TOWARDS COMPLEX URBAN INTEGRATION

Upgrading an Existing Street in Plastic View Informal Settlement

Fig. 1: Cover Page (UPArch UUC 2022)

DECLARATION

In accordance with Regulation 4(c) of the General Regulations (G.57) for dissertations and theses, I declare that this dissertation, 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 dissertation has already been, or is currently being, submitted for any such degree, diploma or other qualification.

I further declare that this dissertation 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

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Research Field: Unit For Urban Citizenship

Ethics Clearance Number: EBIT/15/2022

Fig. 2: Photo of Alex Gatura and I after building on site (UPArch UUC 2022)

ABSTRACT

Urbanisation is recognised as a natural by-product of economic development. However, the rate of urbanisation in many developing countries is not directly proportional with the growth of employment opportunities. This results in unemployment which has led to a term coined 'over-urbanisation'. This global phenomenon has subsequently shifted the paradigm of urbanity. Informal settlements have developed in order to address the urgency of living, creating ingenious and instantaneous solutions to immediate and severe issues. These spaces of urban informality are continuously emerging throughout cities globally, however, they are often characterised by overcrowding, informal housing, insecure tenure and a lack of access to basic amenities.

There have been numerous approaches developed regarding the upgrading of informal settlements globally. However, these approaches generally fail in addressing the needs of the disadvantaged. This dissertation, through utilising Plastic View informal settlement as a case study, aimed to advance the current discourse. An existing street within the settlement was documented in plan and elevation and a process of immersion undertaken with the residents to better understand how space is currently formed on site.

This generated a framework to guide further architectural investigation. With particular dependance on streets as social, cultural, economic and infrastructural spaces in informal settlements, the design explored the streetscape as an instrument for future upgrade. This was illustrated through a phased approach whereby a vision of anticipated development was generated for the enitre street.

Through providing the inhabitants with the streetscape as a foundation, as well as facilitating the upgrade of their individual dwellings, appropriation, identity and permanence could begin to manifest, in turn, leading to complex urban integration.

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01 - POSITION & SITUATION

GENERAL ISSUE

Over-urbanisation

Alex Gatura was forced to leave his home country, Zimbabwe, at the age of twenty two, during the 2008 economic collapse. He had heard from his brother of the beginnings of a settlement called Plastic View, a well situated, prosperous place located within a wealthy area of Pretoria East, South Africa.

According to Pieterse (2014:274-275), urbanisation is a natural, global, historical process catalysed through institutional and technological changes. Traditionally, it is recognised as a natural by-product of economic development. This theory is focused on the relationship between economic opportunity and the spatial dynamics of the labour market, stating that as industrialisation occurs, urbanisation follows (Pieterse 2014:259). However, it was recognized that the rate of urbanisation in many developing countries was not seen to be directly proportional with the growth of employment opportunities, therefore resulting in under and unemployment leading to a term coined 'over-urbanisation'(Pieterse 2014:259). This global phenomenon creates migrant cities and is especially prevalent within South Africa (Wekesa, Steyn & Otieno 2010:239).

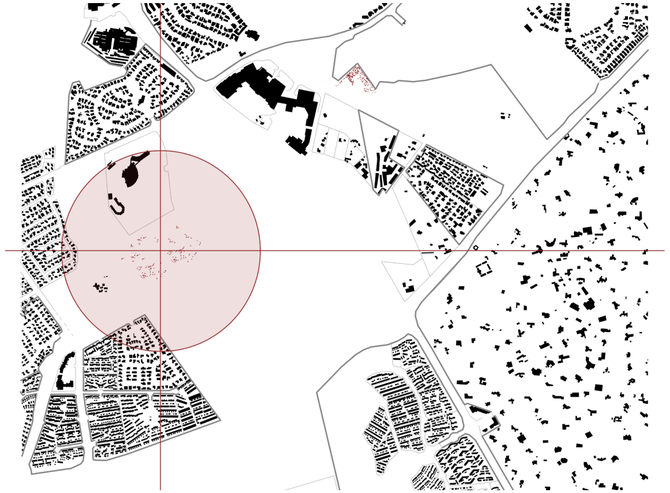


Fig. 3: The beginnings of Plastic View Informal Settlement (Author 2022)

URBAN ISSUE

Informality

Alex moved into his brother's house, a small temporary dwelling constructed out of black wattle and recycled plastics, with no access to basic amenities such as potable water or electricity. All the dwellings at this time were constructed in a similar nature, concealed between shrubs and trees, with hidden entrances and openings so as to provide protection against law enforcement, in the event of unexpected evictions. However turbulent the living conditions, the necessities of employment were fulfilled. Alex was able to find work as a landscaper in one of the surrounding affluent estates and it was here that through continuous inquiry, his employer taught him the basics of welding.

Over-urbanisation, in conjunction with the sterile attempts to portray the city as a totally planned entity, has subsequently shifted the paradigm of urbanity (Viana 2009:179-186). Cities worldwide have developed innate survival instincts that address the urgency of living, creating ingenious and instantaneous solutions to immediate and severe issues (Viana 2009:179-186). Their spatial conditions reach beyond the geographical, urban or demographic constraints of the predetermined and are not defined by rationality or functionality (Viana 2009:179-186). These spaces of urban informality are continuously emerging throughout cities globally, however, they are often characterised by overcrowding, informal housing, insecure tenure and a lack of access to basic amenities such as water, sanitation or electricity (Pieterse 2011:1-2). This is primarily due to the unequal division of income, goods, power, and services as a result of poor social policies and programmes, unfair economic arrangements, and bad politics (Pieterse 2011:3). This results in harsh living environments for inhabitants and according to Wekesa, Steyn & Otieno (2010:239), these spaces of urban poverty will continue to be exacerbated, as the amount of people residing in informal settlements is expected to triple by the year 2050. Complex urban integration is the objective and urban informality could pose the solutions needed to which this could be achieved (AlSayyad et al 2006:127;Viana 2009:179-186).

Fig. 4: Plastic View Informal Settlement as it is today (Author 2022)

SITUATING THE DISSERTATION

South Africa

This notion of inequality is one that is synonymous with the context of South Africa, as over 9.1 million people find residency within informality (Wekesa, Steyn & Otieno 2010:239). Past race-based politics and economic policies in conjunction with over-urbanisation has resulted in the complete imbalanced dispersion of wealth and power (Wekesa, Steyn & Otieno 2010:243). In 2019, The World Bank identified South Africa, and still does today, as the most unequal country in the world (Sulla, Zikhali & Cuevas 2022:9,11). In 2021, during the COVID-19 pandemic, South Africa's unemployment rate rose to 34,9%, the country's highest since the 2008 economic collapse, causing over 2 million people to lose their jobs (Stats SA, 2021). Furthermore, despite South Africa having a progressive housing policy that looks at creating socially and economically sustainable communities, 21% of South Africa's housing stock is still regarded as informal (Wekesa, Steyn & Otieno 2010:243) and an estimated 18,9% of the country's population lives on less that R28 a day, below the international poverty line (UNDP 2020:366). Little progress has been made by the government, since democratisation, in rectifying these inequalities and concerns are raised with regards to how legislative policies are translated, introduced, and implemented (Wekesa, Steyn & Otieno 2010:243). In addition to this, Wekesa, Steyn and Otieno (2010:239-243) state that with the current lack of governmental funds, expensive conventional building technologies, suitable building land and the outdated building standards, these settlements will continue to proliferate for the foreseeable future.

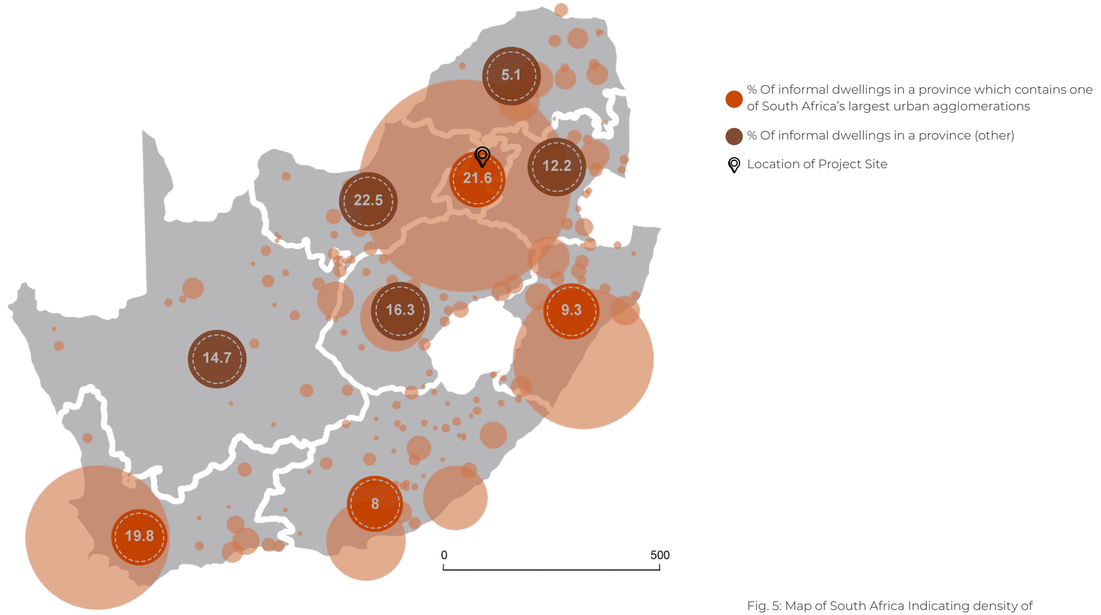


Fig. 5: Map of South Africa Indicating density of urbanization in South Africa, layered with statistics on informal dwellings per province (2016)
(UPArch UUC 2021)

Gauteng, KwaZulu-Natal and the Western Cape are the three provinces that accommodate South Africa's largest urban agglomerations with the metropolises of Johannesburg, Pretoria, Durban and Cape Town serving as major attractions for those seeking opportunity (UP Hons 2021:13). Specific emphasis is placed on Gauteng which has two major cities, Johannesburg and Pretoria. This results in the province accounting for over 21% (UP Hons 2021:13), or 625, of South Africa's Informal Settlements, of which 227 are located in Tshwane (Mitchley 2021). Despite being twenty eight years into democracy and with a new legislation and constitution (1996), it is clear that little has changed with regards to Tshwane's urban footprint (UP Hons 2020:13). This causes one to question Tshwane 2055 urban vision of a "liveable, inclusive and resilient city"(Landman & Nel 2021: 16). South Africa's past exclusionary strategies are still able to perpetuate the urban landscape of today. Furthermore, economic inequality persists, with people still living far away from work opportunities, reinforcing the need for migration and resulting in the emergence of informal settlements (UP Hons 2020:15). Spatial injustice is the issue, and the informal settlement presents itself as a desperate solution to those most disadvantaged by the legacy of economic disparity that is preserved by the oppressive urban footprint (Strauss and Liebenberg 2014:444).

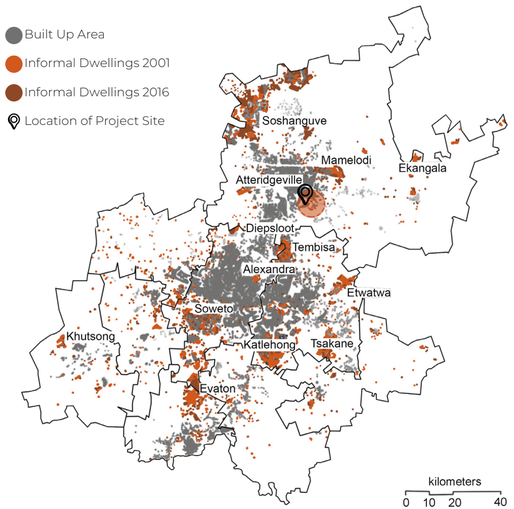


Fig. 6: Map of Gauteng indicating the change in informal dwellings in Gauteng (2001 vs 2016) (UPArch UUC 2021)

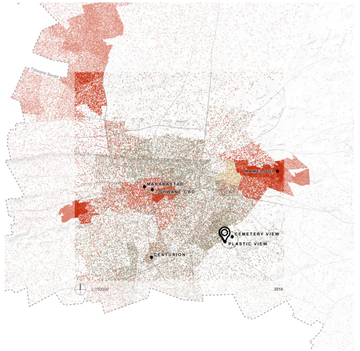


Fig. 7: Spatial Demographics of Tshwane - 2016 (UPArch UUC 2020)

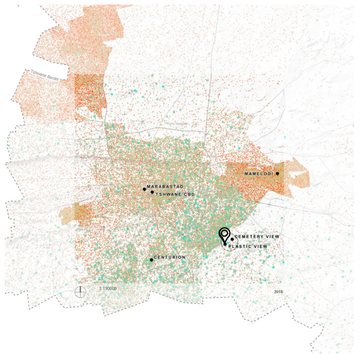


Fig. 8: Economic Distribution in Tshwane -2016 (UPArch UUC 2020)

Plastic View Informal Settlement

Plastic View Informal Settlement has become a by-product of this migratory need for economic stability. Primarily inhabited by economic refugees from Zimbabwe and Lesotho, this is a settlement that has developed due to its proximity to wealth and opportunity (UP Hons 2021:10-18). It is situated in Moreletapark, Pretoria East, adjacent to the Moreletapark Gemeente church and within close vicinity to multiple gated estates. Originating in 2001, due to the area's high demand in construction labourers, the settlement began as makeshift shelters concealed in a field between shrubs and trees, with no access to basic amenities (UUC Hons 2022). After multiple acts of illegal eviction by the South African Police and other civic departments, the municipality was court ordered to acknowledge the existence of Plastic View as an informal settlement in 2009 (UUC Hons 2022). This meant that residents could settle in plastic view as long as they did not build permanent structures and the municipality was supposed to provide basic service provision and infrastructure to the inhabitants (UUC Hons 2022).

This mandate was never fully executed by the municipality and since 2009 the settlement has grown to contain more than 922 dwellings housing over 8000 inhabitants (UP Hons 2020:26). This in turn has led to severe overcrowding and inadequate transient housing with an overall average of 7 people per 20m2 informal unit (UP Hons 2020:26,29). It sits in stark contrast to its surroundings, with the standard of 1 affluent house equating to 22,5 informal dwellings (UP Hons 2020:28). Furthermore there is a gross lack of service provision and infrastructure. No electricity is provided and there is insufficient access to water and toilets (UP Hons 2021:54-59). There is a crèche and a clinic in close proximity to the site, however these too are inadequately sized in relation to the settlement (UP Hons 2021:54-59).

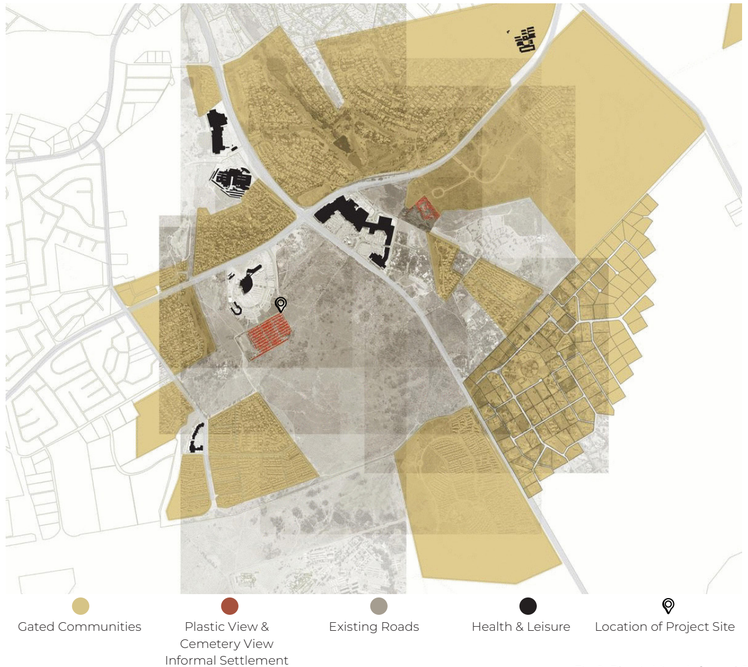


Fig 9: Plastic View Informal Settlement surrounded by gated estates in Moreletapark, Pretoria East (UPArch UUC 2020)

Fig 10: Historic Spatial Development of Plastic View Informal Settlement (UPArch UUC 2020)

These harsh living conditions in concurrence with legal action against further upgrading and a looming developmental precinct plan issued by The City of Tshwane (2021) has left a sense of uncertainty and transience ingrained within the inhabitants of Plastic View. However, irrespective of these difficulties, mapping done by (UP Hons 2020 & UP Hons 2021) shows how permanence is slowly beginning to materialise through an increase in masonry structures and gardens as well as the implementation of complex leadership and socio-economic structures.

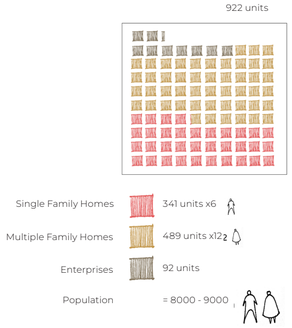


Fig 11: Housing Data showing the number of units in Plastic View (UPArch UUC 2020)

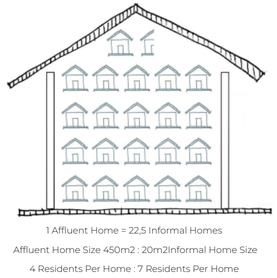


Fig 12: Housing Data showing affluent houses in comparison to informal houses (UPArch UUC 2020)

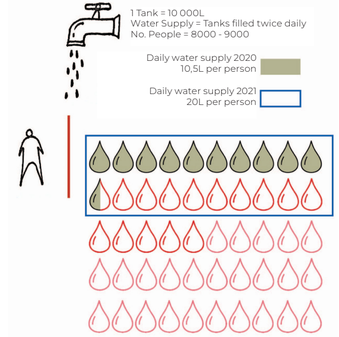


Fig 13: Water Data -20L of water is supplied per person per day (UPArch UUC 2021)

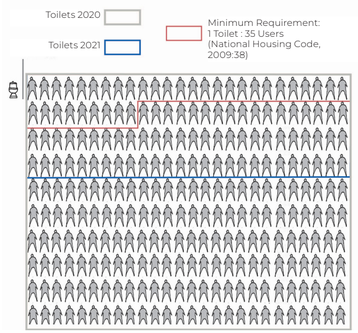


Fig 14: Sanitation data showing 1 Toilet is supplied for every 41 inhabitants in Plastic View (UPArch UUC 2021)

Fig 15: Contextualising Plastic View Informal Settlement (Zorn 2020)

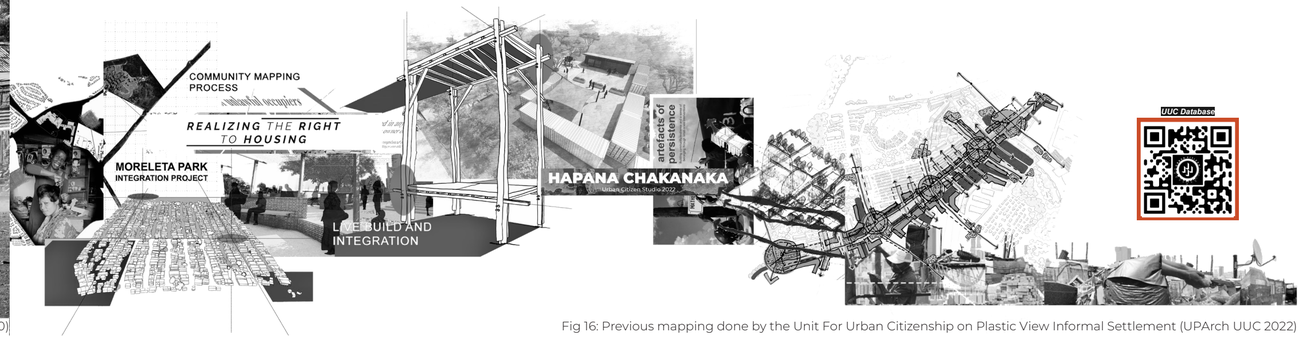


Fig 16: Previous mapping done by the Unit For Urban Citizenship on Plastic View Informal Settlement (UPArch UUC 2022)

ARCHITECTURAL ISSUE

Learning From The Vernacular, The Role of the Architect & Informal Settlement Upgrade

Alex then recognised the economic opportunity for welding within the settlement, saving enough money to buy a generator, a welding machine and a small residence for himself. He quit his job as a landscaper and soon became known as the welding professor, accommodating everyone's requests while working with the resources at hand. As his business expanded, he was able to upgrade his house to steel and brick, correlating the upgrade to his learned skills and the needs of his economic venture. His reputation currently, is not only known as the resident welder, but also, the local designer. He finds solutions to problems which in turn allow for other opportunities. Many examples of this innovation can be seen within his own house and he currently has aspirations of expanding his dwelling vertically to allow for other economic opportunities.

Many approaches directed towards the socio-spatial, economic and ecological issues of today have been rendered inadequate due to numerous reasons. Three of these reasons include; the misconception as to the relationship between people and their environments, inappropriate solutions imposed by bureaucratic and professional ideologies and practices, and, the lack of determination by society towards correcting past, current and future injustices (AlSayyad et al 2006:127).

However, it has been recognised that some of these reasons could be rectified through an enhanced understanding of current processes and practices that sustain human settlements today, despite their socio-spatial, economic and ecological conditions (AlSayyad et al 2006:127).

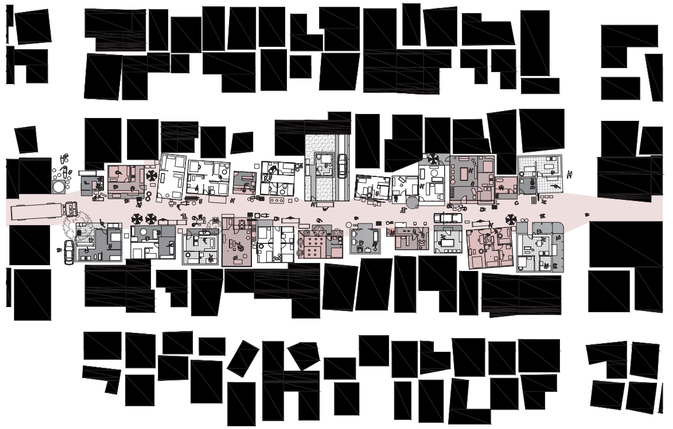


Fig. 17: Depicting an existing street in Plastic View Informal Settlement (Author 2022)

Over 800 million dwellings, more than 90% of the world's built structures, are not designed by architects (AlSayyad et al 2006:128). According to AlSayyad et al (2006:128), these vernacular environments are human constructs that provide indigenous knowledge as a result from ecological, economic, material, political and social relations (AlSayyad et al 2006:110) and therefore cannot be ignored within the built environment (AlSayyad et al 2006:128). Vernacular architecture, as described by Oliver (1997b: xxiii), are structures, built by owners or communities, that respond to inhabitants specific needs and ways of living. Traditional technologies and available resources are utilised in accordance with their environmental contexts. This description and many more has the potential to include informal settlements (Kellet & Napier 1995:7) and studies into these habitats could enable policy makers and professionals in planning for social change (AlSayyad et al 2006:125). Viana (2009:180) states: "The ingenious, creative and alternative micro-systems that are found within informality, are systems that address the urgency of living – they are relevant and worthy of analysis, and the resulting knowledge is essential for attempts at addressing the major urban problems they contain, evaluating the possibilities of transformation and upgrading their urban spaces in future."

Previous mapping done by UP Hons (2020 & 2021) has begun to show how Plastic View Informal Settlement is an example of how people from different economic, cultural and political backgrounds have created ingenious solutions to meet their specific needs. Furthermore, the mapping has started to elucidate an understanding of how space is formed on site. For instance, mapping into ethnicity in relation to masonry structures, courtyard typologies and building technologies has potentially revealed an understanding into ethnicity as an agent to technological and typological change (UP Hons 2021:30-48). However, the current research fails to translate into a complex spatial understanding of the settlement. It is therefore proposed that research into this subject be furthered within this dissertation.

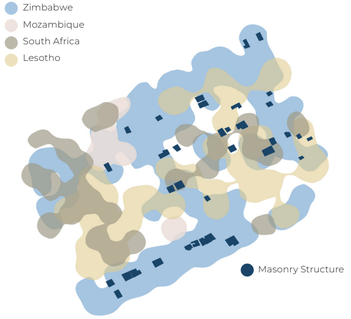


Fig 18: Left
Ethnicity heatmap overlayed with masonry structures in Plastic View Informal Settlement.
We see the correlation between Masonry structures and ethnicity, specifically how most masonry structures have been build by Zimbabweans.
(UPArch UUC 2021)

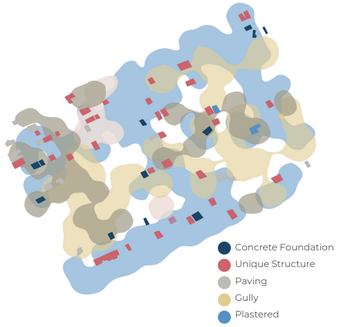


Fig 19: Left
Ethnicity heatmap overlayed with various mapped building technologies. Here we see the correlation between different building technologies and ethnicity, specifically how building technologies are beginning to be transferred between different ethnicities
(UPArch UUC 2021)

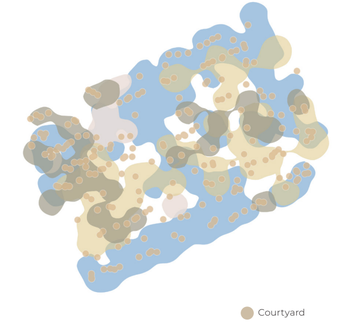


Fig 20: Left
Shared spaces are common among all groups of ethnicity and found throughout the settlement. However, the nature of these shared spaces differ.
(UPArch UUC 2021)

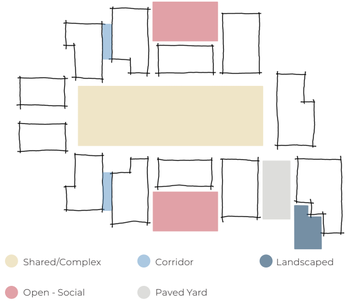
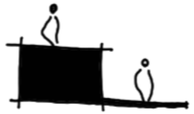


Fig 21: Left
The different Courtyard Typologies Found in Plastic View Informal Settlement.
(UPArch UUC 2021)

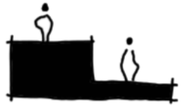
THE ROLE OF THE ARCHITECT

Authorship

In Bernard Rudofsky's book, "Architecture without Architects'' (1964:7), he compares "the serenity of the so-called underdeveloped countries with the architectural blight of the industrial countries," recognizing the anonymity and beauty of the unplanned and handmade. Giancarlo deCarlo, in his seminal work, "Architecture's Public" (1969:13), challenges traditional views on authorship, contending that architecture has become too important to be left to architects, due to the complexities of society. "Architecture for the Poor" (1976) by Hassan Fathy furthers this notion as he analyses the demise of his most well known project, New Gourna, specifically emphasises his role within the project and demanding, in hindsight, that architects pay close attention to the social and cultural values of those they design for (Awan, Schneider & Till 2011:170). Christopher Alexander's book, "A Pattern Language" (1977), also aimed to blur the distinction between designer and user, by publishing 253 patterns of various spatial configurations of the everyday in order to portray the unconscious association to space and the vernacular knowledge of everyday users. More recently professionals such as Alejandro Aravena (2014), Balkrishna Doshi (2018) and Francis Kéré (2022) have all assumed an understanding that their role as designers has changed to include processes of engagements (Hyatt Foundation 2022). The Architect is no longer seen as the primary designer, but rather as a collaborator.



