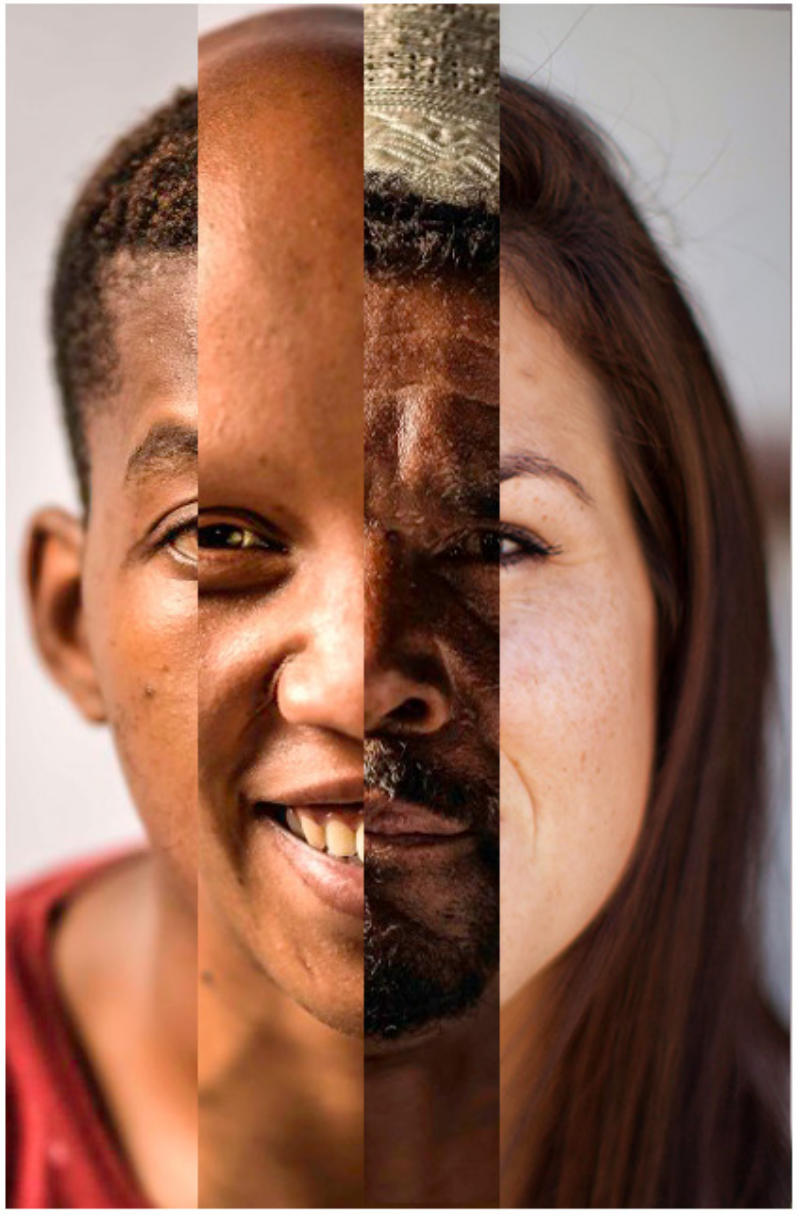

Common Ground

Finding commonality in a place of learning

MProf (Arch) 2016
Catherine Crocker
University of Pretoria

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

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

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

Catherine Crocker
2016

Submitted to fulfill part of the requirements for the degree Masters in Architecture (Professional), Department of Architecture, Faculty of Engineering, the Built Environment and Information Technology, University of Pretoria, 2016

Course Coordinator: Arthur Barker
Study Leader: Carin Combrinck

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My mom , Annatjie Crocker for caring and continously worrying about me.

And my plastic view girls, Michelle Whitaker and Toni Mclagan who I could relate to on so many levels.

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Degree: Masters of Architecture (Professional)
Department: Department of Architecture
Faculty: Faculty of Engineering, Built Environment and Information Technology
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Project Summary

Programme: Community Vocational Facility (CVF)
Client: Moreleta Park Church congregation in association with the Department of Education.
Site location: Plastic View, Moreleta Park, Pretoria East
Theoretical Premise: Common Ground investigates the process in which a Community Vocational Facility can be integrated within the context of Moreleta Park and specifically Plastic View through an extroverted approach.
Architectural Approach: The dissertation identifies that citizenship education , which is a key component of educational policy, can be addressed spatially by considering three main principles; to define spaces for interaction, consider the urban condition and address the multifunctionality of space.
Research Field: Human settlements and Urbanism.
Keywords: Community Vocational Facility, citizenship education, extroverted educational approach, Integration, social cohesion

Fig 0.1 Site of conciliation, Author (2016)

Abstract

Common Ground investigates the process in which a Community Vocational Facility is integrated within a community through an extroverted approach. This responds to the current educational typology which are formed from introverted spaces that help aggravate inequality within South Africa. The dissertation explores how an educational facility can be spatially organized to encourage social exchange among learners, parents and the community and by doing so contributing to a common and equal society within Moreleta Park and specifically Plastic View.

Abstrak

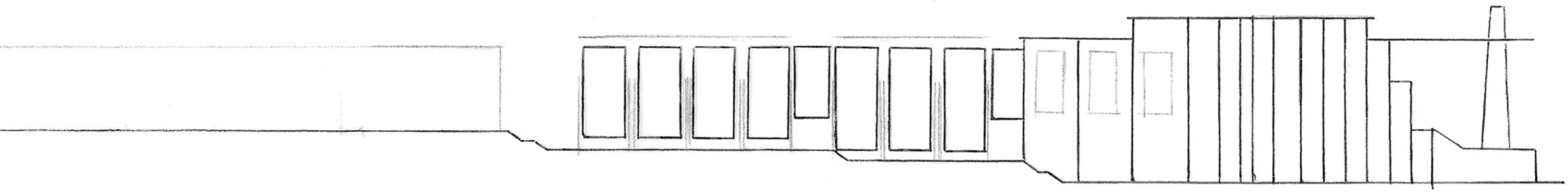
Sentrums vir onderig in Suid-Afrika is geskoei op ‘n argitektuurmodel wat ruimtelik na binne keer en gevolglik uitsluitend is. Hierdie modelle ondersteun nie prosesse om ‘n meer gelyke samelewing te skep nie. ‘Common Ground’ ondersoek die moontlikheid om ‘n Gemeenskaps-beroepsentrum beter in ‘n gemeenskap te integreer deur ‘n alternatiewe ruimtelike benadering toe te pas.
Die verhandeling ondersoek hoe ‘n onderwysfasiliteit ruimtelik georganiseer kan word om interaksie tussen leerders, ouers en die gemeenskap aan te moedig. Op hierdie wyse word argitektuur ingespan om by te dra tot ‘n gelyke en geintegreerde gemeenskap in Moreleta Park en Plastic View.

Table of contents

Table of contents

Finding commonality in an integrative communal educational environment

Fig 0.2 Diagram of scheme, Author (2016)



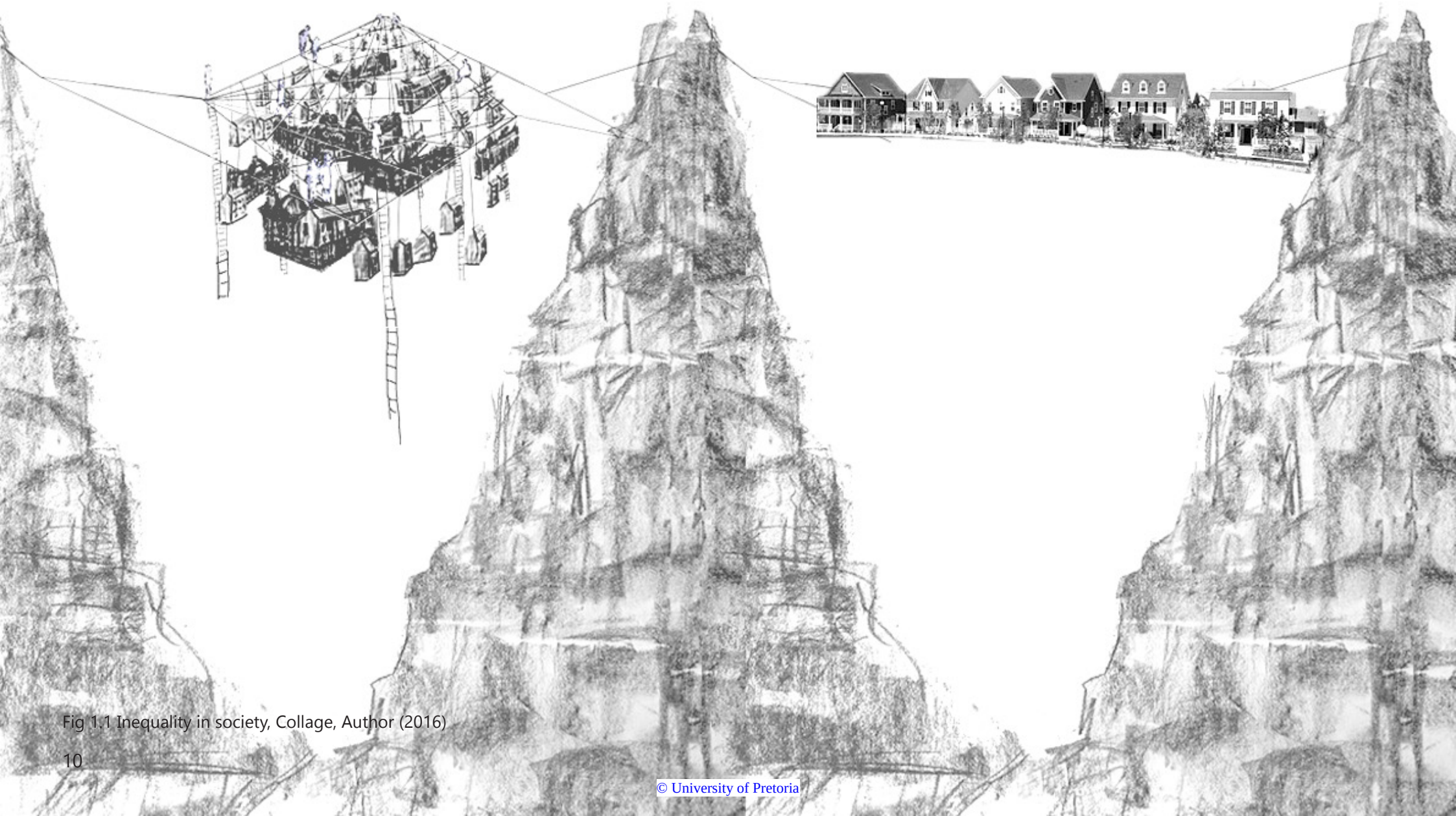


Fig 1.1 Inequality in society, Collage, Author (2016)

1 Introduction

Fig 1.2 Education is the most powerful weapon, Painting jurjotorres.com (2016)

1.1 The role of education in society

Educational facilities have an important role to play in ensuring that learners are well prepared to become active citizens in post-apartheid South Africa. Educational facilities can be seen as a microcosm of society as learners gain knowledge, skills, values and attitudes with which to respond to South Africa's rich and varied multicultural society. However South Africa has failed to use educational facilities to contribute to a common and equal society, highlighting a short-sighted and underdeveloped approach to education in South Africa (SA DOE 2001:3). Therefore this dissertation investigates how educational facilities can begin to contribute to society in order to create a socially and spatially democratic and equal society in order to achieve what the government set out to accomplish in 1994.

After the government was democratically elected in 1994 the Department of Education (DOE) was faced with addressing poor and unequal education opportunities and facilities in socially and physically unequal environments. The government recognized the potential education has on transforming society as it can be used to minimize the gap in inequality by enabling citizens with tools to enter the working world thus in turn creating socially and physically equal societies. Nelson Mandela stated that, *Education is the most powerful weapon which you can use to change the world* (usaid.gov 2016). An *education-for-all approach* which supports an education for citizenship and democracy was the way forward in terms of addressing problems of inequality in South Africa. However twenty years after the end of apartheid, South Africa remains one of the most unequal countries in the world (Fintel 2015) as educational policies as well as the physical environment fails to reflect this inclusive approach in the development of learners in South Africa.

> *On the one hand they (schools) are capable of helping individuals gain knowledge and develop skills and values which can be of great benefit to both the individual and the wider society. On the other hand they (schools) reproduce existing inequalities... and reinforce authoritarian attitudes* (Harber & Mncube 2011:241).

Fig 2.0 People in isolation, Collage, Author (2016)

2 Programmatic intent

2.1 The history of education in South Africa

The history of education in South Africa is discussed further in order to understand the policies and approach to education set forward by the DOE.

Pre colonial education in Africa

In pre-colonial African societies education was seen as part of daily life, where African children learned by experience from doing everyday tasks. African traditional education supported a *people's education* which helped develop a sense of belonging in the community and encouraged actively participative citizens. There were however weaknesses in the educational system as the learning environment became one of indoctrination where fear and punishment were used as a means of educating learners in order to produce obedient and submissive students who were loyal to the traditional African authorities and elders.

> *The boys learned how to distinguish useful grasses and dangerous weeds, how to stalk wild game, and how to stalk sheep and goats. … All children were taught tribal history by oral tradition and were also helped to acquire the sacred cultural morals and attitudes as well as the modes of behaviour which were valued by their society. While the mothers prepared the evening meal after a long working day, the grandmother kept the children awake by telling fireside stories and by asking them to find answers to riddles and puzzles* (Mathebula 2009:171).

Colonial rule

> *Schooling is there to serve the perceived wishes, hopes, interests and fears of those who rule the country, and to serve the creation and maintenance of a particular economic order* (Mathebula 2009:176).

The history of South Africa's educational policies since the middle of the 17th century was to ensure dominance of the European colonists over the mass of native people of South Africa. Education was used as a tool to *civilize* the native people by firstly training them in disciplines of industrial and urban society. This was done by promoting compulsory education and manual work to drive student-slaves into positions of servility, turning them into efficient and obedient workers (Hunt 1974).

Secondly education was used to promote obedient citizens who were loyal to the Empire. In South Africa the idea of encouraging obedient citizens was introduced by means of religious instruction. In 1658 the first formal compulsory school for the Dutch East Indian Company's slaves was opened, Van Riebeek confided in his diary that school attendance was made compulsory, *to stimulate the slaves to attention while at school and to induce them to learn the Christian prayers* (Horrell 1970: 3). The slaves resisted colonial compulsory schooling as it prepared them for inferior roles in society.

Fig 2.1 The future is ours, Poster, popularedu cation.co.za (2016)

The National Party

Under the National Party government, the white population was educated for an uncritical and supportive role and was assigned superior forms of citizenship (Mathebula 2009:170). This further widened class distinctions, encouraging a segregationist and supremacist ideology in society. The National Party Government took it a step further in 1953 when the Bantu Education act was passed which reaffirmed the educational practices of the past, encouraging segregation in society through education. This was done by racially separating educational facilities in order tot increase the divide and inequality between black and white people. Education continued to promote obedient citizens, as both black and white children were educated to be submissive and loyal citizens of the Republic of South Africa. This idea that education was used to tame, as opposed to liberate its citizens, was bound to be resisted and rejected by the public (Mathebula 2009:198).

> *... the school that I went to was an overcrowded school, there were quite many of them in Alexandra that were overcrowded, there were not enough schools to take care of all of us so we used to share classes. There would be a morning class that goes up to 11 o'clock and then we'll go home and then other kids of the same grade will come after 11 o'clock up to 2 o'clock and therefore the teachers will then run two sets of class ... in some situations they will even use a tree in the schoolyard... We were around 70 to 80 [pupils in class] when I was in grade 1 and grade 2* (South Africa: Overcoming Apartheid Building Democracy).

In 1985 the National Education Crisis Committee (NECC) motioned for a *people's education* agenda which provided a vision for people's education for people's power. This initiative provided a participatory, community based approach to education in order to build a truly democratic South Africa.

> *The real struggle is to replace an undemocratic, coercive, ineffective and irrelevant education system with a democratic, participatory and relative alternative* (Mathebula 2009:123).

Post-apartheid: citizenship education

Post-apartheid education policy has had a great emphasis on the role that education plays in creating a more democratic and equal society. Consequently the educational curriculum is aimed at encouraging active and participatory classrooms in order to create more independent and critical thinkers.

> *It should be a goal of education and training policy to enable a democratic, free, equal, just and peaceful society to take root and prosper in our land, on the basis that all South Africans without exception share the same inalienable rights, equal citizenship and common destiny, and that all forms of bias (especially racial, ethnic and gender) are dehumanising* (SA DOE 1995a:22).

However post apartheid educational policy does not embrace an updated *version of citizenship as a foundation for citizenship based education in schools* (Mathebula 2009:185). Citizenship in terms of practice can be defined as an *awareness of oneself as an individual living in relationship with others, participating freely in society and combining with others for political, social, cultural or economic purposes* (Osler and Starkey 2005:14). Where citizenship education aims to *foster active, critical and inquiring individuals who are able to contribute to the common welfare of society* (Mathebula 2009:235). Citizenship education is therefore a very important aspect to post apartheid educational policy as it supports the creation of an equal society by building social cohesion amongst learners, a political goal in post-apartheid South Africa. This notion was also supported by the NECC, during the apartheid struggle, who highlighted that a form of citizenship education (*people's education)* was the way forward in terms of replacing an *undemocratic, coercive, ineffective and irrelevant education system* (Mathebula 2009:123).

The freedom charter (1995) indicated that education for citizenship and democracy which is based on the *will of the people* will likely bring prosperity to its citizens which continued to be a guiding document in the anti-apartheid movement (Mathebula 2009:182). This concept was given legal status in South Africa's new Constitution of 1996 which states that; *everyone shall have the right: a) to basic education, including adult education; and b) to further education, which the state, through reasonable measures, must make progressively available and accessible* (1996: 14).

Sadly however policies in practice reflect a minimalist concept of citizenship education as the post apartheid South African education policy approach favored by the government was of a top-down, vertical nature which hampered radical ideas such as the NECC causing educational facilities to contribute to a physically and socially unequal environment . This will be discussed further by critiquing the policies set forward by the post-apartheid government.

The first White Paper on Education and Training (1995) sets out key aspects of what is to be achieved through the new educational system. The policy had emphasis on gaining human capital for more equal opportunities in society, through education, in an attempt to prevent unequal social and economic reproduction of apartheid to occur (Harber & Mncube 2011:234).

The South African Schools Act (SASA) of 1996 further emphasized gaining human capital through education by supporting educational decentralization which sees schools as *denizeen-commune spaces, defined as public places that have the potential to marshal the collective and public exercise of power for the good of pupils, teachers, schools and society at large* by encouraging active, participatory, community- based citizenship education (Mathebula 2009:124). According to Mathebula (2009:126) this is in line with the educational programme known as Trisano, a Sotho word meaning *working together*, the Trisano document perceives a school as a centre of community life, a public space *where there is a role … for religious bodies, business, cultural groups, sports clubs and civic associations, both to serve their own requirements and to contribute to the school's learning programme both in and out of school hours* (SA DOE 2000: 1). The document then moved from a concept of *people's education* which emphasizes *civic participation* to the idea of introducing School Governing Bodies (SGB) as a solution reflecting a minimalist approach to community participation and involvement in South African schools.

The SASA introduced a form of democratically elected and representative structures which encouraged parents, teachers and learners to get involved in democratic forms of decision-making and school organization systems known as School Governing Bodies (SGB) and Representative Councils of Learners (RCLs) (Harber & Mncube 2011:235). Studies of the functioning of new governing bodies found that many stakeholders, *particularly principals and educators, do not necessarily value participation in itself or for advancing democratic participation in school. In their practices, such participation is little more than information sharing or limited consultation …* (Grant Lewis & Naidoo 2006:422). The parents are disadvantaged by a lack of confidence and expertise, poor communication of information and the rural-urban divide causes transportation problems. Learner participation is reasonable but concentrates on fundraising, learner discipline and sports activities (Harber & Mncube 2011:239). Therefore in practice the SASA doesn't seem to maintain the vision of the current government which is to support a participatory democracy and active citizenship in schools.

The Outcomes Based Education Curriculum 2005 (C2005 1997) is intended to assist in more active and participative forms of learning in order to develop learners to become critical thinkers that are able to analyse and solve problems which arise in the classroom, school and society. This is a direct call for citizenship education that promotes an active learner and facilitating teacher approach as opposed to an authoritarian subject and teacher centered approach of the apartheid system.

C2005 has the desire to encourage citizens of South Africa to build social cohesion while promoting a democratic society. *Citizenship reflects the idea that citizens act in the public sphere, they contribute to, and shape the discourses which, in turn and in part, structure our society* (Caragata1999:270). Therefore C2005 does not only educate learners on how to become effective citizens in public life but also develops the learner's rational, moral and practical capabilities as future adults. However citizenship education is not a key component of the curriculum having very little status in post-apartheid South African schools (Mathebula 2009:130). This highlights the contradictions and tensions in the discussion on educational transformation between an ideal policy that is not yet adhered to in practice.

Even though the policies set forward have great intentions in supporting a democratic society the dominant model of schooling, with exceptions, is still authoritarian in approach (Harber & Mncube 2011:242) where government officials, head teachers and teachers decide what is taught, where it is taught and how it is taught and the learners, parents and community have no say in the role education plays in society. Thus the opportunity for teaching citizenship in schools is minimal despite being a very important aspect in supporting the creation of an equal society in South Africa.

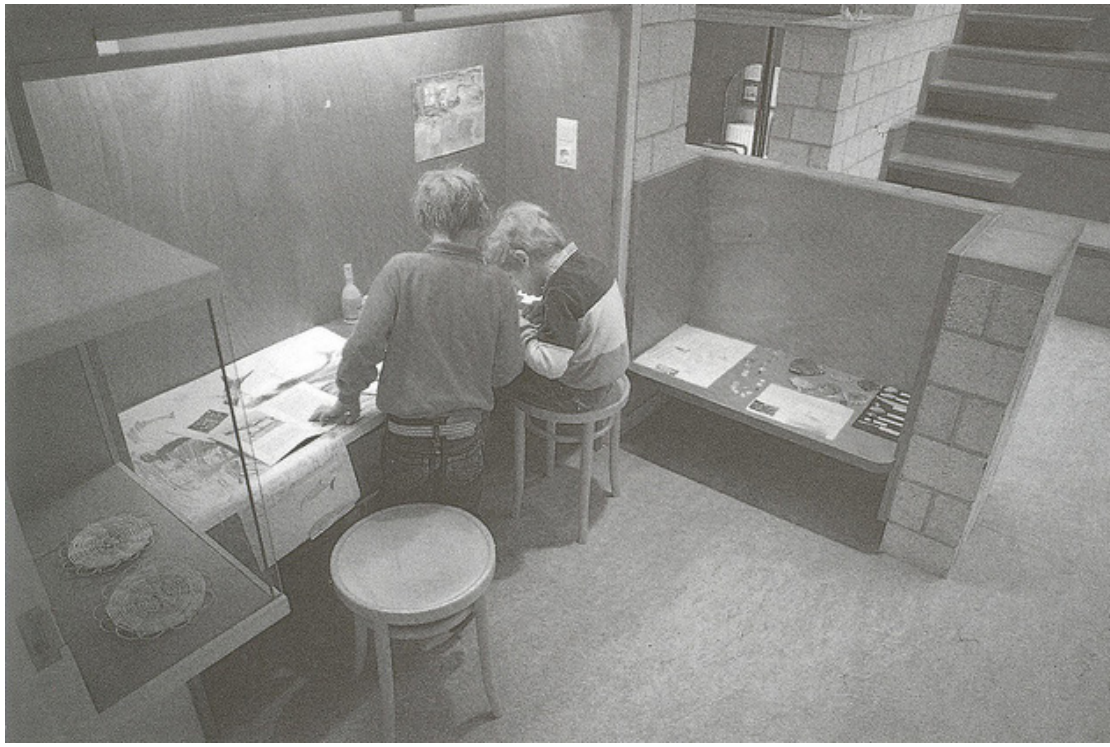


Fig 2.2 Socially interactive environments, Hertzberger, farm6.staticflickr.com (2016)

2.2 Alternative thinking

Community school/ extended school approach

Global trends in liberal democracies that support citizenship education state that citizenship education is most definitely not limited to a formal school curriculum and requires active community engagement (Mathebula 2009:241). Schools are seen as undividable from community engagement as learning and the gaining of knowledge happens in a range of forms. This is known as an extroverted rather than introverted approach to education as it encourages interaction with the community beyond school grounds (Quirk 2012). This allows learners to contribute to society, a notion that C2005 and the Trisano document intended in order to build social cohesion in society.

Educational facilities, as noted by the NECC under apartheid rule, remain undemocratic, coercive and ineffective facilities in society. A paradigm shift in the way that one thinks of learning is necessary which will lead to behavioral change and social change in society (Teisetd 2013:520) where goals are accomplished which would be impossible through more isolated learning efforts. 21st century learning must take place in contexts that *promote interaction and a sense of community [that] enable formal and informal learning* (partnership for 21st century skills :3).

> *The school become like a city with learning expanding beyond the school curriculum. It is important that our entire environment is educational just as continuing education is no longer confined to school hours, so with learning leaving the school territory and embracing the surrounding as a whole we can speak of boundless education. Then not only does the school become a small city but the city becomes an exceedingly large school* (Hertzberger 2008:9).

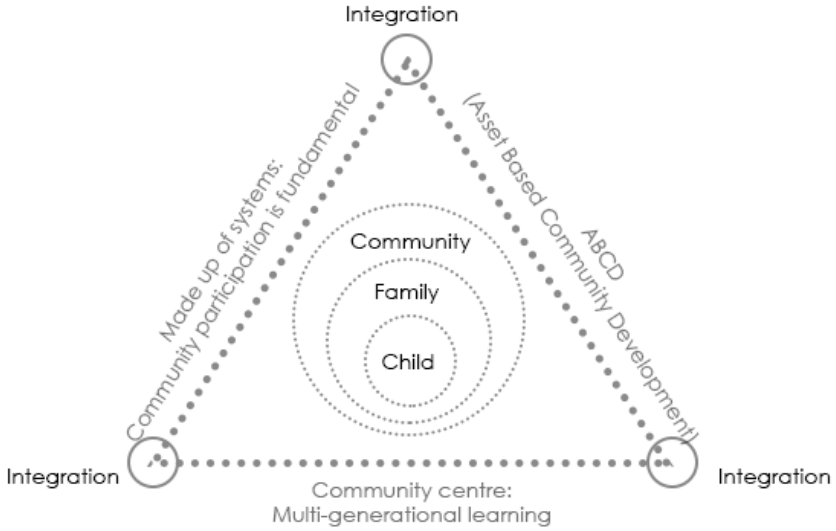


Fig 2.3 Community school, diagram, Author (2016)

Fig 2.4 Components organised in extended school to form architectural unity, Diagram, Author (2016)

Community schools known as *extended schools* or community learning centers, reconsider education as a child centered endeavor where families and communities work to support the students' educational success in turn building stronger families and communities. Community schools develop partnerships with health, social services, nonprofit organizations that help strengthen the schools existence as a vital hub in the community (The Children's Aid Society's National ... 2013). The educational facility becomes a s*ociocultural complex* (Hertzberger 2008:169) which serves many different multifunctional activities such as adult education. Thus public facility integration allows for cross discipline interaction between people, a principle supported in Gehl's (2010), Salat's (2011) and Alexander's (1977) theories of compact cities and heterogeneity where different activities take place in close proximity to one another creating a vibrant lived-in city.

> *Build houses into the fabric of shops, small industries, schools, public services, universities-all those parts of cities which draw people in during the day, but which tend to be non-residential. The houses may be in rows or hills with shops beneath, or they may be free-standing, so long as they mix with the other functions and make the entire area live -in* (Alexander 1977:258).

The *de-schooling* process which was proposed by Ivan Illich (1973) considers a decentralized approach to learning as learning is encouraged through *learning networks* (Alexander 1977) of society. This concept supports the SASA Policy which sees schools as decentralized communal spaces. This is especially important for adolescents who are maturing and deciding what they want to do and be in this world. *Environments are needed that represent a microcosm of adult society* (Alexander 1977:417) . In order for this to be achieved a *high school* needs to be non-compulsory so that teenagers are able to participate in society. By reducing the size of schools the facility is able to become a part of society and formal learning must include opportunities to work as apprentices at local businesses (Alexander 1977:418).

> *People of all walks of life come forth, and offer a class in the things they know and love; professionals and workgroups offer apprenticeships in their offices and workshops, old people offer to teach whatever their life work and interest has been, specialists offer tutoring in their special subjects. Living and learning are the same. "(*Alexander 1977:101)

Fig 2.5 Space that permits common use, Diagram, Author (2016)

Fig 2.6 Components accessed from communal space Diagram, Author (2016)

Fig 2.7 And take on the character of a central square Diagram, Author (2016)

Vocational Education

> *Replace the high school with an institution which is actually a model of adult society, in which the students take on most of the responsibility for learning and social life... Provide adult guidance, both for the learning, and the social structure of the society (Alexander 1977:418).*

The emphasis on gaining human capital through education, as policies set out to achieve, is explored further through vocational education and training. Improving learners success and achievement in high school has become one of South Africa's most challenging priorities (Stumpf & Niebuhr 2012 :1). Studies indicate that nearly one million young South Africans who had completed school up to grade 10 were unemployed and not studying (Stumpf & Niebuhr 2012 :1). It is clear that there is a huge transition gap between leaving school, after completing grade 10- 12, and getting a job: *The general lack of skills and employability among South Africa's youth is one of the perverse consequences of the poor quality of education received* (Spaull 2013: 45).

South Africa's general education prepares learners for life in general, as well as for higher education studies in knowledge based studies and forms the dominant role of school education. Further vocational education currently forms the domain for further education and training (FET) only and aims to produce adults who are useful in the work place immediately (Stumpf & Niebuhr 2012:2). However FET colleges remain limited as they have strict entry requirements and capacity constraints (Spaull 2013: 45). The need for technical and artisan skills in South Africa (Stumpf & Niebuhr 2012:2) suggests that the school education system needs to become more diversified in order to help learners find their niche in life. This can be done through vocationally-orientated education where the learner either continues with a general education system or a further education and training system. Vocational- orientated education offers an environment where learners are prepared on practical occupations and then further trained in a particular occupation before entering the work environment.

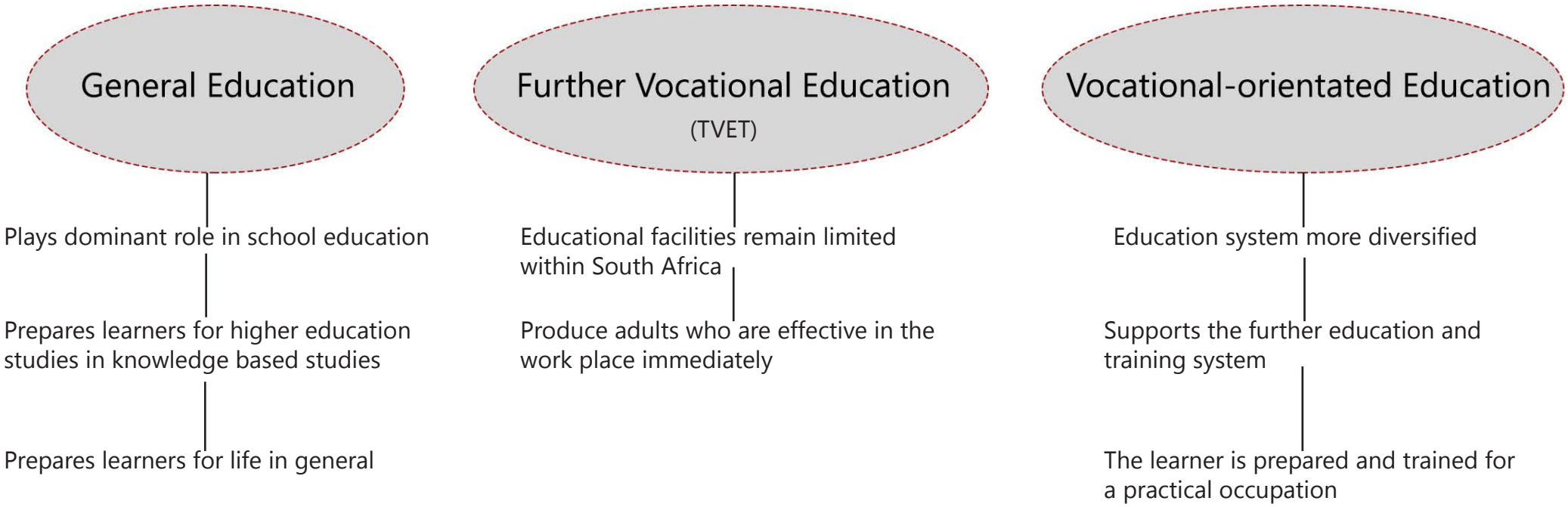


Fig 2.8 Types of education, Diagram, Author (2016)

2.3 Precedents

The following examples and precedents of educational facilities offer an alternative programmatic approach to educational facility design, encouraging citizenship education and a community school approach in the spatial development.

Soshanguve School Development Project (SSDP)

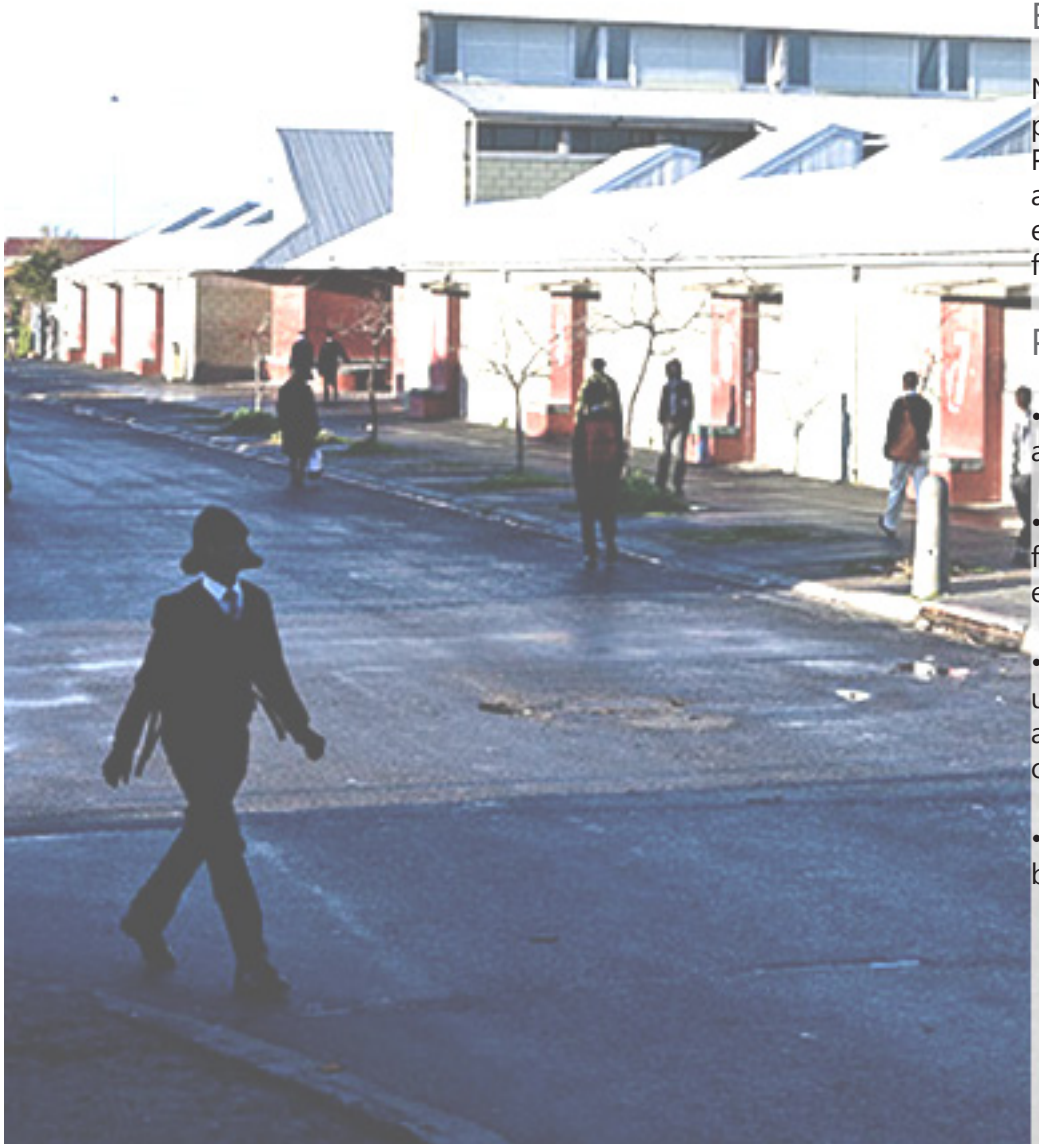
Community Involvement in School Development: Modifying School Improvement Concepts to the Needs of South African Township Schools, an article by Martin Prew (2009) tries to better understand the issues faced in reproducing inequality in educational facilities in South Africa. The article uses facts collected from a study of 96 schools involved in the Soshanguve School Development Project (SSDP).

The main issues highlighted indicate that educational facilities reflected a community that was segregated, violent, lawless and highly politicized (Prew 2009:826). An environment which is starved of resources, underfunding and poorly trained teachers results in low expectation of pupils, low teacher morale, weak management and poor results (Prew 2009:825).

The challenge in resource starved environments is to determine the general needs of the local community and society in order to come up with solutions that create more effective schools (Prew 2009:826). It is essential for schools to become more flexible and resilient in the developing world. This can be done by allowing the community to make decisions regarding the school which best fit its environment (Prew 2009:833).

The SSDP project acted as a means of encouraging the community to become involved in the schools productively (Prew 2009:833). This project is a reaction to a main issue experienced with educational facilities in today's society as they have become segregated and isolated entities in society. It therefore contributes to a socially corrosive environment where violence is prevalent. The SSDP Project highlights the need for an educational facility to become a part of the community, allowing the community to understand that they own the facility and that the educational facility is there to provide them with opportunities that they might not have had before.

Fig 2.9 SSDP Student teacher involvement, Photograph, cepd.org.za (2016)



Project name: Usasazo Secondary School 2004
Location: Khayelitsha, Cape Town, Western Cape
Architect: Noero Wolff Architects

Background:

Noero Wolff Architects explores the impact an educational facility could possibly have in creating social change within the community of Khayelitsha. Programmatically the current school typology is adapted in order to include activities that allow for the educational facility to integrate within its environment. This is done by activating the edge conditions of the educational facility.

Programme:

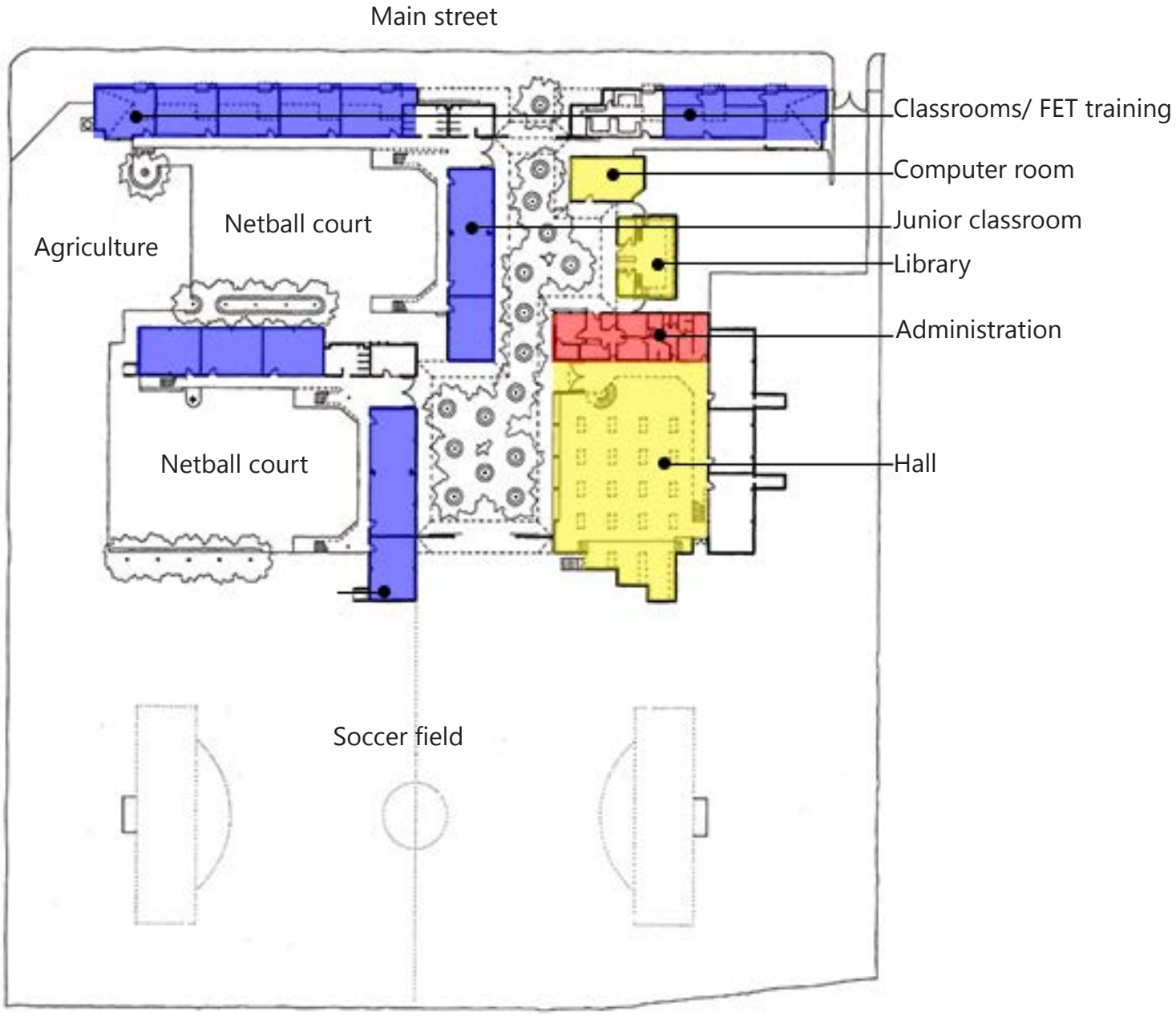
- The Usasazo school includes 37 classrooms, a library, computer room, hall and administration section.

- The brief was expanded by the architects to allow the school to be adapted for Further Education and Training (FET) legislation which asked for more entrepreneurial training.

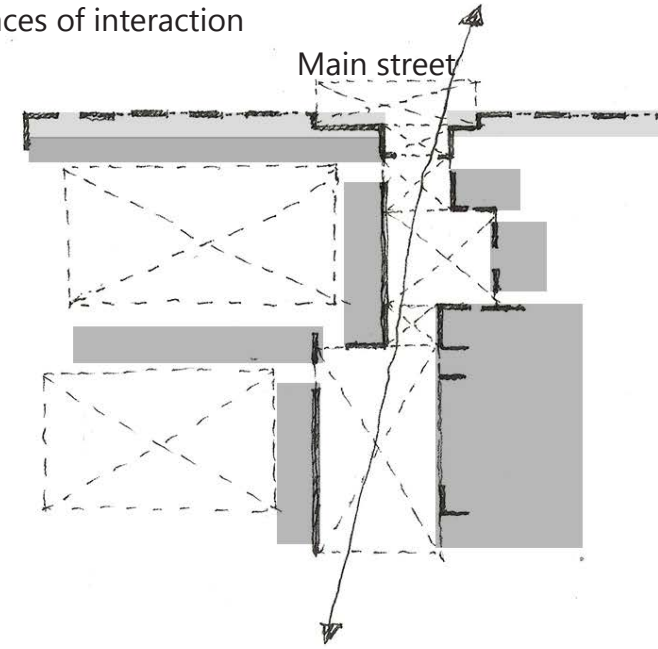
- Classrooms along the street edge can be spatially adapted in order to be used for entrepreneurial teaching as the classrooms open onto the street allowing interaction with the public. Subjects like car and appliance repair, hair care and food trade will use these classroom facilities.

- Programmatically the spaces encourage and allow for interaction to occur between learners, teachers and community.

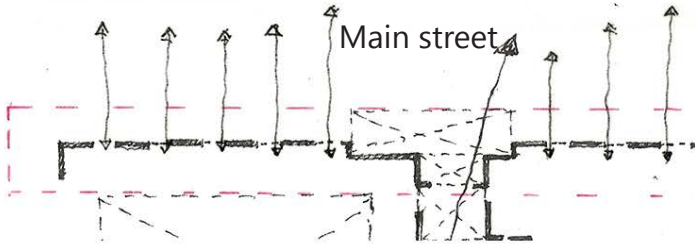
Fig 2.10 Street edge of Usasazo School, Photograph, Noero Architects (2016)



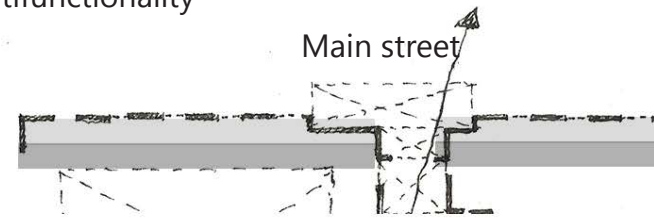
Spaces of interaction



Urban conditions

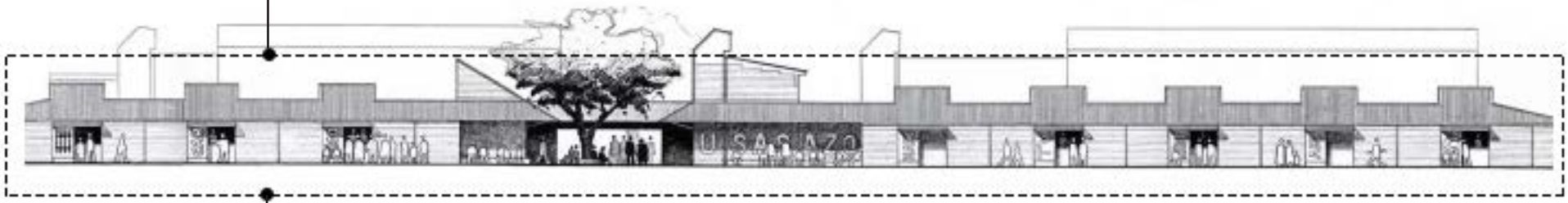


Multifunctionality



The programs frame spaces of interaction occuring in the negative space

The FET training programme responds to the main street



Can be adapted to be used as classrooms or as FET training facilities

Fig 2.11 Analysis of Usasazo School, Author (2016)

Project Name: Blurred Classroom Design team, Jiya Community School
Location: Jiya, India
Architect: Open Architecture Network's Classroom of the Future Challenge.

Background:

The community school questions how the permeability between a school and its community can become the key factor in overcoming inequality in society. The school challenges its significance in the community as it offers facilities that can be used by the community.

Programme:

- An Internet Cafe and Innovation Lab was introduced where people from the school and the community can collectively gather to work.

- The school focuses on connecting and extending both the physical space and learning opportunities to both students and the larger community.

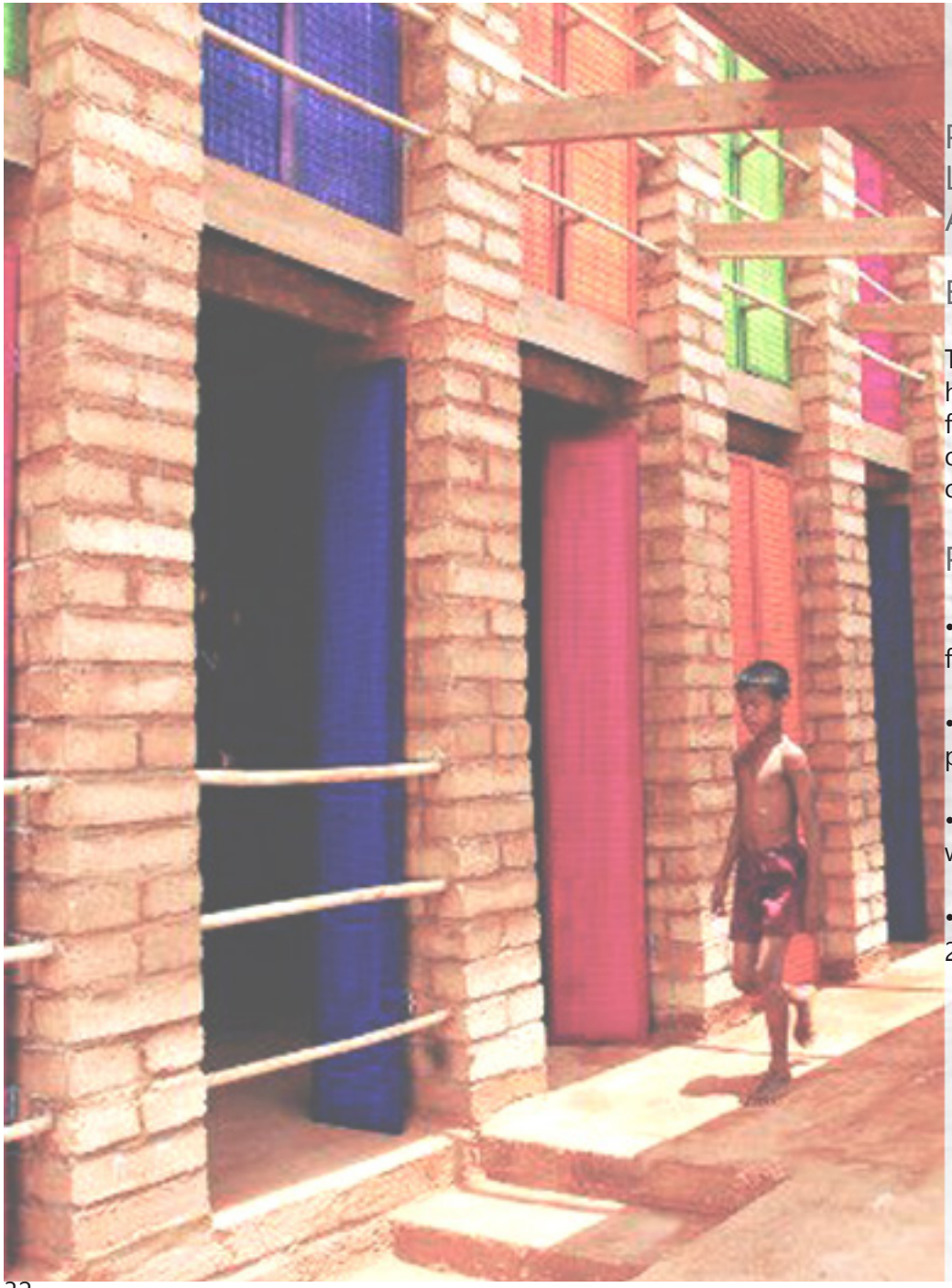
- The school then becomes a part of the community, a facility that can be used by the community to their benefit, opening up business, learning a new skill or simply a place where people can interact with one another (Quirk 2012).

Fig 2.12 Jiya Community school, Quirk (2012)

The programmes allow for freedom in order for interaction to occur between learners and the community

The spaces are made accessible to the community by introducing local amenities that the community can benefit from

Fig 2.13 Jiya Community analysis, Quirk (2012)



Project name: Sra Pou Vocational School
Location: Cambodia
Architect: Rudanko & Kankkunen Architects

Background:

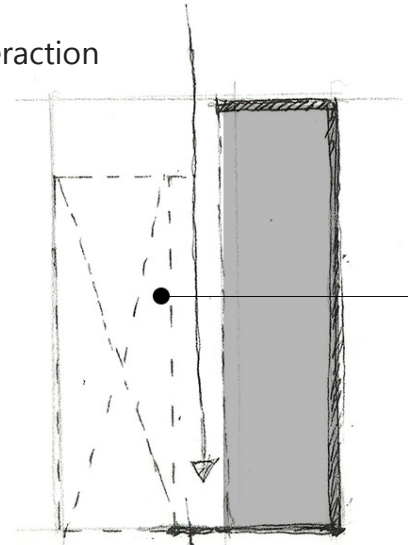
The Sra Pou vocational school serves as a business training centre and public hall. The school was built by the local community. They used hand-dried blocks from the surrounding soil. The aim was to teach people how to make the most out of the materials that are easily available so that they can apply the same construction techniques for their own houses in the future.

Programme:

- The purpose of the vocational training centre is to encourage and teach poor families to earn their own living.
- The new vocational school provides professional training and helps the people to start sustainable businesses together.
- It is also a place for public gathering and democratic decision-making for the whole community.
- A local Non Profit Organization (NGO) organizes the teaching (Dezeen.com 2011).

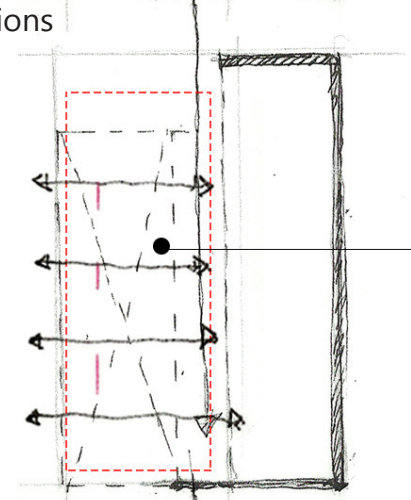
Fig 2.14 Sra Pou Vocational school, Photograph, Denzeen.com (2011)

Spaces of interaction



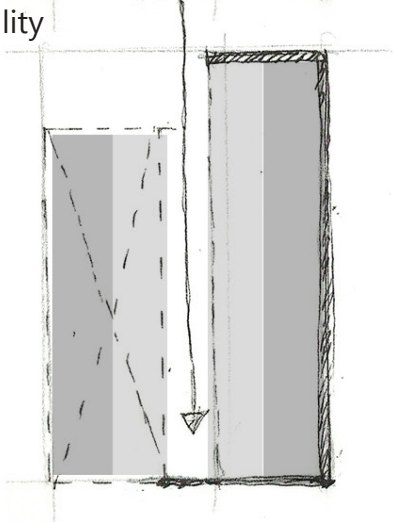
The vocational training centre frames and defines an outside area which can be used for community meetings and gatherings.

