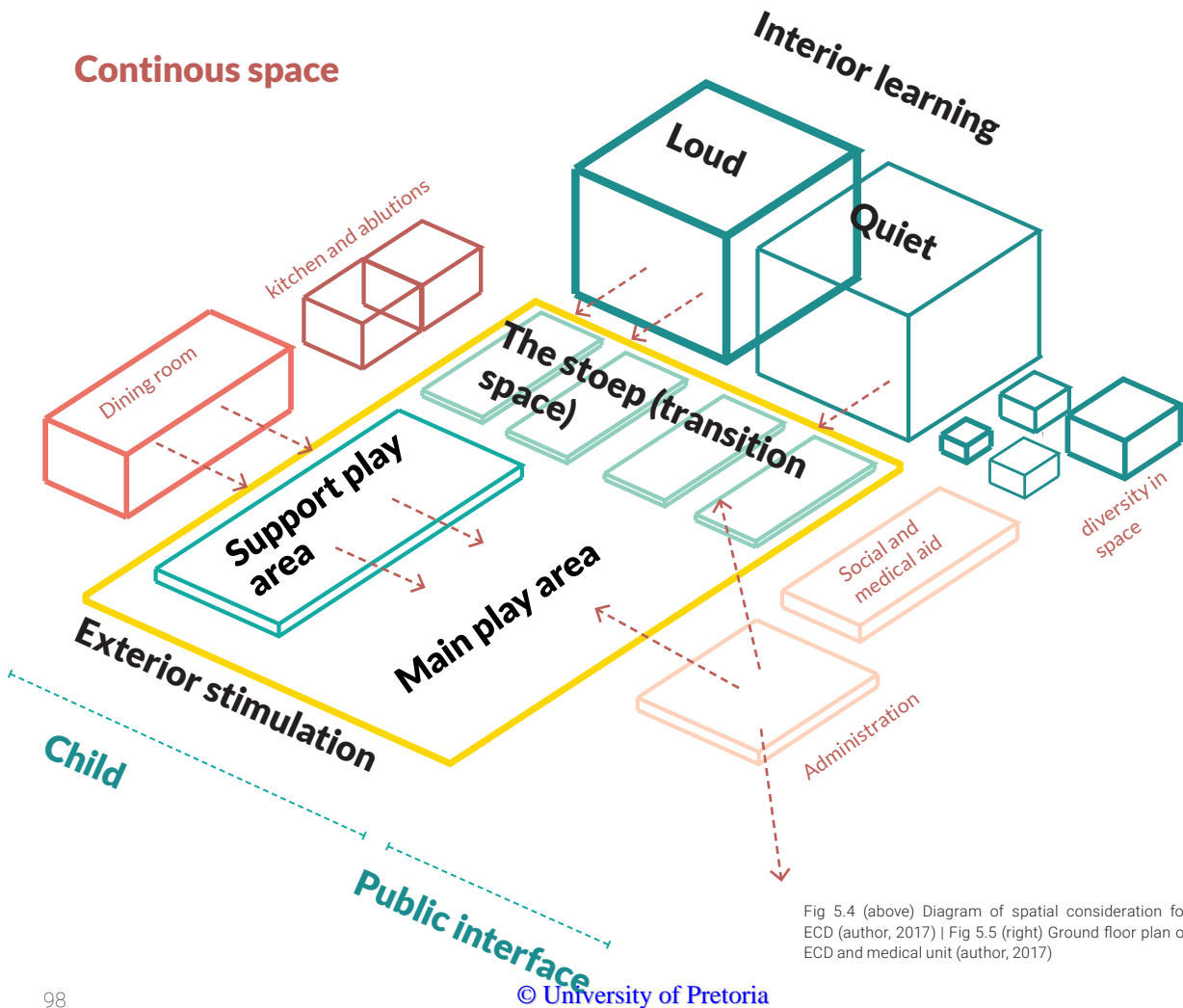
Fig 5.4 (above) Diagram of spatial consideration for ECD (author, 2017) | Fig 5.5 (right) Ground floor plan of ECD and medical unit (author, 2017)

Outreach classroom:
music class afterhours or
adult education.

Adminstration

Loud

5

6

Stoep

Parents meeting room

Garden

Main play area (collective)

Keep walking boundary condition

Medical unit

Support, individual play

Stoep

Trampoline

1

2

Quiet

Outdoor classroom

Garden

3

4

Sandpit

Loud

Garden

art orientated classroom

Private outdoor
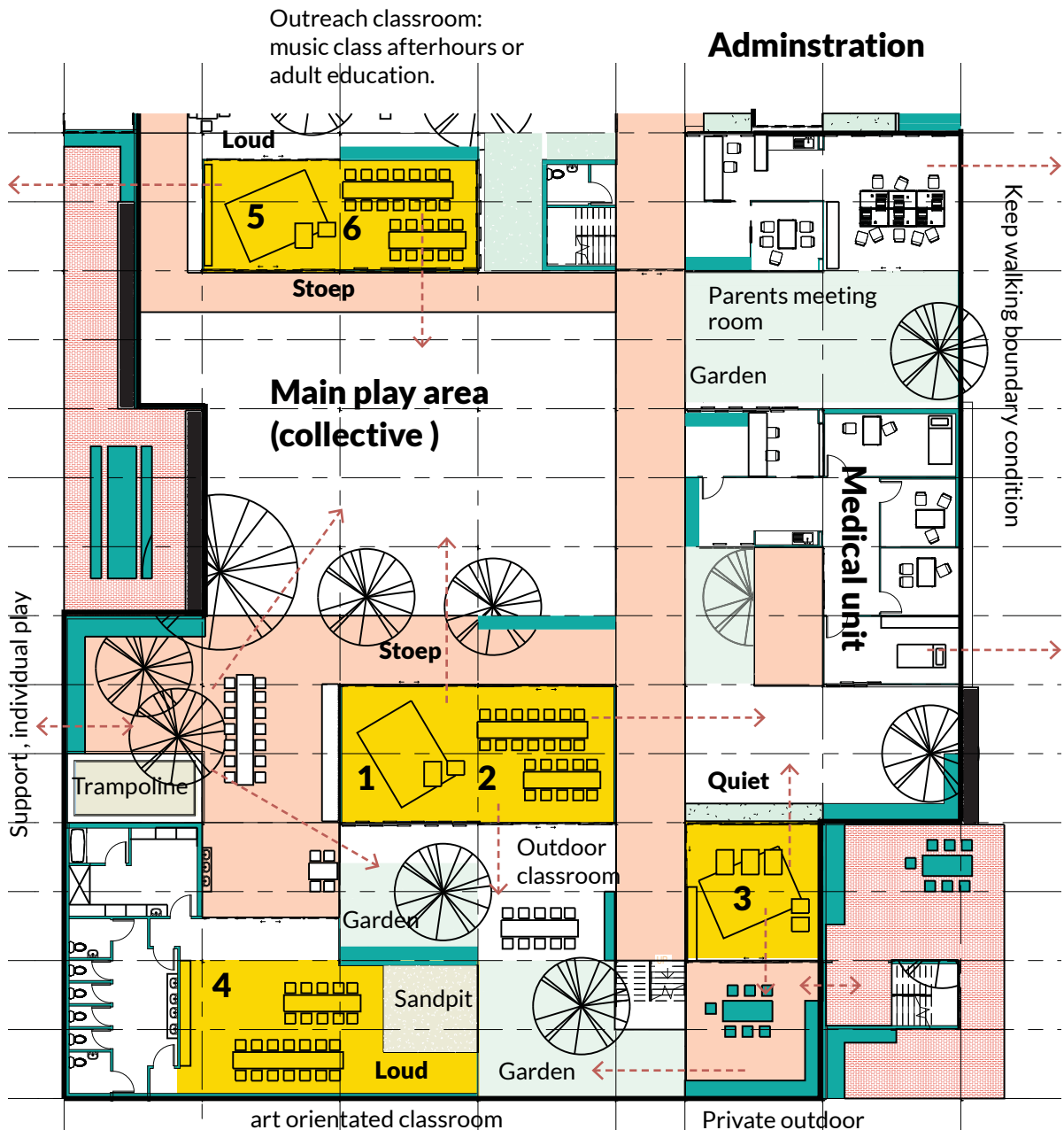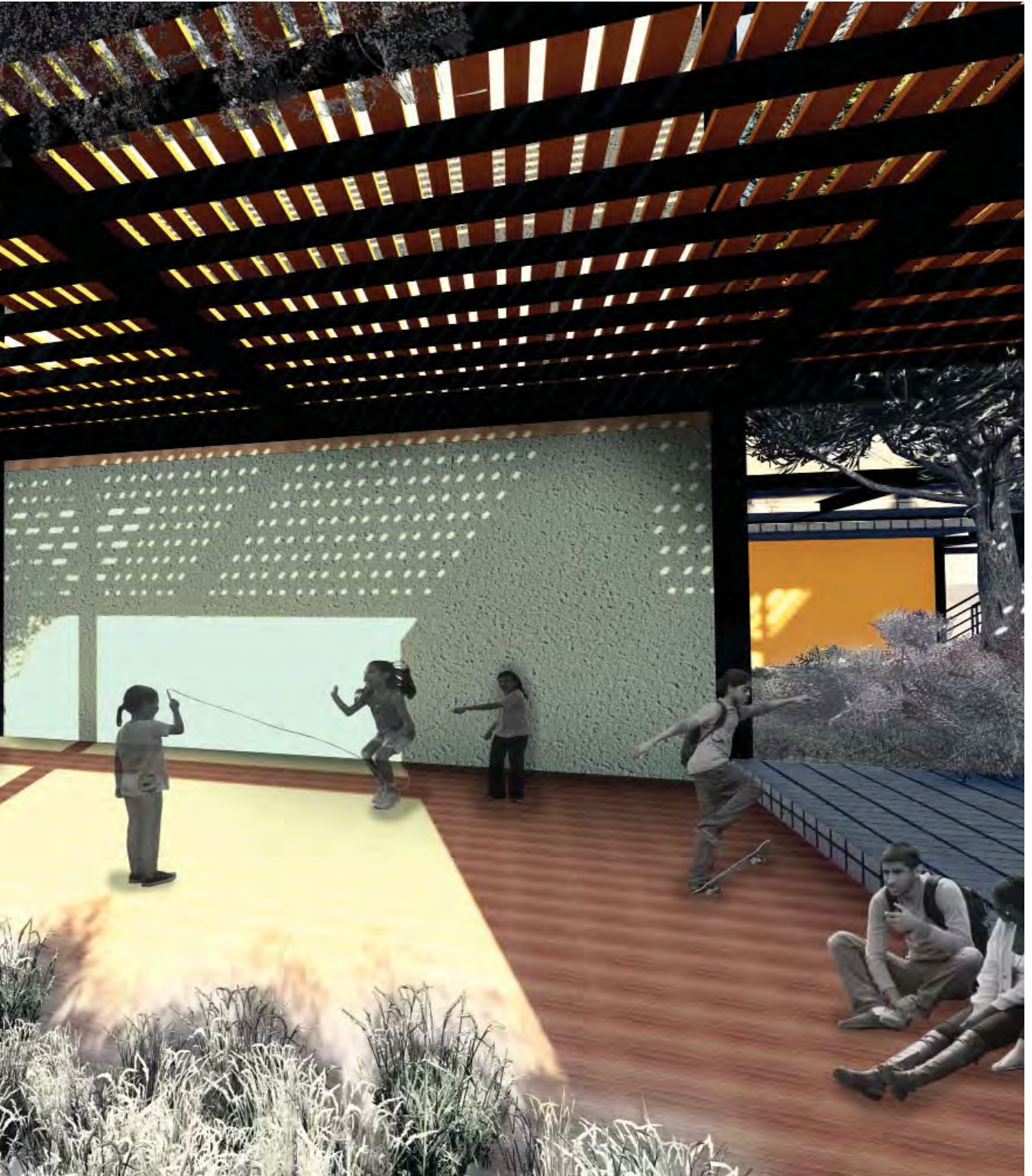
5.4 Economic anchor

Diverse economic structures and scales contribute to the local economy. Low (2013:152) writes that transport orientated development (TOD) is currently the main driver for spatial transformation in South African cities, impacting socioeconomic change, with capacity for creating networks and incorporate small business opportunities. Cross programming with existing functions aids the sustainability of the project such as a muti-market at Faraday station. Violence Protection through Urban Upgrade (VPUU) project for example in Khayelitsha Cape Town is a combination of social aid, small businesses and public amenities. Both VPUU and TOD encourages small business opportunities to strengthen and ground the project in the urban environment. Johannesburg Development Agency (JDA) responsible for the Corridors of Freedom project has budgeted R650 000 for local economic initiatives in Westbury (City of Johannesburg 2015 cited in Klug, 2017:45).

Klug (2017:48) describes unemployment as the key root of poverty in Westbury with 36.9% of residents having no monthly income, contributing to a cycle of decline defined as unemployment leading to poverty, drug abuse and drug dealing. A high number of residents are unemployable due to age, above 51 and below 25, with some having criminal records.

The composition of legal business in Westbury is 47,1% retail (mostly tuck shops), 27,5% catering with the remainder being in services or motor industries. The catering industry has increased over the past five years while retail declined. The mean monthly profit in Westbury, Coronationville and Slovo Park ranges between R5000 and R10 000 per month with 83% of owners residing in Westbury, Coronationville and Slovo Park (Klug, 2017:23).

Eagles Wings Bakery is a home business bakery, located in Westbury. In 2012 the business was registered as formal business. Growth is a key challenge of the business, with owners uninformed about advertising methods and methods to source funding for additional staff, raw materials and machinery. Recently the bakery secured a fixed employment of running a factory canteen in Industria, but the bakery had no capital to purchase the initial raw materials (Klug, 2017:25).

Like the consolidation of existing ECDs, economic anchors are articulated in the consolidation or provision of a shared platform for existing catering business, to support where capital is needed, to accommodate a larger order such as in the case of Eagle Wings Bakery enabling for growth of the business, shared machinery or support in case of an emergency such as a broken oven. A partnership between existing catering owners and the CLT is expressed as a shisa nyama, a shared resource reducing demand for capital, aligned with project land tenure intention.

The shisa nyama will be in the urban edge, the public interface boundary (refer to 3.4) providing security of space with a portion of the kitchen located in the urban environment. Mediating between CLT and public use, such as supporting the small square mainly to be used by teenagers and young adults, seen as an informal meeting place before public meetings such as ward councillor meetings and events such as movie nights hosted across the street in Westbury Recreational Hall (Rec Hall). The shisa nyama is supported by office space or retail space of 3m by 3m on the first level, encouraging sub leasing.

A partnership between the shisa nyama and ECD could be beneficial; the shisa nyama will provide food for children with the ECD being a stable client for the shisa nyama, supporting the ideology of recycling financial resources within Westbury.

Project intentions are aligned with Westbury development precinct plan proposals (CoJ 2015). If this was not the case, then the project would not likely to be approved or supported. The development plan proposes to identify well located land for housing, supplement existing social infrastructure, and create public space linked with social infrastructure to existing diversification and intensification of land use, densification of the urban fabric, vibrant public realm and increased accessibility or social and economic opportunities (Klug, 2017:45).

Fig 5.6 Boundary condition (author, 2017)

Ablutions
Kitchen
Social Space
Sales
Sports
The stoep, negotiation of space
Outdoor braai
eyes on the street
Urban furniture can be appropriated to tuck shops
Urban furniture

Urban furniture
Urban furniture
12m by 12m square
The stoep
Shisa nyama
Outdoor Braai
Kitchen
two doors to avoid bullies
Internal outdoor space
Entrance to ECD
Refuse and recycling
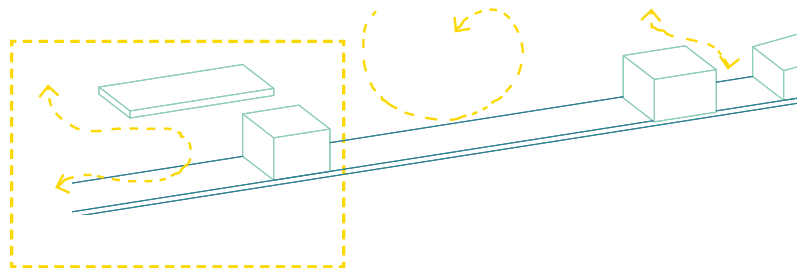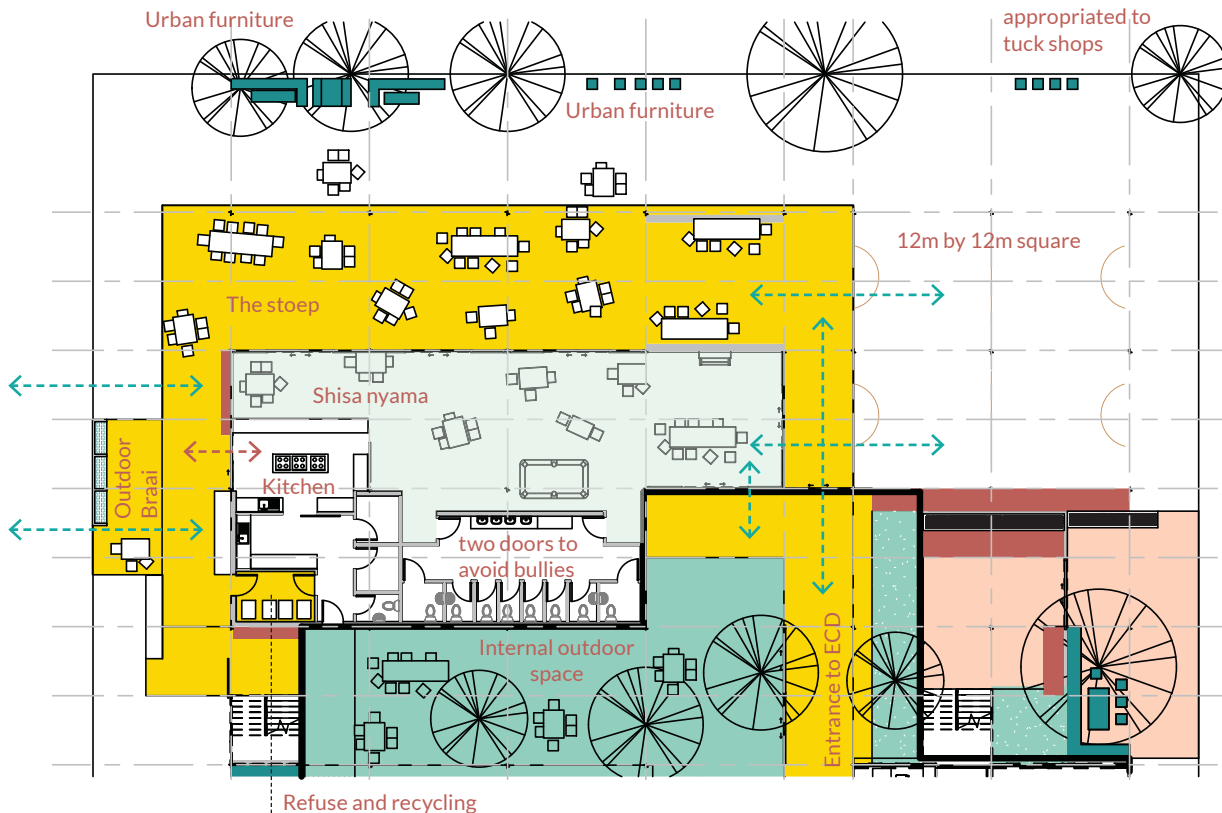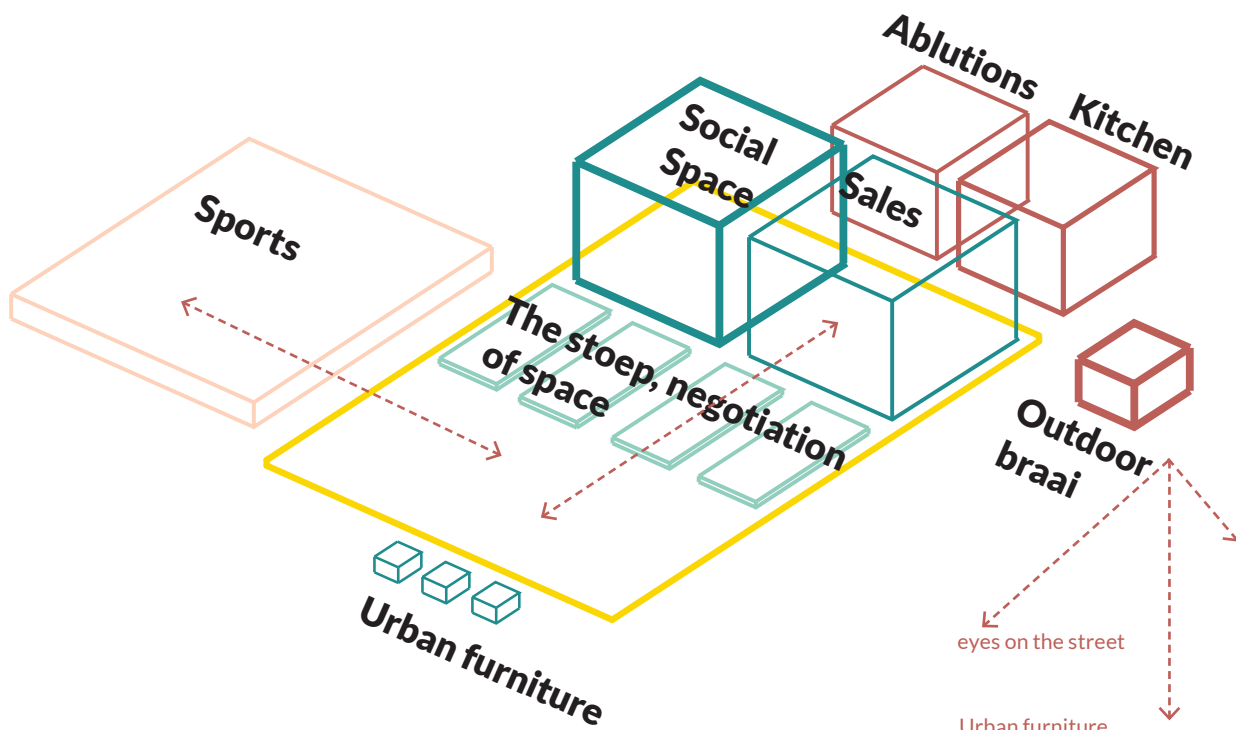
Fig 5.7 (top) Diagram of spatial consideration for shisa nyama. (bottom) © University of Pretoria round floor plan of shisa nyama (author, 2017)

5.4 Operational anchor

The newly built Westbury Clinic required a capital cost of R33 million, but due to operational cost constraints can only hire 5 professional nurses (Hlatshaneni, 2016). The built fabric has the capacity to cater for 500 000 people, but does not have not the human capacity. This is wasteful as the clinic is really the fault of poor planning for operational phase, resulting in a poorly executed project while the community has a great need. This is like most of the white elephant state projects, but is even more unacceptable since white elephants are typically rejected by the community.