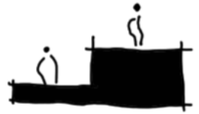
Sole Designer



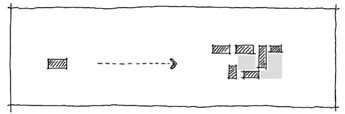
Primary Designer

Mediator

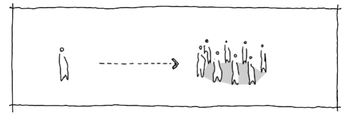
Collaborator



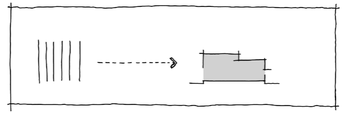
Assistant



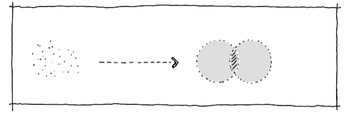
Architect as Facilitator of Emergence



Architect as Facilitator of Community Participation



Architect As Facilitator of Enablement



Architect As Facilitator of Meaningful Engagement

Fig. 22: Above
Principles extracted from theory of what the role of the architect has become (Author 2022)

Fig. 23: Below
Drawings depicting the variations of authorship within design processes (Author 2022)

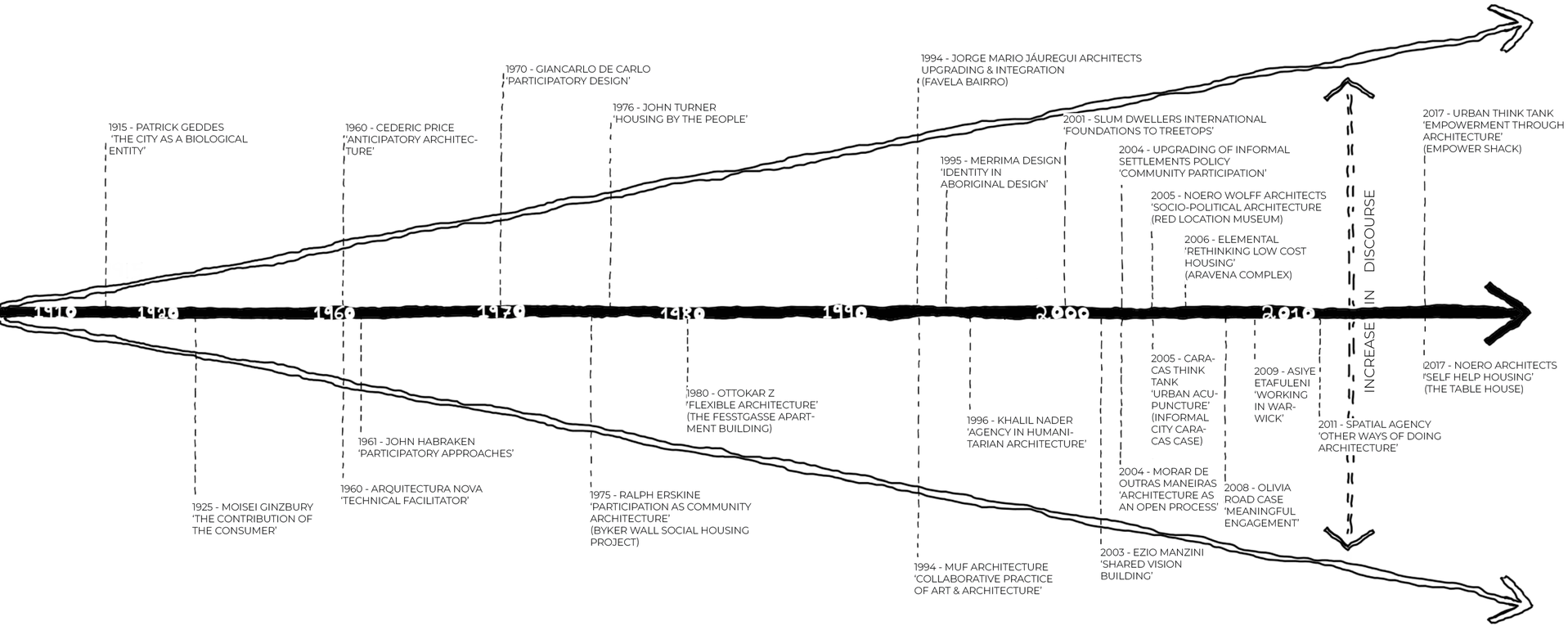


Fig. 24: A time-line depicting an exponential increase in theory relating to authorship and architecture
(Author 2022)

Within the architectural discipline, there has been a recent resurgence of interest regarding informal urbanism (Perold, Donaldson & Devisch 2019:97). As primary members of the built environment and with specialised knowledge, the profession has the ability to offer spatial, technical and social expertise (Perold, Donaldson & Devisch 2019:98). However, at large, the discipline remains relatively disengaged, isolated and elitist (Perold, Donaldson & Devisch 2019:98). In order to remain relevant, architects need to dissociate with their history of entrenched exclusivity and address the current needs of our evolving society (Perold, Donaldson & Devisch 2019:98). This means that for the profession to engage with spaces of informality, it needs to become less formal, re-conceptualising architectural pedagogy, theory and professional ideology (Perold, Donaldson & Devisch 2019:98).

INFORMAL SETTLEMENT UPGRADE

The Discourse & Participation As A Resource

There have been numerous approaches developed regarding the upgrading of informal settlements globally, as it is no longer considered a marginal issue (Combrinck, Vosloo & Osman 2017:43). However, despite the introduction of progressive policies and strategies, the discourse remains complex and underdeveloped, as these approaches have generally failed to address the needs of informal settlement inhabitants (Mitlin 2021:298). This is primarily due to a lack of authentic participation within development processes as policies have remained intrinsically top-down with authorities fearing subversion (Valladares 2013:20). This systematic incomprehension around the meaning of participation has therefore led to the implementation of inappropriate solutions in informal settlements (Mitlin 2021:298 & Valladares 2013:20). To this end, an investigation into participation as a resource to upgrading processes was undertaken within this dissertation.

To better understand this currently underdeveloped and complex discourse a matrix was created (UP UUC 2022). Approaches were placed on a horizontal axis relating to authorship with the architect as primary author on one end and facilitator on the other. They were then placed according to tenure on the vertical axis. Projects without tenure were placed within the realm of temporary relief and advocating for change while projects with tenure were stipulated as those of small and large-scale upgrade.

As an example, designed as a form of temporary relief, without tenure is the project “Table House” by Jo Noero. The architect acts as an interpreter of current conditions in order to enable change. Asiye etafuleni is an NGO that also places themselves within the realm of temporary relief, however, the NGO acts as an enabler for facilitating user induced change. On the other end of the matrix you can see approaches such as the reconstruction and development programme where the architect has primary authorship and a generalised large scale solution is constructed. Lastly, the Upgrading of informal settlement programme (UISP) was also positioned. Initially without tenure the programme advocates for collaboration in interpreting the current conditions of a settlement. The settlement is then gradually upgraded until a position of tenure is reached which enables future development.

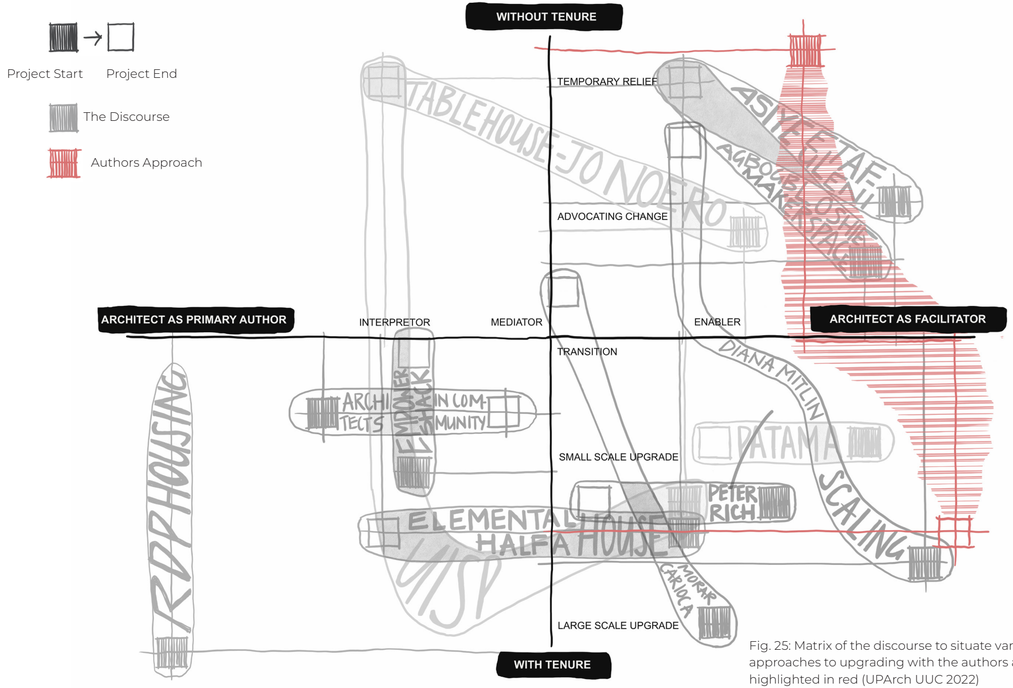


Fig. 25: Matrix of the discourse to situate various approaches to upgrading with the authors approach highlighted in red (UPArch UUC 2022)

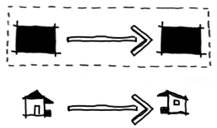
SCALING PARTICIPATION

In Diana Mitlin's editorial (2021:295-298): "Citizen participation in planning: from the neighbourhood to the city" she suggests possibilities in which participatory processes could be scaled to make them more accessible and in turn more impactful. "Scaling within" offers that participation and knowledge gained in one household within a neighbourhood could be replicated within another in the same context while "scaling out" proposes that these practices could also be taken out into new neighbourhoods (Mitlin 2021:297). "Scaling through" then further accentuates this by stating that lessons learnt could also be utilised within larger scale projects (Mitlin 2021:297). "Scaling across" focuses on one service to another within the same neighbourhood and lastly, "scaling up" advocates for the change in legislative policies to include these participatory projects as precedents (Mitlin 2021:297).

The complexity of this dissertation lies within these notions of scaling. The knowledge learned within a singular process of small scale collaboration could be re-applied to improve and sustain human ecosystems at the scale of specific dwellings, buildings, settlements, cities and countries (AlSayyad et al 2006:127). The outcomes of this proposal aim to be scalable to this theory. The Results of collaboration between indigenous knowledge and professional expertise could be scaled within, out, across, through and up effecting change up to legislative level.

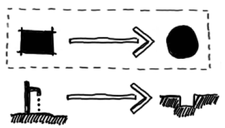
Fig. 26: Sketches representing the notions of scaling theorised by Diana Mitlin (Author 2022)

Scaling Within



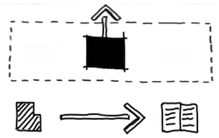
House To House

Scaling Across



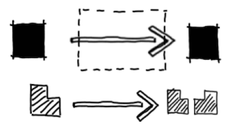
Service To Service

Scaling Up



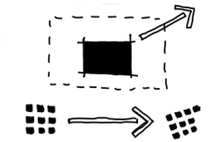
Project To Policy

Scaling Through



Precedent To Project

Scaling Out



Community To Community

THE SITE

An Existing Street in Plastic View Informal Settlement

This dissertation is one of five located within and around Plastic View informal settlement. Each dissertation has their individual approach in dealing with various issues that informal settlements currently face, utilising Plastic View as a case study. Ryan Meij's dissertation is positioned on the periphery of Plastic View and investigates regenerative landscapes as a tool for upgrading and sustaining informal settlements; Ingrid Schmutz is focussed on the crèche, critiquing and re-conceptualising existing education, healthcare and sanitation relief typologies; Annique Haese's project is situated at the entrance to the settlement, researching the effect that anchor institutions could have as platforms for knowledge transfer and upgrade; Naseera Goga is exploring play and recreation as an instrument for temporary relief, utilising the space surrounding the soccer and netball fields; and lastly this dissertation is premised on inadequate housing and service delivery, investigating in-situ upgrading processes. These projects together create an urban vision for Plastic View informal settlement that is focussed on upgrading and integrating the settlement within the surrounding urban fabric.

An existing street within Plastic View informal settlement is chosen as the site for this dissertation. The street is situated centrally within the settlement and currently contains a total of two portable toilets and one 10 000 litre water tank, that also services numerous other streets. The tank is filled up twice a day, providing an average total of 20 litres of water per person per day. Similarly to the rest of the settlement, no electricity is provided, however Alex's welding shop (no.22) does have a generator and solar lights that provide some illuminance onto the street at night. The street consists of 25 structures of varying typologies and materiality, many of which provide economic opportunity as well as accommodation to the inhabitants. Each of these have been documented in plan and elevation and some of their owners have been interviewed. Particular significance is placed on Alex's welding shop (no. 22) as throughout this dissertation reference is made to the lessons learnt during the upgrading process of Alex's dwelling.

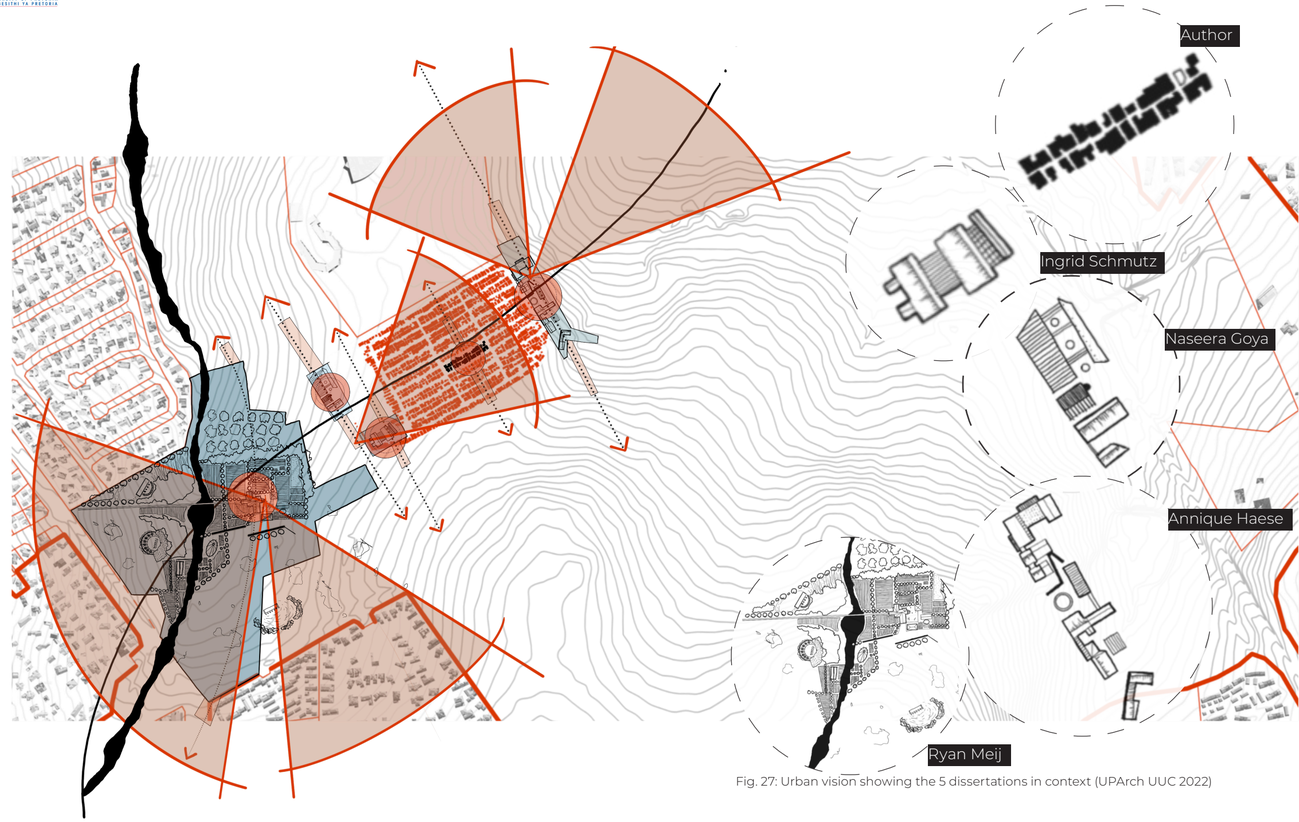


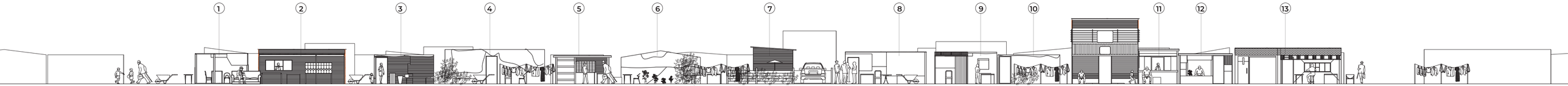
Fig. 27: Urban vision showing the 5 dissertations in context (UPArch UUC 2022)

EXISTING GROUND FLOOR PLAN

Fig. 28: The site, an existing street in Plastic View Informal Settlement (Author 2022)

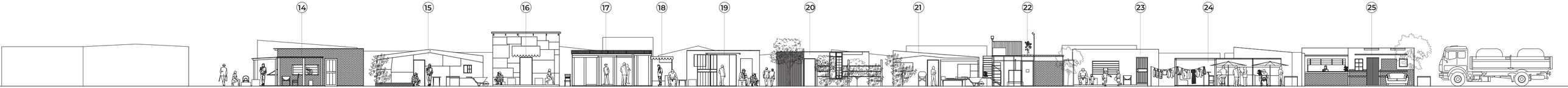
LEGEND

01- Gatura's Barber Shop
02- Numsa's Spaza & Restaurant
03- Joseph's House
04- Nester's Rental
05- Manuel's Green Grocer
06- Belief's Rental
07- Judith's House
08- Noel's Cash For Scraps
09- Jabulani's House
10-Petrus' House
11- Roy's Shabeen & Spaza
12- Franci's Tailor Shop
13- Mary's Spaza & Barber Shop
14- Peter's Spaza & Restaurant
15- Prosper's Rental
16- Roy's Second Shebeen
17- Sylvester's Clothing Outlet
18- Petrus' Cobbler Shop
19- Remember's Barber Shop
20- Nako's Chickens
21- Primrose's Rental
22- Alex's Workshop
23- Precious' Spaza Shop
24- Joyce's Restaurant
25- John's Spaza Shop



SOUTH WEST ELEVATION

Fig. 29: The site in elevation (Author 2022)



NORTH EAST ELEVATION

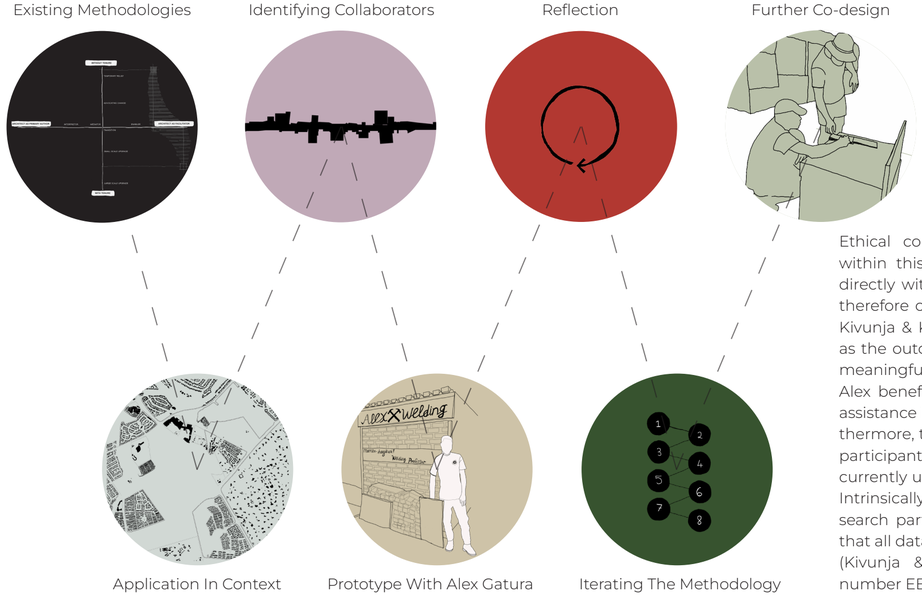
Fig. 30: The site in elevation (Author 2022)

METHODOLOGY

Architectural Ethnography

The successful inclusion of residents and communities, in attaining their inherent knowledge within the design process, rests on the implementation of sound participatory methods (Valladares 2013:22). It is in this context that this dissertation's methodological framework was situated. An analysis of existing participatory methods elucidated suggestions on collaboration techniques. This analysis dissected each phase of the methods, researching the activities through which participation was achieved. Furthermore, authorship and the role of the architect within each process was also researched. Principles were then extracted and a participatory method generated and applied in context. This commenced an ethnographic process of immersion. First, a typology study was conducted to better understand how space is currently formed on site. Following this, some dwelling owners were interviewed with regards to how and why their houses have changed over time, as well as any future aspirations they might have for them. This process led to the meeting of Plastic View's local welder and designer, Alex Gatura, from which further collaboration took place. Informal interviews along with more formulated surveys relating to Alex's dwelling and design process were conducted. His house was then analysed through written journal entries, maquettes, sketches and photographs. This led to the generation of a concept from which initial design sketches could be iterated through informal conversation, sketching and maquetting. Lastly, a week-long immersion into the building of the first floor of Alex's dwelling was undertaken and documented through videos.

This ethnographic process aimed to uncover a participatory method which could extrapolate indigenous knowledge from the inhabitants. This led to a better understanding of the context from which further design development could take place. The knowledge was scaled 'across' to the design of the streetscape, 'back' to Alex, 'within' to two other households and 'out' to the rest of the dwellings within the street. This all culminates in a hypothetical vision of the upgraded street (Mitlin 2021:297).



Ethical considerations were very important within this project as work was undertaken directly with local residents. The research was therefore conducted as per criteria set out by Kivunja & Kuyini (2017:28). The process as well as the outcome of the project aimed to effect meaningful change within an unjust society. Alex benefited from the process through the assistance in the building of his house and furthermore, the resultant research will benefit all participants as the project aims to influence the currently underdeveloped discourse. Moreover, Intrinsically moral values and fairness to the research participants was also upheld ensuring that all data was truthful and ethically acquired (Kivunja & Kuyini 2017:28).(Ethics clearance number EBIT/15/2022.)

Fig. 31: The methodology that will be followed (Author 2022)

DISSERTATION INTENTIONS

Informality could present vital solutions in addressing complex urban issues (Viana 2009:180). This realisation is essential in effecting complex urban integration in our currently inequitable society. Despite calls for progressive notions such as facilitation and collaboration within upgrading processes, alternative approaches, within the policy landscape and professional environment, are not yet the norm (Perold, Donaldson & Devisch 2019:98). This dissertation, through an immersive process with Alex Gatura and other collaborators, intends to reduce this disparity between policy and practice, advancing the current legislative framework and professional discourse. An investigation into participation as a resource in disseminating the reciprocal knowledge transfer that can begin to take place between architect and end user, is conducted. This results in a conceptual framework that is scaled to act as a guide to the upgrading of an entire street in Plastic View Informal Settlement and could, in turn, be further scaled to effect change on a larger platform. Through engaging the architectural discipline at a localised level, knowledge can begin to surface that will be essential in redefining the larger urban issues informality contains (AlSayyad et al 2006:127; Mitlin 2021:298 & Viana 2009:180).

Fig. 32: A dwelling in Plastic View Informal Settlement (Zorn 2020)

02 - LEARNING FROM THE VERNACULAR

INTRODUCTION

Design Research

Effective Informal settlement upgrading requires a rigorous understanding of the context (AlSayyad et al 2006:127). This is achieved through the implementation of sound participatory methodologies that enable a platform for knowledge transfer (Mitlin 2021:298 ; Valladares 2013:22), where vernacular knowledge can be extracted and combined with professional competency (AlSayyad et al 2006:125). Through applying participation, interventions that recognise and respond to everyday lived realities are realised (Mitlin 2021:298). These citizen-led approaches promote bottom-up and alternative ways of tackling urban development that facilitate adaptability to local diversity while improving affordability (Mitlin 2021:300). However, there is an apparent disparity between policy and practise with regard to the implementation of citizen participation in developmental processes globally (Mitlin 2021:298). This imbalance is especially prevalent within South Africa and is exacerbated by the systematic incomprehension as to the defined act of participation (Valladares 2013:20).

To this end, In order to understand Plastic View as its own vernacular environment, research into an immersive, participatory design methodology was conducted and piloted on site. An analysis into existing methods provided a foundation from which calculated experimental action research occurred. A typological study, as well as sketched interviews regarding the iterative journey of the informal dwelling, elucidated an understanding of how space is formed on site. This then led into a process of immersion with Alex Gatura where Interviews, surveys, drawings, photographs, maquetting and building were carried out to further present insight as to how design and building decisions are made. The process also helped in defining a participatory method which can be scaled “within” the street to other households, “across” to alternative issues of service delivery, “out” to the rest of the settlement and other communities, “through” to projects of a different nature within the urban framework and “up” to effect legislative change.

Fig. 33: Collaboration on Site (UPArch UUC 2021)

PARTICIPATORY PRACTICES

To Informal Settlement Upgrade

According to Diana Mitlin (2021:298), collaborative and participatory practices are particularly important for inhabitants of informal settlements. However, existing approaches generally fail to address the needs of the disadvantaged. This is primarily due to inappropriate solutions imposed by intrinsically top down policies that do not embrace the full potential of participation (Mitlin 2021:298).

This gap between intent and reality is especially prevalent within The Upgrading of Informal Settlements Programme proposed by South Africa's Department of Human Settlements. The policy advocates for participatory in-situ upgrade (SA HS 2009:9), focusing on tenure security, infrastructural stability and socio-economic integration, and empowerment (SA HS 2009:13). It is premised upon the extensive and active community participation in conjunction with government in order to achieve spatial justice and inclusivity (SA HS 2009:13). However, the central notion of the state as provider remains within the South African policy genealogy (Combrinck, Vosloo & Osman 2017:45) and according to Valladares (2013:20), research into the execution of participatory design methods presents that authorities are more likely to prevent any community control over design decisions due to the misconstrued notion of collaboration leading to subversion. Furthermore, a participatory design methodology is not stipulated within the legislative framework and the role of the architect is omitted, disregarding the positive impact the profession could have on these emergent urban processes (Perold, Donaldson & Devisch 2019:97-98). This lack of policy implementation in conjunction with the systematic incomprehension as to the defined act of participation (Valladares 2013:20), has led to a continued proliferation of informal settlements within South Africa (Combrinck, Vosloo & Osman 2017:45).

The success of participatory design is largely dependent on the degree to which it fits into the existing legislation (Valladares 2013:20). Policies that advocate for participation should focus more on the development of collaborative methodologies rather than just advising participation at a normative level (Valladares 2013:22).

The Community Architect Programme in Cuba was designed in conjunction with its participatory design method (Valladares 2013:23). The Programme aims to enable low-income residents, through the facilitated interaction with an architect, to communicate their spatial needs and ensure that residents make informed decisions about building (Valladares 2013:19). A rigorous methodology is followed consisting of four phases: A site visit where primary data is collected through sketches, interviews and participatory role playing games; a feasibility study where three design variations are conceptualised and presented to colleagues; an explanation and presentation of the three designs to the residents; and finally an instruction manual detailing the chosen design's construction process (Valladares 2013:21). However the architect still assumes the majority of the authorship. End users are involved and considered within the approach, however they are seen more as clients then collaborators with each end user irrespective of their design and construction knowledge undergoing an identical process.

Mitlin (2021:300) further states that participatory efforts create a deeper sense of democracy when driven from below. This promotes alternative ways of urban development that challenge the modernist vision of urbanisation (Mitlin 2021:300) that were said to systematically neglect the socio-cultural dimensions of society (Valladares 2013:18). Asiye eTafuleni (2021) and URBZ (2022), are two non profit organisations, including citizens and professionals, that have developed portfolios of such methodologies in support of incremental development. Both organisations conduct experimental and action research projects with citizens, associations and local governments through surveys, workshops and community meetings (Echanove & Srivastava 2022:1-11; Dobson & Lees: 2021: 5-37). Their objective is to merge local and global knowledge to produce innovative models for the built environment that improves the experience of the general urban dweller (Echanove & Srivastava 2022:1-11; Dobson & Lees: 2021: 5-37).

In each of these approaches the architect or designer takes a different perspective on authorship: Due to a lack of a defined participatory method within The Upgrading of Informal Settlements Programme, the designer is still posed as the primary author who makes the final decisions; The Community Architect Programme advocates for a role of mediation where the architect follows a rigorous method that utilises the stakeholders input within generating concepts; Asiye eTafuleni acts as a collaborator, partnering with the stakeholders to create outcomes together; and URBZ assumes the role of a facilitator, assisting stakeholders in realising their concepts by enabling the design process. Each approach specifies and uses the outcomes of participation in alternative ways.

The methods can also be scaled according to the theories proposed by Diana Mitlin (2021:295-298) : The approach used in The Upgrading of Informal Settlements Programme is “scaled out” to other settlements; The Community Architect Programme’s method is “scaled within” to other households; Asiye eTafuleni’s is “scaled across” to alternative forms of service delivery and “through” to create precedents for future projects; and lastly, the lessons generated from URBZ are “scaled within” to different households, “through” to create precedents to alternative projects and “out” to other communities.

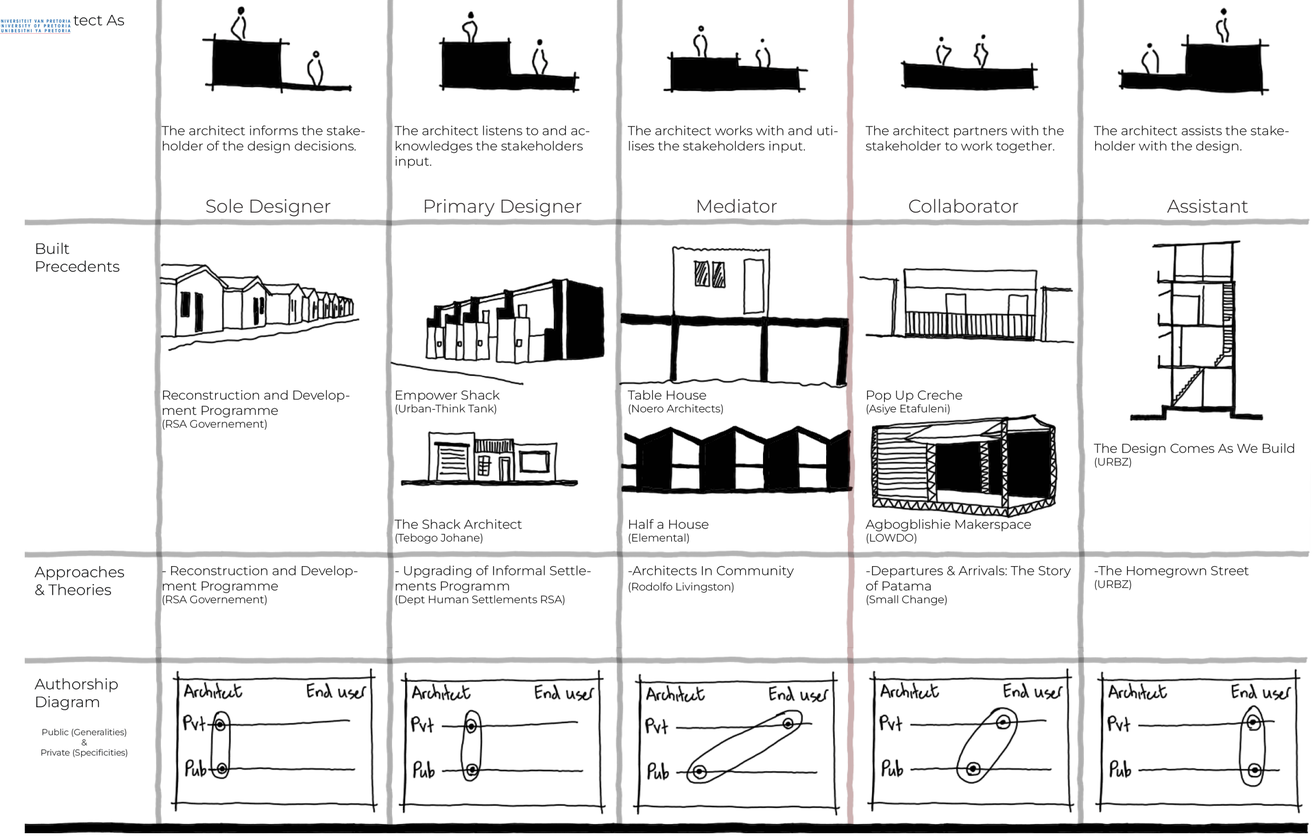


Fig. 34: Graph that situates each precedent & approach in accordance to the designers authorship (Author 2022)

Within this dissertation, the role of a collaborator is assumed and an investigation into how the outcomes of the collaboration could be scaled is undertaken. Following the explored approaches a proposed method is generated regarding participation on site in Plastic View Informal Settlement. Firstly, a holistic understanding and documentation of the way space is currently formed on site will allow for a better comprehension of spatial determinants (Echanove & Srivastava 2022:1-11). Following this, owners of the dwellings, or collaborators, within the chosen street will be met and their dwellings documented in plan and elevation (Echanove & Srivastava 2022:1-11). Interviews will also be conducted concerning their vision for their dwellings (Echanove & Srivastava 2022:1-11 & Valladares 2013:23). This should reveal programmatic and conceptual intentions. Maquettes and sketched responses to the conceptual vision will then be iterated in collaboration to determine a finalised design(Echanove & Srivastava 2022:1-11). The architect will then be able to draw up an instruction manual for the building process (Valladares 2013:23).