Urban conditions



This space acts as a public edge which is made accessible to the community, itegrating the facility into its environment

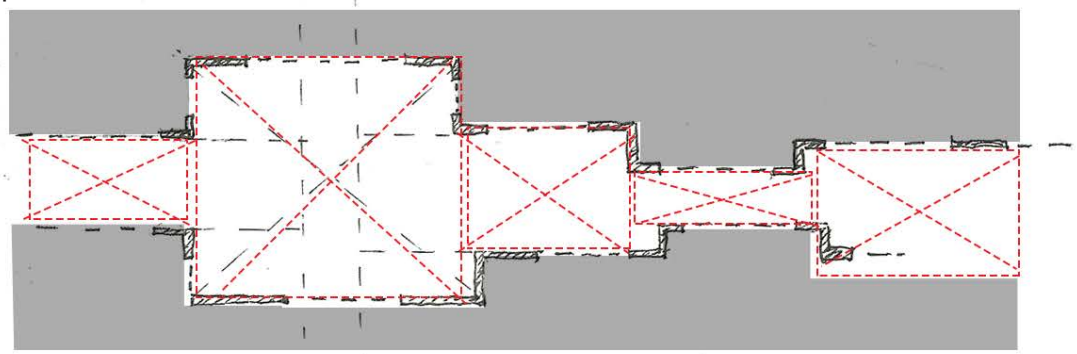
Multifunctionality

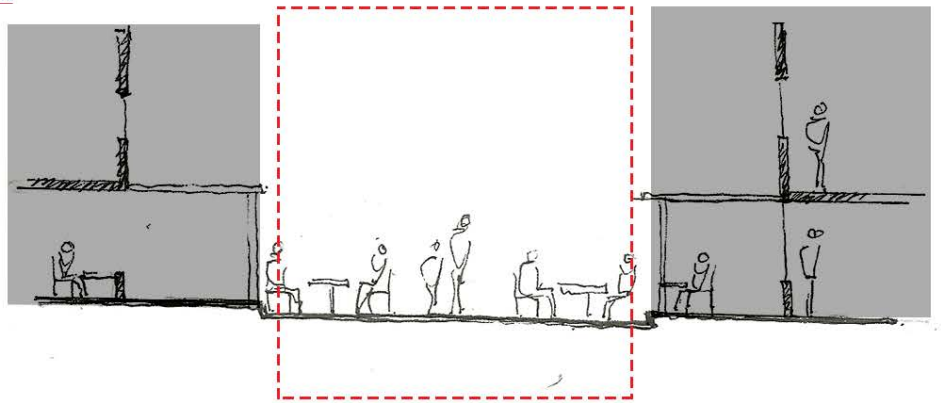


Programmatically the centre adapts to the needs of the user while catering for all age groups

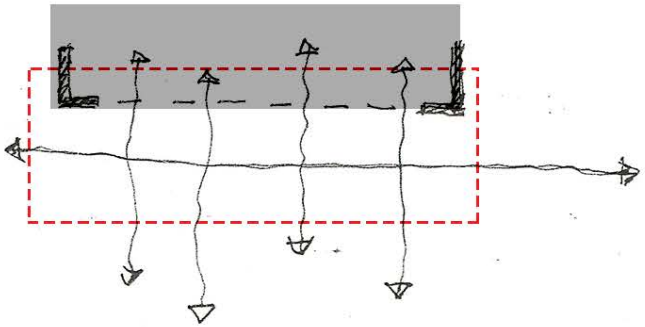
Fig 2.15 Sra Pou Vocational school analysis, Photograph, Denzeen.com (2011)

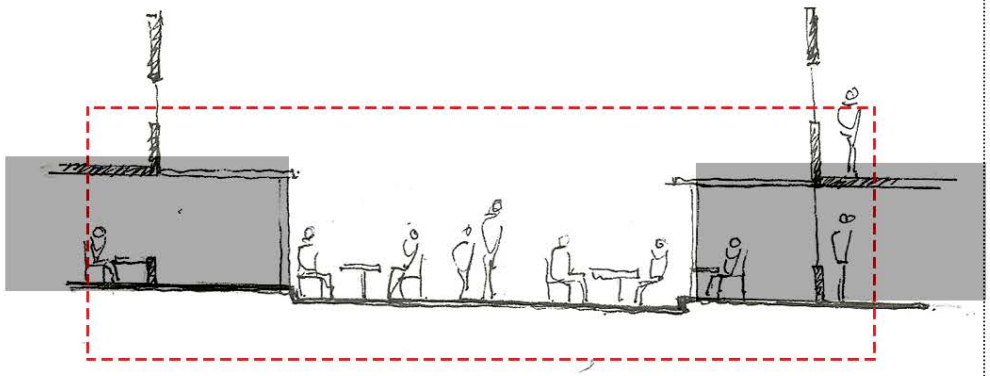
Spaces of interaction





Urban conditions





Multifunctionality

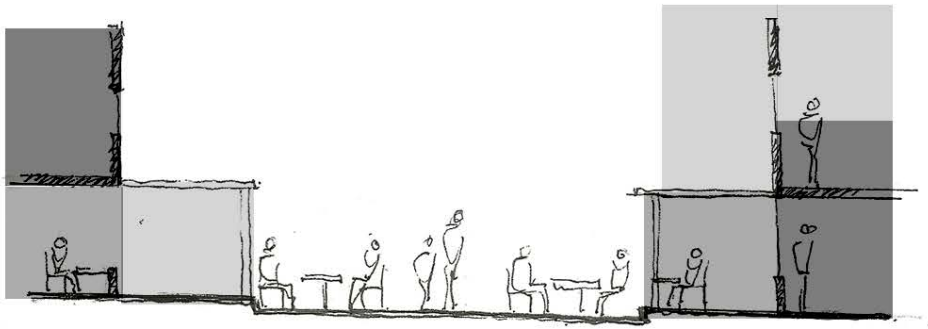


Fig 2.16 Programmatic conclusion, diagrams, Author (2016)

The programmes frame in-between space where interaction between the learners and community can take place

Local amenities are situated on the main axis in order to create an accessible environment which caters for the needs of the whole community

The programmes need to be able to be adapted and transformed in order to suit the needs of the community.

2.4 Programmatic conclusion

Conclusion

This dissertation supports a citizenship approach to education as it encourages social cohesion amongst people in post-apartheid South Africa, by educating learners to be active citizens in their community.

It is proposed that a Community Vocational Facility (CVF), which is seen as a community centre, is necessary in order to successfully implement the policy of citizenship education in practice. Therefore the following programme encourages:

- Spaces of interaction: The programmes support and frame the interaction and social exchange which occurs between the learners and community. This is essential when supporting more participative and active forms of citizenship in learning environments.

- Urban conditions: A decentralized model is suggested promoting that the facility be integrated into its environment and invested in by the community encouraging a variety of local amenities that are run for and by the community.

- Multifunctional: The CVF includes a range of multifunctional and generational learning activities. This will ensure that the space is used frequently and actively, keeping the space alive. Various activities also allow for cross discipline interaction between people to occur which could help build social cohesion in society.

These three elements; spaces of interaction, urban conditions and multifunctionality of the space are taken forward in the dissertation forming a hypothesis which is addressed programmatically as well as spatially. It is suggested that if these elements are addressed architecturally they may lead to spaces that promote a social paradigm shift with regard to citizenship education.

Fig 3.0 Integration into everyday life, collage, Author (2016)

3 Architectural Intent

3.1 Spatial consequences of school design

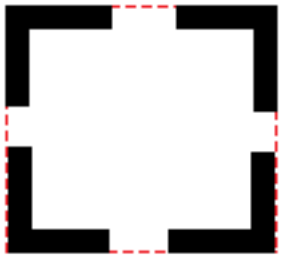


Fig 3.1 Introverted approach, diagrams, Author (2016)

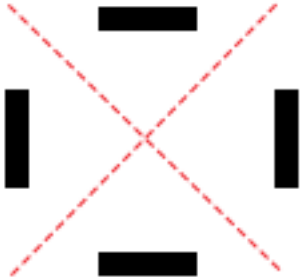


Fig 3.2 Extroverted approach, diagrams, Author (2016)

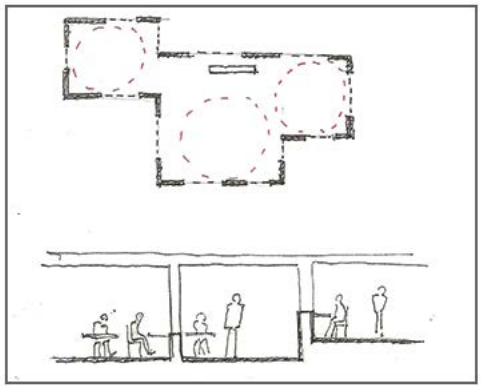
Reproducing inequality

Chapter 2 highlighted the complex nature of South Africa's education policies and implementation thereof in practice. The question then remains whether the spatial layout of schools has enabled inequality or reduced it? School design has lagged behind social and educational development, as schools are *outdated buildings that are unsuitable for the curriculum they are asked to deliver* (Mirchandani & Wright 2015:4). The result has been to enable or even aggravate inequality South Africa. School design therefore plays a significant part in the inequalities faced in society as Hertzberger (2008:71) describes schools as having *Introverted layouts*, which are *isolated, mono functional and functionally dominant and intimidating spaces*. Lister (1974) goes as far as comparing schools to prisons:

> *The headmaster is the prison governor; teachers are warders; the prisoners are the pupils, in the obvious instance, but the teachers are prisoners too... Pupils have to attend by law. ... The deprivations of school include being deprived of the company of human beings other than members of the pupil's peer group* (Lister 1974: 85-86).

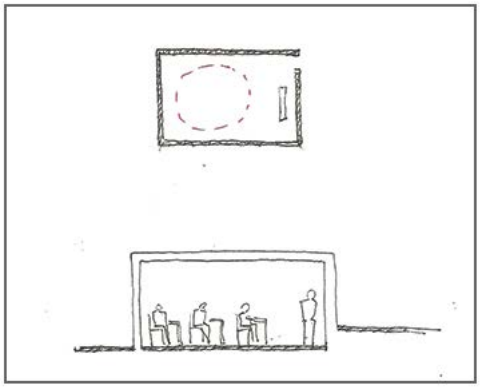
The social intentions, as discussed in chapter 2, have a direct influence on the spatial implications of school designs. Therefore an investigation into examples of school design and the spatial consequences thereof is necessary in order to suggest what form of spatial intent will promote citizenship education and what form of spatial intent does not promote citizenship education.

> *Schools have always been a reflection of a society's stage of development* (Kuhn 2012).



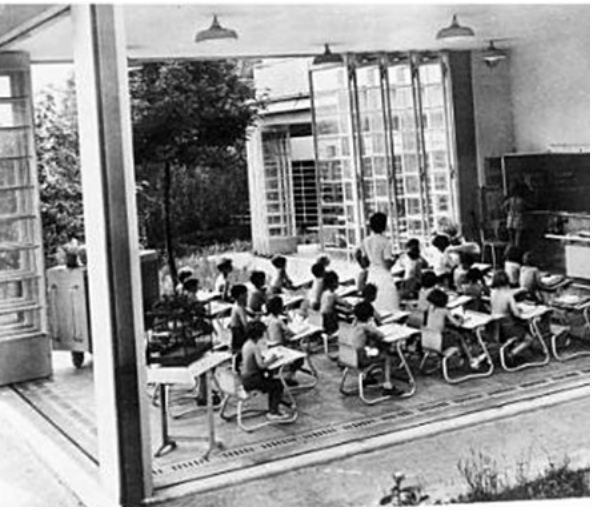
Middle ages learning environment

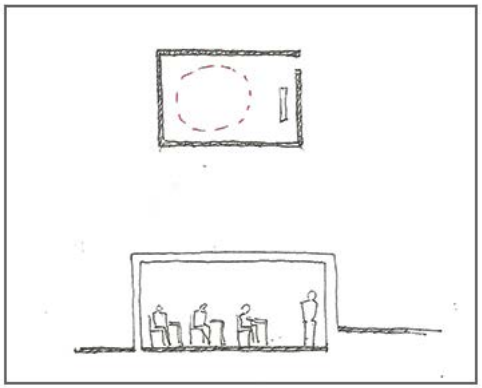
Illustrated in a painting by Dutch artist Jan Steen, a 17th-century village school is portrayed as a room in which the children hardly appear to be engaged in learning as we know it today (Kuhn 2012). In the middle ages learning environments were merely collections of teachers who students were attracted to because they had knowledge of something to offer (Alexander 1977:232). The scene captured in the painting, as strange as it seems, actually portrays children who are actively involved in a learning process.



Industrial era- Scholastic learning environment

The industrial era brought about change in schools, designed to be highly controlled environments, in order to promote obedient citizens in the machine age. In a painting by Albert Anker in 1848 the scene sets a classroom of a German village school, portraying rows of benches with the boys occupying the middle and girls placed on the side. The classroom is a hollow stone space where the windows are placed high enough to limit the learners view to the outside, thus instilling the idea that a school is designed to teach people to be efficient and obedient workers in order to grow the country's economy (Hertzberger 2000 :54). In Chapter 2 a similar approach to schools was undertaken by the British and Dutch who colonized South Africa as the educational intent was to teach students to be obedient and submissive citizens in a thriving economy.





Modernist era- Open air learning environment

The aftermath of the industrial revolution saw a paradigm shift and response by the Modern Movement. An example of this shift can be seen in the open air school in Amsterdam built in 1927-30 by Jan Duiker . The open air school forced one to rethink the nature of school architecture as the design focused on addressing the poor physical conditions of neglected children of urban workers in the industrial era. Instead of the closed off classrooms, which had no interaction with the external environment, the open air school approach encouraged openness, getting rid of walls in order to become spacious and light. However as open as it was it was a highly controlled space as the classroom layout itself was set up in rows which faced a teacher who taught them (Kuhn 2012).

Fig 3.3 Classroom layout on plan and section, diagrams, Author (2016)

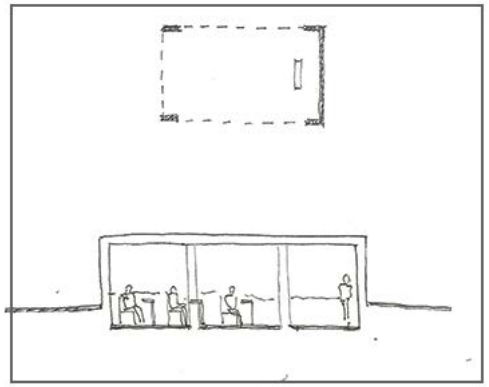
Fig 3.4 Middle ages, painting, Kuhn (2012)

Fig 3.5 Industrial era, Photograph, adventureswithagile.com (2016)

Fig 3.6 Modernist era, Photograph, thearchitectureofearlychildhood.com (2016)

Fig 3.7 Wood hill college, Photograph, Author (2016)

Fig 3.8 Current day classroom layout on plan and section, Diagram, Author (2016)



Current day- Scholastic learning environment

In today's society as noted in Chapter 2 the standard model of schooling is one of an authoritarian approach which lacks the rigor citizenship education has to offer to society. Educational facilities of today reflect industrial age origins as the spatial layouts promote rigid schedules, inflexible facilities and set boundaries between grades, disciplines and classrooms (partnership for 21st century skills:23).

Field research was conducted by the author in order to identify the extent to which a few educational facilities in Pretoria reflect a scholastic learning environment within their spatial layout and programmatic intent. The method of research consisted of identifying and analyzing one private and one public school which are both located in the East of Pretoria within near proximity to the chosen site. Both a private and public school were chosen in order to make a more generalized conclusion of educational facilities within our current day society, and more specifically learning conditions present in Pretoria East.

The field research method included visiting both schools on one occasion each, observing, taking photos and walking around the educational facility within school hours. The visit was done in school hours as it was important to understand the school dynamics in terms of teacher, pupil relationships and what effect this had on the spatial and programmatic requirements within the school design. The analysis had a particular focus on whether or not the spatial and programmatic conditions promote citizenship education and contribute to creating a socially corrosive environment. A table was drawn up that was used as a basis on which to analyze the schools and were informed by the conclusions made in Chapter 2 which is the following:

- Spaces of interaction: To what extent does the school encourages spaces where learners/ teachers and community can interact.

- Urban conditions: To what extent does the school consider the urban conditions surrounding it.

- Multi functionality: Whether or not the facility is multifunctional and/or offers generational learning.

3.2 Case Studies

Project Name:
Wood hill College
(Private school)
Location:
Pretoria, Moreleta Park

Spaces of interaction: Corridors Hall/ main gathering space Meeting spaces	 Used as circulation space and where school bags are left Used to brief children and on occasion for performances. Found indoors in offices, classrooms
Urban conditions: Access Barriers Street edge condition	 By appointment Double security: Security guards, boom gated, fencing Isolated from the environment
Multi functionality: Adaptability/ multi functionality of classrooms Generational learning	 Basic classroom layout which indicates a subject teacher centered approach. No form of adult learning provided.

Project Name:
High school Garsfontein
(Public school)
Location:
Pretoria, Garsfontein

Spaces of interaction: Corridors Hall/ main gathering space Meeting spaces	 Used as circulation space Used to brief children and on occasion for performances. Found indoors in offices, classrooms
Urban conditions: Access Barriers Street edge condition	 By appointment Fencing The street edge is used to drop off and pick up children
Multi functionality: Adaptability/ multi functionality of classrooms Generational learning	 Basic classroom layout which indicates a subject teacher centered approach. No form of adult learning provided.

Conclusion

The field research concluded that the current spatial layouts of the schools lack space for interaction between teachers, students and the community. The schools did not contribute positively to their urban surroundings or offer alternative ways in which the schools can be used multifunctionally.

- Spaces of interaction:

The corridors of schools are merely used as circulation spaces and the central space/ hall is used purely to brief the learners and on occasion host events and do not encourage public interaction with one another (Kuhn 2012).

The interaction between students, teachers and the community highlights the extent to which meeting spaces are considered in the design. Most meeting spaces and spaces of interaction are found inside the buildings (such as offices and classrooms) creating spaces that are isolated from each other. There are few architectural resources used to create as many places as possible for people to meet and interact, for example: full or half-height walls and steps.

The result is that learners do not know how to interact with one another, how to take each other into consideration and understand one another which is vital in order to mould citizens who know how to act with others in the public sphere.

> *Schools must be an ever changing environment where there is a lot going on and there are choices to be made. Children need to contend with other children, work things out between them, understand each other. This is a great deal more than reading, writing and arithmetic and the school space must encourage it*
> (Hertzberger 2008).

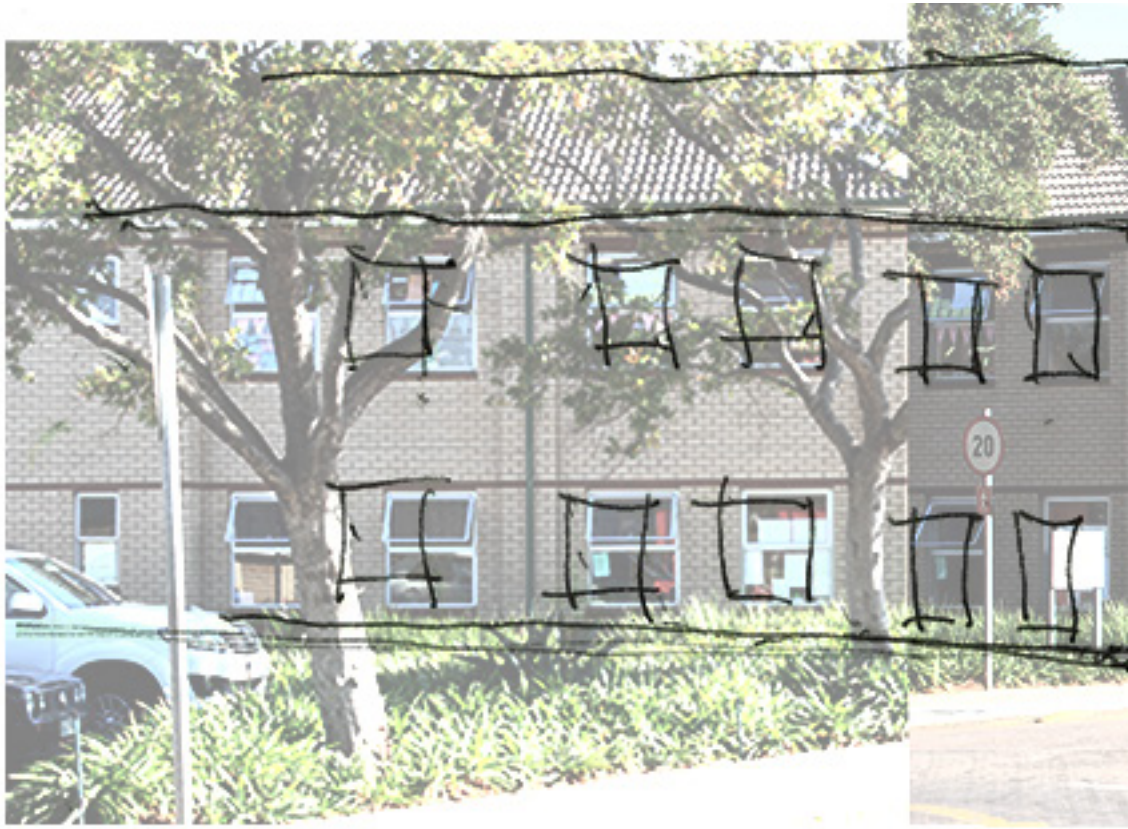


Fig 3.9 Wood hill college, photograph , Author (2016)

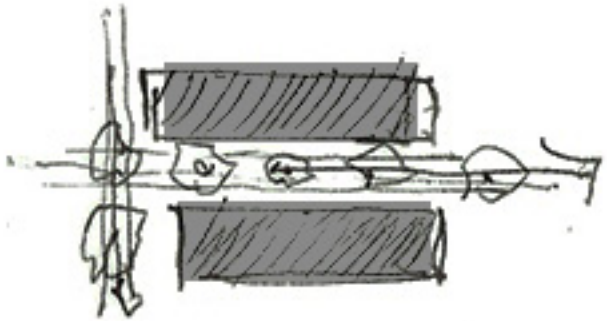
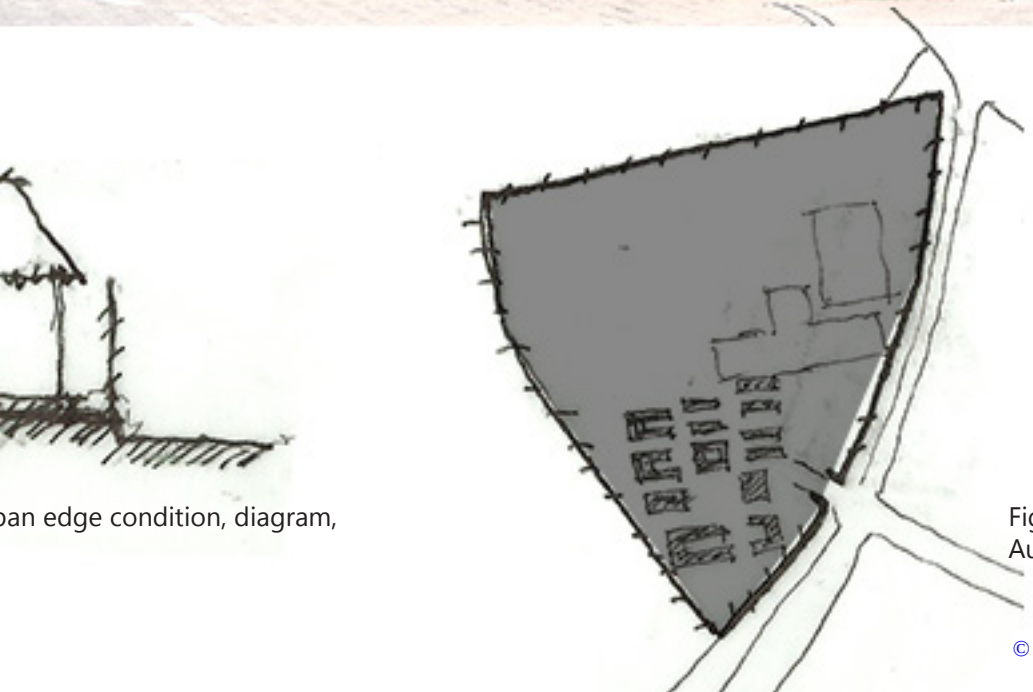


Fig 3.10 School analysis of classroom layout, diagram, Author (2016)

Fig 3.11 Section of urb
Author (2016)



ban edge condition, diagram,

- Urban conditions:

Schools lack the interaction and participation necessary to be seen as a positive attribute to society.
Barriers and limited access highlights a controlled environment .
The relationship between the educational facilities and street edge indicate a harsh, hostile and isolated edge condition as the facilities physically isolate themselves from the surrounding community.
Not only are educational policies implemented in a top-down manner but so is the managing approach to schools. A centralized school condition results in administration authority, which is not vested in by the local community but, is controlled by a central body which has complete power over decisions made regarding the school (Brennen 2002).

- Adaptability and Multi functionality:

A individual based education model has been the result of an authoritarian approach for over two centuries (Kuhn 2012) where learners act individually as they set their own goals, make their own decisions and take responsibility of the outcomes. The result is that schools require more and more workplaces which have a specific function and cannot easily be adapted (Hertzberger 2008:9).

C2005 intended for an active learner and facilitating teacher approach to take place rather than an authoritarian subject and teacher approach however the spatial layouts of classrooms have not been adapted.

> *The building should provide a general framework for education and learning, while, being flexible enough to respond to changing demands*
> (Hertzberger 2008:1)

Fig 3.12 Plan of urban edge condition, diagram,
Author (2016)

3.3 A social paradigm shift

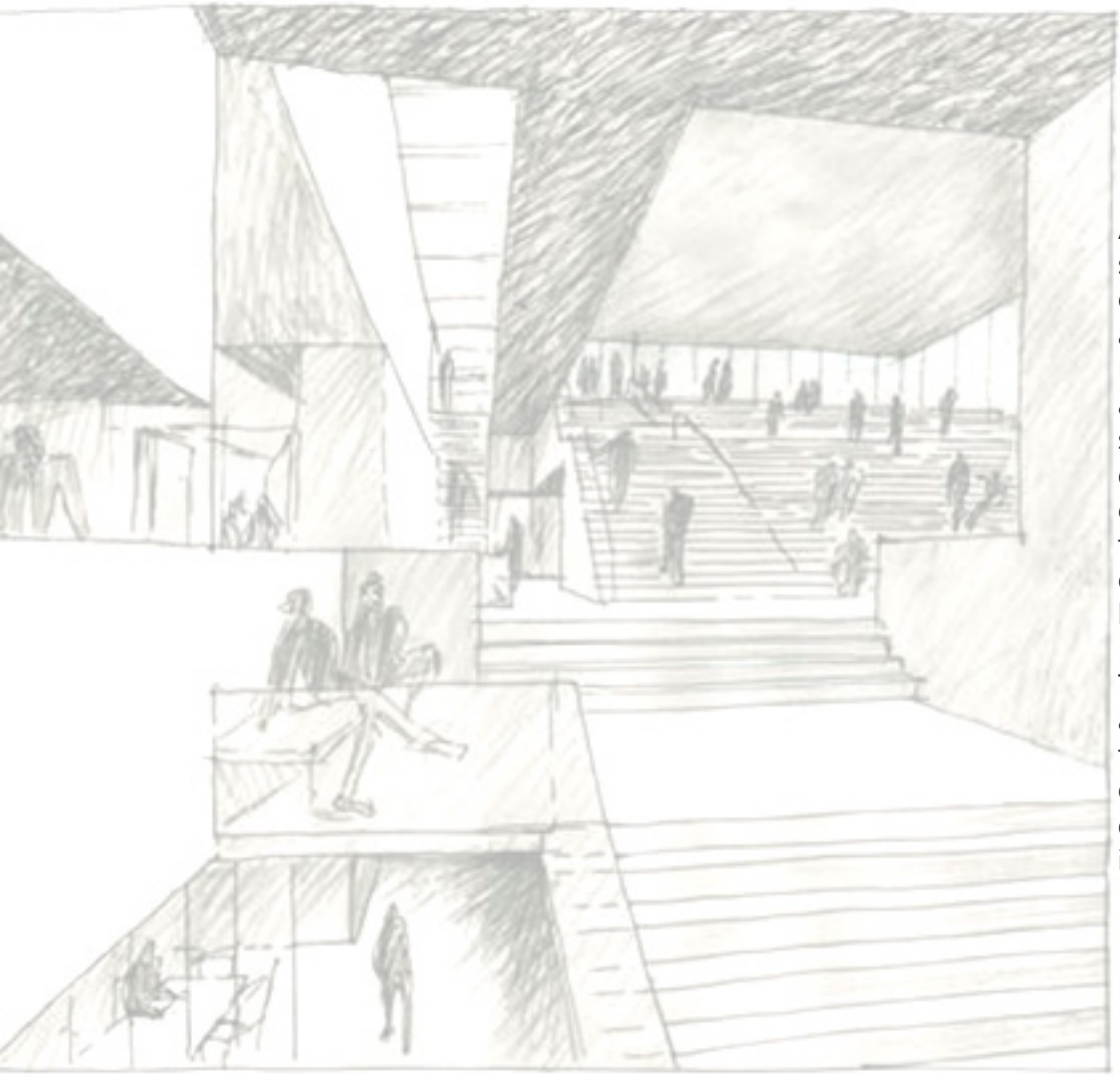


Fig 3.13 A socially interactive environment, sketch, bdp.it (2016)

In the industrial era, schools developed as highly controlled environments to instill the discipline to thrive in a machine age. Now, to prepare pupils for success in a knowledge economy, the evolving typology is more fluidly conceived to provide flexibility, connectivity, and spaces for social and educational encounters (Kuhn 2012).

A *community school/ extended school* approach supports a social paradigm shift which encourages alternative thinking on how schools are organized in order to encourage a new spatial notion which is to encourage social exchange among learners, parents and the community. Theorist such as Herman Hertzberger (2008), Christopher Alexander (1977), support a citizenship approach to education and describe how this can be achieved spatially suggesting that an educational facility is seen as a micro-city. This offers a new dimension to how communal space in educational facilities is viewed: corridors are seen as learning streets, classrooms as the domestic domain and the junction of streets as the central communal square. This allows for an ordered system of social space provoking communal interaction between learners, teachers and the community to occur, forming a network of learning.

Theorists such as Jan Gehl (2010), and Serge Salat (2011) support an ecological approach to the design of the urban environment. The supportive theory helps to identify and explore further what a successful urban environment is made up of. It is essential to understand the components of a successful urban environment as it is suggested that the educational facility acts as a micro-city itself.

Lefebvre's (1987) theory on the production of space is used as an architectural informant as it supports the idea of a *community school* approach. This stems from the idea that participation of the community is an integral part in the production of space . A citizenship education approach directly relates to Levebre's (1987) theory as space is seen as a social construct that is socially produced and shaped by those who live in it.

If the production of space is produced for domination (production for capital) issues begin to arise such as increased fragmentation and disagreement among urban inhabitants which indicates that the space has a limited capacity to be meaningful, inclusive and democratic (Stout 2008:10). Serves to highlight issues in schools as school designs are outdated buildings which are inappropriate for the societies they need to deliver for and support (Mirchandani & Wright 2015:4).

Lefebvre (1987) suggest that space needs to be produced for appropriation which serves human need (Moltch 1993:889) rather than for domination. Thus space values local knowledge and the social dynamics of people becomes critical in shaping that place (Stout 2008:25).
People shape space naturally, socially and simply by how they use it therefore the architecture explores the scale to which individuals and communities begin to inhabit, change and appropriate the building. In order to provide for more democratic and participatory places the space needs to reflect the values and attitudes of the people in all its diversity and differences: this offers the potential for lived and everyday space that produces a stronger cultural and social significance in a place (Stout 2008:31).

> *Architecture, human densities, locational relations are a force in structuring what can be done in space itself. Walls and roads obviously privilege certain kinds of activity and inhabit others, support the projects of one type of actor and deter the goals of others. Beyond such material impediments are the symbols and styles that also influence behavior: elements of grandeur that disempower, monotonous cubes and towers that stultify rewarding forms of sociability. Space contains more than we ordinarily appreciate. A space is thus neither merely a medium nor a list of ingredients, but an interlinkage of geographic form, built environment, symbolic meanings, and routines of life*. (Moltch 1993:889)

3.4 A city in miniature

Fig 3.14 Sketch of a street in Istanbul, Author (2016)

The Community Vocational facility is seen as a micro-city, a social or relational entity in its environment

The educational facility, a micro-city, needs to integrate into its environment forming a space where social exchange occurs, a public space. The educational facility should aim to draw people together and hold them there forming *meeting places* (Gehl 2010:25) or *living rooms* (Hertzberger 2000:135) of the city. Architecturally this can be described as a street or square as these components of the city provide space for social exchange to occur.

The treatment of the facade is also a significant component, Gehl (2010:77) describes the ground floor condition as important determining whether or not the walk is interesting or not. Therefore the complexity, layering and depth of the facade is essential in order to create a comfortable but enticing experience for the community members walking by in order to provide opportunities for social interaction and community engagements to occur.

The precedents are critiqued on the conclusions made in Chapter 2 which suggest that spaces of interaction, the urban conditions and how multifunctional the CVF is, will play a huge role in the success of the project being able to integrate and play a productive role within its environment.

H. Hertzberger

Educational facilities should consist of both streets and squares forming a small city which encourages the greatest amount of social contact between people.
(Hertzberger 2008:123)

C. Alexander

The simple intercourse created when people rub shoulders in public is one of the most essential kinds of social glue in society
(Alexander 1977:489)

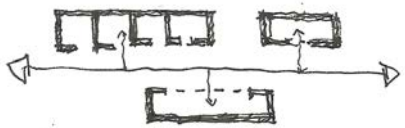
J. Gehl

People come where people are
(Gehl 2010:81)

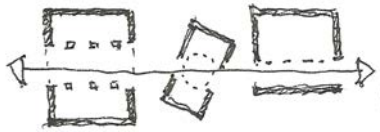
S. Salat

In order for a community to be sustainable it needs to be structured around public spaces where social interaction is intense
(Salat 2011)

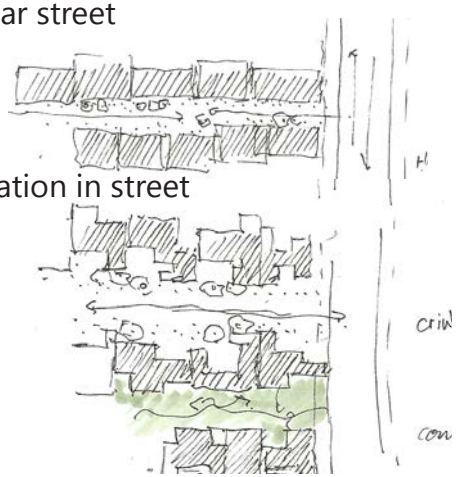
Pass by space



Pass through space

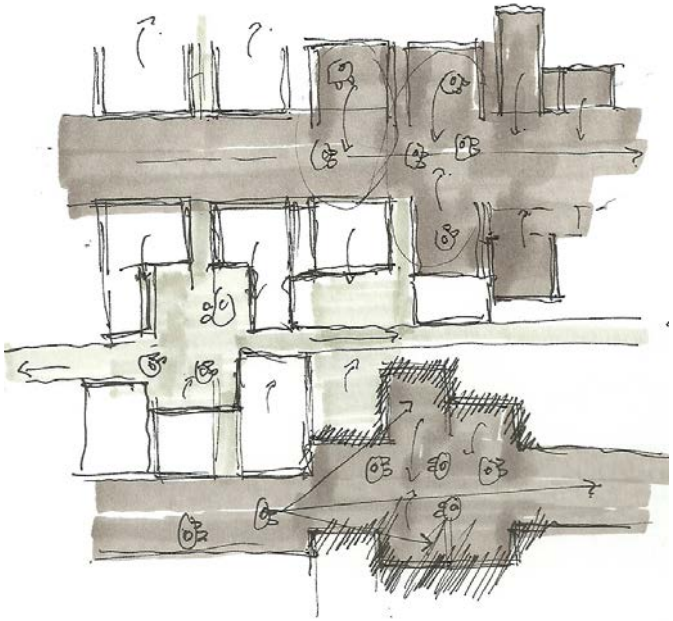


Linear street



Variation in street

The street as a socially cohesive element where the street stiches individual entities together



The street as a socially interactive element where the street becomes an extension of the built environment

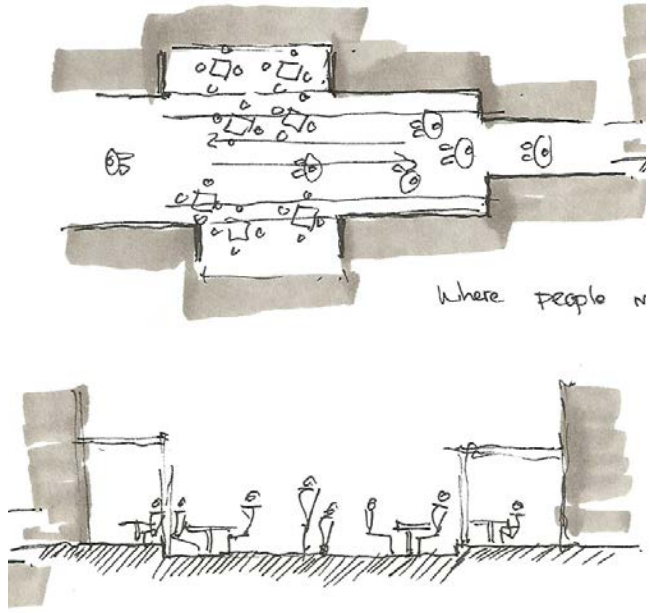
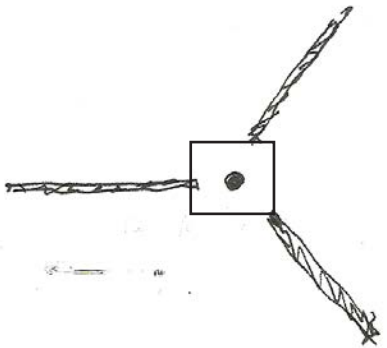
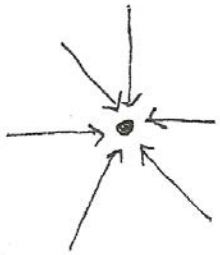


Fig 3.15 Diagrams of street conditions, Author (2016)

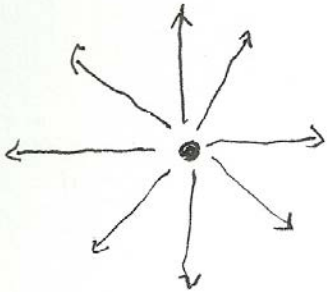
Fig 3.16 Sketch of a square in Istanbul, Author (2016)



A square becomes a node of interlinking paths

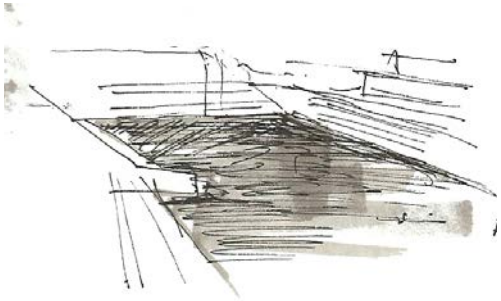


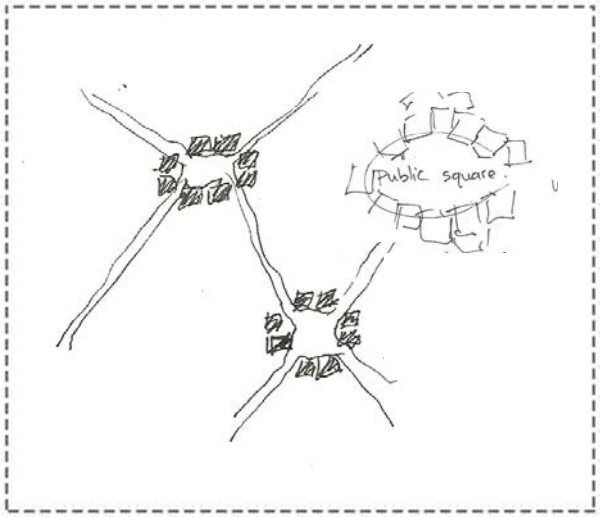
A square becomes the central focus



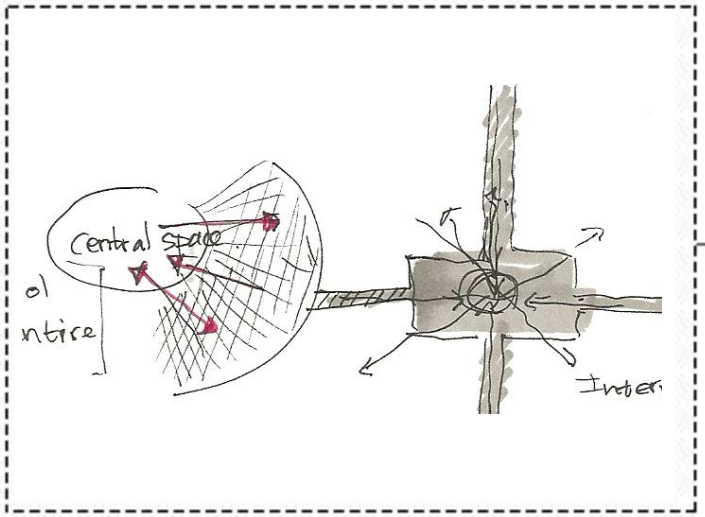
A square becomes a node that radiates out

The negative space is framed by the form, Monte Alban, Mexico



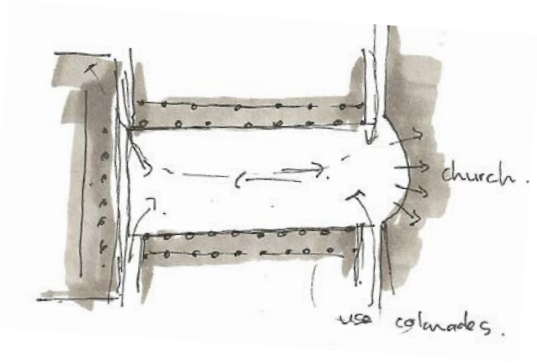


Small clusters of work places, paths and community facilities make up squares



Square is a place that expresses a sence of collectivity. Where streets intersect and therefore pedestrian movement is organized to run through,drawing people together and holding them there.

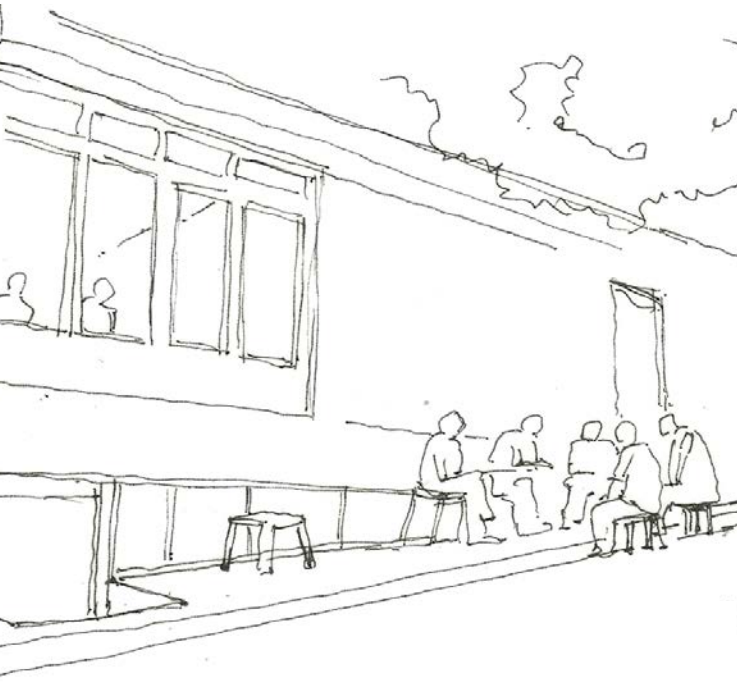
The square is deliberately formed by the buildings, Central piazza, Italy



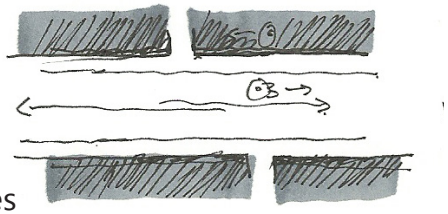
The square is formed from left over space, Castelvittorio, Italy

Fig 3.17 Analysis of public squares, Author (2016)

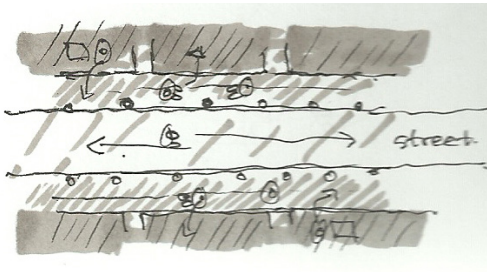
Defining the urban conditions and multifunctionality of space



Edge conditions

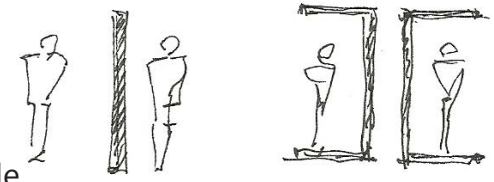


Hard edges

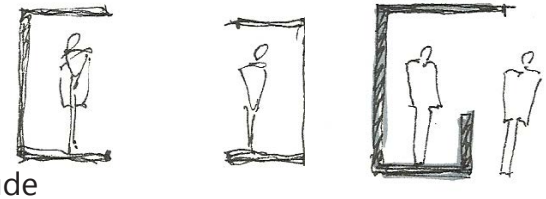


Soft edges

Accessibility

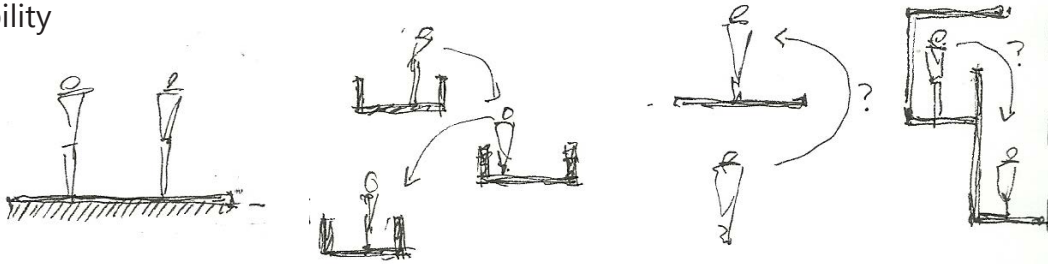


Disclude

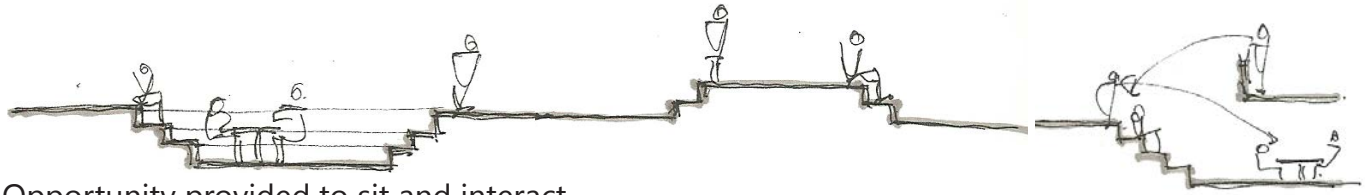


Include

Visual accessibility



Stairs and level changes



Opportunity provided to sit and interact

Fig 3.18 Sketch of an urban condition in Istanbul, Author (2016)

Fig 3.19 Diagrams of urban conditions and multifunctionality, Author (2016)

H. Hertzberger

The main street needs to be spatially visible and accessible to everyone using the space as this is important in promoting social cohesion.
(Hertzberger 2008: 123)

C. Alexander

Decentralized learning approach where classrooms can be ordered around a central space that has a social function
(Alexander 1977:425)

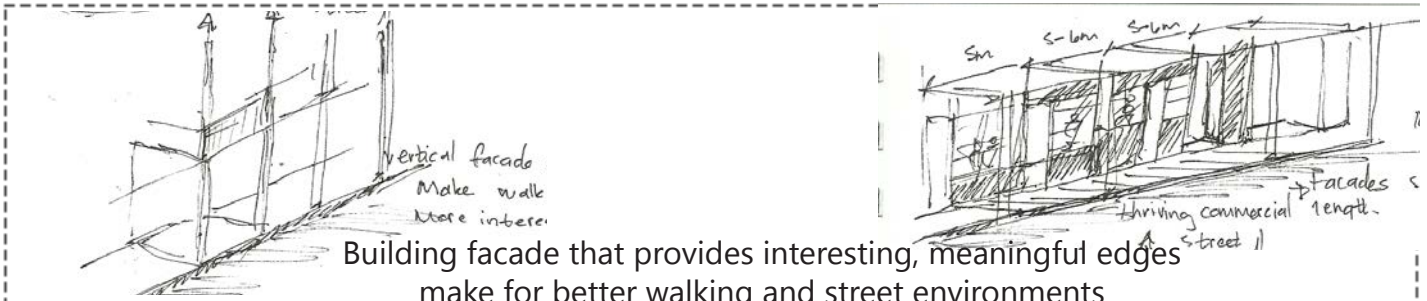
J. Gehl

A good view of people is essential. A good city for meeting is one that offers good opportunitites for seeing, hearing and talking (Gehl 2010:148)

H. Lefebvre

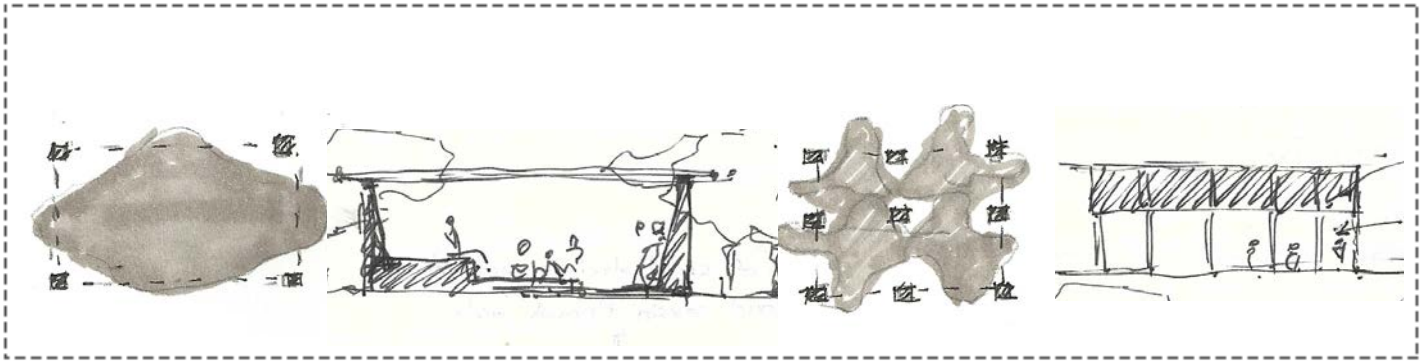
People shape space naturally, socially and simply by how they use it. Space is then produced for appropriation as everyday life produces and transforms our social worlds.
Lefebvre (1987)

Verticality and horizontality



Building facade that provides interesting, meaningful edges make for better walking and street environments

Multifunctionality of space



3.5 Precedents

The following precedents look at alternative ways in which a school can be spatially organised in order to promote citizenship education and interaction among learners and the community.

Project name: Meeste-a-Bophelo Primary School, 2009
Location: Mamelodi East township, Tshwane (Pretoria)
Architect: Humphries Jooste Practice. Architects

Background:

The ArcelorMittal South Africa Foundation has initiated 10 new building projects within underprivileged areas and Meests-a-Bophelo Primary School is one of them. There was an existing school, made of temporary classrooms, on site which needed to remain operational while construction commenced and therefore the work had to be phased. The new school design incorporated the existing community school activities such as the soup kitchen (now a central nutrition centre) and community gardens. The edges of the school consist of 50 % residential zone and 50% commercial high traffic zone. The intent of the design was to reinterpret the traditional school typology of an authoritarian character in order to explore a more social interactive spatial layout to occur (Raman 2011: 13).

Fig 3.20 Meeste-a-Bophelo Primary School, Photograph, constructalia.com (2016)

Supports Architectural intention by:

- Spatial interaction:

The layout of the school indicates that a student-centered educational approach was promoted. At the school's heart one finds a nutrition centre with covered outdoor and indoor seating areas where meals are eaten and the community and learners gather after school hours encouraging a sense of collectivity amongst one another.

The corners of the triangular courtyards are dealt with well as they create small amphitheatre spaces which function as external classrooms.

- Urban condition:

The computer room and library are positioned near the entrance of the school which suggests an active edge condition between the community and school facilities.

All areas of the school are observable which highlights the consideration to safety as well as a social consideration. By being able to view others and the many activities taking place the spaces become less isolated as people are able to interact with one another more easily (Hertzberger 2008:126).

- Multifunctional and generational learning:

Fresh vegetables can be grown for the children as around thirty ladies from the local community have been trained to manage the vegetable gardens.