Operational cost, such as good management, is vital for the sustainability of the project reducing the risk of urban decay and maintaining the functionality of the tenant system. The CLT will receive financial rates from tenants such as the shisa nyama, from the ECDs with mothers training and a medical unit. Continuous redevelopment and change increases the risk of no payment, especially during quiet months with limited tenants. The conversation of housing and land is intertwined, housing provides a stable income; the project can accommodate 70 people at initial phase with 25 single units (2 people, 17m^2) and 4 three-bedroom units (5 people, 35m^2).

The units are small, to maintain affordability for residents. Income of residents from Westbury/Coronationville range between R1000 and R1500 per month, with 7,4% of households with no income (which is still higher than the mean of 3,9% for all case study areas (Klug, 2017:13). Communal housing, provided by the housing department agency are units of 30 square metre providing rental options for monthly income of R2500 and less (The Housing Development Agency, 2004). The scale of development is determined by both scale of urban context and capacity of local economic structures. As a response to the small unit, common areas are provided with a shared kitchen, lounge, laundry and computers with internet for academic and employment purposes. Semi-public walkways ranging from 3m to 6m becoming outdoor streets filled with activity such as hoops (netball or basketball) with discussion tables on the first and second level of the development.

17m^2 35m^2

common area, kitchen, laundry and pc with affordable internet

35m^2

35m^2
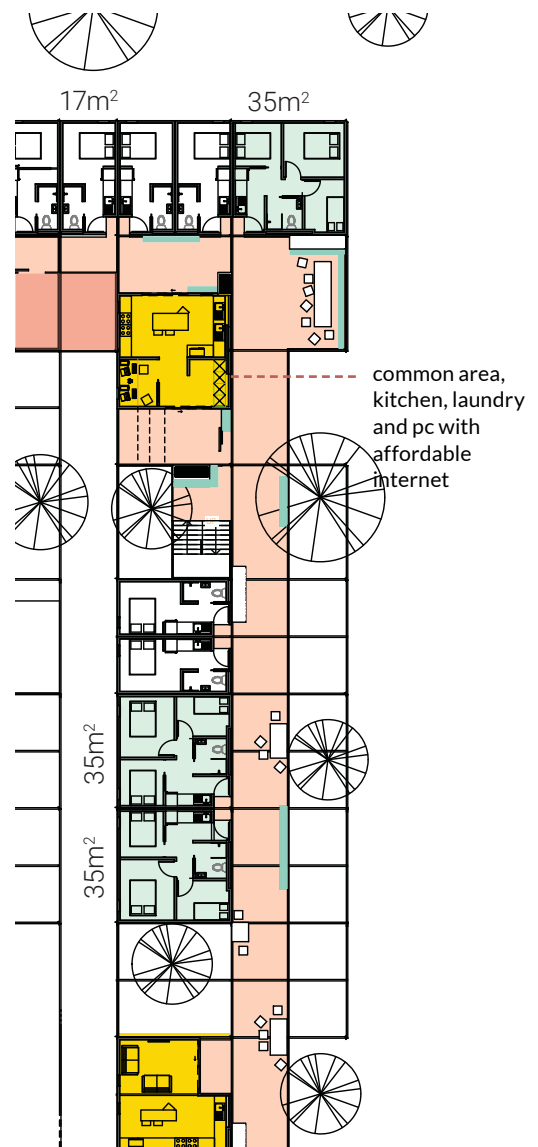
Collective Programme

The Family:

External use

Grounds project in urban condition

3 D Shisa nyama
Uncle + Grandfather

6 E daily appropriation of tuck shop
Aunt

1 C public space homework and sport
Sibling

Stable use

Changeable use

4 F Housing
Aunt

Mother outreach
Home based care training
ECD staff
CLT staff
Shisa nyama staff

Grounds internal space

2 A Early Childhood Development (ECD)
Child

5 B medical unit
Mother training

Internal use

Hierarchy of programme:

The number indicates phased development sequence

The letters indicates focus and investment groups

Fig 5.10 Diagram of collective programme (author, 2017)

Focus and investment groups

The child

The mother

The sibling

The uncle and grandfather

The aunt

Phased development

The sibling

The child (and informally the mother)

The uncle and grandfather

The aunt

The mother

3 Operational Anchor

Housing developed by community land trust to cover operational costs such as maintenance of services and structure, vegetation, salaries, legal requirements and upgrades.

 CLT will receive financial resources by tenants such as the shisa nyama, ecd, medical unit and mothers'' training

2 Economic Anchor

Office space as extension of shisa nyama, opportunity to sub lease and extra income for shisa nyama other than sales

Shisa nyama can partner will existing bucther down the road, limiting transport cost and strengthening existing economic opportunity

Shisa nyama will partner with the ECD providing meals for the children and in return secure a stable client

Skills training of the mothers enable them to become economically stable with the capacity to pay school fees

1 Social Anchor

ECD will receive funding from fees and social aid (public and private)

ECD form a partnership with recently upgraded Westbury clinic with a semi-temporary medical unit on the land parcel for safety of children and skills transfer to teachers and mothers

Administration office has clear sight lines of external space such as street and public square as well as internal space namely early childhood development (ECD)

Welded wire mesh fence, seperating Housing from internal workings of site such as the ECD

Public square mostly for afterschool activities hosted by dorcas centre, across the street, strengthened with shisa nyama

Housing as 'look out' tower visability at night

Welded wire mesh fence, able to see who is hiding behind the corner

morning

afternoon

Shisa Nyama with outdoor braai and kitchen located on edge activating the street corner, especially in the late afternoons. Acts as informal meeting place before public meetings in Rec hall, across the street

night
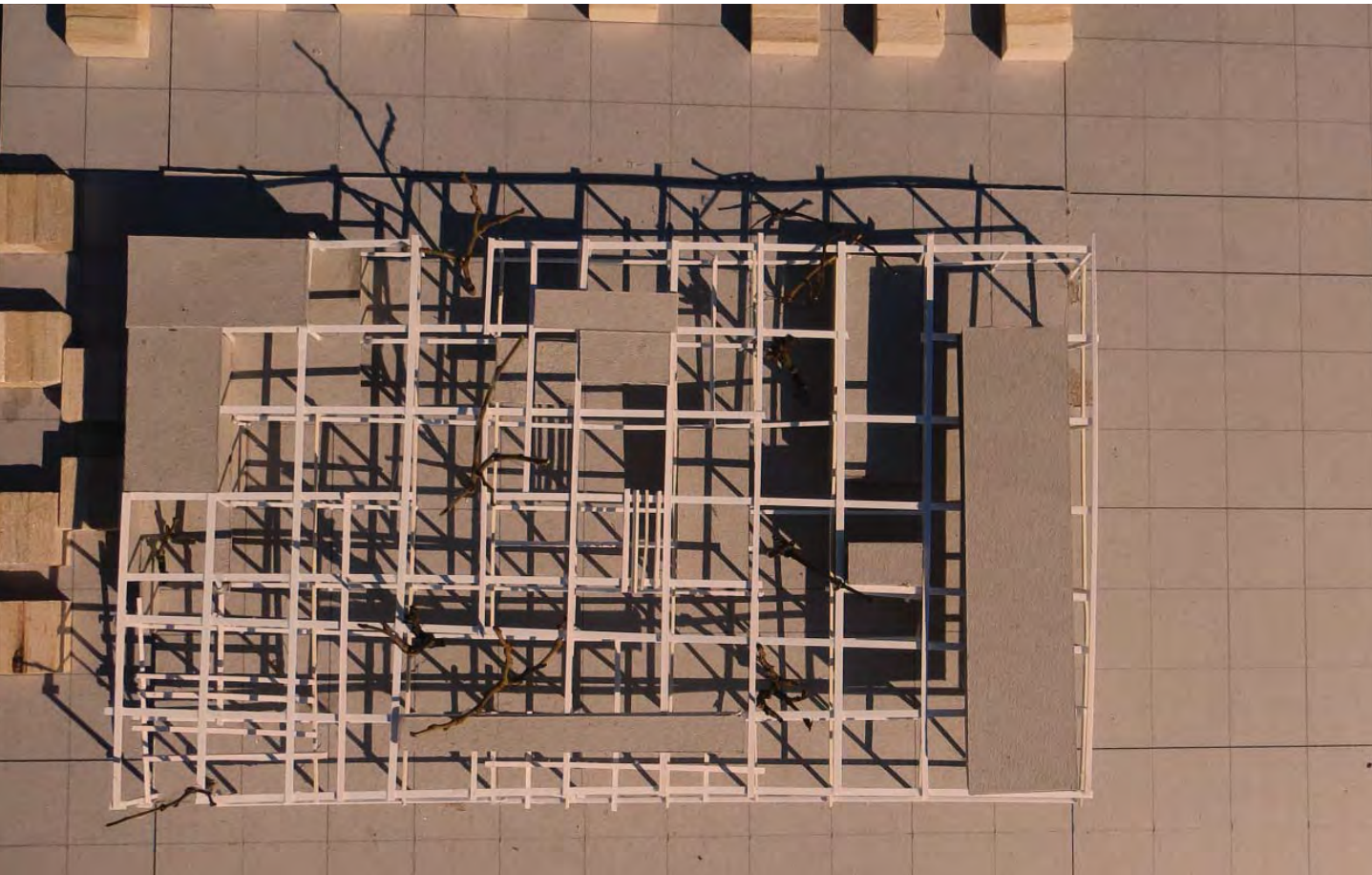
Fig 6.1 Design development model, August 2017 (author, 2017)

Chapter 6

Development
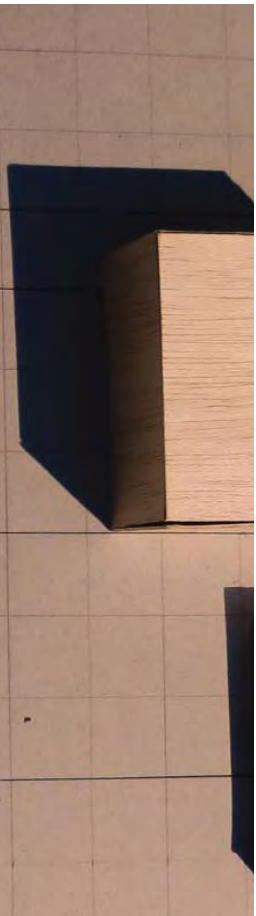
6.1 Concept development

The initial departure of this project was a circumstance of an ECD renting land from the City of Johannesburg (the dissertation is based on an on-going project in Westbury). The lack of ownership determined the temporary nature of the ECD. The study developed with the investigation of recent developments in Westbury and the understanding of local land difficulties within the South African land question. The study considered ownership structures such as city ownership, free hold title ownership and sectional title. Ownership by the city of Johannesburg limits development and multiplicity of land use along with the potential risk of poor urban management. Free hold title deeds required large amount of capital along with high risk of failure due to lack of support and capacity building. Land Reform and Rural Development Minister Gugile Nkwinti discusses the 'use it or lose it' approach with reference to rural land reform, but this could be argued for urban land as well. He stated that 90% of land bought by government for emerging farmers was unproductive and not functional with the state losing revenue (Mail and Guardian, 2010). Sectional title deeds could hinder the process of redevelopment and increase inefficient land use. A community land trust removes land from the market, provides stability and security for the neighbourhood while mediating between land use that the tenant needs and can afford.

Land and the history of land, both South African and Westbury, influenced the thinking of land as a finite resource and that land should be a shared resource. The built fabric was considered as fixed and temporal. This notion failed to acknowledge various scales of change and stable built fabric, particularly the scale of change based on time such as daily, 5 years or 50 years. This study acknowledged the need for a stable structure with changeable structures, then considered plug in or visiting structures in June 2017 (iteration 1.1). The spatial definition of the individual fixed buildings on site located at the two edges, was lacking and limited the opportunity of development. The introduction of a structural grid in August 2017 (iteration 2), following characteristics of open buildings, ordered the site and increased the opportunity of continual redevelopment and multiplicity of use. The grid as open building was refined with the notion of predetermined no development zone, service development lines, external spaces and construction methods (iteration 2).

The programme was developed based on the need and opportunities within Westbury, from an ECD with mothers training to, the consolidation of ECDs with mothers training and small scale urban agriculture, later the addition of a shisa nyama to strengthen the public edge and ground the project in the urban environment. The addition of a medical unit acknowledges professional partnerships and skills transfer. In South Africa, the majority of literature on land discusses housing a primary land use. The opportunity of housing further provided a stable tenant to cover operational cost. Office space as an extension of the shisa nyama highlights the opportunity to sub lease.

Fig 6.2 (left) Ground floor plan, June 2017 (author, 2017) | Fig 6.3 (right) Ground floor plan, October 2017 (author,2017)

1.1 - June 2017

Kitchen

Open square

Hall

Administration

Collective play

Secondary play

ECD

Individual garden

N

2 - October 2017

Shisa nyama and hall

Mini sport square for afterschool

Main entrance for housing

ECD

Administration

Collective play

Medical unit

ECD

N

6.2 Design development

White indicates public use and red indicates stable built fabric.
The project considered existing urban fabric to define natural squares and lingering spots

N
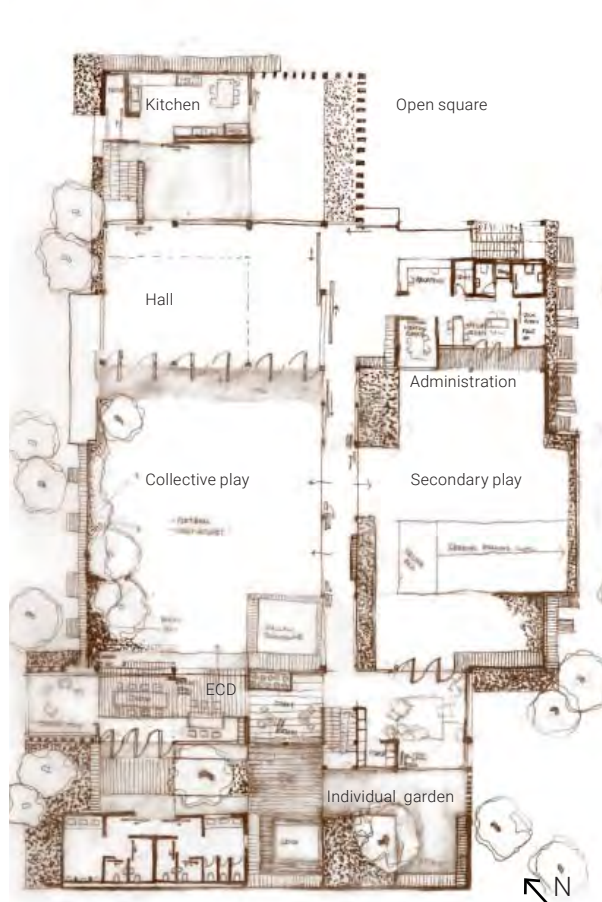
6.2.1 Location of land

The location of the project within a neighbourhoods' urban structure has influence on the design approach, such as site A (iteration 3) located at the apartment blocks, is undefined and open, limiting the use of the urban environment to define strict boundaries such as Site F, located in the civic precinct. The location of site A reduces the defensibility of the project, with the project forming part of the 'first layer of defence', not protected by the urban fabric from external threats, and therefore requiring stronger boundaries. The changeable nature of the project increases the ease of theft and vandalism, which is addressed with good governance, 24-hour use and utilising of the urban structure for protection.

Site C, located between the public swimming pool and primary school, showcase the increase intensity of impact in compact sites compared to sprawl. Site K is an existing park which highlights the need not to develop all open land with built fabric. Site L, located within the single residential unit highlights the importance of the project to be located on existing movement routes for increased economic opportunity. Site F best utilise the urban composition for protection and movement routes, and is located in the civic node along with single residential units, reducing the risk of theft and vandalism and supports diverse activities (although existing activities needs to be strengthened) (iteration 4).

Fig 6.4 (top left) Site location investigation, March 2017 (author, 2017) | Fig 6.5 (bottom right) Site plan development, March 2017 (author, 2017)

6.2.2 Internal functionality

Key to internal functionality are the boundary condition, internal courtyard, a formal circulation route, with public activities which locate to the street and private activities which locate to the back.

Precedents of ECDs in low-income areas indicates the potential of small scale interventions such as two classrooms and outdoor play, utilising the structure as playground, and limiting spatial requirements in relation to capital available.

The land parcel is too large for the single use of an ECD, with difficulties such as poor visibility of children and wasteful land use.

Iteration 1.1 and 1.2, June 2017 functioned internally, but neglected the urban condition. Iteration 5 showcase the potential of the shisa nyama located on the public edge, grounding the project in the urban environment with the braai area located on the Northwest corner of the land parcel, near Ebrahim Sons Butchery and providing eyes on the street, especially late afternoon. Iteration 6 and 7.1 shows the shift of the hall from then occupying space allocated for the shared central courtyard to the public edge, combined with the shisa nyama increasing versatility and reducing spatial requirements.

5

6

Fig 6.6 (left) Iteration 5 ground floor plan, July 2017 (author, 2017) (right) Iteration 6 ground floor plan, August 2017 (author, 2017)

1.2 - June 2017

This shift freed internal space with increased flexibility, although a clear separation of use is sometimes needed, such as separating housing from the ECD. The ablution located to the back, iteration 5 shifted, such as in iteration 7.1 for the protection of north-west sunlight, privacy for public for the ECD and freed up internal space. The mothers training area was initially located on the entire first level (iteration 1.2), but the single use was wasteful like the ECD. Iteration 7.2 consolidates and concentrates the mothers training to the back of the site, enabling the mothers and the ECD to work closely with majority of training occurring the classroom.

↖ N

7.1

Shisa nyama and hall

Mini sport square for afterschool

Administration

Services shifted back to provide space for hall, and strengthening the boundary edge

Collective play

ECD

↖ N

7.2

Housing

Mother training

↖ N
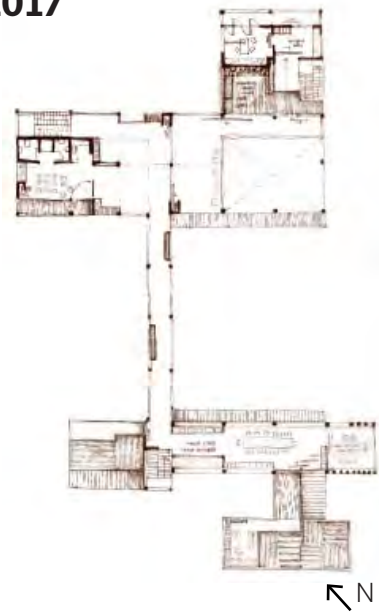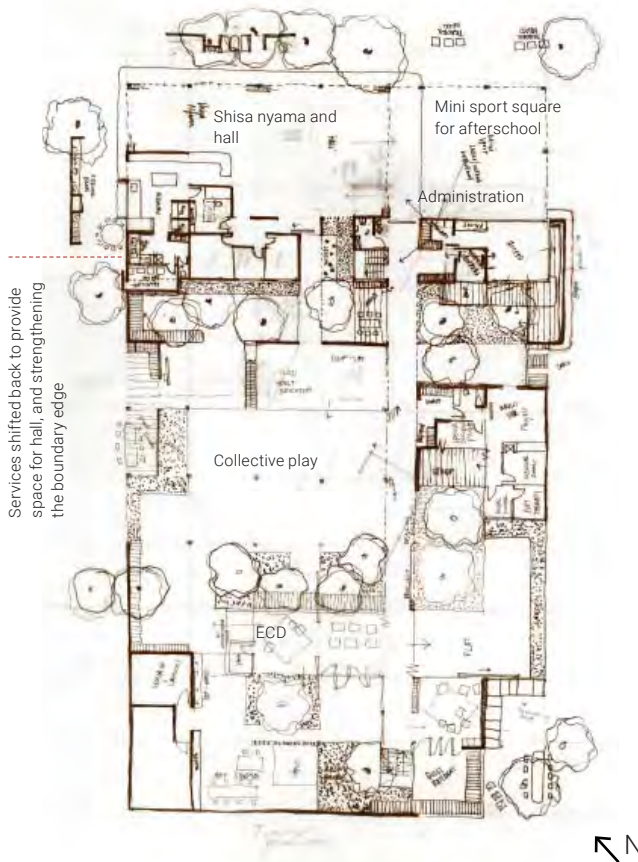
Fig 6.8 (left) Iteration 7.1 ground floor plan, September 2017 (author, 2017) | Fig 6.9 (right) Iteration 7.2 first floor plan, September 2017 (author, 2017 | Fig 6.10 (top right) Iteration 1.2 first floor plan, June 2017 (author, 2017)

121

6.2.3 Grid

6.2.4 Section

A grid alone has difficulties to differentiate ownership; required boundary namely two boundaries to ground the project, such as iteration 10. The definition of the boundaries shifted in iteration 11 to accommodate a step back from direct north-eastern sunlight, with spatial benefits such as a negotiation space between public and shisa nyama. The public interface boundary host public activities, yet clearly restricting access to internal functions of the land parcel allowing for privacy and protection. The existing building interface boundary, initially two storey was reduced to one to reduce impact such as casting shadows on existing residential units and being out of scale from the perspective of the homeowner.

The grid significantly influences the development of the land parcel and infill (Iteration 8). A uniform grid best supports flexibility, due to a regular module and standard lengths. Designing for change requires a balance between definition and vagueness. The grid can give direction to development, such as iteration 8, encouraging north-facing development. A 6m by 6m column grid and a 3m by 6m beam grid best accommodates between opportunities for infill and free space.

Iteration 9, June 2017, limited development and redevelopment, this approach consisted of open land with limited permanent buildings guiding infill and with foundations and vegetation. This iteration was poorly spatially defined, only accommodating a limited degree of dependency with majority of tenants being independent, with poor definition of system logic. This iteration highlights the difficulties of plain land tenure without architecture as guide and support. Iteration 10, with the introduction of a light structural grid highlighted the increased opportunity of changeability. Iteration 10 indicates the shift in the author's thinking of architecture, inverting the built fabric, with a focus on void compared to build fabric. This enhanced the author's normative position to define space and not to design buildings.