It is important to note that this method is extracted from the above theories and is certain to change on site.

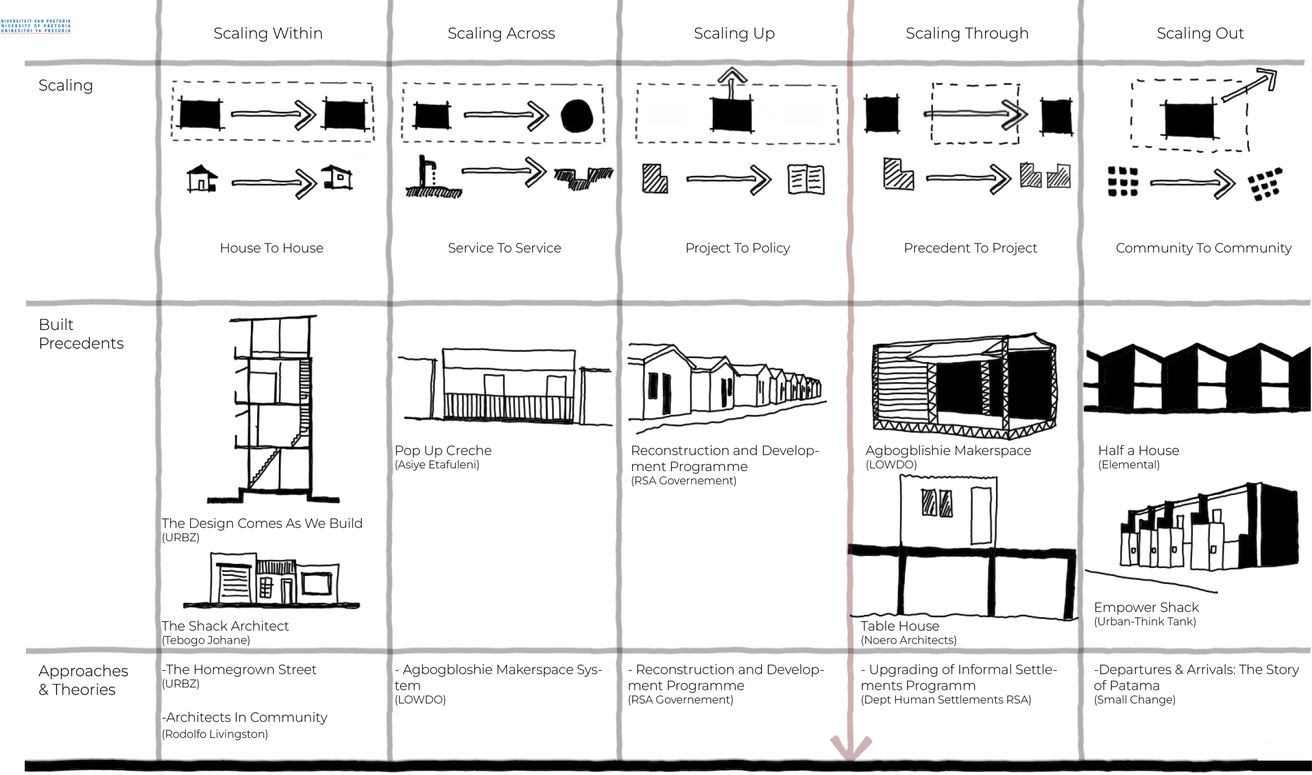
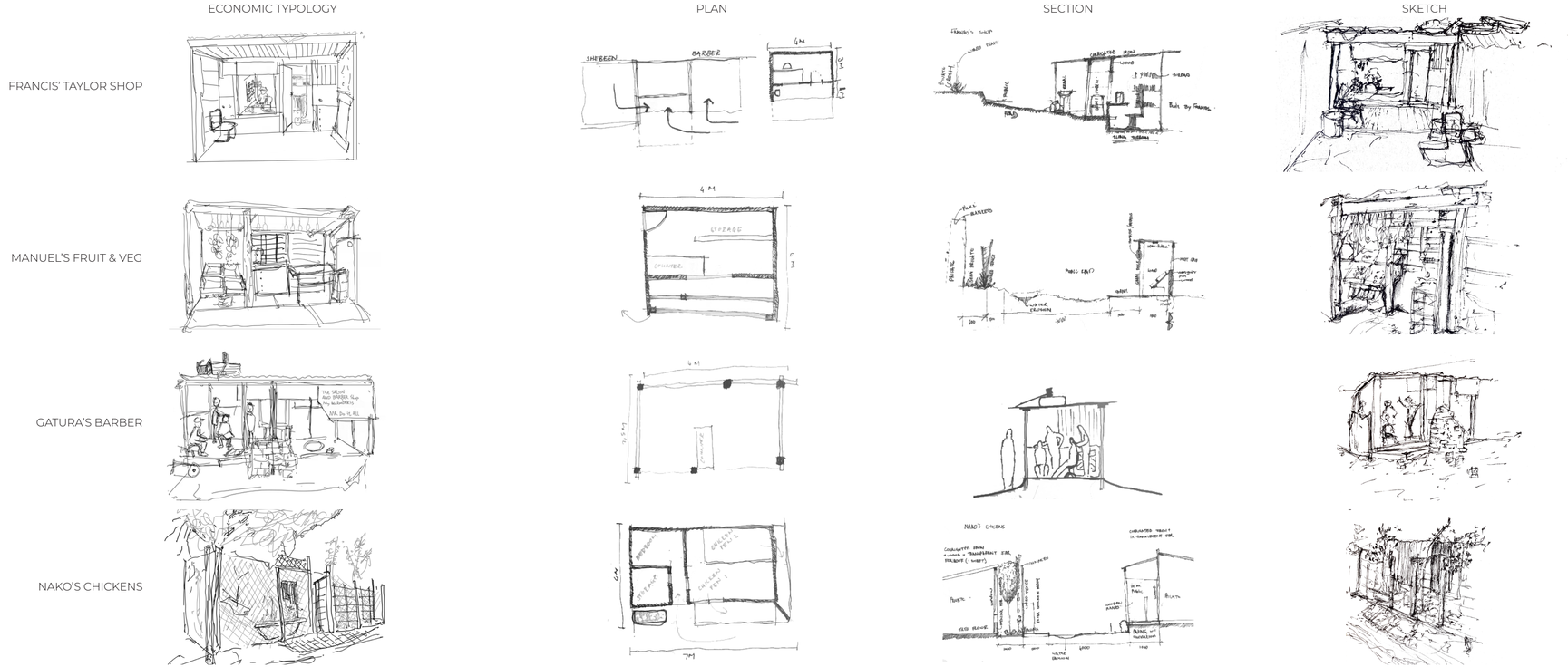


Fig. 35: Graph that situates each precedent & approach in accordance to Diana Mitlins notions of scaling (Author 2022)

A PROCESS OF IMMERSION

As stated in essay 1, previous mapping done by (UP Hons 2021:30-48) has begun to elucidate an understanding as to spatial determinants on site. However, the outcome of the mapping failed to demonstrate the resultant spatial typologies that materialise from the found determinants. Therefore, to better understand how space is currently formed on site, a socio-spatial lexicon was collated (UP UUC 2022).

Fig. 36: Rough drawings extracted from the socio-spatial lexicon exercise that show the documentation process of the economic typologies (UPArch UUC 2022)



SOCIO-SPATIAL LEXICON

This process involved the geotagging and observational sketching of multiple typologies found on site. Within each, their spatial configuration, objects and relevant actors were noted. From this, three categories of typologies were observed namely; economic, dwelling and shared space. Three examples within these typological categories were then chosen to be collated to create a socio-spatial lexicon. For example, within the economic typologies, the tuck shop, the social lounge and the barber shop were selected and a spatial representation of each typology created. Their objects and actors were depicted. This was then repeated for dwelling and shared space typologies.

This allowed insight into what objects, actors and spatial qualities become commonalities in the formation of certain types of space. For example, the barber shop is depicted as an open,-shaded and shared social space with moveable furniture, while the social lounge is generally more enclosed, dark and social with similarly movable objects. The spaza shop uses thresholds as indicators between public and private space with a shaded external social space with moveable objects merged with a more enclosed internal private space with fixed objects.

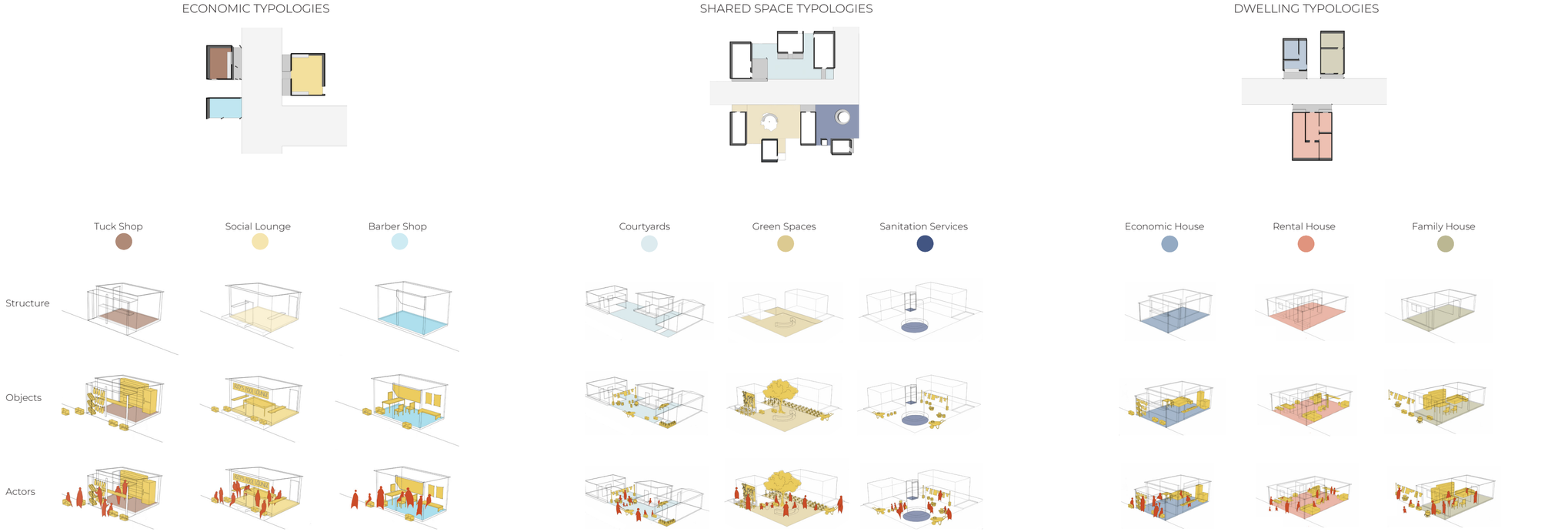
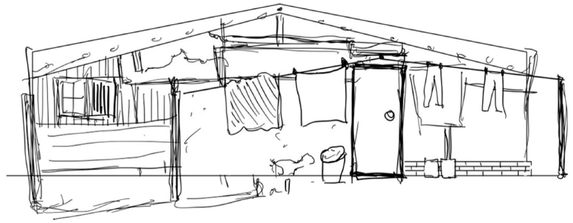


Fig. 37: Socio-spatial Lexicon (UPArch UUC 2022)

Following this, as seen in figures 31-33, an existing street's dwellings were documented in plan and elevation and their corresponding owners met. Interviews with some of the owners were also conducted regarding the iterative process that their dwellings have been through since they began residing in Plastic View, as well as any future aspirations they might have for them.

Residents were asked to describe their first house in Plastic View. This was sketched out in plan with notes to correlate. Questions were then asked about changes that were made to their dwellings, why they were made and when. This too was documented through notes and sketching to create a time-line of events which depicted the spatial, programmatic and technological journey of the dwelling. Furthermore, residents were then asked about any aspirations they might have for their dwellings and these were also noted and sketched as a part of the time-line. This process aimed to uncover reasons for change and the spatial implications thereof, in turn revealing the iterative processes of design and construction that inhabitants follow.

This process led to the meeting of Alex Gatura, the local welder and designer in Plastic View Informal Settlement, and thus commenced an enriched process of collaboration with many site visits composed of discussions, story telling, drawing and building.



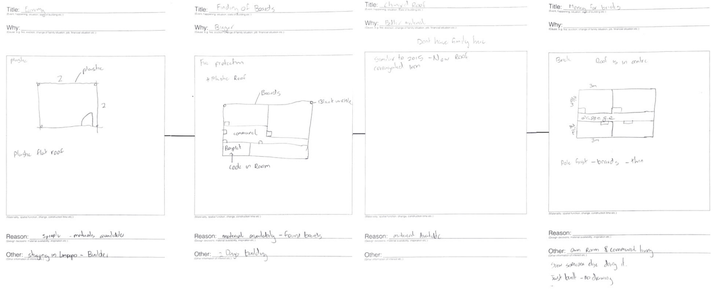
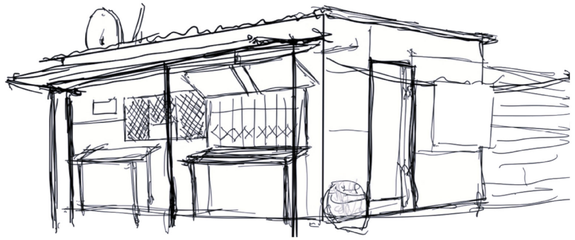
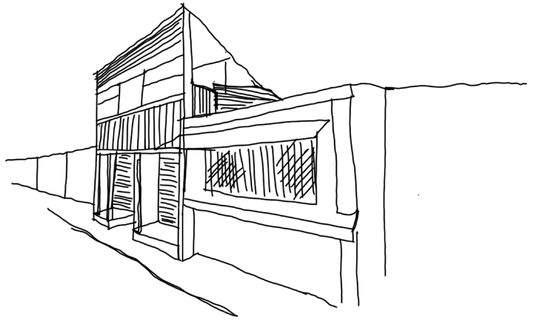
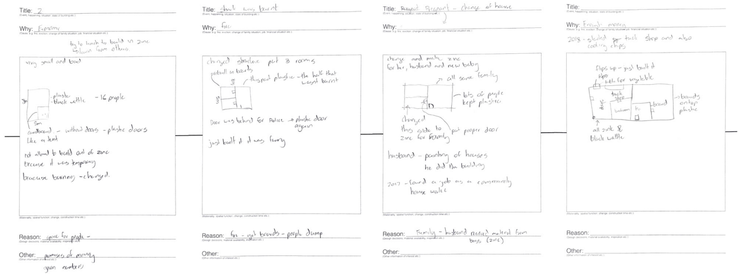
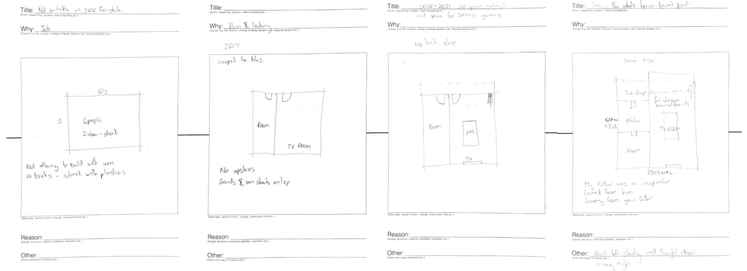


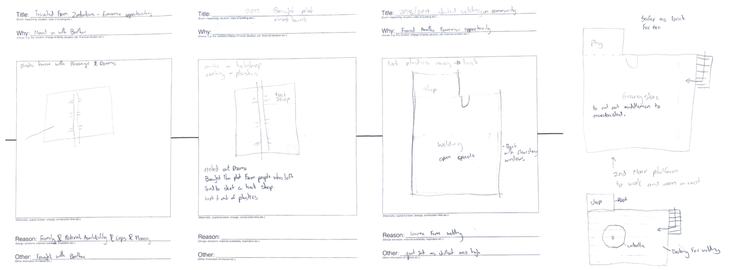
Fig. 38: Rough drawings extracted from the 'iterative dwelling' exercise (UPArch UUC 2022)











INTRODUCTION TO ALEX & HIS DWELLING

Site Visit 1

It was clear from the street elevation of Alex's dwelling that he had design and construction expertise. The dwelling was the only one constructed out of steel and brick and a sign on the wall read: "Alex The Welding Professor". A refurbished scrap trailer stood outside holding two steel barrels that seemed to retain water collected from his roof and furthermore, makeshift steel and timber stairs with positioned pot plants and another sign that read: "design is a good idea" led to the top of his roof. This seemed to propose future construction of a first floor.

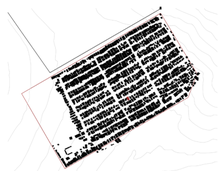


Fig. 39: Alex Gatura & the location of his dwelling in context (Author 2022)

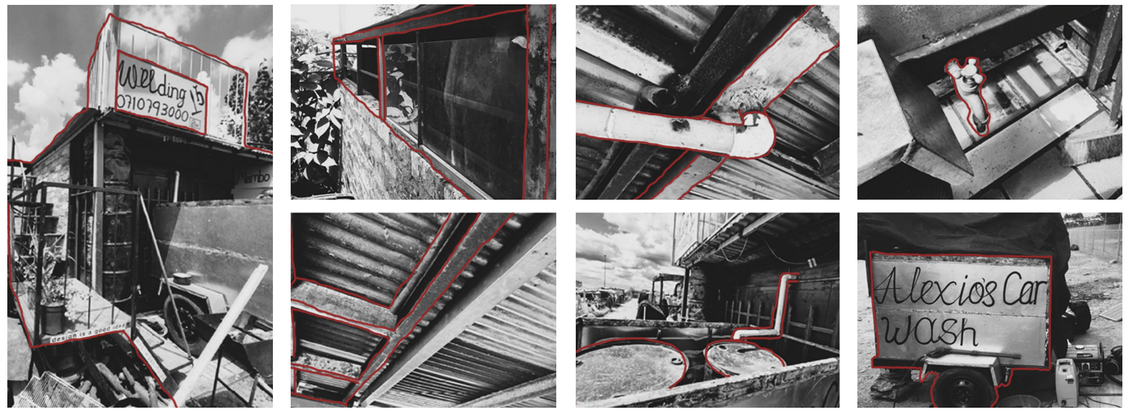


Fig. 40: Photo analysis of the dwelling (Author 2022)

Upon knocking on his door, Alex gestured to enter. He had been constructing a wheelbarrow, using old parts and a steel barrel. On entry, it could be seen that the house was separated into two rooms, a small dark space with no openings for light and only a bed, and a larger room for his welding workshop and living space. The larger room was cluttered with scrap steel, welding equipment, a generator, a workshop table, a couch and two chairs, and was lit through clearstory openings. Introductions were made and an explanation as to the interest into his dwelling was given. Informal conversation was initiated and questions were asked about the way he builds and designs and organically the conversation turned to his aspirations and creative intentions. The 'Iterative Dwelling' exercise was then carried out, which further uncovered his story as a self taught welder and designer as well as the narrative and future aspirations he has for his dwelling.

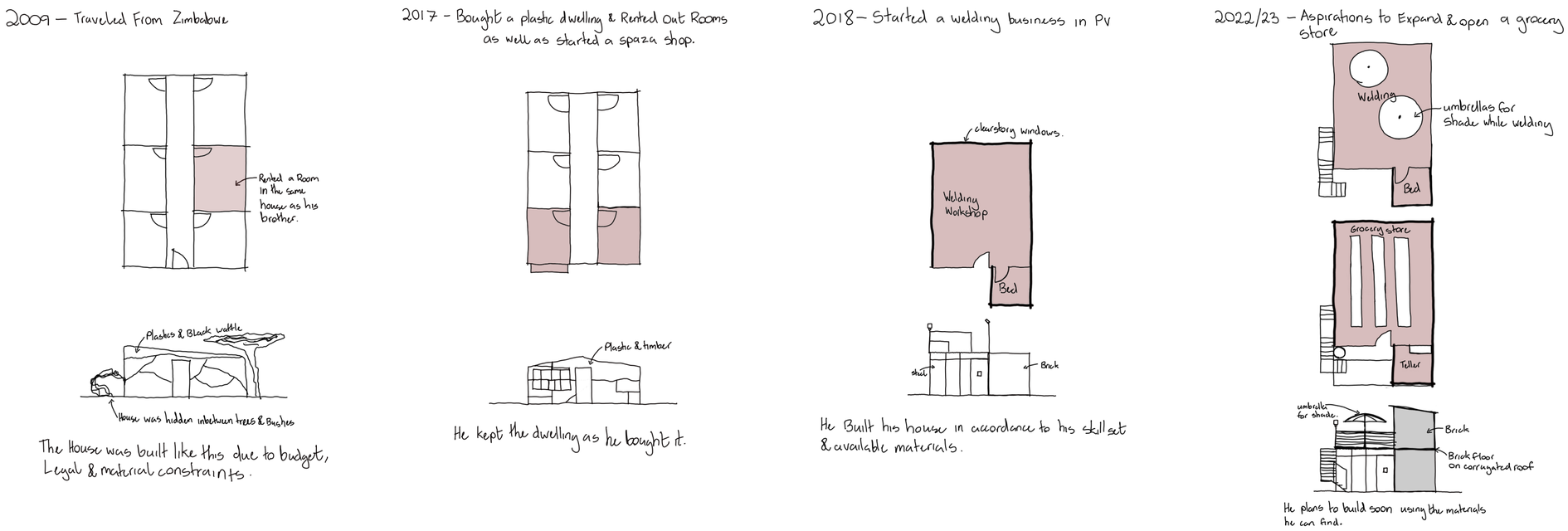


Fig. 41: Iterative dwelling exercise with Alex Gatura (Author 2022)

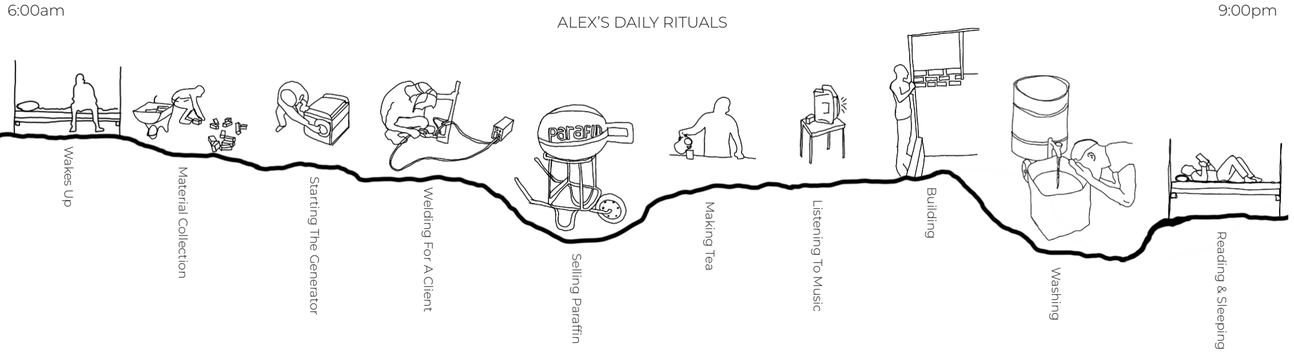
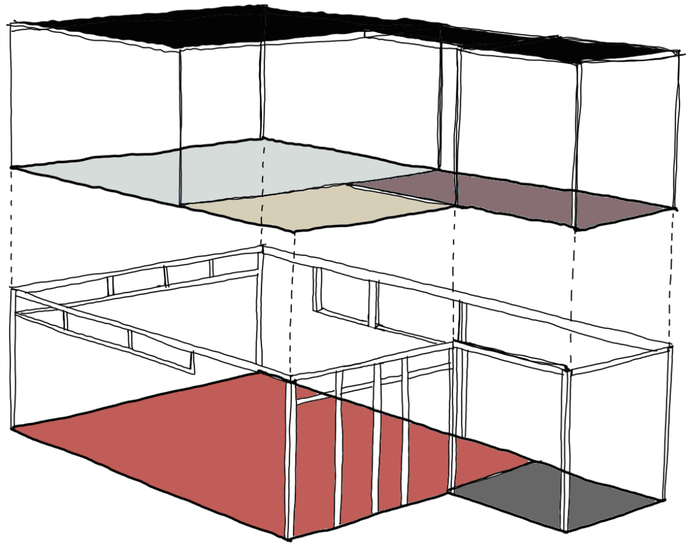


Fig. 42: Alex's daily rituals (Author 2022)



Welding Workshop
Outdoor Living
Bedroom
Grocery Shop
Teller

Fig. 43: Sketch portraying the concept and proposed programmes (Author 2022)

From this introductory site visit, a programme and a concept was determined. Alex aspires to open a grocery store on his ground floor that supplies the local tuck shops. His current bedroom would become a space for the cashier and he proposes to expand his dwelling vertically to move his welding shop and living space to the first floor. The concept of expansion- the act of becoming larger or more extensive - was determined.

Due to the success of this site visit, plans were made for a second in which an analysis of his existing house could be done in more detail and further conversations about his expertise and aspirations as a designer could take place.

ALEX'S EXPERTISE & AN ANALYSIS INTO HIS DWELLING

Site Visit 2

A week later, as planned, a second site visit was undertaken with more emphasis placed on analysing the existing dwelling. Together with Alex, measurements and photographs of the entire structure were taken and as the process developed he would explain how he had designed and built the house, show his mistakes as well as speak to additional aspirations and possible details he had in mind for the upgrade. This allowed extensive insight into his expertise and design capabilities, especially with regards to what he could comprehend visually.

The site visit also enabled an improved understanding of his dwelling. A ground floor plan, a roof plan, a section and elevations were drawn up to facilitate the design process. Furthermore a critique with regards to the structural flaws of the house elucidate an understanding of what needs to be addressed within the design process. The most clear of which was the need to add foundations to the dwelling.

It was from this process that a technical concept emerged. Due to his profession as a welder, knowledge of steel and access to it as a building material, as well as the analysis into his existing dwelling, the technical concept of a structural skeleton with varying infill technologies was defined.