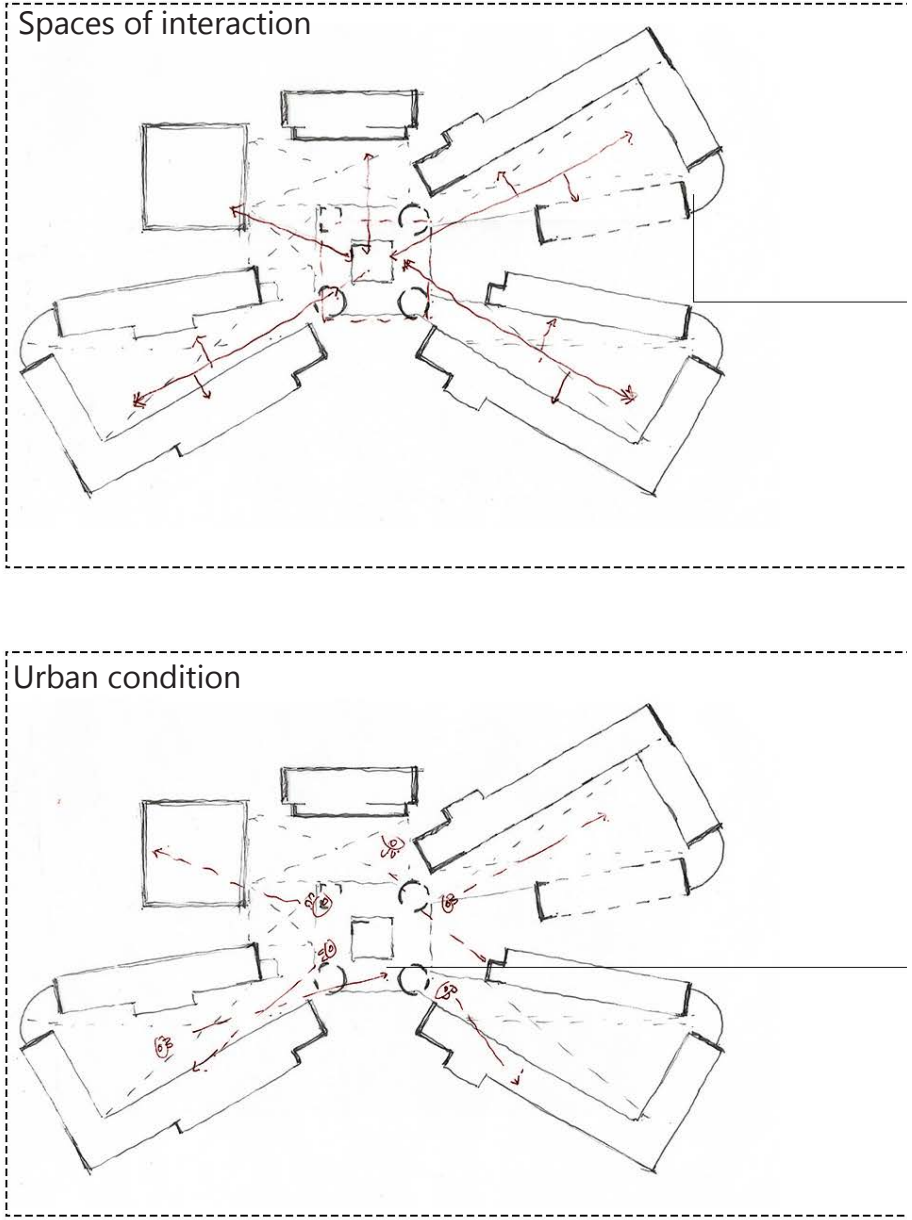


Fig 3.21 Meeste-a-Bophelo Primary School analysis, Diagram, Author (2016)

Critique:

- Spatial Interaction:

The interaction between the students and teachers is limited as the teachers have separate administration offices instilling an unnecessary hierarchy. Rooms that can be accessed and used by pupils encourages a learning environment (Hertzberger 2008:150).

- Urban condition:

The edge conditions and urban relationship of the school are not addressed successfully with the result that the school is fenced off from the community.

The parking area is situated in front of the entrance separating the site from the street edge.

The school design spatially suggests an introverted approach rather than
extroverted approach as the spaces are shut off from the surrounding community and results in the fact that the school design does not contribute to the existing urban fabric of the community.

More seating space is needed in the courtyards in order to encourage interaction between learners of different ages or race who might never socialize. This form of citizenship education is a training ground forsociety as is reflects the complex social patterns of the world (Hertzberger 2008: 117).

Fig 3.22 Meeste-a-Bophelo Primary School analysis, Photograph, P. Wolmarans (2016)

Project name: Usasazo Secondary School 2004
Location: Khayelitsha, Cape Town, Western Cape
Architect: Noero Wolff Architects

Background:

In an area where all of the surrounding buildings are constructed by the people themselves, the project realizes the critical role that schools play in promoting permanent, durable public infrastructure in order to form a good quality environment. The spatial layout of the school shows an understanding and respect for the spatial character of the informal settlement as the main circulation space mimics the street conditions in Khayelitsha.

Fig 3.23 Usasazo Secondary School, Photograph, Noero Architects (2016)

Supports architectural intention:

- Spatial interaction:

The main circulation space is given an undulating character which defines the in-between space successfully. The street is sheltered by trees and sitting space is provided along the street where learners can gather. The street varies in size as one moves along it mimicking the character of the street in the informal settlement.

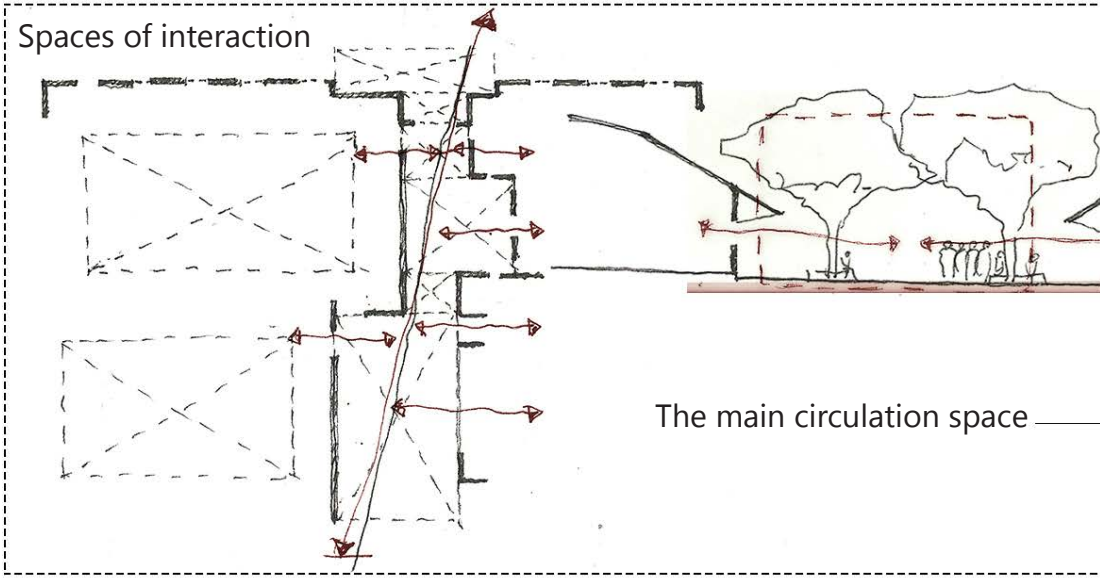
The spatial layout of the school suggests that the main circulation space connects the individual entities forming a communal public space where the learners and community can interact with one another.

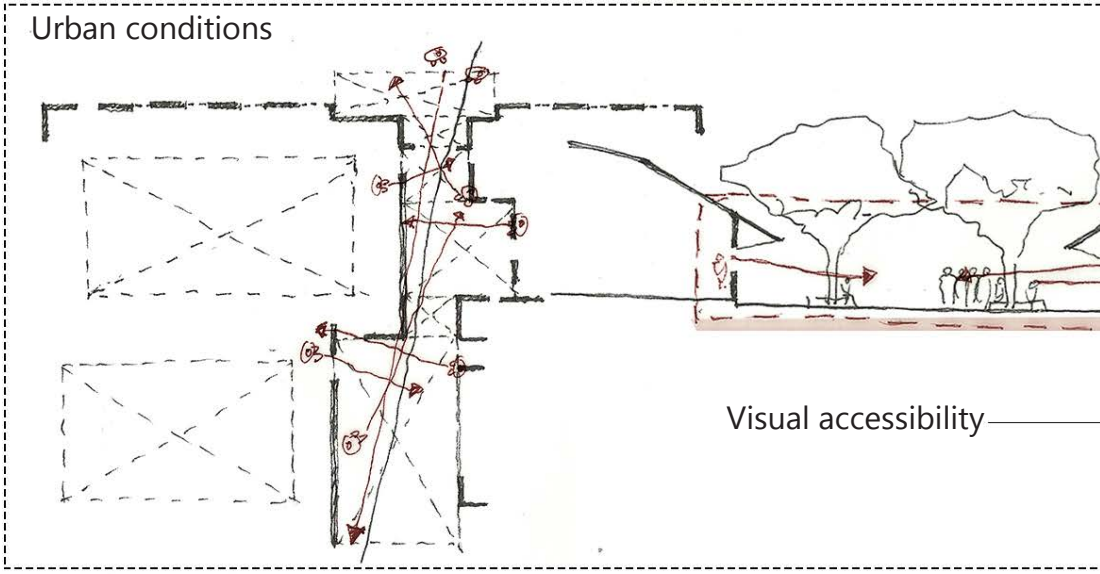
- Urban condition:

The main circulation space is visually accessible from the classrooms allowing the public space to become more appealing and inviting to the users.

Communal sports fields and a productive agricultural area take up the remaining land becoming a soft edge condition towards the residential side of the site.

The roves allow for variation in scale as they successfully define a human scale along the main circulation space while filtering light in from higher roves.





Critique

- Urban Condition:

The street edge condition of the entrepreneurial training facility does not speak of the same interactive language on elevation as it does on plan. If the shutters of the training facility are closed the students using the training facility are not visually accessible, thus creating an isolated space.

- Multi functional and generational learning:

The entrepreneurial training facilities are also used as classrooms. The class-rooms however cannot be adapted in order to create larger or smaller rooms if needed for entrepreneurial training.

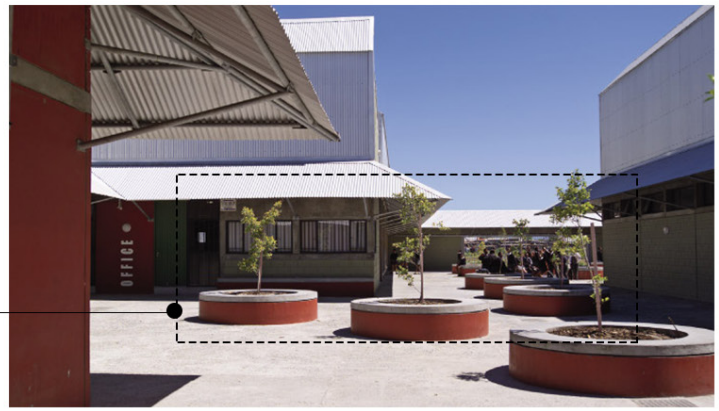


Fig 3.24 Usasazo Secondary School Analysis, Photograph, Noero Architects (2016)

Project name: Service Centre and Pay Point
Location: Khayelitsha. Cape Town, Western Cape
Architect: Piet Louw Architects

Background:

The service centre which are modest in form rise above the mixture of formal and informal houses in Khayelitsha. The centre is clustered with existing community facilities, forming places of civic significance. The entrance to the building forms a portico which is used as a gathering and recreational space. The service centre includes offices for local councillor's and courtyard areas for public interaction.

Provision made for sheltered gathering spaces

Fig 3.25-27 Service centre and pay points, Photograph, Piet Louw Architects (2012)

Robust and layered entrance

Supports architectural intention:

- Spatial interaction:

The robust form allows for interaction and social engagement to occur by making provision for gathering spaces which are sheltered, with steps to sit on and a courtyard.

The service centre is raised from ground floor which defines space but does not isolate it from its urban context.

The architect is able to design spaces for appropriation which takes into consideration the social dynamics of people in space. The spaces are used freely by the community, specifically the robust forms at the entrance which people sit on and sell things from.

- Multifunctional spaces:

The centre incorporated and includes existing community facilities which forms places of civic significance.

The robust but minimalist form allows for flexible and adaptable spaces.

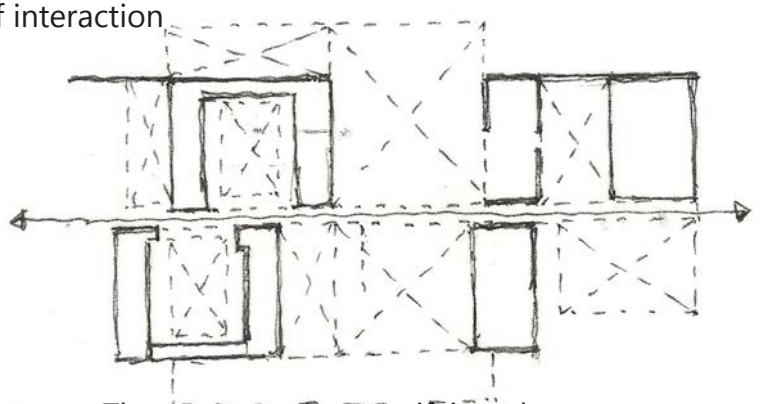
Project name: Urban Park and integrated complex of Primary and Secondary School and Public facilities- Romania School, 2010
Location: Palermo IT, Rome
Architects: Herman Hertzberger, Marco Scarpinato, Dickens can der Werff

Background:

The project is located in a new urban centre highlighting the important role it plays in introducing a space that incorporates a communal area with facilities for the community. Two entrances on opposite ends of the site frame two communal gathering spaces, which are intended for recreation and socializing, and is divided by a central connecting street. A park, teaching garden and sports and recreation facilities surround the school. The facility becomes an integrated space with areas dedicated to both socializing and learning.

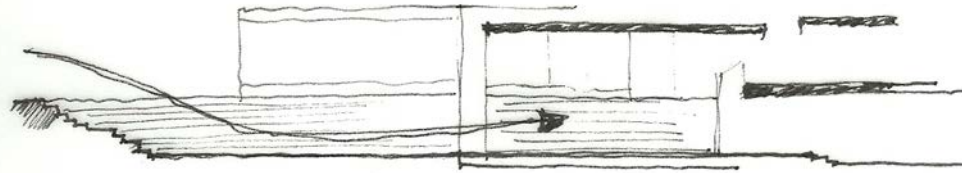
Fig 3.28 Urban Park, Photograph, architectural-review.com (2012)

Spaces of interaction



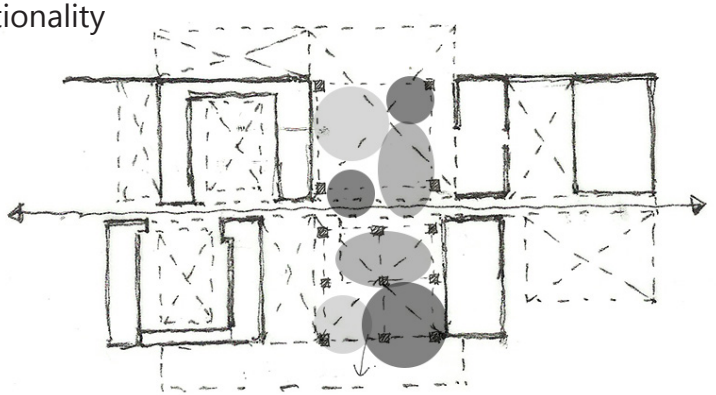
The street acts as a unifying element

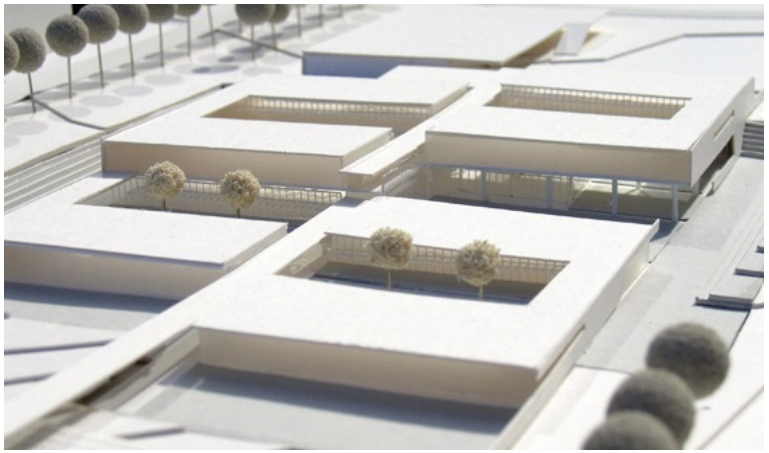
Urban conditions

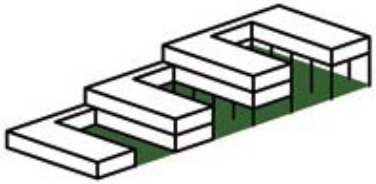


The level changes and stairs are used as a social element where people can sit and gather

Multifunctionality







Supports architectural intention:

- Spatial interaction:

The project is an example of Hertzberger's (2008) extended school theory which allows for a socio-cultural exploration of educational facilities.

A connecting street acts as the main artery of the school that leads to and from a public gathering space while joining the classroom units. The street acts as a socially unifying element within the space.

The school is successfully seen as an interactive public space within the community

- Urban Conditions:

The site sinks into the ground, accessed by steps which can be used as seating. The steps frame the central square. The level differentiation between the site and urban context helps define the school perimeter yet does not separate the school from the public space that surrounds it.

Stairs, seating, ramps and courtyards allow for a range of gathering spaces for the learners and community.

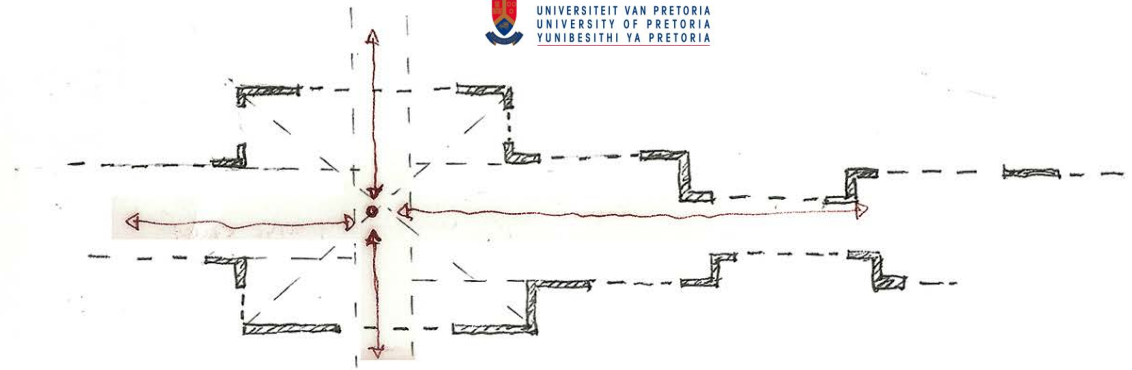
- Multi functional and generational learning:

Community facilities are integrated with learning spaces by lifting the built form off the ground floor, allowing the ground floor to be opened up. This allows the public space to become adaptable and versatile.

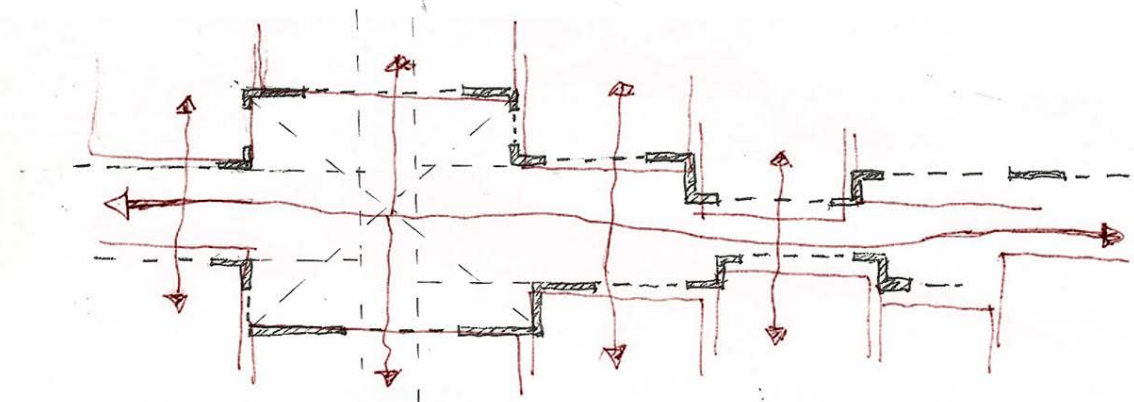
The school facilities link with the central communal gathering space promoting shared facilities as well as cross discipline multifunctional activities.

Fig 3.29 Urban Park analysis, Photograph, architectural-review.com (2012)

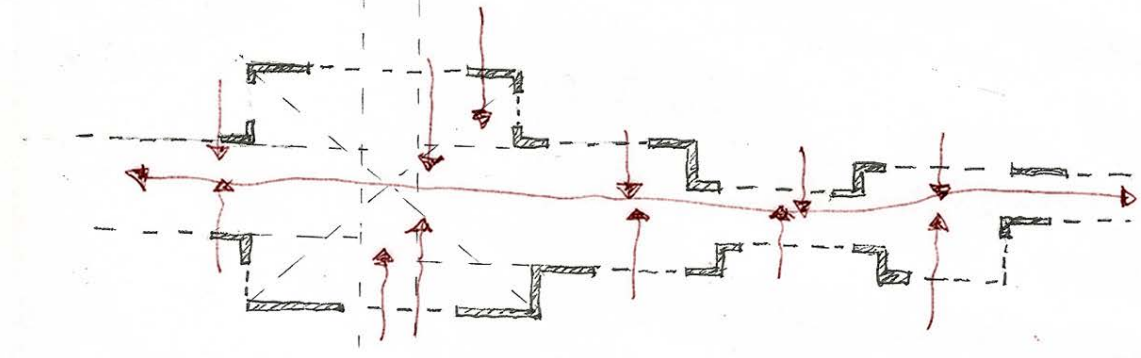
Spaces of interaction



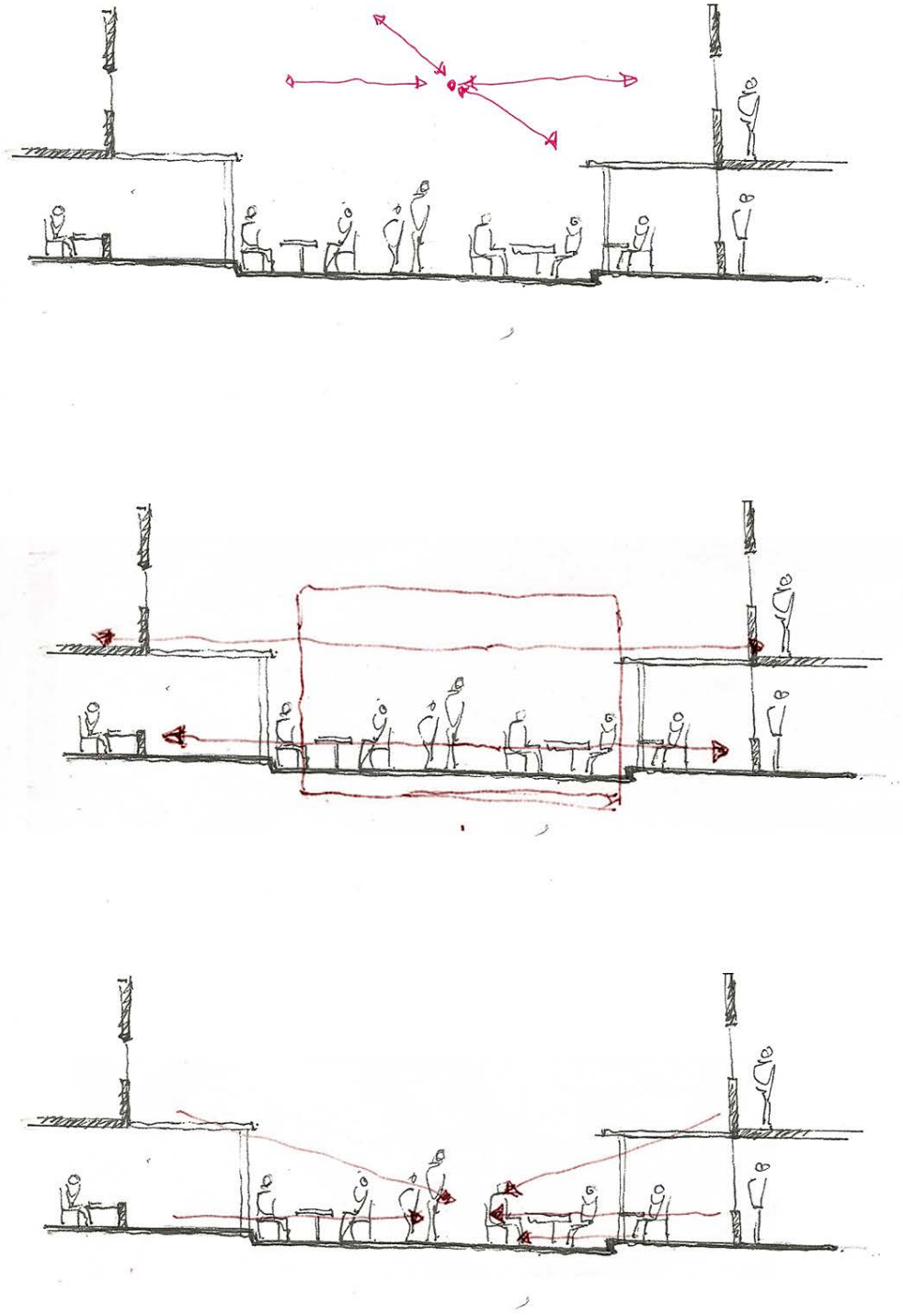
A public square becomes a node from which streets interlink



A street is used to connect and stitch individual entities together in order to create socially cohesive spaces that encourage social exchange to occur



The built forms frame the public street and square becoming an extension of the interior spaces



3.6 Architectural Conclusion

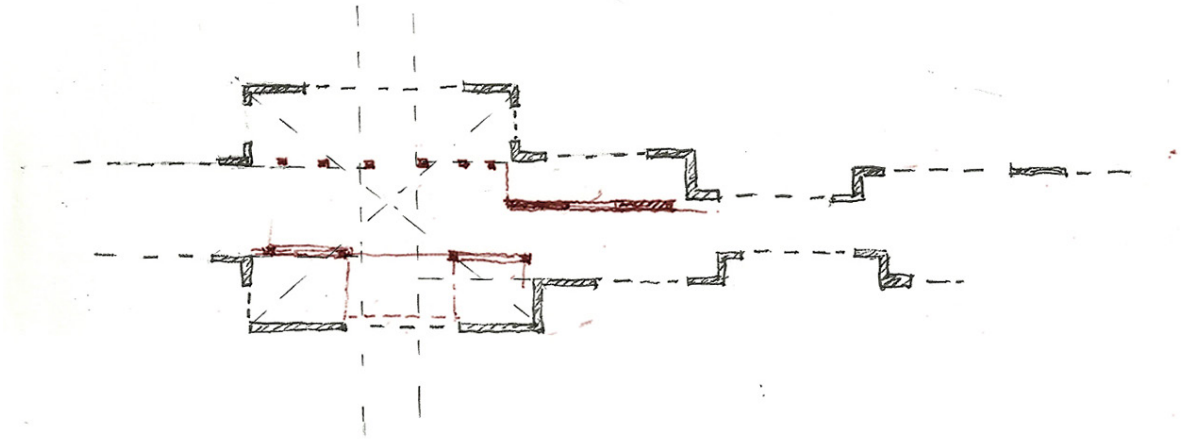
This dissertation supports a citizenship approach to education. This is achieved spatially by interpreting the CVF as a micro-city that integrates into its environment. In support of the theory and precedents considered above, the conclusion of the spatial potential is as follows:

Spaces of interaction: The spatial intent of the dissertation promotes an active and participatory environment by introducing elements that provoke communal interaction, thus social cohesion could begin to form between people. This is in response to identifying that educational facilities are isolated entities in their environment. The diagram's below, that conclude on the theory and precedents discussed previously in the Chapter, interpret the principles used going forward when defining spaces of interaction spatially. Hertzberger (2008) suggests that public communal gathering spaces (public square) express a sense of collectivity where streets that intersect squares can be used to draw people together. A street is seen as a symbol of social cohesion as they can be used to connect entities together while forming public spaces where social interaction can take place.

Urban conditions: The urban condition promotes the idea of boundless education (Hertzberger 2008) in order for the CVF to become undividable and integrated within the community. Diagrams that can be seen in Figure 3.31spatially achieve this by incorporating soft and permeable edge conditions, allowing spaces to be visually accessible to everyone using the space which is important in promoting social cohesion.

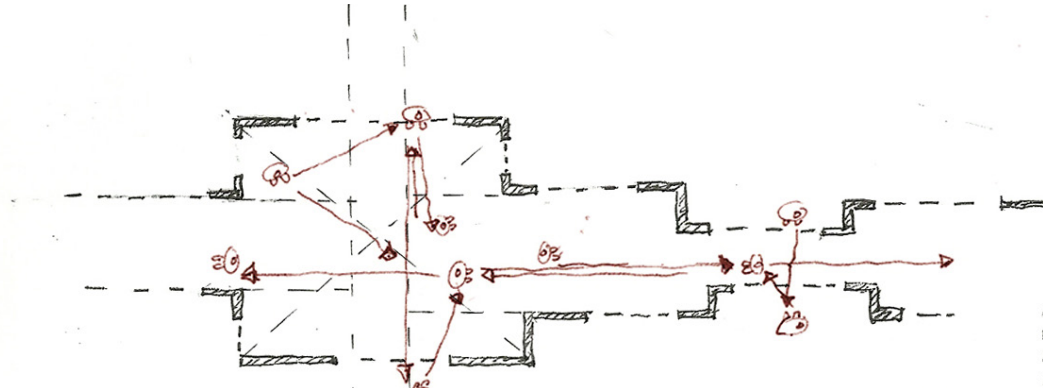
Multifunctionality: According to policy on citizenship education discussed previously in the dissertation, educational facilities need to become the centre of community life incorporating spaces that can adapt for multifunctional activities. The CVF can then possibly become a vital hub in the community. The diagrams indicate how this can be achieved spatially by incorporating vertical and linear elements that define space yet do not restrict the layout.

Fig 3.30 Spaces of interaction conclusion, Diagrams, Author (2016)



The facade conditions are layered offering thresholds that allow for various forms of gathering to take place

Urban conditions



Permeable edges that provide visual accessibility for those using the space is needed.

Soft edge conditions such as stairs and level changes help define space yet does not alienate space from its surroundings.

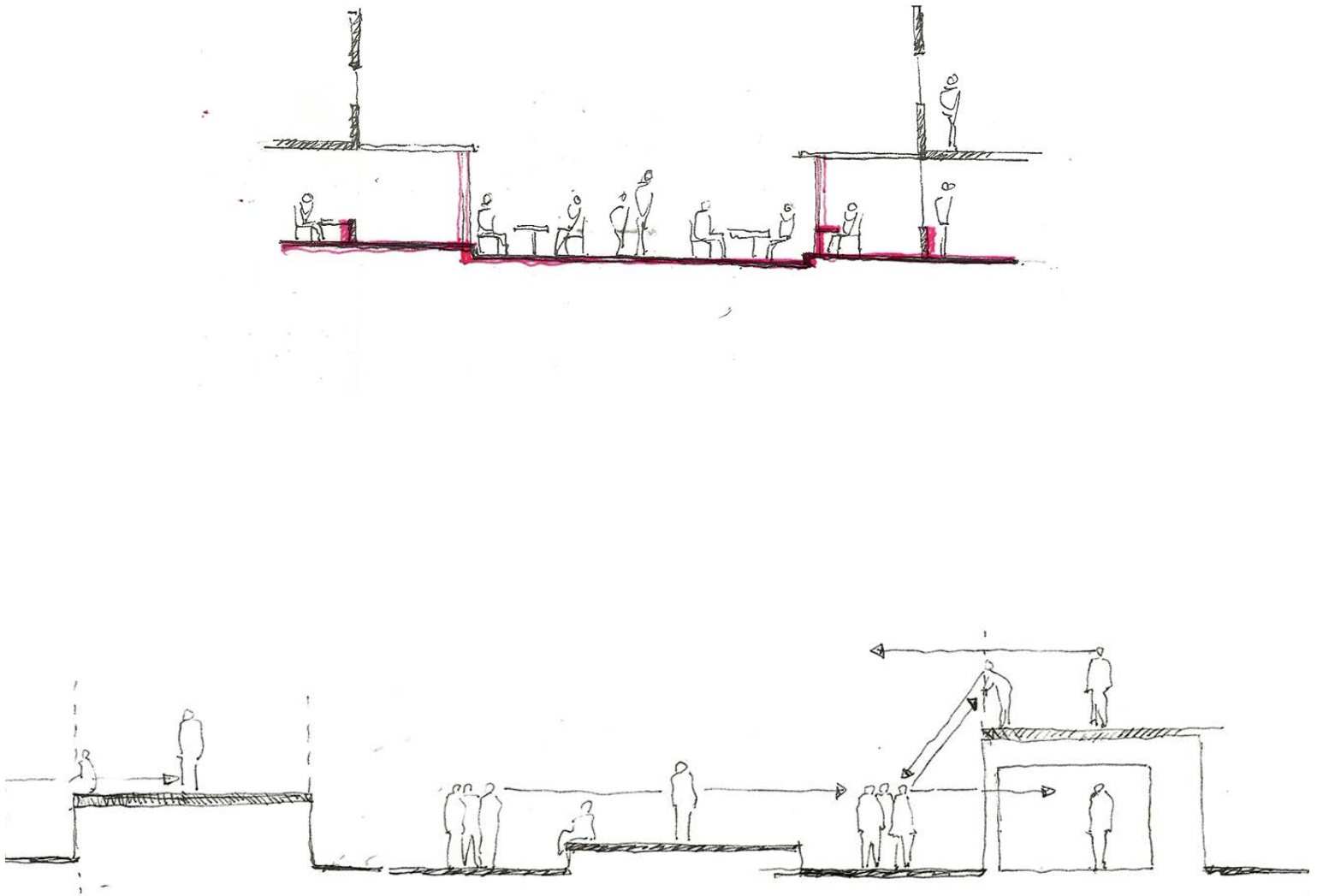
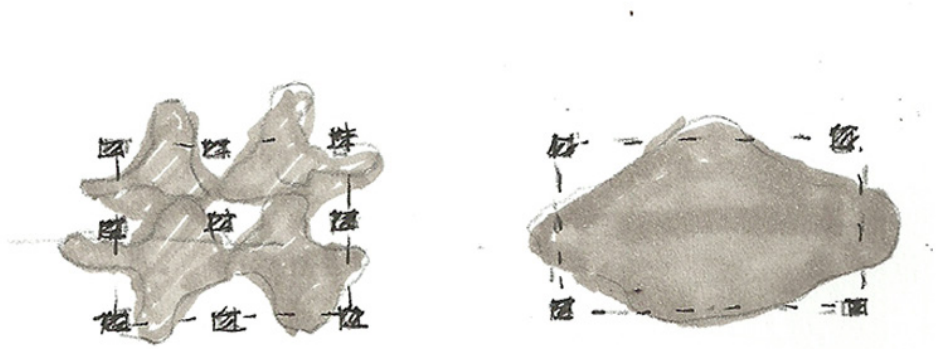
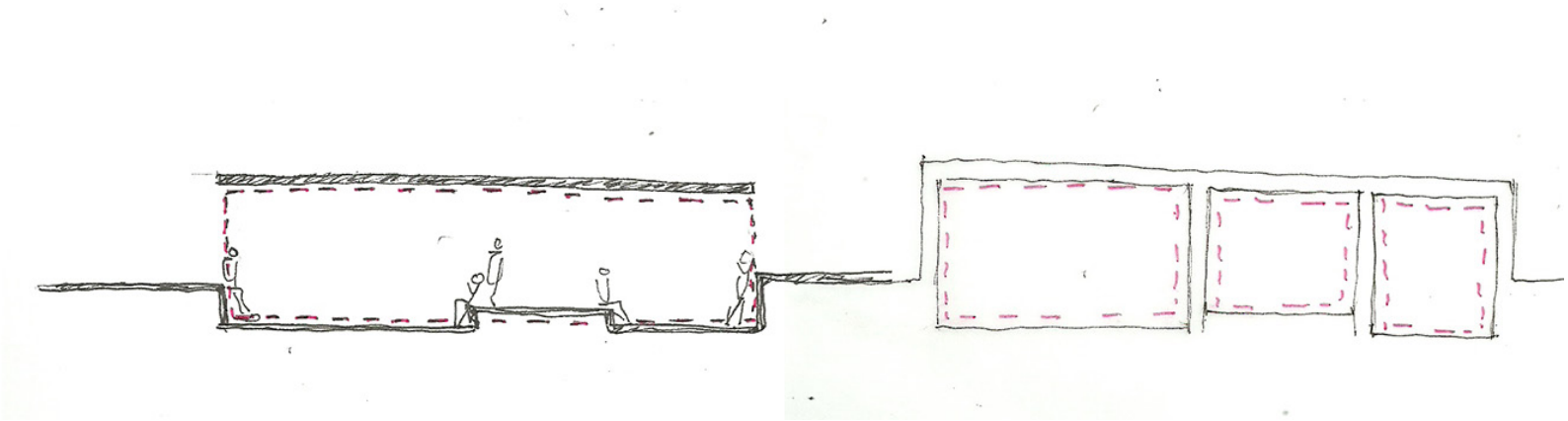


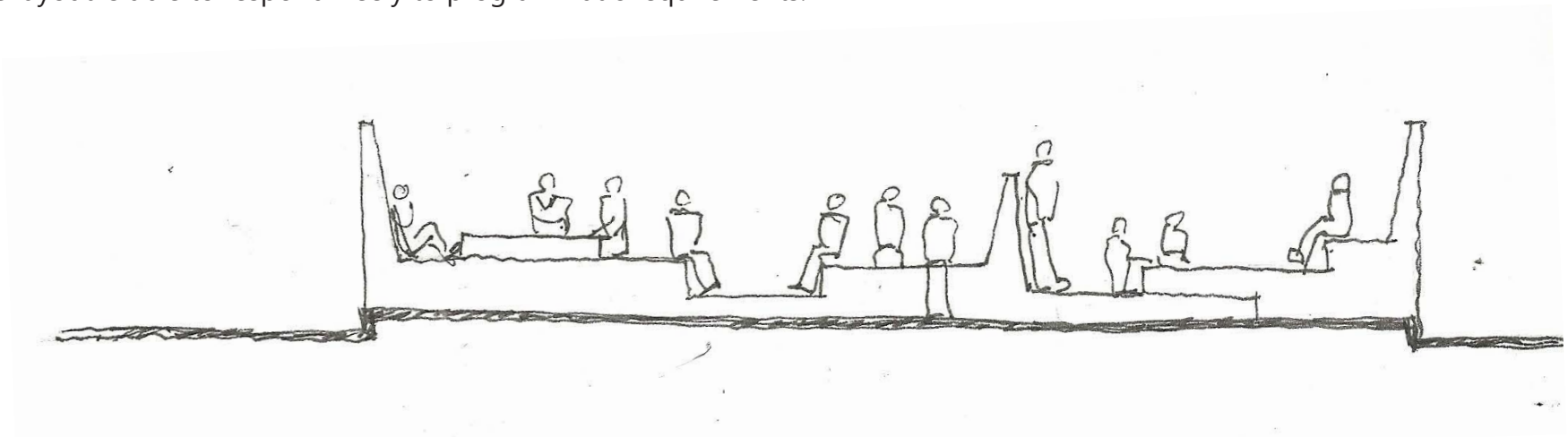
Fig 3.31 Urban conditions conclusion, Diagrams, Author (2016)

Multifunctionality





Vertical linear elements create spaces than can be defined and adapted for various uses by the user.
The layout is able to respond freely to programmatic requirements.



Robust forms that allow for the space to be consumed and interpreted differently by the user should be considered.

Fig 3.32 Multifunctionality conclusion, Diagrams, Author (2016)

Fig 4.0 Site of conciliation, Urban Vision, Author (2016)

4 Site Introduction

4.1 Pretoria East

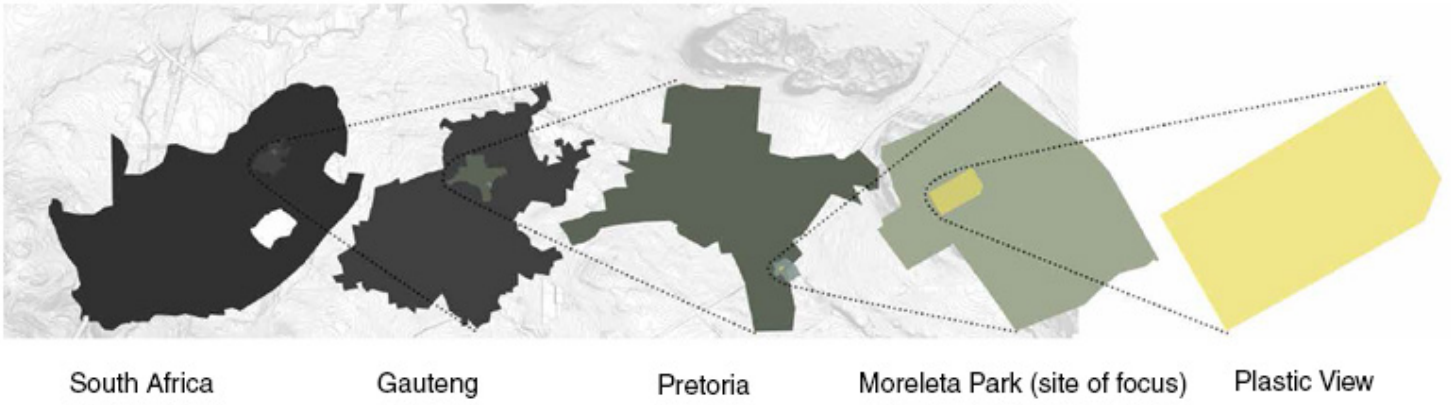


Fig 4.1 Site location, Urban Vision, (UP Arch Hons 2016)

Pretoria East, home to Plastic View

Over the past fifteen years commercial and residential development and investment in the City of Tshwane has shifted eastward (Peres 2013:5). Due to this shift in development, there was a need for affordable medium density housing for middle income markets and a market for high-income earners arose as well. The gated estate typology has been a dominant response in this area and can be characterized by large, physically cut-off and privately managed and serviced landholdings. These gated communities are serviced by car-dominated roads which are poorly serviced by public transport. Privately owned malls, schools and hospitals dominate the landscape leading to no or very little council led investment in amenities, infrastructure or public spaces (Peres 2013:5).

Pockets of left over land which consist of neglected municipal grounds, servitudes and natural areas becomes evident in a landscape surrounded by these gated communities. Peres (2013:5) suggests that there has been development of at least 10 informal settlements which are developing in these left over spaces. Woodlane Village, an informal settlement more commonly known as Plastic View, emerged on one of these islands of left over space (Turok, Hunter, Robinson, Swilling, & van Ryneveld 2011).

Fig 4.2 Aerial view of Plastic View, (UP Arch Hons 2016)

Fig 4.4 Plastic view 2008, Whitaker (2016)

Fig 4.4 Plastic view 2009, Whitaker (2016)

An island of left over space, The history of Plastic View

As far back as 2002 there is evidence that a community had begun living on a vacant piece of land alongside a small stream which runs through Pretoria East, known as the Moreleta Spruit. This community was constantly at risk of being evicted by the local police forces and the municipality, a pressure which was heightened by the surrounding land property value market and gated estates (Dredge 2014:14-17).
Colin and Denise Dredge, the Founding Members of Tswelopele Step by Step, a local NPO, wrote an article titled *A journey between two worlds* (2013), in which they describe the journey that they undertook with this community in order to offer support and resources to the community.

> *They had no shelters and slept simply rolled up in whatever rags, plastic or pieces of old carpeting they could find. Their only source of water for bathing, laundry and drinking came from the Spruit. There were no toilets and the trees and bushes in the area served as a screen for them to bathe, dress and use as a toilet. They did their cooking on open wood fires using any old empty tins, such as coffee tins, for their pots. Pieces of wood or sticks served as spoons to stir their food. Plates were nonexistent and everyone simply had to dip in with their hands when they ate* (Dredge 2013:2).

Tswelopele was registered with the vision to:

- Care for and empower disadvantaged and destitute individuals and communities with the purpose of enabling them to be involved in their own development.
- *Develop projects and programmes which promote responsibility, dignity and skills whereby Individuals and Communities will be developed and uplifted* (Dredge 2014).

They set out to achieve this by:

- Deeply investing themselves in the community in order to develop programmes suitable to their needs.

These programmes were continuously adapted and changed as the community developed and grew with the hopes of one day achieving independence and integration into mainstream society (Dredge 2014).

This community was however at risk of being evicted by local authorities and suffered continuous harassment by the local home owners who *linked criminal activity to the informal settlement, and suggests that the overcrowding and unsightly unhealthy living conditions are reasons for their property investments declining* (Peres 2013 ; Roux 2012).

In 2009 the residents association from the surrounding area took the local municipality to court in order to obtain a court order to remove the homeless community from the land which is owned by the municipality. Tswelopele were asked to assist in re-organizing all groups living on the land into a fenced off area below the Moreleta park Congregation's boundary fence (Dredge 2013:17). This informal settlement was then acknowledged as Woodlane Village but more commonly known as Plastic View.

In March 2015 the Municipality threatened to sell the vacant land for development at a public auction. Lawyers for Human Rights were contacted by Tswelopele who initiated a court case against the government in order to stop the sale of the land that Plastic View was founded on (De Lange 2015). Together the Lawyers for Human Rights and residents of Plastic View won the court case and halted the sale of land that they were currently occupying (Mudzuli 2015). The Tshwane Muncipality however still does not recognize this community in terms of service provision and access to amenities, which is in direct contradiction to the principles laid out in the Bill of Rights (SA 1996: Chapter 2).

While many residents in Moreleta Park are opposed to the settlement (People opposed to Plastic View and Cemetery view facebook group, n.d) , the community of Plastic View continue to receive support and resources form a number of Non- Profit Organizations based in Moreleta Park and the surrounds. Tswelopele found that an increasing number of churches in Pretoria East were interested in supporting and assisting the community of Plastic View. The Tshwane East Advancing Communities Holistically (TEACH) Forum was established which is a Forum of churches and organizations who support and include Plastic View as a part of the Pretoria East community (Dredge 2013:24).

The Moreleta Park Congregation located above Plastic View play a vital role in the support and development of the community. The Pure Hope foundation, a programme which was started in 2011, provides an education and feeding scheme in support of the underprivileged children of Plastic View. The educational facilities include a pre-primary school and primary school up until Grade 4, with the intention of adding on a grade every year (UP Arch(MProf) 2016).

A programme has also been introduced that provides skills and development training to the community of Plastic View. Discussions are held with the community leaders of Plastic View in helping identify what skills training programmes are needed to help develop the community. These programmes include sewing classes, a training programme for domestic workers and training programme for teachers (UP Arch(MProf) 2016). The Foundation supports a similar vision to that of Tswelopele and encourage and support the integration of the community of Plastic View into mainstream society.

As a result of the above, one can see that Plastic View exists on an island of left over space in amongst the larger urban fabric in which it is found, thus becoming a site of contestation which is indicated by the rising tensions between the Moreleta park residents, the municipality and the community of Plastic View.

Fig 4.5 TEACH Forum, diagram, Author (2016)

Privately owned housing estates

Woodlands Boulevard mall

Neglected Munciple ground

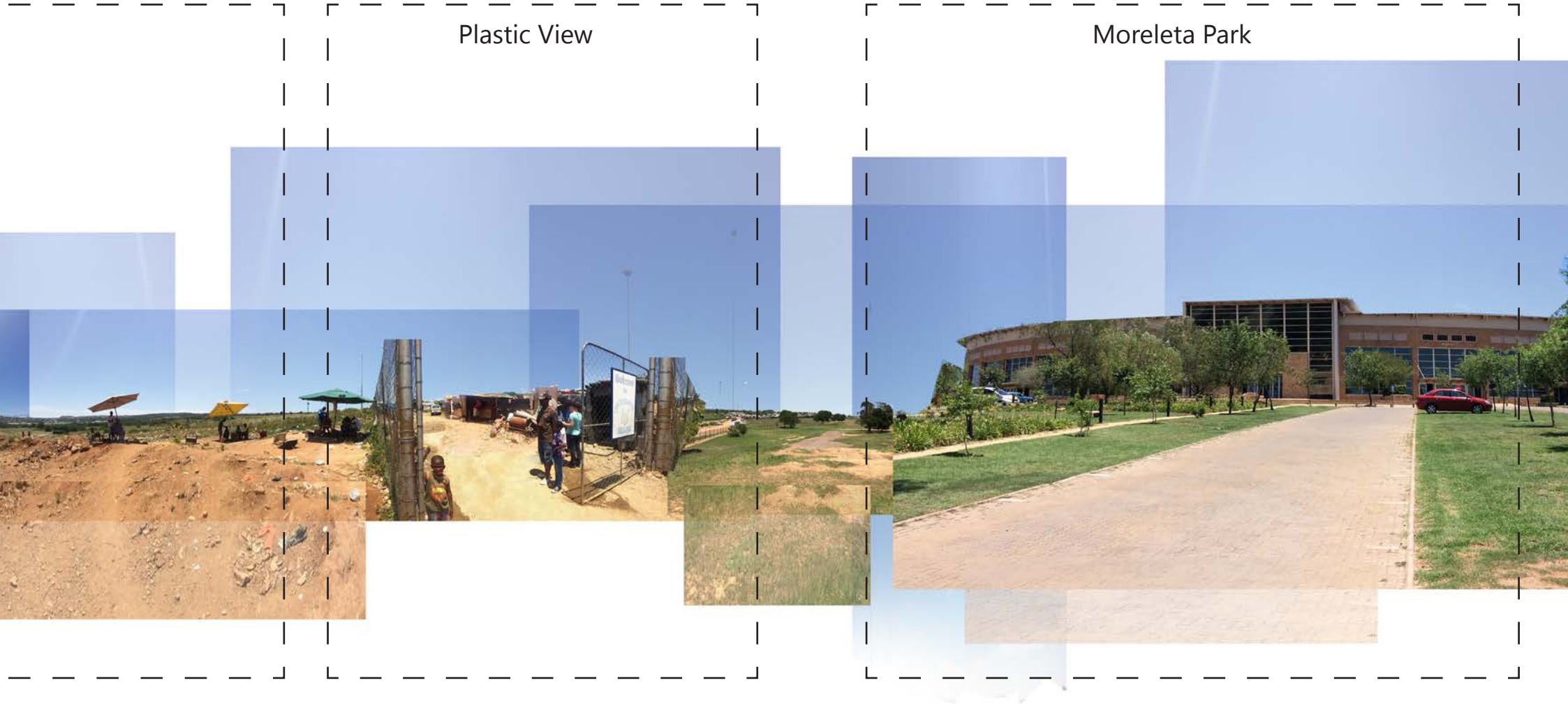


Fig 4.6 Collage of site and surrounds, Whitaker (2016)

Fig 4.7 Images of Plastic View, Photographs, Author (2016)

4.2 Research and theory

Quantitative and qualitative research was conducted by the University of Pretoria's Department of Architecture UP Arch(Hons) and UP Arch (MProf) research groups. Desktop research consisted of mapping the surrounds, analysing proposed frameworks for the site as well as considering the Tshwane Vision 2055 for the area (Tshwane). Field research consisted of a number of site visits including transect walks, informal interviews and site observation. This was done in order to:

- Understand the immediate and future influences of the current urban conditions on site.
- To establish an understanding of the local culture and existing networks in Moreleta Park, specifically Plastic View and the immediate surrounds.
- Analyse and understand the spatial arrangements of Plastic View from which conclusions can be drawn, respected and supported architecturally.

Research and theory into the history of urban patterns was undertaken by the UP Arch (MProf) in order to understand how this has informed the current urban settlement patterns which are present in our urban context.

The Democratic Constitutional Law of South Africa, specifically the Bill of Rights in Chapter two of the constitution (SA1996: Chapter 2), and the Breaking New Ground Policy (BNG) (Trusler 2009) which was put into place by the South African government in response to apartheid urban planning is discussed further. Both the constitution and policy recognize that South Africa is made up of fragmented and complex urban environments, and therefore the policies were set out to achieve more cohesive, multi cultural, sustainable communities which support the eradication of spatial inequality and the right of equal access to basic amenities such as food, health and education.

Despite the promising principles put forward by the South African government in these policies, the spatial implementation of these principles into South African society is not yet evident (Tissington 2010). Further the lack of implementation of these policies is intensified by the increasing number of informal settlements which are forming around areas of opportunity. For example, more specific to site location, development of the Menlyn and its surrounds have had effects on the surrounding area as at least 10 informal settlements are developing on open pieces of land in the area (Peres 2013:5).

Future proposals such as further growth of the Menlyn economic centre, the new K54 main road, which is proposed to border the land on which Plastic View is founded and becomes the extension to the Gautrain which is proposed to run through Pretoria East to Mamelodi, highlights that the island of left over space that Plastic View occupies is a significant area of urbanization and significant area of research for future development of Pretoria.