8 - August 2017

Direction of development

No development zone, the backyard

N
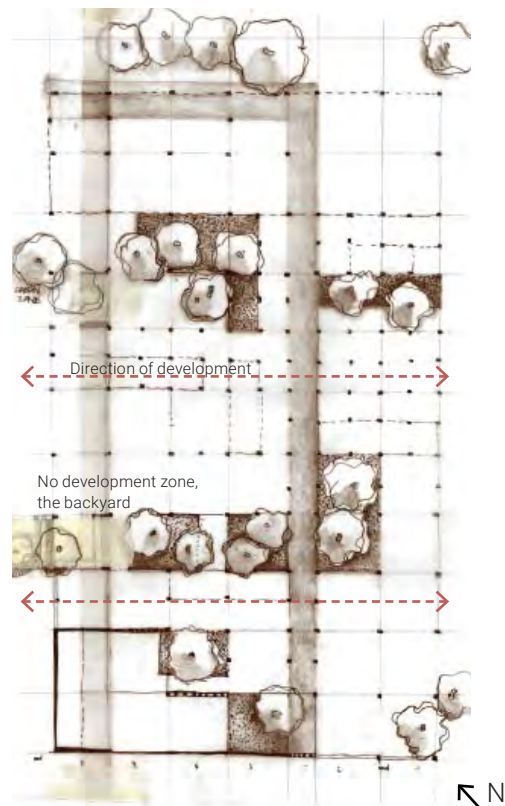
Fig 6.11 (left)Grid ground floor plan, August 2017 (author, 2017) | Fig 6.12 (right) Section, June 2017 (author, 2017)

9 - June 2017

Urban furniture as soft boundary

Roberts Avenue

stable base supporting vertical development

foundations to encourage future development

dark space due to overshadowing

Vegetation to limit development

existing built fabric, housing typology 1
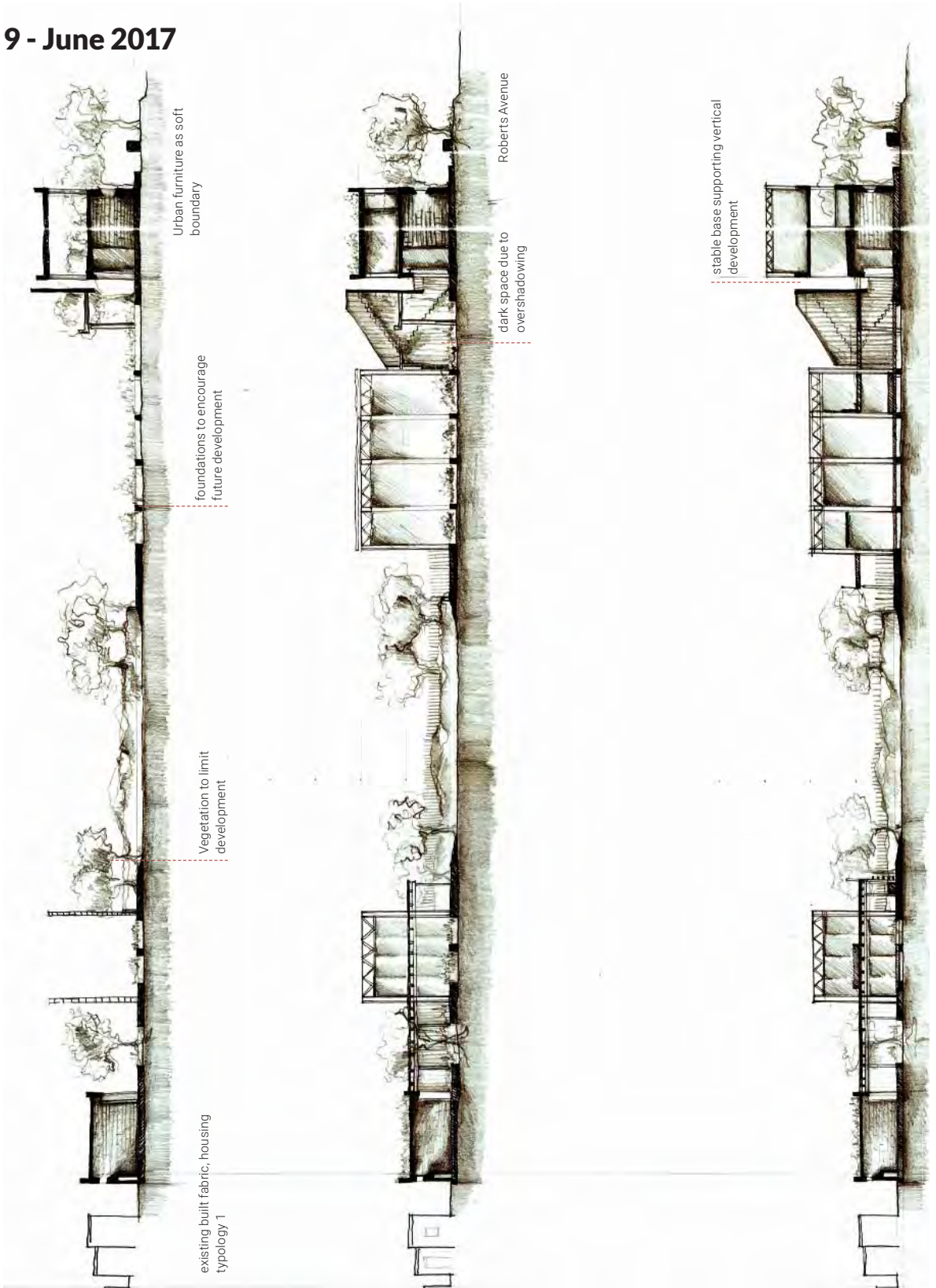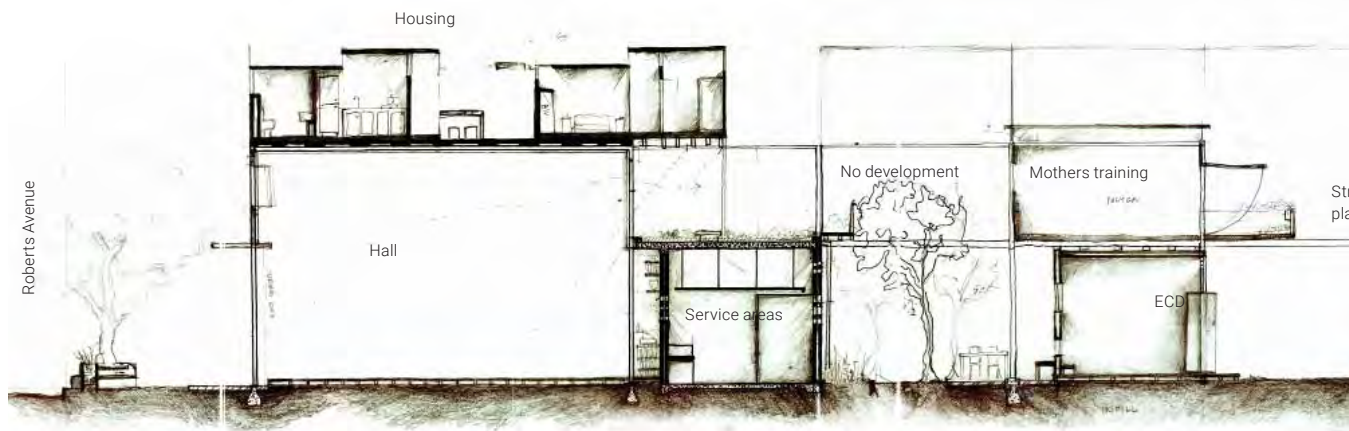
10 - August 2017

Housing relationship with grid, iteration 10 showcases the 3m cantilever and the development on the backyard (no development zone).

11 - August 2017

 structure becoming
ayground

No development

ECD

ECD

FOR CONSTRUCTION

INFILL
PANEL CONSTRUCTION

FIT OUT

potential future built fabric

No development

Existing built fabric

inverse of built fabric

August 2017

June 2017

N

Fig 6.15 Models of June 2017 and August 2017 (author, 2017)

13 - August 2017

N

14 - August 2017

reduce structural grid

N
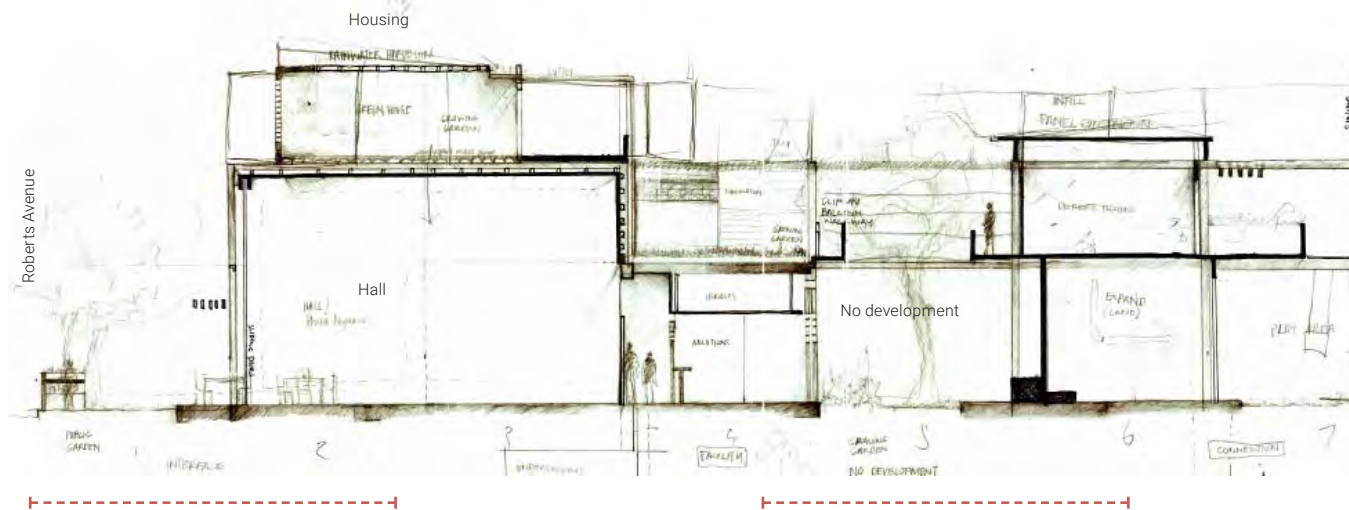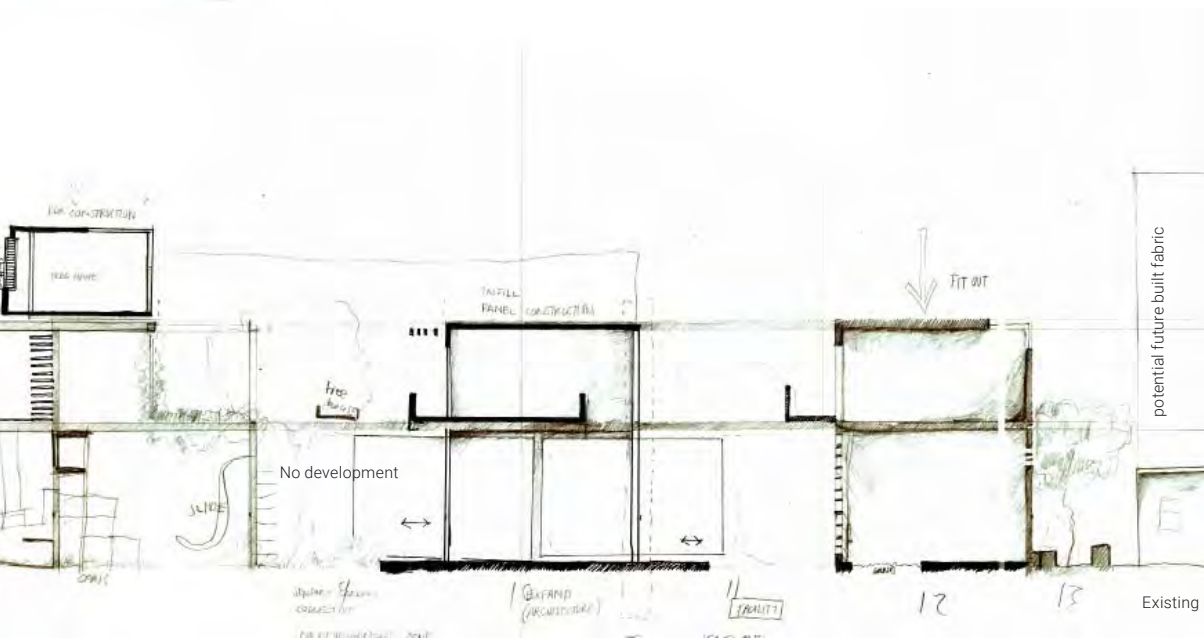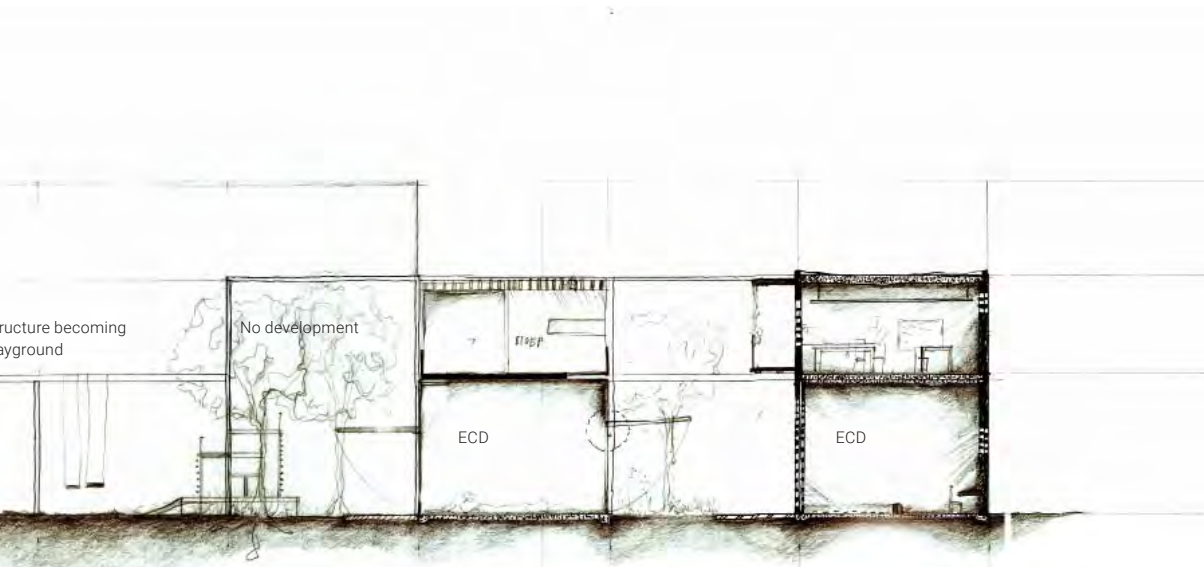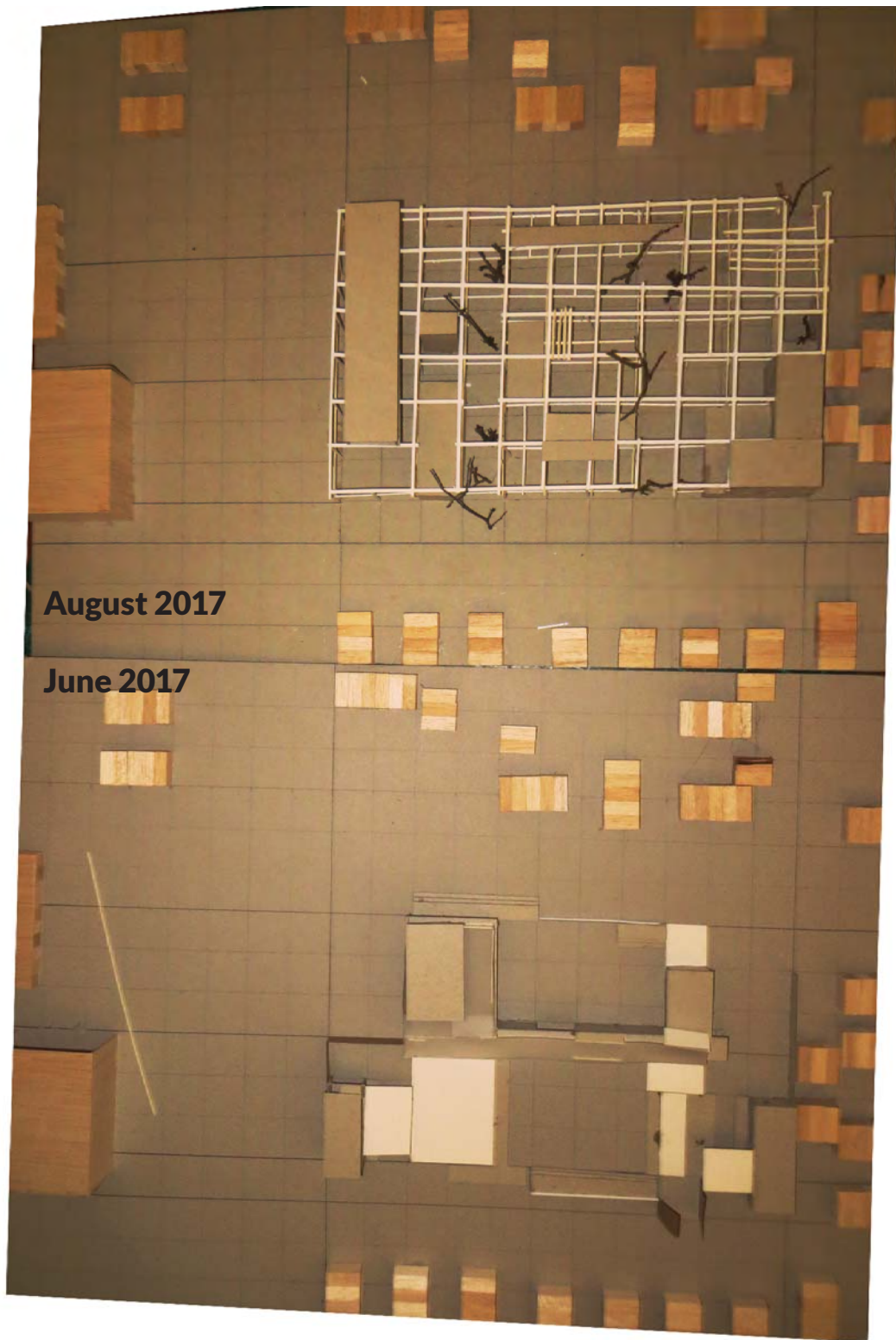
Fig 6.16 (top) Iteration 13 Models, August 2017 (author, 2017) (bottom) Iteration 14 Models, August 2017 (author, 2017)

6.2.5 Housing

Housing initially developed as independent units, such as iterarion 16 and 17. Iteration 15 had difficulties adjusting to the grid and stable fabric on both first and second level. The double row of housing caused difficulties of limited social space and provision of adequate daylighting. This iteration could host 58 people in 24 (17m2 units) and 2 (35m2 units).

Iteration 2 (October 2017) at initial development can host 70 people with 25 (17m2 units) and 4 (35m2 units), along with 3 (35m2 units) for common areas such as laundry, collective cooking, internet and semi-public streets as the stoep.

15

3m wide outdoor corridor

3m wide outdoor corridor

Fig 6.18 (left) Housing second floor plan, September 2017 (author, 2017) | Fig 6.19 (middle) Housing unit iteration, September 2017 (author, 2017) | Fig 6.20 (right) Ground floor plan, October 2017 (author, 2017)

16

17

N
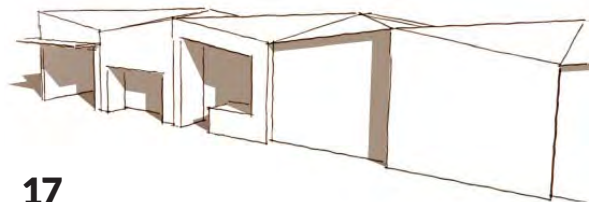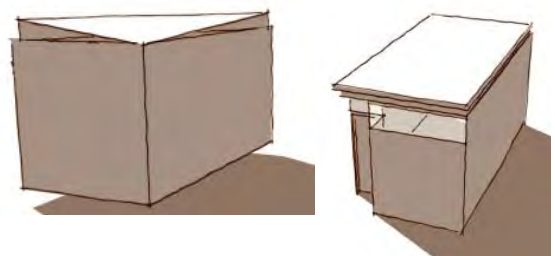
6.3 Collective approach

Learning and understanding of land tenure as development strategy were derived from Westbury, the site with support of literature, such as the notion of compact development within strict urban boundary is a direct response of the existing urban fabric the project is situated in, the question was how to develop without the opportunity to physically expand. Demolition should never be the initial response, for it is wasteful, further existing housing cannot be demolished unless housing of an improved quality is provided.

The main drivers of the design development were the aim to increase flexibility and land tenure options (a dialogue between definition and haziness), a consideration for daylighting and the notion to consolidate and concentrate activity, reduce spatial requirements and increase multiplicity of one room, such as class room 5, one room for activity of an ECD (morning), a music room (afternoon) and adult education (late afternoon). Internal functionality of each programme was first understood and then tested within the conditions of the project.