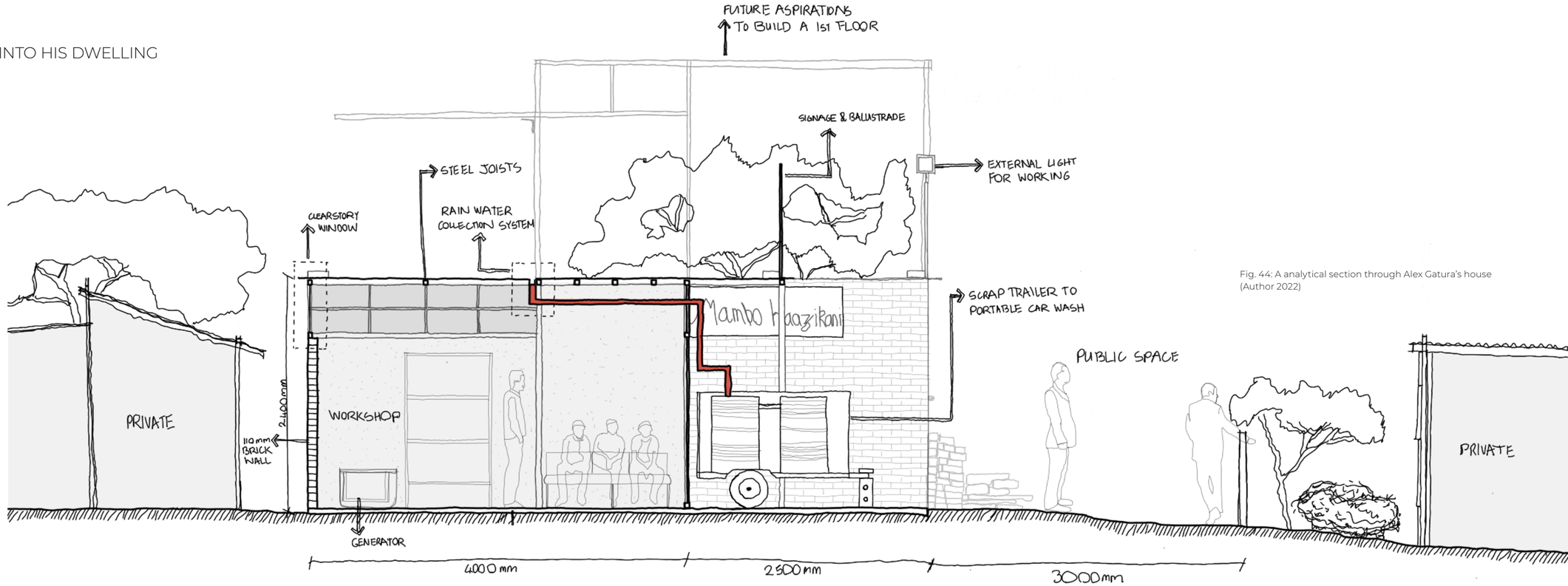


Fig. 44: A analytical section through Alex Gatura's house (Author 2022)

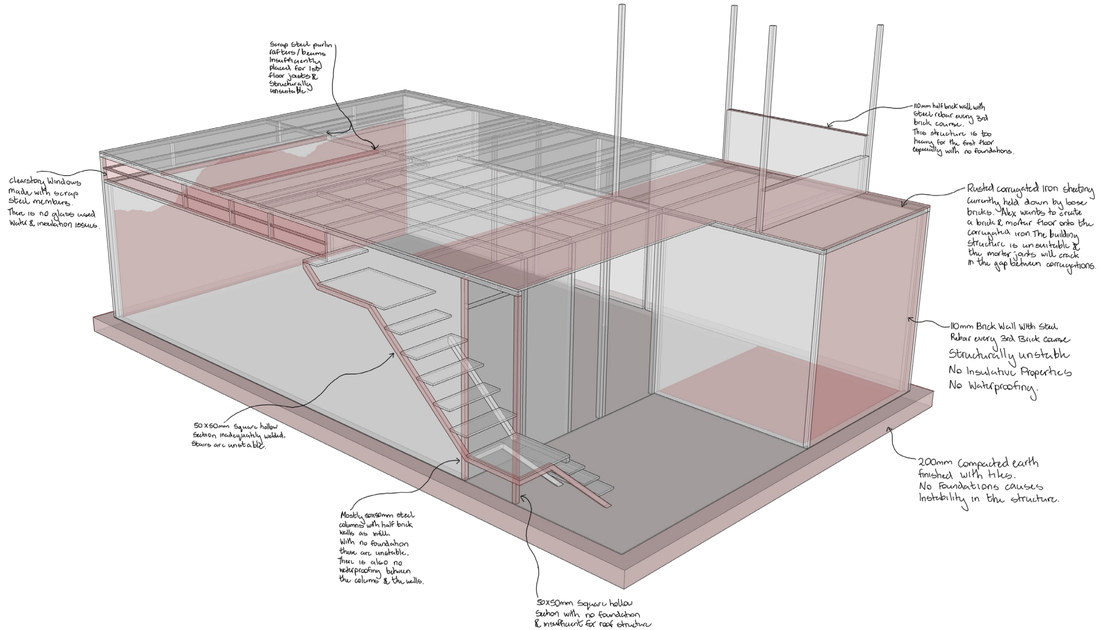


Fig. 45: A critique on the existing structure (Author 2022)

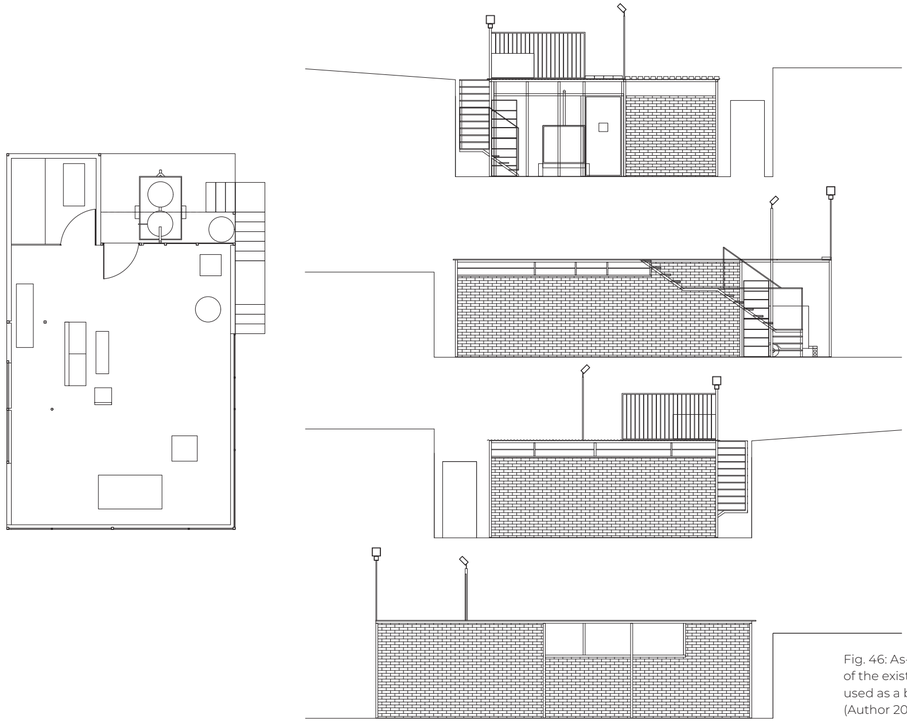


Fig. 46: As-built drawings of the existing dwelling used as a basis for design (Author 2022)

SKETCH DESIGN DEVELOPMENT

Site Visit 3

The third site visit involved the visual representation and development of Alex's proposed aspirations. The as-built drawings were given to Alex, and he then showed and discussed them with others that passed by in the street. After a while, Alex then began explaining how he visually pictured the dwelling and its materiality. Sketches were made to represent that depiction.

Sketch 1 - Alex's Design

This sketch is a direct representation as to how Alex envisioned his dwelling. On the ground floor, nothing much would change. The bedroom would be converted into a space for the teller and makeshift steel aisles would be placed in the current welding workshop to create a grocery store. He then plans to construct a brick and mortar floor onto the existing roof structure, utilising the corrugated iron sheeting and steel purlin-beams as permanent shuttering for the bricks. Onto this he proposes to build, similarly with steel and brick, a bedroom for himself as well as a retractable steel shading device, under which he can weld.

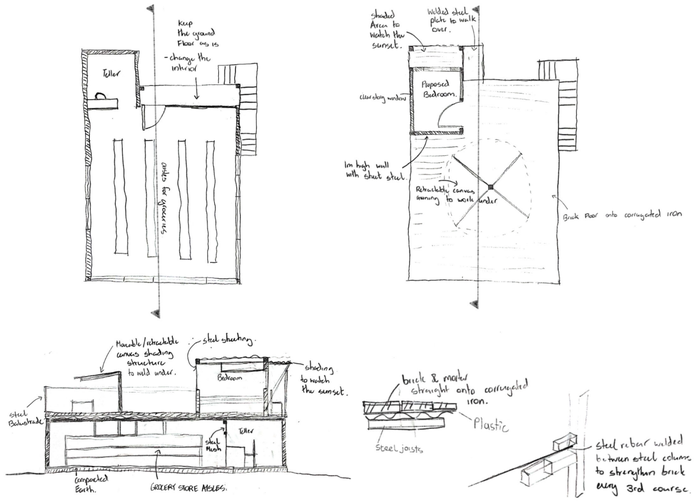
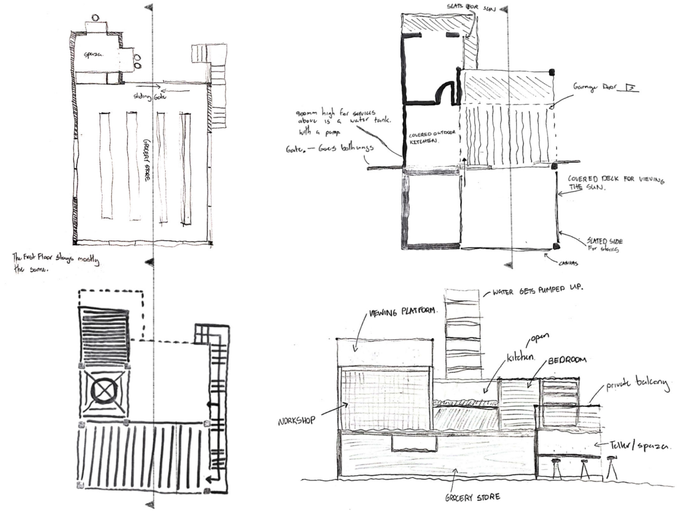


Fig. 47: Sketch 1 - Alex's Design (Author & Gatura 2022)



Sketch 2 - Architects Interpretation

Authorship then changed as Alex's design was interpreted and developed by the architect. On the ground floor, an investigation into how the teller space could become multifunctional by the additional programme of a tuck shop was done. The first floor then explores his welding shop and living space. His welding shop is fabricated out of a steel frame. A small space is enclosed with brick walls for storage while another larger space is designed to be completely openable with sliding doors and perforated steel mesh walls. An outside uncovered space is also suggested for when he welds externally. Lastly, a covered kitchen is then used as a buffer between his welding workshop and bedroom space. It is also proposed in this design that he continues capturing water off of his roof to be used for welding and for the kitchen.

Fig. 48: Sketch 2 - Architects interpretation (Author 2022)

Sketch 3 - Architects Interpretation

The next drawings grappled with the ground floor. The notion of designing retractable doors and windows out of scrap steel was explored in order to open the ground floor to the public streetscape. Subsidiary programs such as a tuck shop & a restaurant as well as a place for people to wash their hands, using his captured rainwater system was also conceptualised. This design also proposed a small storage space to be added to the ground floor. This pushed the aisles to one side of the dwelling and a clear circulation path ensured security within the shop.

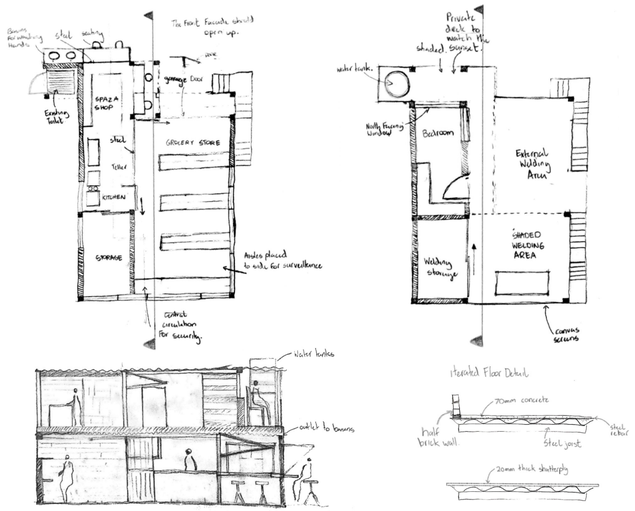
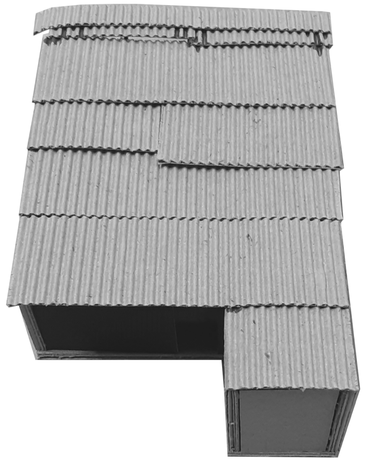


Fig. 49: Sketch 3 - Architects interpretation (Author 2022)

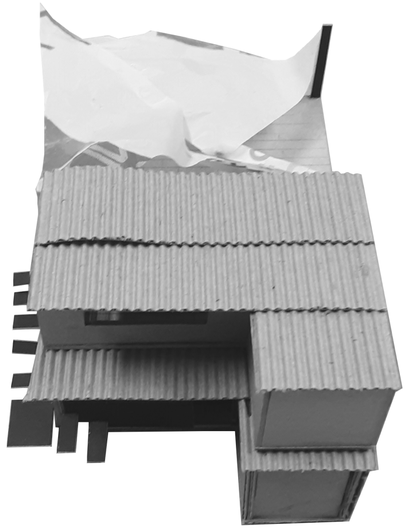
Upon return to site, Alex had unexpectedly started building. The plan had been to discuss the aforementioned sketches, however, he had acquired enough scrap steel and saved enough found bricks to begin the construction process. After a quick discussion regarding the proposed conceptual sketches, Alex became excited. He enjoyed being able to visually see what the design could become, with specific emphasis placed on his potential welding space. He then proceeded to draw, in the sand, a rough perspective of a shading device which he thought could be added. It was at this point that a decision was made to be a part of the building process and this led to an incredibly insightful week of building.

Delimitations must be noted, due to issues of liability no building or design decisions could be proposed to Alex and thus the role of a facilitator was assumed.

Fig. 50: The building Alex had done upon arrival for the next site visit (Author 2022)



Existing Condition



Alex's Proposal

Architects Interpretation

Fig. 51: Maquettes showing the design development (Author 2022)

BUILDING

Site Visit 5-9

The building took place over the course of 5 days. The first day consisted mainly of material sourcing. Welding rods, a bag of cement and fuel was bought for his generator at a local store, bricks that he had collected were thrown up to his roof and steel reinforcing rods were grinded off of a scrap sign to be used as reinforcing every 3rd brick course. The second day consisted primarily of teaching as he showed where to get good quality building sand and bricks on site, how to make consistent dagga with minimal cement, the process of laying a brick and the strenuous procedure of starting his generator. After multiple efforts in trying to get it started, it was decided that the day should be called early. On day three the generator started and he was able to weld the brick reinforcing and frames for the windows. Together, the next brick wall was laid. Day 4 saw the continuation of this process, however he had to leave to do a welding job for someone in the settlement. More sand and bricks were collected, dagga mixed and bricks laid. By day 5 the brick laying went much quicker and by midday half the brick wall was completed. Thereafter he bought drinks to share on his rooftop as the settlement began humming with weekend activity.

Through the process of building and being on site everyday for a week, valuable insight into how design and construction decisions are made on site could be achieved. Materials were sourced from site with only a few exceptions and design decisions were made during the building process. These decisions were mostly dictated by material availability, as one source of material ran out, it was replaced with another. In this case these materials were steel and brick. Furthermore, Alex's expertise had a direct influence on the way he built and designed. At this point the realisation of discerning authorship according to a collaborators apparent design capabilities became important, Alex may be able to spatially envision his aspirations whereas someone else with less design capabilities may find it more difficult.

Collaboration Video: https://drive.google.com/drive/folders/17_t02AQoz93z-aW5re2QbYoKiP5dZTPi?usp=sharing

Fig. 52: Pictures from building on site with Alex (Author 2022)

REFLECTION

Through utilising participation as a tool for knowledge transfer, a better understanding of the way space is formed on site could be obtained. This rigorous understanding of Plastic View Informal Settlement as its own vernacular environment with indigenous knowledge, is paramount to future upgrading of the street and the settlement. Furthermore, from the collaboration with Alex Gatura, a refined participatory methodology (Seen in figure...) could be extracted. This method will be applied within the rest of the street, scaling it in various ways which in turn will inform further architectural investigation. This will result in the upgrading of the entire street with an iterated framework which could be used to effect change throughout the settlement.

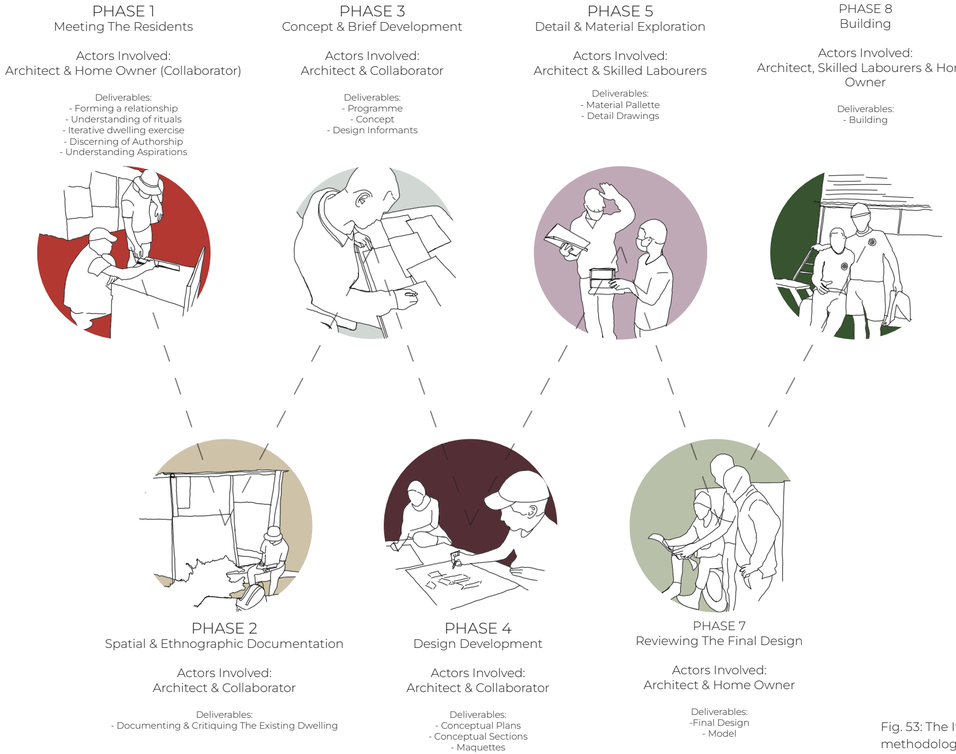


Fig. 53: The Iterated methodology (Author 2022)

03 - THE ROLE OF THE ARCHITECT

INTRODUCTION

Consolidating Lessons Learnt With Professional Competency & Scaling To Effect Change Within The Street

The process of immersion revealed an enriched understanding as to the way space is created on site. A participatory method was extracted and was used as a framework for further upgrading of the street.

Iteration 1 consists of the framework being scaled 'across' to the street, 'back' to Alex and 'within' to two other households (Mitlin 2021:297). Iteration 2 and 3 re-examined the street design, exploring the impact it could have as an informant for the upgrading of the dwellings. Iteration 4 then explored the three dwellings in relation to the developed street design and final plans, sections and details were drawn. An investigation into the proposed water capturing system was also conducted to confirm enough water was captured for sustaining the inhabitants in the street. Furthermore, thermal transmittance of the proposed technologies was explored to ensure thermal comfort in the dwellings.

This process helped refine the framework for further scaling to take place within the street and out to the rest of the settlement. The participatory method, the uncovered design and technical concepts and the proposed details were then utilised in upgrading the rest of the dwellings in the street. Lastly, to conclude, a completed vision of the upgraded street and dwellings is illustrated through a final model, plans, elevations and perspectives.

Fig. 54: An aerial photo of the settlement (UPArch UUC 2022)

ITERATION 1

‘SCALING ACROSS’ TO THE STREET

There is particular dependance on streets within informal settlement as social, cultural and economic spaces (Dovey 2013: 84; Hernández-García 2012:138; Rise 2021:37 & Schwab 2018: 137) They help in providing a sense of common identity, strengthening community cohesion and their conditions have a direct influence on the quality of public life (Rise 2021:37 & Schwab 2018: 137). Therefore, where environmental quality is low, health concerns are raised as there is a high risk of exposure to pathogens (Rise 2021:37).

Furthermore, within the upgrading of informal settlements, streets become important spaces for engineering infrastructure such as pipes, greywater recycling wetlands, drainage services, black water treatment and electrical infrastructure (Rise 2021:37). The formalisation of streets in settlements is therefore a high priority among residents (Rise 2021:37).

In account of the street being a common space between multiple inhabitants, authorship was shifted to the architect as primary designer. The responsibility of understanding and representing each inhabitants needs was realised, however, the process of collaborating with over 25 people became difficult. Therefore it was the role of the designer to conceptualise a design which was able to encompass the needs of all 25 people.

Fig. 55: A sketch of the street in Plastic View (UPArch UUC 2020)

Existing Street Conditions

Eroded rubble roads with minimal drainage that lead to stagnant pools of grey-water characterise the conditions of the streets in Plastic View. As stated within the mapping, no electricity is provided and there is minimal access to drinking water and portable toilets. However, as explored in the socio-spatial lexicon, the streets together with the external courtyards, the existing sanitation services and green areas, become the public spaces within the settlement. Activities such as washing, building, braaing, recycling, collecting water, the playing of games and socialising are always seen taking place. Furthermore, through documenting this specific street, interviewing some of the owners of the dwellings and spending valuable time on site with Alex, it was seen first-hand that this street is an important social connector, acting as the public domain for the inhabitants.

Fig. 56: Photographic analysis of the public space in Plastic View (Author 2022)

Programmes & Concept

The existing activities that take place within the street, in conjunction with the current lack of service infrastructure influences the programming of the design. The primary objective is to create public space for the residents that also provides them with services. This public space will provide water and a space to cook as well as be adaptable to various other activities that currently take place within the street. From this understanding of the context and programmatic requirements, the notion of the street as a central spine was conceptualised. The concept represents the functional needs within the street as well as the requirement to act as a public interface and connector of the dwellings and their inhabitants. The design should therefore facilitate the inhabitants in further upgrading of their environments.

Design Development

Rough design development took place in the form of plans, sections and models. It was proposed that due to issues of space that subsidiary streets become pedestrianised to allow for services to be erected, and the current primary streets are to remain vehicularised to allow for larger acts of service delivery such as refuse removal.

A central, repetitive structure was therefore proposed. Wetland plants are encompassed by a stepped brick wall which accommodates various programmes relating to the street analysis, namely seating, braais, wash basins and counters. This is then semi-covered to provide some shade by a steel and wattle pergola. It is also proposed that stormwater and greywater is captured and directed through the plants and into a submerged retention tank. The water would then be hand pumped to raised water tanks for pressure to be provided to the basins and the houses.

The design was utilitarian in nature. Simple and low cost construction technologies were utilised to ensure the community would be able to build the system themselves and durable materials such as reclaimed brick and concrete surfaces were proposed to ensure longevity.

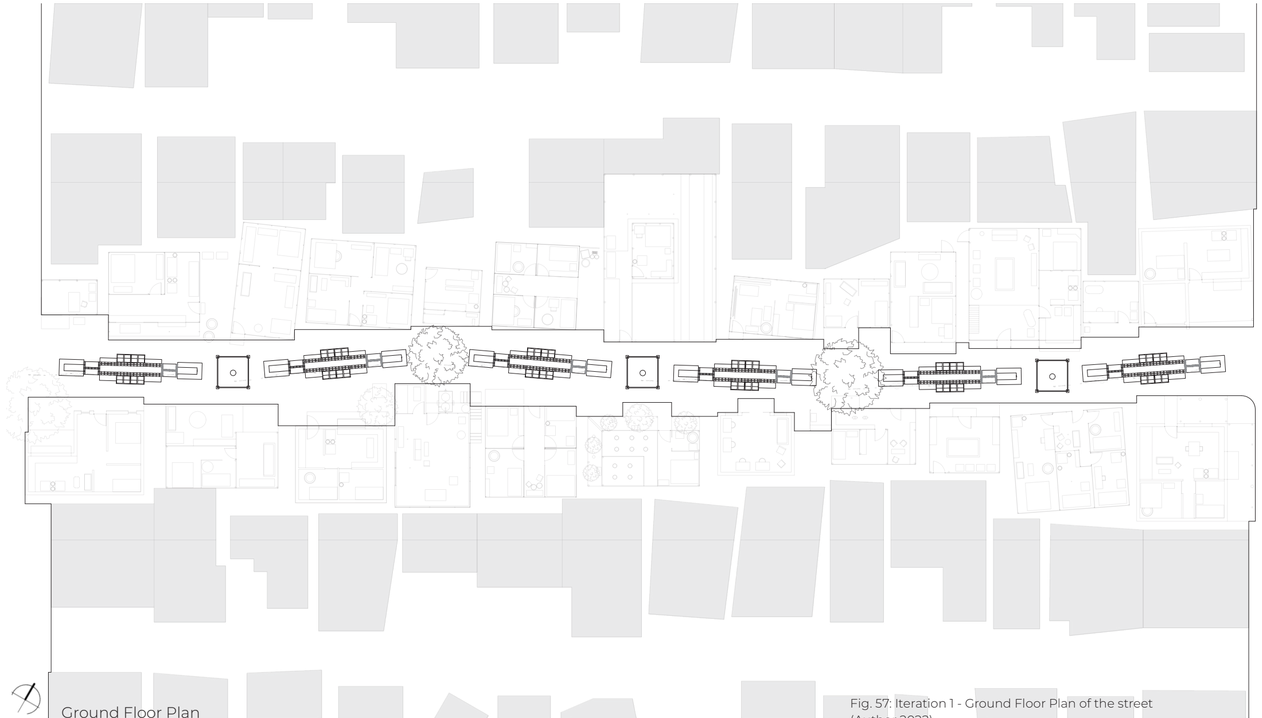


Fig. 57: Iteration 1 - Ground Floor Plan of the street (Author 2022)

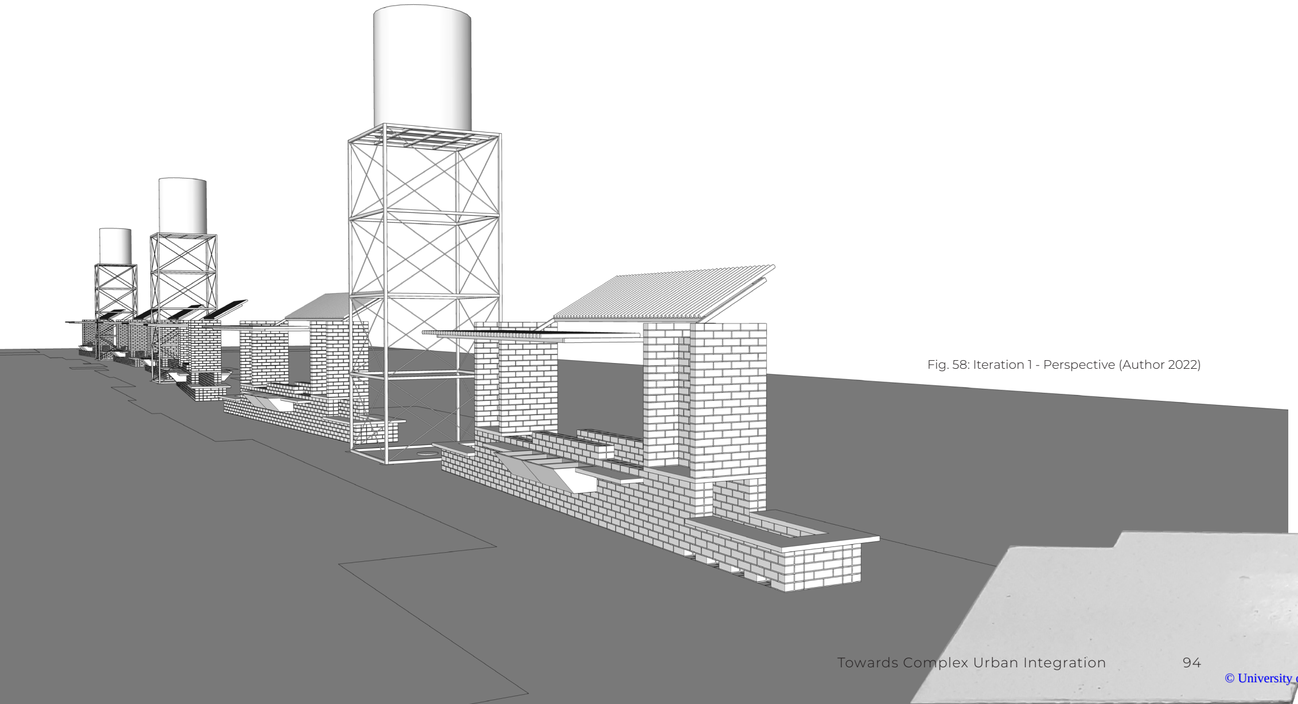


Fig. 58: Iteration 1 - Perspective (Author 2022)

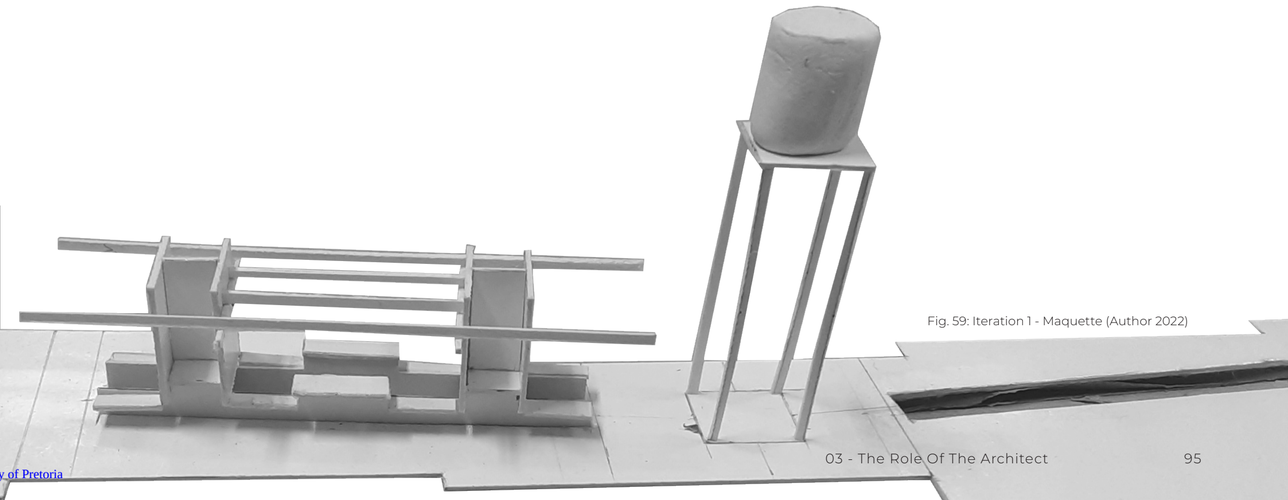


Fig. 59: Iteration 1 - Maquette (Author 2022)

‘SCALING BACK’ TO ALEX

Alex’s dwelling design was then re-visited and developed further. The grocery store on his ground floor completely opened up to the streetscape, becoming part of the public domain. Furthermore, subsidiary programmes such as a tuck shop, a kitchen, a space for the teller and secure storage were positioned adjacent to the grocery store.