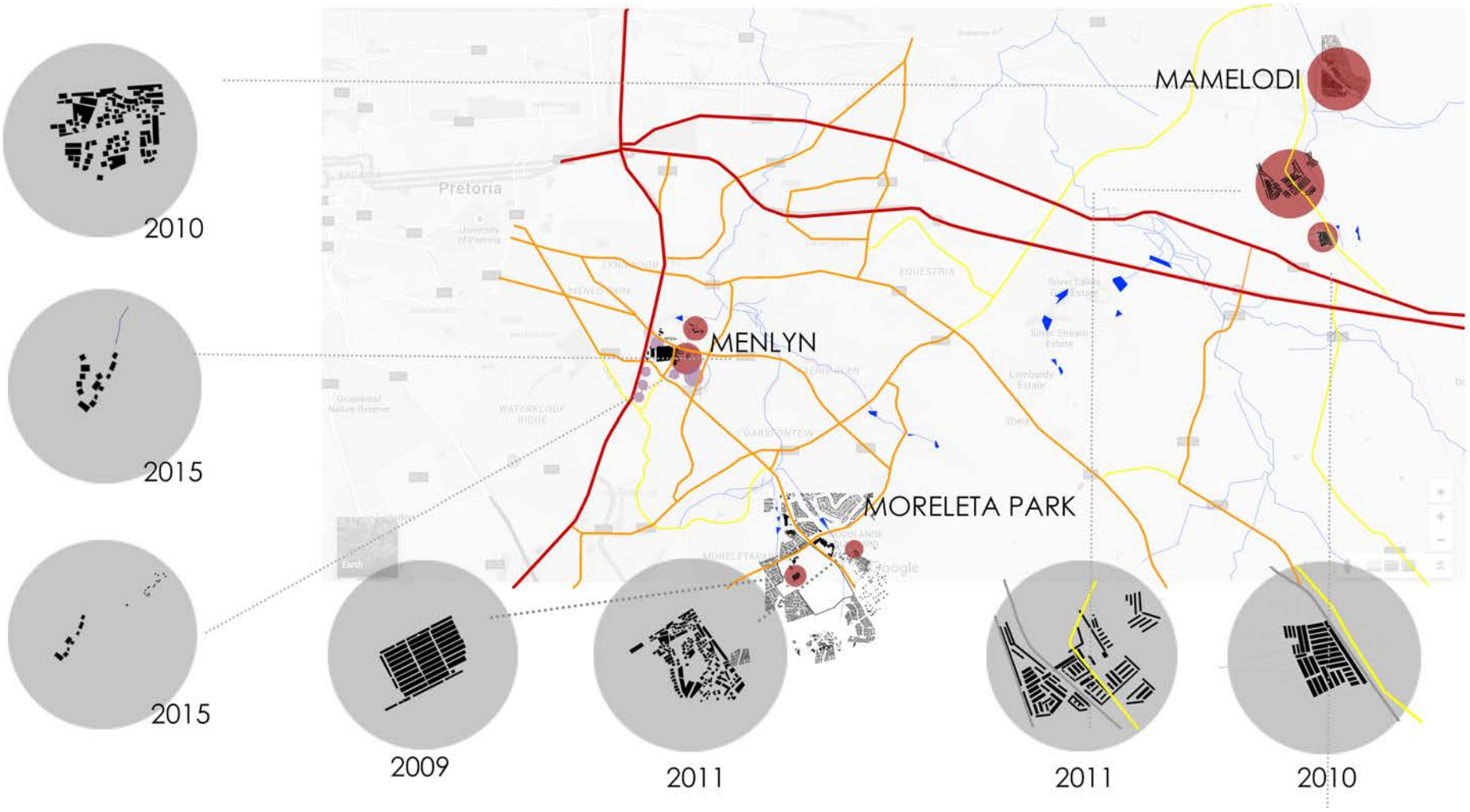


Fig 4.8 Current urban settlement patterns, Mclagan (2016)

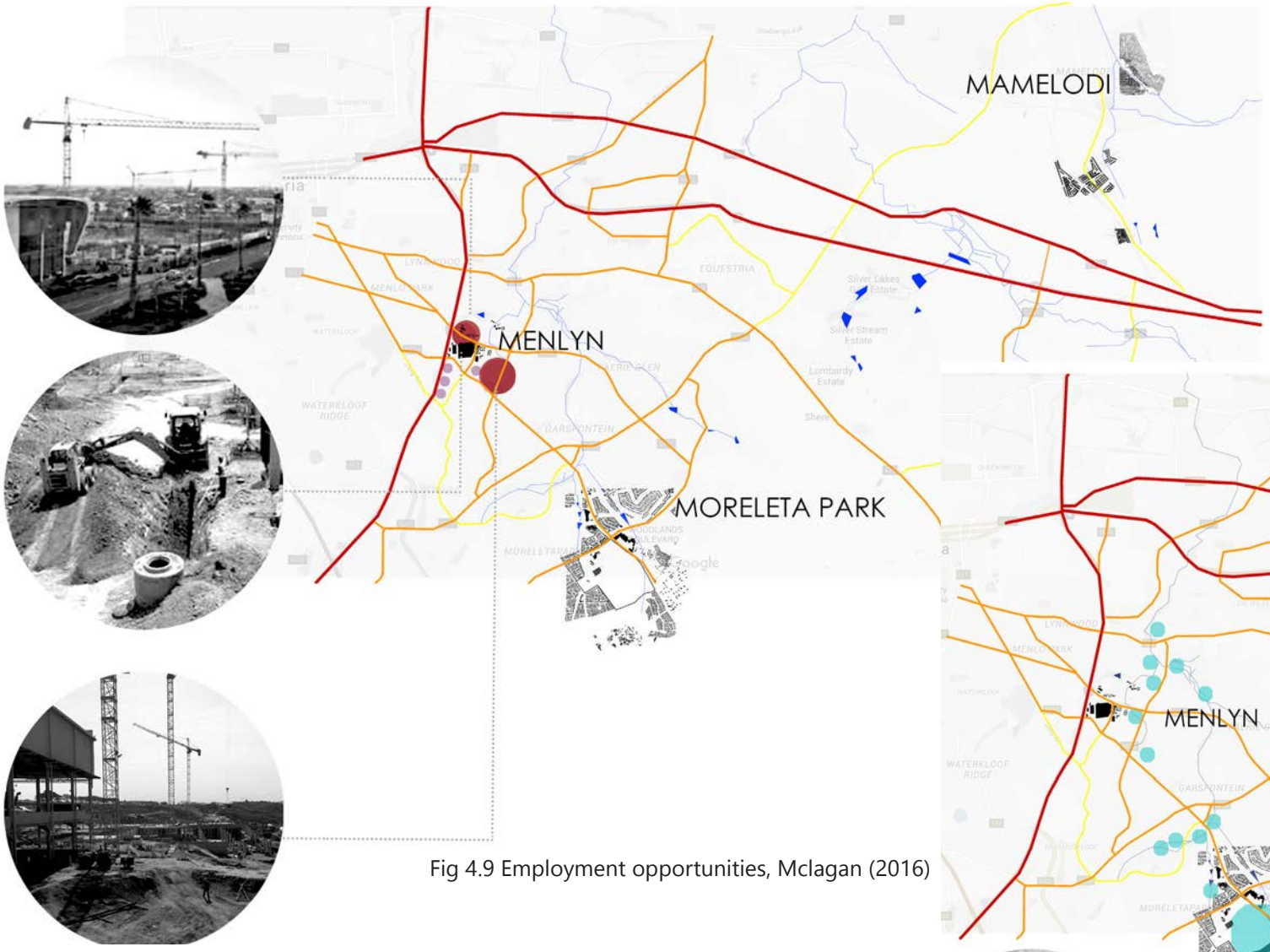


Fig 4.9 Employment opportunities, Mclagan (2016)

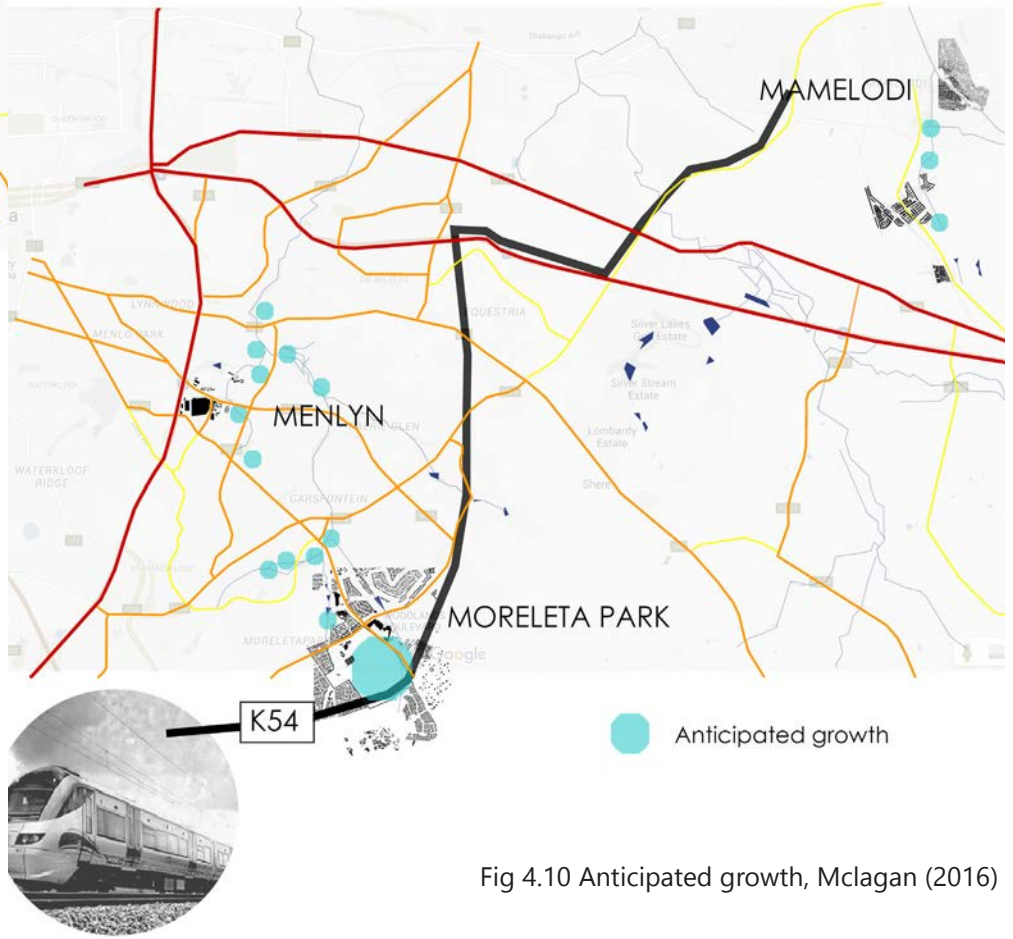


Fig 4.10 Anticipated growth, Mclagan (2016)

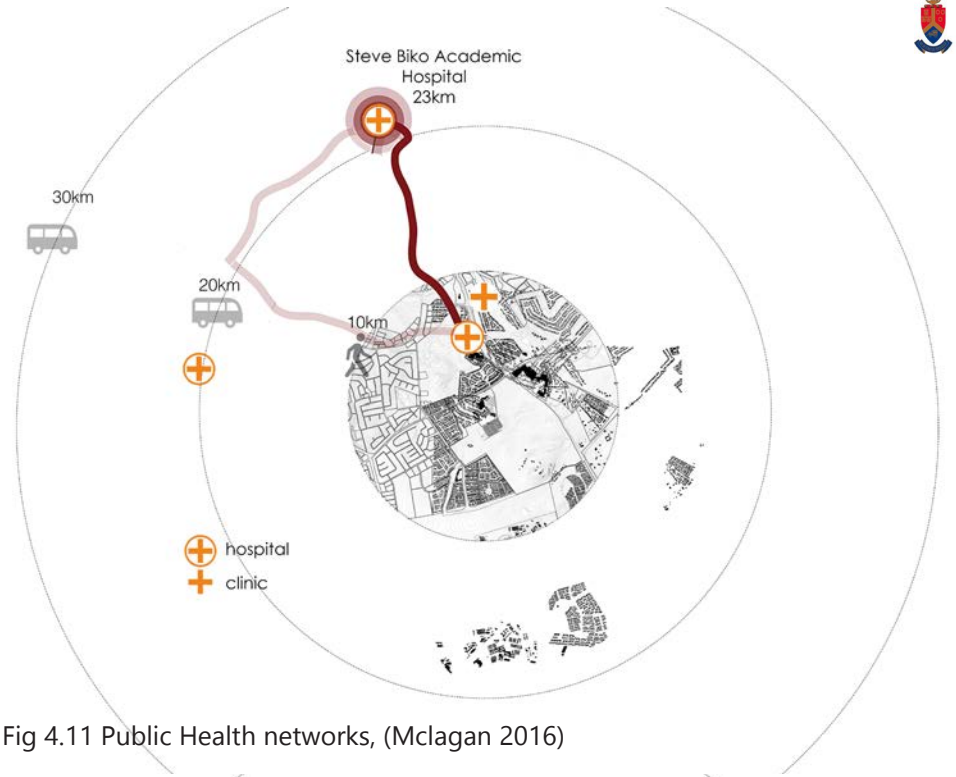


Fig 4.11 Public Health networks, (Mclagan 2016)

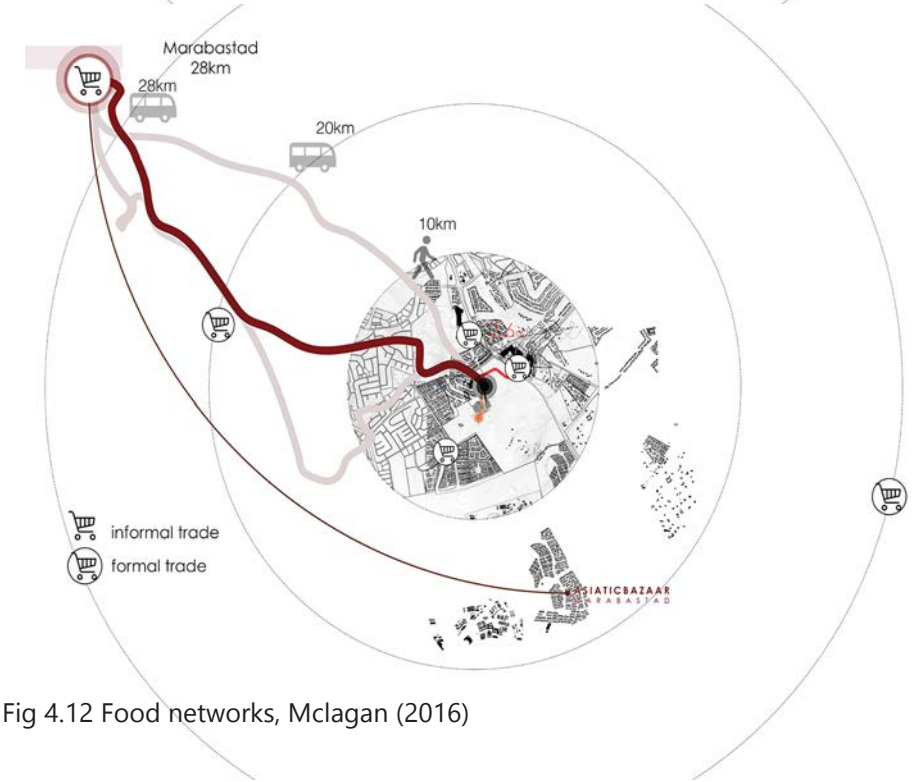


Fig 4.12 Food networks, Mclagan (2016)

Access to Basic amenities in Moreleta Park

In support of the principles promoted in the Bill of Rights (SA 1996: Chapter 2) and the Breaking New Ground Policy (Trusler 2009), one of the mapping exercises conducted in alliance with the UP BArch (Hons) research group also working on the site, included the mapping of basic amenities situated around the site.

In order to achieve this mapping, the research was divided into a number of sub focus research topics, namely; infrastructure, economic nodes, environmental mapping, cultural asset base, social capital, density, the financial profile of the surrounding areas and food sovereignty. This mapping involved both a macro scale of the context around Plastic View and a micro scale which looked at Plastic View itself.

The research considered both the public and private sectors of service provision to the area and concludes that education, health and food is easily accessed within the private sector. However, accessibility to amenities in the public sector is limited. Informal interviews conducted by the UP Arch (MProf) students with that community members of Plastic View identified that the access to basic amenities in Moreleta Park is of concern as some of the nearest public amenities are more than 20 km away, contributing to the divide and inequalities present in the area. The unequal access to basic amenities have limited the interaction between people of different race, cultures and classes thus restricting the creation of networks to form as a basis for social and economic activities (Landman & Schonteich 2002:81).

The spatial disadvantages which affect those who live in Plastic View become a tangible experience of inequality in their day to day lives, *undermining the sense of social inclusion and equity prevents any chances of building a commonly-held consensus that society is fair* (Philip, Tsedu, Zwane 2014:35).

4.3 Urban issues and intent

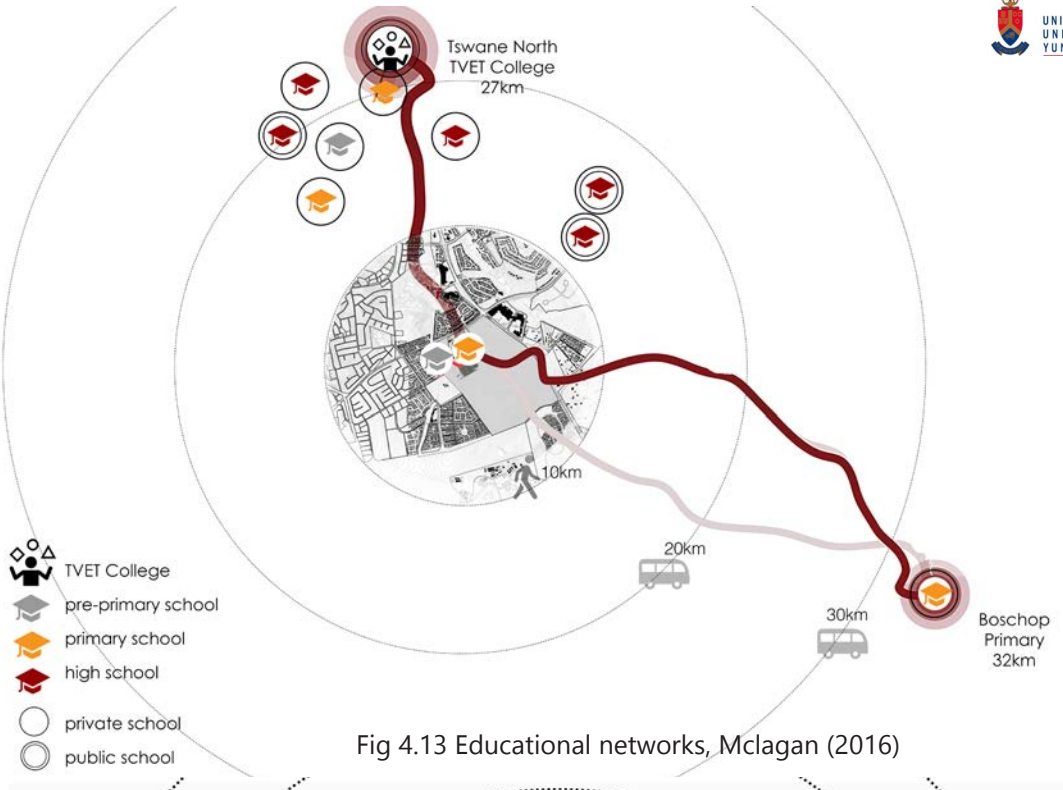


Fig 4.13 Educational networks, Mclagan (2016)

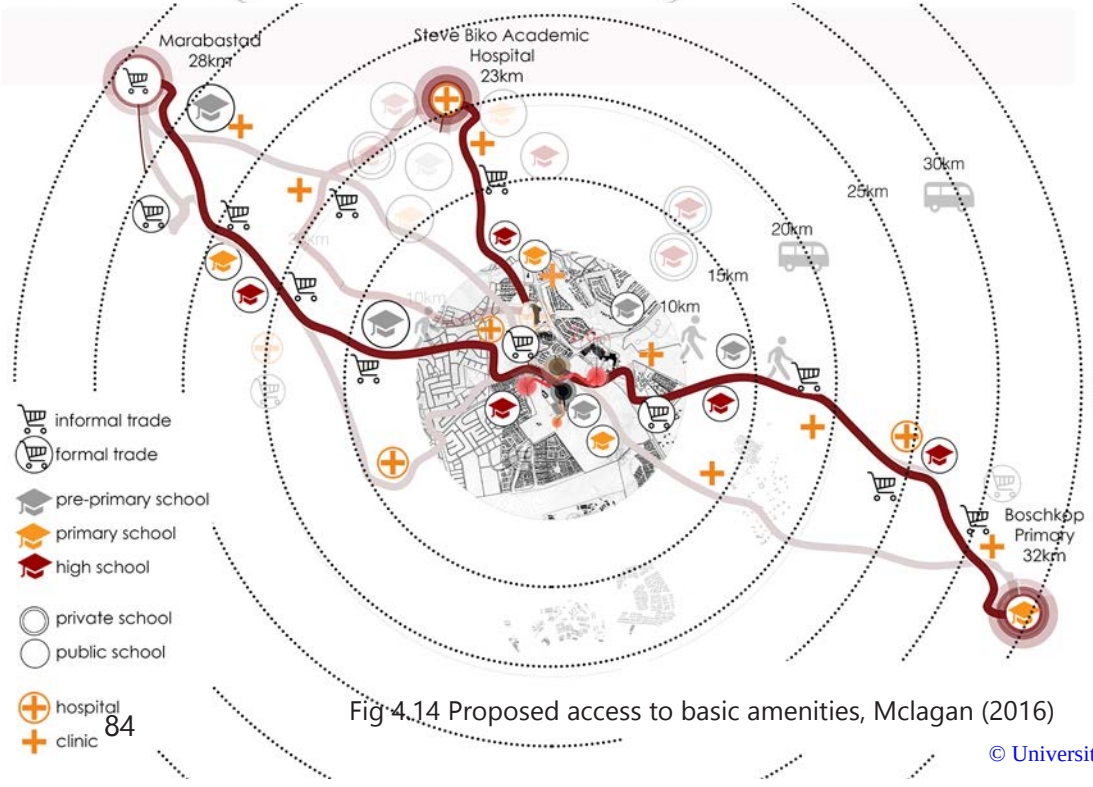


Fig 4.14 Proposed access to basic amenities, Mclagan (2016)

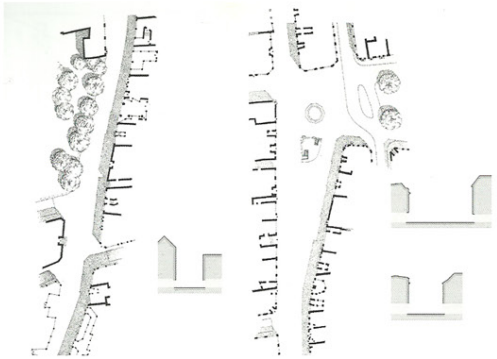
The research conducted by the UP Department of Architecture (UP Arch (MProf) 2016) research group working on the site of Plastic View concludes that the principles put forward by the bill of rights and Breaking New Ground Policy have not been implemented in Plastic View.

The research concludes that the island of left over space that Plastic View is situated on is a site of contestation amongst a socially corrosive and spatially fragmented and segregated urban fabric. The fragmented urban fabric has restricted the creation of service provision networks to form and limits the interaction between people of different race, cultures and classes leading to inequality of access to opportunities for those less privileged.

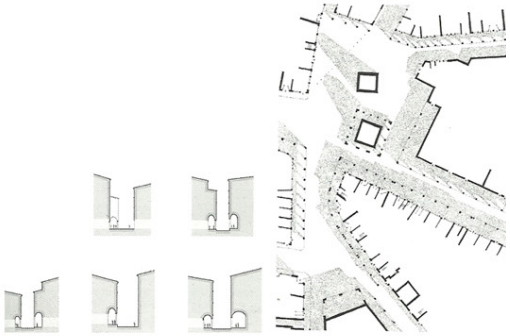
The urban intention of the UP Arch MProf (2016) research group working in Plastic View proposes an urban vision which spatially translates policies such as Breaking New Ground while supporting active networks such as the Pure Hope Foundation programme located at the Moreleta Park Congregation. It is suggested that by stitching the fragmented urban networks, the gap between the private and public sector service provision could be reduced within the Moreleta Park area. This would encourage a more socially cohesive and spatially integrated society to form, leading to improved access to opportunities.

In this way, Plastic View which is currently a site of contestation could become a site of conciliation.

1. Street layouts a

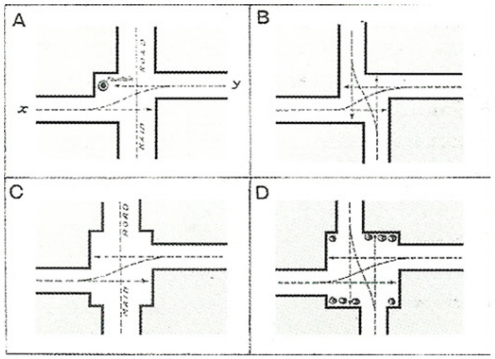


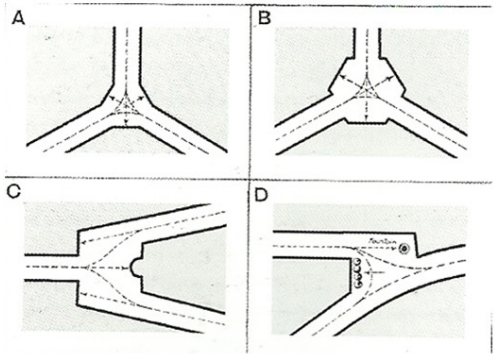
2. Street layouts b



3. Proposed street intersections a

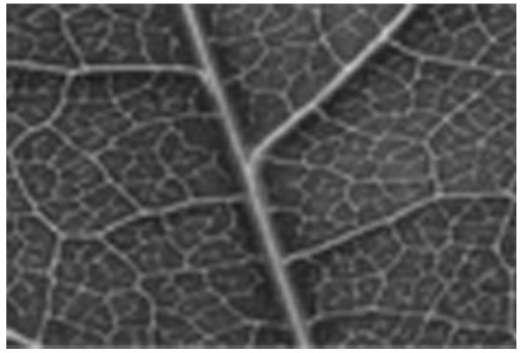
3. Proposed street intersections b





5. Resilient urban fabric taking the structure of a leaf

6. Urban layout aims to connect all networks



4.4 Urban vision and framework

In order to translate this urban intention into an urban vision (which improves the spatial implementation of principles put forward by the current governmental policies), the UP MProf (2016) research group unanimously adopted an approach which has recognised the need for a paradigm shift in terms of the planning procedures conducted in the South African urban context from a neo liberal view to a more ecological world view.

Ecological Approach

Theorists such as Serge Salat (2011) and Gerald Steyn (2005), who have adopted this ecological approach, become the leading theoretical drivers to the conceptual urban vision and approach to this dissertation.

Salat (2011:309) describes urban space as a *complex human experience*, explaining that the structure of the urban fabric should be like that of a leaf, providing resilience through the multi connected and inter connected network systems. The advantages of viewing the urban fabric as a living system which is never static, suggests an adaptable system that ensures its sustainability and resilience over time.

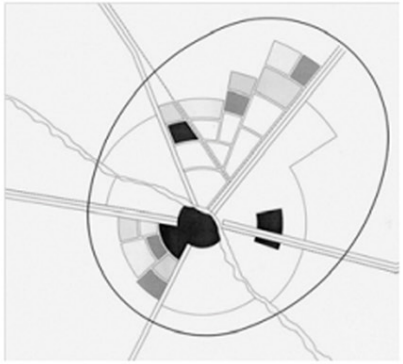
In order to achieve this Salat (2011) suggests the following characteristics;

- Streetscapes becoming a stage for activity which create fluctuating energy nodes within the urban context,
- High density communities,
- Mixed use communities,
- Pedestrian and bicycle oriented environments,
- The provision of public space,
- Self sufficient districts made up of heterogeneous communities
- Strong recognition of the existing conditions on site.

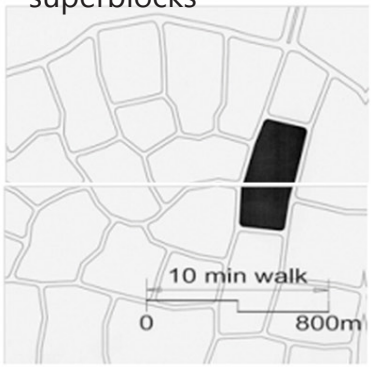
Fig 4.15 Urban principles, Whitaker (2016)

Images: Salat, S. 2011. Cities and Forms: on sustainable Urbanism. Urban Morphology Laboratory of CSTB.

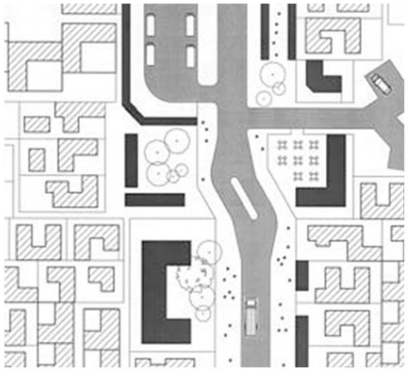
1. Medium-sized compact cities



2. Urban villages in superblocks

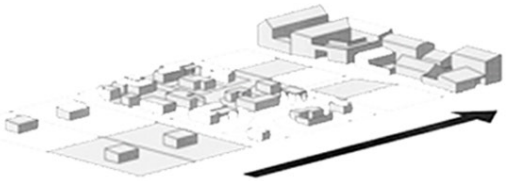


3. Appropriate boundaries & streets

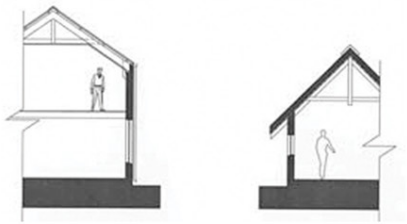


4. Mixed-use main streets

5. Medium density, robust with courtyards, walkable.



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



These principles where exercised in a local example, Thorntree View in Shoshanguve by Holm Jordaan Architects (GWA Studio U3 2007). The urban planning focused on strengthening the existing networks and therefore the project was not viewed as an isolated entity but rather an additional node within its surrounding context. This was achieved by proposing heterogeneous, mixed density communities which focused a high concentration of energy and density along activity corridors (GWA Studio U3 2007).

Gerald Steyn, the author of *Patterns for People Friendly Neighbourhoods* (2005),offers a local interpretation of a similar view. Having conducted research in Mamelodi, Steyn states that due to urban sprawl and spatial and social fragmentation, our urban fabric has become unsustainable. Steyn's (2005) response to this observation concludes that although a sustainable African neighbourhood would certainly differ from a European one in terms of character and appearance, such as the one Salat (2011) considers, the basic ordering principles and characteristics would essentially be the same, namely:

- Compact,
- Walkable,
- Mixed use environment,
- High level of economic self sufficiency.

Using these principles as basic informants for the conceptual urban vision, the urban framework proposal in this dissertation is as follows:
- The framework proposal considers and critiques an existing formal framework proposal for the development of the Plastic View site by StudioMAS Architects (StudioMas 2008).

By viewing this formal proposal through the lens of the theoretical approaches listed above, specifically focusing on
- Accessibility,
- Heterogeneity and
- Consideration for the existing conditions on site,

the UP Arch MProf research group critically assessed this proposal altering areas within it accordingly in order to reach the urban vision used in this dissertation.

Fig 4.16 Urban principles, Whitaker (2016)

Images: Steyn, G. 2005. Patterns for people friendly neighborhoods in Mamelodi, South Africa. Department of Architecture at Pretoria University: Pretoria

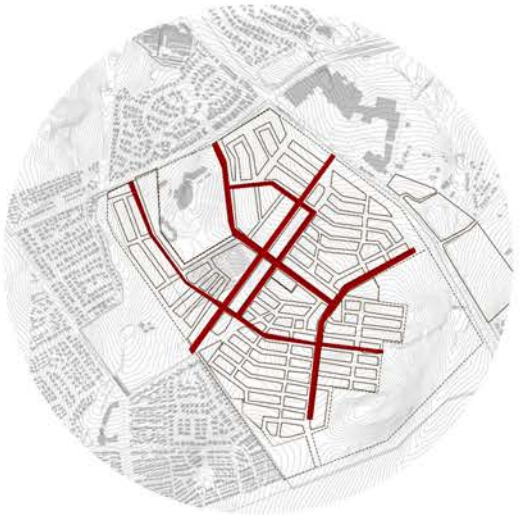
SERGE SALAT PRINCIPLE EVALUATION

ACCESSIBILITY
streetscape, fluctuating energy nodes & the walkable city.

HETEROGENEITY
high density community, mixed use public space and social interactions.

EXISTING CONSIDERATIONS
existing conditions and relationship of people to space.

Access
Walkable community



Density
Heterogenous community

Response to gated communities

Fig 4.17 Evaluation of urban framework, Mclagan (2016)

It is proposed that the current community of Plastic View will be catered for within this urban framework through the provision of low income housing. The municipality is currently proposing that the community of Plastic View be decanted and moved to a site across from Garsfontein Road to the North East of the current site. It is envisioned however that more people will be in need of low income housing in Moreleta Park and therefore this land will provide the access to mainstream society (UP Arch (MProf) 2016).

Due to the vast scale of the site which is around 9ha in size, the UP Arch MProf research group's focal point was directed at developing the high activity access boulevard that stretches across the site, connecting high energy nodes of activity on either side of the site. Desktop research identified very strong desire lines on site as a result of walking paths through the site. The desire lines became an important aspect as it helped inform the location of the boulevard which therefore considers existing conditions. The existing and new servitudes on site coincide with the position of the high activity access boulevard.

The boulevard is envisioned as becoming a highly densified, mixed use activity corridor which aims to draw existing energy onto and across the proposed site. These boulevards connect high energy nodes of activity on either side of the site, namely the Woodlands boulevard and the Village shopping centre. The access boulevard consists of a main vehicular orientated road as well as a secondary pedestrian orientated road which supports compact, accessible and walkable living as Steyn (2005) and Salat (2011) suggest.

The North West part of the site, the area cornered by Garsfontein Road and De Villa Bois Mareuil road was zoned as a high density typology, that consists of a three to five storey build up and accommodates for formal retail and offices. To the south of the high density area is the main vehicular road which connects Garsfontein road to the residential area on the Western edge of the site. A pedestrian island that is located between the main vehicular and pedestrian boulevard caters for informal retail activities that are one-two storeys in height. The buildings surrounding the proposed site are zoned to be two- three storey medium density live work units which slowly become one-two storey low density residential living units toward the southern side of the precinct. Smaller access roads that run around the proposed site are encouraged to be pedestrian orientated. Sidewalks are necessary along the vehicular road for pedestrian use.

The provision of basic amenities was considered for the urban vision. Using Salat (2011) and Steyn's (2005) theories, the proposed provision of three basic amenities, namely Health, food and educational amenities are positioned along the main boulevard providing walking distance proximity around the site.

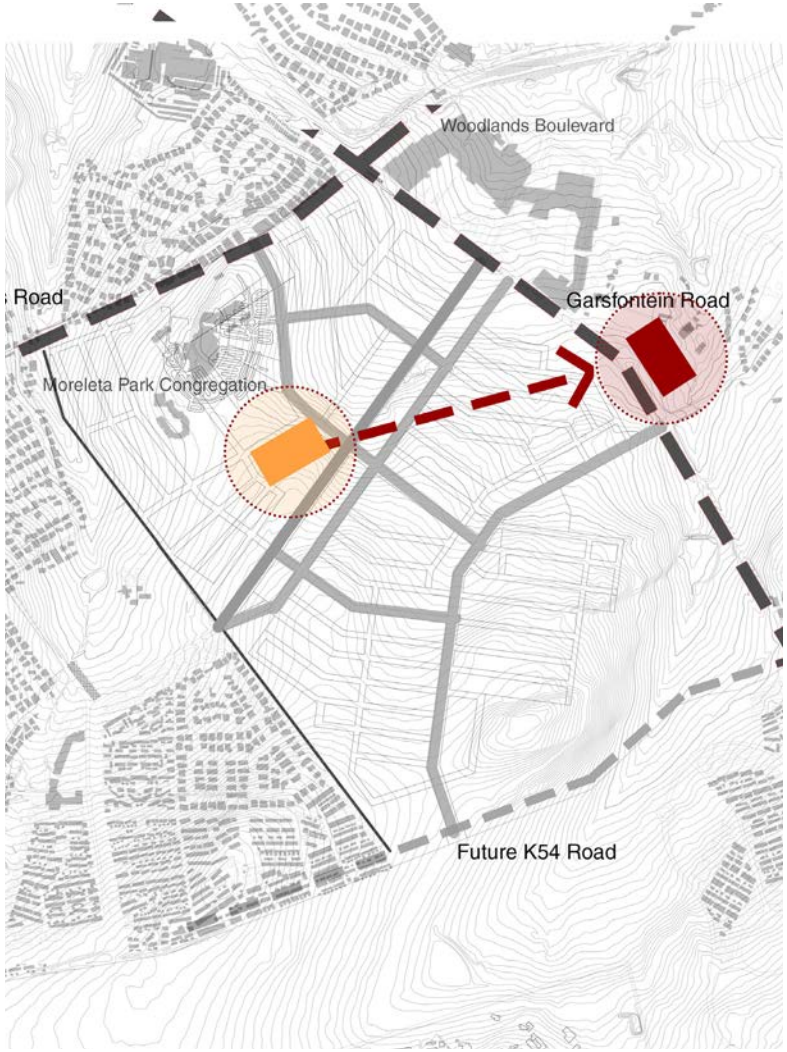


Fig 4.18 The relocation of Plastic View, Mclagan (2016)

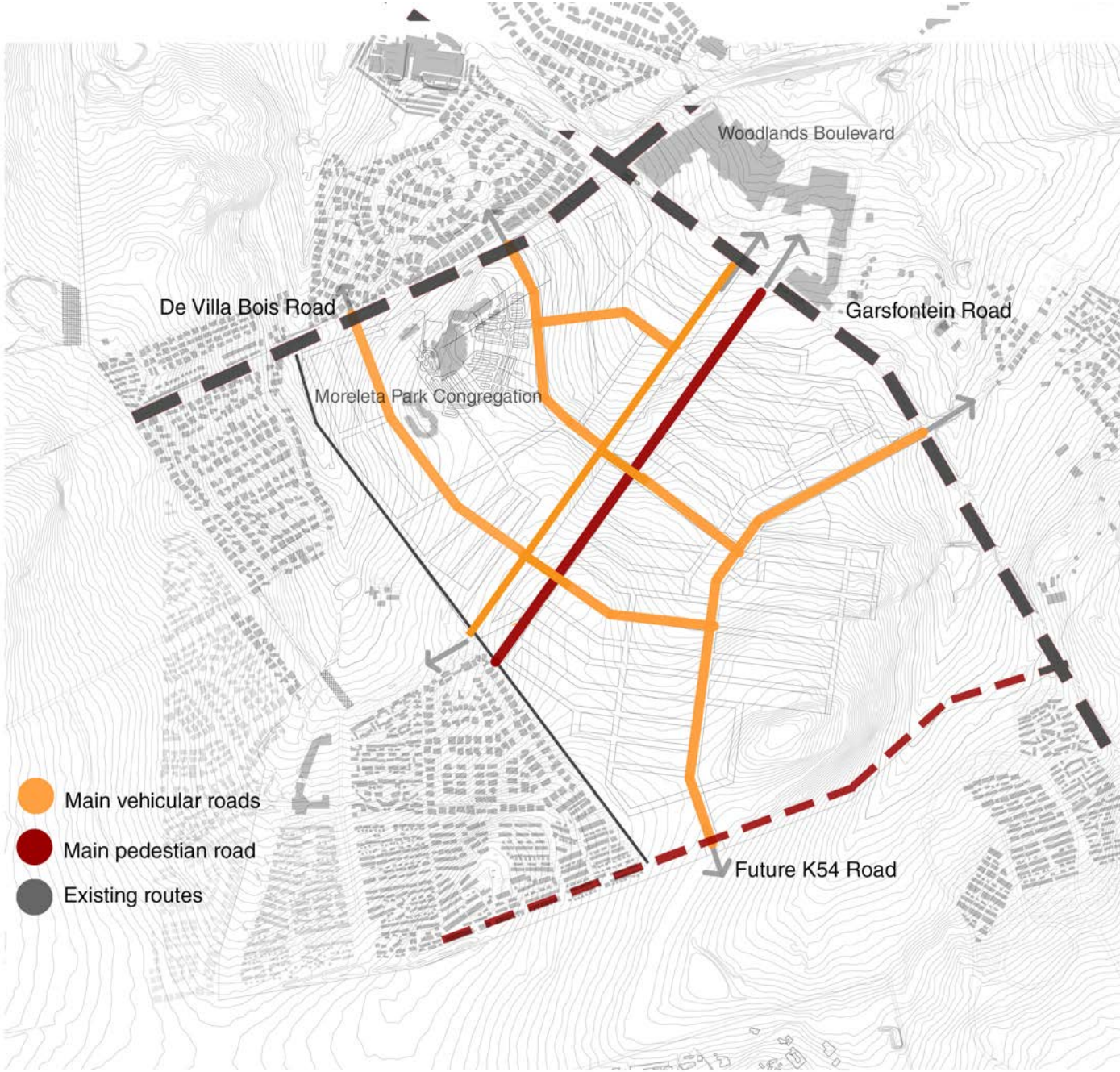


Fig 4.19 The main vehicular and pedestrian roads, Mclagan (2016)

Fig 4.20 Sewer reticulation, Whitaker (2016)

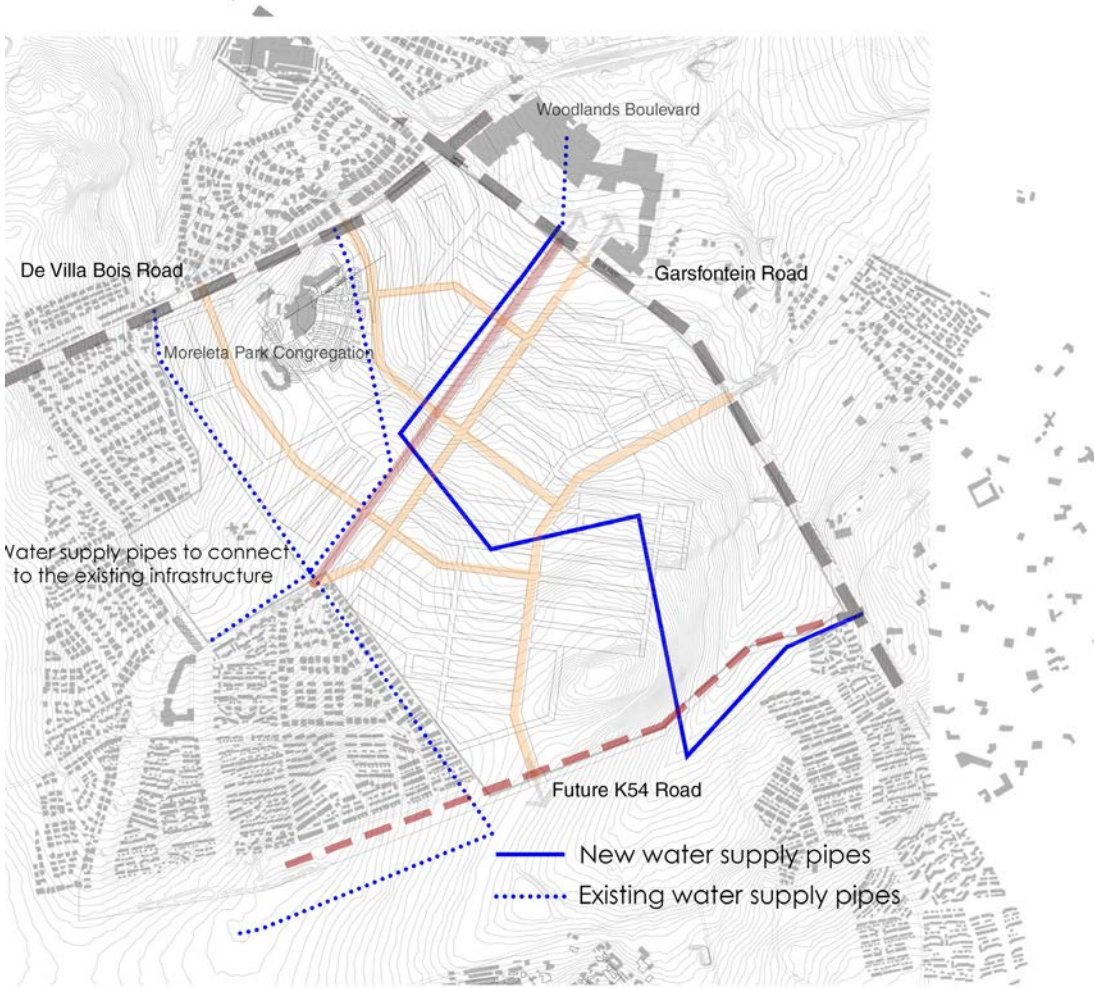


Fig 4.21 Water supply, Whitaker (2016)

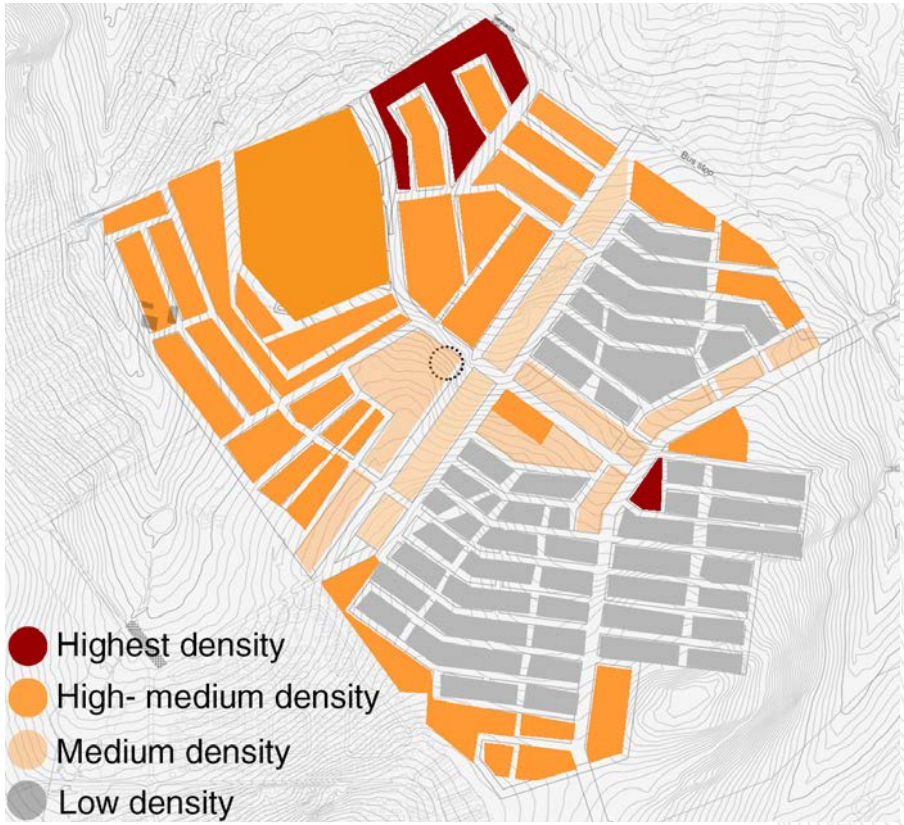
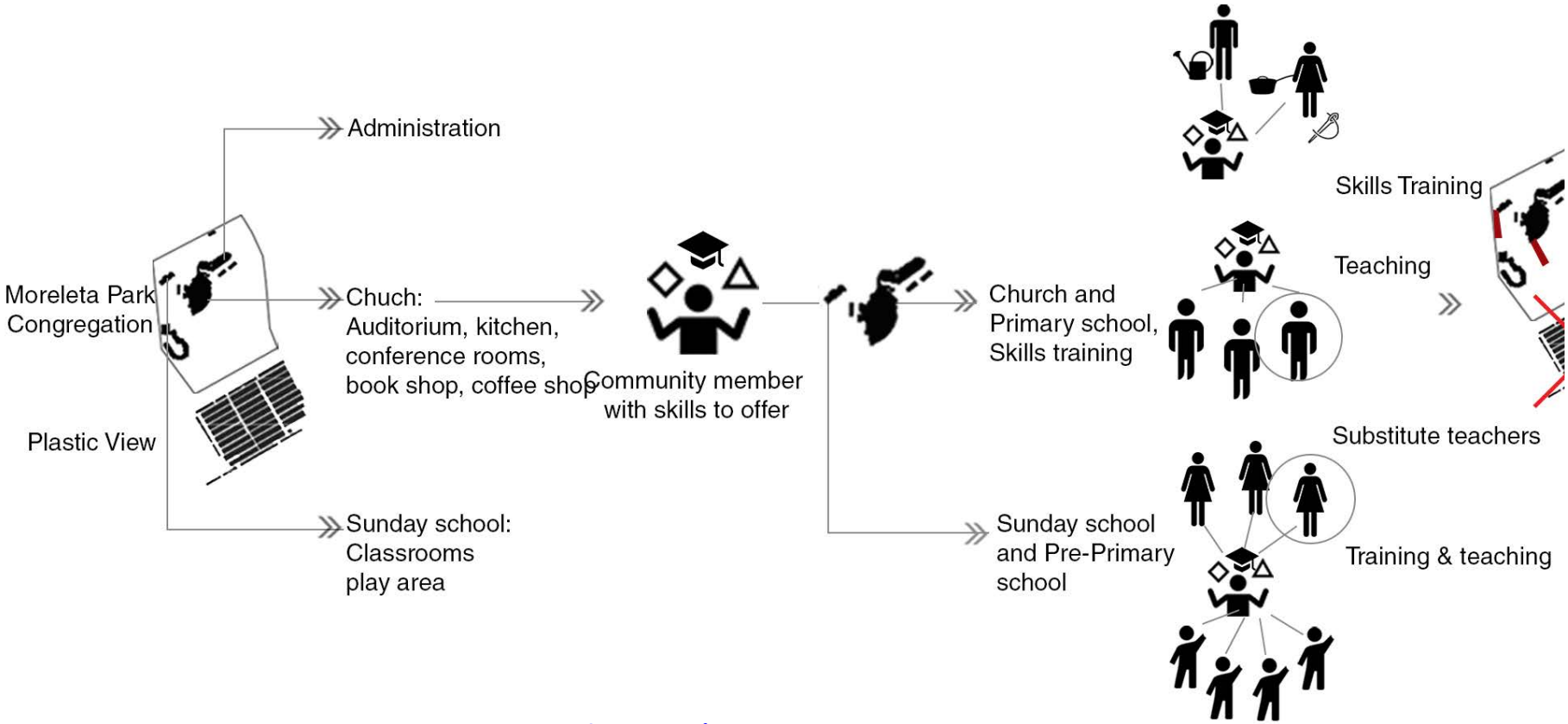


Fig 4.22 Urban density, Mclagan (2016)

Fig 4.23 Site locations, Mclagan (2016)

4.5 Site choice substantiated

The South African government recognizes the potential education has in transforming society as it can be used to minimize the gap in inequality by enabling citizens with tools to enter the working world thus in turn creating socially and physically equal societies. However South Africa has failed to use educational facilities to contribute to a common and equal society, indicating a short-sighted and underdeveloped approach to education in South Africa (SA DOE 2001:3).



Site of Conciliation

The Pure Hope Foundation provides access to education and skills development for those less privileged as the Foundation indentified that:

- Education and skills development are among the most effective actions in breaking the cycle of inequality.
- Education can be used in an attempt to help improve the evident gap in education networks in the Moreleta Park area, this will help break the cycle in which poor experience lower, late and uncertain returns in educational achievement (Netshitenzhe 2013:11).

The Pure Hope education and training programme is made up of volunteers from the surrounding community who are qualified in a specific field or have a skill that they can offer and teach to the community of Plastic View. This a citizenship approach to education and training that results in:

- Educational networks of Moreleta Park are strengthened as the programme supports the integration of the community of Plastic View into mainstream society.
- Supports the notion of citizenship education as the programme encourages social cohesion among people by encouraging interaction between people of different race, cultures and classes, promoting equality in society.

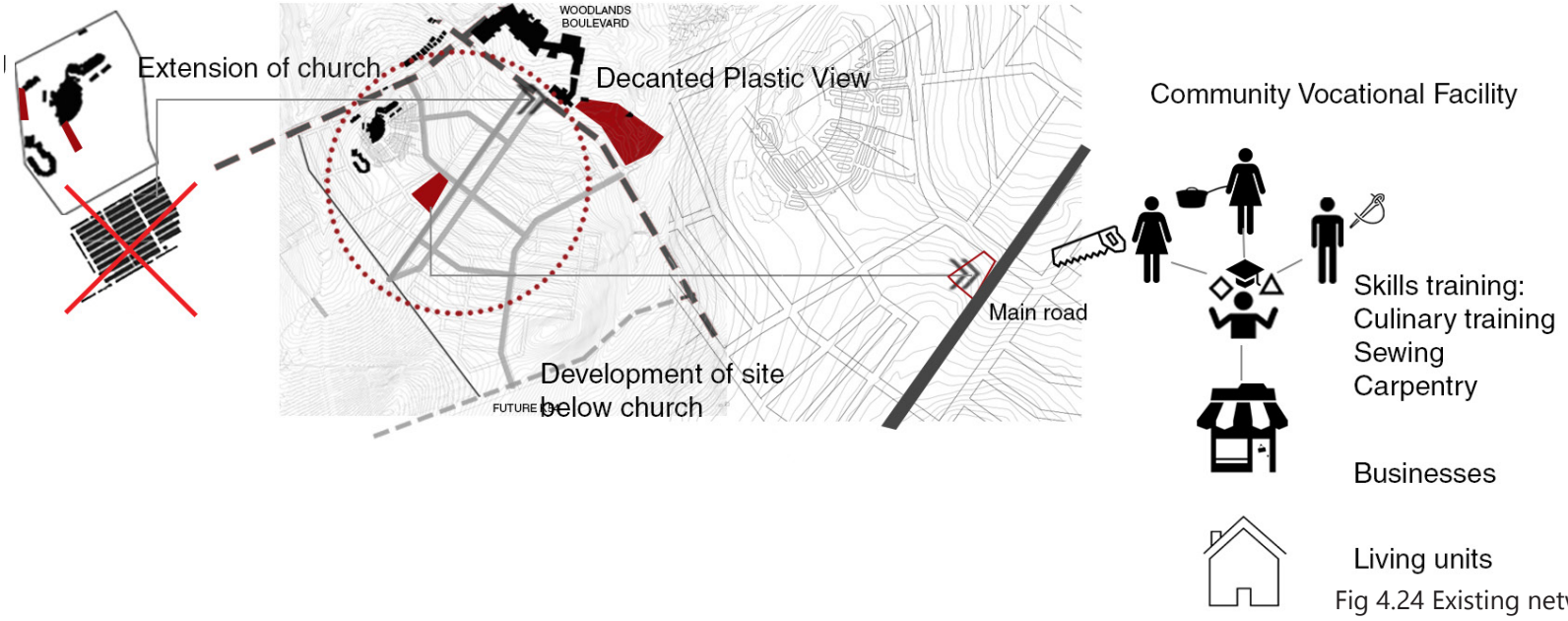


Fig 4.24 Existing networks on site, Diagram, Author (2016)

> *The interactions among neighbours, friends and members of groups and associations generate social capital and the ability to work together for a common good. This is especially important for the poor. Social capital can be used by the poor as a substitute for human and physical capital* (Claridge 2013).