2 - October 2017

Shisa nyama and hall

Mini sport square for afterschool

Main entrance for housing

View through the development, increase neighbourhood visibility

Classroom 5 and 6

Collective play

Administration

Lingering spot

Medical unit

no clear view for privacy and security for the children

ECD

courtyard hidden from street

N
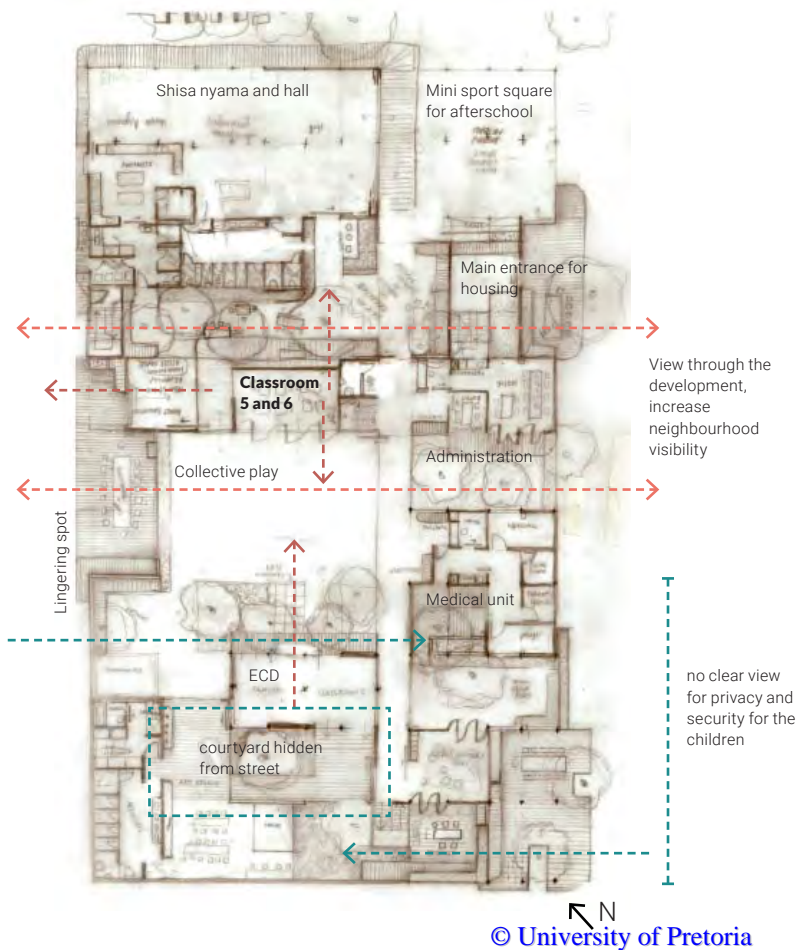
6.4 Plans along the way

18 Initial north-facing plan, this ignores the existing urban fabric . (March 2017)

N

19

N

22 odd spatial definition

N
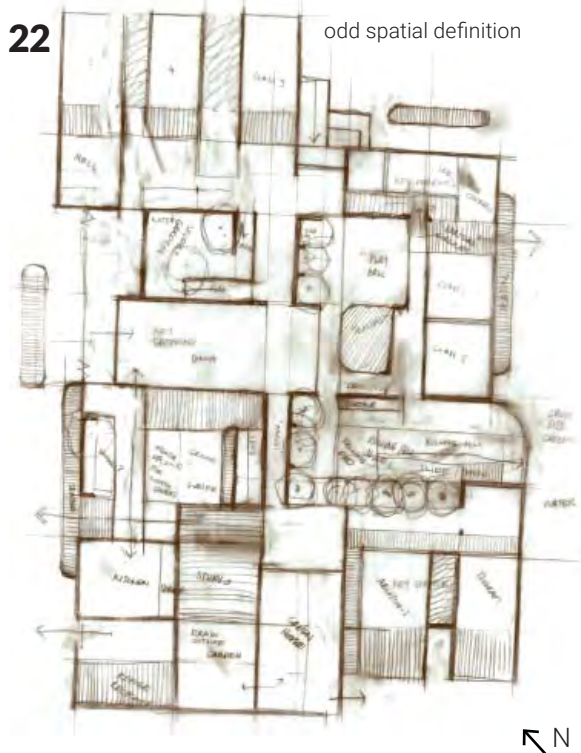
23 consideration for stable and changeable built fabric (May 2017)

N
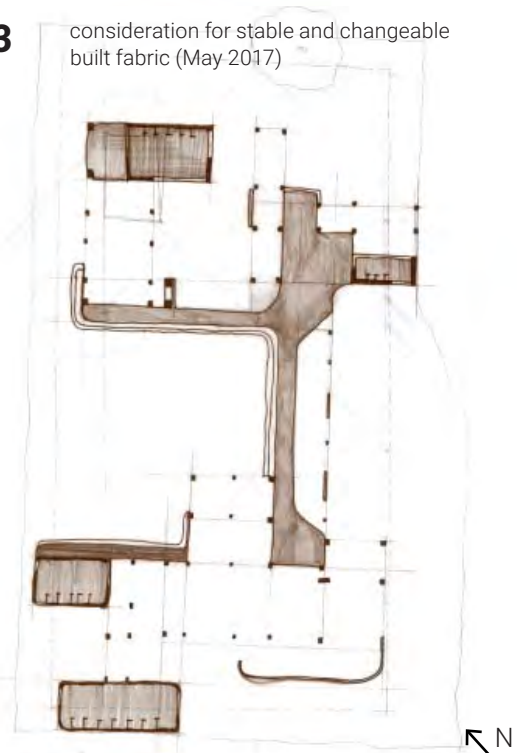
20 Investigation of outdoor space and key play areas, a test questioning the effect if architects designed the outdoor space first before interior space.

N

21

N
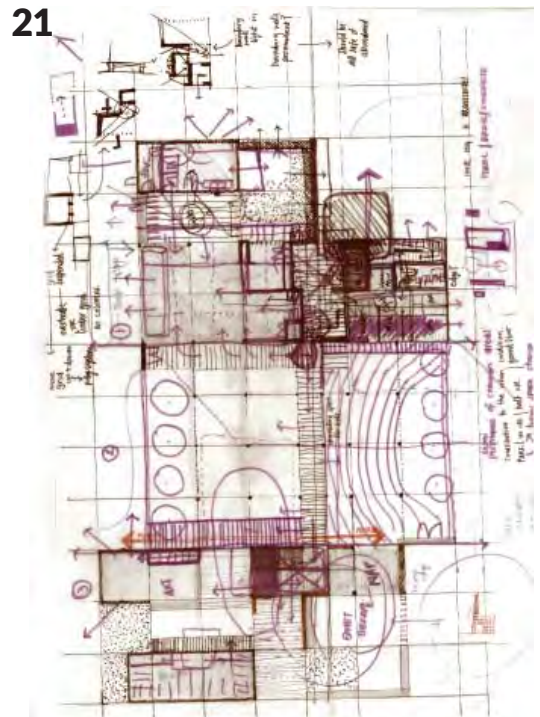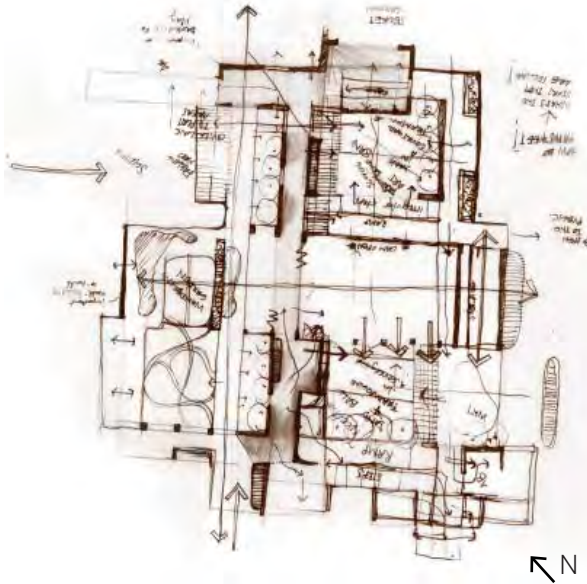
24 consideration for internal and external movement (May 2017)

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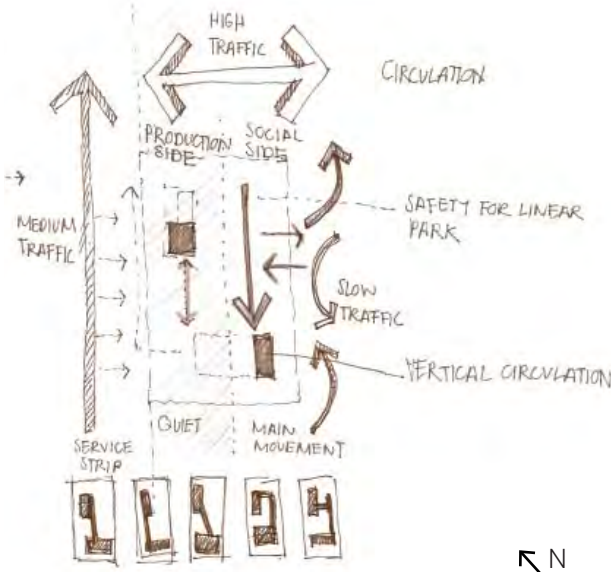
25 Initial 6m by 6m grid plan (May 2017)

N
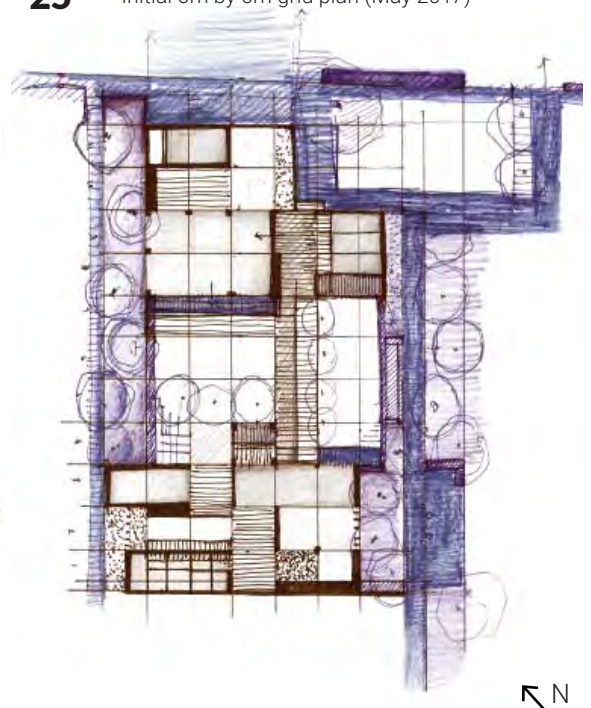
Fig 6.21 Plan development February to June 2017 (author, 2017)

6.5 Design

Shisa nyama

outdoor braai

lingering spot

Collective play

ECD

Main Housing entrance

Administration

Medical unit with
social welfare

lingering spot

N

office space
9m²

35m² Housing

Common area

view over
collective play
area

Staff room

Mother training

17m² Housing

N
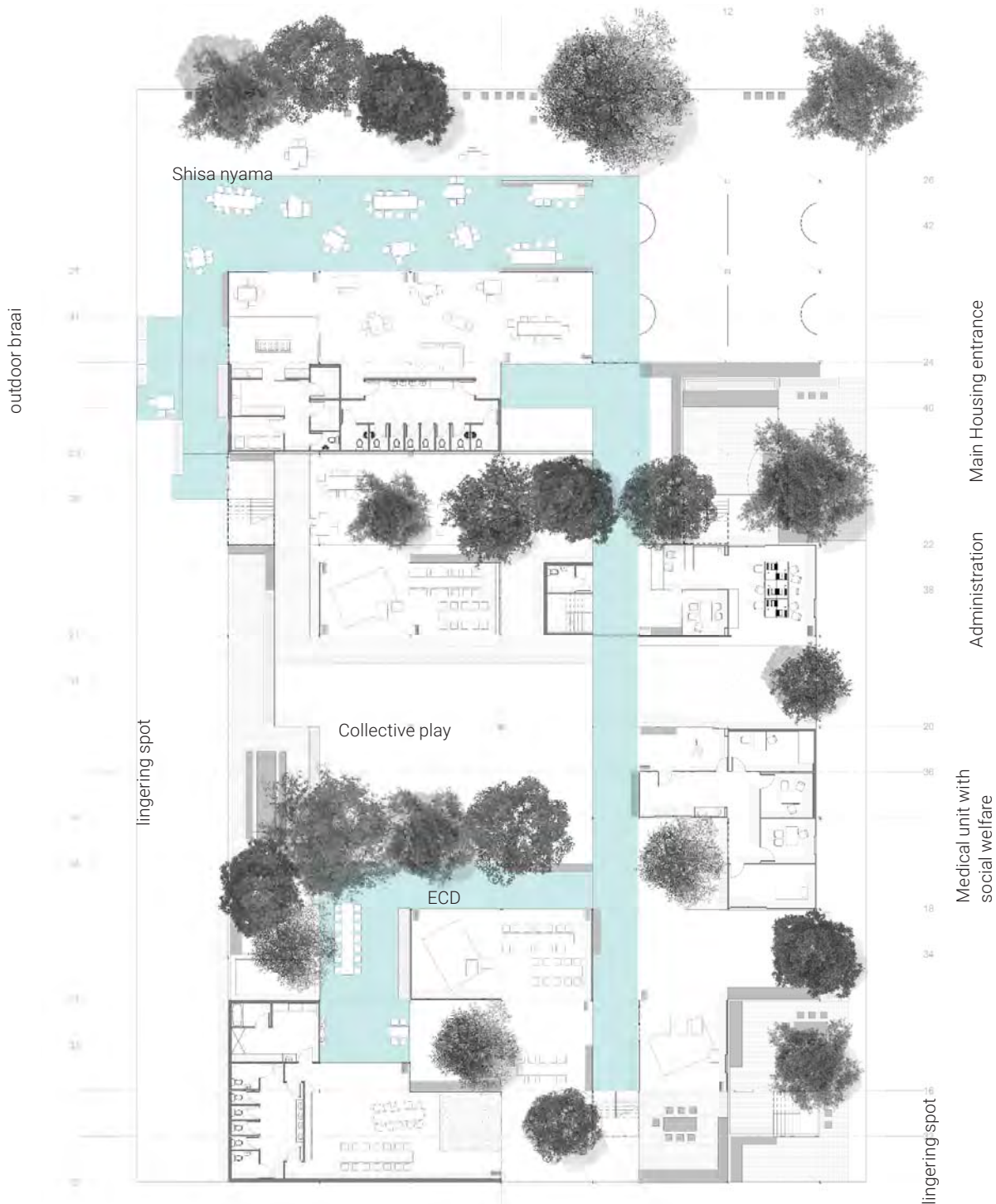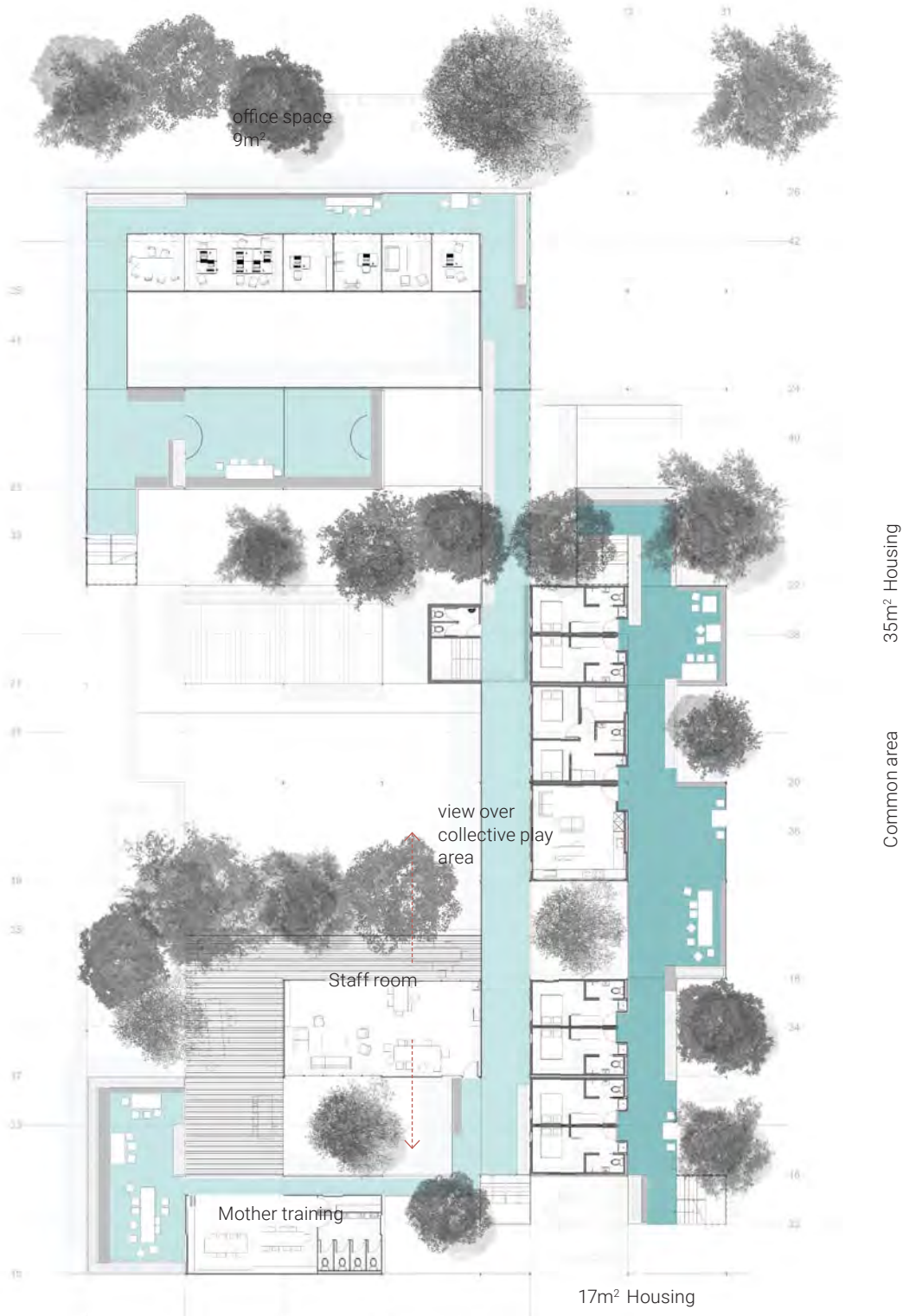
Fig 6.23 First floor plan (author, 2017)

133

B

Secondary circulation

Mini sport

Common area

Main circulation

A

B

35m² Housing

Common area

Secondary circulation

17m² Housing

N

The builf fabric shifts, a play between outdoor space
(backyards) and interior rooms

Restriction of structural
grid, this limits development
adjacent to the lingering
spot on street level

Fig 6.25 Section transition (author, 2017) | Fig 6.26 South East street elevation (author, 2017)

Infill steps back from
North- Eastern sun

Shisa nyama

the backyard, no
development zone

Fig 6.27 (top) Section B perspective (author, 2017) | Fig 6.28 (bottom) Street perspective (author, 2017)

Staff room

Staff room

ECD

12m by 12 m public square   Roberts Avenue
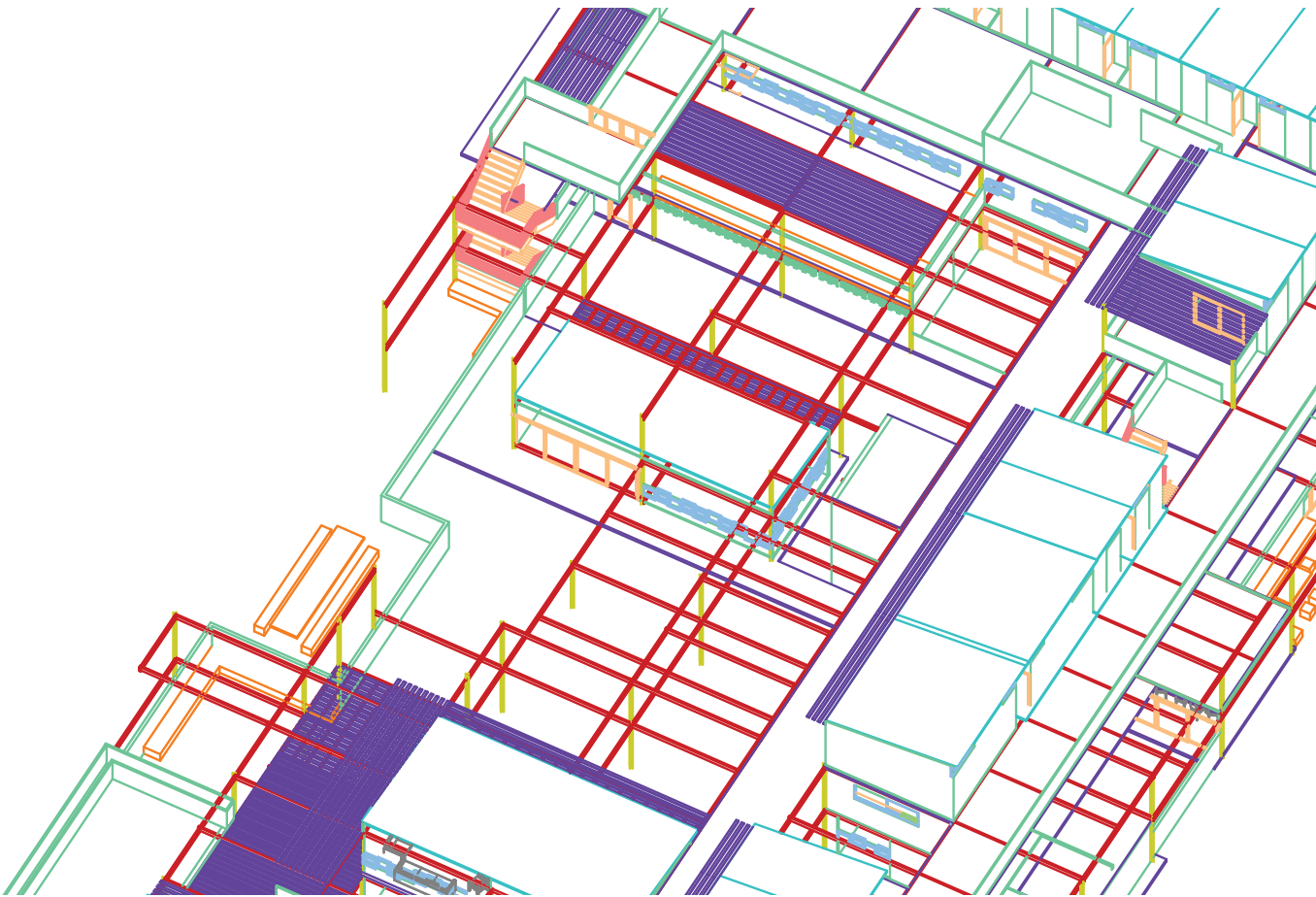
Fig 7.1 Overall structure (author,2017)
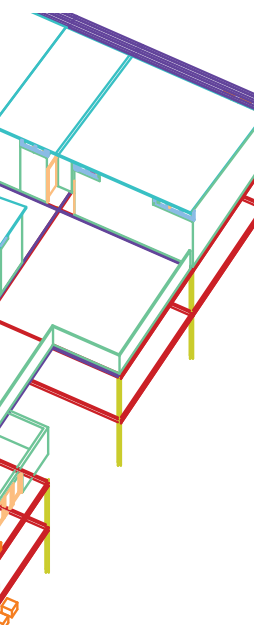
Chapter 7

Technology

7.1 Tenant options

Change is positioned in the ease of development, not the potential of disassembly. The dialogue between stable and changeable built fabric is further articulated with the dialogue of appropriation and infrastructure guided by existing responses visible in Westbury (refer to 1.4.3). The idea of 'infrastructure as base' explains the initial interaction, which is, the tenant uses infrastructure as is, with infill such as walls or furniture. 'Infrastructure as support' highlights the dialogue of working next to infrastructure, utilizing it to better position users in the urban environment such as informal traders occupying the public edge (direct support) or strengthening existing neighbouring functions such as Ebrahim and Sons butchery with the addition of shisa nyama, a meeting place to grill meat on an open fire (indirect support). 'Additions to infrastructure' extends existing infrastructure such as an 'insert approach', improving stable built fabric to meet tenant's needs. 'Manipulation of infrastructure' consists of physical alterations to stable built fabric such as addition to the steel structure to accommodate shading devices or the removal of a few columns to define an outdoor square. 'Infrastructure as Base', 'manipulation of infrastructure' and 'additions to infrastructure' are direct and internal interactions, whereas 'infrastructure as support' is indirect and external.