The first floor plan then housed the more private functions; the bedroom, living space, bathroom and workshop. The workshop, similarly to the grocery store, opened up to the living space.

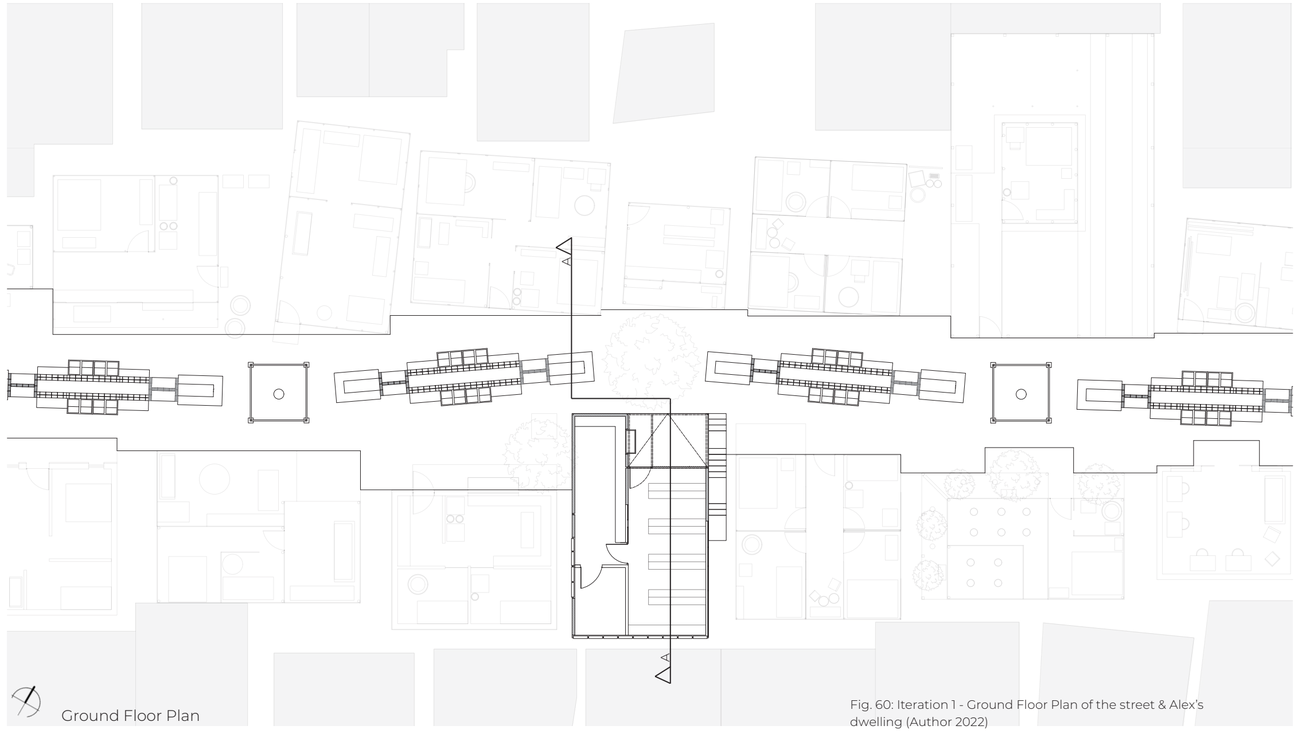
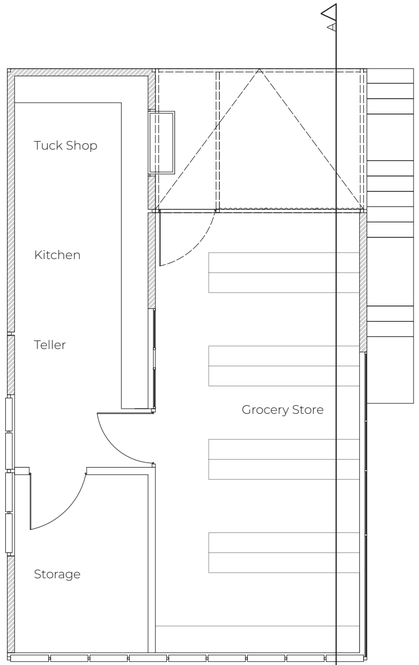
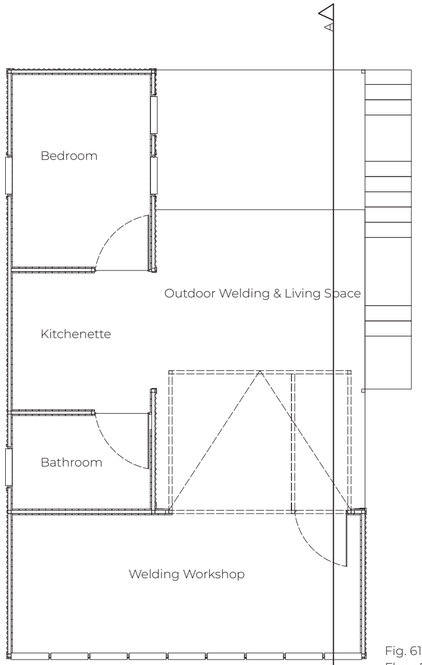


Fig. 60: Iteration 1 - Ground Floor Plan of the street & Alex’s dwelling (Author 2022)

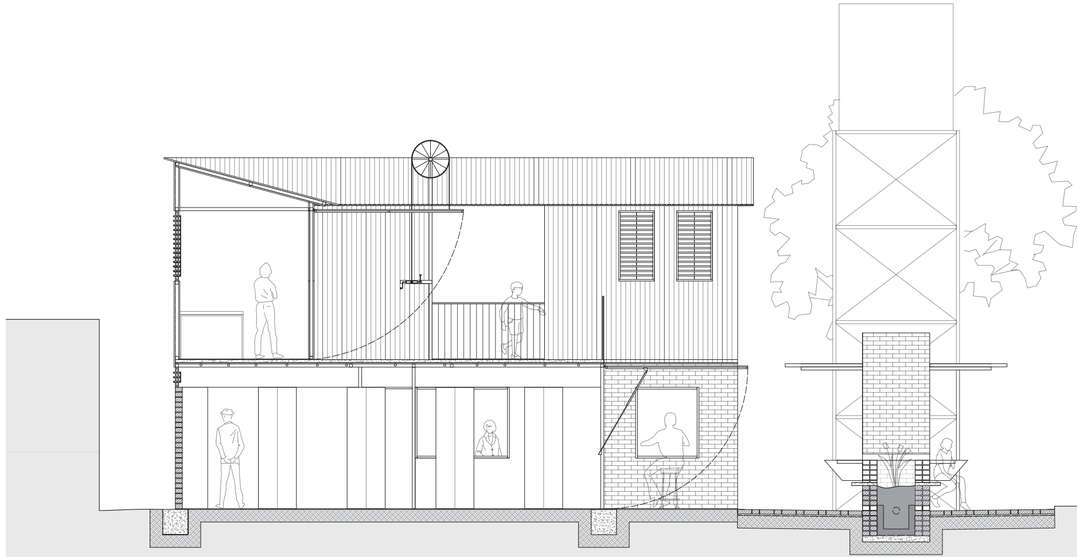


Ground Floor Plan



First FLoor Plan

Fig. 61: Iteration 1 - Floor Plans of Alex's dwelling (Author 2022)



Section A-A

Fig. 62: Iteration 1 - Section A-A (Author 2022)

‘SCALING WITHIN’ TO NUMSA

A similar process of collaboration that was undertaken with Alex, then began with Numsa, a healthcare worker and tuck shop owner of dwelling number 2. She currently lives with her husband John, a brick layman, and her relatives live in the adjacent house, number 3. Through the iterative dwelling survey and informal conversation she explained her and her husband’s journey as well as how their dwelling has changed since being in Plastic View. It currently consists of two spaces, a bedroom and a tuck shop and is built out of reclaimed corrugated iron sheets and black wattle poles. Numsa explained that when they first arrived in Plastic View their dwelling was built out of cardboard and over time they upgraded due to various reasons such as fire, and security. Each time they upgraded, they would give their old materials to their relatives. However, both their dwelling and their relatives dwelling are unsuitable for inhabitation as no insulation is used, there are no foundations, the wattle poles are untreated and the external cladding is in a state of disrepair. She then outlined their future aspirations. Numsa and John plan on having children and knowing the fire and safety risk within the settlement would like to upgrade their house and the adjacent house to brick. She also plans to start a daycare since the existing crèche is not big enough.

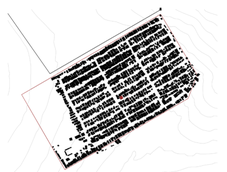
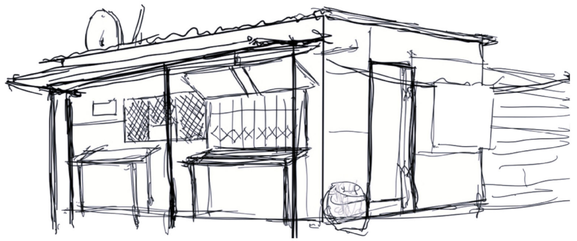


Fig. 63: Numsa & the location of her and her families dwelling in context (Author 2022)



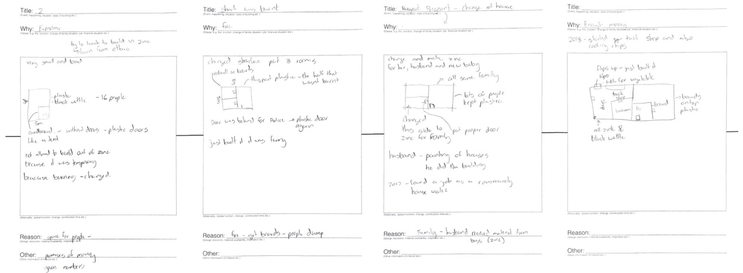


Fig. 64: Iterative dwelling exercise with Numsa (UPArch UUC 2022)

Similarly with Alex, through collaborating with Numsa and analysing the dwelling, proposed programmes along with design and technical concepts were revealed. Since the dwelling is currently unsuitable for inhabitation, it would need to be re-built however, the existing programmes would remain and additionally a bedroom, a daycare and a bathroom would be added. Due to the aspiration and need for change, the design concept of 'transition' - the process or a period of changing from one state or condition to another.- was determined. Furthermore in response to the issues of security and safety, the technical concept of solidity - the quality or state of being firm or strong in structure - was established.

Numsa's design was then developed through maquettes, plans and sections. The ground floor includes four separate spaces, one for the existing tuck shop, another for a communal space for her family, a bathroom and lastly, a space for the proposed crèche. The first floor then houses the more private spaces, a room for Numsa's Family and a room for her relatives.

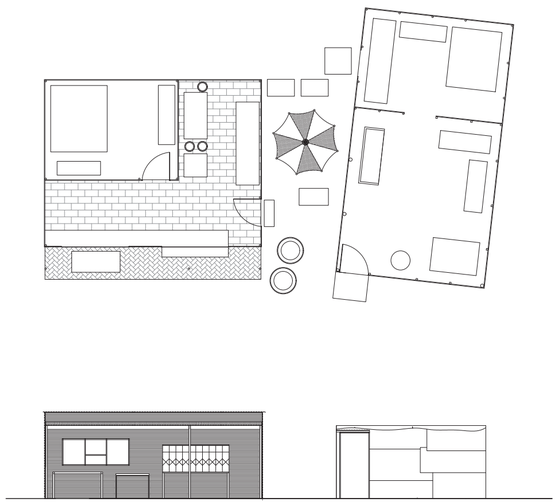


Fig. 65: As built drawings for Numsa and her families dwellings (Author 2022)

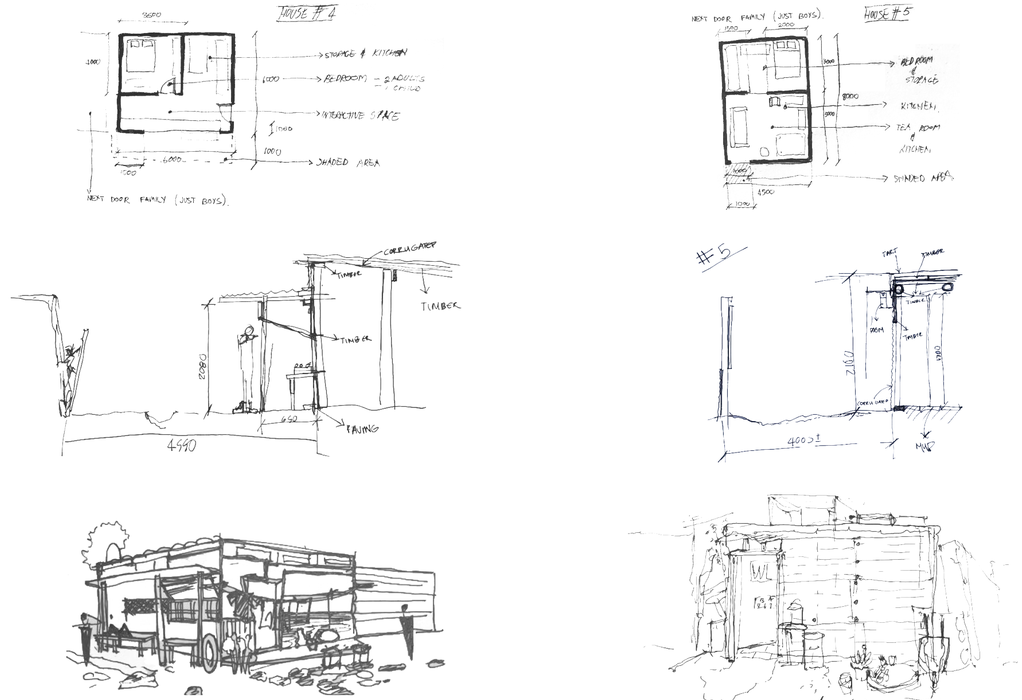


Fig. 66: Rough drawings analysing the dwellings (UPArch UUC 2022)

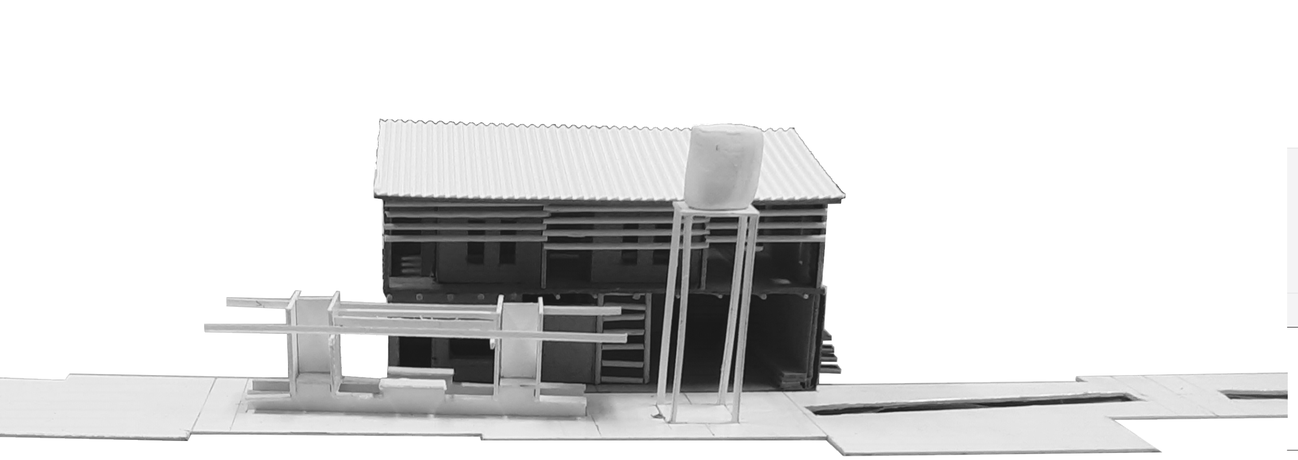


Fig. 67: Iteration 1 - Maquette (Author 2022)

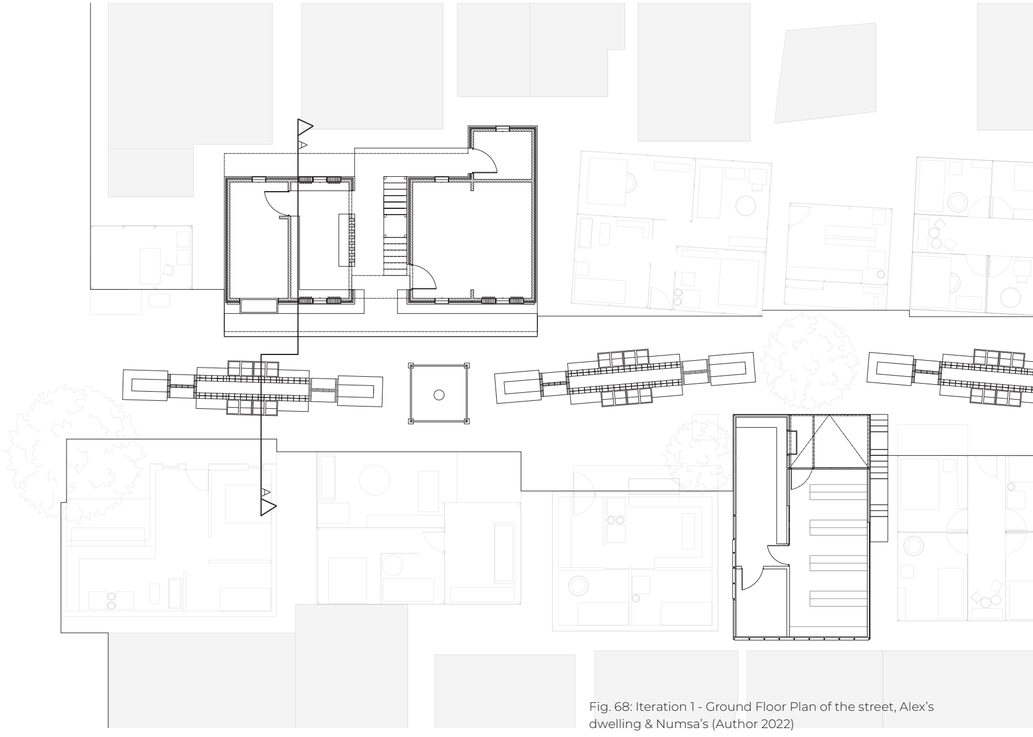
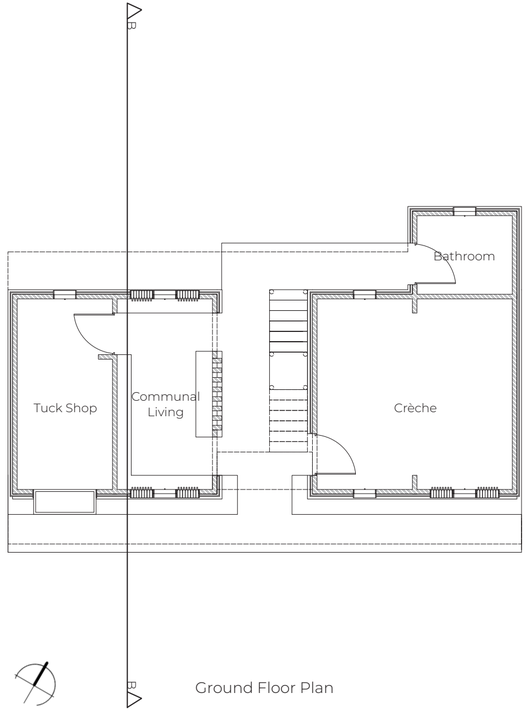
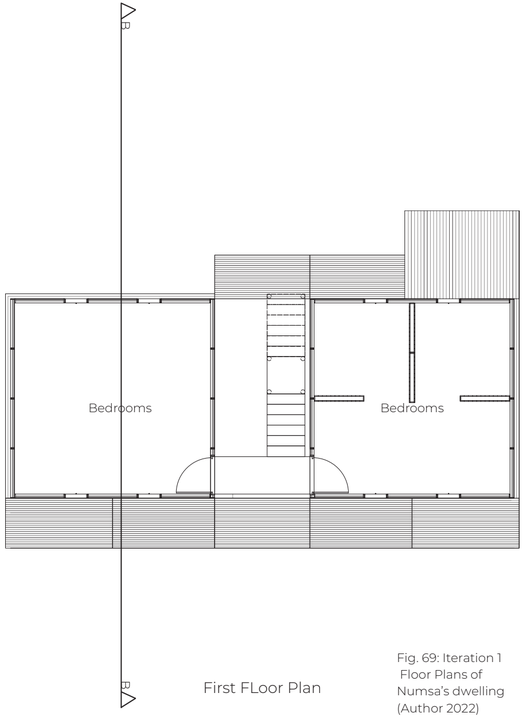


Fig. 68: Iteration 1 - Ground Floor Plan of the street, Alex's dwelling & Numsa's (Author 2022)

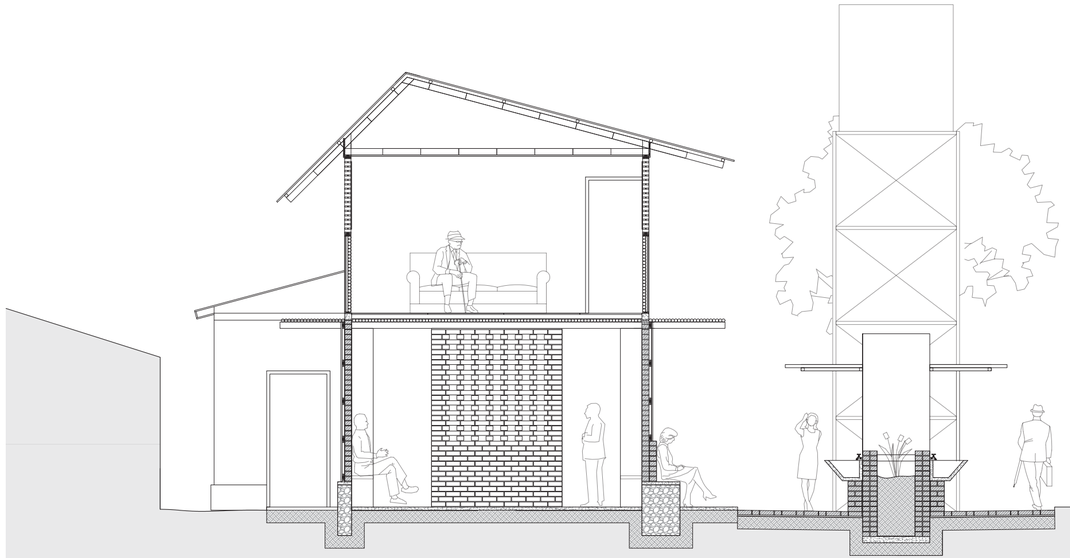


Ground Floor Plan



First FLoor Plan

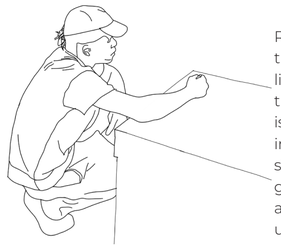
Fig. 69: Iteration 1
Floor Plans of
Numsa's dwelling
(Author 2022)



Section B-B

Fig. 70: Iteration 1 -
Section B-B
(Author 2022)

‘SCALING WITHIN’ TO ROY



Roy has been in Plastic View since 2004, before the establishment of the settlement. He now lives with his wife and two sons and is a part of the leadership structure in the settlement. He is a trained carpenter and currently has a painting and plastering business called Roy’s Professional Painters which services the surrounding gated estates. He also owns two social lounges and a tuck shop. His current dwelling is made up of black wattle, scrap timber and cladded with reclaimed materials he acquired from building sites he has worked on. This makes it unique and eclectic and furthermore it is one of the only double story dwellings in the settlement with a makeshift timber loft in the social lounge. The dwelling is split into two primary spaces, one large open space for the social lounge and another demarcated by curtains, housing a tuck shop, kitchen and bedroom. The dwelling however does not have foundations or insulation rendering it unsuitable for inhabitation. From the iterative dwelling process, it was realised that Roy recognises these issues and does plan on rebuilding to add foundations and insulation. Furthermore, due to the proximity of the bedroom to the social lounge, he intends to insulate the walls better and add to his current house, moving the bedroom to the first floor and replacing the existing room with a bathroom.

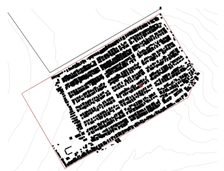
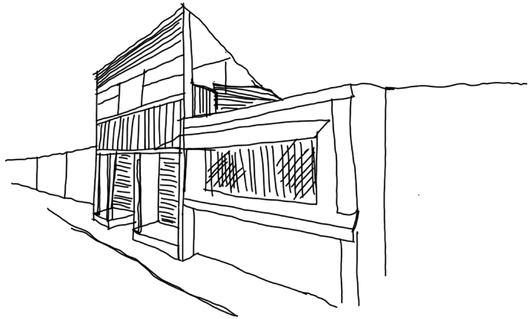


Fig. 71: Roy & the location of his dwelling in context (Author 2022)



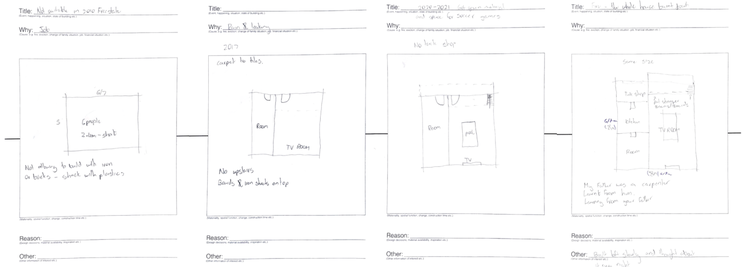


Fig. 72: Iterative dwelling exercise with Numsa (UPArch UUC 2022)

Roy's expertise as a carpenter and builder meant that the role of a facilitator could be assumed within the collaboration process. The only change to the current layout of his dwelling would be the addition of a first floor. This meant that the structure itself was the primary focus and led to both the design and technical concept for Roy's dwelling. The design concept was that of 'separation'-the division of something into constituent or distinct elements. This was extracted from his need to separate the more public and private spaces. In response to the structural issues of the dwelling and the need for insulation, the technical concept of 'skin' - the thin layer of tissue forming the protective outer covering of the body- was determined.

The design therefore explores how the dwelling can become structurally and thermally efficient through the application of insulation. Due to his skills as a carpenter, the house is to be constructed out of timber, re-using as much of the existing materials. The only spatial and programmatic addition to the dwelling is replacing the bedroom on the ground floor with a bathroom. The bedroom will then be moved to the first floor.