The interaction between people, specifically of different race, culture and classes is vital to achieve social cohesion. Frequent interaction between people creates a norm of exchange through which people become more willing to assist one another. This improves the way information is shared increasing mutual trust and respect for one another and encourages future collaborative efforts (Claridge 2013). The programmes encourage a co-operative process in which people work together to achieve a common goal essentially highlighting the commonality and understanding between one another.

The urban vision and framework of this dissertation supports a paradigm shift in terms of planning procedures in the South African context, supporting that the site is one of conciliation within a contested environment. Site proposals need to challenge existing typologies in order to encourage proposals that support socially cohesive conditions and spatially integrated environments.

Citizenship education, specifically a Community Vocational Facility (CVF), supports this paradigm shift as it suggests that education and educational facilities could encourage and represent what an equal society consists of. The CVF proposes the integration between an educational facility and the community in order to become the key factor in overcoming inequality in society.

> *If we want to create public value in society, it is schools that need this kind of thinking. Schools should be the measure of a society's belief in human qualities* (Jacobs 2016: 46).

Fig 4.25 Cooking classes at the Moreleta Park Church, Photographs, Erasmus (2016)

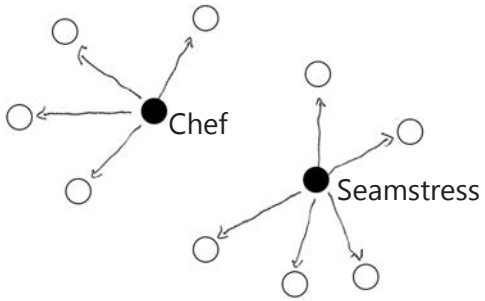


Fig 4.26 Current skills networks, Diagram, Author (2016)

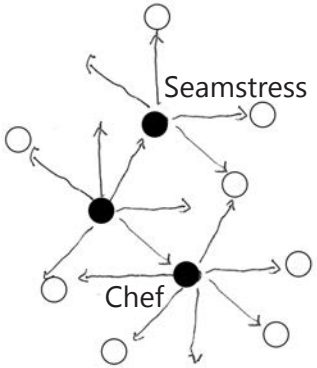


Fig 4.27 Strengthening skills networks, Diagram, Author (2016)

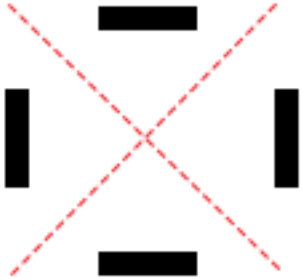


Fig 4.28 Extroverted approach to education, Diagram, Author (2016)

Fig 4.29 Integrated within its environment, Diagram, Author (2016)

4.6 Project intention

Common ground- finding commonality in a place of learning

The dissertation seeks points where commonality between people of different race, culture and class is highlighted in Moreleta Park in order to encourage equality and social cohesion among citizens . This is done by:

- Focusing on strengthening and supporting the currently active learning networks at play, specifically the education and skills training programmes that are run at the Moreleta Park Church. The programmes identify that learning can be used as a means to realize commonality between one another.

- Integrating the learning environment into the community's everyday spaces by promoting permeability between learner, educational facility and the community.

- Introducing an extroverted spatial approach to education that establishes a sustainable interactive platform for interaction between the community of Moreleta Park.

- Encouraging the students and community as a whole to learn how to be active citizens in their environment as citizenship education encourages learning through different media and informants, social interaction being one of them.

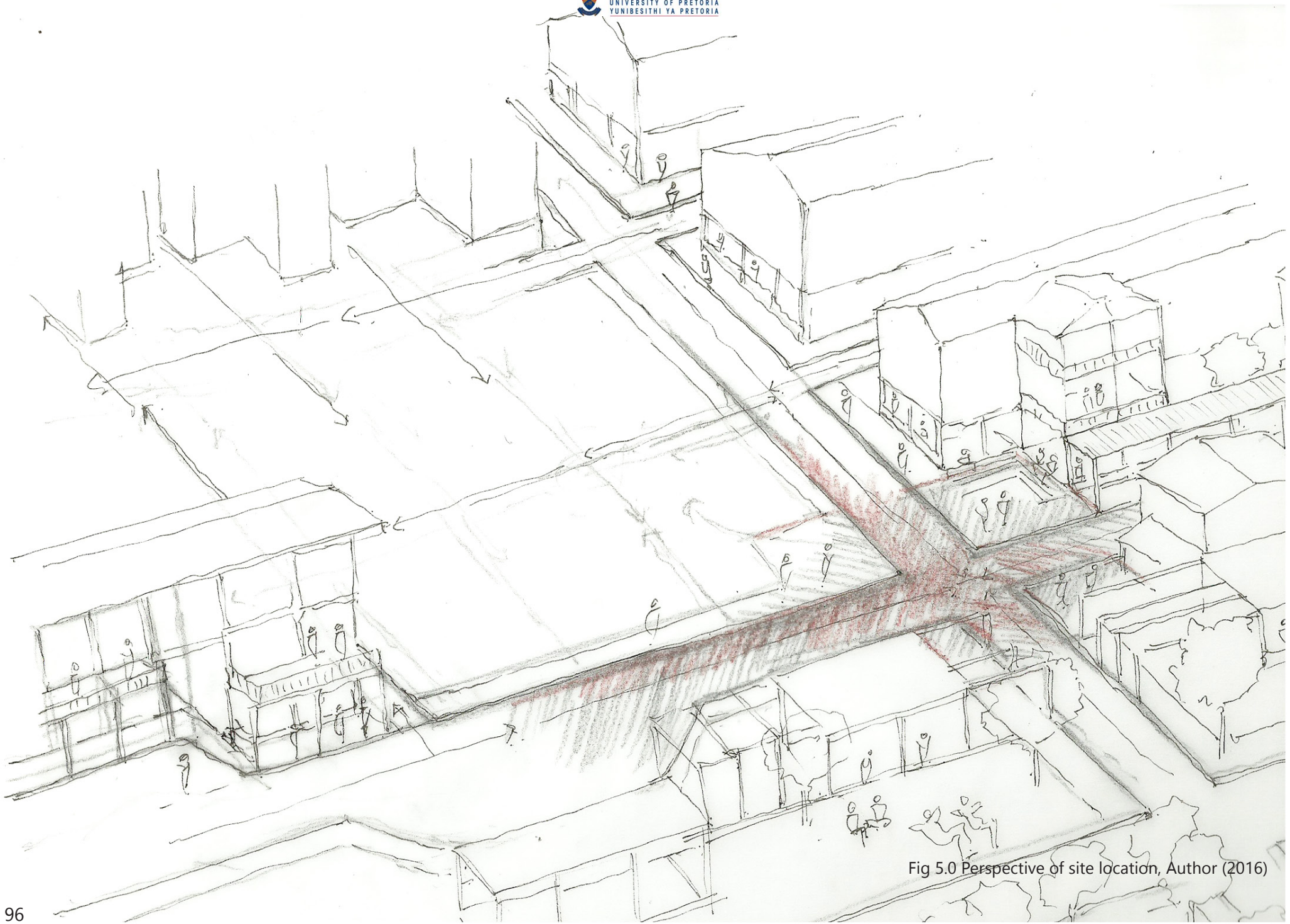


Fig 5.0 Perspective of site location, Author (2016)

5 Design proposal

5.1 Spatial patterns as an informant

Due to the lack of infrastructure and built fabric of the larger site, the conditions of the urban context were informed by the set of guidelines laid out in the urban vision, which created a number of informants for the design to respond to namley StudioMas's framework of the site, the urban groups's theoretical stand point which is influenced by Salat (2011) and Steyn (2005) as well as the groups analysis of spatial patterns found in Tshwane.

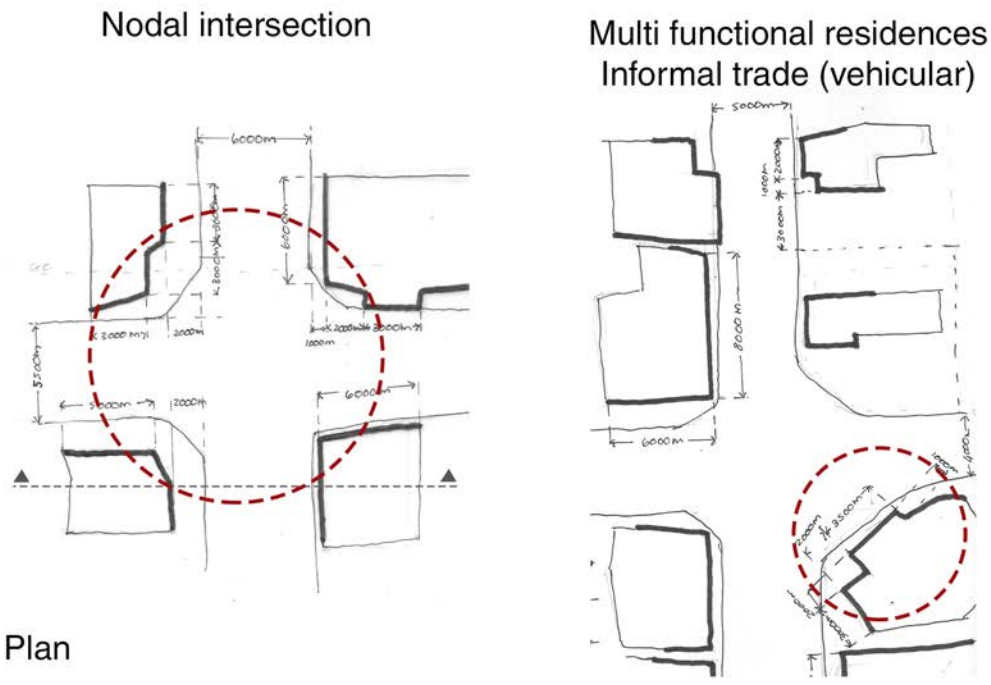
In order to enrich the design and research phase as well as inform the building footprints onsite, the study of spatial practices was done. This is an important tool which can be used to strengthen and build on existing structures rather than starting a new (Hamdi 2010). Salat (2011) emphasizes that in order to create a sustainable urban condition it is essential to consider and recognize existing site conditions.

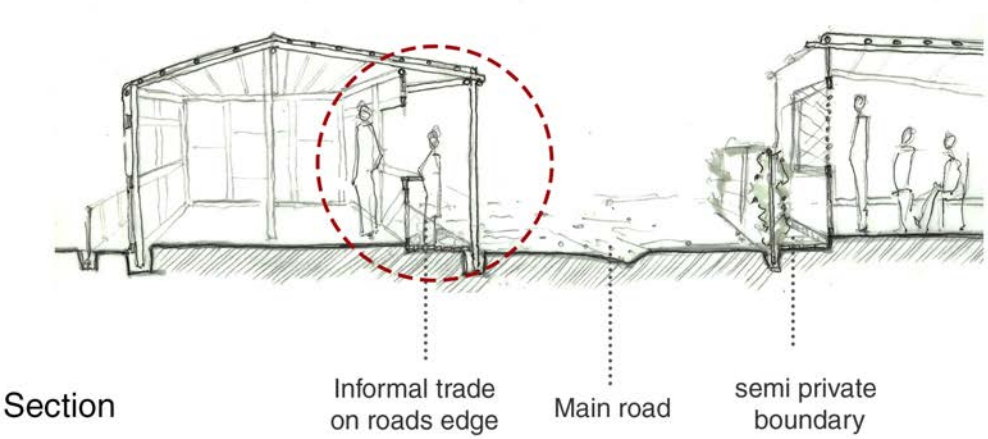
> *Change is integral to assuring a good fit between people and place over time. Places grow, adapt, transform in response to needs and circumstances, if allowed to do so and, if not, become a burden on the economy and on people who become captive in the absence of choice* (Hamdi 2010:xvi).

In support of Lefebvre's (1987) *Architecture of the everyday* as a theory by which local knowledge and the social dynamics of people is valued. Human practices including spatial patterns created by those that live and create informal spaces themselves can be used as an informant.

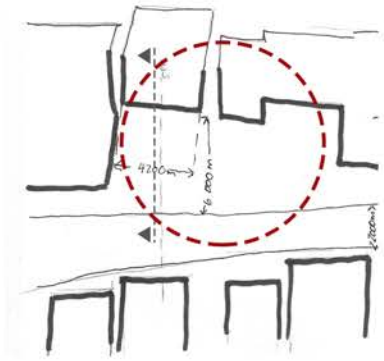
The diagrams illustrate spatial patterns found in Plastic View, Moreleta Park and considered how programmes informed the relationship between the street edge and building. These conditions where analysed both on plan and section and include:

- Nodal intersections,
- Informal trade on a road accessed by vehicles and pedestrians,
- Private and public edges within relations to courtyards as a defining element.
- Multifunctional spaces

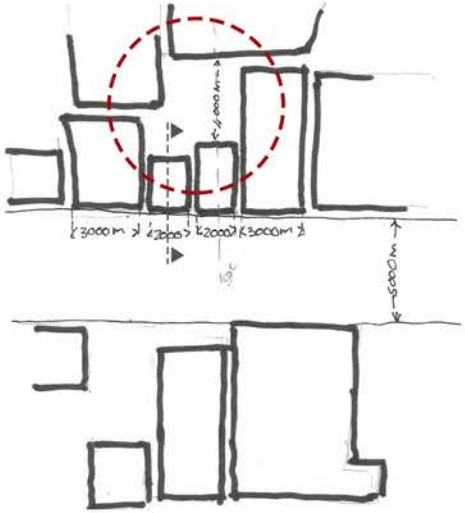




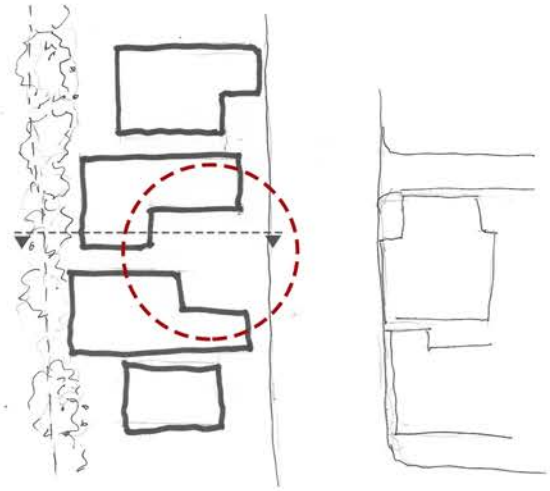
Multi functional residences:
Informal trade (pedestrian)



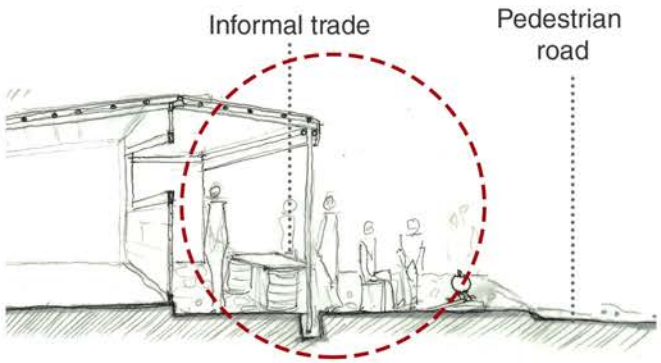
Private edge with relation to courtyard

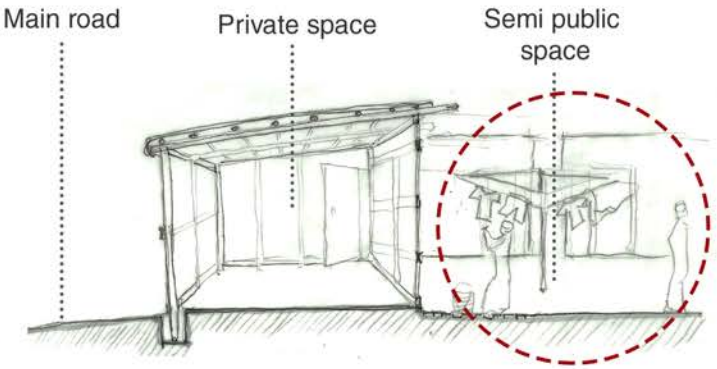


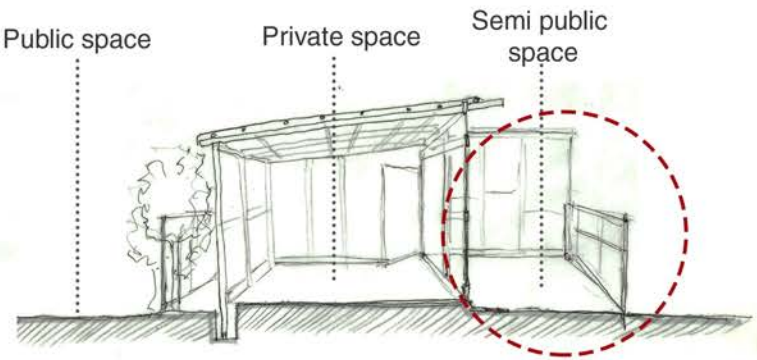
Public edge with relation to courtyard



Plan







Section

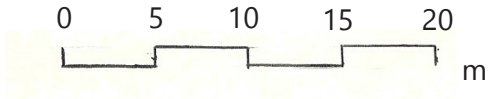


Fig 5.1 Analysis of spatial patterns, Diagrams, Author (2016)

These spatial arrangement patterns were then used as informants for the urban edges around the proposed site and extended urban framework. For example, retail based activity on the vehicular accessed boulevard is situated closer to the roads edge, as fast moving traffic can catch glimpses of the retail activity, while on the pedestrian boulevard retail activity is set further back from the roads edge. Often the case in these informal settlements, it is essential the buildings become multifunctional spaces which offer both housing and retail opportunity, evident in the live/ work units proposed in the urban framework. The retail aspect is situated on ground floor forming the public interface of the building where the residential unit is located above the retail space and the first floor, defining a more private realm. Entrances to residential buildings are set back from the main thoroughfare, where a public square or courtyard acts as an entrance to a number of residential blocks.

The analysis indicates that entrepreneurial activity is more or less evenly distributed through the settlement thus indicating a decentralised approach to planning. This idea of decentralising amenities is supported by theory discussed in chapter 2 as well as the urban framework and therefore informs the spatial intent of the project.

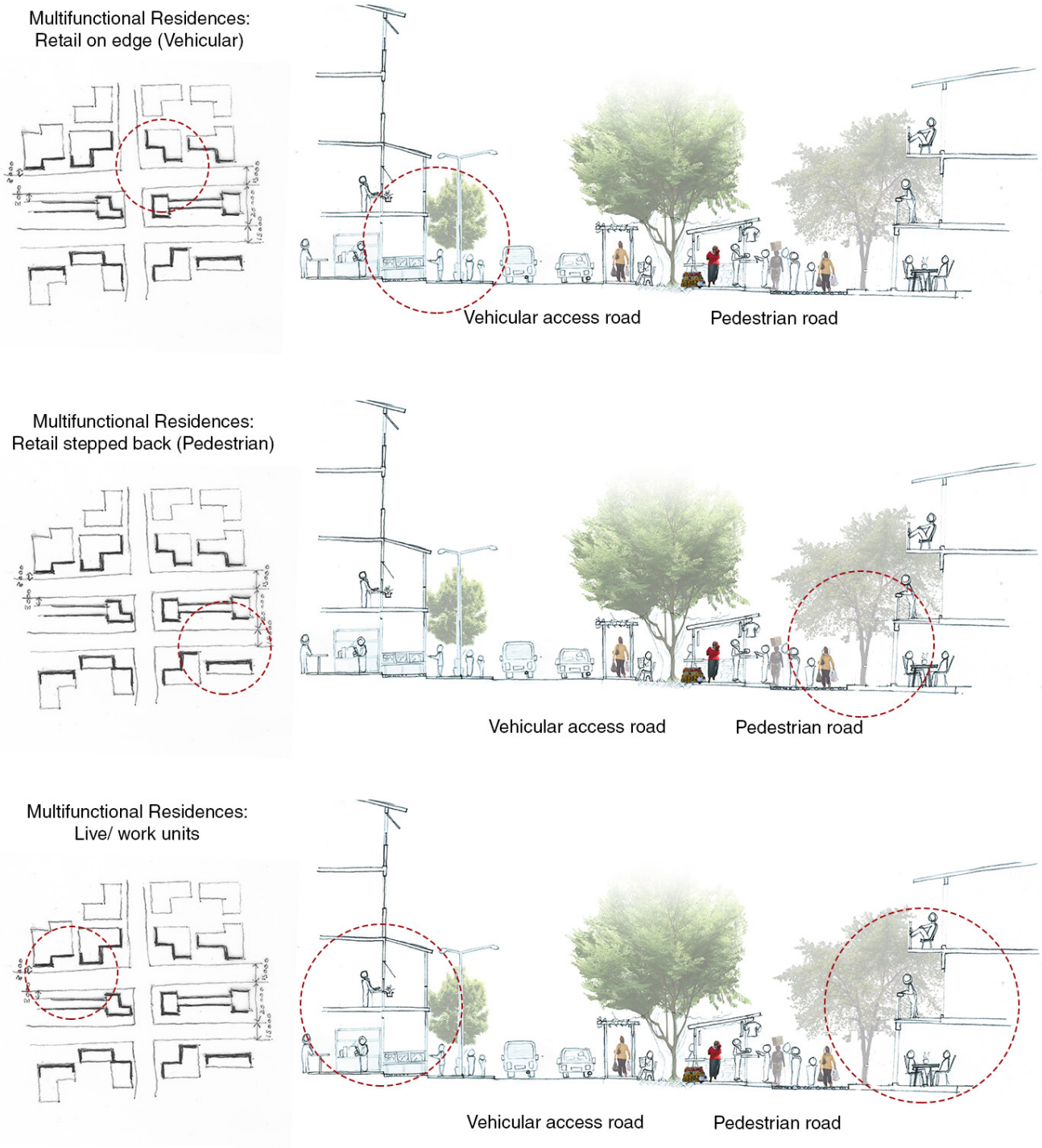


Fig 5.2 Urban framework spatial patterns, Diagrams, Author (2016)

Fig 5.3 Site plan, Mclagan (2016)

Fig 5.4 Perspectives of urban surroundings, Whitaker (2016)

Fig 5.5 Perspectives of the island and main vehicular road, Urban framework, Author (2016)

The analysis indicates that entrepreneurial activity is more or less evenly distributed through the settlement thus indicating a decentralised approach to planning. This idea of decentralising amenities is supported by theory discussed in chapter 2 as well as the urban framework and therefore informs the spatial intent of the project.

The footprint sizes of the surrounding retail and residential blocks needed to be specified in order to achieve the anticipated density on site. A document which specifies a number of principles regarding the spatial implications of low, medium and high density housing was used in order to guide this design decision (CSIR 2011:4). According to this document, an area of high density occupation, as is specified for the areas near the chosen site, would consist of 120 dwellings/ha (du/ha) with each unit covering the minimum living unit area of 50m² (CSIR 2011:4). Therefore, in order to achieve this figure at a floor area ratio of 0.6, the residential block footprint sizes would be at an area of 200m²/block (UP Arch MArch (Prof) 2016). This average footprint size would also then allow for larger unit sizes for larger families occupation as well as single units in the residential block design of the urban vision.

Fig 5.6 Plastic View decentralized approach to planning, (UP Arch Hons 2016)

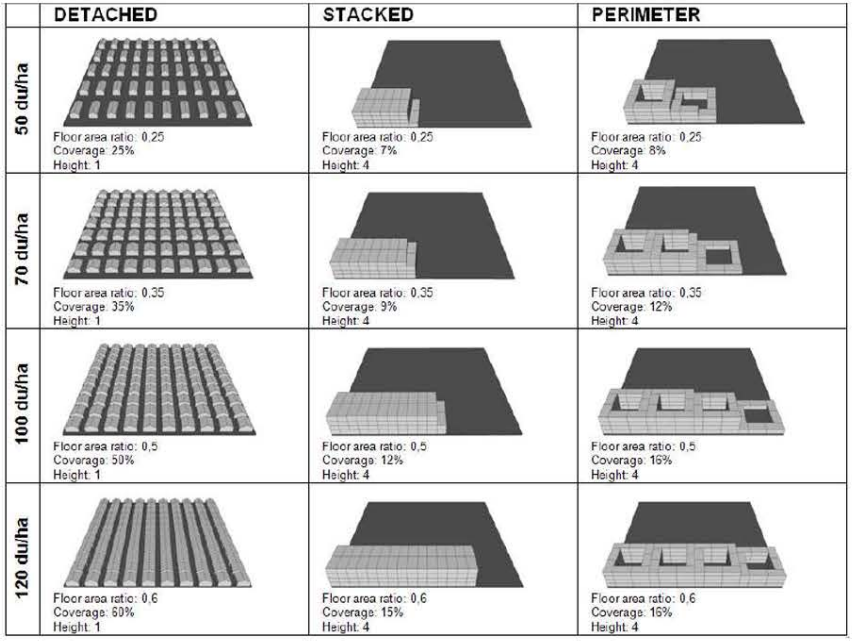


Fig 5.7 Foot print sizes, CSIR (2011)

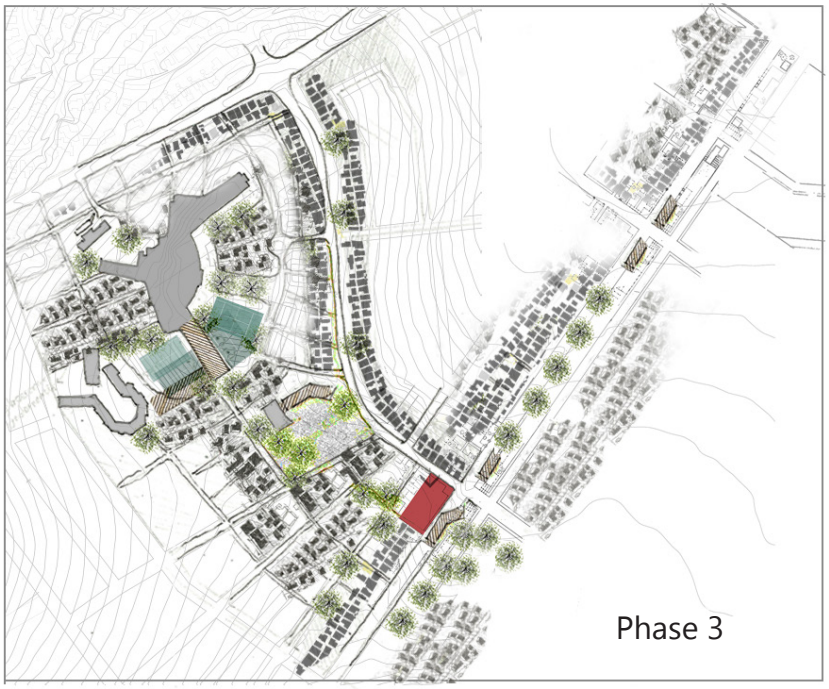
5.2 Detail study area analysis

As highlighted in chapter 4, currently educational facilities are not easily accessed by the community of Plastic View. Therefore while considering the site with regard to the Pure Hope Foundation located at the Moreleta church, it is important that the choice of site is more easily accessible to all in the area.

The urban vision of this dissertation proposes that the individual research proposals on the Plastic View site branch off from the main access boulevard that extends across the site. This is done in order to support the urban framework which envisions the boulevard as a spine that draws energy onto the site. It is envisioned that the site develops incrementally thus supporting Salat's (2011) theory of an ecological approach to urban planning. The scenario played out suggests that urban growth begins along the main activity corridors and existing networks, namely the Moreleta Park Congregation site.

The existing learning networks on site that are located at the Moreleta Park Church play an important role in the dissertation and site location. An educational corridor is envisioned that connects the site to the Pure Hope Foundation by suggesting a number of educational facilities that are located along the corridor. It is suggested that the Moreleta Park Church cater for learners up to Grade 7 (primary school) and that a high school be built below the church.

Fig 5.8 Incremental phasing of development around the site, Author (2016)



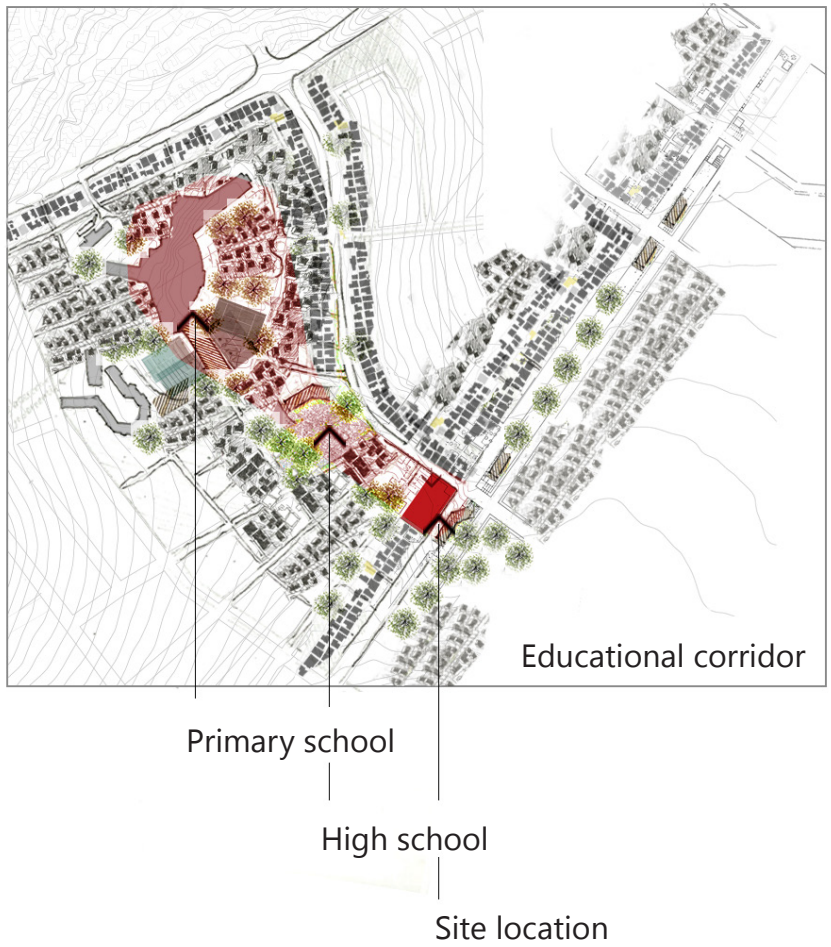


Fig 5.9 Incremental phasing of development around the site, Author (2016)

The programmatic and architectural intent of this dissertation highlights the importance of community interaction and exchange within a public space. Based on the urban framework, the site is located on a main intersection. The site sits on the main vehicular route which offers drop off points and bus stops at various intervals thus the site has the opportunity to engage with those who commute daily from work.

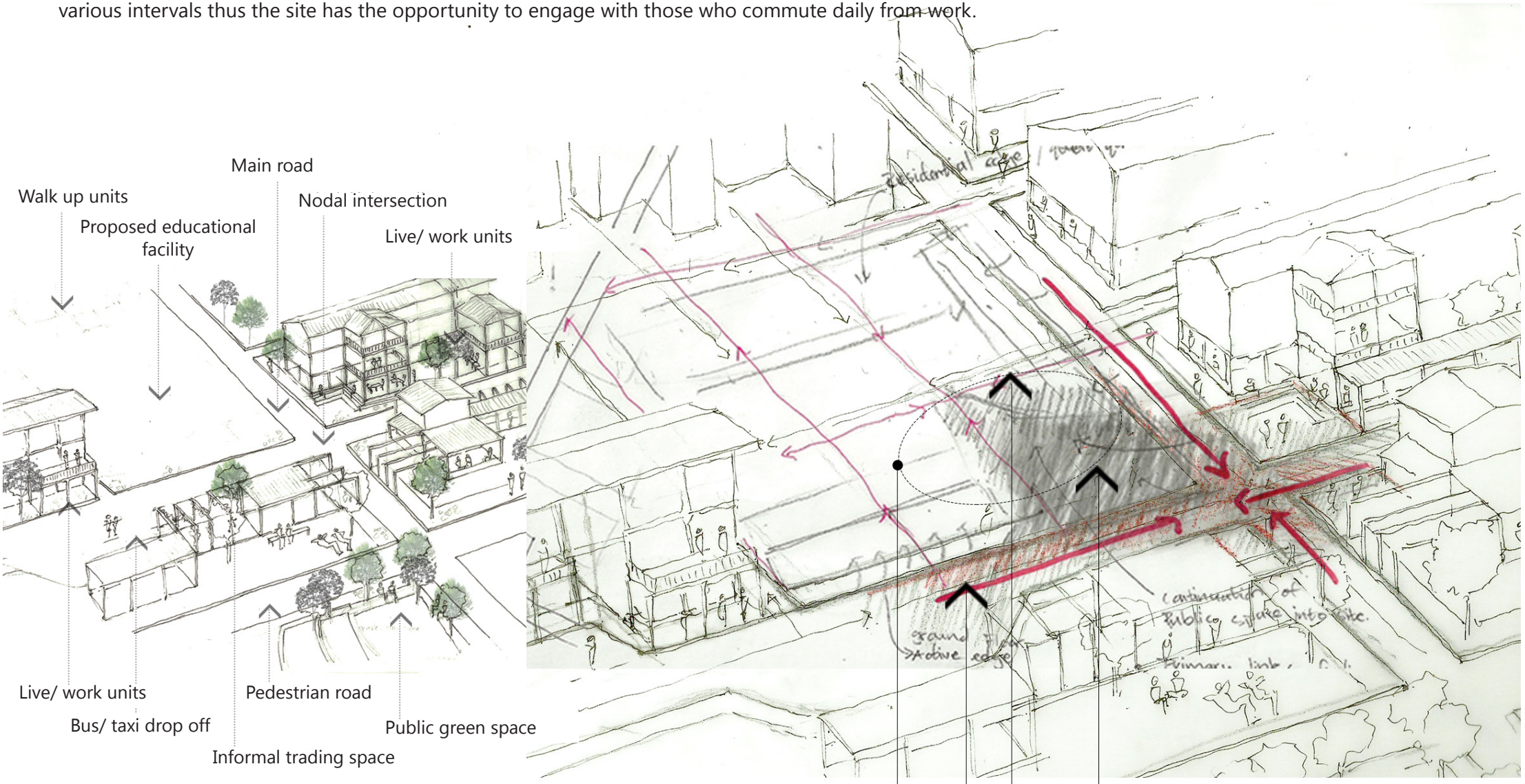


Fig 5.10 Activity around the site, Diagram, Author (2016)

The site becomes a space of transition between a retail/ commercially orientated streets edge and residentially orientated urban condition found behind the commercially oriented street edge. The architectural intent of creating a micro city that integrates into its urban fabric is able to occur on this site as it offers many city like conditions that one can respond to.

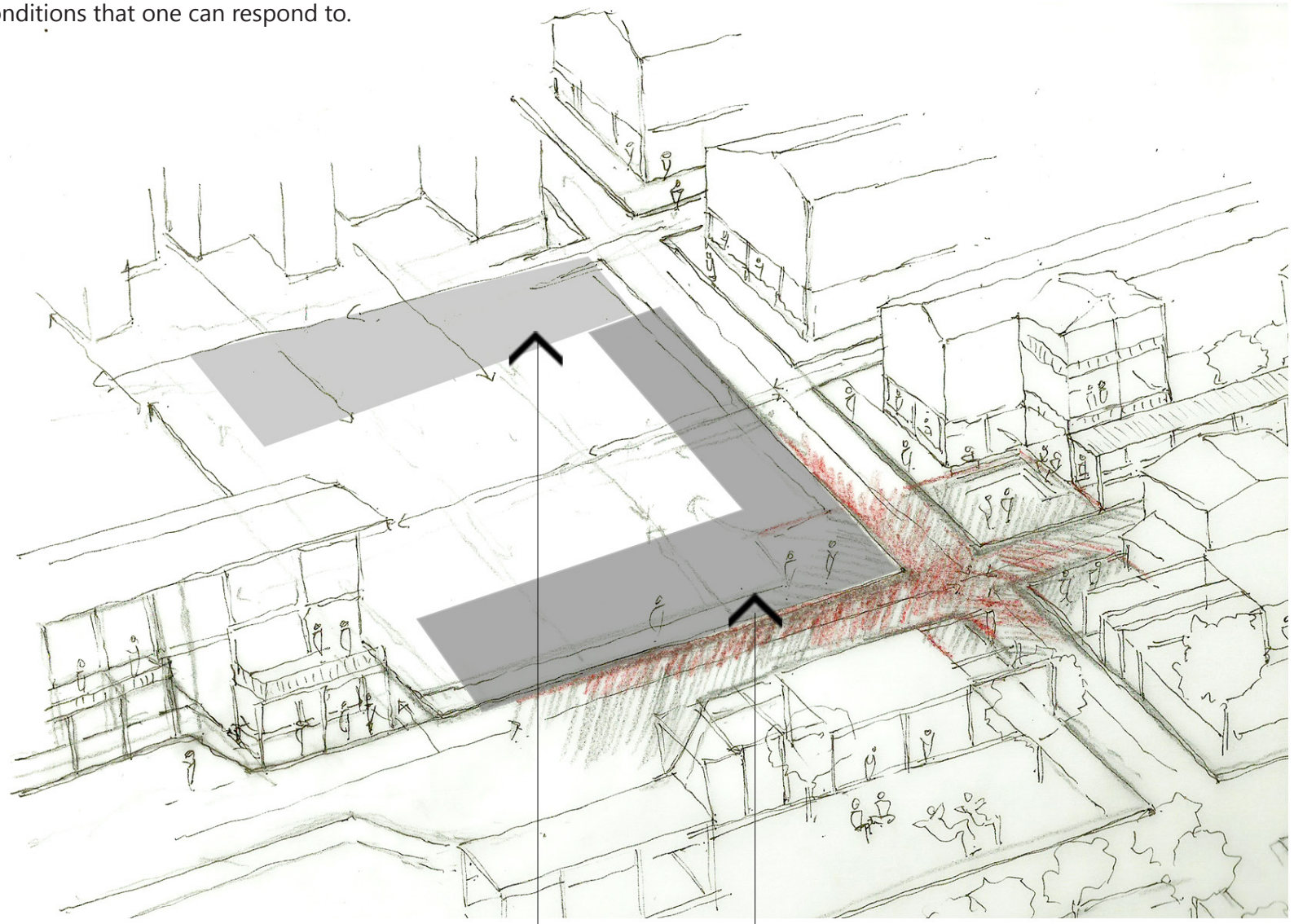


Fig 5.11 Edge conditions, Diagram, Author (2016)

5.3 Program development

The programmatic intention as discussed in Chapter 2 highlights that citizenship education can be used to encourage social cohesion and equality amongst people in a community. It is proposed that an integrated CVF be used to implement this notion of citizenship education by:

- Encouraging permeability and interaction between the community and educational facility.
- Establishing a variety of local amenities that are run by community members.
- Including a range of multi-functional and generational learning activities.

The intention developed in this dissertation is to focus on strengthening and supporting currently active learning networks, which is that of Pure Hope Foundation and skills training Programmes run from the Moreleta Park Church for members of Plastic View. The skills and development training programmes include:

- Sewing classes
- Training programme for domestic workers which consists of cooking classes, classes in washing, ironing and communication skills.

The field research conducted by the UP Department of Architecture ((UPArch(Honours)2016 & UPArch (MProf)2016) shows two forms of skills set in Plastic View are used to generate a form of income. These skills include;

- Carpentry
- Sewing

The above mentioned identifies that there are active learning and skills networks in Moreleta Park that can be facilitated for and strengthened. The CVF thus supports an integrative and participative approach to learning as the programme recognized existing training and skills networks used to appropriate the facility within its context.

Fig 5.12 A member of the cooking class at Moreleta Park Church, Photograph, Erasmus (2016)

5.4 Client

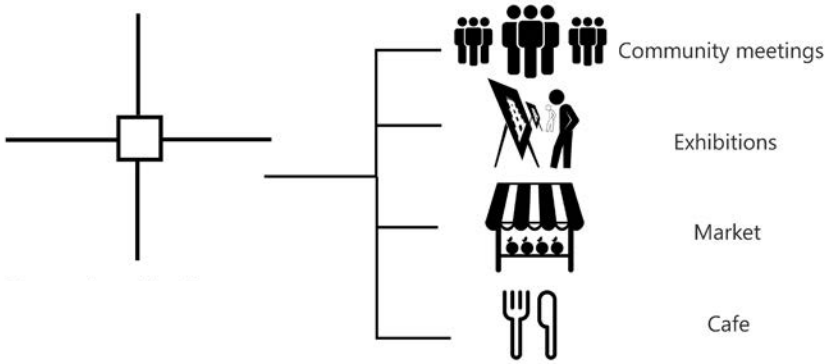
As suggested by Alexander (1971) and Salat (2011), the facility comprises of mixed use spaces and is intended to be a self sustaining entity in the community. The facility therefore needs to function as many things so that the community can use the facility as a resource to their needs. Therefore, following *community school* theory (Hertzberger 2008), the programme is flexible as the functions of the spaces change and adapt as the needs of the people adapt, becoming truly integrated into the community.

Community participation and volunteer work at the Moreleta Park church is essential and supports the urban vision, of conciliation, citizenship education and decentralised learning. Therefore it is essential that the CVF encourage and engage in socially integrating people from different races, classes and cultures. Programmatically this is done by:

- Encouraging that the facility be used by different organizations and learning networks such as POP UP or the University of Pretoria.
- Accommodating those who would like to volunteer their skills such as the Moreleta Park Church community.

It is to be noted, as highlighted in chapter 2, that the facility would cater for students who decide to further vocational education from grade 10 onwards. The facility would also cater for adult training after hours.

Central gathering space



Hospitality training

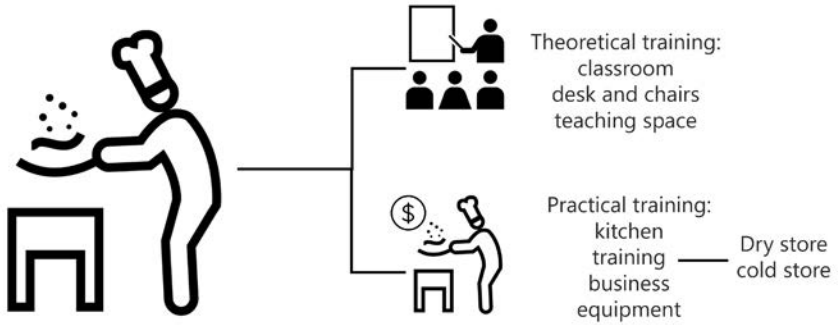


Fig 5.13 Diagrams of the programmatic requirements, Author (2016)

The Community Vocational Facility consists of:

- A Central communal space

In terms of the architectural and programmatic intent proposed in this dissertation, the facility is seen as a micro-city which can be used as a community centre. The central communal space functions as a large gathering space where community meetings can take place and where exhibitions or markets can be held.

This space is seen as the heart of the facility as the arteries (streets) radiate from the main public space.

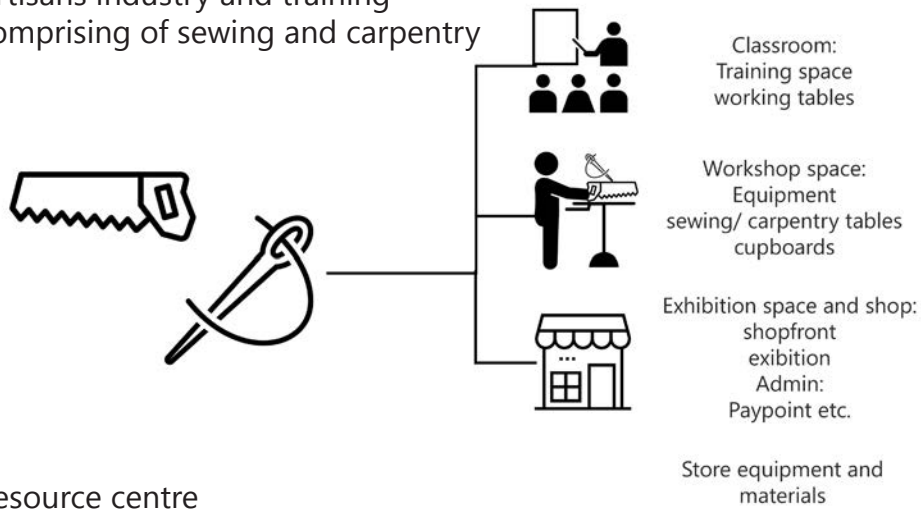
- A hospitality Training space

The skills training programmes that are run from the Moreleta Park church includes hospitality training. The course is offered by a professional chef, who lives in Moreleta Park (UP Arch (MProf)2016). It is suggested then that this learning network be supported and strengthened through the CVF and therefore hospitality training is offered as a programme.

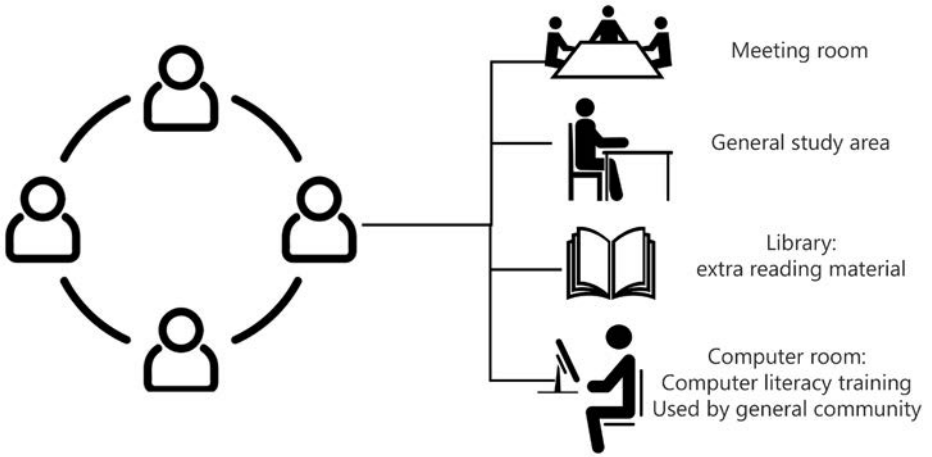
It is suggested that the training programme is run by a member of the community who partook in the cooking course at the Moreleta Park Church, and that the member uses this facility to train others to cook thus expanding the learning network. The kitchen also functions as a business which caters for the learners and community as well as for events or markets that can be held. Therefore the learners that are being trained are also able to generate an income.

The programme requires facilities for theoretical training, such as meeting rooms, an area that can provide the learners with extra study material such as a resource centre, as well as kitchen with basic facilities for practical training.

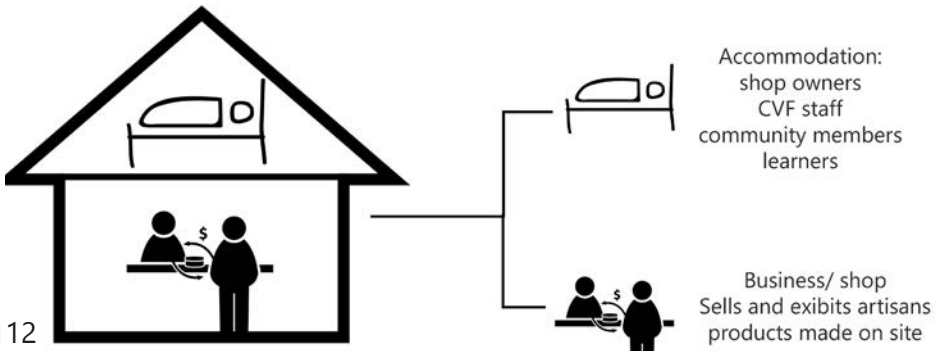
Artisans industry and training comprising of sewing and carpentry



Resource centre



Live/ work units



• Artisans industry and training space which comprises of sewing and carpentry.

The practical training programmes consists of three parts:

Training: Students receive their theoretical training in spaces that comprise of seminar rooms, meeting rooms and general study spaces.
Production: Students receive practical training in workshop spaces. This space must also be able to accommodate theoretical training.
Enterprise: The products can be sold on site, if the students are hired by the business owner to produce goods for him. This provides an opportunity for the students to begin generating an income as well as ease their way into the working world.

• A resource centre

The resource centre is seen as a community centre as it offers resources that the whole community can benefit from:

A computer room is used for computer literacy activities and can be used by the general public.
A general study space can be used by the students and community.
A small library which offers extra reading material in the specific subjects is necessary.

• Live/ work units

In support of the urban vision it is proposed that live/work units are based off of the main Boulevard. This provides for people to run their businesses on ground floor and then live above the business. The business owners will have a direct relationship with the CVF suggesting either that they take courses themselves or complete a course and then teach others.

• Administration

An office is needed for the manager of the facility.

Fig 5.14 Diagrams of the programmatic requirements, Author (2016)

5.5 Conceptual development

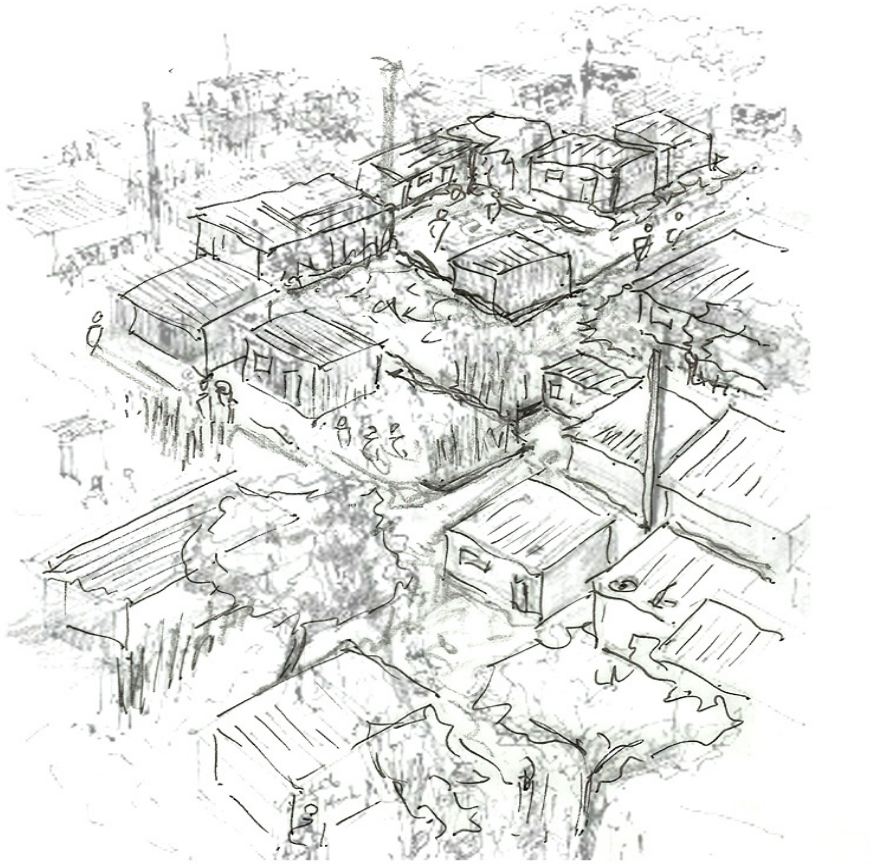


Fig 5.15 Sketch of urban condition in Alaska, Mamelodi, Author (2016)

Conceptually , the proposed facility aims to strengthen social exchange between the learners and community. This translates into a spatial relationship between the building and its surrounding urban fabric. The aim of the facility is to move away from the idea of an institutional layout which can be described as isolated, functionally dominant and intimidating, but rather suggesting a complex layout that integrates learning with its surrounding environment, thereby creating spatial networks.

Proposing that the CVF is a city in miniature, as discussed in Chapter 3, as well as using site specific informants such as that of spatial patterns identified in informal settlements. The dissertation explores the components that a city comprises of by which the design is interpreted and developed as a city in miniature.

The notion of learning streets as Hertzberger (2008:113) describes it is a space that offers the greatest variety of interaction to occur between people of a different age, race and class, becoming a training ground for how one would act in society. The notion of a learning street has a direct spatial implication on the policy needed to achieve citizenship education. In reality this idea of what a street can become is not far off from the role streets play within informal settlements which were analysed previously in the dissertation.

True to many informal settlements the street space, which is used as a means to move and access space is also used to socialize and congregate in, thus becomes a collective public space. The main market streets are used for business. This is typically where spaza shops (an informal convenience store) are found that sell fresh produce and cooked dishes, where one can find barbers and hair braiders or where minibus taxis are washed.

Steyn (2008) describes the streets of Mamelodi, adjacent to Alaska informal settlement, as vibrant and busy where people interact and socialise with one another while busy with daily activities. The street acts as a main artery from which
amenities and businesses are connected. Hertzberger (2008:123) suggests that a street allows the space to be experienced as a coherent whole which creates spatial unity and social cohesion amongst the community.

> *Spaza shops (makeshift kiosks) selling fresh produce, sweets and tobacco, mobile phone kiosks, barbers and hair braiders, stalls selling cooked mealies, shack factories, a spot for washing minibus taxis; all seemed to be doing brisk business. There was also a shop selling snacks and beverages, which was heavily frequented for socialising*
> (Steyn 2008).

One can then suggest that streets are used for a variety of things. Streets act as a means of moving through space in order to access other spaces as well as acting as a place where one can pause and learn indirectly. If people congregate around a stall where one prepares to cook a meal, the notion of learning streets (Hertzberger 2008:113) occur.

Therefore conceptually, the notion of a learning street is explored further that focuses on the educational and spatial journey one takes through space. The dialogue between movement into space which symbolises the increasing of educational knowledge through learning is contrasted with pause in space which is necessary at times to reflect, contemplate and interact with others on what one has learnt.