Open building systems may be noble in accommodating users' preference, but often, open buildings only accommodate one scale of infill, such as the Torra David (Baan, 2013) with the requirement of wall systems. Scales of dependency on stable built fabric, as in this project, is expressed as use and fit-out, infill and/or insert. Fit-out is limited to the interior such as ceilings and wall partitions. Infill is characterised by lightweight sandwich panel construction with the intention to be easily assembled and dissembled, maintaining durability and thermal qualities. Insertions comprise of lightweight frame construction such as light gauge steel systems, enabling the unit to be mostly independent from stable built fabric
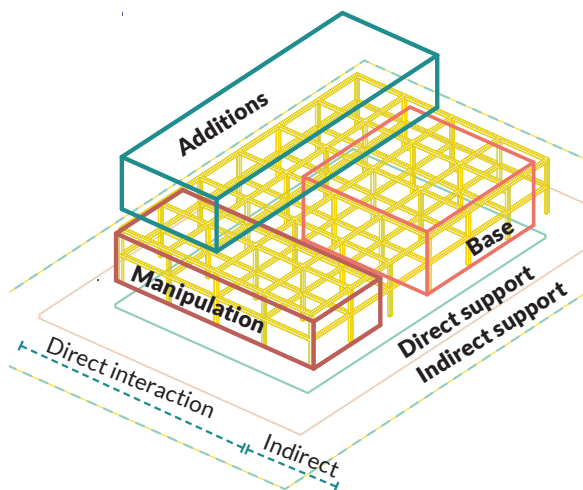
Fig 7.2 Diagram of appropriation of infrastructure (author, 2017)

INSERT
Built fabric ownership of Tenant

INFILL
Built fabric ownership of Tenant
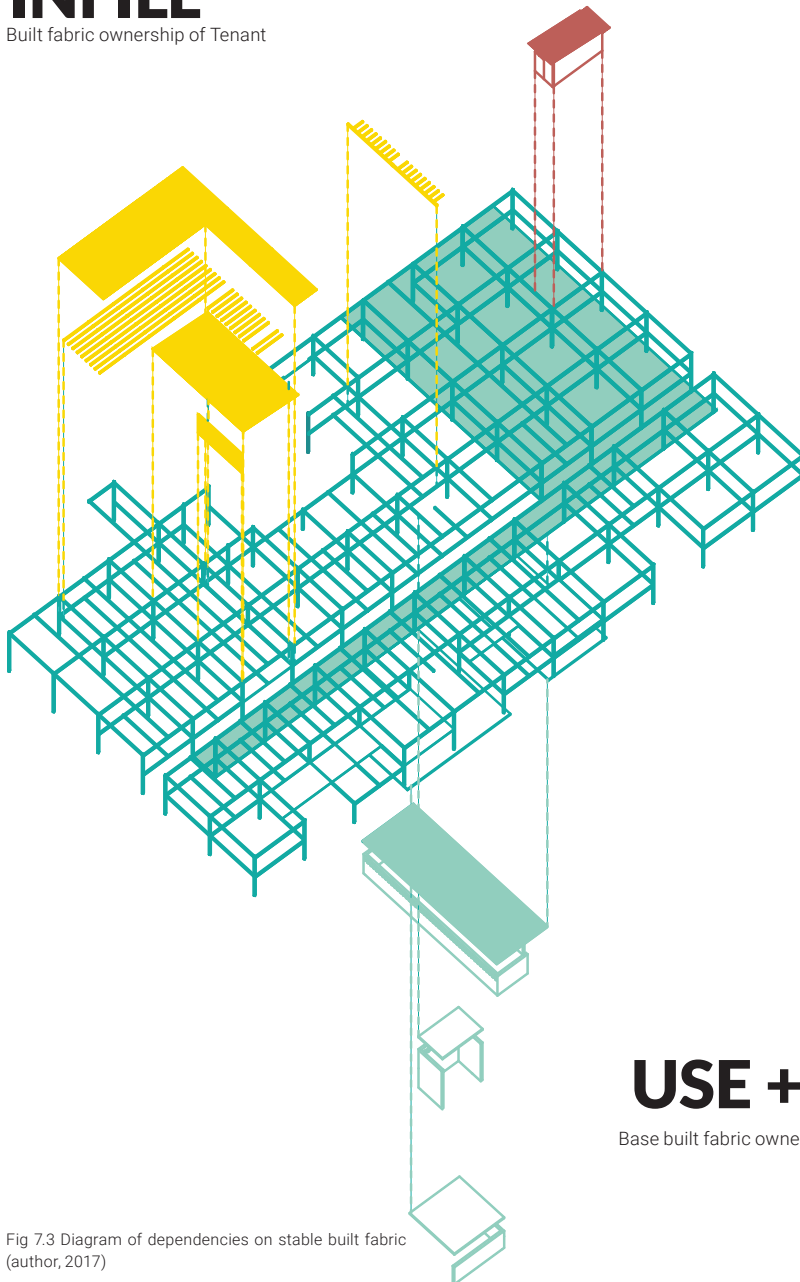
USE + FIT-OUT
Base built fabric ownership of CLT (Community Land Trust)

Fig 7.3 Diagram of dependencies on stable built fabric (author, 2017)

7.2 Construction approach

This thinking is further articulated in three main construction approaches namely wet construction, dry construction and no construction.

1 Wet Construction
The ruin of the urban park

1. Foundations namely cast in-situ concrete raft foundations and column footings
2. Urban furniture mostly face brick

2 Dry Construction
The effort of building

1. Steel construction such as hot rolled steel unequal angles and channels
2. Masonry construction such as hydraform and precast concrete floor
3. Panel construction such as MgO Board with EPS sandwich wall panel and Chromodek with EPS sandwich roof panel
4. Frame construction such as light gauge steel with Mgo Board and Chromodek cladding

3 No Construction
The backyard

1. Vegetation

7.2.1.   Wet construction: The ruin of the urban park

Urban vacant properties are often negative urban spaces. The condition of a property at the end of use must be considered to reduce wasteful- and inefficient land uses along with negative voids in the urban fabric, reducing the potential of hijacked buildings. The intention of the CLT is to contribute to the urban environment past its use and ownership, namely the redevelopment of land (refer to 5.6.1), defining space for future development or temporary appropriations. Aligned with the intention of public use as default space use, the permanent built fabric is considered as an urban park. The permanent built fabric comprises of cast in-situ concrete raft foundations, cast in-situ concrete column footings and face brick urban furniture and later addition of underground water tanks (refer to 7.4). Raft foundations are limited to the main circulation route and public edge area, deliberately not providing further concrete platform for development, to accommodate land based uses such as urban agriculture or recreational activities, maintaining a degree of soft landscaping. Face brick urban furniture accommodates temporal appropriation such as spaza shops and homework areas, supporting public accessibility of the CLT.
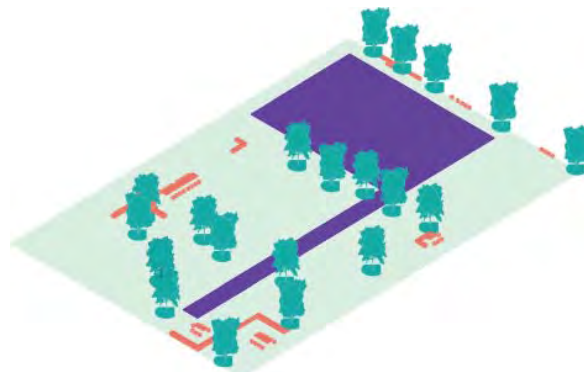
Fig 7.4 Diagram of wet construction (left over) (author, 2017)

7.2.2 Dry construction

Change is determined by effort required, financial or physical. Dry construction offers the potential of removal and change, although a scale of permanence of materials should be acknowledged, for instance it is less likely that a Hydraform wall will be removed, compared to lightweight sandwich panel wall system, both elements representing 'construction of change'. Dry construction methods are order according to effort required. Hydraform is a stable material in 'construction of change' followed by structural steel systems, additions to structure, frame construction, sandwich panel construction, fit-out and use. Dependency on stable built fabric increases with temporality of material, for instance panel construction is dependent on stable fabric compared to light gauge steel construction which can act independently.

Hydraform consist of interlocking blocks, locking back to front, top and bottom which supports a dry stacked approach, eliminating 70% of mortar use. Mortar is use in the first few courses and the top 3 courses. Hydraform is three times quicker than conventional bricks, reducing cost and time. Hydraform is produced on site, limiting transportation, comprises of local soil and 10% cement mix, with the benefit of good thermal properties. Hydraform is a South African company located in Johannesburg (Hydraform, 2017). Hydraform construction is manipulated, defining openings by shifting the brick slightly; to reduce types of materials used, such as glass, limiting the effect of vandalism when building is not in use, while maintaining ventilation and day lighting. Hydraform construction is used for facilities such as ablutions within the CLT.
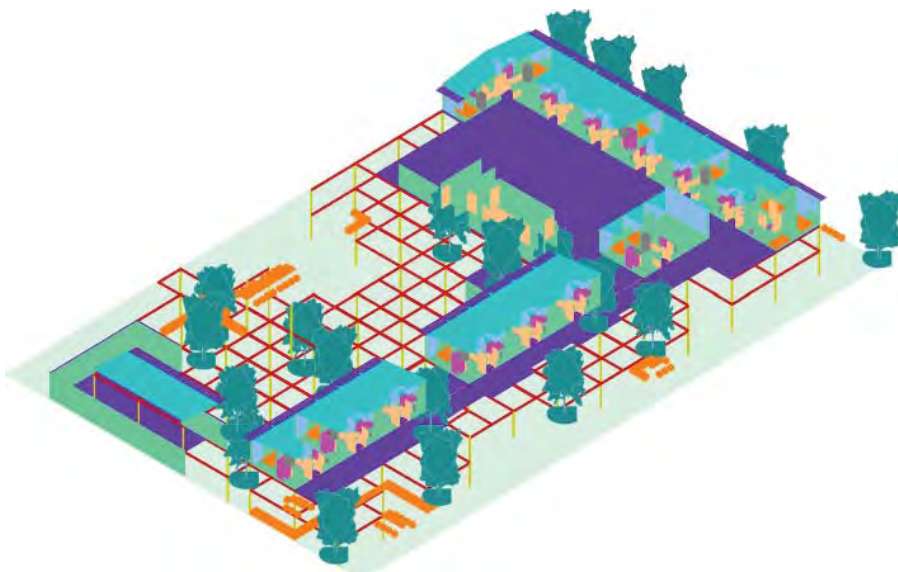
Fig 7.5 diagram of project (author, 2017)

7.2.2.1. Steel structure

The steel structural system is based on a 6mx3m (beam system) or 6mx6m (column system) module grid to best accommodate visiting structures while maintaining flexibility and material efficiency. The column is expressed in two unequal angles of 150x90x15 mm, back to back, bolted together, limiting thermal breaks, and allowing for disassembly and recyclability at end of use. It is an appropriate host to visiting wall systems, limiting need for additional connections and base plates. The beam systems comprised of 200x75x25 hot rolled steel taper flange channel spanning 6m and 100x50x11 hot rolled steel taper flange channel spanning 3m.

Additions to structure comprises of rhinowood as decking material and shading device along with precast elements such as slotted storm water channels. Rhinowood is wood treated to change chemical and physical composition for increased durability and reduced movement such as cupping. The wood is thermally modified and treated with an impregnation process, the wood is less susceptible to damp (thermally modified) and increased density, strength and hardness achieved by filling the voids of cells through a pressure process (impregnation process), (Rhinowood, 2017).
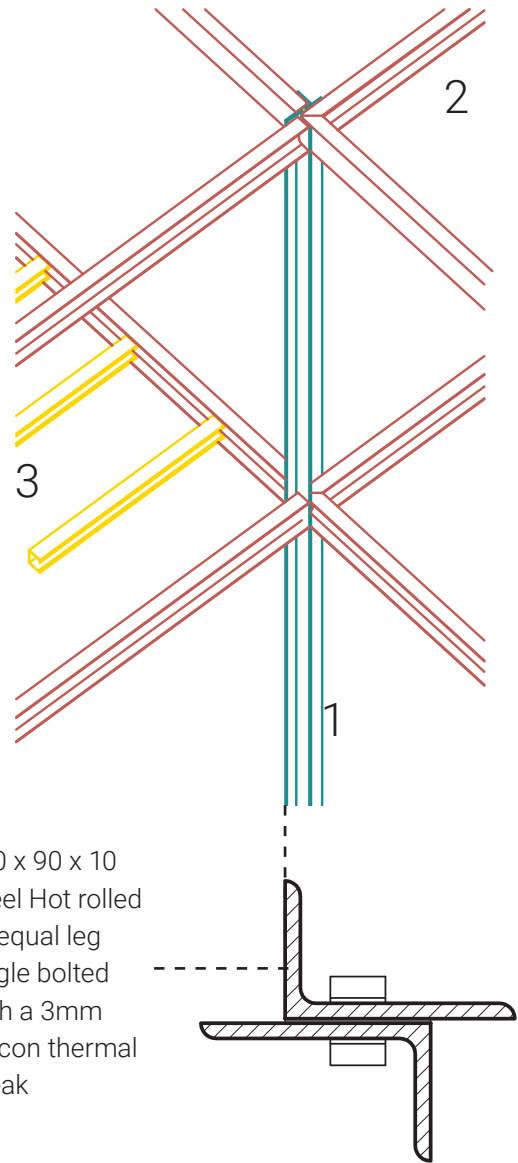
150 x 90 x 10 Steel Hot rolled Unequal leg Angle bolted with a 3mm Silicon thermal break
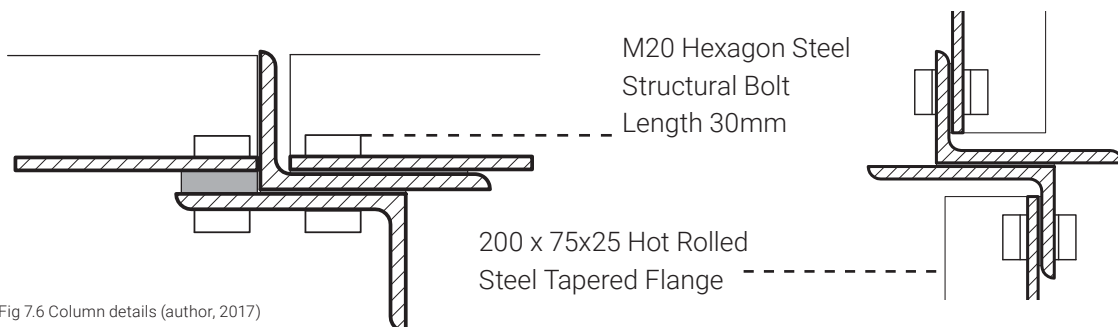
M20 Hexagon Steel Structural Bolt Length 30mm

200 x 75x25 Hot Rolled Steel Tapered Flange

Fig 7.6 Column details (author, 2017)

7.2.2.2. Frame construction

Frame construction is expressed as light gauge steel systems cladded with Magnesium Oxide Board (MgO) (wall and floor material) and Chromodek as roofing material. Light gauge steel reduces time of construction, limited waste and reduced transportation cost. Components are manufactured in factory conditions with embodied energy being 50% less than conventional masonry wall and more than 70% of the steel used is recycled. Light gauge steel is durable, a characteristic generally not perceived with changeable and temporal built fabric (Schmidt, 2013:473). Frame construction is aligned to 'insert' articulated in housing units.

MgO was developed as an alternative to fibre cement board, and is widely available in South Africa. MgO board is a light weight material and is environmentally sustainable with a zero-carbon footprint, has a high sound insulation, water and moister resistance, and high impact strength. Applications include commercial, residential buildings, health care facilities, and recreation, culture, government and education structures. MgO can be used as part of a wall system or a floor system, available in a 1200mm module (1200mm by 3000mm) (Develop Africa, 2016).

7.2.2.3. Panel construction

Panel construction consists of MgO board with EPS (Expanded Polystyrene) sandwich panel, in a module of 1200mm with tongue and groove connection system. MgO is often used in mobile homes of construction camps, an example of architecture without land. EPS is a thermal insulation which is recyclable, resistant to aging, mildew, bacteria and rot, is easily cut with conventional hand tools (Isover, 2017).Panel construction is aligned with 'infill' articulated in the ECD (early childhood development), shisa nyama, medical unit and mothers training unit.
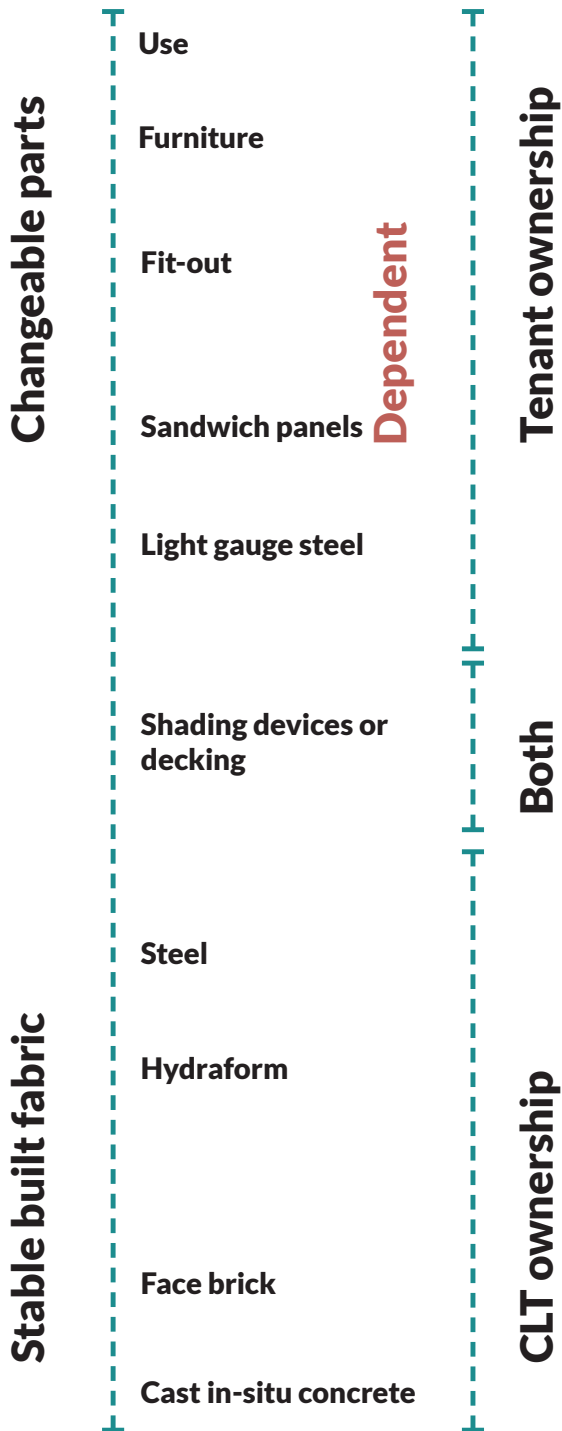
7.2.3. Material strategy

'Construction of change' is dominated by standard or prefabricated building components, although for overall material efficiency, types of materials used should be limited to the minimum, reducing capital cost (buying in bulk), better maintenance strategies with the potential to use a single material in multiple scenarios, considering material flexibility. MgO board can be used as internal and external cladding, sandwich panel system, and floor or ceiling systems. Rhinowood is used as external decking and shading devices with the unequal angles used as columns and gutters.

Changeable parts

- Use
- Furniture
- Fit-out
- Sandwich panels
- Light gauge steel
- Shading devices or decking

Dependent

Tenant ownership

Both

Stable built fabric

- Steel
- Hydraform
- Face brick
- Cast in-situ concrete

CLT ownership

Fig 7.8 Diagram of dependency of materials (author, 2017)

7.2.4. Thermal qualities of materials

Thermal conductivity (K-value), thermal resistance (R-value) and thermal transmittance (U-value) of a material influences the interior environment. Lightweight materials such as 'construction of change' are general perceived as poor thermal resistors (no thermal mass). Two 10mm MgO board with 55mm EPS, a total thickness of 75mm has a u-value of 3 W/m2K (EPS has a K-value of 0.04), whereas a 250mm brick wall has a u-value of 2 W/m2K and 150mm cast in-situ concrete wall a u-value of 3.9 W/m2K (the engineering toolbox, 2017). A better u-value can be achieved by increasing the thickness of the EPS, a thickness of 150mm has a u-value of 0.22 W/m2K. Dependent on need and use the thickness of the sandwich wall or insulation will vary. A vertical single glazed window in a metal frame has a u-value of 5.8 W/m2K (the engineering toolbox, 2017), whereas clear polygal thermogal, with a thickness of 32 has a u-value of 1.3 W/m2K (Plazit Polygal , 2013).

The project achieved an initial SBAT rating of 3.8, at a stage of development where renewable energy strategies such as solar power has not yet been implemented. The SBAT tool emphasised well located land and this projects position, that land tenure development strategies must be well located close to economic opportunity.