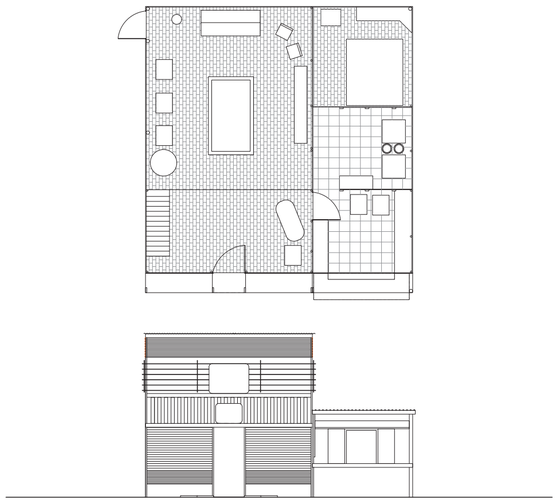


Fig. 73: As built drawings for Roy's dwelling (Author 2022)

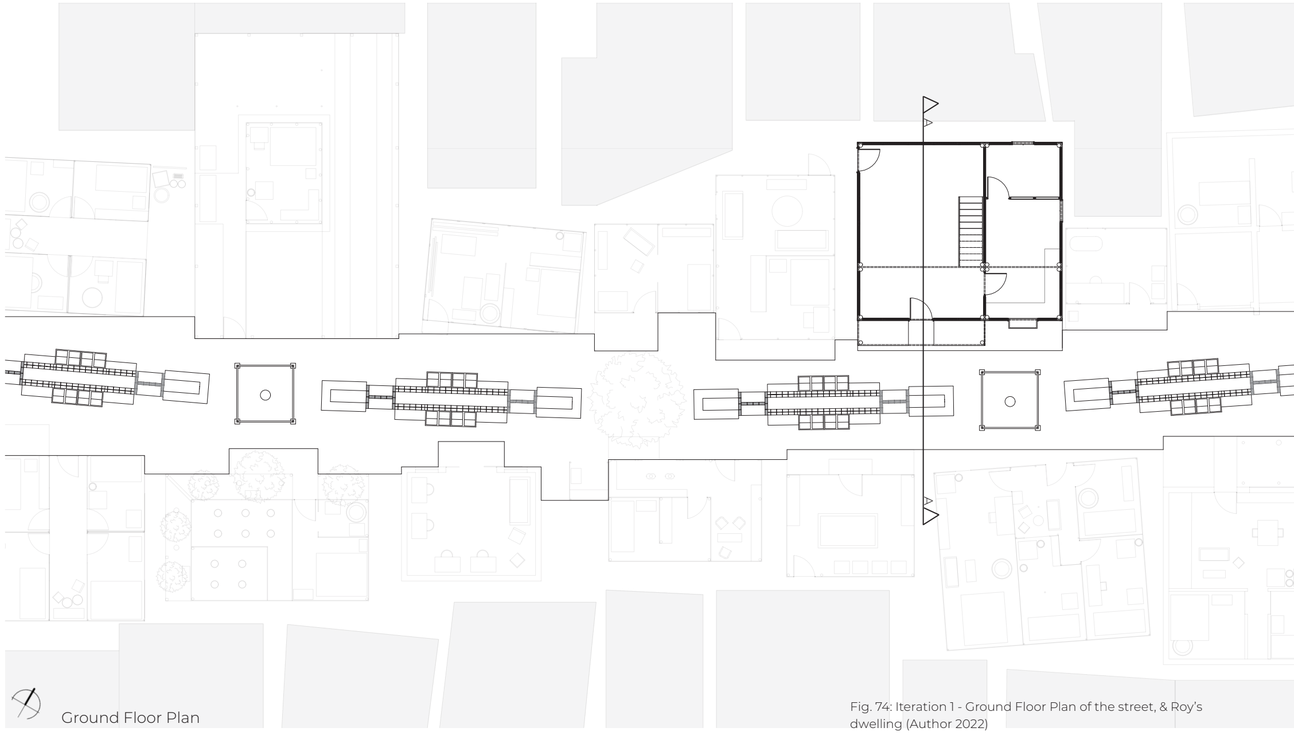


Fig. 74: Iteration 1 - Ground Floor Plan of the street, & Roy's dwelling (Author 2022)

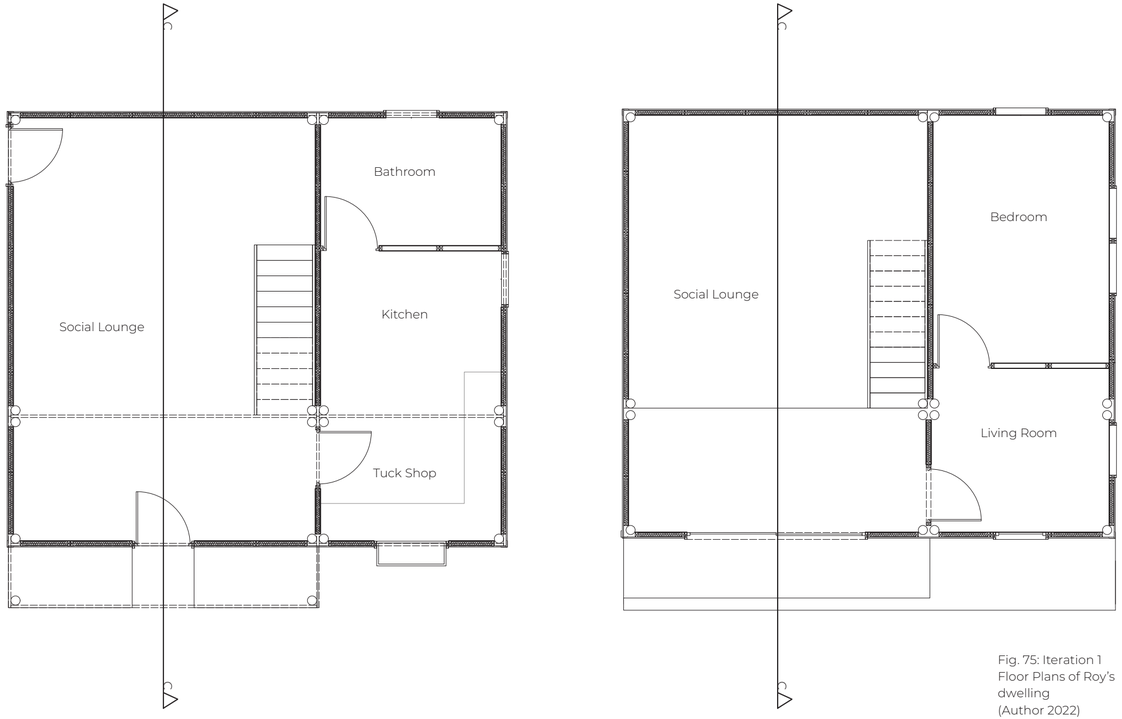


Fig. 75: Iteration 1
Floor Plans of Roy's dwelling
(Author 2022)

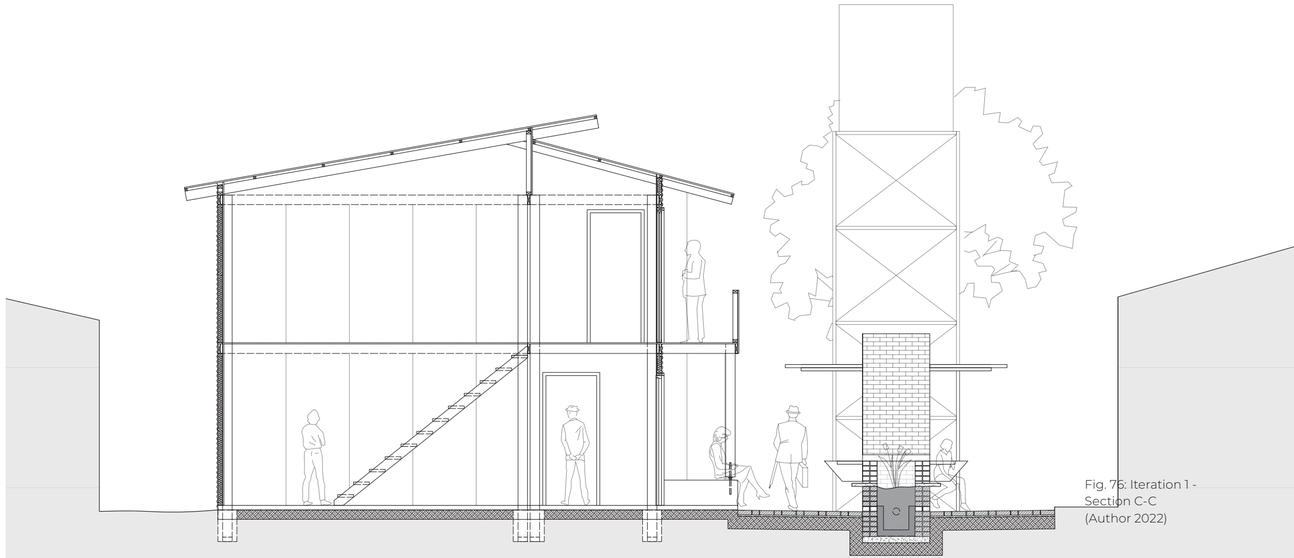


Fig. 76: Iteration 1 - Section C-C
(Author 2022)

Section C-C

REFLECTION

This iteration was developed based on the outcome of collaboration and investigation into the needs of the inhabitants within the street. While the exploration responded to these functional needs, programmatic complexity and integration between the street and the dwellings was not achieved. Furthermore, the pedestrianisation of the street meant that accessibility by vehicles in the case of an emergency would be restricted.

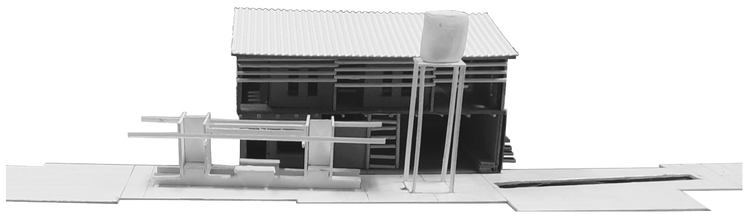


Fig. 77: A maquette of a dwelling and the streetscape (Author 2022)

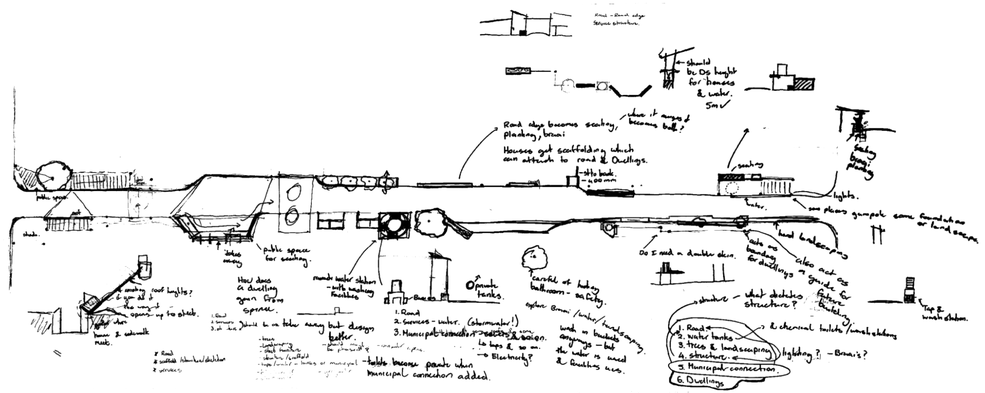


Fig. 78: Design development sketch (Author 2022)

ITERATION 2

‘SCALING BACK’ TO THE STREET

In response to these shortcomings, this iteration explored how the street design can be consolidated with the existing dwellings, while also informing and facilitating their upgrade. Vehicular access was also prioritised and therefore the intervention was repositioned to the edge of the street. A 2.8m wide road with two passing bays was proposed and the space left in front of the existing dwellings became the public interface. The programmes established in the previous exploration were then repositioned to three selected areas dictated by spatial opportunity. These spaces, coincidentally, were the two ends and the centre of the street. Furthermore, due to the slight natural slope of the contours from the centre of the street towards the two ends, underground and raised retention tanks were placed on either end to capture the stormwater.

Where space permitted, columns, walls, seating and green areas were proposed in the remaining street edge, in front of existing dwellings. This acted as a boundary to the dwellings to minimise encroachment into the public domain. It also acted as a framework which could be attached to, which in turn would influence the future upgrading of the structures.

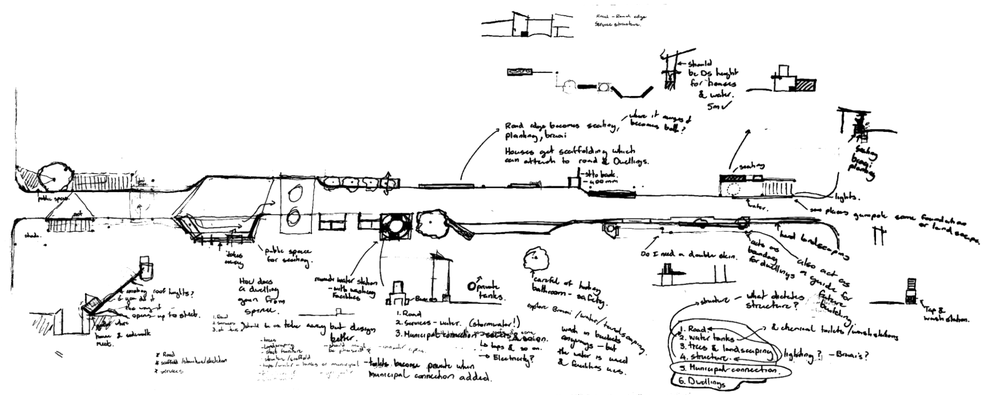
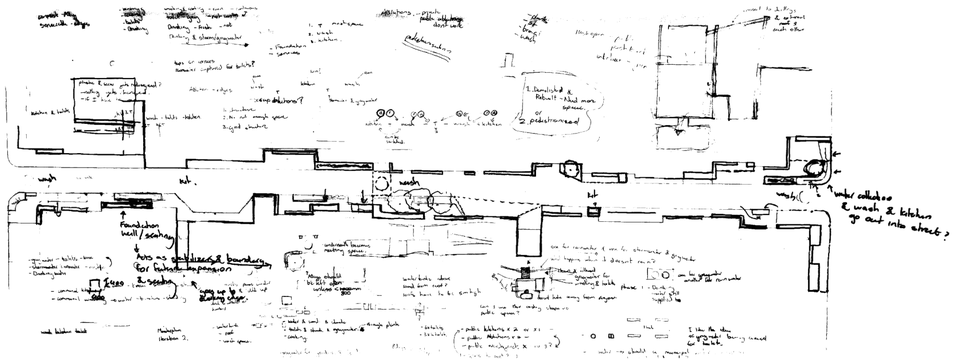


Fig. 79: Iteration 2- Design development sketches (Author 2022)



REFLECTION

This iteration explored the streetscape as a multi-purpose intervention that would not only service the inhabitants in various ways but also inform future upgrading of the dwellings. However, the design was apprehensive in nature, being overtly respectful of the temporal context in which it was placed. This in turn would have the opposite effect for future upgrade as the inhabitants would similarly be apprehensive in actualising permanence in the settlement. In addition to this there was an absence of order within the design. Elements were placed solely according to the amount of space available rather than being dictated by the needs of the dwellings. This rendered the overall design of the streetscape dis-junctioned with no singular design language being established.

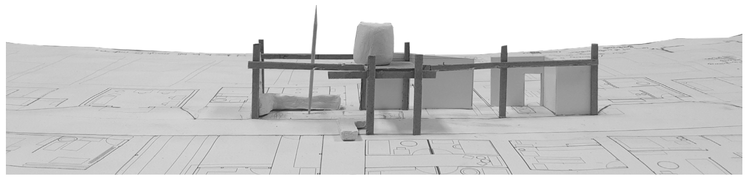


Fig. 80: Iteration 2- Maquette (Author 2022)

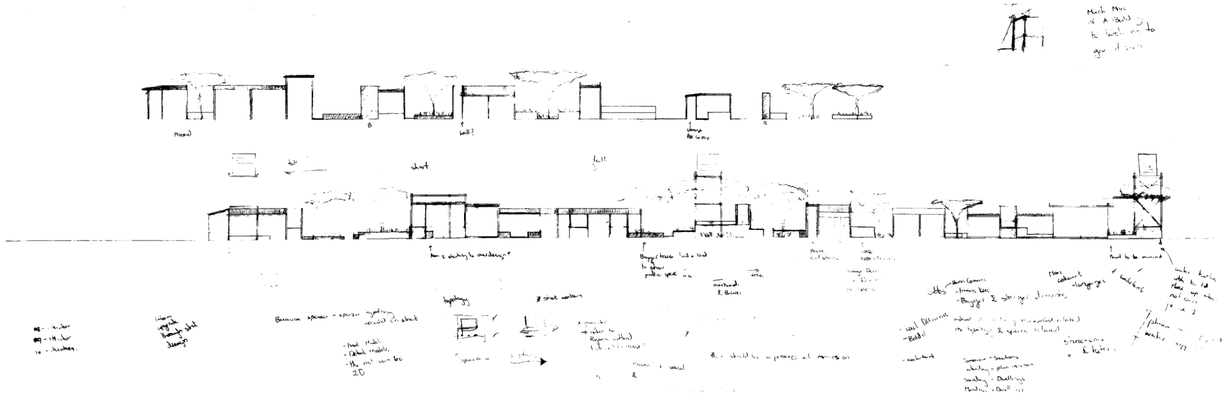


Fig. 81: Iteration 2- Design development sketches (Author 2022)

ITERATION 3

In acknowledgement of this, the design was developed further according to notions of permanence and order. Being grounded within the Upgrading of Informal Settlements Programme, this dissertation investigates alternative upgrading processes. Therefore, advocating for permanence within the street is justified and will contribute to the permanence of the dwellings. This iteration therefore explored verticality, horizontality and mass as representations of permanence. Furthermore, it was also decided that the design of the street would be ordered according to both space availability and typology. Where space was permitted, specific functional elements would be placed according to the need of the typology. For this reason, the socio-spatial lexicon, figures 21-23, was revisited.

The allocated public spaces explored in the previous iteration were designed according to the shared space typologies uncovered through the lexicon. Spaces to wash, cook, sit and gather under shade were created. Tuck shops and their relationship to the street as a public service require movement for economic activity, seating for socialising, and a threshold to display their goods and act as a semi-public interface. Therefore a colonnade with seating elements was placed outside the existing tuck shops. The street interface of social lounges, barbers, hairdressers and rental dwellings are primarily used for social gatherings. For that reason, these structures were serviced with braais, wash spaces and in some cases seating, counters and overhead structures. Furthermore, it was often the case that these dwellings were make-shift in nature, built out of reclaimed plastics and timber boards making them unsuitable for inhabitation. Therefore, according to materiality and structural integrity of these dwellings, columns and wall elements with openings were proposed as facade additions. Lastly, the street interface of the family dwellings were perceived to be more private. Most houses had a small veranda which were used as multifunctional spaces. Therefore a brick screen is proposed to offer privacy and if there was enough space, functional elements such as braais, a water point and seating were also proposed.

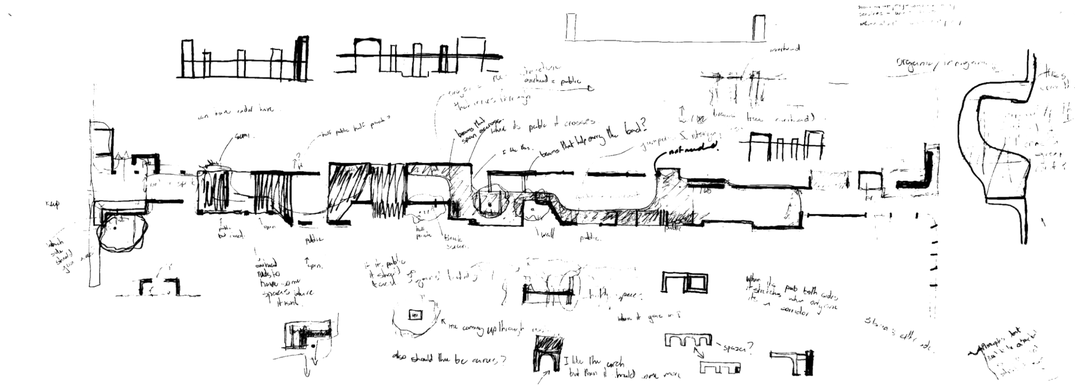
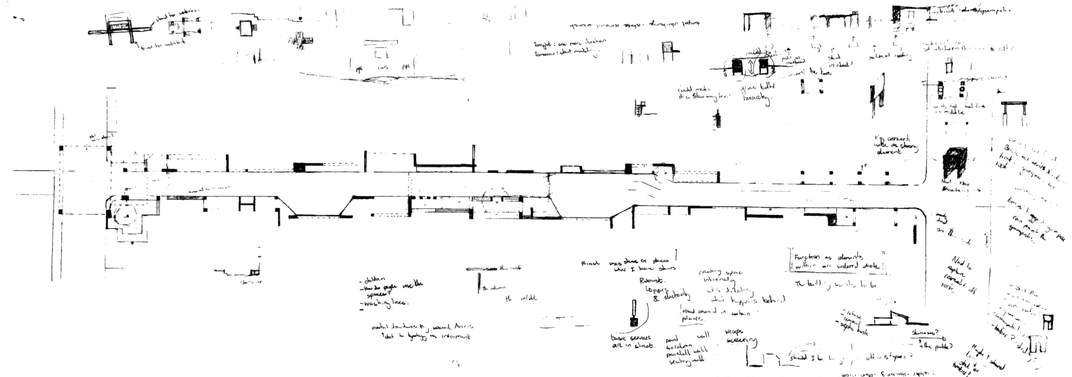


Fig. 82: Iteration 3- Design development sketches (Author 2022)



REFLECTION

Through this iteration, the street transformed into an urban interior. It became a system that could supply services to the inhabitants, while also providing a more permanent platform from which further upgrade could take place. This iteration formed the basis of the design outcome.

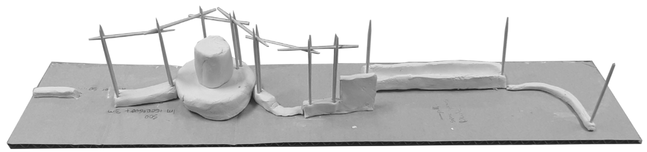


Fig. 83: Iteration 3- Maquette (Author 2022)

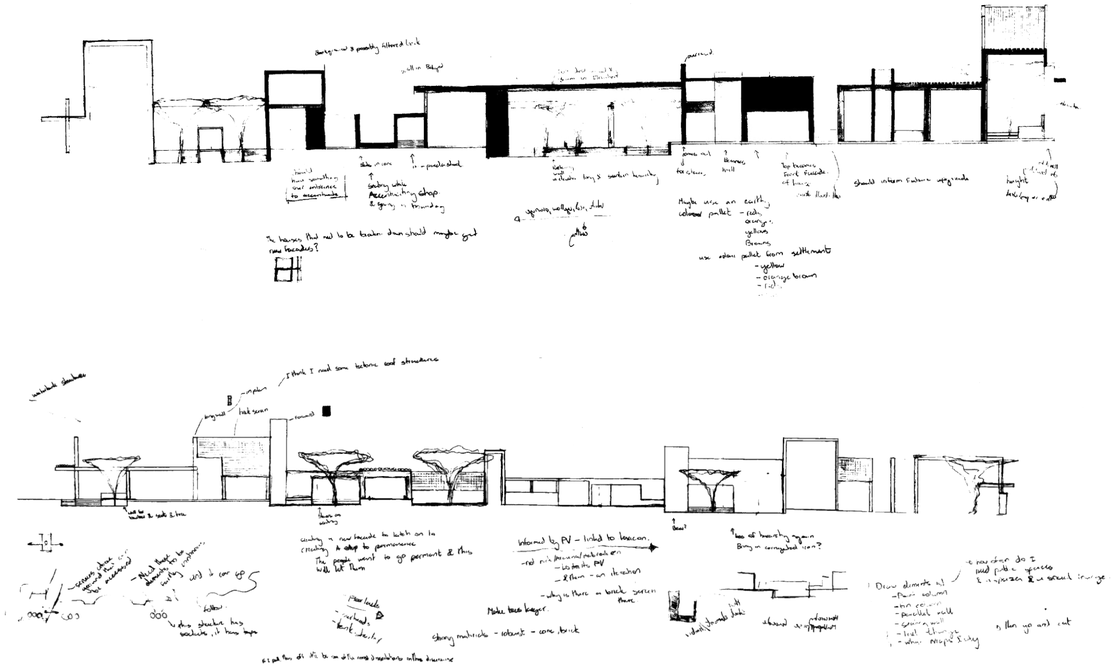


Fig. 84: Iteration 2- Design development sketches (Author 2022)

FINAL DESIGN OUTCOME

Ultimately, the design outcome is a culmination of all of the above iterations. It is portrayed as a phased approach and is commenced by the streetscape intervention. Following this, appropriation began taking place as Alex, Numsa and Roy's houses were upgraded. The resulting knowledge from the collaboration with Alex, Numsa and Roy was then extracted and scaled out to the rest of the dwellings within the street creating a final vision.

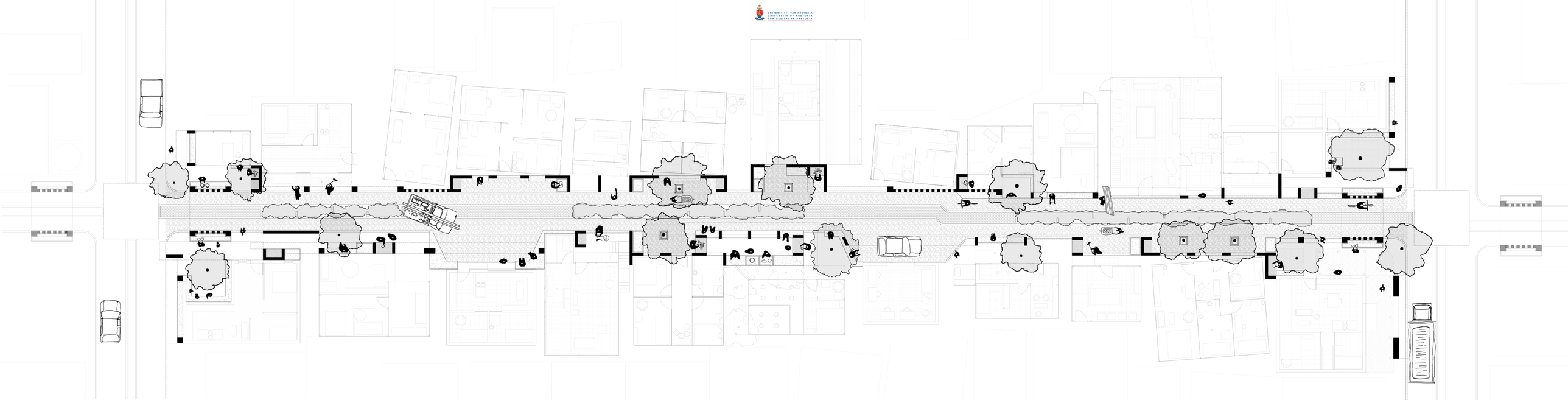
Fig. 85: Existing ground floor plan (Author 2022)

EXISTING GROUND FLOOR PLAN

EXISTING SOUTH WEST ELEVATION

EXISTING NORTH EAST ELEVATION

Fig. 86: Existing elevations (Author 2022)



PHASE 1: THE STREETSCAPE

This intervention, informed by typology and space, provides the inhabitants with a framework from which further upgrading can take place. Public space is created, basic service infrastructure is provided and the design acts as a structural anchor from which the dwellings can attach to. The intervention therefore reflects both the current state of space making which aims to enable shorter term upgrading while also proposing a vision of what the dwellings and the streetscape could become through advocating for permanence and appropriation.

Fig. 87: Proposed 2 - Streetscape ground floor plan (Author 2022)

PHASE 1: GROUND FLOOR PLAN

PHASE 1: SOUTH WEST ELEVATION

PHASE 1: NORTH EAST ELEVATION

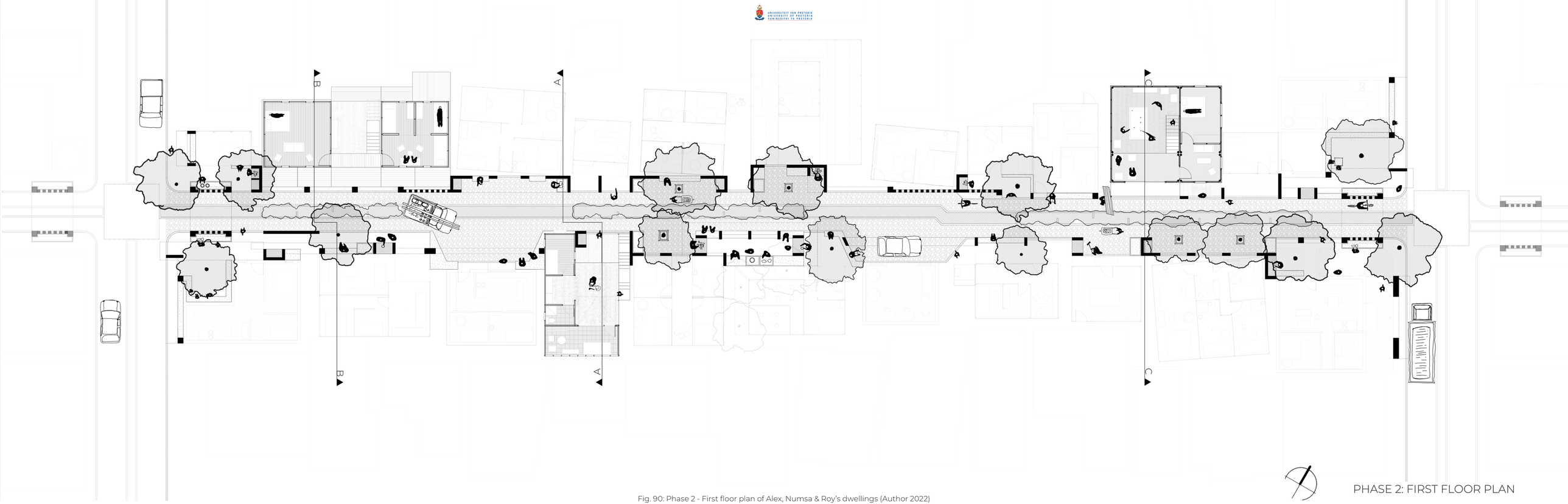
Fig. 88: Phase 1 - Streetscape elevations (Author 2022)

PHASE 2: ALEX, NUMSA & ROY'S DWELLINGS

Alex, Numsa and Roy's dwellings were then upgraded from the process of collaboration that was undertaken and in relation to the proposed streetscape design. It must be noted however that unlike the design of the streetscape where primary authorship was attained by the architect, authorship changed with the upgrading of the dwellings and the role of a facilitator was assumed. This meant that the dwellings were upgraded from their existing scenarios and therefore were limited by constraints such as cost and material availability, while the streetscapes architectural language advocates for an extended vision of these dwellings.