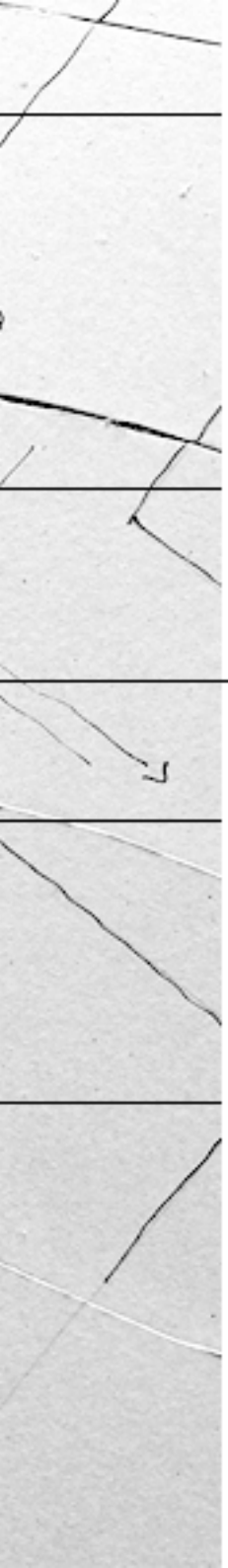
Fig 5.16 Sketches of urban conditions in Alaska, Mamelodi, Author (2016)

Fig 5.17 Urban surroundings in Plastic View, photographs, (UP Arch Hons 2016)

Fig 6.0 Model in June, Author (2016)

6 Design Development

Fig 6.1 Programmatic layout 1, Author (April 2016)



6.1 Iterations

First Design Attempt

Programmatic intent:

The first design attempt explores the complexity of Moreleta Park surroundings while continuing to explore the potential impact the project can have programmatically within its context in order to try and create a more socially cohesive environment.

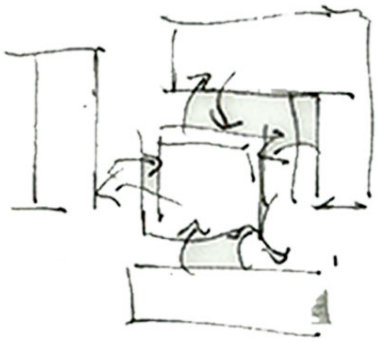
In response to theory by Hertzberger (2008) and Alexander (1971), who encourage introducing programmes that help integrate educational facilities into the community , the first step was to identify current practices in the surrounding area such as hospitality training and business opportunities (discussed in chapter 4) which can be used as a catalyst that helps bind a community activity with the educational facility.

Critique:

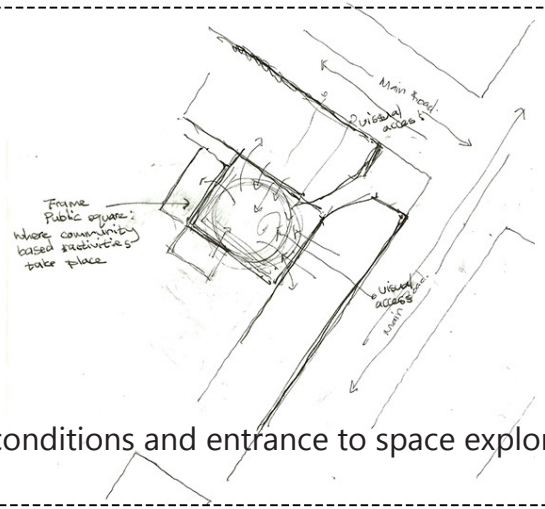
Programmatically a high school was considered at first, however after discussions held with educators from Pure Hope Foundation and theory on education by Hertzberger (2008) and Alexander (1971) it was decided that vocational education should rather be considered. A vocational facility is able to offer resources to teenagers and the community, thus supporting a paradigm shift in educational thinking. Supporting vocational education also helps strengthen an active network in place at the Moreleta Park church focused on skills development and training.

Fig 6.2 Parti diagram 1, Author (April 2016)

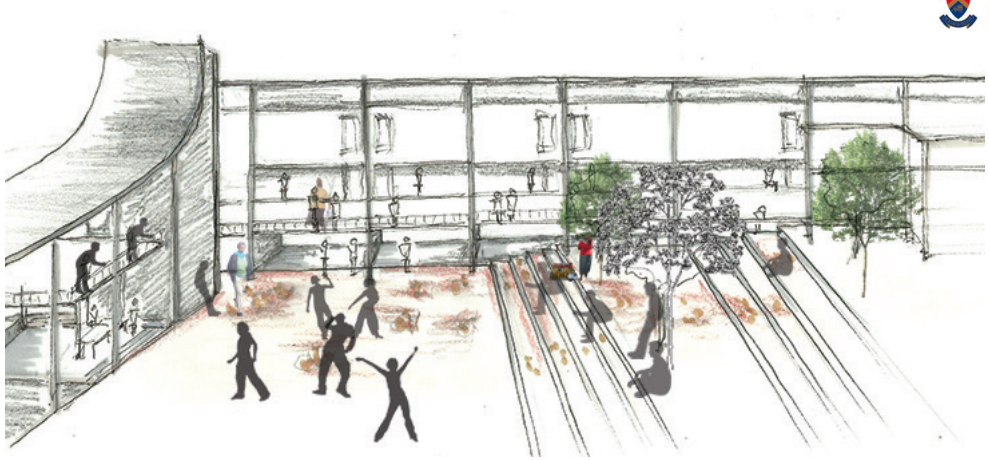
Meeting spaces as a place of common ground

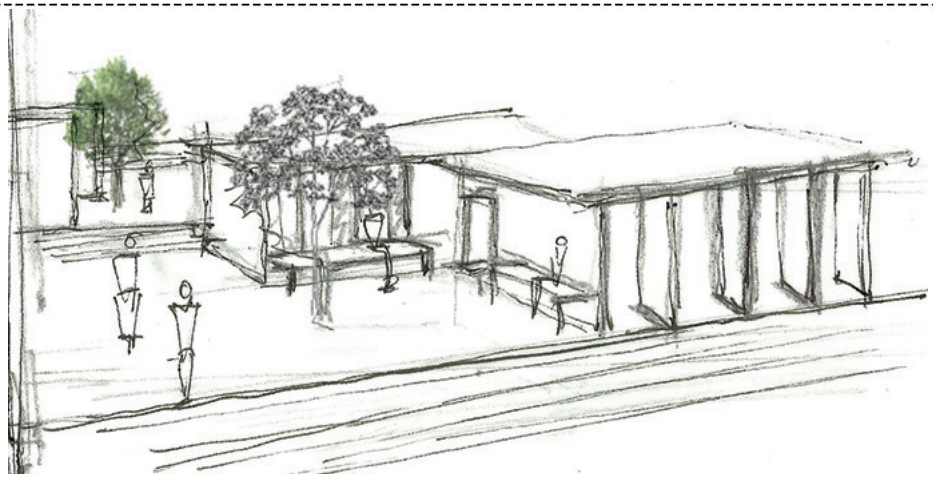


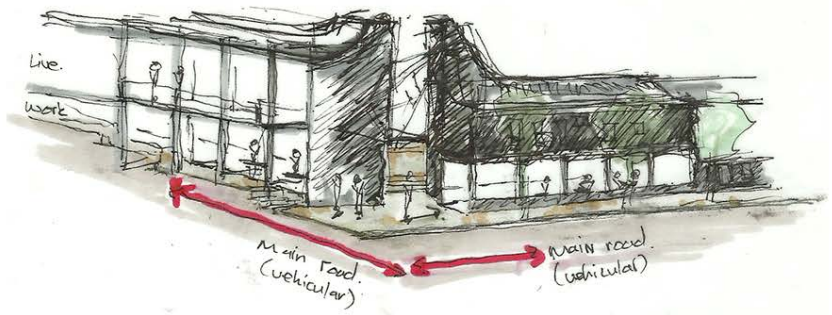
Building frames in-between space



Edge conditions and entrance to space explored







Architectural intent:

The first design proposal was an intuitive reaction to initial theory by Hertzberger (2008). It responds to the notion that public meeting spaces can act as a catalyst in order to find common ground between the users of the building and the surrounding community.

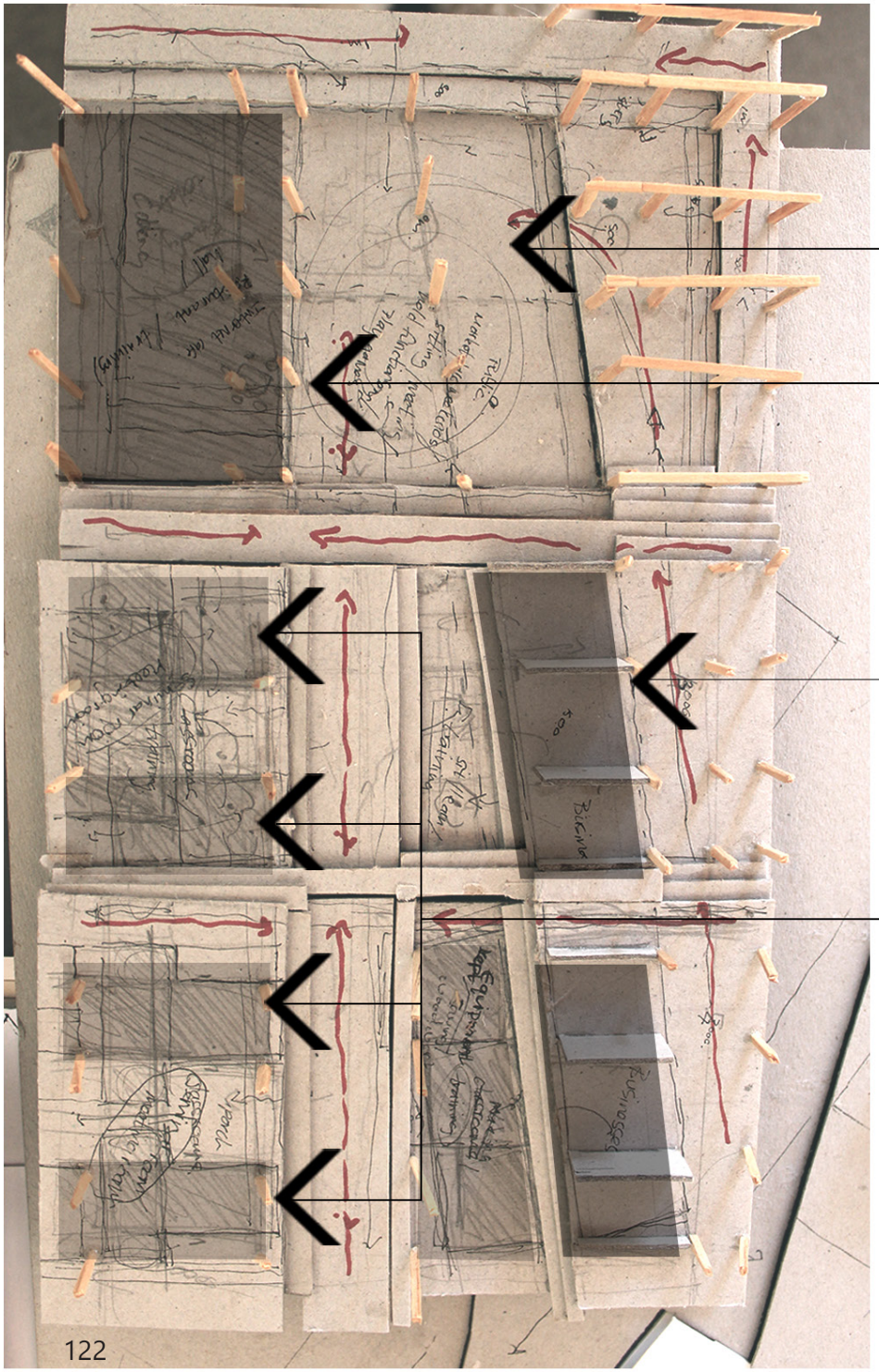
The model begins to explore how the in-between space can be framed by walls and columns, level differences and thresholds thus spatially exploring how a building frames negative space. The model also investigates how the edge conditions can be activated in order to draw people onto the site.

Critique:

Architecturally this proposal explores the spatial development of the plan and struggles to interpret the architectural intent through form. The conceptual design proposal was presented to external examiners in April and the critique was as follows:

- The architectural language needs to be investigated further.
- The access and movement of the users through the site can be better considered and defined.
- The levels of thresholds from public to private space needs to be better considered.
- Better resolution of the surrounding urban fabric will help ground the project within its context. Therefore circulation and access routes should be more rigorously determined.

Fig 6.3 Sketches of proposal 1, Author (April 2016)



Central communal gathering space

Community vocational Facility: A resource centre is propsed offering access to a library, meeting rooms, study spaces and a computer lab

Public local amenities: hospitality training and food business

Local businesses and accommodation:
The urban framework and supportive theory suggests that the CVF be integrated with local functions and therefore live/ work units are proposed along the main boulevard.

Community vocational Facility:
Skills and development training

Fig 6.4 Programmatic layout 2, Author (May 2016)

First Iteration

The development of the stated hypothesis begins to take shape as supportive theory and precedent studies are concluded on. Therefore the remainder of the iterations are looked at through the lens of identifying how spaces of interaction, urban conditions and multifunctionality of the spaces can be interpreted programmatically and architecturally. These principles, used to evaluate the project, are founded on the programmatic and architectural conclusions made previously in the dissertation as they encourage how a citizenship approach to education can be achieved spatially.

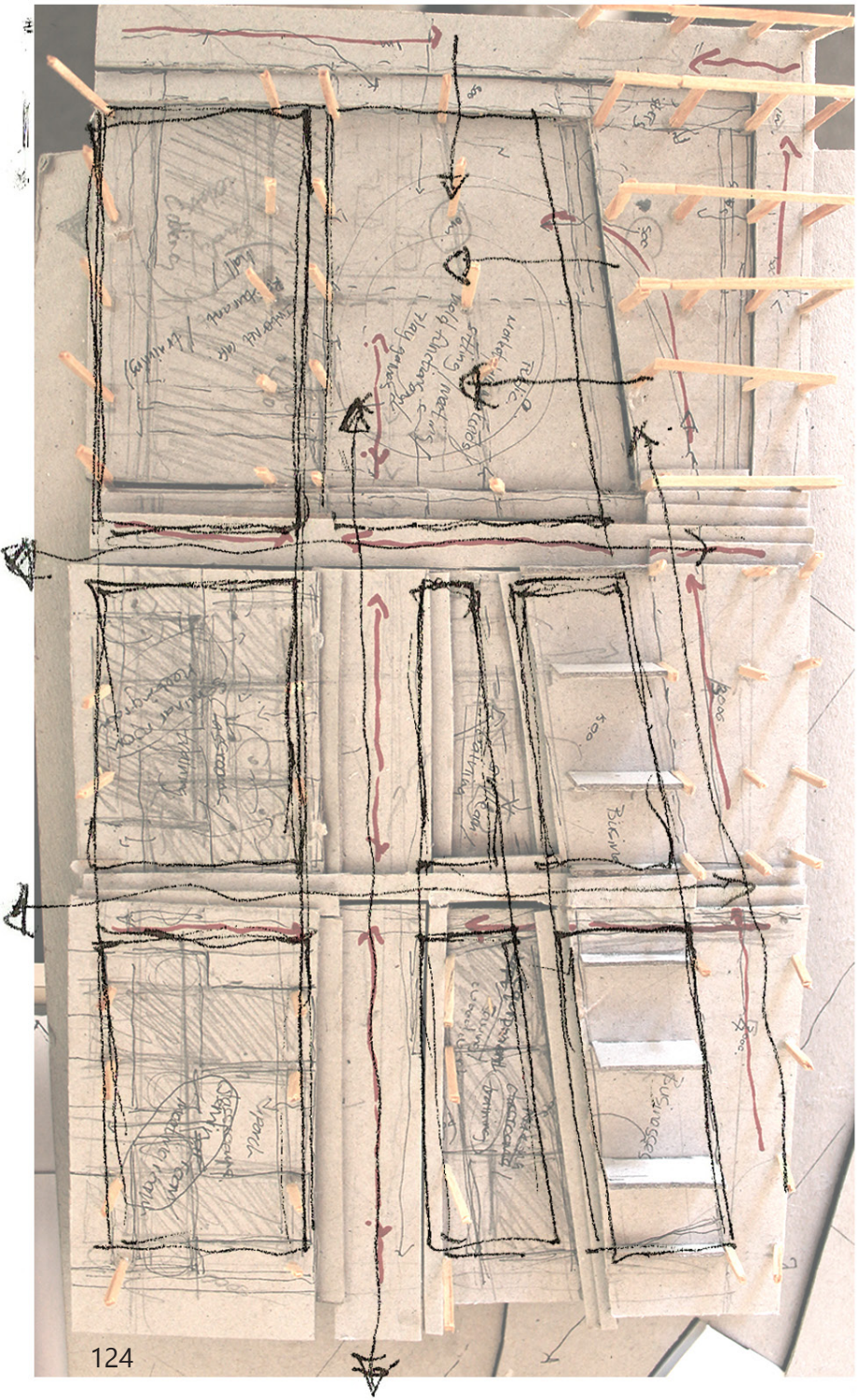
Programmatic intent:

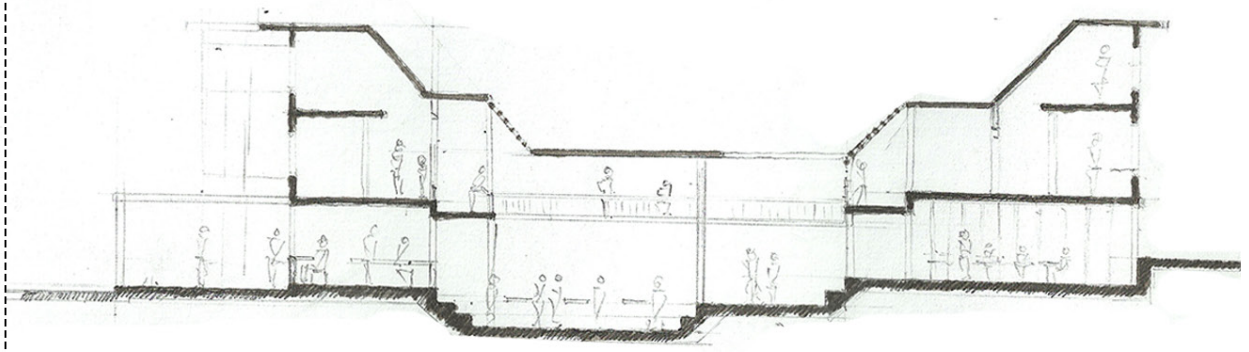
Urban conditions:
This iteration explores further the programmatic potential of a CVF as identified in chapter 2. Existing skills development and training courses are identified at the Moreleta Park church becoming the main programmatic drivers of the CVF. In response to the programmatic change of focus, this iteration attempts to understand the individual programme requirements and the potential this has spatially.

Critique:

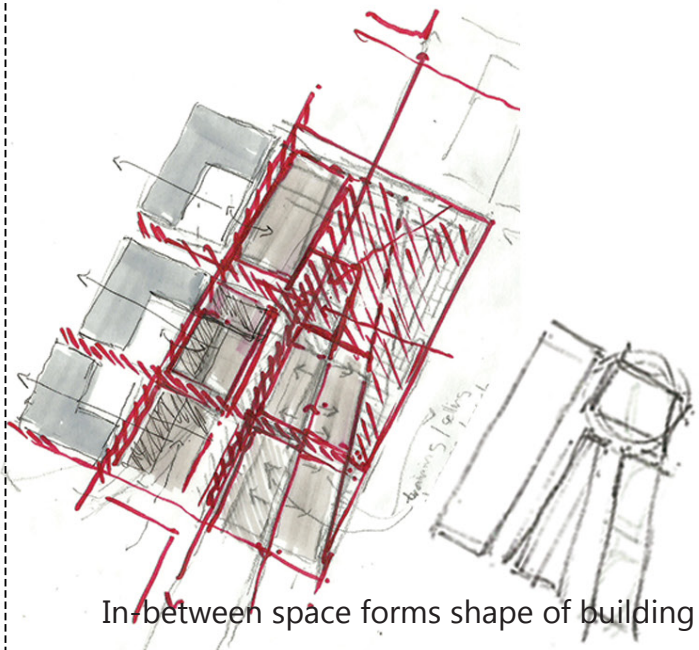
Multifunctionality:
The relationship between programme and the spatial function can be better resolved in order to create spaces that can be used for various functions.

Fig 6.5 Photo of model, proposal 2, Author (May 2016)

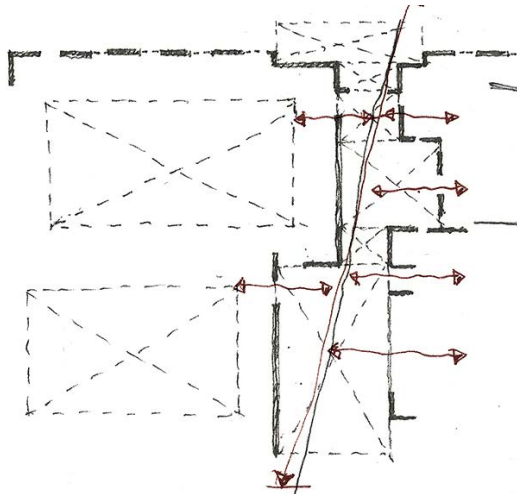




Roof as a defining element

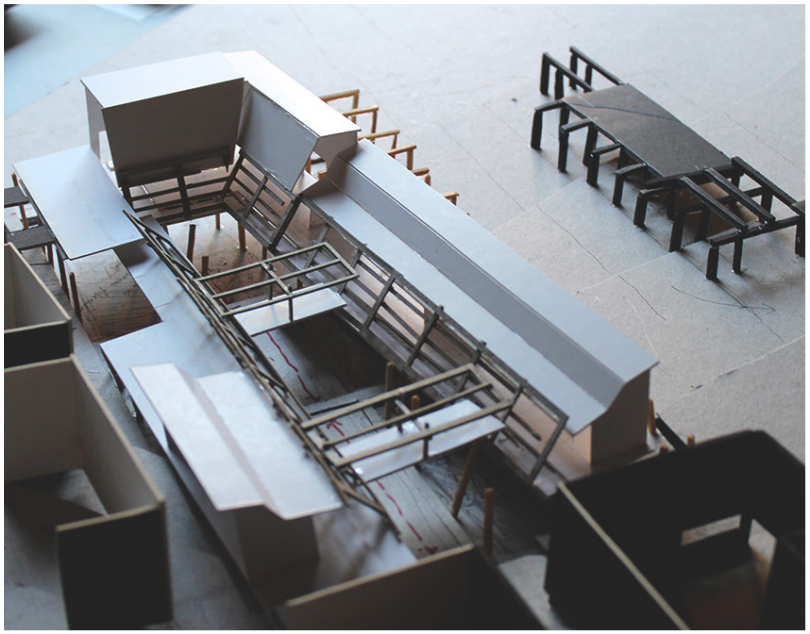


In-between space forms shape of building



Usasazo Secondary school layout

Fig 6.6 Parti diagram 2, Author (May 2016)



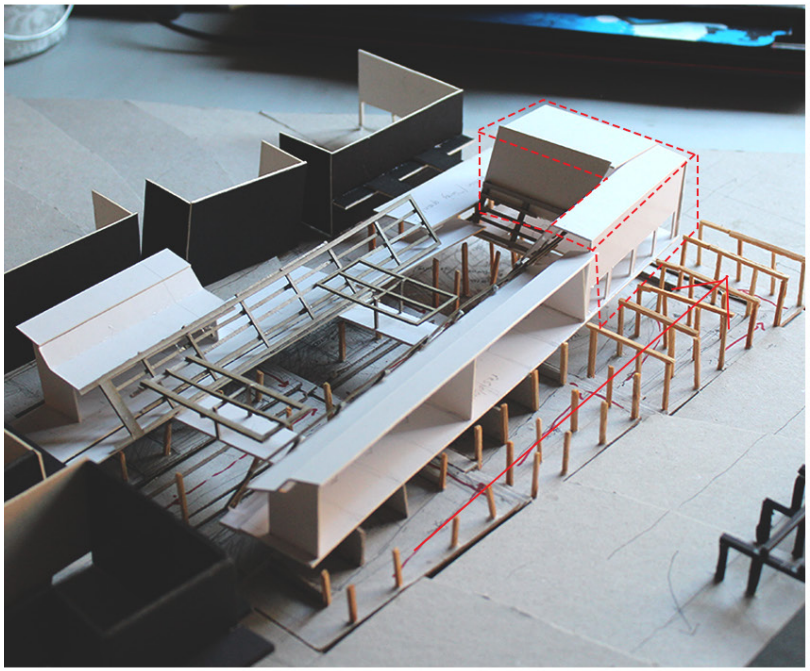


Fig 6.7 Sketches and photos of model, proposal 2, Author (May 2016)

Architectural language:
A rudimentary approach to this iteration was taken as the architectural intent, as discussed in chapter 3 of this dissertation, was still being explored and discovered. This proposal explores how the roof can become a defining element. The roof is interpreted as an element which moulds and defines spaces where interaction can take place between people which relates back to theory on an *extended school* approach (Hertzberger's 2008).

Spaces of interaction:
This iteration, rather than exploring how a building shapes space, explores the potential in-between space has in framing and informing the shape of the building in an attempt to create as many points where interaction can take place. This approach to space making was highlighted in a precedent analysed in chapter 3 by Noero Wolff Architects. The Usasazo Secondary school layout is informed by the in-between space encouraging an accessible environment where paths intersect with one another in order to create as many points of interaction between people as possible.

Urban conditions:
Specifically the building's edge condition facing the main boulevard is explored as this is an important urban edge that needs to draw people onto the site. In response to Gehl's (2010) book on *cities for people* the urban edge is directed at an angle which pulls the threshold of the building back, helping direct users into a central public space . The corner, where the two main streets intersect, becomes an important space as architecturally this can serve as a landmark within the context.

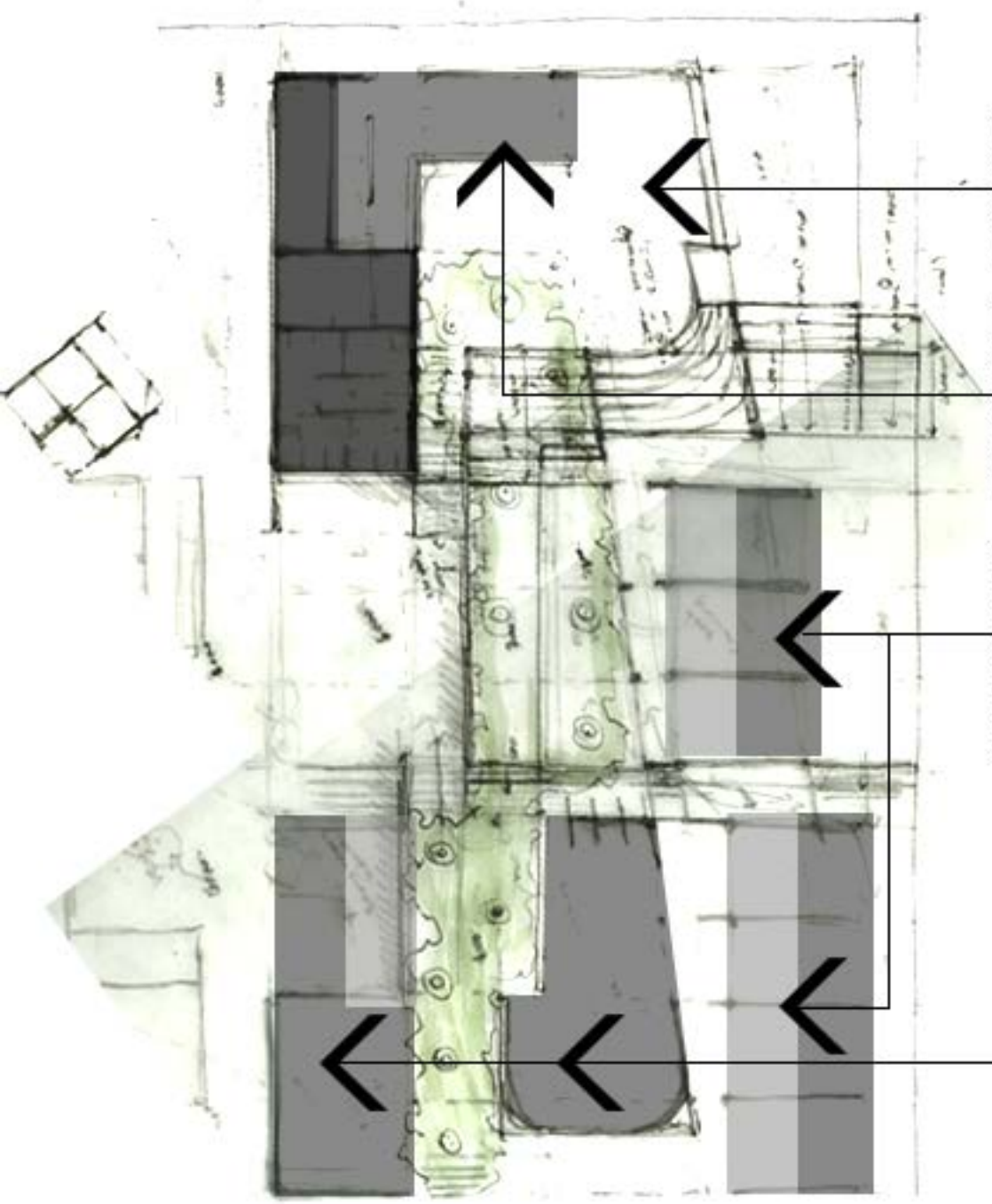
Critique:

Architectural language:
The form and language the building portrays needs to be explored further. The roof as a defining element is challenged by theory of Gehl's (2010) which highlights the potential the facade can play in activating the urban edge conditions.

Spaces of interaction:
The in-between conditions created are too similar in form and shape. There is no hierarchy or elements that successfully define the spaces differently.

Urban conditions:
The facade of the edge condition facing the main road is harsh and uncomfortable as the pergola structure meets the facade.

Multifunctionality:
Spatially the programmes result in creating spaces which aren't used for various functions causing the spaces to become less active. The street is isolated and acts purely as a form of circulation from which the programm



Central communal gathering space

Community vocational Facility: A resource centre is propsed offering access to a library, meeting rooms, study spaces and a computer lab

Public local amenities: hospitality training and food business

Storage and service cores

Local businesses/ workshops and accommodation:
Live/ work units are proposed along the main boulevard. The businesses can be used as workshop areas allowing the spaces to be easlity adapted.

Community vocational Facility:
An artisans industry and training space which consist of theoretical and practical training space

Fig 6.8 Programmatic layout 3, Author (June 2016)

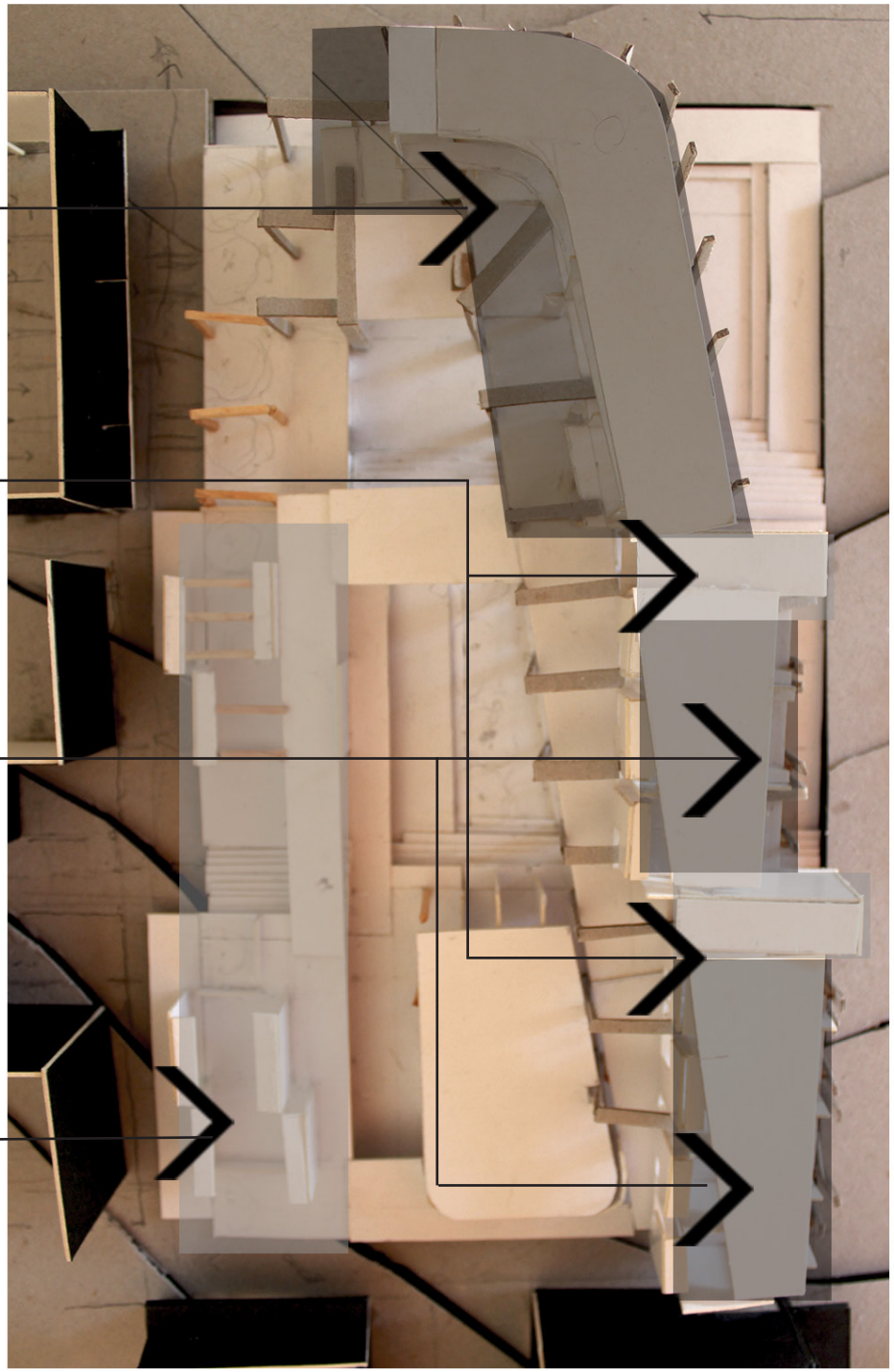


Fig 6.9 Photo of model, proposal 3, Author (June 2016)

Second Iteration

Programmatic intent:

Multifunctionality:
As identified in the second iteration the programme needs to become more adaptable in function. This need for adaptable space is supported by theory and precedents discussed and analysed in chapter 2 which suggests that the constant use of the spaces for different purposes will help ensure that the space is kept alive with activity.

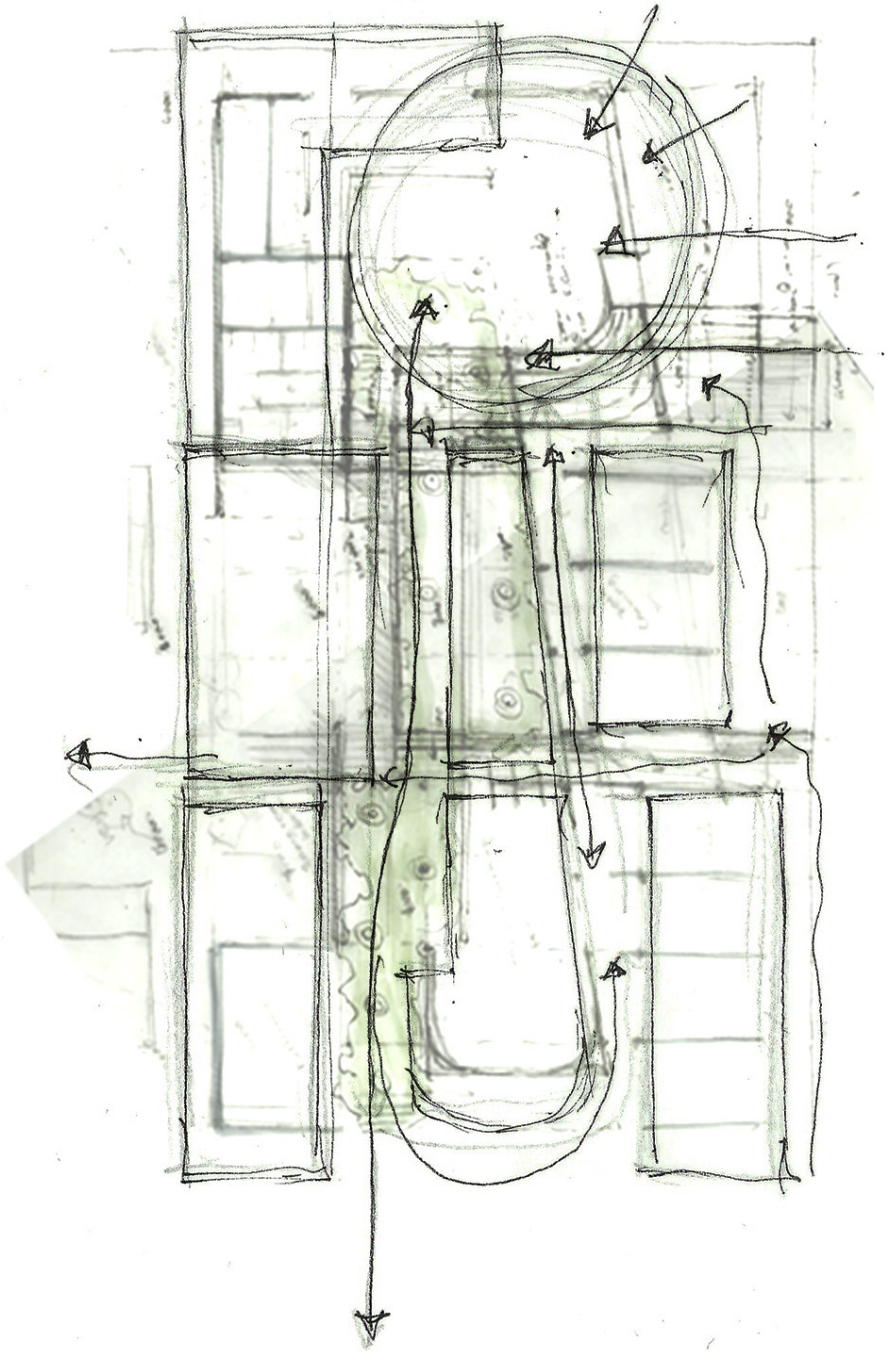
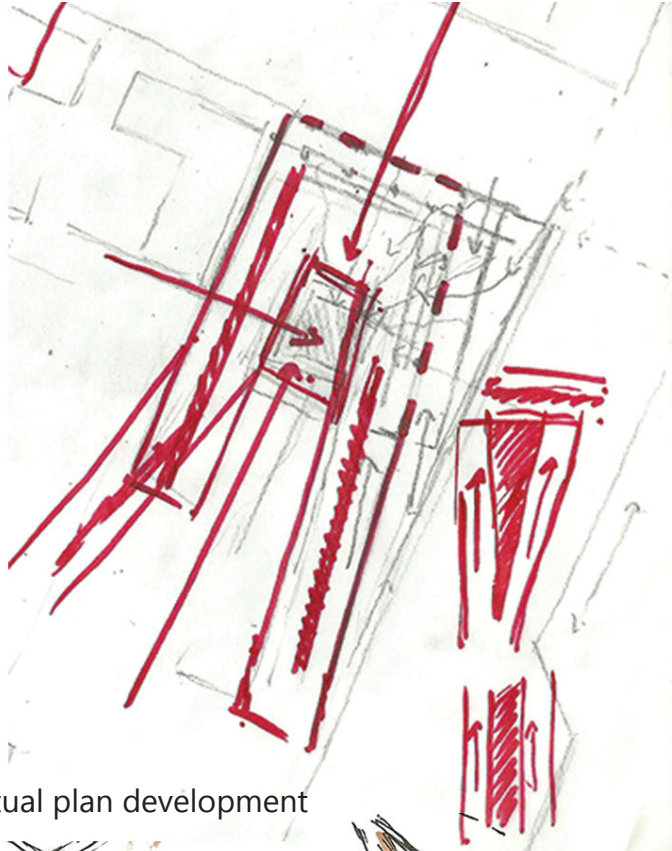
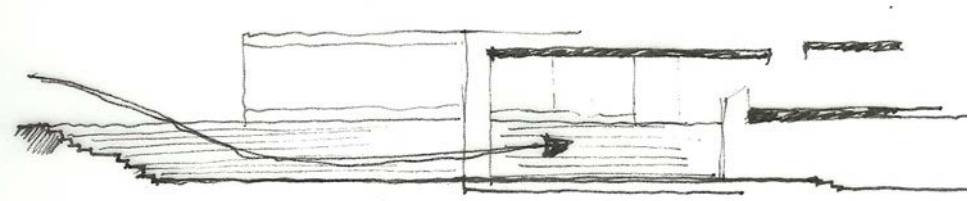


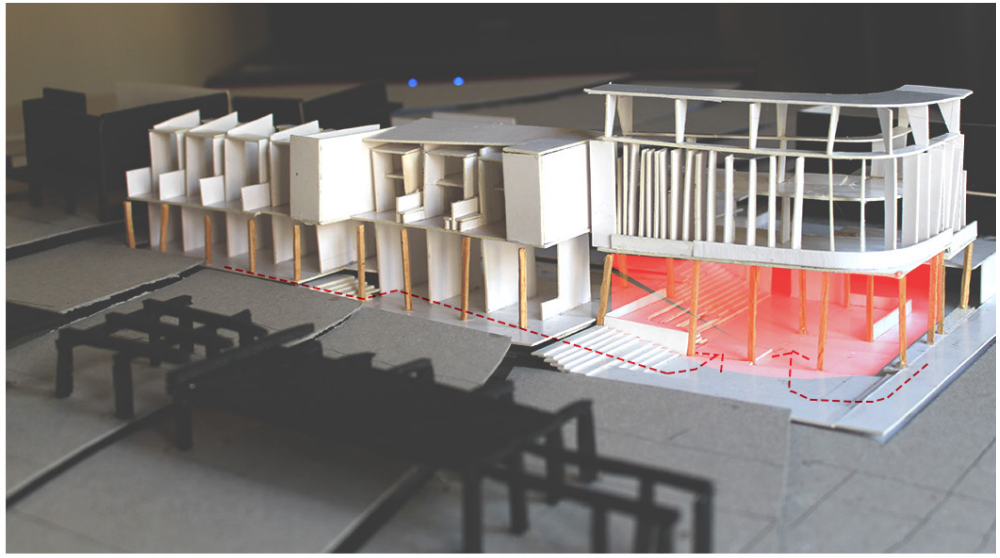
Fig 6.10 Parti diagram 3, Author (June 2016)



Conceptual plan development

Romania School section showing level change





Edge conditions, facade as defining element

Fig 6.11 Sketches and photos of model, proposal 3, Author (June 2016)

Architectural language:
In support of considering the facade of the building as a defining element, a relation is drawn to Lefebvre's (1987) theory on the production of space. Lefebvre (1987) suggests that people shape space naturally, socially and simply by how they use it every day. It is then intended that the architectural form explored defines space and programme well not limiting the extent to which the structure can be inhabited, changed and appropriated by the users. Lefebvre's (1987) theory of how space can be perceived supports the notion of the facility as a microcosm of society where people are able to socially interact with one another in society.

Spaces of interaction:
The second iteration is an amalgamation of the lessons learnt from the previous iterations. The in-between space both defines and is defined by the built form. This strikes a good balance between the formally programmed spaces and the in-between space where informal everyday activities and interactions between the users take place. This approach to form and space is influenced by the architectural intent and precedents analysed in chapter 3, specifically the Romania school by Herman Herzberger who uses form and the in-between space to successfully create areas where interaction can take place.

Urban conditions:
The floor level of the main public gathering space is influenced by the Romania school's use of public space, by dropping the public gathering space below natural ground level. This helps define the in-between space better by incorporating seating while still directing users into the main public gathering space.

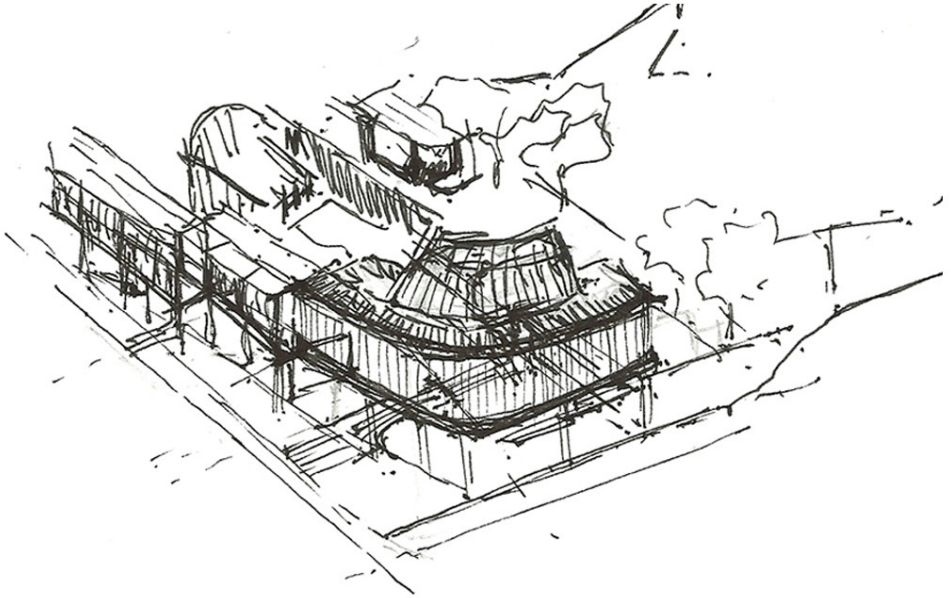
The corner of the facade is rounded at the major street intersection. This is done in order to emphasize the continuity of the form in space. This naturally directs the users into the main public gathering space.

Multifunctionality:
The main intent is to create space that can respond freely to changing programmatic requirements as previously highlighted in chapter 3 of the dissertation. With the programmes able to adapt more freely the street is activated promoting a space that can be used for multiple functions.

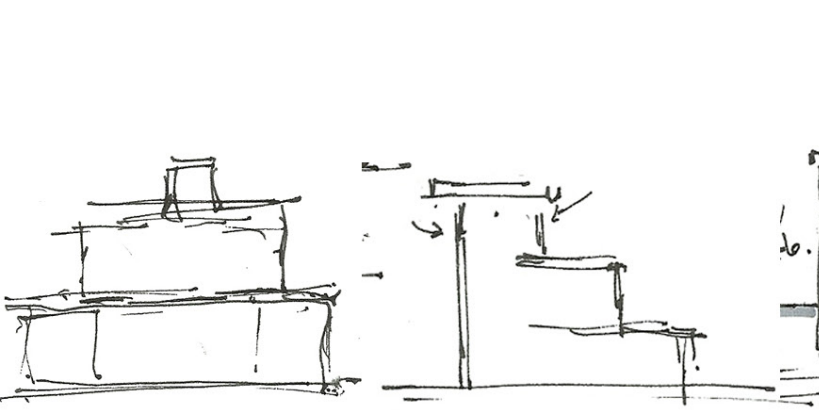
Spatially the intent of adaptability is achieved by introducing structural vertical elements which allows for the in-between space to be more easily adapted. This can be seen in the thumbnail sketches which explore raising the built form off the ground floor level allowing for the ground floor level to become a versatile and adaptable public space.

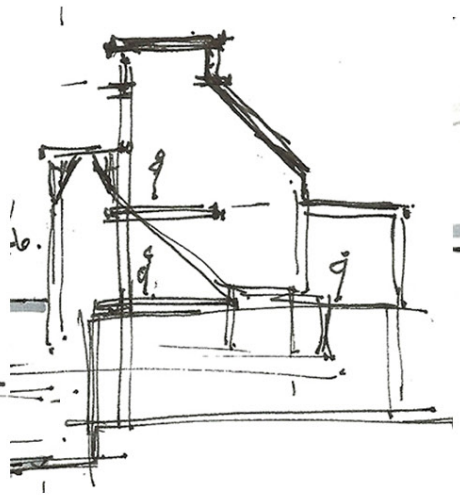
Critique:

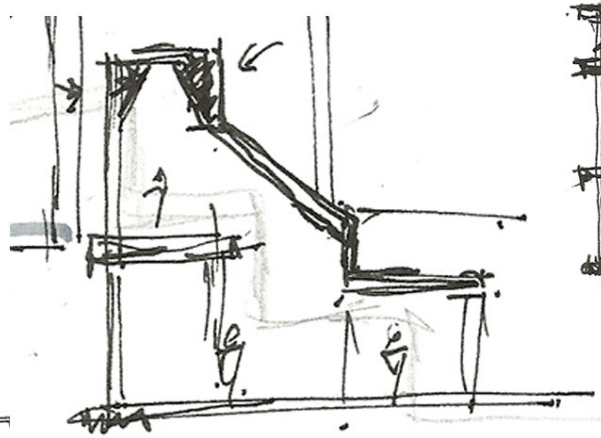
Urban conditions:
The concept of a learning street as well as the spatial intent diagrams, that were still developing at this stage of the design process, helped guide the author in defining the in-between space better. As a result the spatial ordering was positively received by the lectures.
The facades facing the main road begin to express verticality within their form where as the facades facing the courtyards express horizontality. The critique suggested that this verticality and horizontality be defined and expressed better in order to explore the architectural language these elements begin to suggested.