7.2.5 Connections

The connection between dependent infill such as sandwich panels and the steel column can be expressed in mainly three options : aligned with structure (1) inside structure or outside structure (2)

1

150 x 90 x 10 Steel Hot rolled Unequal leg Angle bolted with a 3mm Silicon thermal break

3mm neutral silicon for expansion and thermal break

Aluminium Frame/ Wall Track

3mm neutral silicon for expansion and thermal break

200 x 75x25 Hot Rolled Steel Tapered Flange (spacer)

MgO Board with EPS sandwich panel
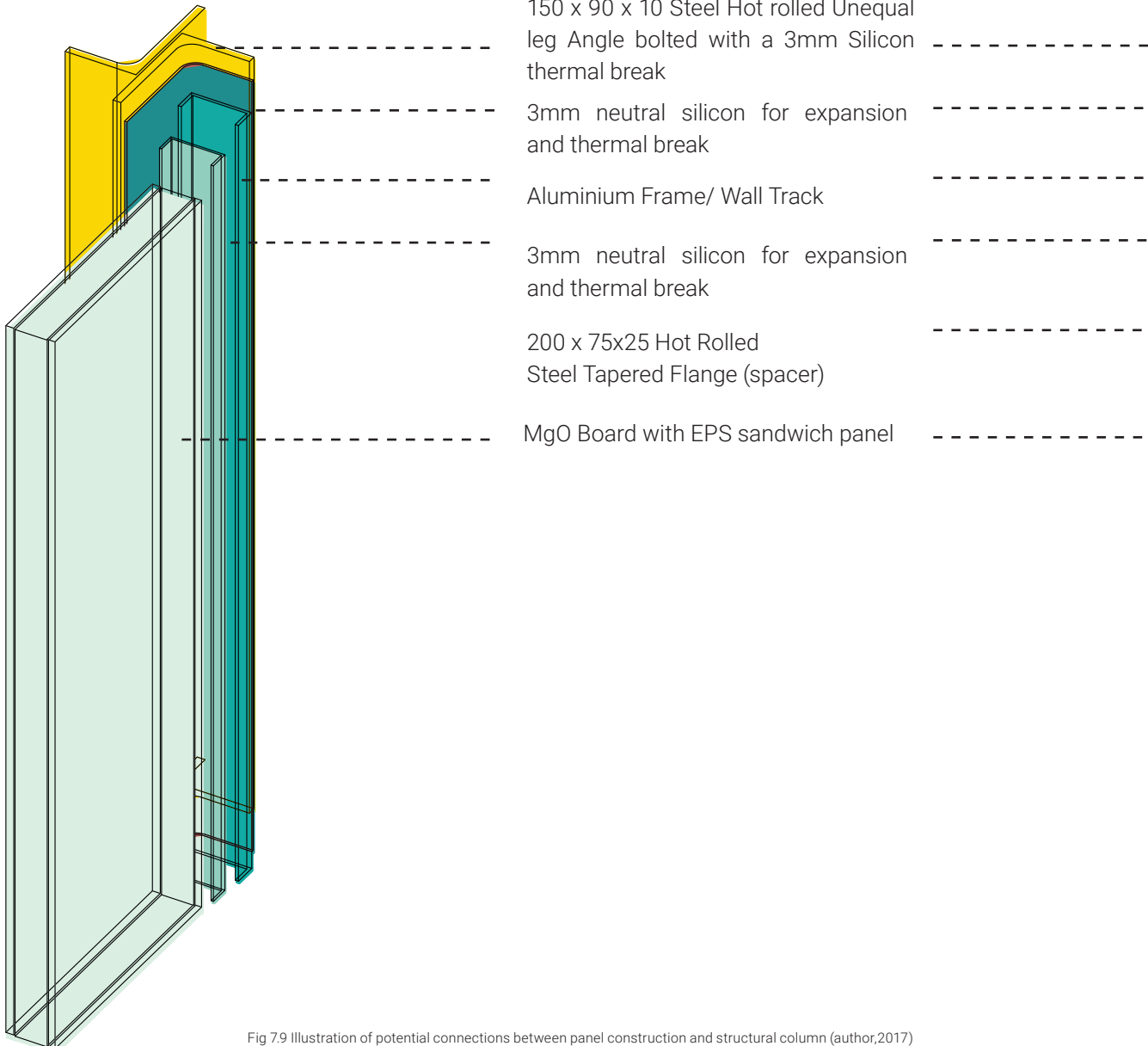
Fig 7.9 Illustration of potential connections between panel construction and structural column (author,2017)
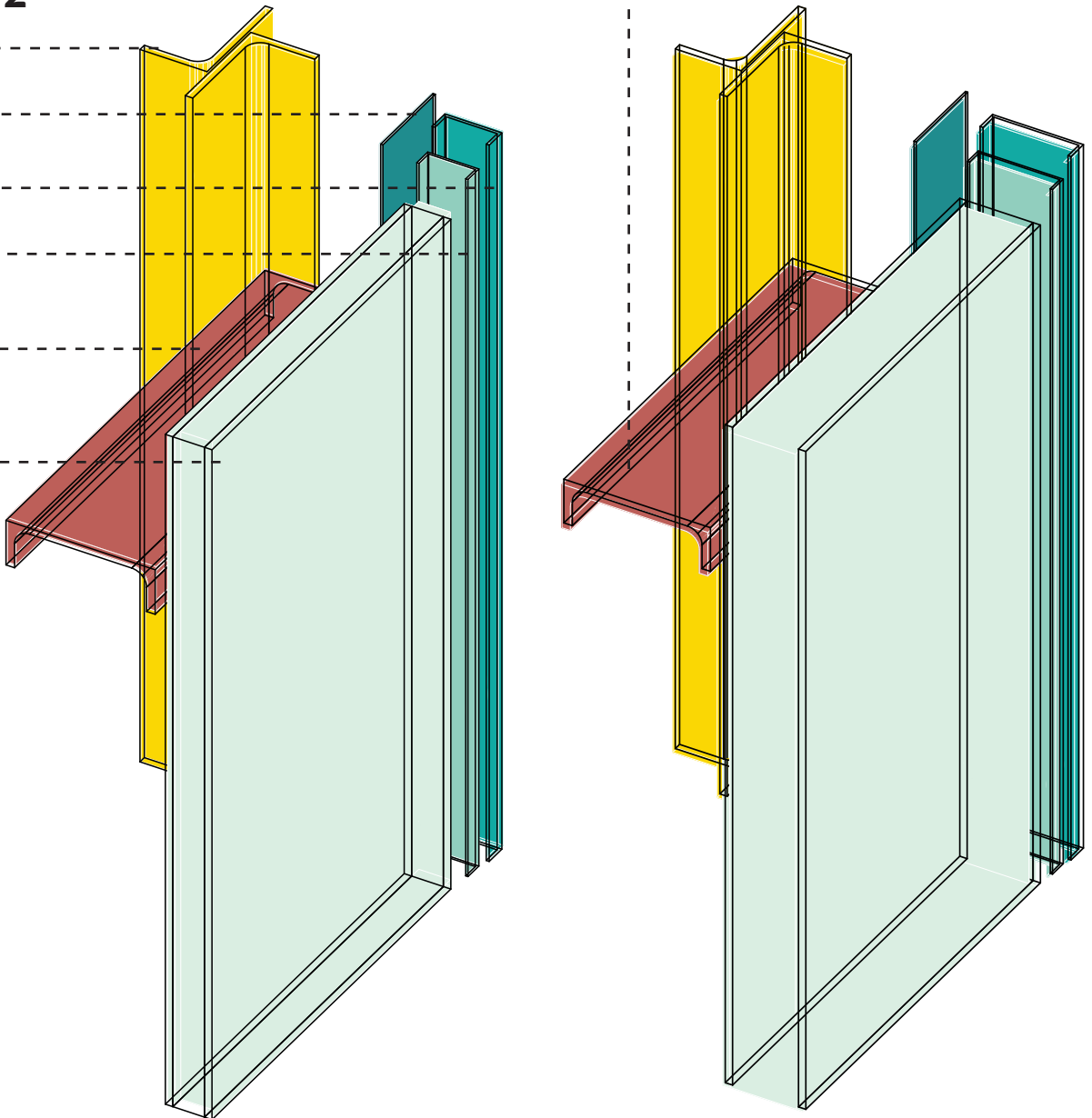
200 x 75x25 Hot Rolled Steel Tapered Flange or similar (depending on need) as spacer appropriately accommodates various thickness of wall panels, this increases the option of infill

2

7.2.6 Openings

Openings are treated as a custom element comprised of standard elements namely aluminium frame with Polygal multiwall. Polygal is an appropriate material (UV protected polycarbonate) compared to glass. Polygal is impact resistant, lightweight, recyclable, no waste during production, excellent fire resistance and UV protected with good u-values (between 1,3 and 3,9 W/m2 per °C depending on thickness.) Openings are part of panel construction, designed within the dimensions of a typical sandwich panel which is 1200mm by 3000mm.

1200mm

3000mm

Aluminium Frame

Secondary Side hinged Aluminium Frame

32mm Polygal thermogal

Third Aluminium Frame

Screen for to control daylighting reducing overlit spaces

Fig 7.10 Illustration of opening panels as part of panel construction. Author 2021
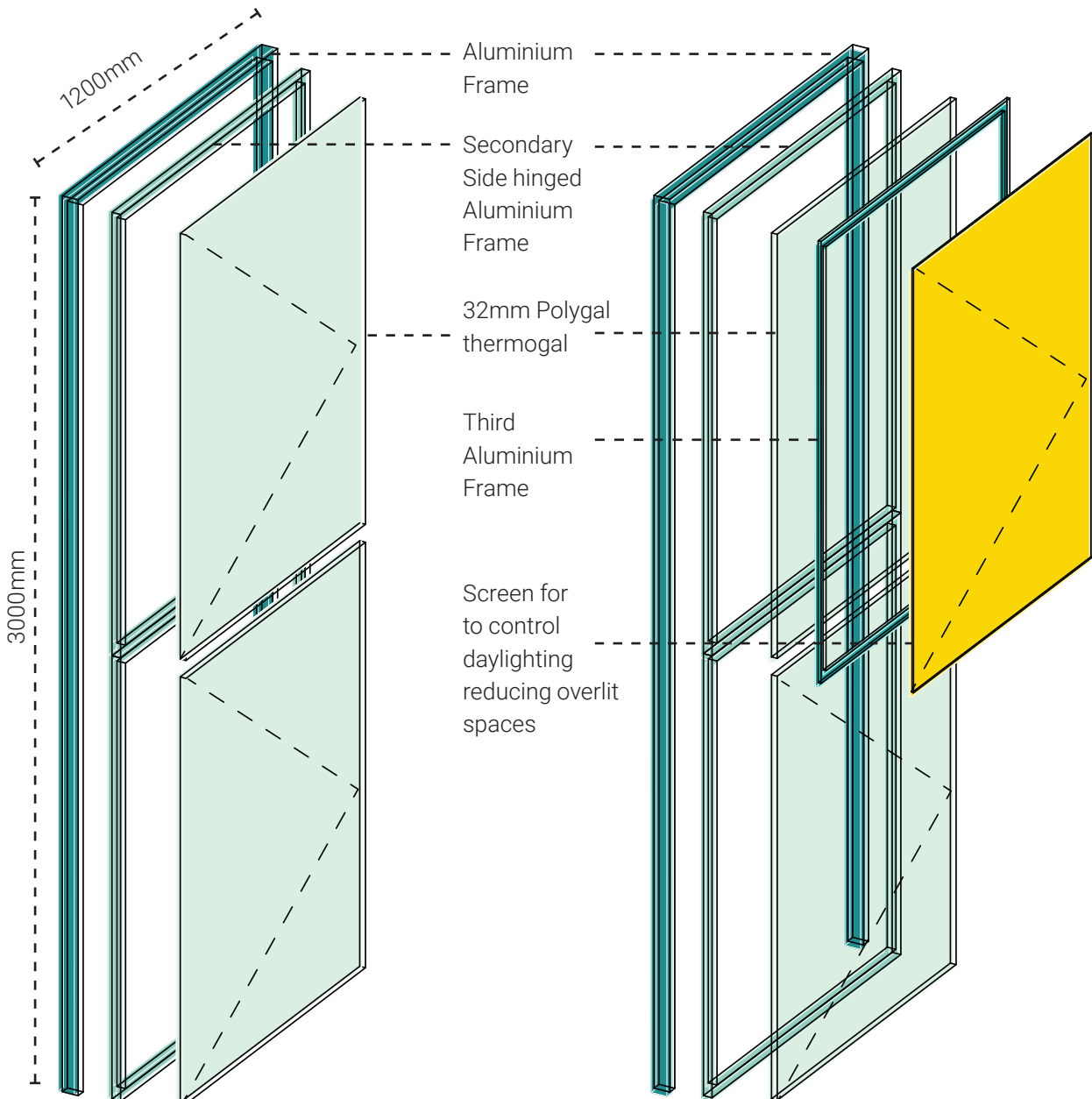
7.3 No construction:
the backyard

The backyard is predetermined breaks within the built fabric dominated by deciduous vegetation (refer to3.6). The built fabric development should be limited to a width of preferably 12 and there should be a break after every 3 modules on the grid of 6m, (i.e. 18m). A balance between need, density and breaks should be considered allowing for flexibility such as a 18m zone of built fabric accommodating increased opportunities of infill compared to a 12m zone of built fabric. A combined strategy of flexibility and environmental responsive space is followed to best accommodate continuous redevelopment.

The main wind direction in Westbury is North West and a minimum sun angle of 64 degrees between September till March. Trees, located in the no development zones will provide shade and cool the air in summer months along with soft landscaping, not reflecting heat into the building. These common outdoor spaces are defined as the growing garden, the sensory collective and the sensory individual aligned with the internal composition of land. The growing garden supports small scale urban agriculture as extension of the shisa nyama and to provide vegetables with better nutrients for the ECD and clients. The collective garden and individual garden will be used as simulation and education by the ECD, as most of Westbury is deprived of vegetation, spaces to recollect and explore, particularly if an autistic child or child with disabilities requires silence to regroup. The garden should be low maintenance and not water intensive, mostly trees, vegetables and grass.
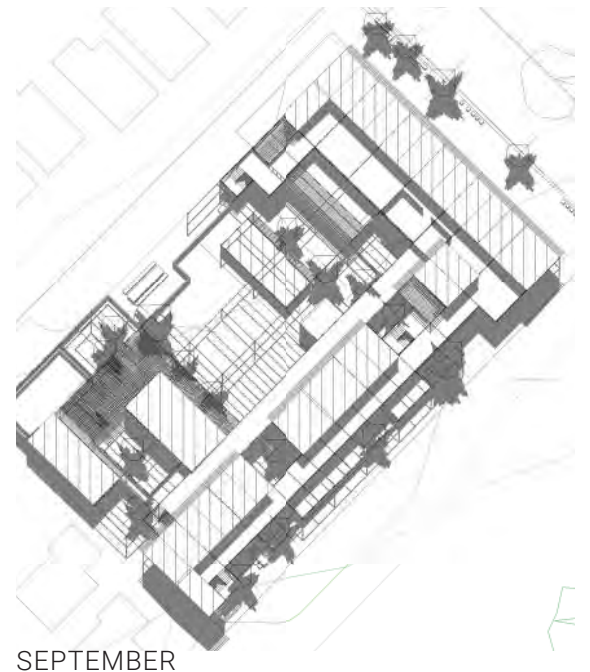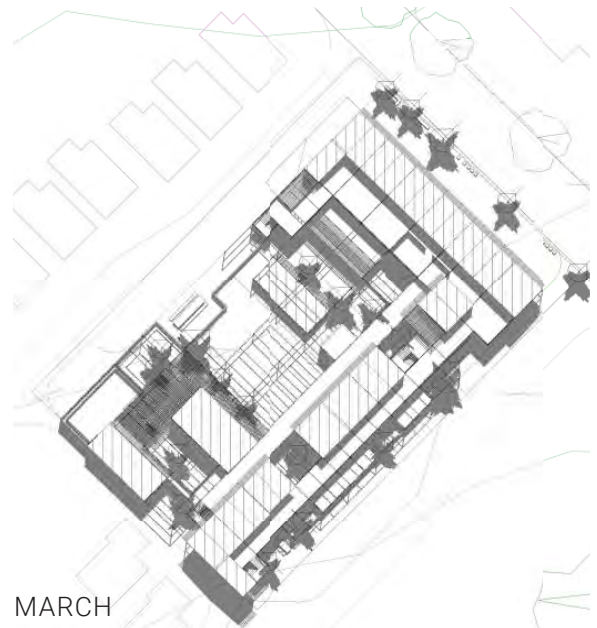
MARCH

SEPTEMBER

Fig 7.11 Sun angles namely March and September (author, 2017)

7.4 Services

'Construction of change' is the responsibility of the tenants guided by the CLT. Stable built fabric and services are the responsibility of the community land trust (CLT). The development of services is ordered with a phased approach, namely 'reduce phase', 'recycle phase' and 'addition phase'. Capital and the accumulation of capital could be problematic. The 'reduce phase' forms part of the initial phase of development, and includes a service strategy to reduce water and electricity use with the implementation of low flow taps and instant hot water heaters. Recycle phase, like the development plan and particularly the social and economic anchors, consolidates water use and the cycle of water through the site, to reuse, reducing dependency on municipal connection. The cycle of water consists of municipal water connection for showers, wash hand basins and kitchen sinks. Grey water is collected from all tenants and stored collectively in underground tanks within the no development zones, for easy accessibility, except water from kitchens due to potential of grease. Grey water can only be stored for 24 hours, after 24 hours the water will be discarded into the municipal sewage line. The tank has two components namely a filtration tank and storage tank. The grey water is used for water closets, with the black water connected to the municipality sewage line. The CLT considers a supply and demand system of grey water, with housing fulfilling the supply and facilities such as ablutions. Housing will provide grey water at night and early morning whereas facilities will use the grey water during the day, municipal water will be used as aid to grey water.

Addition phase considers harvesting of rainwater and sunlight. Rain water will be collected and used for vegetation on site, separate from the water recycling system on site. Solar panels require high capital cost compared to a tenant who may only lease for 5 years. Implementation of solar panels is the responsibility of the CLT, but accumulation of capital can be a lengthy process due to low rental rates. This could be a potential business opportunity and partnership with a third party. The CLT provides space for batteries to be stored underneath the floor between the structure beam systems.

The project strategically encourages and discourages development to maintain system logic and environmental responsive conditions, to enable occupation of land tenure, providing well located, serviced, access to land.

Electricity

Water supply

Sewage
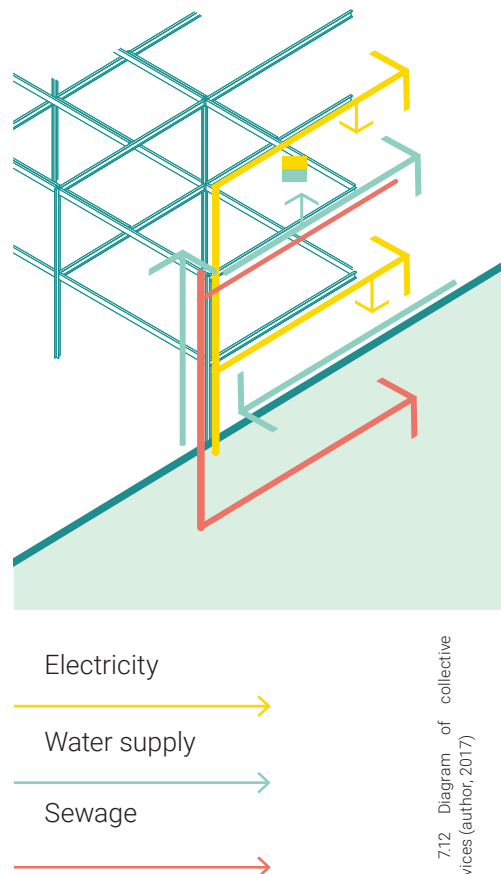
Fig 7.12 Diagram of collective services (author, 2017)