Fig. 89: Phase 2 - Ground floor plan of Alex, Numsa & Roy's dwellings (Author 2022)

PHASE 2: GROUND FLOOR PLAN



PHASE 2: FIRST FLOOR PLAN

Fig. 90: Phase 2 - First floor plan of Alex, Numsa & Roy's dwellings (Author 2022)

PHASE 2: SOUTH WEST ELEVATION

PHASE 2: NORTH EAST ELEVATION

Fig. 91: Phase 2 - Elevations of Alex, Numsa & Roy's dwellings (Author 2022)

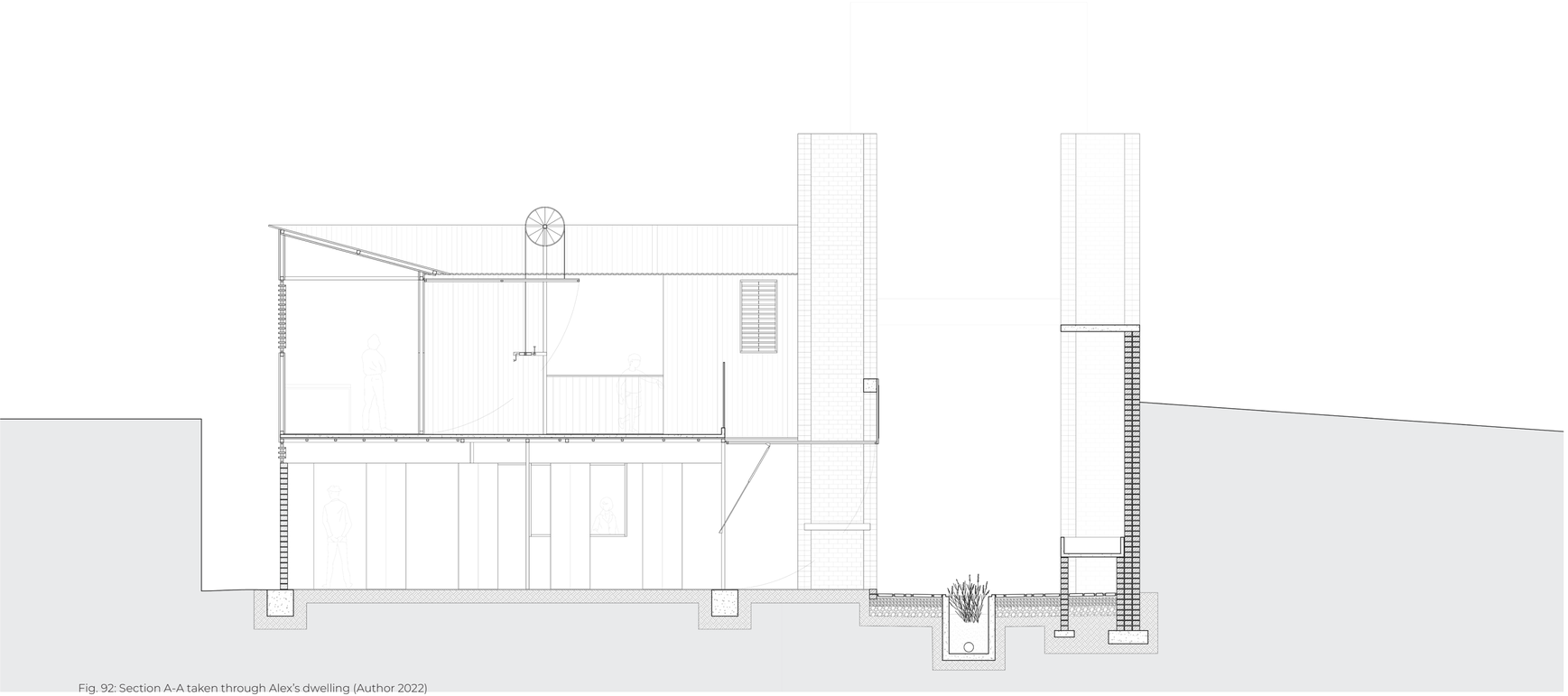


Fig. 92: Section A-A taken through Alex's dwelling (Author 2022)

Alex's dwelling expanded with the addition of a grocery store, moving the welding shop and living spaces to the first floor. Hand dug foundations were proposed to be added to the existing walls to attain structural stability and steel and timber louvres were suggested for the existing clearstory openings. To open the ground floor up to the streetscape, reclaimed gas struts from his scrap trailer were proposed to create a tilting door. Similarly on the first floor a tilt door, made using an old bicycle tire as a pulley system, is also suggested for his workshop. Furthermore alternative construction technologies were investigated and his existing corrugated iron and steel roof is to become permanent shuttering and joists to a reinforced concrete floor. To ensure the weight of the first floor is kept to a minimum, a steel frame is proposed with corrugated iron external cladding, cardboard insulation and timber pallets as internal cladding. Scrap plastics are to be used for waterproofing and steel and timber louvres as openings.

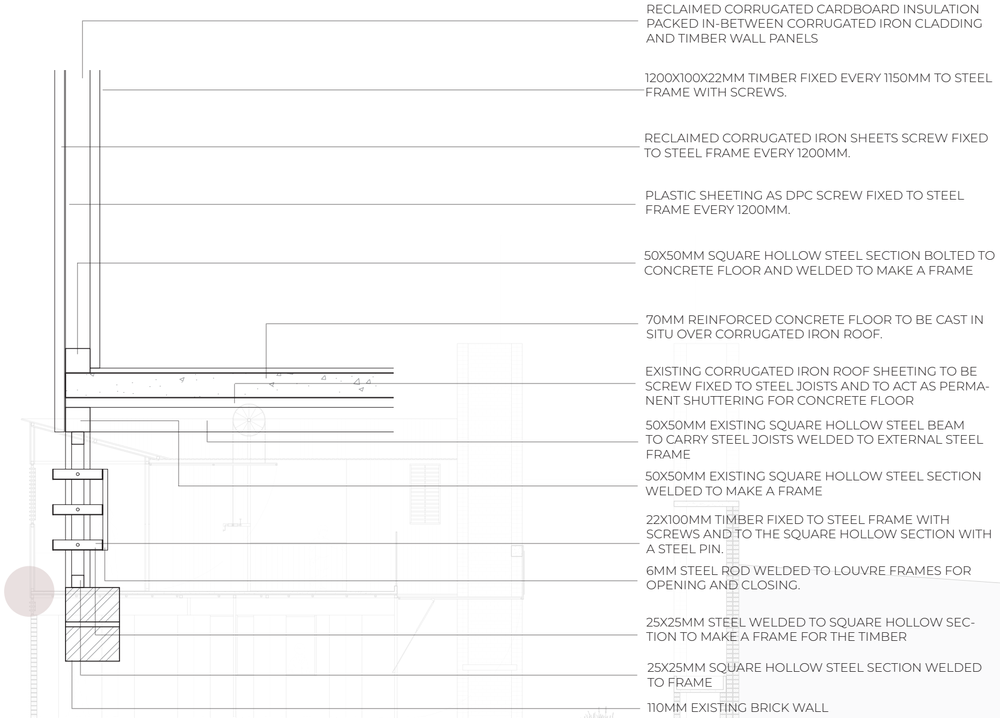


Fig. 93: Detail 1 showing the wall and floor construction of Alex's dwelling(Author 2022)

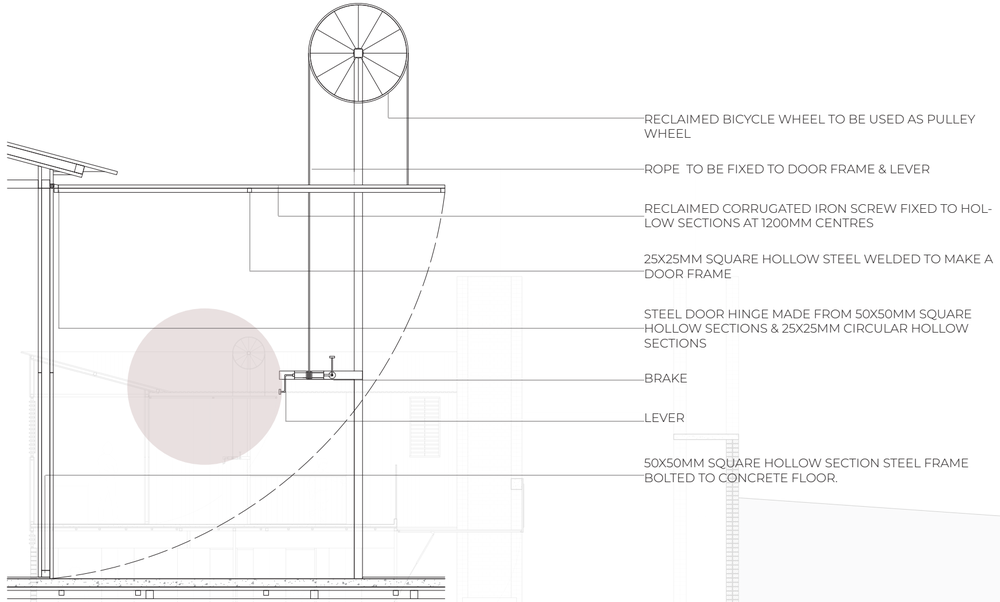


Fig. 94: Detail 2 showing the tilting door system(Author 2022)

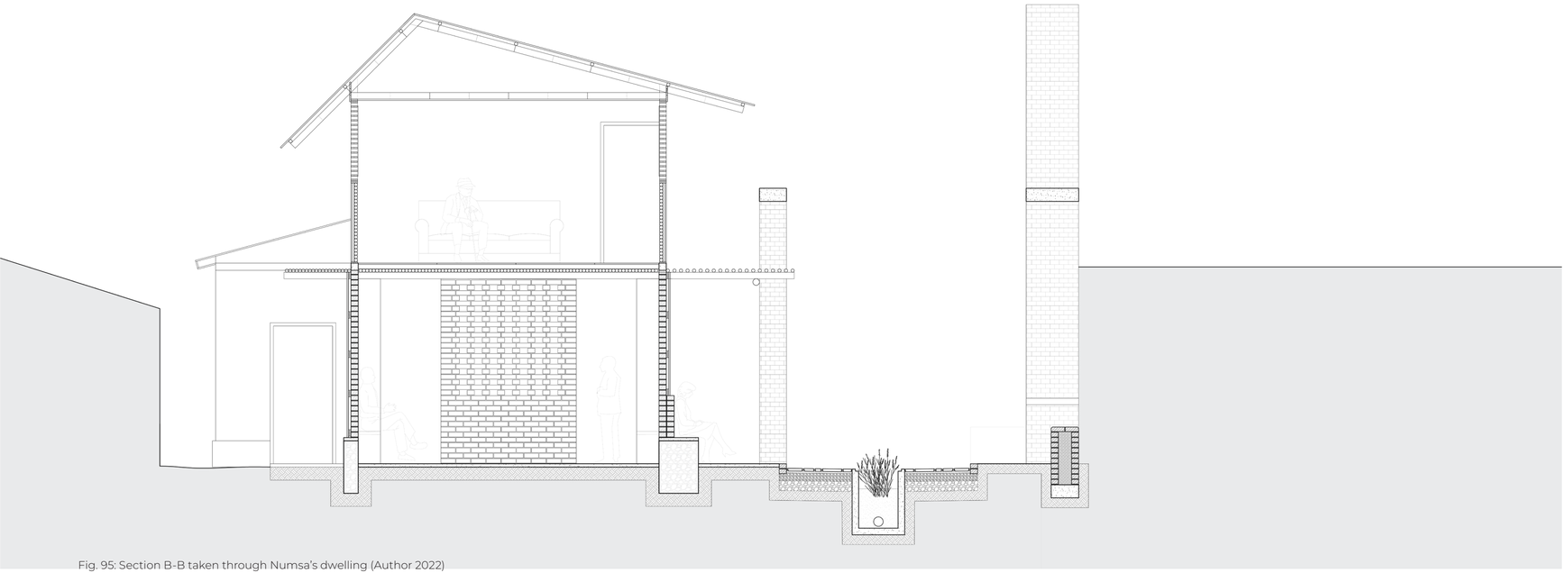


Fig. 95: Section B-B taken through Numsa's dwelling (Author 2022)

Numsa's house was completely re-designed to accommodate for the transitional period in her and her family's life. A daycare, a communal space and a bathroom was established on the ground floor and the bedrooms accommodated on the first floor. Similarly to Alex, alternative construction technologies were explored. Stone and cement foundations are proposed from which single skin brick walls are layed with buttresses every 1200mm. The wall is then capped with a concrete ring. Furthermore, Plastic sheeting is fixed onto the single skin brick wall with timber spacers and wire mesh for plastering. As openings for ventilation and light louvres and glass bottles are proposed. Creosote painted black wattle poles, the material most used in the settlement for construction due to the nearby forest, are then layed in the brick wall to act as beams for more wattle poles to be fixed onto and act as joists. A plastic sheet is then laid onto these beams and wire mesh on top of that. Daub is then proposed to flatten the surface for timber pallets to be fixed to. The first floor wall construction is suggested to be timber pallet frames with thin wattle as infill. This is then daubed over and finished with a lime based plaster. Lastly the roof is constructed to have large overhangs to protect the daub walls. The trusses are created out of fixing reclaimed pallet timber together. Creosote gum poles are then nailed to the trusses to act as purlins and reclaimed corrugated iron from their existing house is used as roof sheeting.

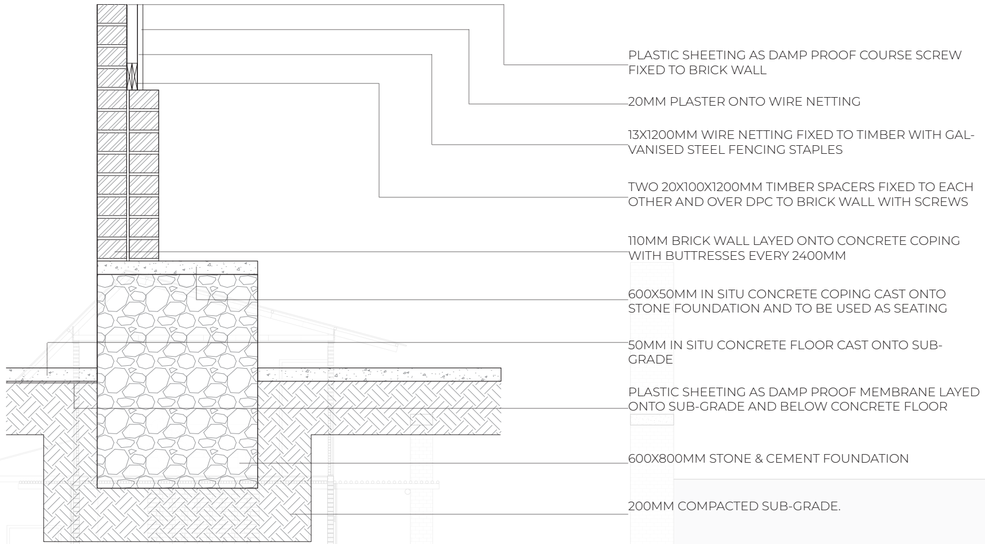


Fig. 96: Detail 3 showing the foundation & wall construction of Numsa's dwelling(Author 2022)

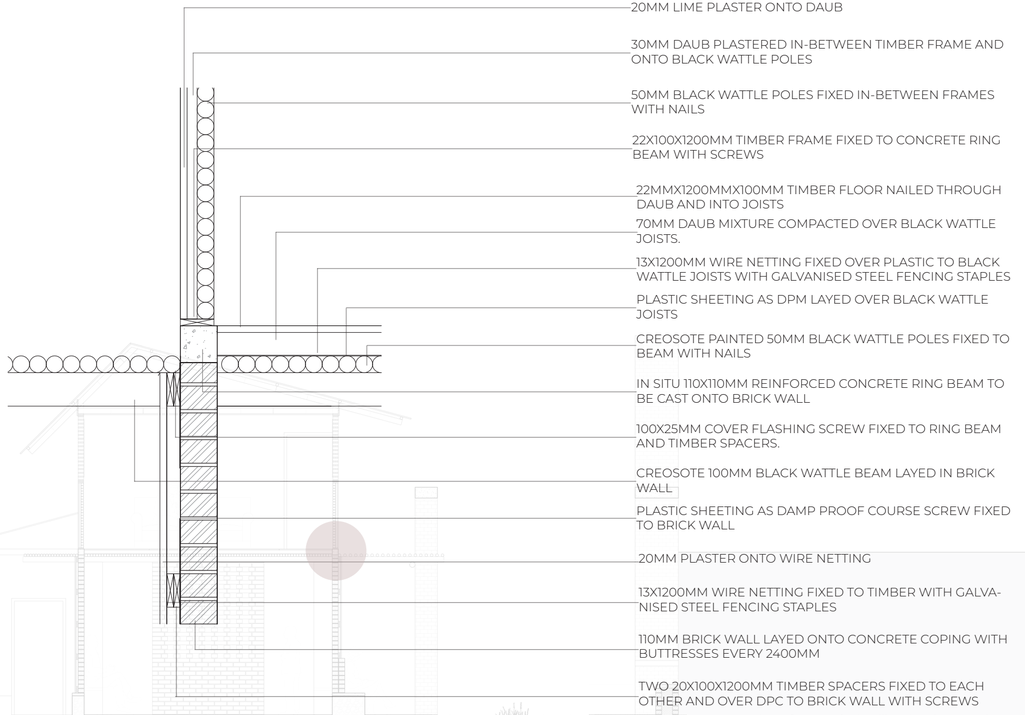


Fig. 97: Detail 4 showing the wall and floor construction of Numsa's dwelling (Author 2022)

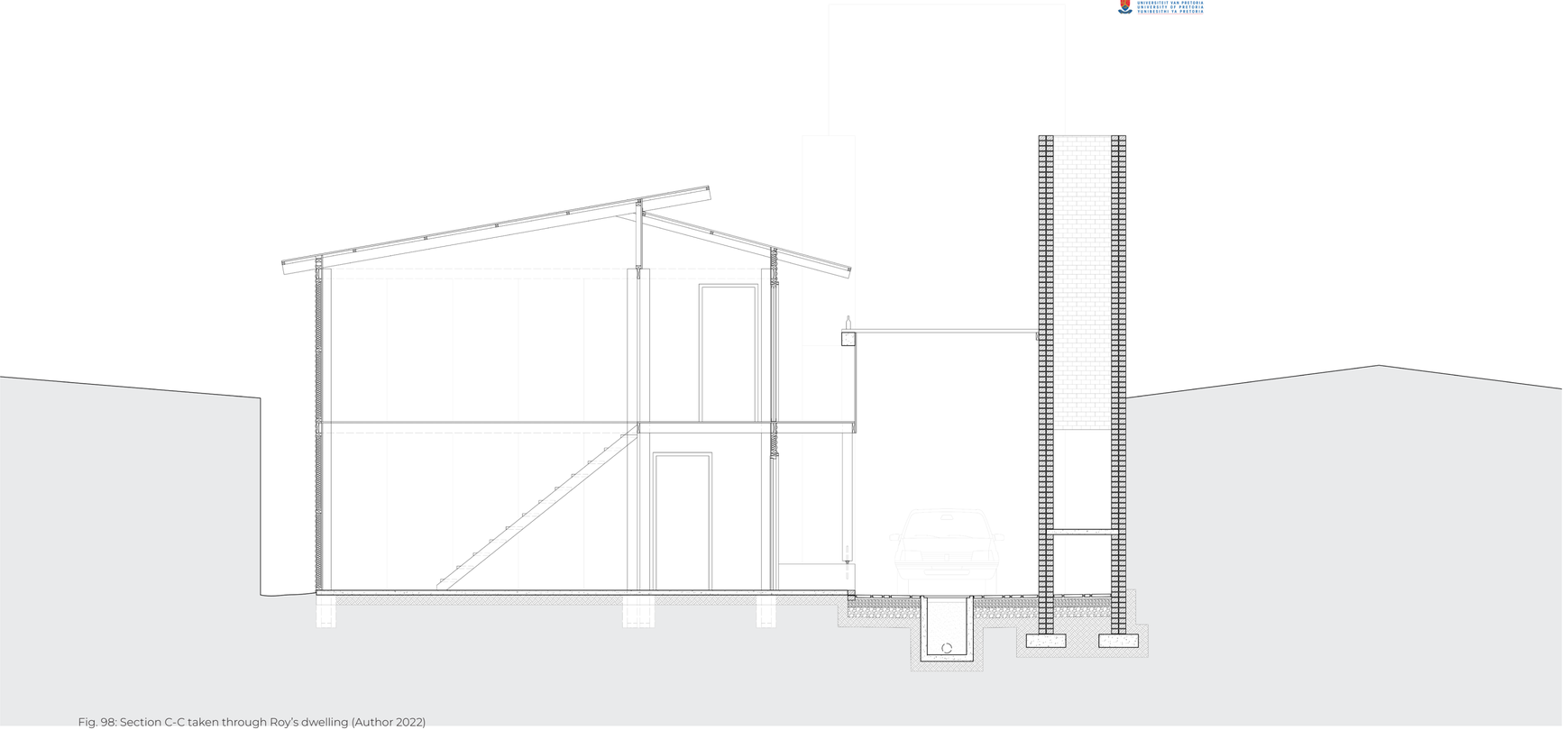


Fig. 98: Section C-C taken through Roy's dwelling (Author 2022)

Lastly, Roy's dwelling was re-constructed to ensure adequate insulation and structural integrity as well as to separate his living spaces from the social lounge. Due to his expertise as a carpenter, timber construction is proposed. Gum poles found in no fines concrete are used as the primary structure with ring beams fixed to them for the first floor and roof construction. Timber studs with corrugated iron external cladding, insulation, and reclaimed timber boards as internal cladding is then proposed as the infill structure.

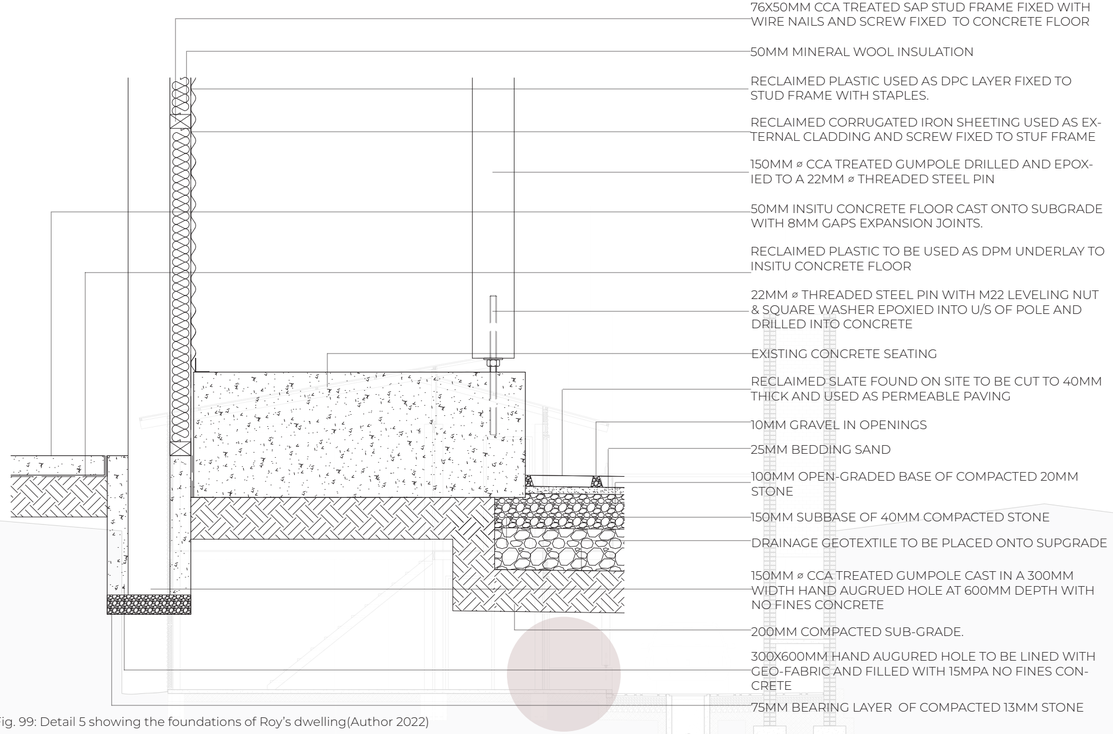


Fig. 99: Detail 5 showing the foundations of Roy's dwelling(Author 2022)

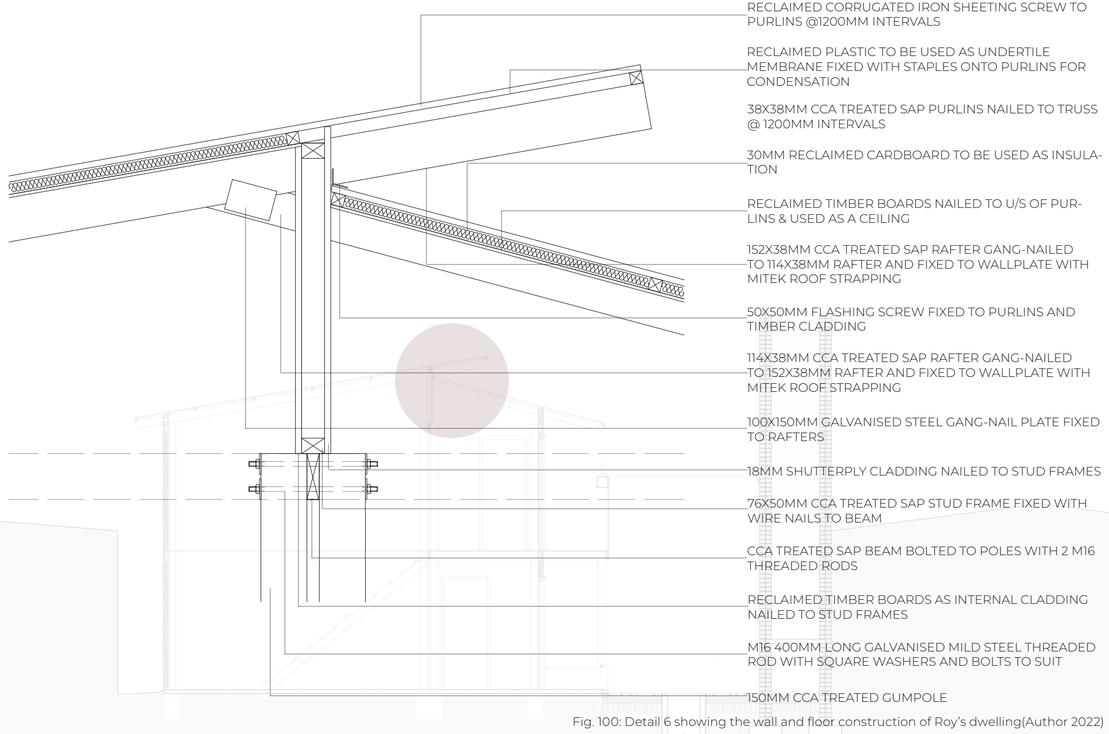


Fig. 100: Detail 6 showing the wall and floor construction of Roy's dwelling(Author 2022)

Water is an essential resource to human life, socio-economic development and ecosystem health (Huang, Yuan & Liu 2021:1). However, more than 1 billion people worldwide do not have access to water and more than 2.4 billion people do not have access to adequate sanitation. (WWF 2022). By 2025, at the current consumption rate, at least two thirds of the world's population will suffer from water scarcity (WWF 2022).

Furthermore, due to rapid urbanisation, access to water in urban populations has stagnated, with water scarcity affecting low income groups (Rise 2021:35). People turn to unsafe water sources which lead to associated health issues such as waterborne diseases (Rise 2021:35). Therefore the importance of water within vulnerable communities is paramount to an improved quality of life (Rise 2021:35).

The capturing and filtering of stormwater and greywater was therefore a primary concern within this design. A bioswale is proposed centrally within the street. The water flows from the sloped street and into the bioswale or is directed from the greywater outlets. It is then filtered through different drainage layers of biomedia, gravel and stone into a geopipe and directed towards an underground retention tank. This water is then pumped using a solar pump to a raised water storage tank to be distributed to the relevant water points. It must be noted that this water would not be safe to drink but it could be used for washing, irrigation, sanitation and most other purposes.

However, from the water calculations, it can be seen that the amount collected will still be insufficient to self-sustain the inhabitants. It is therefore proposed that the water supply is supplimented by the municipality. Furthermore, With regards to drinking water, the municipality currently supplies 20 litres of water per person per day to the community. If this water were solely used for the purpose of consumption, it would be more than sufficient. It is therefore proposed that drinking water points be supplied to each street. Lastly, black water is directed to a septic tank which is also positioned at the ends of the street for ease of access.

Effective rainwater collection area

Surface	Area (m2)	Runoff coefficient	Effective collection area (m2)
Metal roofing	1000	0.8	800
Paving	500	0.7	350
Total effective collection area (m2)			1150

Annual rainwater runoff collection

Month	Average Rainfall m	Effective Collection Area m2	Total Collection m3
January	0.1	1150	115
February	0.12	1150	138
March	0.07	1150	80.5
April	0.04	1150	46
May	0.01	1150	11.5
June	0.004	1150	4.6
July	0.001	1150	1.15
August	0.003	1150	3.45
September	0.009	1150	10.35
October	0.06	1150	69
November	0.098	1150	112.7
December	0.11	1150	126.5
			718.75

Average demand

Dwellings	Occupants	Minimum L per Person	Total L/day	Total L/month	Total m3/mont	Total L/Year	Total m3/Year
24	6	50	7200	216000	216	2592000	2592

Fig. 101: Table of water calculations (Author 2022)

According to Wekesa, Steyn & Otieno (2010:238) the physical conditions of informal settlements are extremely hazardous to the health of inhabitants. This is largely due to a lack of basic infrastructure as well as the make-shift nature of the dwelling units that do not meet the building and land use regulations (Wekesa, Steyn & Otieno 2010:239). These dwellings are mostly constructed out of questionable materials and technologies such as plastic and cardboard and this offers little protection against the elements. They also frequently collapse due to a lack of structural integrity. It is therefore imperative that these environments are developed to improve the quality of life of the inhabitants.

However, the existing building codes and standards do not accommodate informal environments (Wekesa, Steyn & Otieno 2010:242-243). They are outdated, expensive to attain and alternative technologies are not acknowledged. As an example, when speaking to an engineer, it was stated that the standard of 25MPA concrete foundations is over-specified and 15 MPA is more than sufficient, especially in informal settlements. The reforming of building codes to accommodate for housing construction that is affordable is therefore emphasised. Not only will it cut housing production costs and legalise a large amount of existing and proposed housing but it will also encourage development that is safe for inhabitants, therefore also improving the quality of life (Wekesa, Steyn & Otieno 2010:242-243).