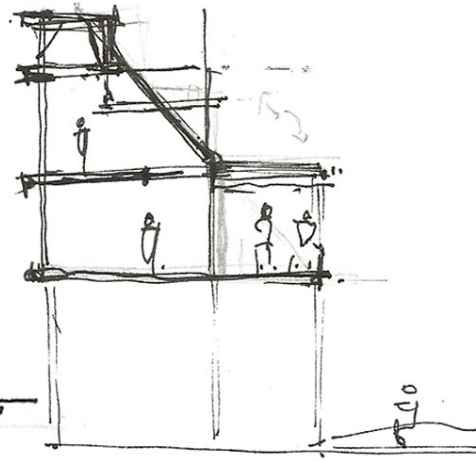


Thumbnail sketches exploring edge conditions









Exploration of resource centre roof and form

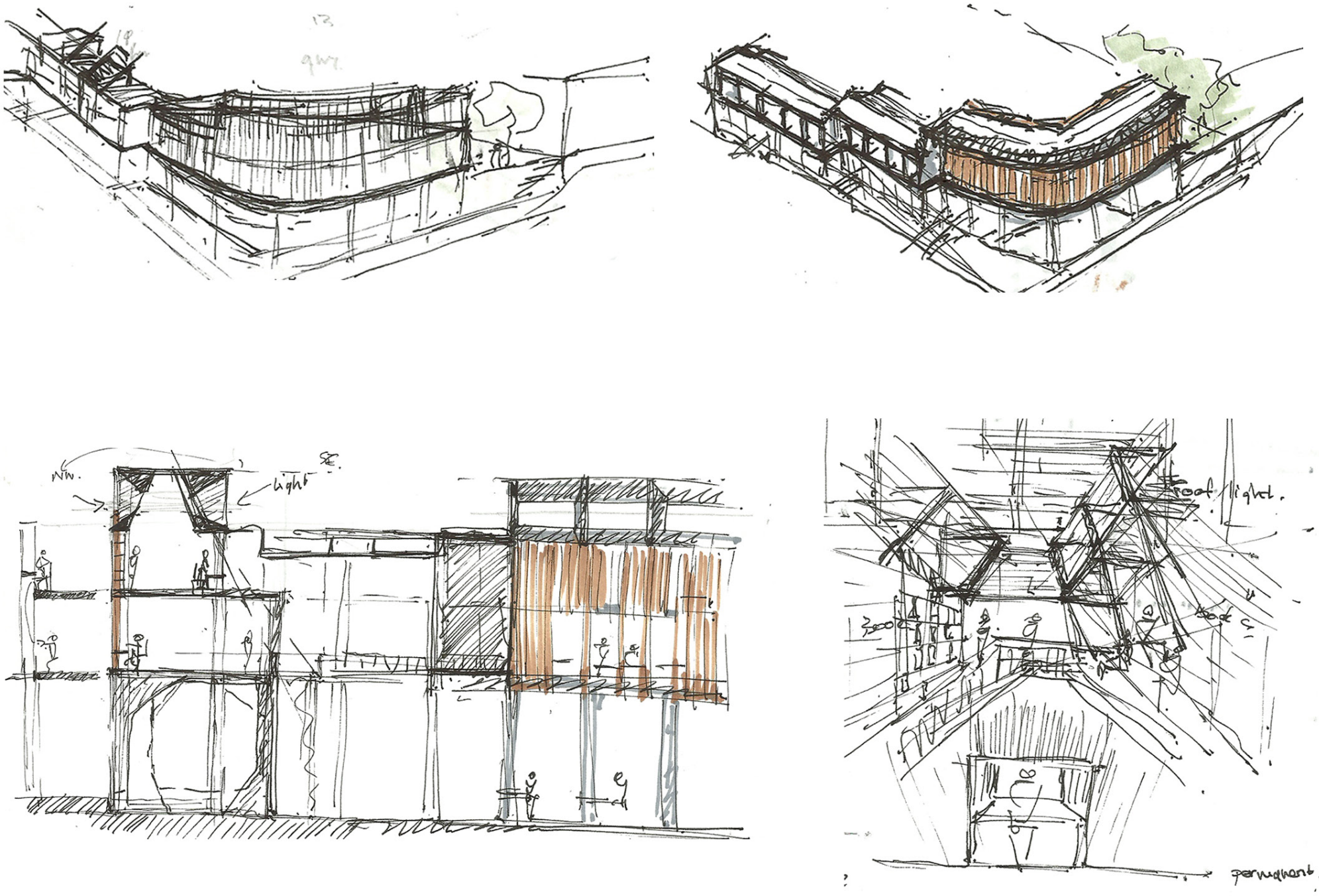
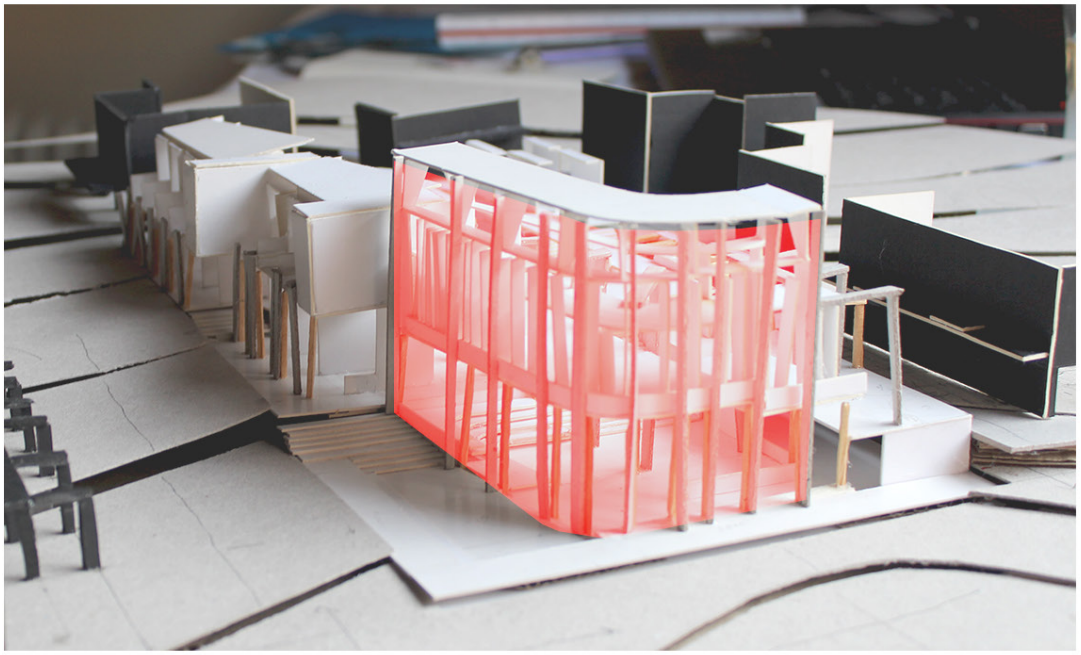
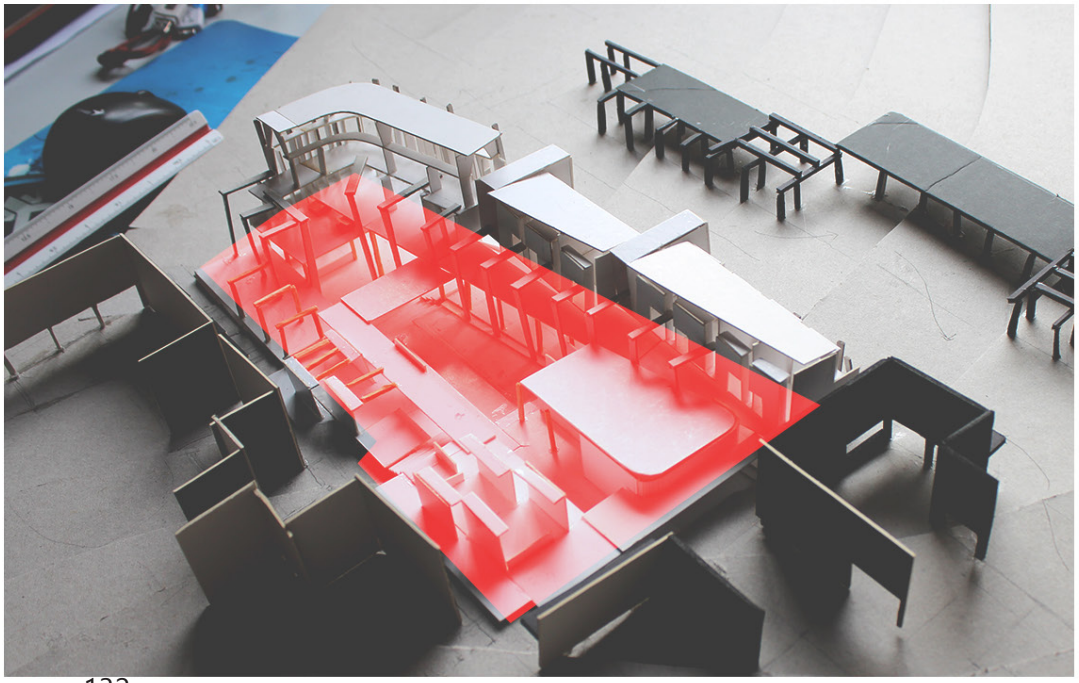


Fig 6.12 Design development sketches proposal 3, Author (June 2016)



Iteration 3.1



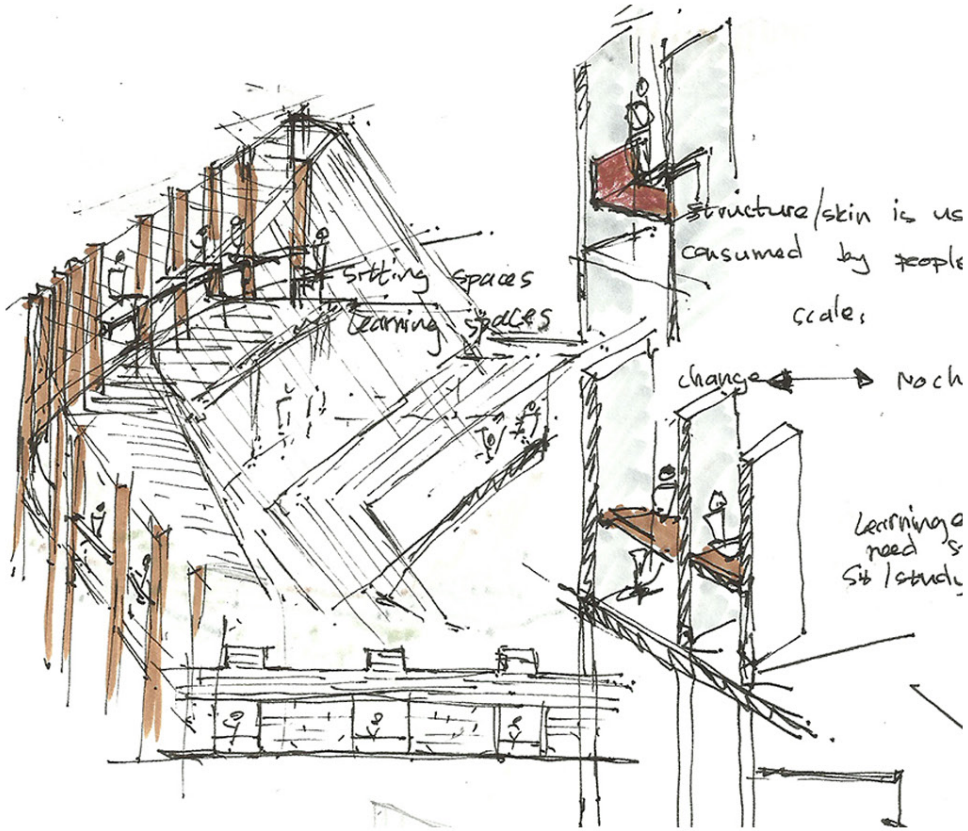
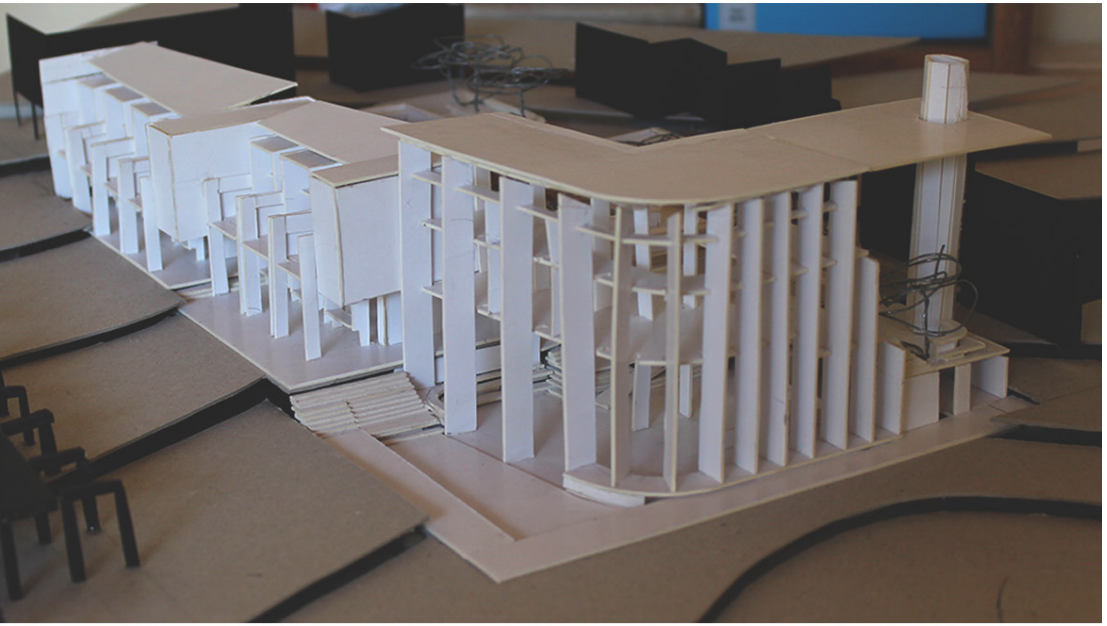
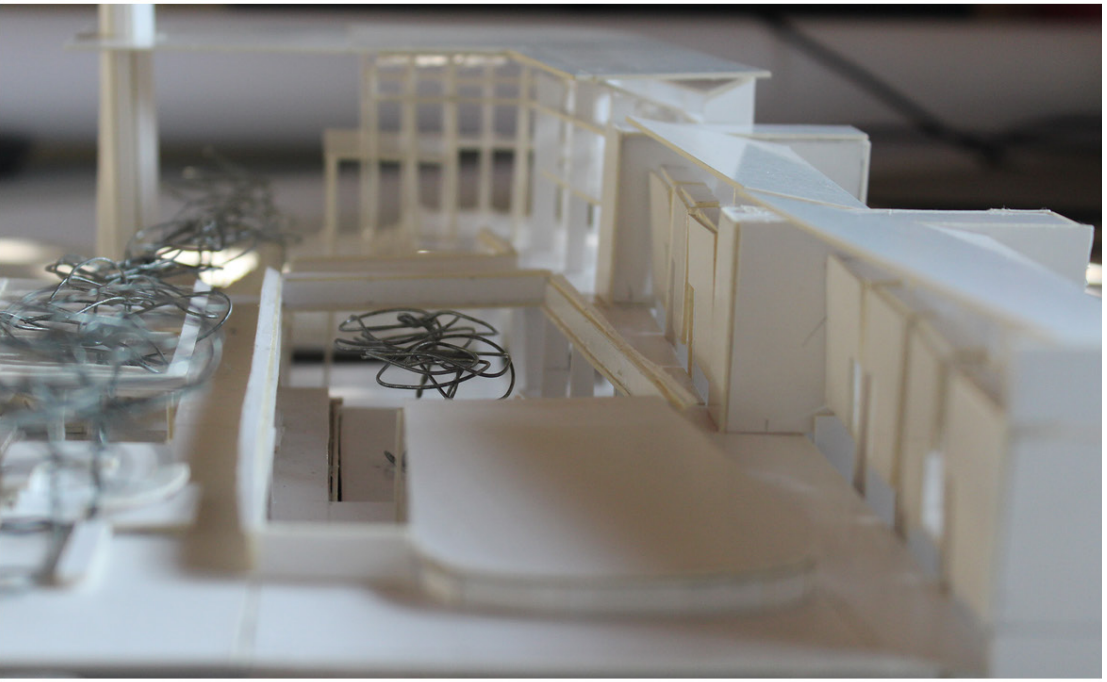


Fig 6.13 Sketches and photos of model, proposal 3, Author (July 2016)



Iteration 3.2



Third Iteration

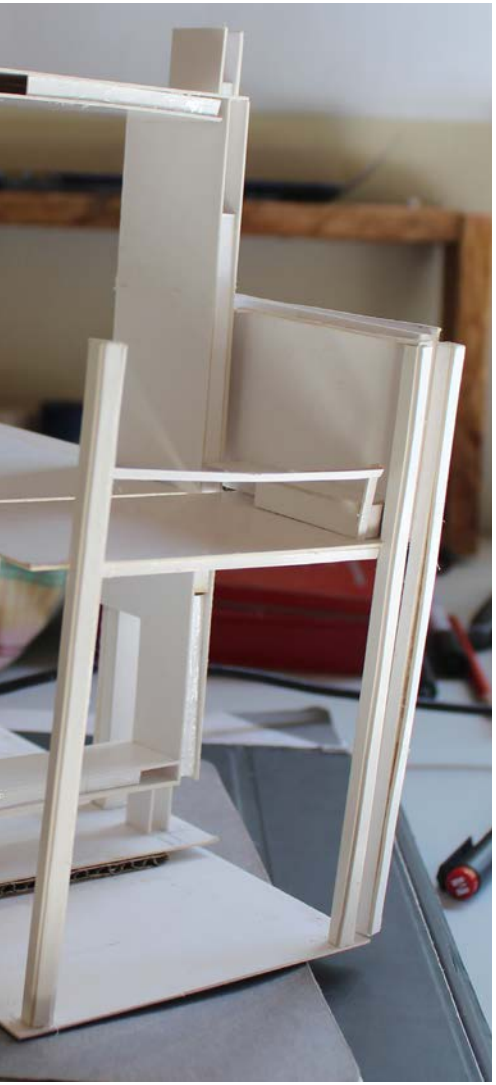
Architectural intent:

Verticality and horizontality:
Based on principles laid out in Chapter 3 and with specific reference to Hertzberger's (2008) theory that envisions educational facilities as a micro-city, the form's response to its urban environment becomes important. This is achieved by expressing the verticality of the facade which in turn symbolizes and suggests the movement of people into the central communal space while the horizontality of the inner space is expressed and symbolises the idea of holding and containing people which spatially encourages social exchange between people.

Live/ work units:
The facade as a layered component which offers various forms of thresholds and gathering spaces, as discussed in chapter 3, is spatially explored in the layout and form of the live/work units. As can be seen on the following page, horizontal and vertical plains protrude out and sink back in which allows for a layering of space and threshold to occur.

Theoretical training and study spaces:
The main intent was to explore how space can be adapted and changed in order to be used for various functions. This area can be used as another movement route through the site. The learning spaces then form nooks on the path where one can pause and reflect. This idea of learning and movement directly relates back to the concept of learning streets which is discussed in Chapter 5. The seating was influenced by the robust nature of the service centre pay points, designed by Piet Louw, as the learning spaces should be made of robust forms that can be interpreted freely by the user. Spatially the idea then is that the learning pods are scattered along a main axis which consists of a line of trees. This edge condition, as opposed to the edge condition along the main road, is more open to be changed and adapted by the users and community who neighbour the facility, therefore the intent was for this edge to be integrated into the urban condition surrounding it. This spatially supports *extended school* theory (Hertzberger 2008) as well as citizenship education policy that encourages educational facilities to become more integrated within their surroundings.

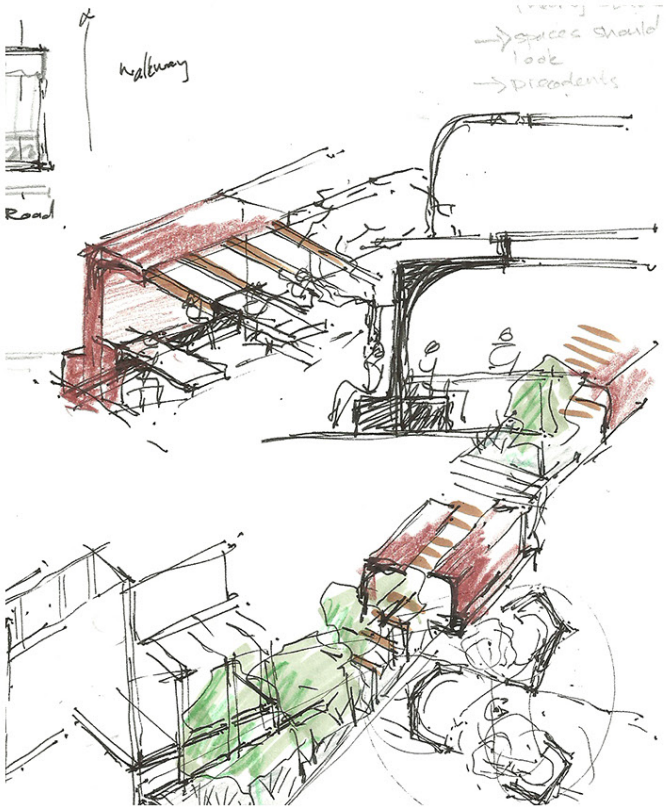
Iteration 3.1



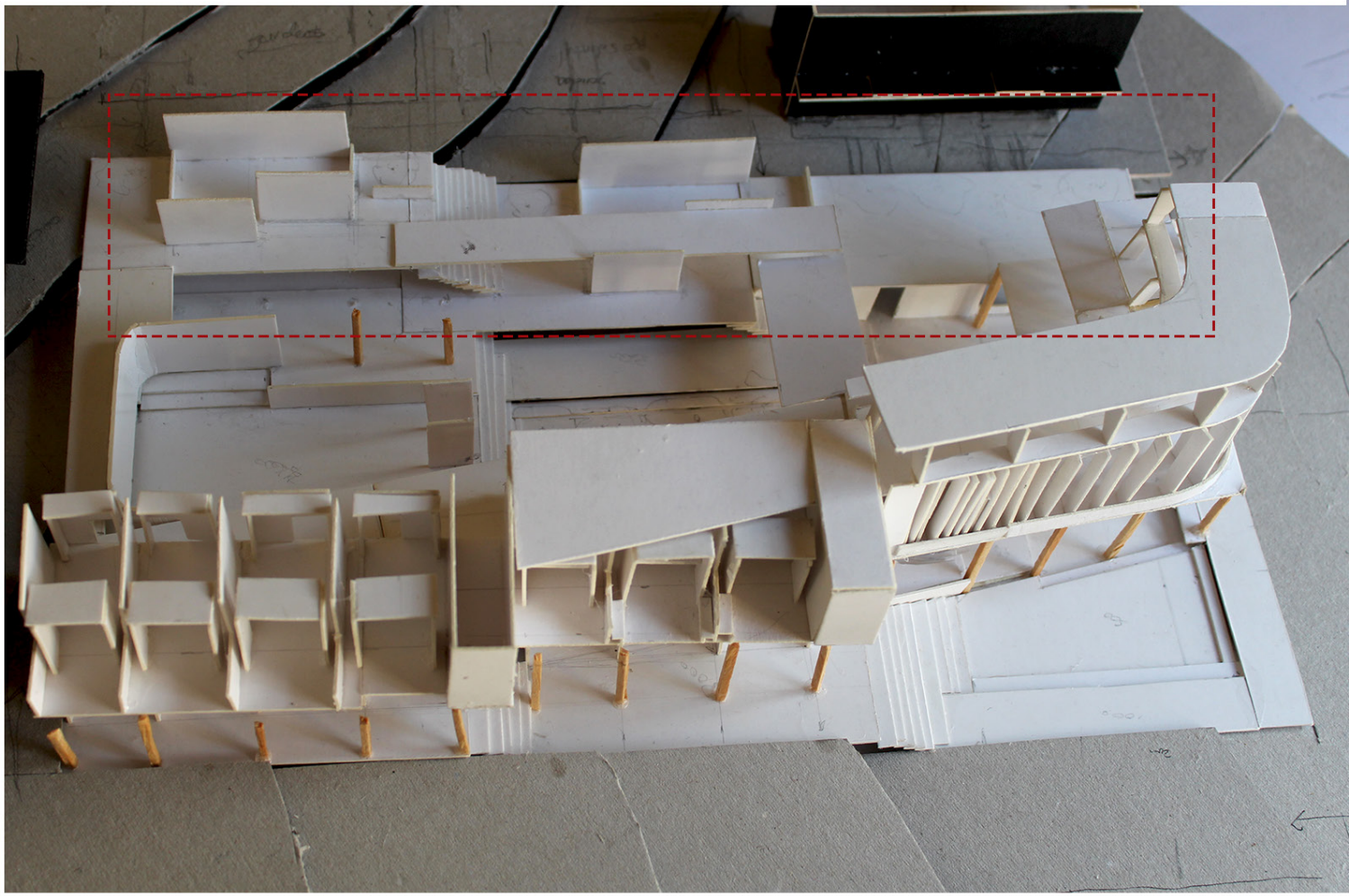
Iteration 3.2

Fig 6.14 model and sketch exploration of live/ work units, proposal 3, Author (July 2016)

Theoretical training and study spaces used by community and learners

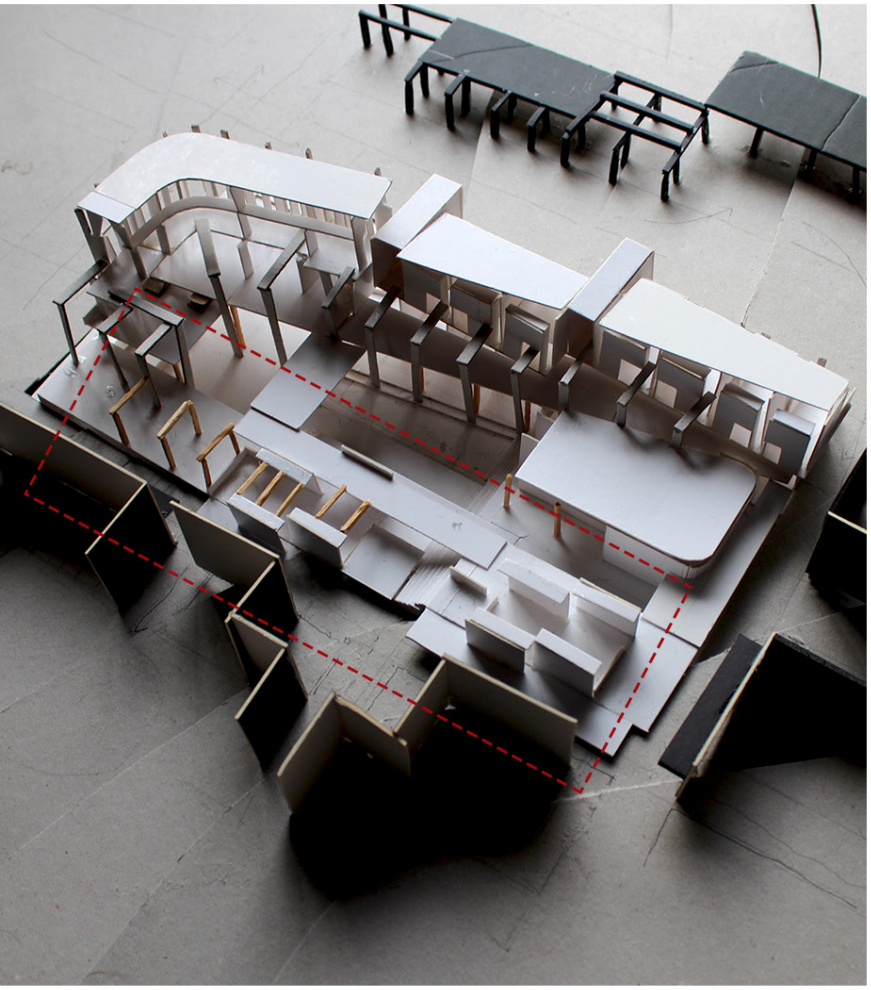


Iteration 3.1



Iteration 3.2

Iteration 3.3



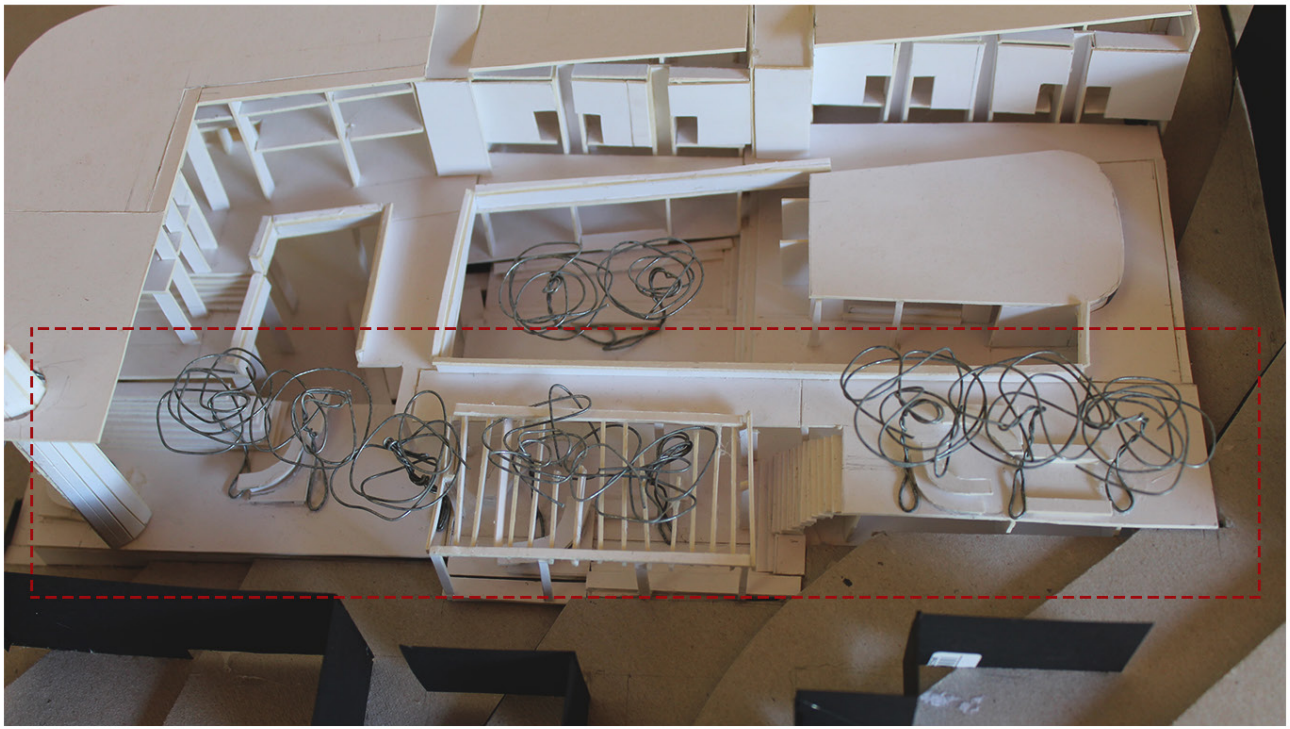
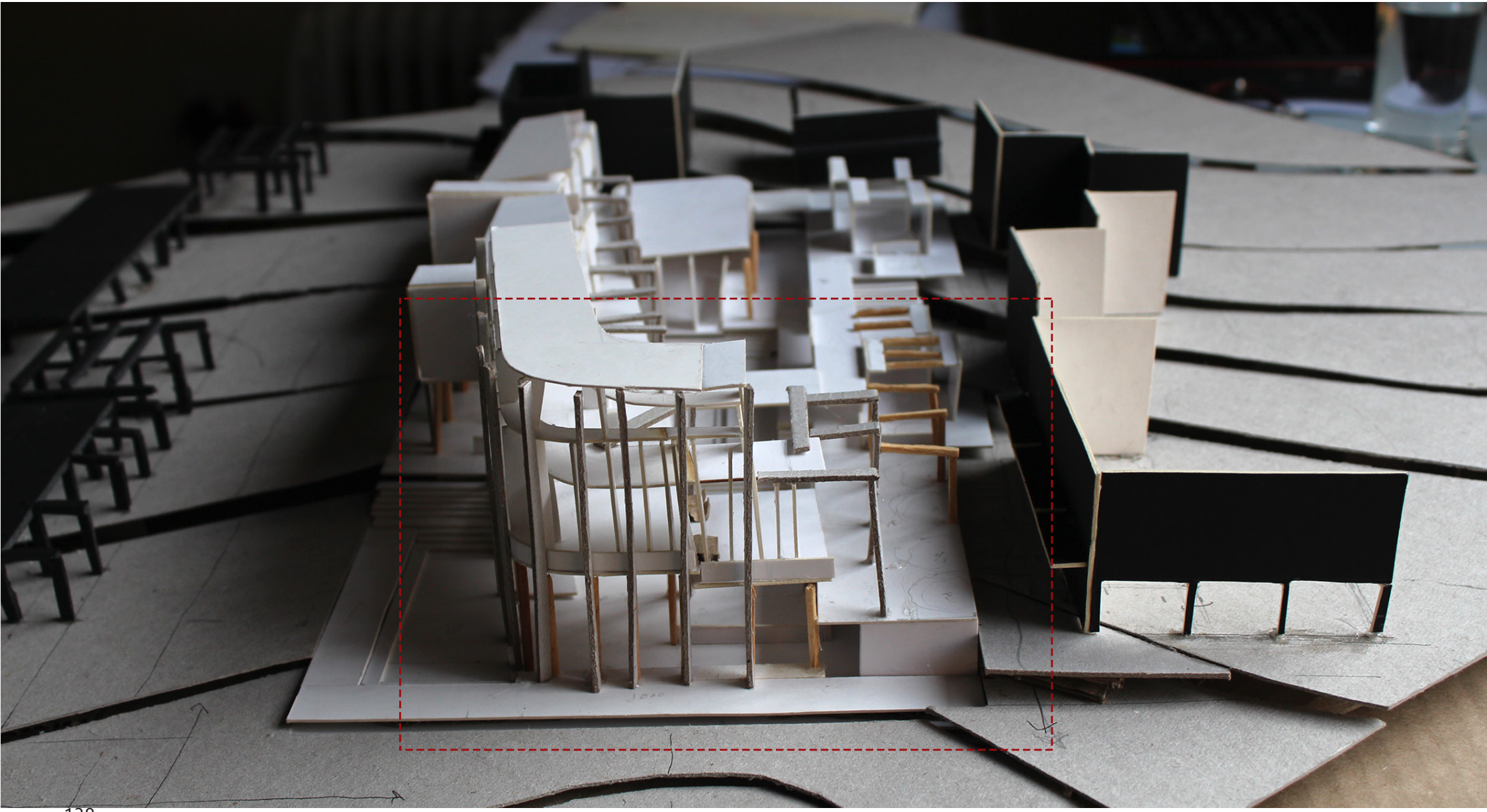


Fig 6.15 Theoretical training and study space, iterations, Author (July 2016)

Roof and furnace condition:

As can be seen below the roof condition ended uncomfortably, feeling unfinished while not benefiting the space as a whole.
The restaurant area functionally lacked an element that would draw heat from the area when cooking, like a furnace. The spatial critique identified that the restaurant area lacks an element that drawers users to the space like a fire place.

Iteration 3.1



Therefore the need to extend the roof condition and introduce a furnace offered the opportunity to do both while benefiting the space as a whole. The furnace acts as a structural component which holds the roof up and becomes a social component as a fire place and pizza oven.

Iteration 3.2

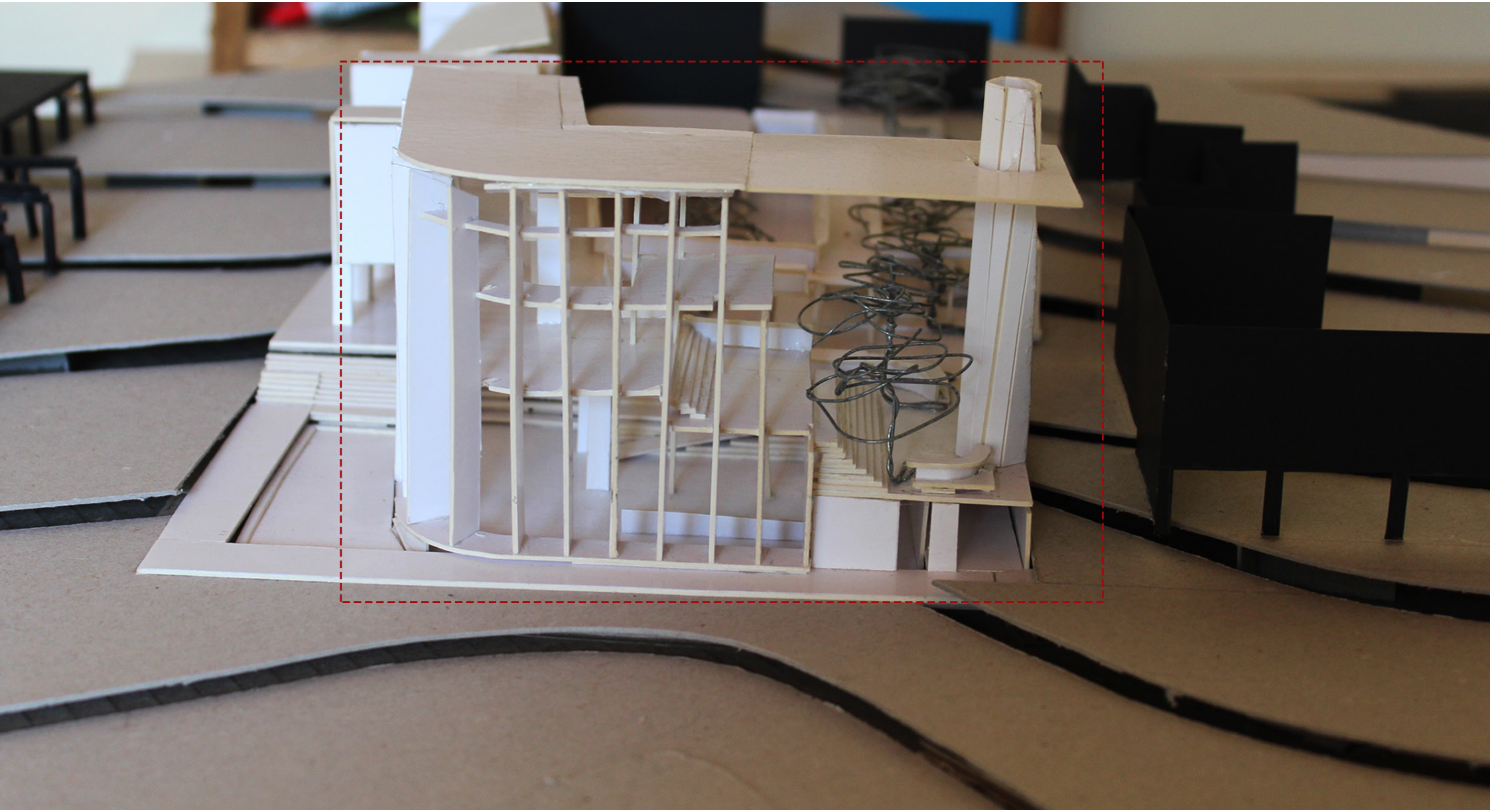
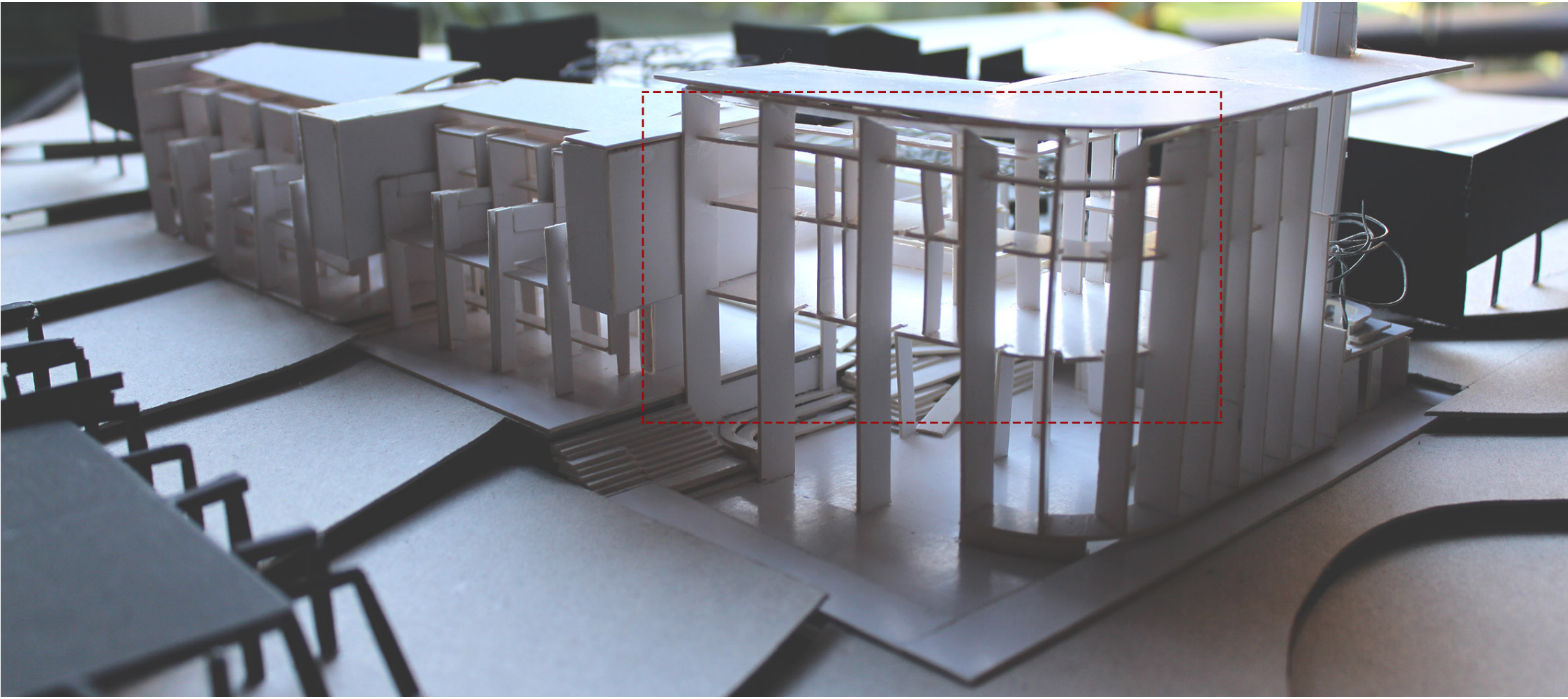


Fig 6.16 Introduction of furnace, iterations, Author (July 2016)

Elevation Development

A this stage of the design process the implication of the architectural language was further explored on elevation, particularly the South East elevation. The corner of the South East facade was found to be the point at which alternative rhythms merged. This corner is also the main entrance to the public square and needed to be better defined. This allowed for the opportunity to relate back to Gehl's (2010) book *cities for people* in which the importance in clarity of the entrance and facade, visual accessibility and transparency, is highlighted. The facade then offers a transparent and interactive facade edge, from both the interior and exterior perspective, by creating boxes in which people can sit and interact.

Iteration 1



Iteration 2

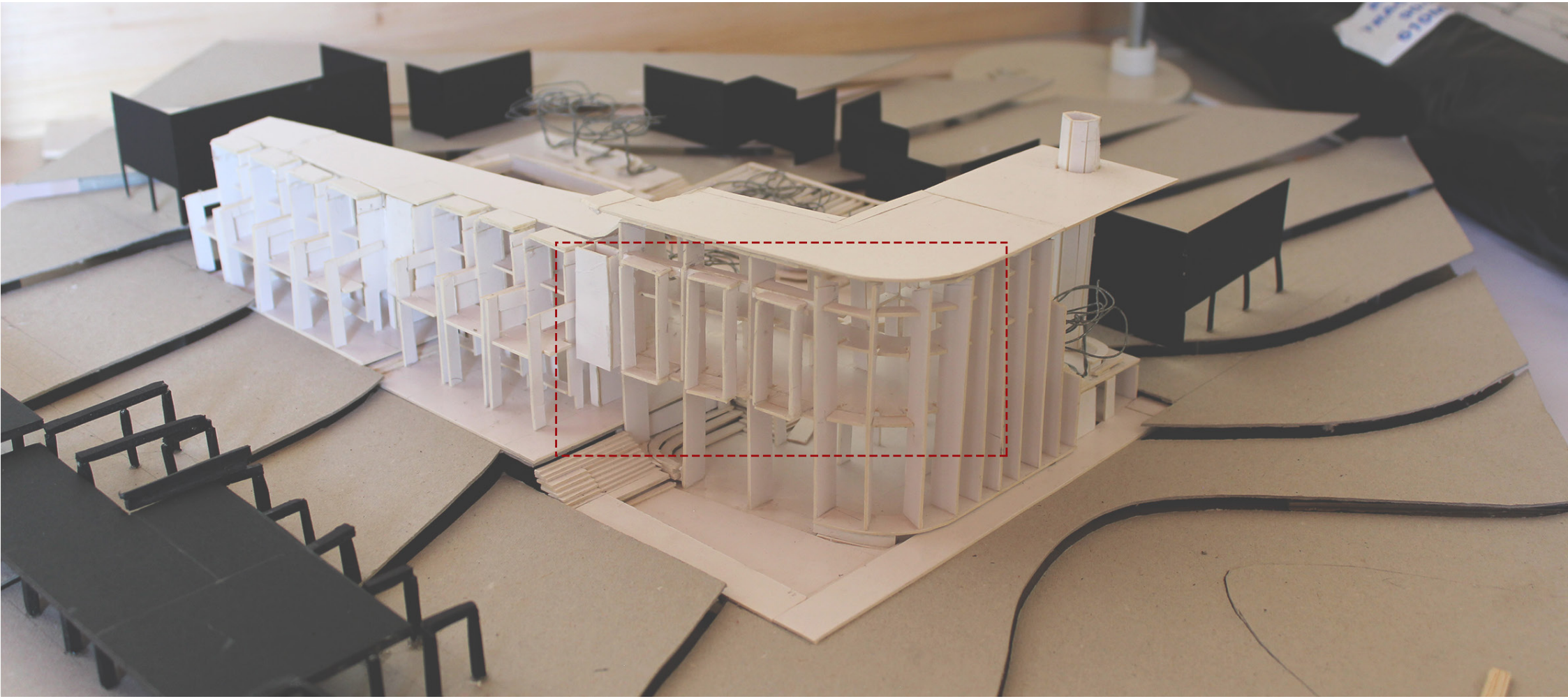


Fig 6.17 Elevation Development, iterations, Author (July 2016)

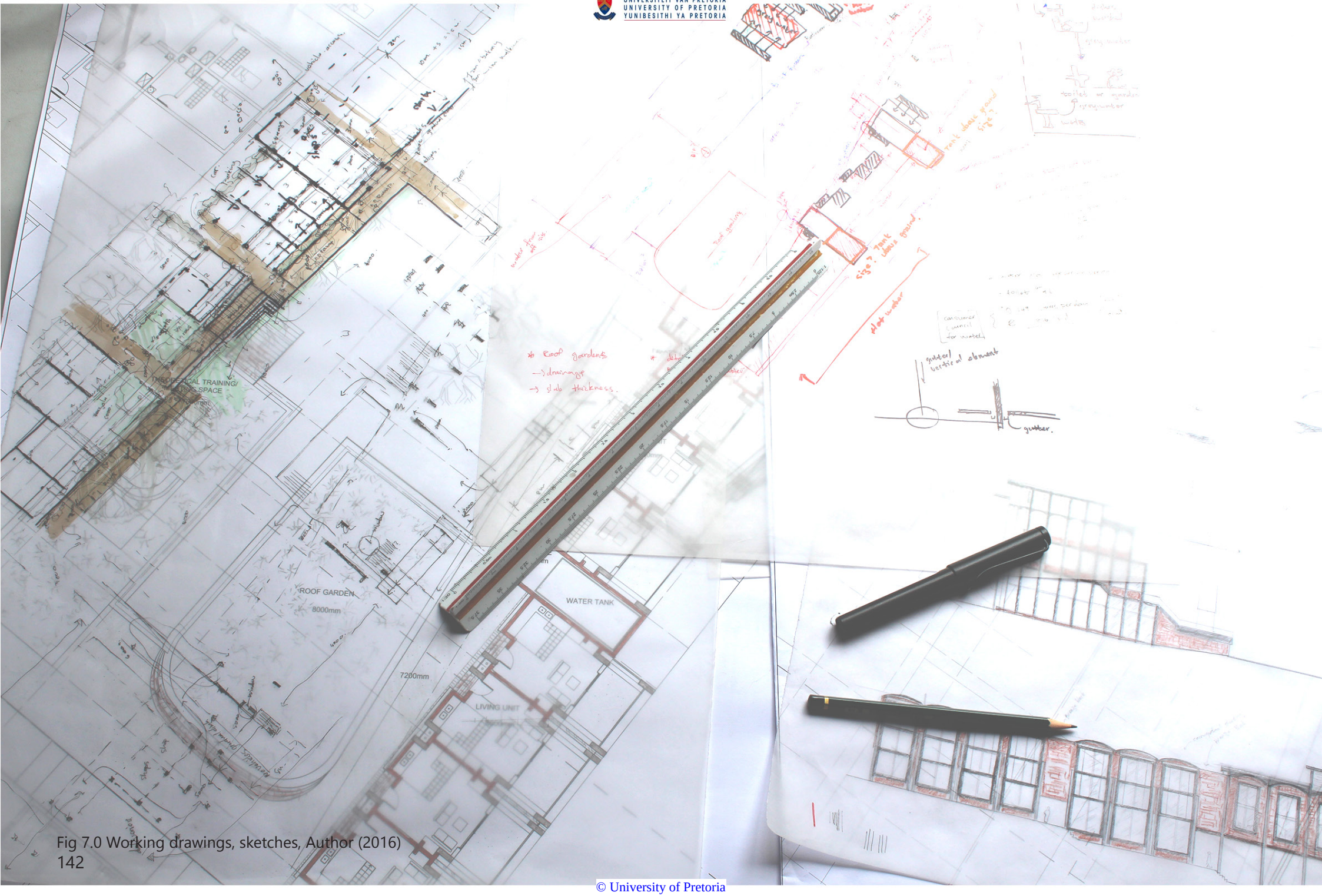


Fig 7.0 Working drawings, sketches, Author (2016)

7 Design Refinement

7.1 Design Development Reflection

Programmatic Reflection

The programmatic intent derived by theory and precedents analysed in Chapter 2 is compared to the programmatic intent and conclusion of the CVF which has been proposed in this dissertation. It is essential these principles be programmatically implemented in the project as it was concluded in Chapter 2 that a citizenship approach to education is supported and encouraged when applying these principles.

Spaces of interaction:
As can be seen in the figure 7.1, the intent of the programme is to frame the in-between space where interaction between the learners and community take place in. Encouraging more active and participative forms of learning to occur, the CVF programmes allow the learners to participate in society as the formal learning environment offers the learner the opportunity to work for local businesses that use the facility as well.

Urban Condition:
The programmatic intent of the urban condition supports the notion that local amenities, which cater for the needs of the community, should be located on the main axis. This challenges the significance of the CVF in the community as an accessible environment is created. Therefore the programmes located on the main urban edge include accommodation for community members as well business/ production space.

Multifunctional:
The programs include a range of multi functional and generational learning activities in order to begin to create a socio cultural environment that supports and strengthens cross discipline interaction between people.

Architectural reflection

Similar to the programmatic reflection, the architectural reflection is based on conclusions made in Chapter 3 and compared to the CVF that is proposed in this dissertation (see figure 7.2).

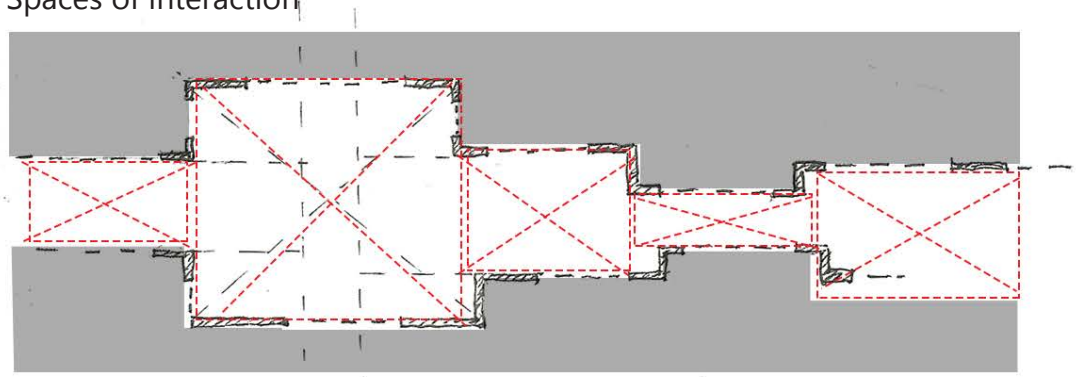
Spaces of interaction:
The need to encourage active citizenship and participation in learning environments is suggested to help build social cohesion in a community. This is in response to identifying that currently educational facilities are isolated and segregated entities in their environment.

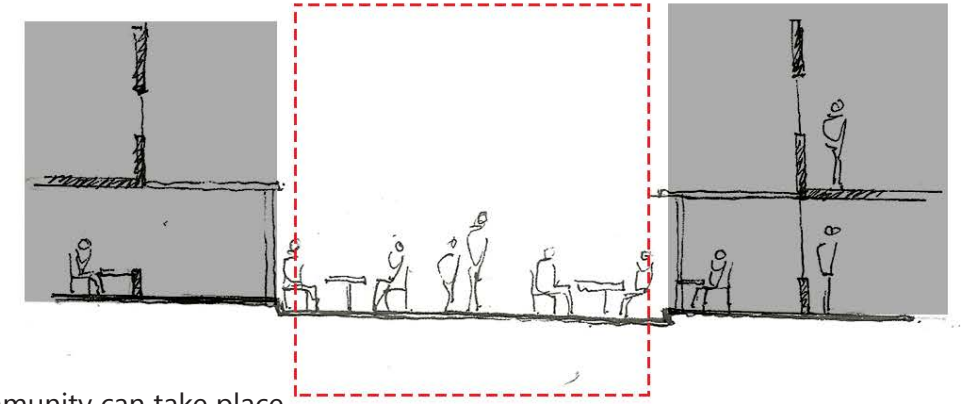
Viewing the educational facility as a micro city offers a whole new dimension to how educational space can be viewed. In the project a public central communal gathering space acts as a node from which streets interlink, the communal gathering space expresses a sense of collectivity as people are drawn together. Pedestrian movement is then organized to run through the communal gathering space. In an attempt to create social cohesion, the learning street connects and stitches the individual entities together encouraging social exchange to occur. The built forms frame the learning street and communal gathering space becoming an extension of the street by use of thresholds and layering of the facade condition in order to encourage various forms of gathering to take place.

Urban condition:
The spatial intent of the projects urban condition is supported by the notion of allowing for permeable and visually accessible edges for those using the space which relates back to Alexander (1971) and Gehl's (2010) theory on successful urban space. Soft edge conditions are achieved by using stairs and level changes to help define space well not alienating space from its surroundings. This approach to the urban condition helps the CVF extend into the community, a key component in addressing and overcoming inequality in society.

Multifunctionality:
In order to achieve spaces than can be defined and adapted for various uses by the user and allow the layout to respond freely to programmatic requirements, structural vertical elements were incorporated which allows more freedom in the use of space. The section (figure 7.3) highlights the use of vertical elements which frame space but do not confine the extent to which the space can be used, indicating that the space can be used as one space or as smaller spaces for various activities.