black water

Grey water

Municipal water

Rainwater

cycle of water

Housing

Shisa nyama

ECD

Night

Afternoon

Morning
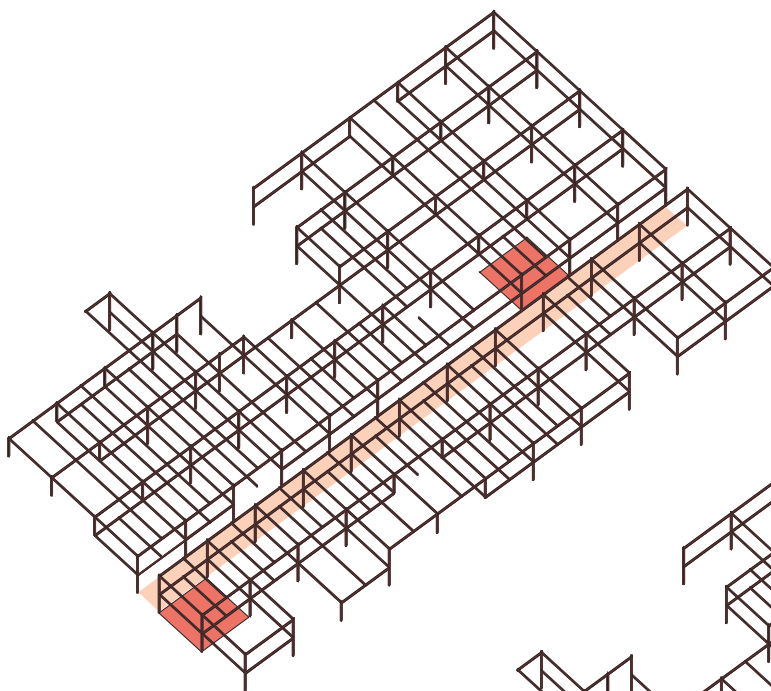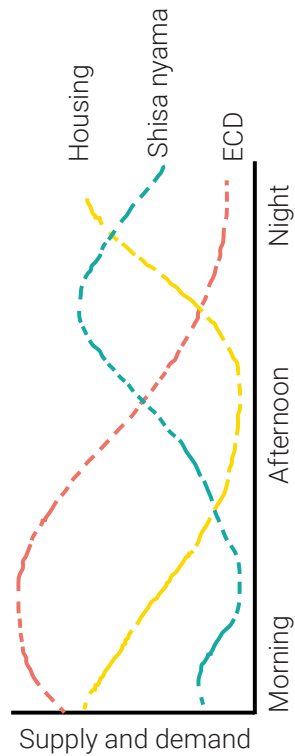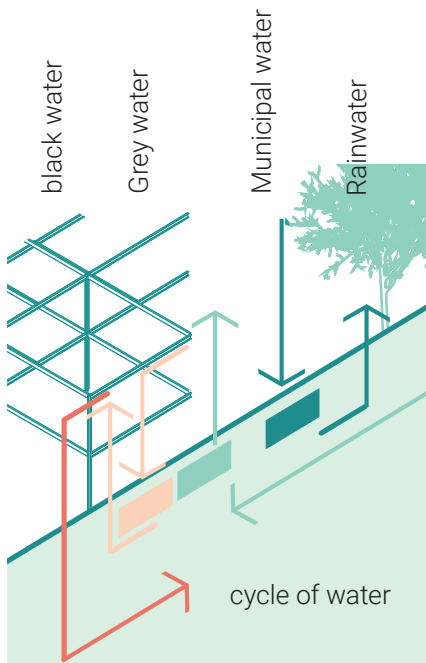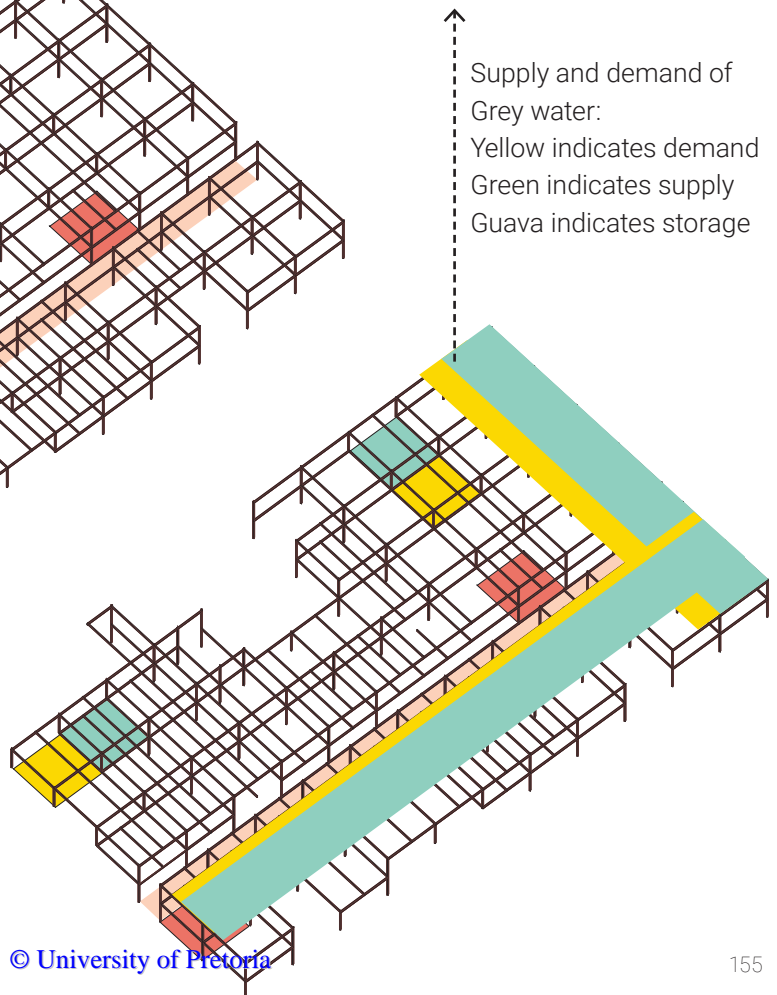
Supply and demand

Supply and demand of
Grey water:
Yellow indicates demand
Green indicates supply
Guava indicates storage

underground
tanks

Fig 7.13 (top left)Diagram of water cycle (author, 2017) | Fig 7.14 (bottom left) Diagram of position of underground storage tanks (author, 2017) | Fig 7.15 (bottom right)Diagram of supply and demand of water area (author, 2017) | Fig 7.16 (top right) Diagram of supply and demand acknowledging time of use (author, 2017)

Construction

Floors

Walls

Roofs

Light gauge steel

independent from steel
structure

Sandwich panel

Hydraform
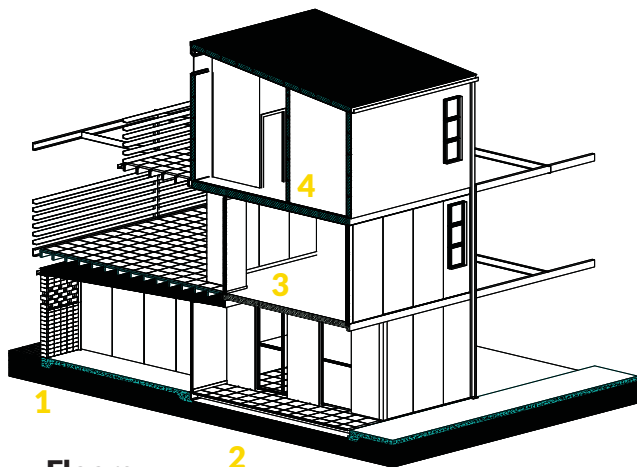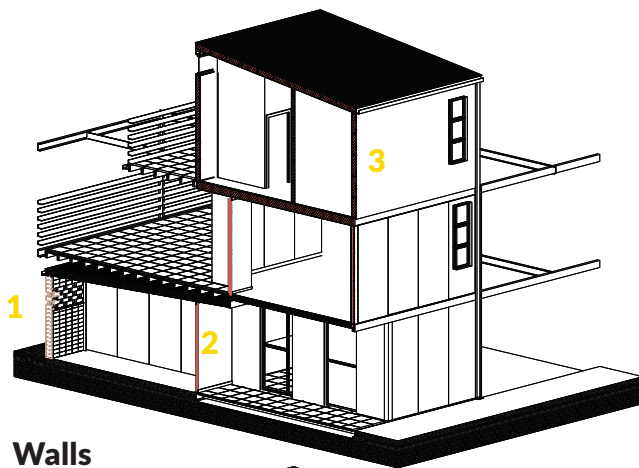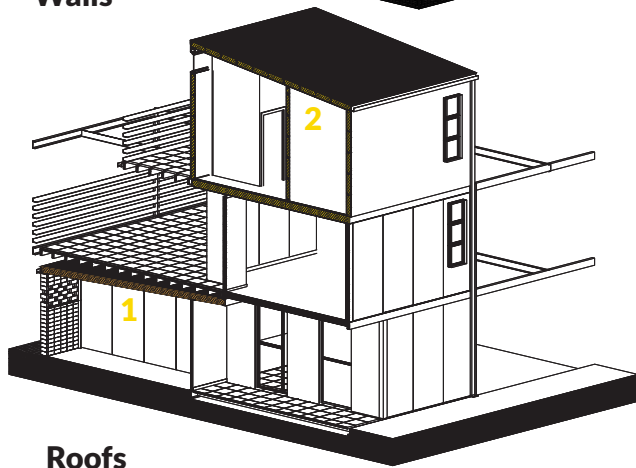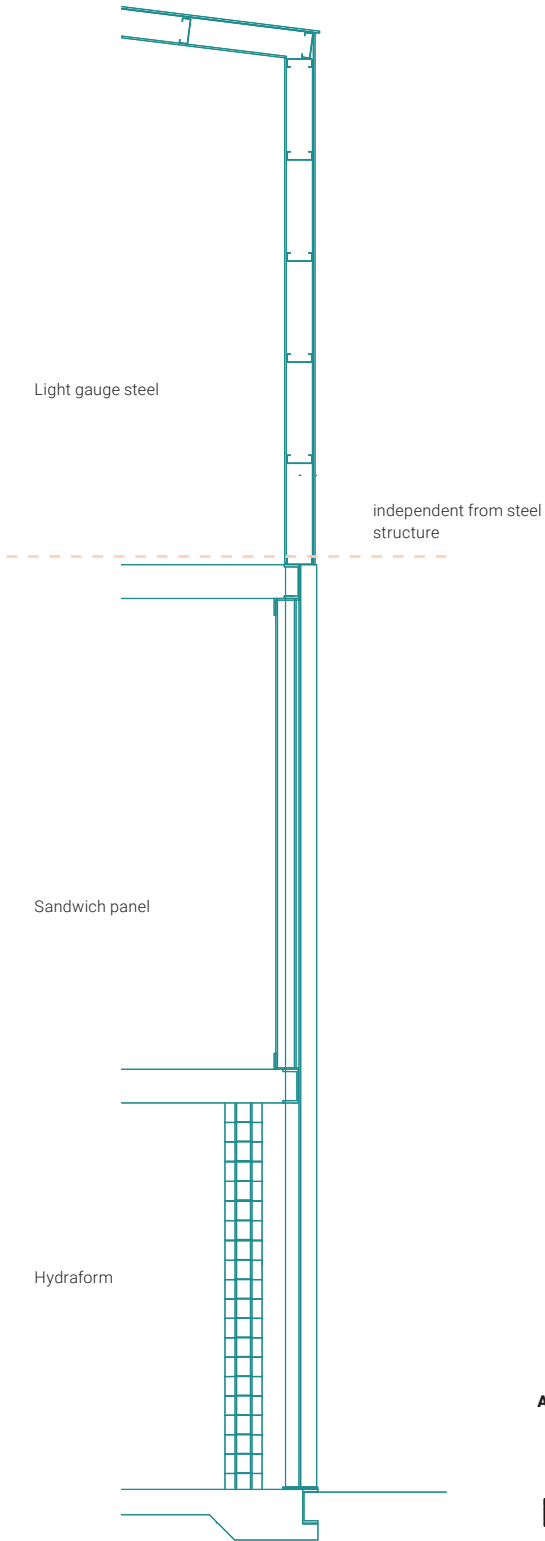
Relationship between infill and
stable structure

Details

A

B

C
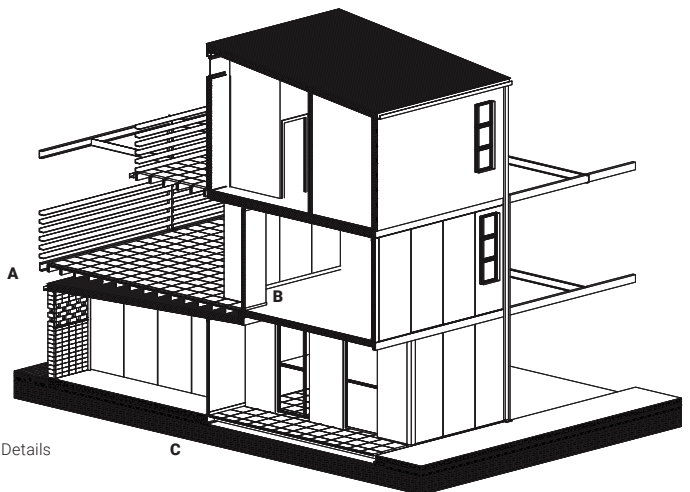
Construction section
Scale 1:20

150x90x12 Hot rolled galvanised steel unequal bolted to column with 30mm M12 galvanised steel bolts. All painted black

435x435 Windeck DT2 tiles grouted and sealed with silicon at joints on 170mm precast concrete Windeck beam DB 170 at 450 mm cc

150x90x12 Hot rolled galvanised steel unequal angle welded with a 120x3 flat bar gutter bolted to 150x90x12 hot rolled galvanised steel unequal angle lintel with 30mm M12 galvanised steel bolts. All painted black

32 Thermogal Polygal sheet with 34.9 aluminum u channel frame fixed to 40x40x3 equal steel angle with silicon sealant.

1200x3000x150 Chromodek sandwiched panel with 150mm expanded polystyrene (EPS) insulation with vapour barrier at tongue and groove joints of panel at slope of 1:50 fixed with self tapping screws to 150x90x12 hot rolled galvanized steel unequal angle. All painted black.

260x260 precast concrete slotted drain with 20 mm opening and 150 diameter, with brick paving 50 mm sand layer on 150mm compacted fill.

220 mm interlocking hydraform blocks dry stacked wall with painted black 150x90x12 hot rolled galvanized steel unequal angle fixed with self tapping screws as support

Power floated 150mm in-situ concrete raft foundation with expansion joints at 12m on 250nm damp proof membrane with 50mm sand binding layer on 150mm compacted fill.

200x90x30 hot rolled galvanized steel parallel flange channel fixed to raft foundation with galvanized steel fishtail anchor bolt. All painted black

435x435 Windeck DT2 tiles grouted and sealed with silicon at joints on 170mm precast concrete Windeck beam DB 170 at 450 mm cc

1200 wide custom opening with 2mm aluminum u channel frame with 900mm openable section either 32mm Thermogal polygal or 10mm MgO Board infill

Floors

Walls
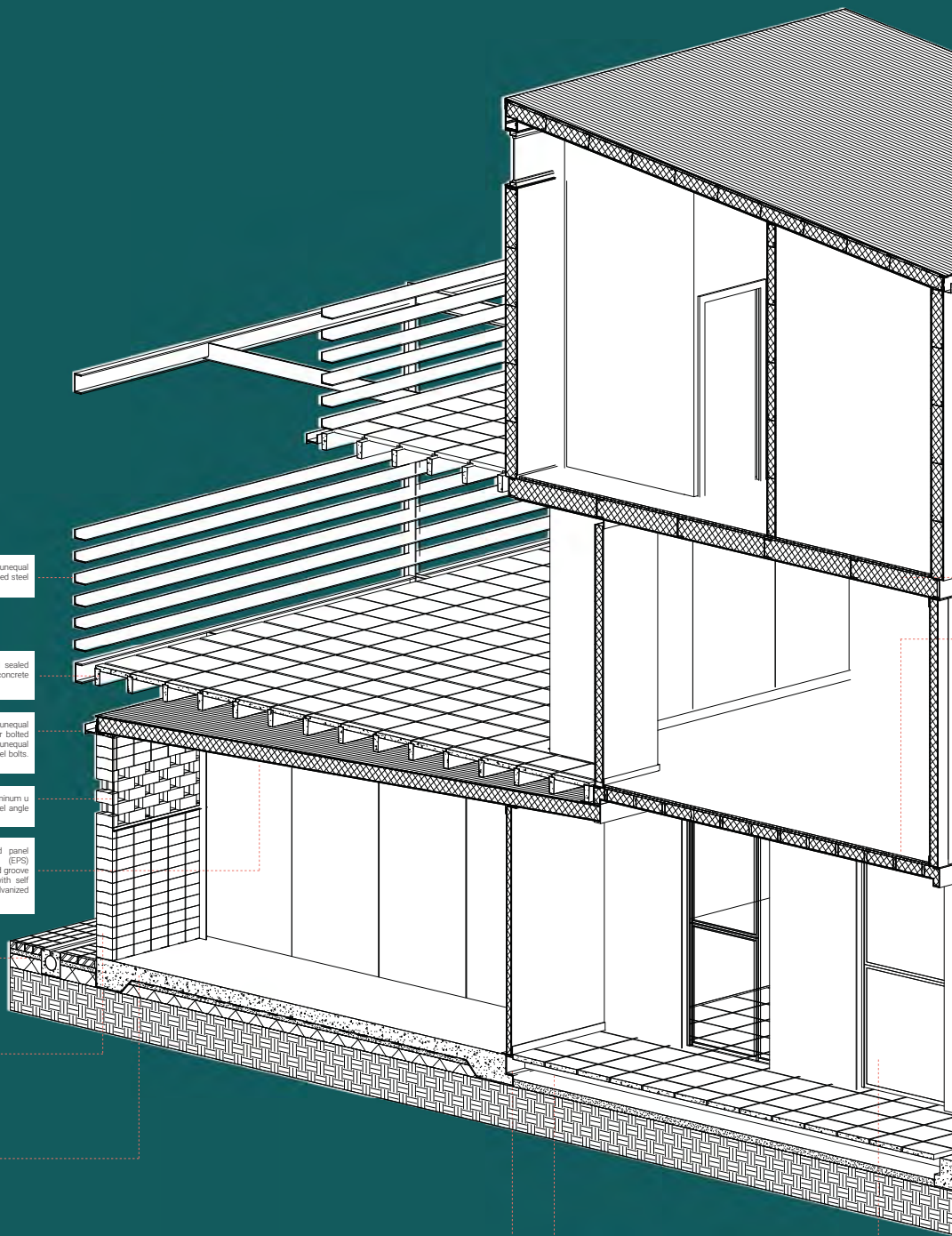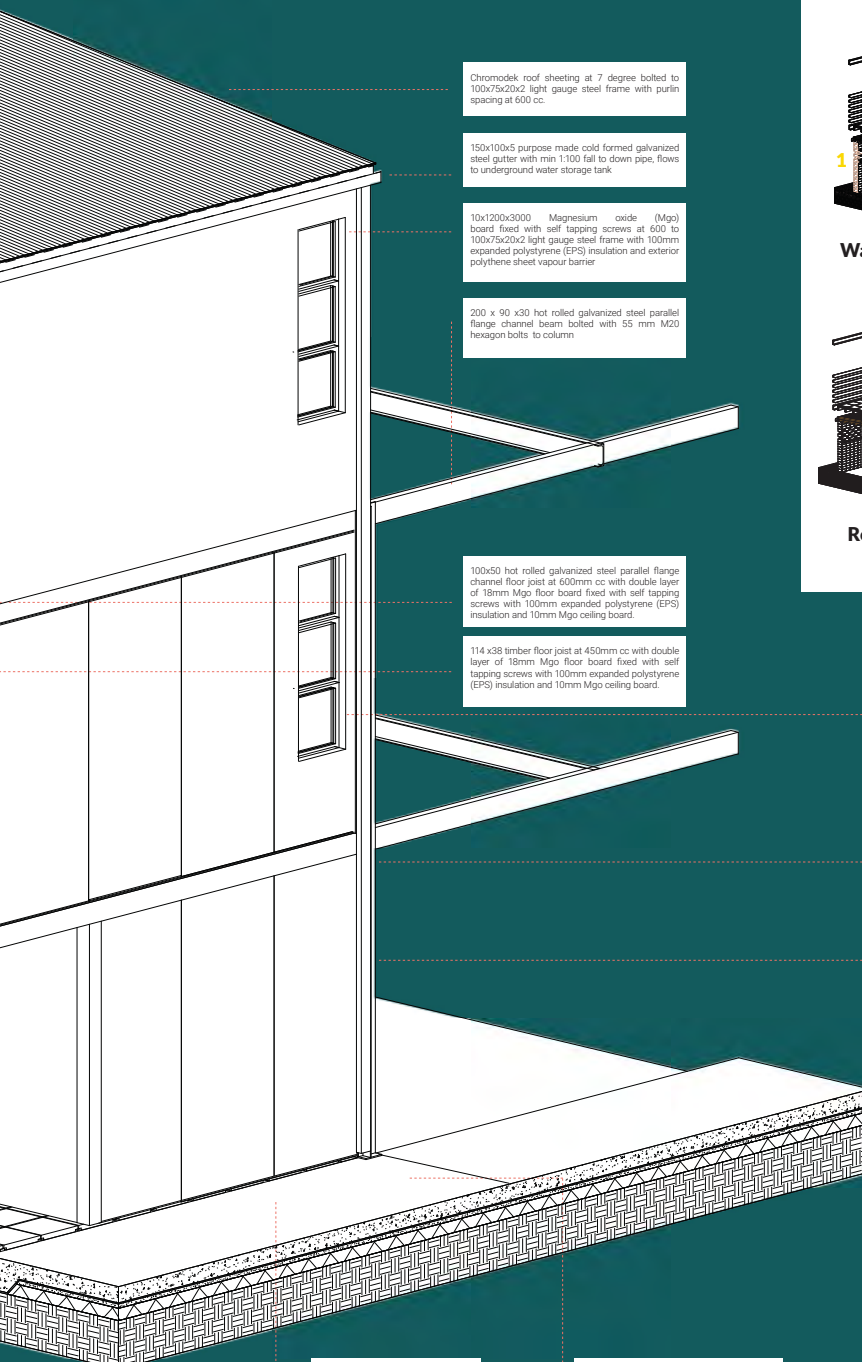
Roofs

Chromodek roof sheeting at 7 degree bolted to 100x75x20x2 light gauge steel frame with purlin spacing at 600 cc.

150x100x5 purpose made cold formed galvanized steel gutter with min 1:100 fall to down pipe, flows to underground water storage tank

10x1200x3000 Magnesium oxide (Mgo) board fixed with self tapping screws at 600 to 100x75x20x2 light gauge steel frame with 100mm expanded polystyrene (EPS) insulation and exterior polythene sheet vapour barrier

200 x 90 x30 hot rolled galvanized steel parallel flange channel beam bolted with 55 mm M20 hexagon bolts to column

100x50 hot rolled galvanized steel parallel flange channel floor joist at 600mm cc with double layer of 18mm Mgo floor board fixed with self tapping screws with 100mm expanded polystyrene (EPS) insulation and 10mm Mgo ceiling board.

114 x38 timber floor joist at 450mm cc with double layer of 18mm Mgo floor board fixed with self tapping screws with 100mm expanded polystyrene (EPS) insulation and 10mm Mgo ceiling board.

1200x3000x120 composite sandwich panel with 10mm Magnesium oxide (Mgo) board sandwiched with 100mm expanded polystyrene (EPS) insulation with vapour barrier at tongue and groove joints screwed with self tapping screws at top and bottom of panel to 150x90x12 hot rolled galvanized steel unequal angle at 600 cc.

120x60x3.5 hot rolled galvanized steel hollow section down pipe with galvanized steel square brackets at 3000mm cc fixed to 150x90x12 hot rolled galvanized steel unequal angle column. All painted black.