The above foundation, floor, wall, opening and roof details utilise alternative construction technologies. They attempt to create a compromise that is affordable while also providing protection against the natural elements in the form of structural integrity and thermal comfort.

Wall System 1 (Alex - First Floor)

Material	d (metres)	K-Value (w/mk)	R-Value (m2k/w)	U-Value (W/m2k)
Corrugated Sheeting			0.01	
Reclaimed Cardboard Insulation	0.05	0.037	1.351351351	
Timber Pallets	0.02	0.14	0.1428571429	
			1.679208494	0.5955186646

Wall System 2 (Roy)

Material	d (metres)	K-Value (w/mk)	R-Value (m2k/w)	U-Value (W/m2k)
Fibre Cement	0.008	0.06	0.1333333333	
Aerolite Insulation	0.05	0.045	1.111111111	
Shutterply	0.02	0.14	0.1428571429	
			1.562301587	0.6400812802

Wall System 3 (Numsa - Ground Floor)

Material	d (metres)	K-Value (w/mk)	R-Value (m2k/w)	U-Value (W/m2k)
Brick	0.11	0.82	0.1341463415	
Reclaimed Cardboard Insulation	0.04	0.037	1.081081081	
Plaster	0.02	0.5	0.04	
			1.430227423	0.6991895025

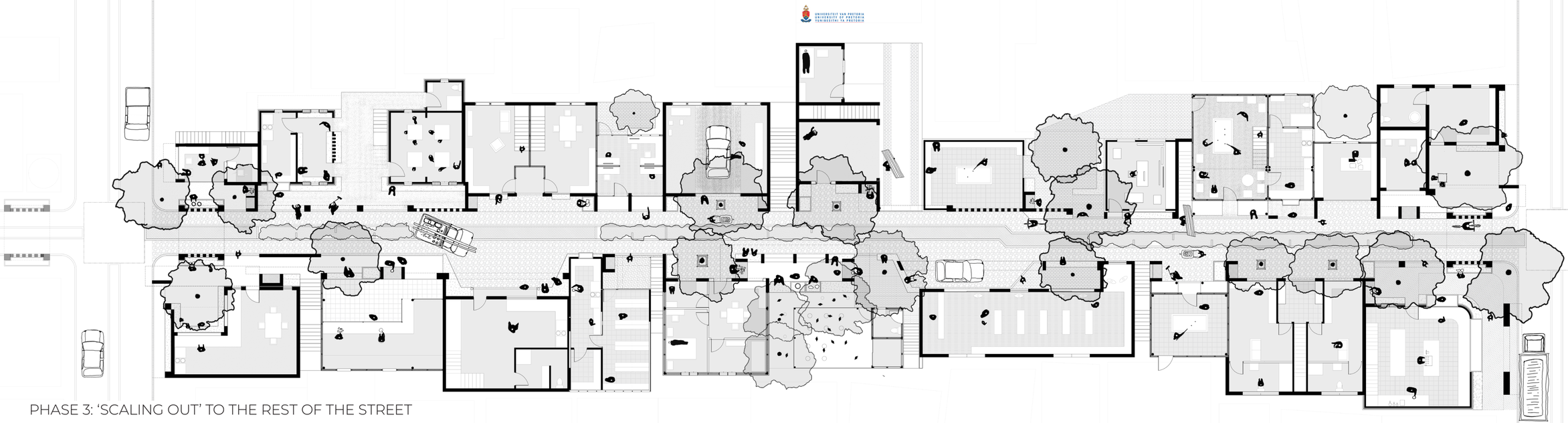
Wall System 4 (Numsa - First Floor)

Material	d (metres)	K-Value (w/mk)	R-Value (m2k/w)	U-Value (W/m2k)
Wattle	0.05	0.16	0.3125	
Adobe / Daub	0.07	0.663	0.1055806938	
Lime Plaster	0.02	0.5	0.04	
			0.6330806938	1.579577469

Roof System 1 (Roy, Numsa & Alex)

Material	d (metres)	K-Value (w/mk)	R-Value (m2k/w)	U-Value (W/m2k)
Corrugated Iron			0.01	
Reclaimed Cardboard insulation	0.05	0.037	1.351351351	
Reclaimed Timber Boards	0.02	0.14	0.1428571429	
			1.705723646	0.5862614395

Fig. 102: Thermal transmittance of the proposed wall & roof systems (Author 2022)



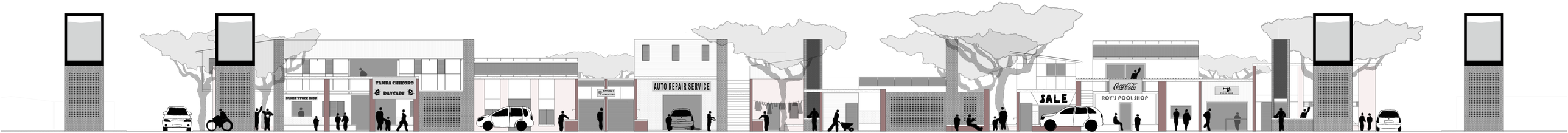
PHASE 3: ‘SCALING OUT’ TO THE REST OF THE STREET

These construction technologies explored above, together with the established design and construction concepts, were then used as a framework in upgrading the rest of the dwellings within the street. Ideally, if time permitted, a participatory process would have been followed with each owner or at least with an owner of each typology. However, this was not the case and therefore this is only an indicative vision of what the street could become. The vision portrays the original street design, shown in phase 1, as being completely appropriated by the inhabitants. The upgraded dwellings combine with the streetscape to create a coherent language of designed and emergent structures, where the street has equipped the existing dwellings and inhabitants with the resources needed to upgrade their dwellings.

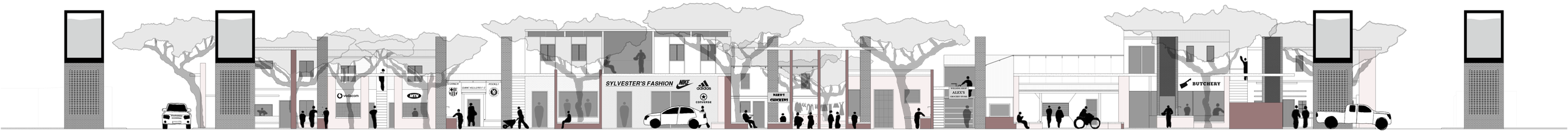
Through providing the inhabitants with the streetscape as a foundation, as well as facilitating the upgrade of their individual dwellings, appropriation, identity and permanence could begin to manifest. This, in time, will lead to complex urban integration.

Fig. 103: Phase 3 - Ground floor plan (Author 2022)

PHASE 3: GROUND FLOOR PLAN

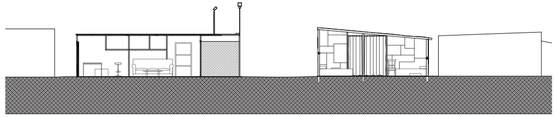


PHASE 3: SOUTH WEST ELEVATION



PHASE 3: NORTH EAST ELEVATION

Fig. 104: Phase 3- Elevations (Author 2022)



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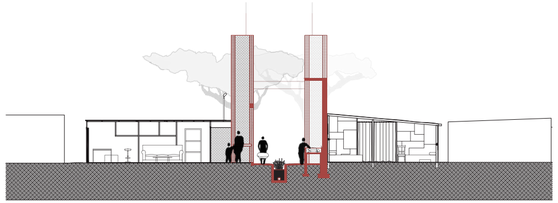
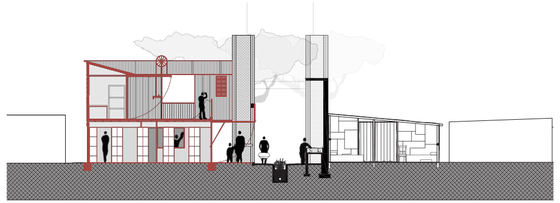
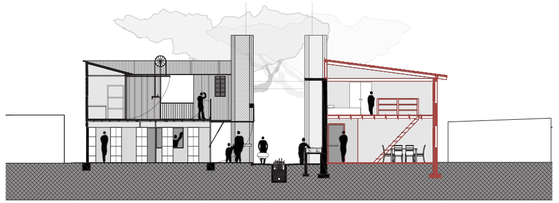


PHASE 1: SECTION A-A
SCALE 1:50



PHASE 2: SECTION A-A
SCALE 1:50



PHASE 3: SECTION A-A
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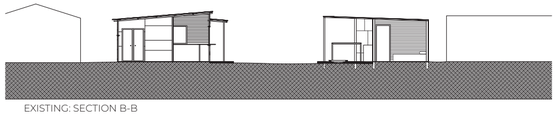

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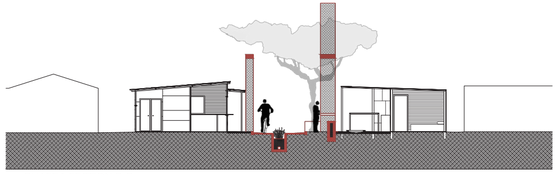

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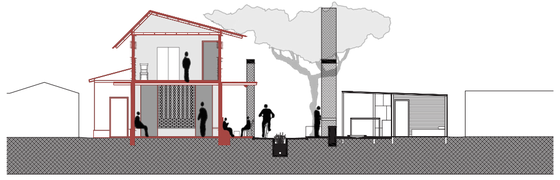

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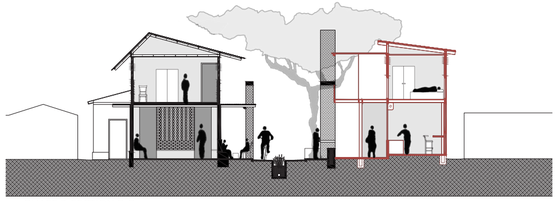

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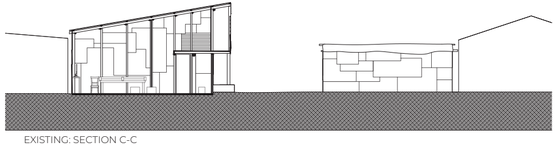

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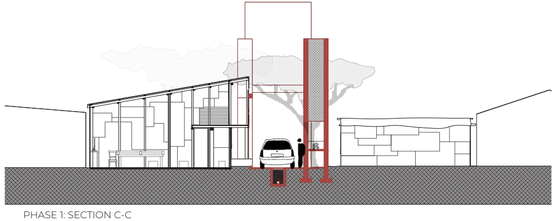

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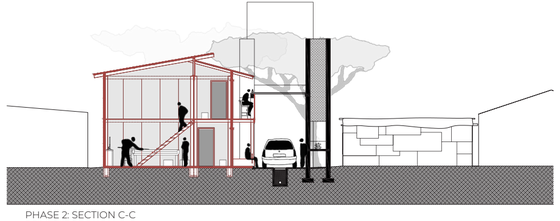

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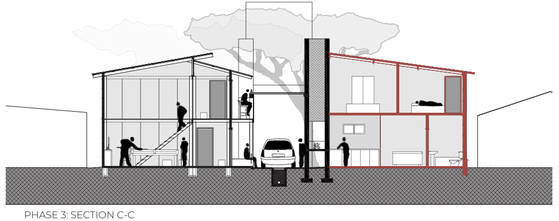

PHASE 3: SECTION C-C
SCALE 1:50

04 - ARCHITECTURE & INFORMAL SETTLEMENT UPGRADE

CRITICAL REFLECTION

Scaling The Acquired Knowledge Towards Complex Urban Integration

This dissertation was initiated through a belief that architecture has the ability to make a social difference within our society. As informal settlements continue to proliferate worldwide, the project aimed to investigate alternative upgrading processes, and the role that architects and architecture could have within them. Participatory methods were utilised in learning from the context as its own vernacular environment with indigenous knowledge, and only then did the project's fruition develop. Unknowingly, this was an extremely difficult process to follow.

Due to the failure of most, if not all existing approaches to informal settlement upgrade, the project had to begin with an honest investigation into developing an approach. This, possibly the most important outcome of all, proved time consuming and by mid year the complexity of the project's architectural, or rather, built outcome was questioned. This demand for a built outcome made it difficult to stay true to the project's intentions of pushing boundaries, like any master's dissertation should. There were multiple instances, solely due to time constraint and stress, where the 'knee-jerk' response of a transport interchange or a skills development centre were almost conceptualised. But would the knee-jerk response really be what the context needed, what boundaries would it have pushed, and how would it further the architectural discourse? The answer to these questions probed the project further and it can honestly be said that the outcomes of this dissertation are not a result of preconceived naivety or the ease of acquiring a master's degree. They are the findings of a complex process of research which explored the architectural disciplines' relevance to the global issue of over-urbanisation and the resultant informality.

The developed approach, although much room for improvement still exists, could influence the discourse of informal settlement upgrade. This is due to the project's scalability. The previous mapping done by UP Hons (2020 & 2021) in conjunction with the participatory process of immersion undertaken in this dissertation, uncovered an enriched understanding of the way space is currently formed within Plastic View Informal settlement. Furthermore, this provided an in-depth needs analysis. The research enabled an informed foundation from which further architectural investigation could take place. The knowledge was scaled across to the design of the streetscape where primary authorship was redirected to the architect due to the interventions commonality. The architectural outcome was therefore a consolidation between the aforementioned research and professional competency. The design of the street challenges traditional upgrading processes, providing the inhabitants with services and public space while also postulating a permanent framework which would inform future upgrading of the dwellings. The service infrastructure itself becomes multifunctional rather than the monofunctional generic proposal offered by the upgrading of informal settlements programme. Furthermore, through focussing on the streetscape as an instrument for future upgrade, there is less expenditure needed for the dwellings. The outcome is a design which advocates for permanence, identity and appropriation.

Authorship was then re-directed again as the upgrading of the dwellings was anticipated. The role of a collaborator was assumed and a participatory process followed with three inhabitants. This process explored alternative construction technologies and resulted in the upgrade of three dwellings in relation to the proposed streetscape. If time permitted a collaborative process would have been followed with each inhabitant, however this was not the case and instead a hypothetical vision of anticipation was developed. This vision intended to illustrate an integration between the architecturally designed streetscape and the emergent dynamic dwellings.

The process grappled with a multitude of concepts and in the end it is deduced that architects and architecture do hold a place within the social realm of our society. However, the glorification of the built outcome as the primary, if not only, outcome to an architectural dissertation is grossly misrepresentative of the profession. Architects have the ability to offer spatial, technical and social expertise and should not be restricted by the prerequisite of a building. It is therefore hypothesised that the discipline's lack of engagement within the upgrading process is not due to the elitist nature of the profession (Perold, Donaldson & Devisch 2019:98), but rather to a general lack of understanding of what architecture could be and could provide.

It is therefore proposed that a process of immersion, similar to that which doctors undertake, should be completed by all architects. This will not only aid in tackling the issue of complex urban integration but it will also enhance a better understanding of the context in which designs are proposed.

To conclude, this year was both the most difficult and insightful year of my education. Architecture, to me, has become so much more than what I originally perceived it to be and as I proceed into the working world I go with a newfound understanding of the contribution that I am able to make as an architect.

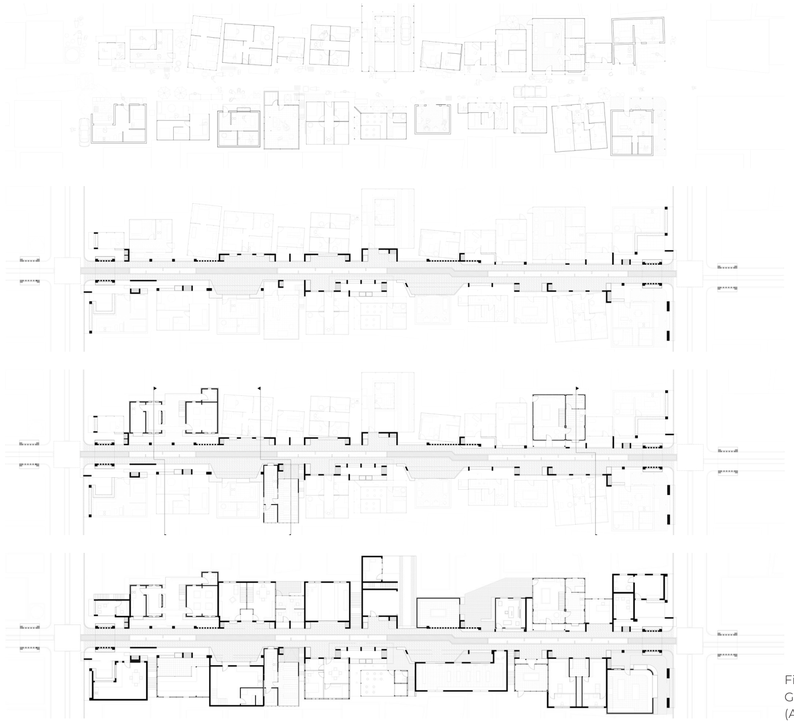

Fig. 105: Phased approach - Ground floor plans (Author 2022)

05 - REFERENCES & LIST OF FIGURES

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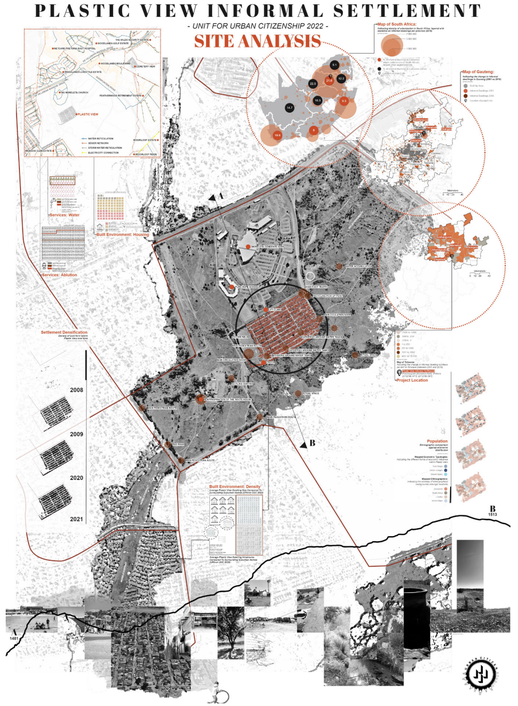
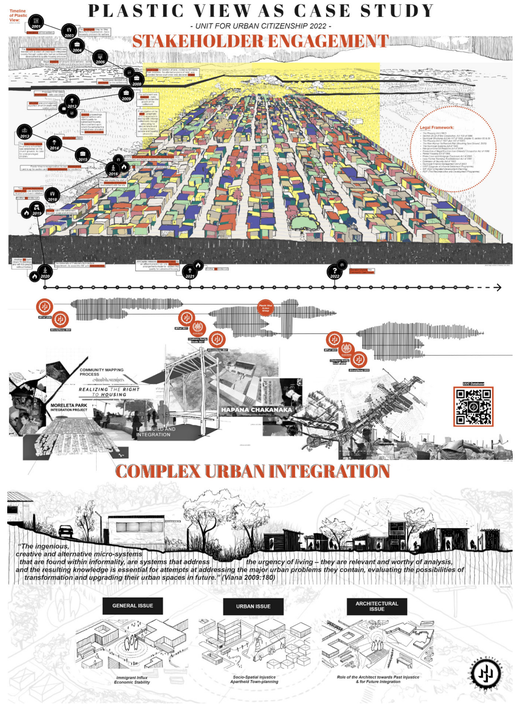
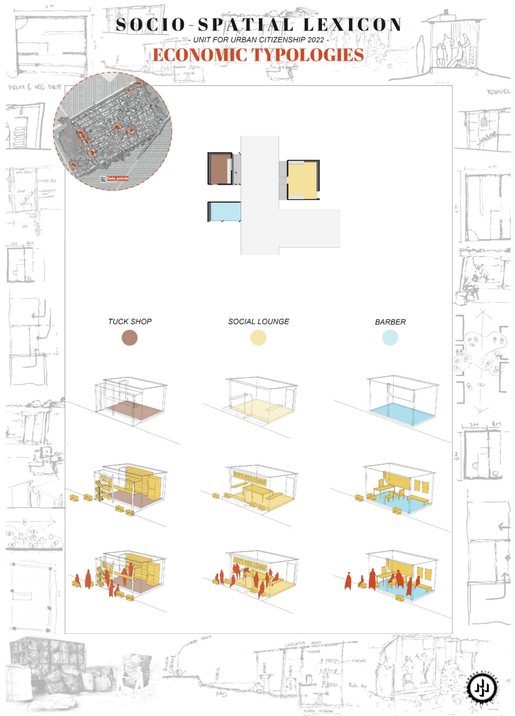
LIST OF FIGURES

Fig. 106: A map of Plastic View Informal Settlement (UPArch UUC 2021)

06 - APPENDIX







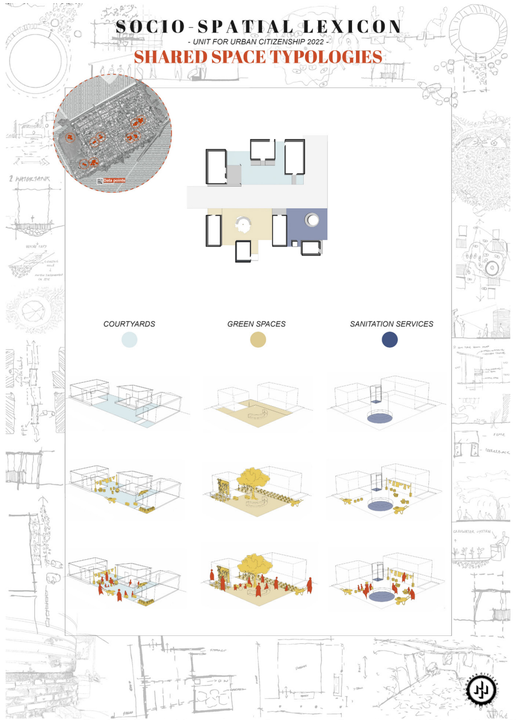
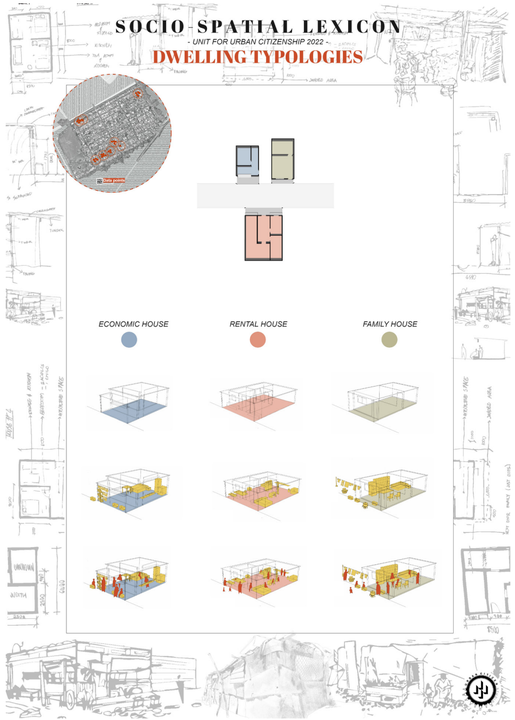
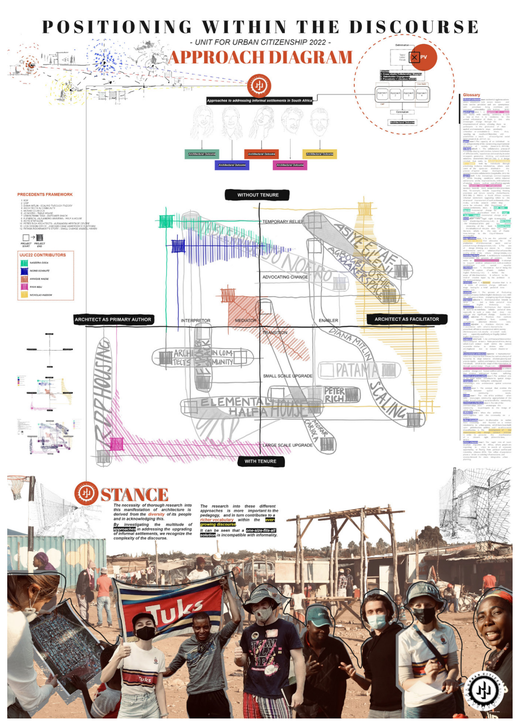
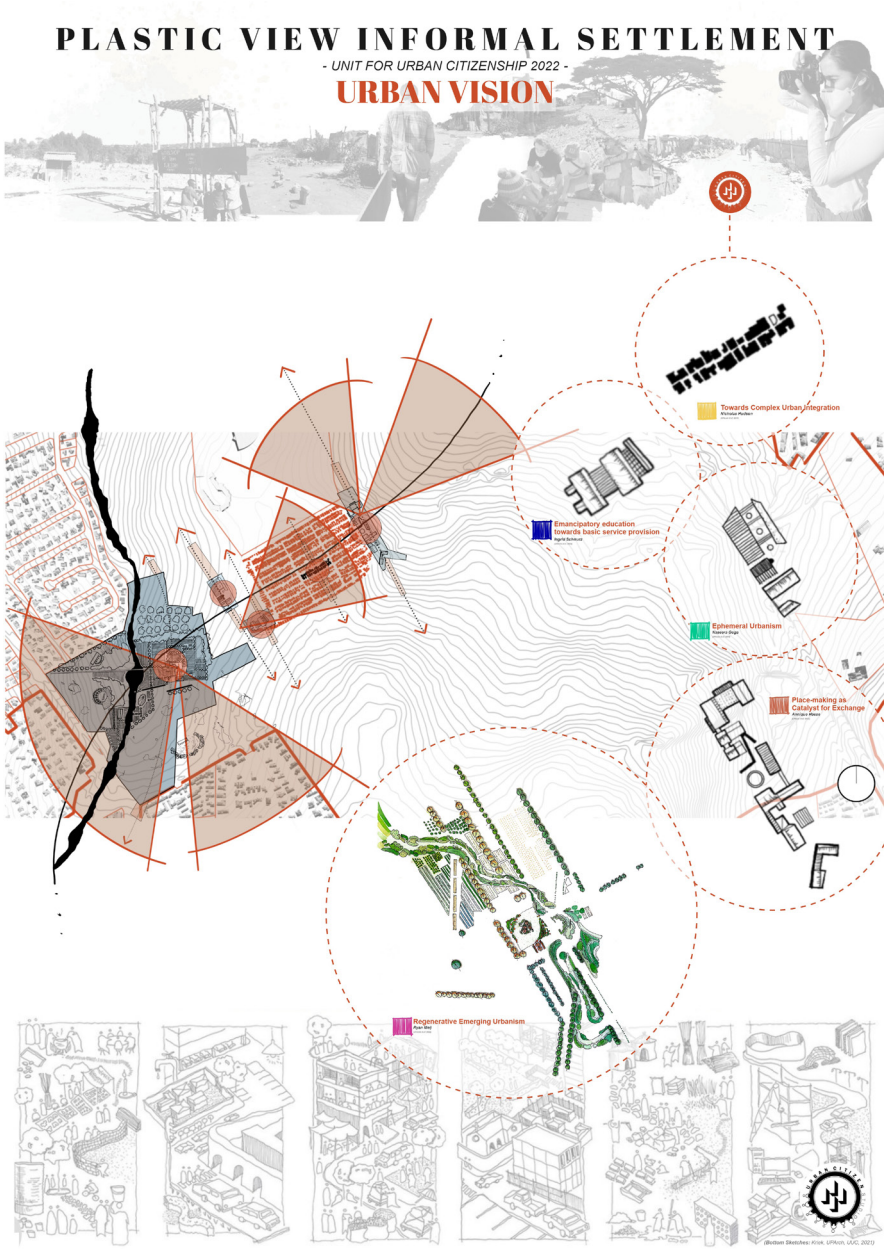


Fig. 107: Plastic View Informal Settlement Compilation (UPArch UUC 2022)







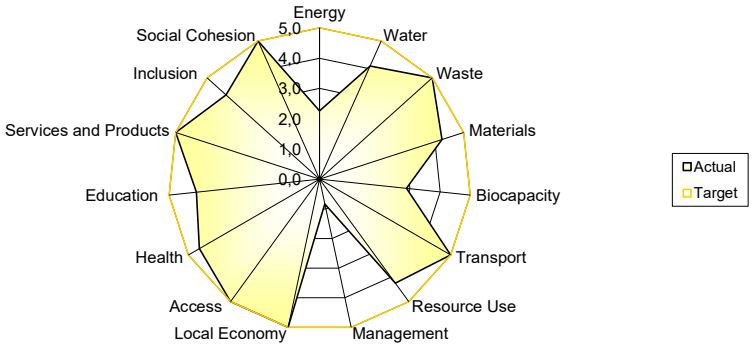
SUSTAINABLE BUILDING ASSESSMENT TOOL RESIDENTIAL
1,04

SB SBAT REPORT	Achieved 4,1

SB1 Project
Towards Complex Urban Integration

SB2 Address
Plastic View Informal Settlement

SB3 SBAT Graph



SB4 Environmental, Social and Economic Performance	Score
Environmental	3,7
Economic	4,0
Social	4,6
SBAT Rating	4,1

SB5 EF and HDI Factors	Score
EF Factor	4,1
HDI Factor	4,5

SB6 Targets	Percentage
Environmental	74
Economic	80
Social	91

SB7 Self Assessment: Information supplied and and confirmed by

Name	Date
Signature	

SB8 Validation: Documentation validated by

Name	Date
Signature	

SB9 Validation Report Version

IVR

Fig. 108: Sustainable building assessment (UPArch UUC 2022)