2 No 150x90x12 hot rolled galvanized steel unequal angles bolted back to back with 55mm M20 hexagon bolts and 3mm silicon thermal break, fixed with 250x250x3 galvanized steel baseplate bolted with 55mm M20 hexagon bolts to painted black 200x90x30 hot rolled steel parallel flange channel. All painted black.
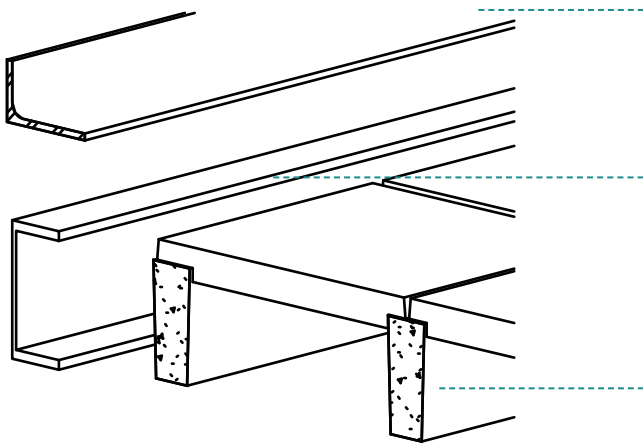
Power floated 150mm in-situ concrete raft foundation with expansion joints at 12m on 50mm sand binding layer on 150mm compacted fill.
External walkway

Expansion joint with 10mm compressible filler and silicon sealant

Detail A | Scale 1:10

150x90x12 Hot rolled galvanised steel unequal bolted to column with 30mm M12 galvanised steel bolts. All painted black

200 x 90 x30 hot rolled galvanized steel parallel flange channel beam bolted with 55 mm M20 hexagon bolts to column

435x435 Windeck DT2 tiles grouted and sealed with silicon at joints on 170mm precast concrete Windeck beam DB 170 at 450 mm cc
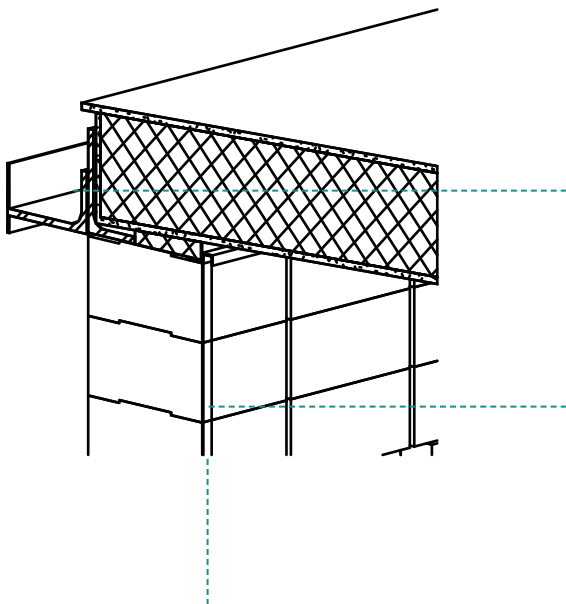
150x90x12 Hot rolled galvanised steel unequal angle welded with a 120x3 flat bar gutter bolted to 150x90x12 hot rolled galvanised steel unequal angle lintel with 30mm M12 galvanised steel bolts. All painted black

32 Thermogal Polygal sheet with 34.9 aluminum u channel frame fixed to 40x40x3 equal steel angle with silicon sealant.

220 mm interlocking hydraform blocks dry stacked wall with painted black 150x90x12 hot rolled galvanized steel unequal angle fixed with self tapping screws as support

1200x3000x120 composite sandwich panel with 10mm Magnesium oxide (Mgo) board sandwiched with 100mm expanded polystyrene (EPS) insulation with vapour barrier at tongue and groove joints screwed with self tapping screws at top and bottom of panel to 150x90x12 hot rolled galvanized steel unequal angle at 600 cc.

435x435 Windeck DT2 tiles grouted and sealed with silicon at joints on 170mm precast concrete Windeck beam DB 170 at 450 mm cc

200x200 purpose made galvanized steel flashing with waterproofing
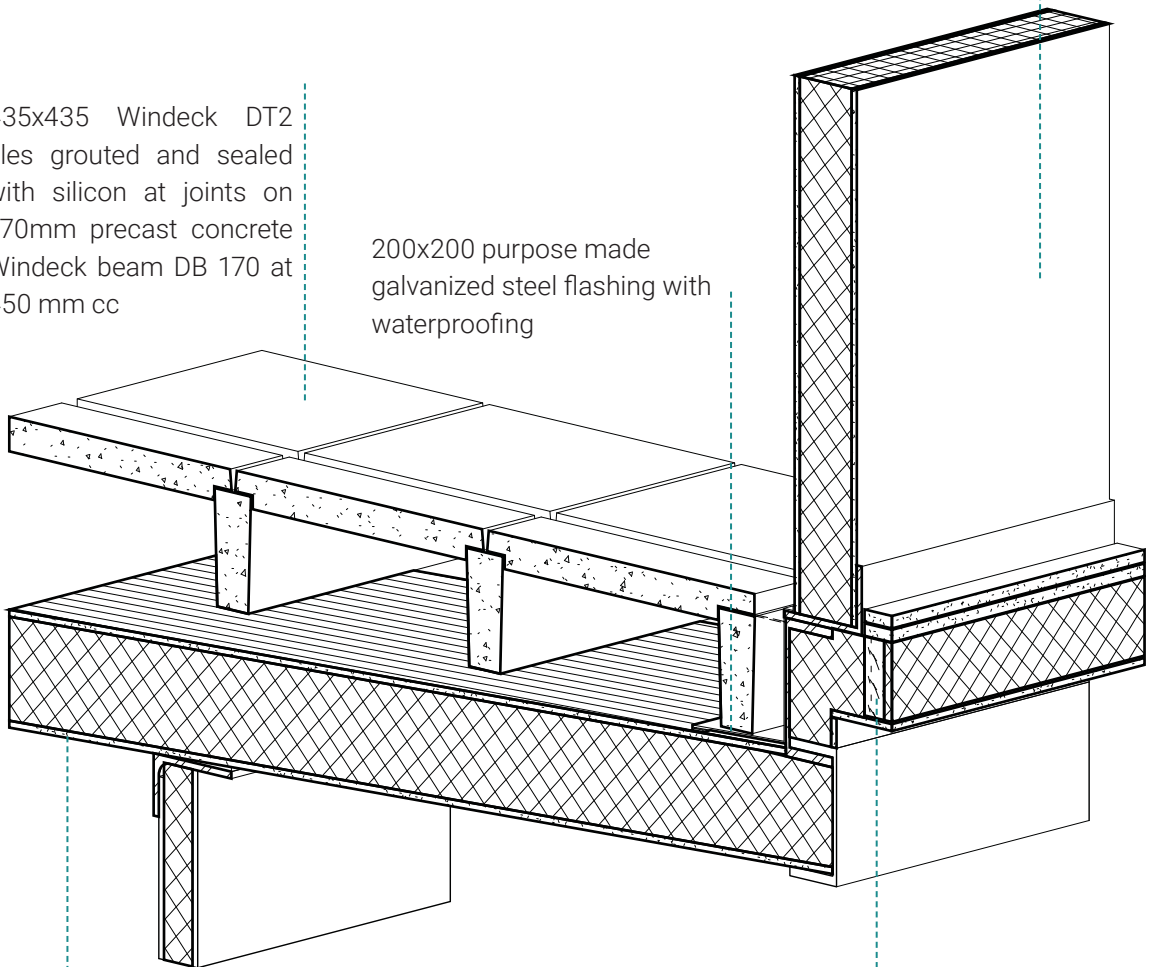
1200x3000x150 Chromodek sandwiched panel with 150mm expanded polystyrene (EPS) insulation with vapour barrier at tongue and groove joints of panel at slope of 1:50 fixed with self tapping screws to 150x90x12 hot rolled galvanized steel unequal angle. All painted black.

114 x38 timber floor joist at 450mm cc with double layer of 18mm Mgo floor board fixed with self tapping screws with 100mm expanded polystyrene (EPS) insulation and 10mm Mgo ceiling board.

Detail C| Scale 1:10
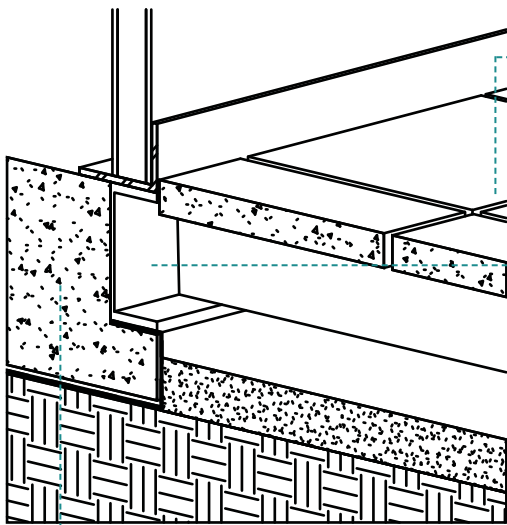
435x435 Windeck DT2 tiles grouted and sealed with silicon at joints on 170mm precast concrete Windeck beam DB 170 at 450 mm cc

200x90x30 hot rolled galvanized steel parallel flange channel fixed to raft foundation with galvanized steel fishtail anchor bolt. All painted black

Power floated 150mm in-situ concrete raft foundation with expansion joints at 12m on 250nm damp proof membrane with 50mm sand binding layer on 150mm compacted fill.
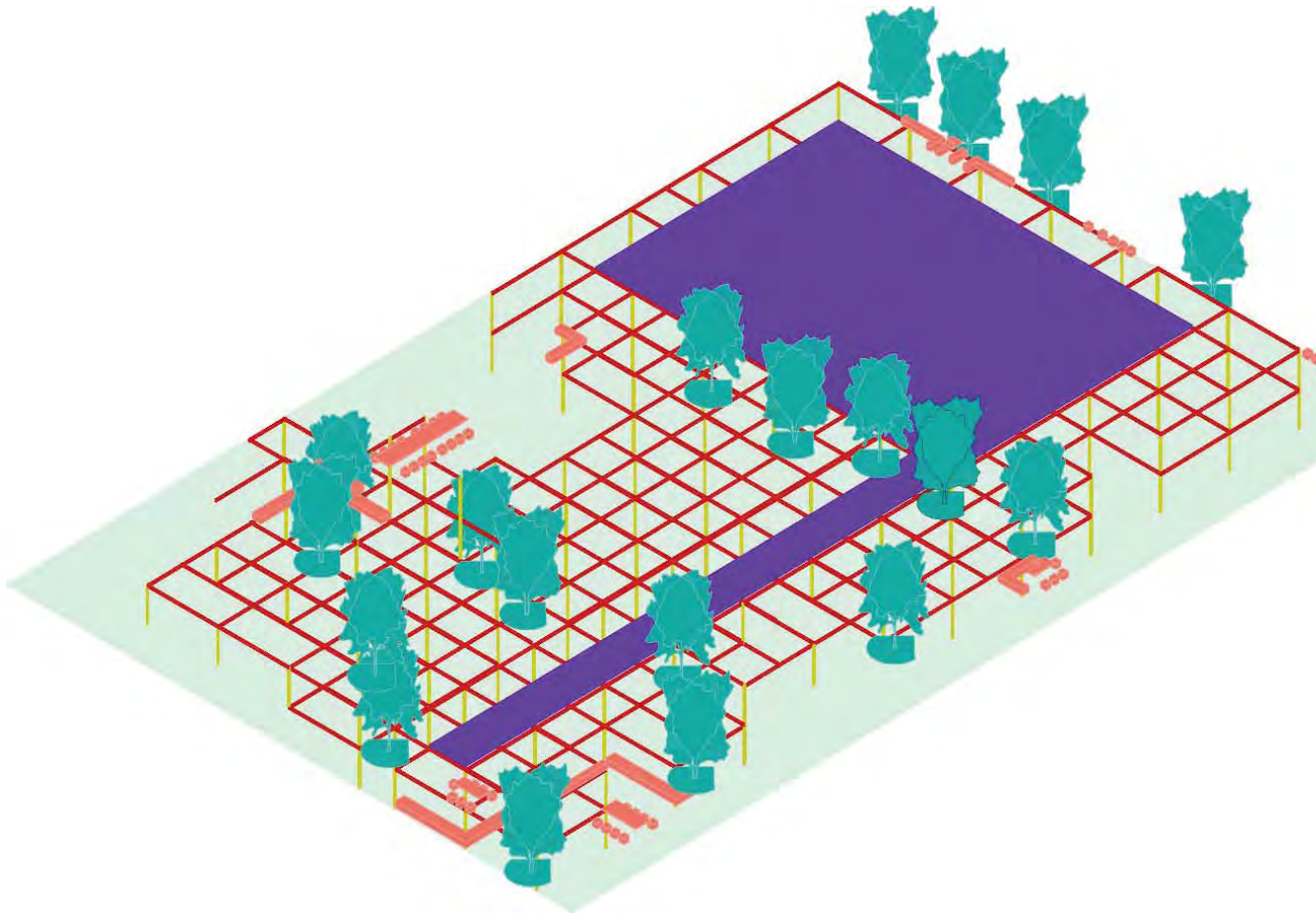
Fig 8.1 Diagram of redevelopment of land (author, 2017)

Chapter 8

Conclusion

Access to land, and access to land in a dignified and sustainable manner was the intention and investigation of this dissertation, expressed in the research questions of architectures' ability to enhance the appropriation of land and architectures' ability to increase opportunities within the system of land tenure.

The intention and questions were best met with the dialogue of stability and change accommodating various levels of dependency compared to the existing site condition of land tenure without architecture, with limits visible in the example of the marque church. Stability and change of architecture appropriately responds to the South African urban land question and development of South African cities, supporting compact urban form. It further responds to urban conditions of critical neighbourhoods that have a deep need for contextual development and legal capacity building. Stability and change of architecture best articulates the opportunity of land which is characterised by continual redevelopment within strict urban boundary and multiplicity of land use. The development is strategically encouraged and restricted to maintain system logic and environmental responsive conditions, enabling occupation of land tenure. Access to land and dignified space is vital to address difficulties concerning critical neighbourhoods and poverty, as both are deeply spatial, noticeable in Westbury such as overcrowding, the lack of a backyard with the absence of land hindering the ability to privately develop and invest. Access to land and land based resources are key to generating opportunities, reducing inequality and increasing legal development of sustainable livelihoods.

The urban land question is précised to the right, right of use and benefit of land; disputes are visible in land invasions and quiet encroachments. Apartheid spatial legacy consist of the physical fragmentation of the urban fabric and the lack of ownership, previously restricted. Ownership has an influence on architecture, without ownership we cannot build. Ownership determines how we build. This dissertation considers and expands on the ownership structure of a single land parcel and its articulation in architecture. Free hold ownership (title deed) requires capital cost and has the responsibility of utility services. Secure land tenure, a form of ownership (lease), allows the tenants to insert, expand or remove built fabric in relation to their economic capacity.

Inefficient and wasteful land uses burden South African city structures, aggravating the contested debate of land. Vacant urban land or abandoned buildings are often negative voids in the urban fabric supporting criminal behaviour such as the conditions in hijacked buildings in the inner city of Johannesburg. The condition of a property at end of use must be considered. Architecture should contribute to the urban environment, past its use and ownership with the redevelopment of land, defining space for future development or temporary appropriations. The permanent built fabric (left-overs) of this project is considered as an urban park, aligned with the notion of public use as default space use, deliberately limiting fixed built form to accommodate land based uses such as urban agriculture or recreational activities.

Changeability in the urban condition is limited without anchors of stability. The work of Price, Friedman and Herron motivates for plug-in and host structures such as infrastructure to strengthen the process of change. The backyarder city policy of Cape Town emphasises

the importance of serviced land and the Cape Town property bylaw highlights the opportunity of multiplicity of land use such as the pre-1955 Sophiatown housing typology.

The dialogue between stable and changeable built fabric with the project function of appropriation of land is best articulated by following characteristics of open building. Stephen Kendell (2006) defines open building as the separation of system such as the urban level, support level, infill level and furniture level. Open buildings often hinder development by only accommodating one scale of dependency. This dissertation motivates for the consideration of various dependencies on stable built fabric. Expanding on the level definition of open buildings, namely to the urban level, support level (stable built fabric), insert level, infill level, fit-out level, furniture level and use level. Each level further has a scale of dependencies such as infill level scaled dependency on the structural grid. This understanding is articulated in the stable built fabric as the provision of facility and connection point. Appropriation of infrastructure is guided by existing responses visible in Westbury such as infrastructure as base, infrastructure as support, additions to infrastructure and manipulation of infrastructure. Standardisation and 'click together' components support inter-changeability such as light bulbs (Schneider, 2005:163)

Designing for change acknowledges the design of the unknown, yet there is commonality in architecture. The internal site layout is ordered with predetermined zones of use such as a public edge, public and private collective, public- and private individual. Change is determined by effort required, financial or physical. Dry construction offers the potential of removal and change, although a scale of permanence of materials should be acknowledge dependent on weight and connection method.

The external space is predetermined to ground the stable built fabric in the urban environment, achieved with public edges, lingering spots and keep walking areas. This concentrates activity for a vibrant local neighbourhood. This dissertation considered the architectures' ability to host the urban condition. The phased development is grounded with three facilities, such as public ablutions as initial development points; their placement on site partially defines the fixed boundaries. This forms parts of the scaled understanding of dependency with the provision of facilities and connection points. The project likewise predetermines initial structure, service and no development zones (the backyard) to maintain internal functionality.

Connection point
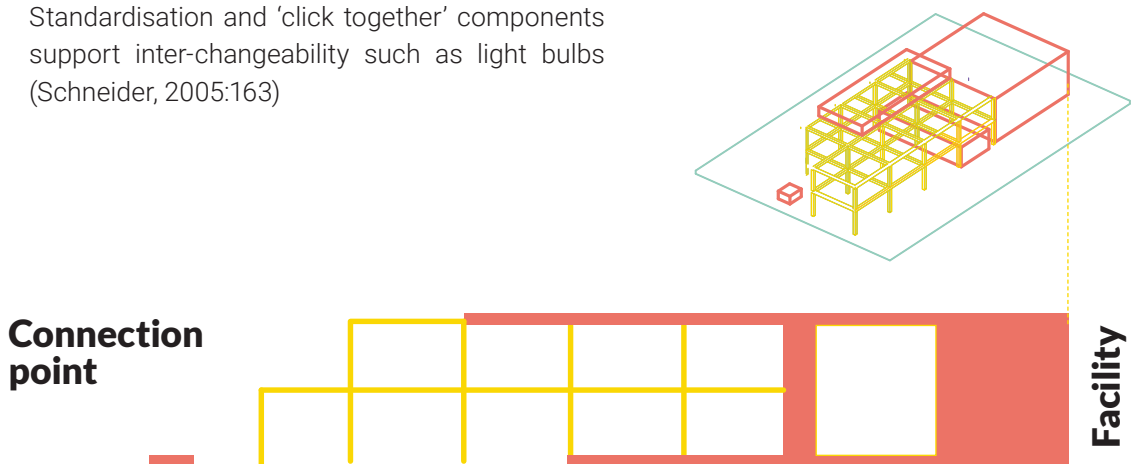
Facility

Fig 8.2 Diagram of connection and facility in stable built fabric (author, 2017)

Deputy Minister of Cooperative Governance, Andries Nel argues for inclusive urban environments opposed to a quantitative approach of matching housing to land. Cross programming and consolidation of new and existing organisations aids capacity building on a neighbourhood scale. Consolidation of existing organisations, businesses and social welfare enables a shared authorship supporting growth and collectively carry risk within a legal framework for development. A legal framework increases the potential of public and private social aid initiatives contributing to growth and local economic development. Land and economy cannot be separated; access to land is ultimately access to economic opportunity. Location of land is vital for the inclusion and restructuring of South African cities. Access to well-located land is a component of the larger discussion of access to the city, which is positioned within the broader discussion of economic opportunity and restructuring of wealth, noticeable in the demands of political parties such as the Economic Freedom Fighters and Black First Land First with the African National Congress calling for radical economic transformation. Land is critical for urban economy. (Joseph, 2014).

Westbury could be considered as an artefact of prominent development strategies of the City of Johannesburg and the urban land debate. Architecture without land is a development strategy of land tenure, not a building system, with the opportunity to be applied on various sites, scales and urban conditions. Each community land trust (CLT) is motivated to be part of a larger city scale network of adaptable, well located, affordable and service land, contributing to the spatial transformation of South African cities.

The strategy of land tenure and learning's from this dissertation provides dignified and sustainable access to land acknowledging economic capacity in critical neighbourhood in South Africa achieved by strategies to maintain system logic and the shared semi-public backyards dominated by vegetation.

Land tenure is the opportunity of land. This provides affordable, secure, well-located access to land, and is an option to better understand the urban land question in South Africa.

This dissertation highlighted the need of scaled understanding in critical neighbourhoods acknowledging diverse conditions within one notion. Further research is required to understand and test the strategy in other critical neighbourhoods such as Kensington, Factreton and Maitland (KFM) in Cape Town or Alexandra in Johannesburg. In addition, it is necessary to test the strategic approach within a diversity of scales namely urban furniture or rooftop construction.

This dissertation showcases the potential of architecture as method to effect positive spatial transformation. The author is optimistic for architectures' ability to enhance and encourage social change.

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Name of external examiner (design): **Thomas Chapman**

Date: **13 Nov 2017**

Comments:

GENERAL*: I was blown away by the depth of this student's argument. Her clear, articulate voice echoes some of the brightest contemporary minds of our time, particularly those in the realm of politics and (radical) economics.*

STRENGTHS:

- **Urban Strategy:** All three students in Westbury exhibit an extremely thorough reading of the context and realistic and nuanced proposal in terms of high-level urban design recommendations. This thesis in particular showcases the history of Westbury as one of land conflict, theft and experimentation. This document accurately represents this history, complexity and opportunity.
- **Incorporation of exciting planning and economic theory with architectural theory**: I found this thesis to present fresh approaches to practice where architecture actually questions and participates in aspects of development reserved for planning and legal professionals.
- **Open Building's Discourse:** The thesis contributes a valuable addition to Open Building's discourse, dominated by Aravena and in recent years by practitioners like Brillembourg and Noero.
- **Design Response:** I find the final design highly contextual, yet representing a fresh urban and architectural direction for the township.

SHORTCOMINGS

- **Implementation Plan:** As with another 'Open Building' project in this thesis group, I am missing detail when it comes to the 'who' of implementation. Analysing Jo Noero's Table House as an example, there is a clear finance and implementation strategy that drives the process. While an architecture thesis generally would not require a detailed costing, I think this project could really benefit from delving into the financial functioning of the Community Land Trust in more detail.
- **Defensibility Plan:** The scheme could use an 'AM/PM' accessibility and defensibility strategy, represented in diagram form.

ASPECTS THAT NEED CLARIFICATION

- **See above:** CLT Finance Structure and Defensibility Plan

RELEVANCE OF PROJECT

- Highly relevant project, particularly in our current socio-political climate.

CREDIBILITY OF ARGUMENT &BIBLIOGRAPHY

- The student has referenced the most relevant South African literature to my knowledge, particularly Neil Klug's very fresh research on community land trusts. International literary references are also extensive and fascinating.