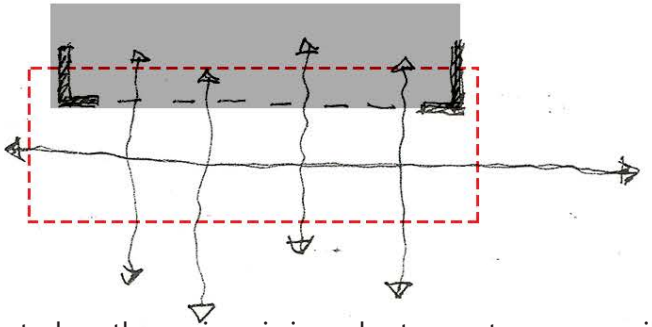
Spaces of interaction

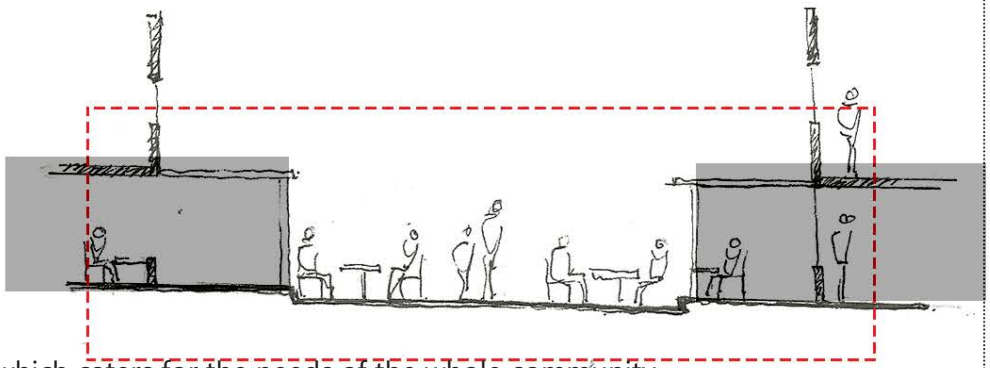




The programmes frame in-between space where interaction between the learners and community can take place

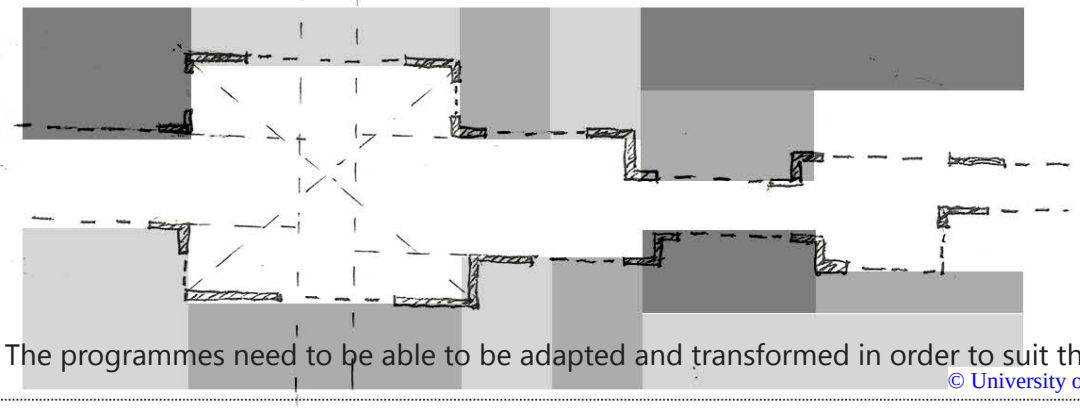
Urban conditions

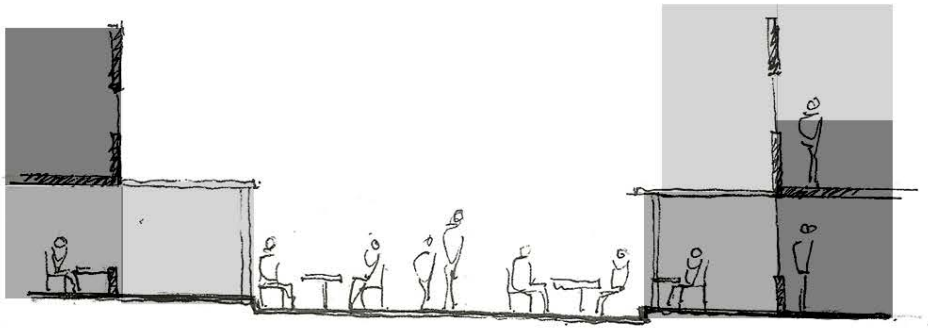




Local amenities are situated on the main axis in order to create an accessible environment which caters for the needs of the whole community

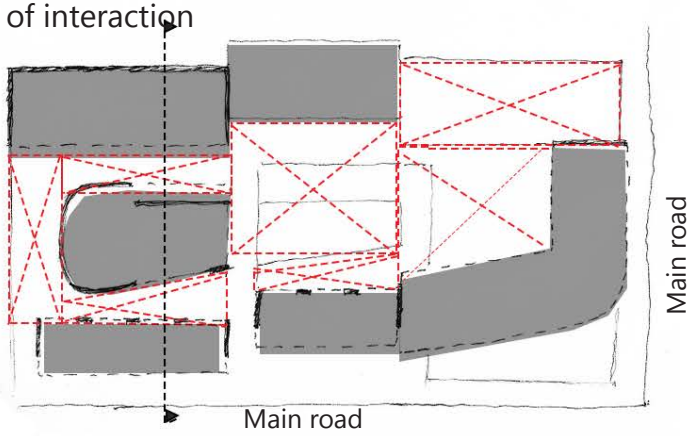
Multifunctionality

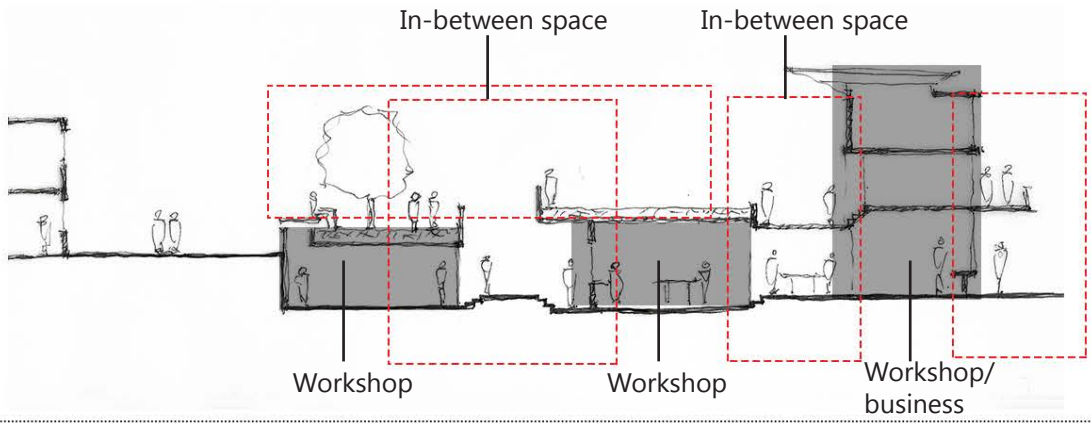




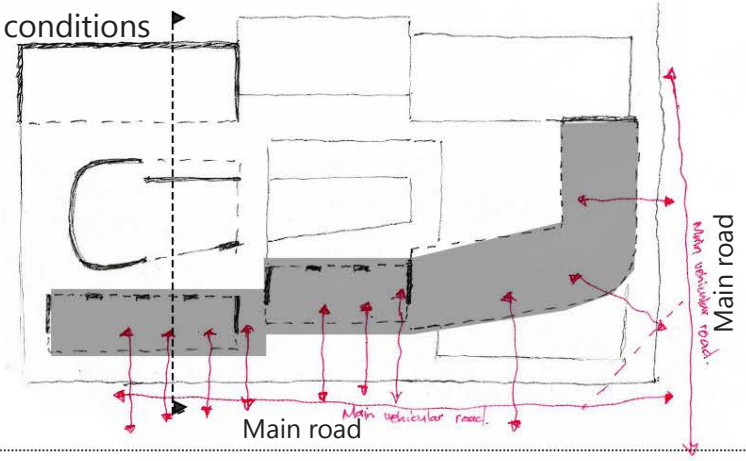
The programmes need to be able to be adapted and transformed in order to suit the needs of the community.

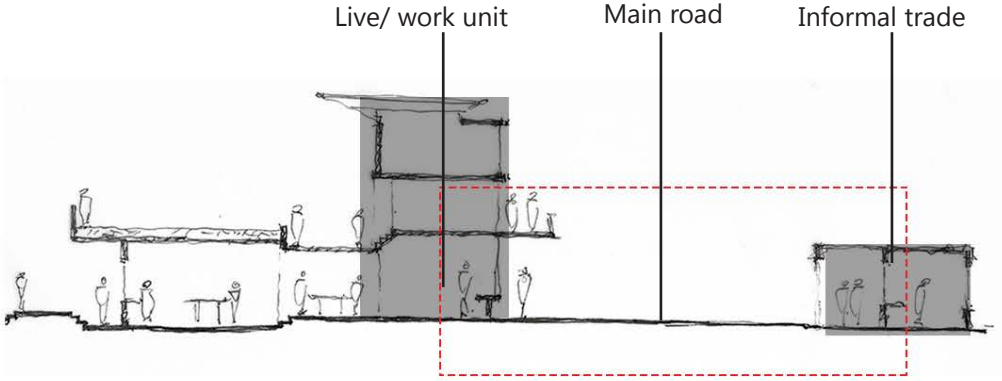
Spaces of interaction



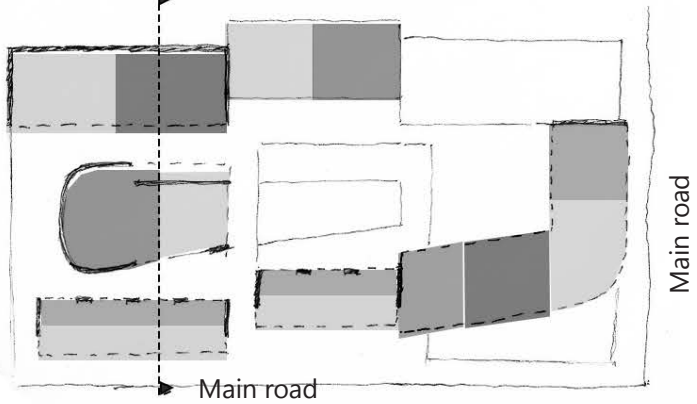


Urban conditions





Multifunctionality



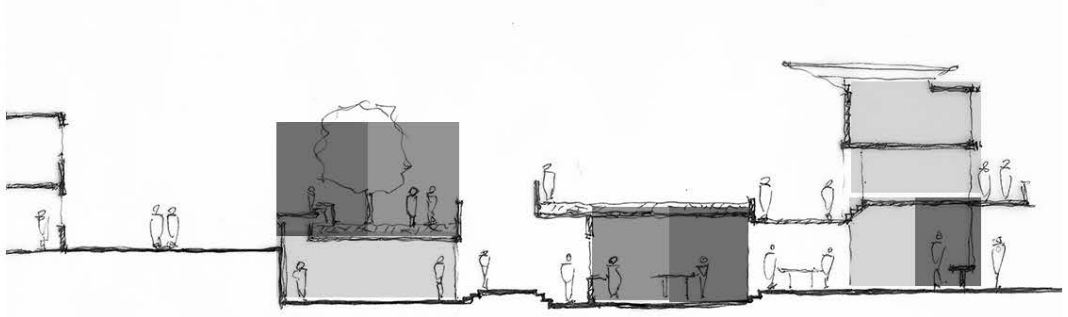
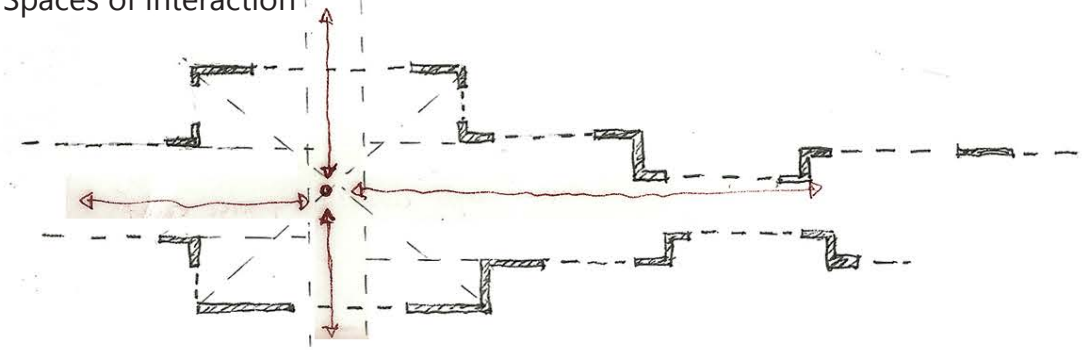
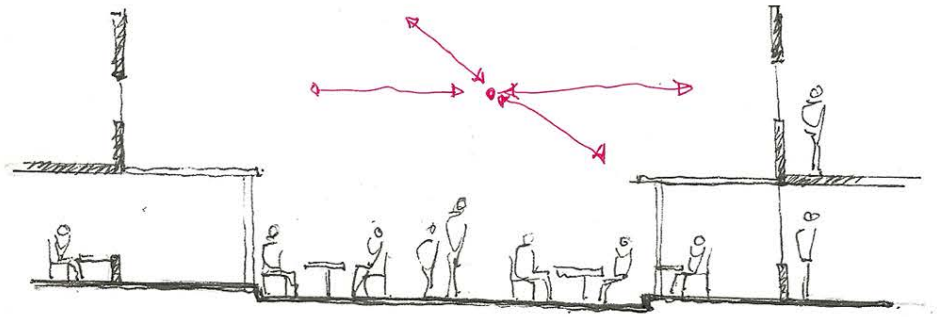


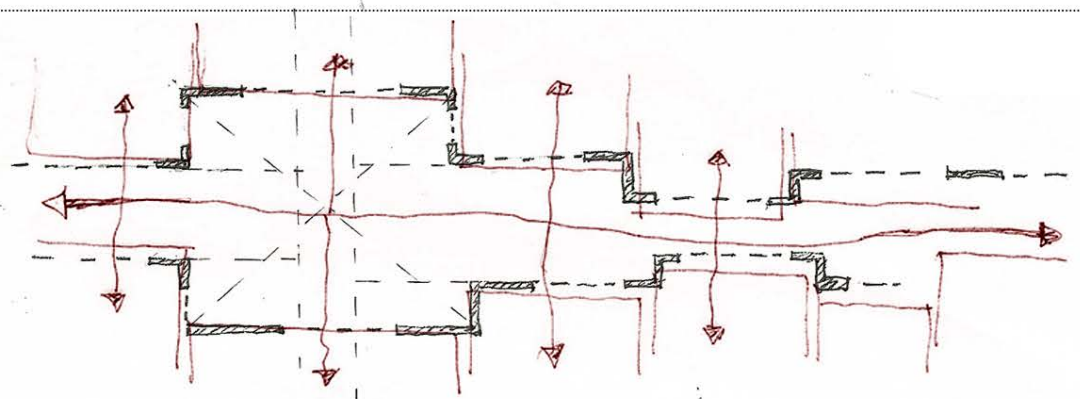
Fig 7.1 Programmatic Intent, Diagrams, Author (2016)

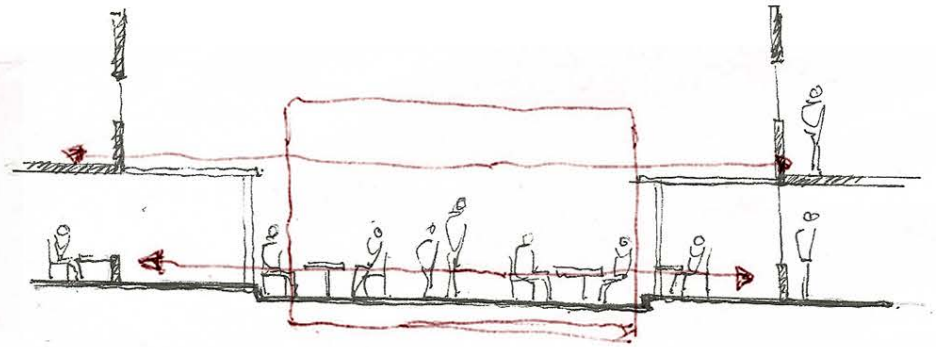
Spaces of interaction



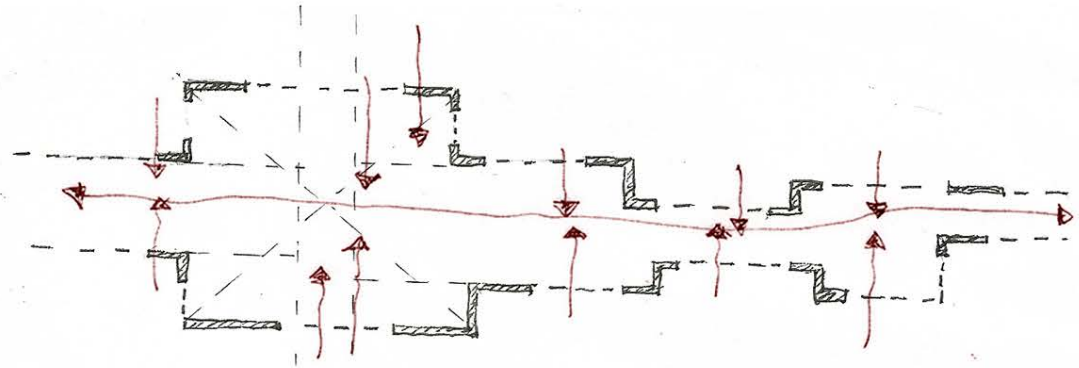


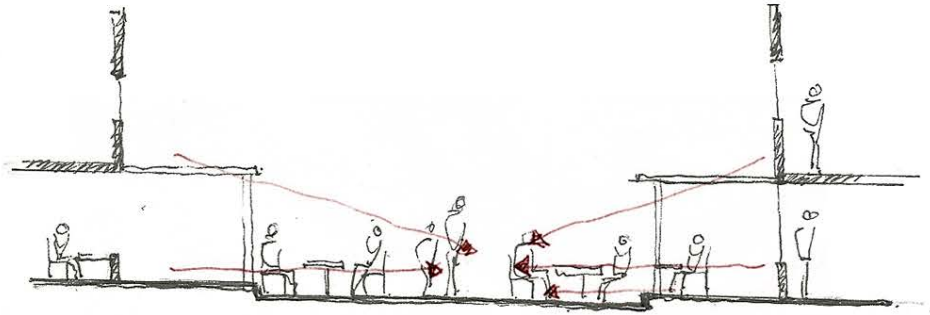
A public square becomes a node from which streets interlink





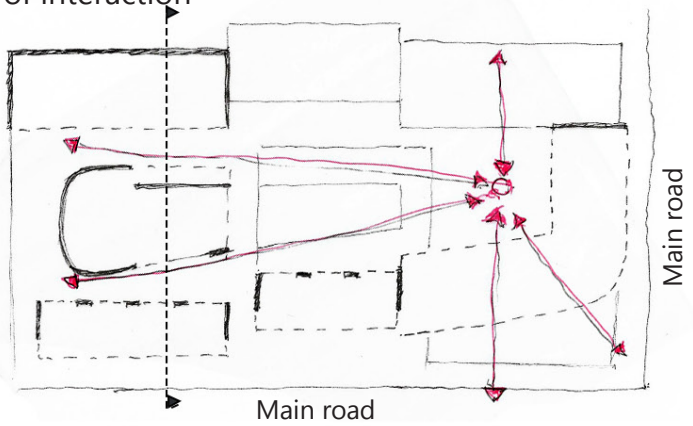
A street is used to connect and stitch individual entities together in order to create socially cohesive spaces that encourage social exchange to occur

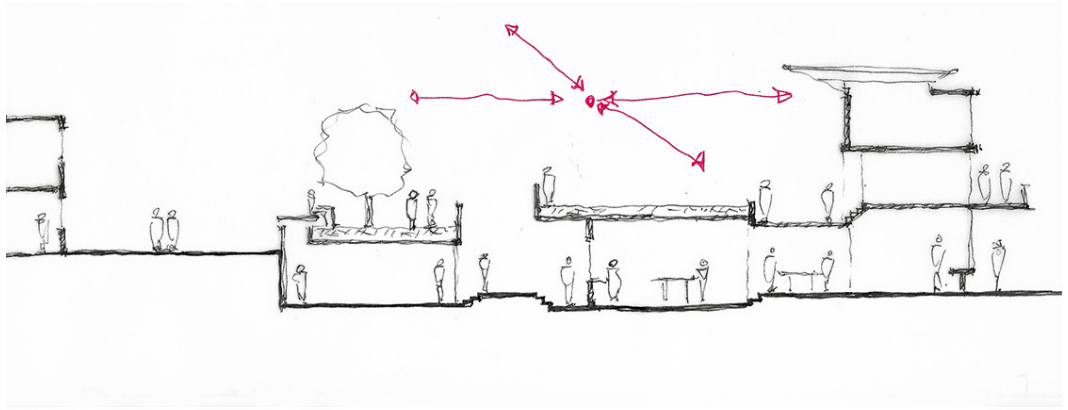


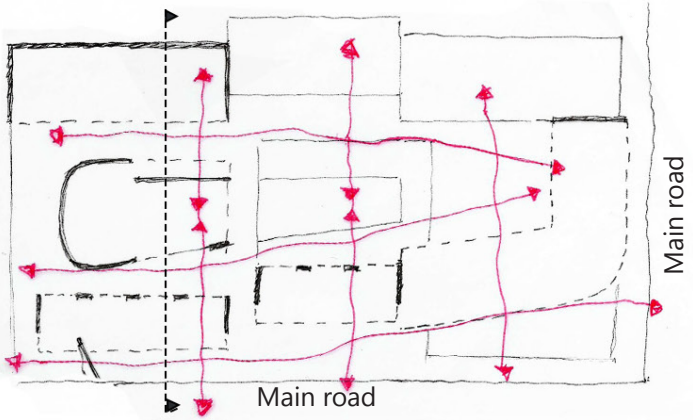


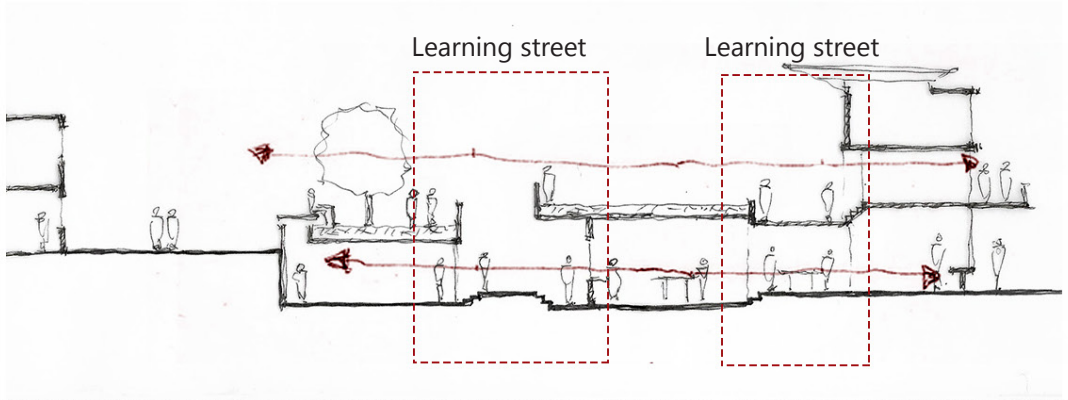
The built forms frame the public street and square becoming an extension of the interior spaces

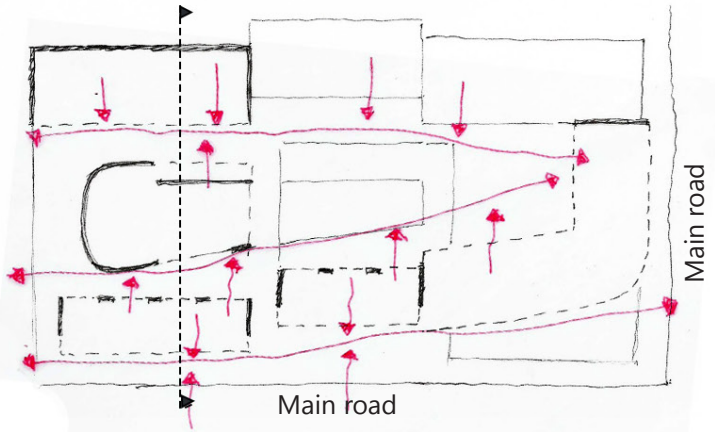
Spaces of interaction











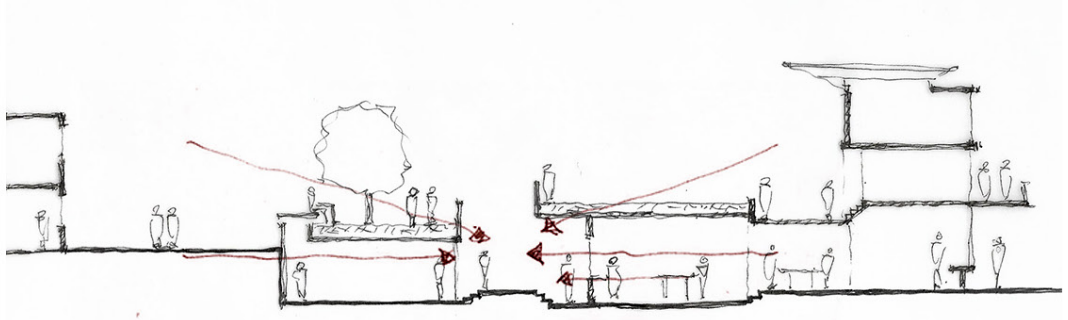
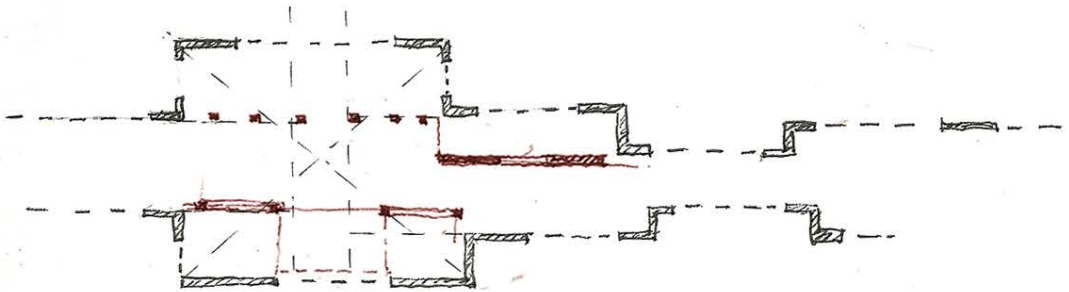
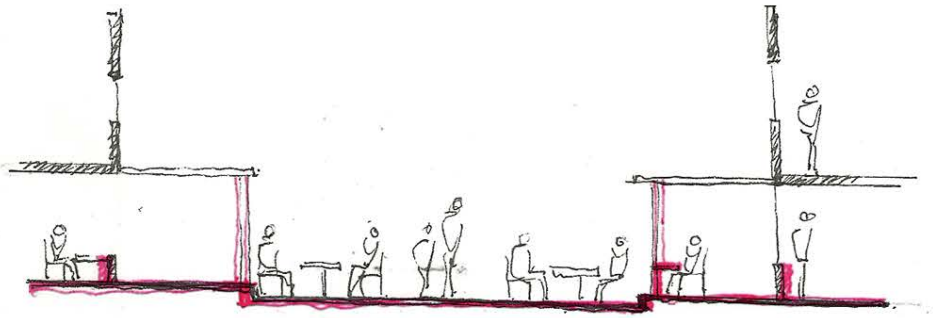


Fig 7.2 Spatial Intent, Diagrams, Author (2016)

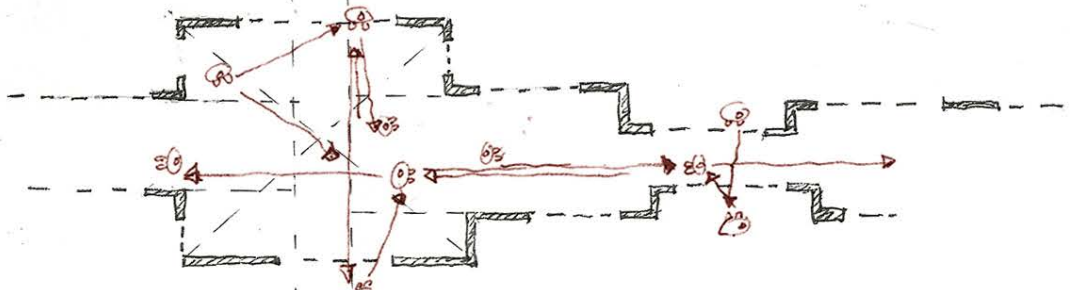
Spaces of interaction

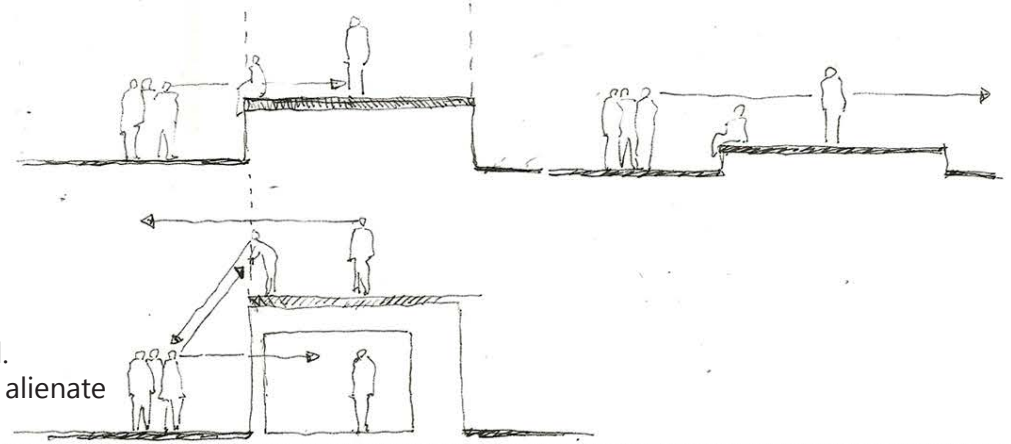




The facade conditions are layered offering thresholds that allow for various forms of gathering to take place

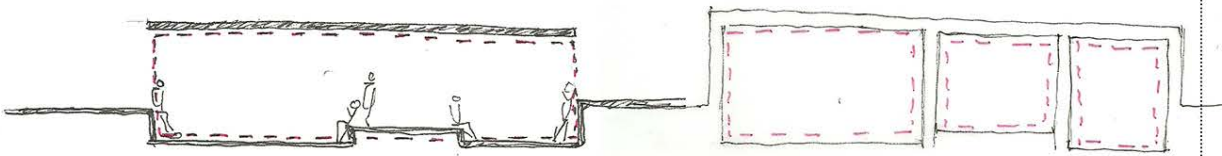
Urban conditions





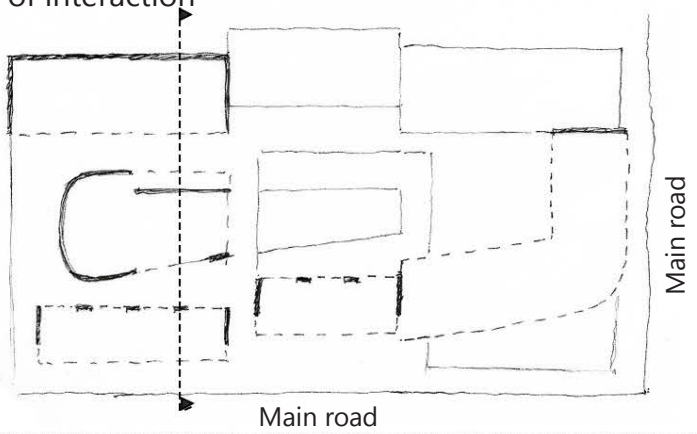
Permeable edges that provide visual accessibility for those using the space is needed.
Soft edge conditions such as stairs and level changes help define space yet does not alienate space from its surroundings.

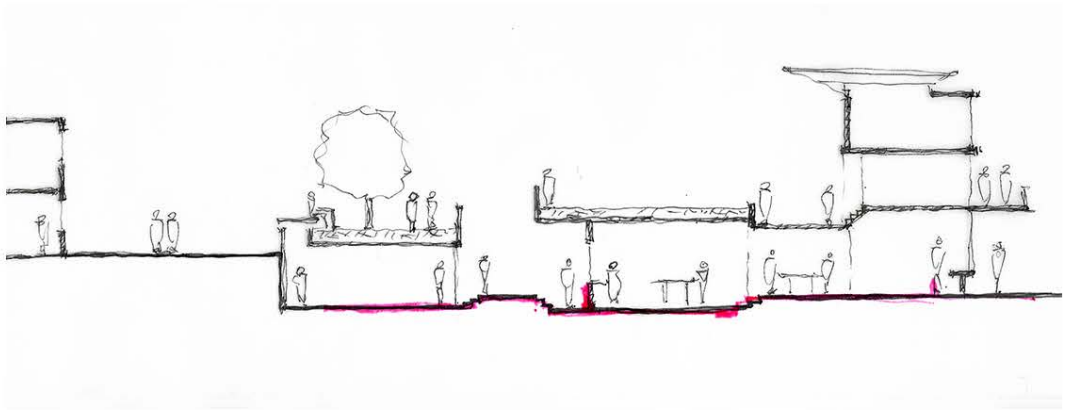
Multifunctionality



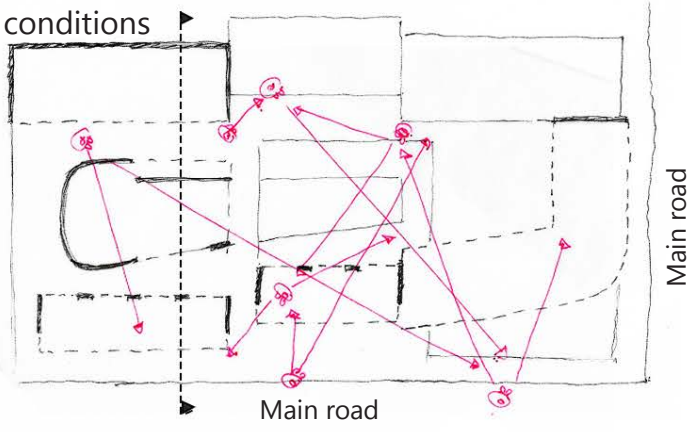
Vertical linear elements create spaces than can be defined and adapted for various uses by the user.
The layout is able to respond freely to programmatic requirements.

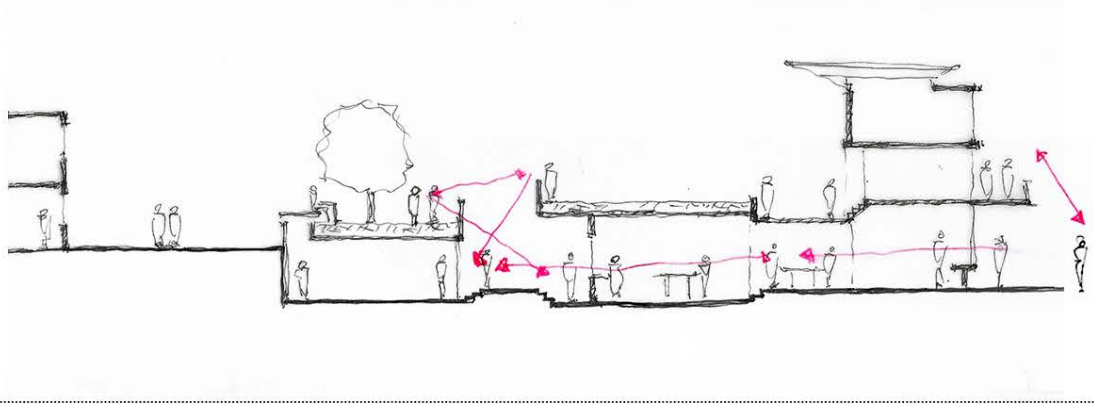
Spaces of interaction



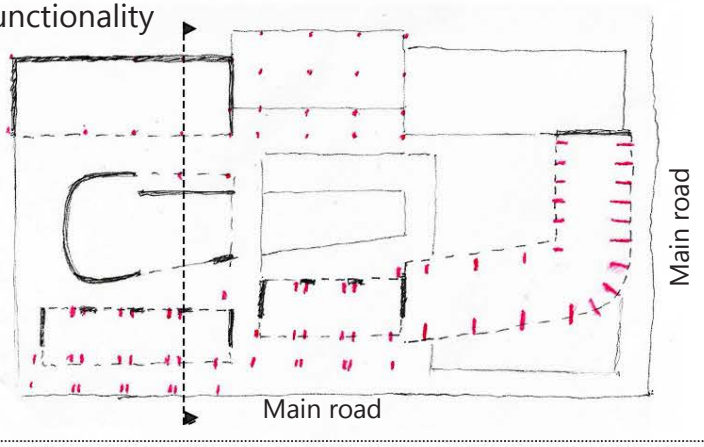


Urban conditions





Multifunctionality



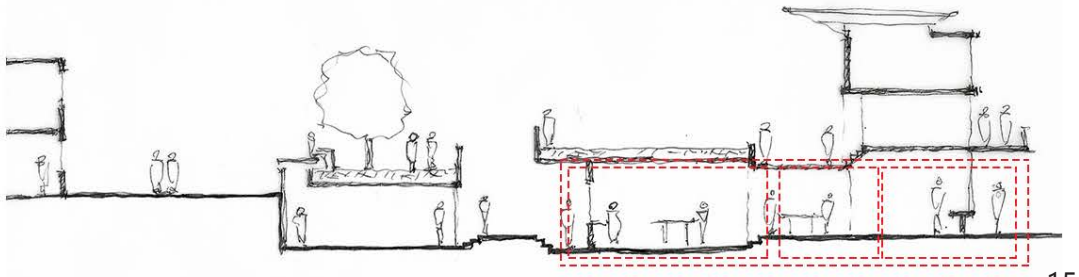


Fig 7.3 Spatial Intent, Diagrams, Author (2016)

Entire CFV can be contained and closed off if neccessary

Parts of the CVF can be closed off if neccessary

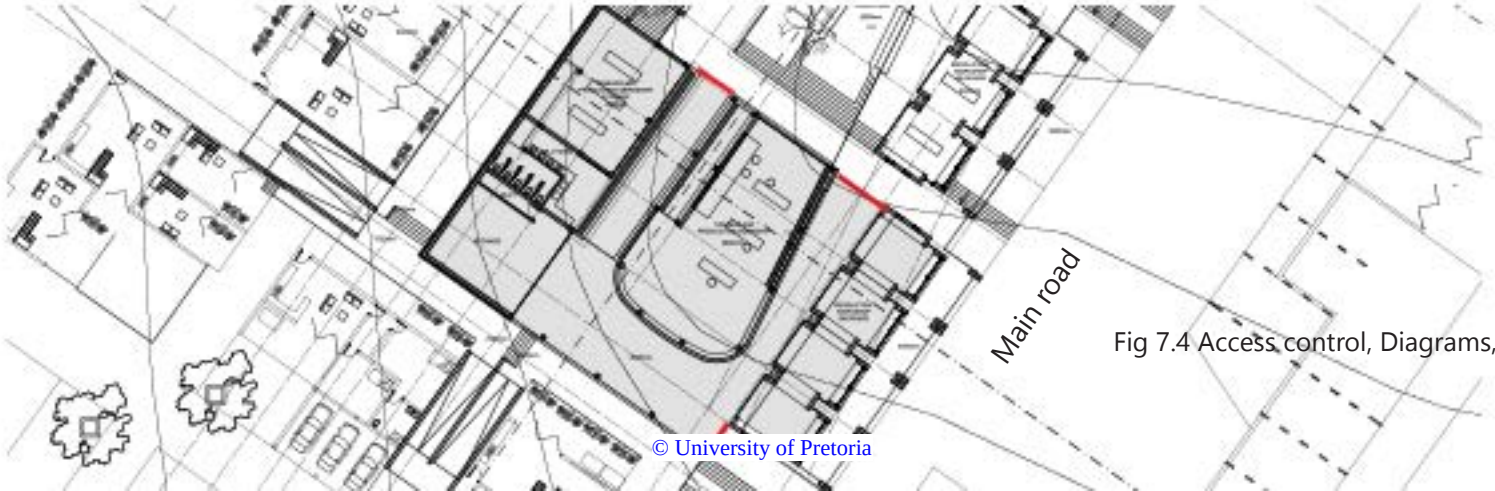


Fig 7.4 Access control, Diagrams, Author (2016)

Access control

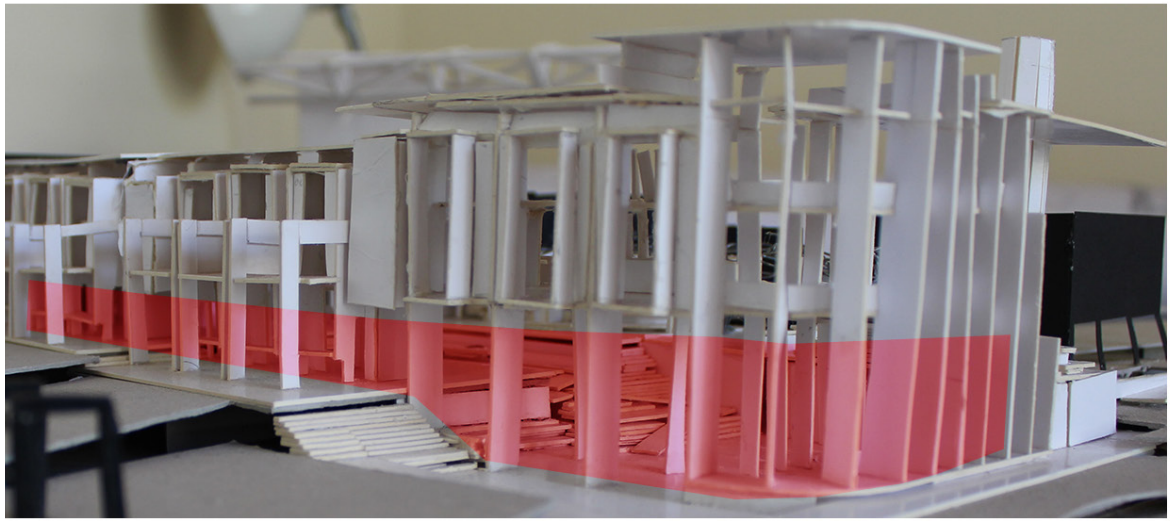


Fig 7.5 Access control, photo of model, Author (2016)

The consideration towards access control into the CVF was considered. As the intent of the design is to become an extension of and integrate into its urban surroundings the CVF has limited visual barriers. However access control into the CVF needs to be considered and planned for if it is necessary in the future.

Examples are given of how the space can be contained with physical barriers if necessary, the entire facility can be contained or smaller parts can be contained individually. The urban condition towards the main vehicular road could be interpreted as an interactive wall that can be closed off or opened up depending on the needs of the user.

The intent was to limit the number of physical barriers needed to contain the CVF in order to prevent isolating the CVF from its surrounding urban environment.

Repetition and underlying order

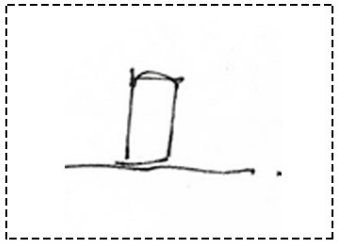


Fig 7.6 Individual unit, Diagram, Author (2016)

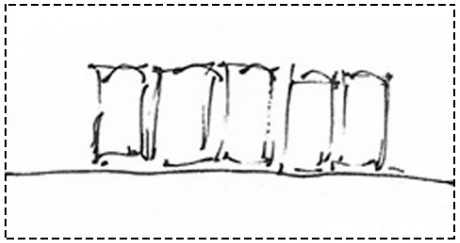


Fig 7.7 Form a greater whole, Diagram, Author (2016)

The conscious intent to repeat the vertical elements on the street edge signifies a deeper response to the theory that informed decisions in the project. It needs to be highlighted that within the repetition and underlying order social cohesion is signified. As suggested in the diagram the greater whole is made of individual units. This notion can be related back to the essence of citizenship education which is set out to create active individual citizens in society by encouraging greater social exchange and engagement between learners, parents and community (Mathebula 2009). Therefore the facade becomes a unifying element throughout the design.

 Fig 7.8 Lower Ground Floor plan, Author (October 2016)

7.2 Design finalization

Ground Floor plan

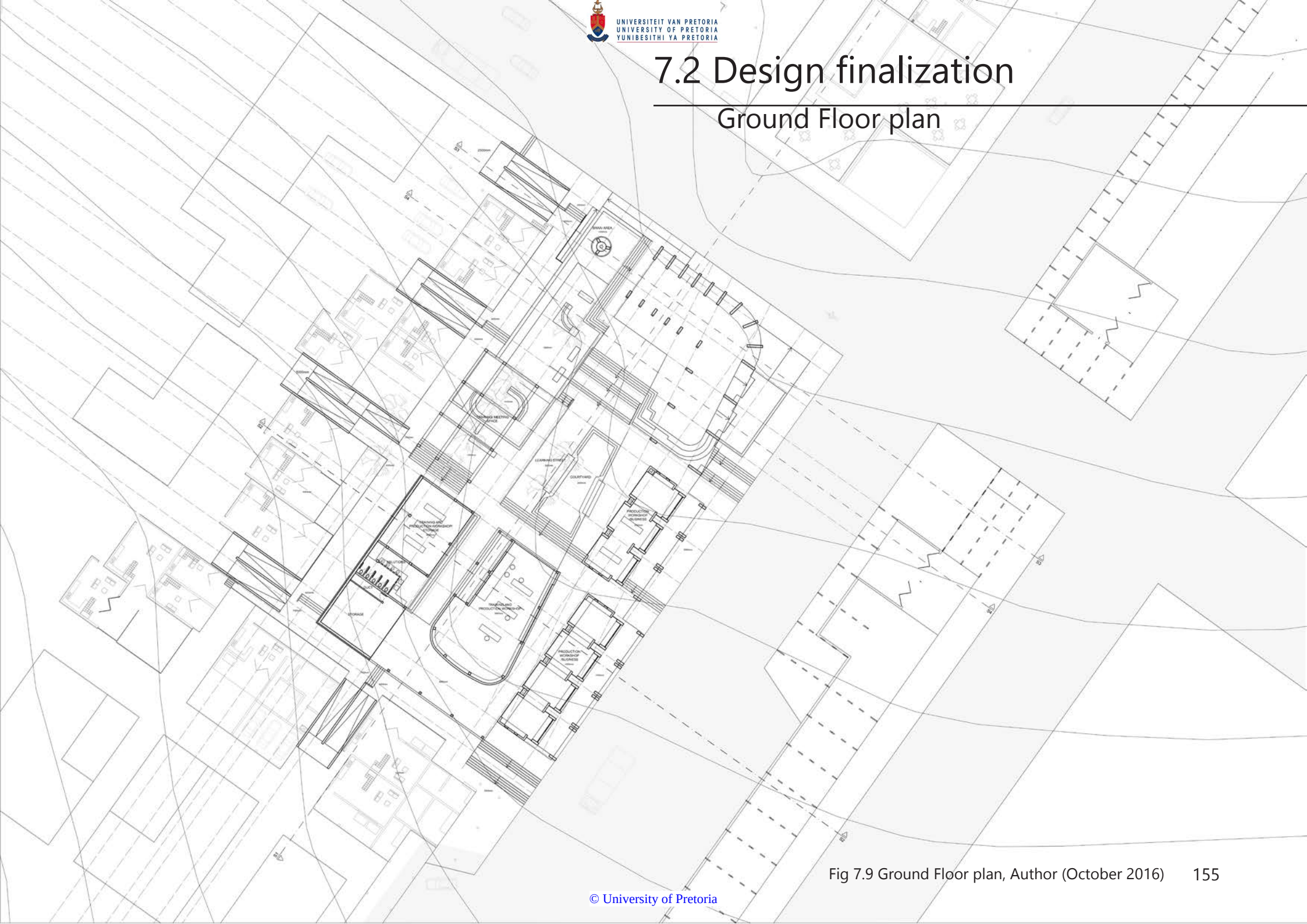


Fig 7.9 Ground Floor plan, Author (October 2016)

First Floor plan

156 Fig 7.10 First Floor plan, Author (October 2016)

Second Floor plan

Fig 7.11 Second Floor plan, Author (October 2016)

South East Elevation

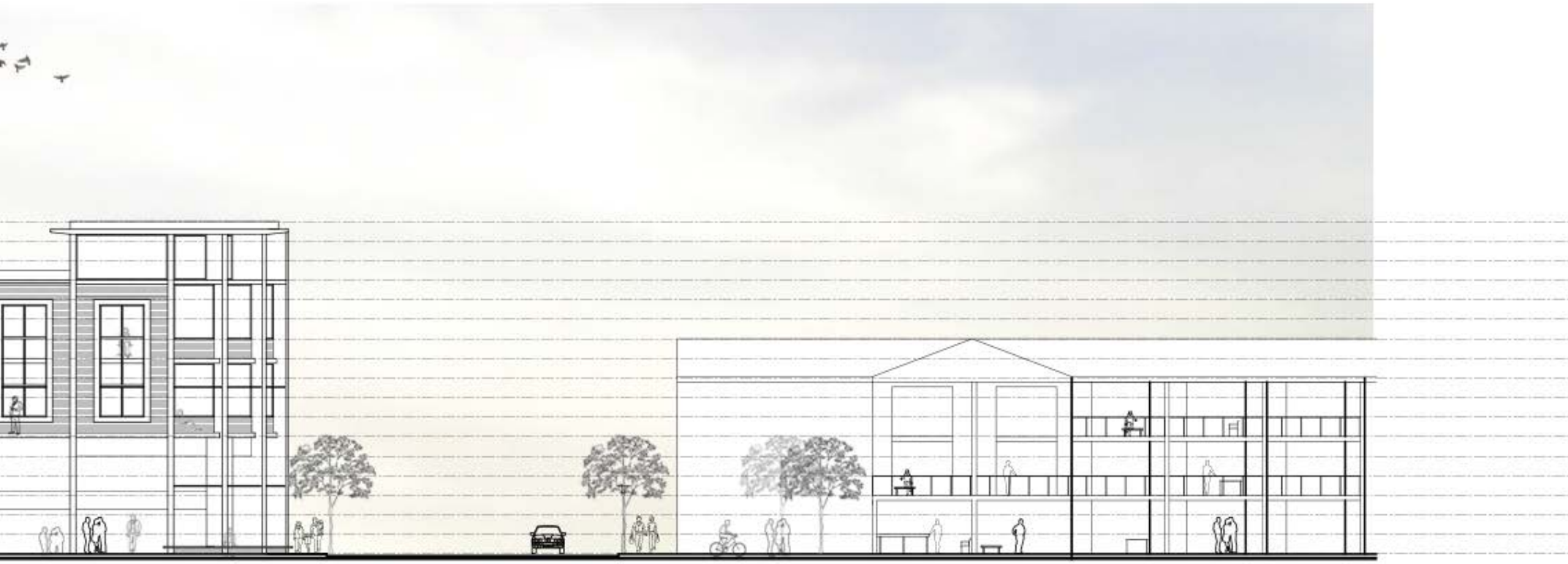


Fig 7.12 South East Elevation, Author (October 2016)

North East Elevation

Fig 7.13 North East Elevation, Author (October 2016)

North West Elevation

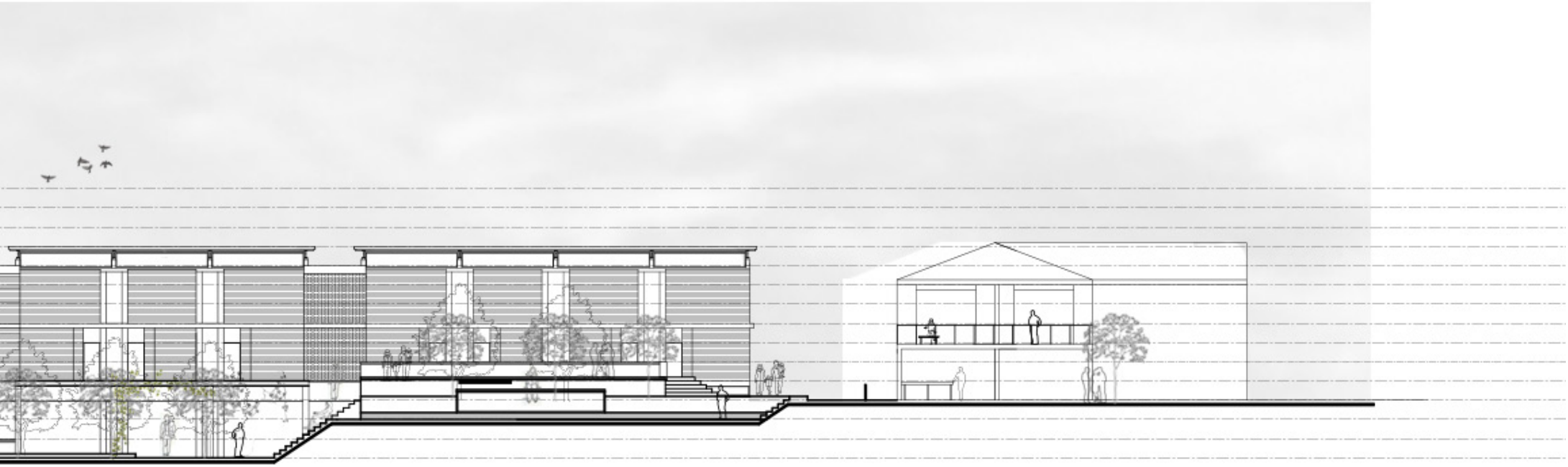


Fig 7.14 North West Elevation, Author (October 2016)

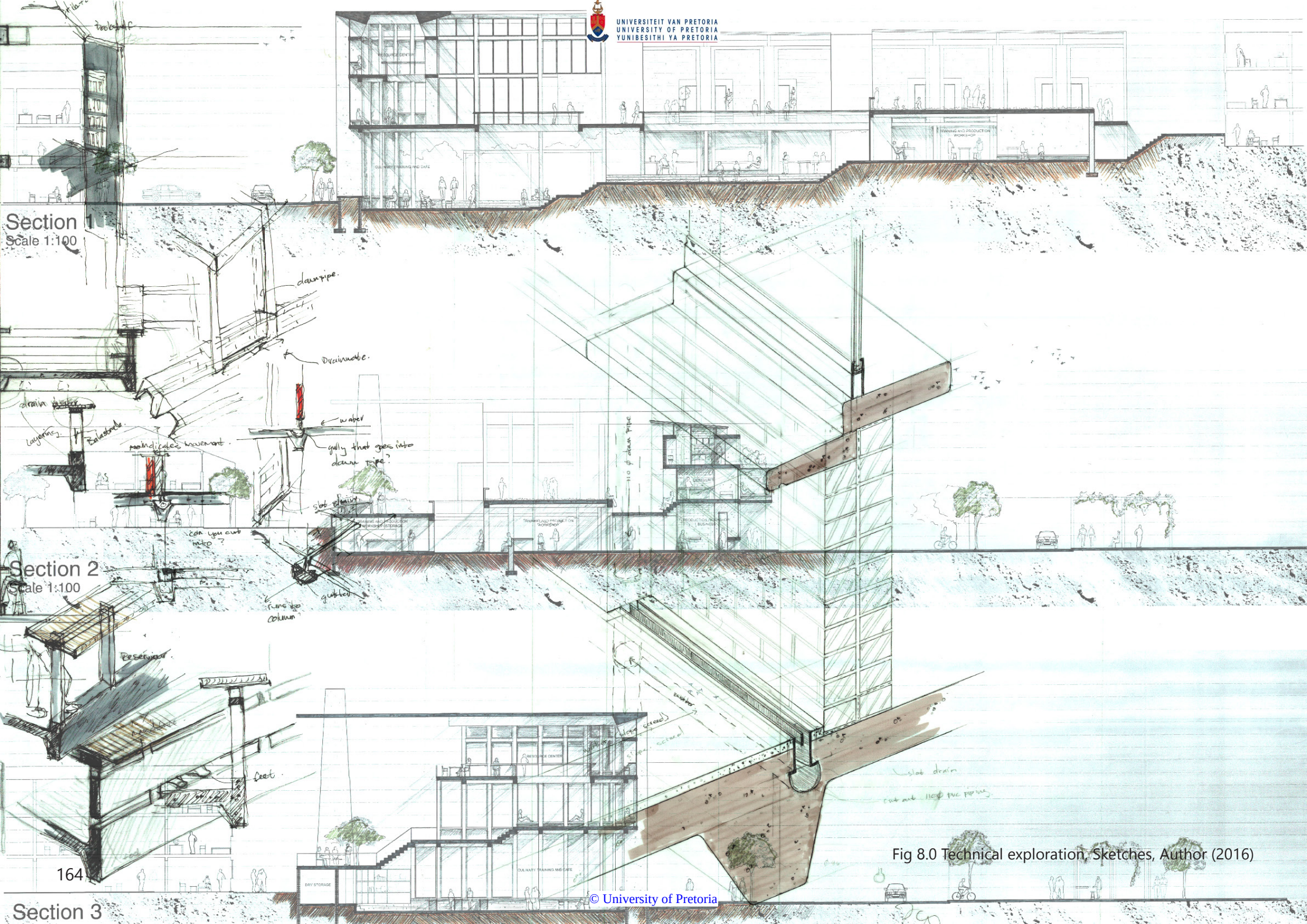
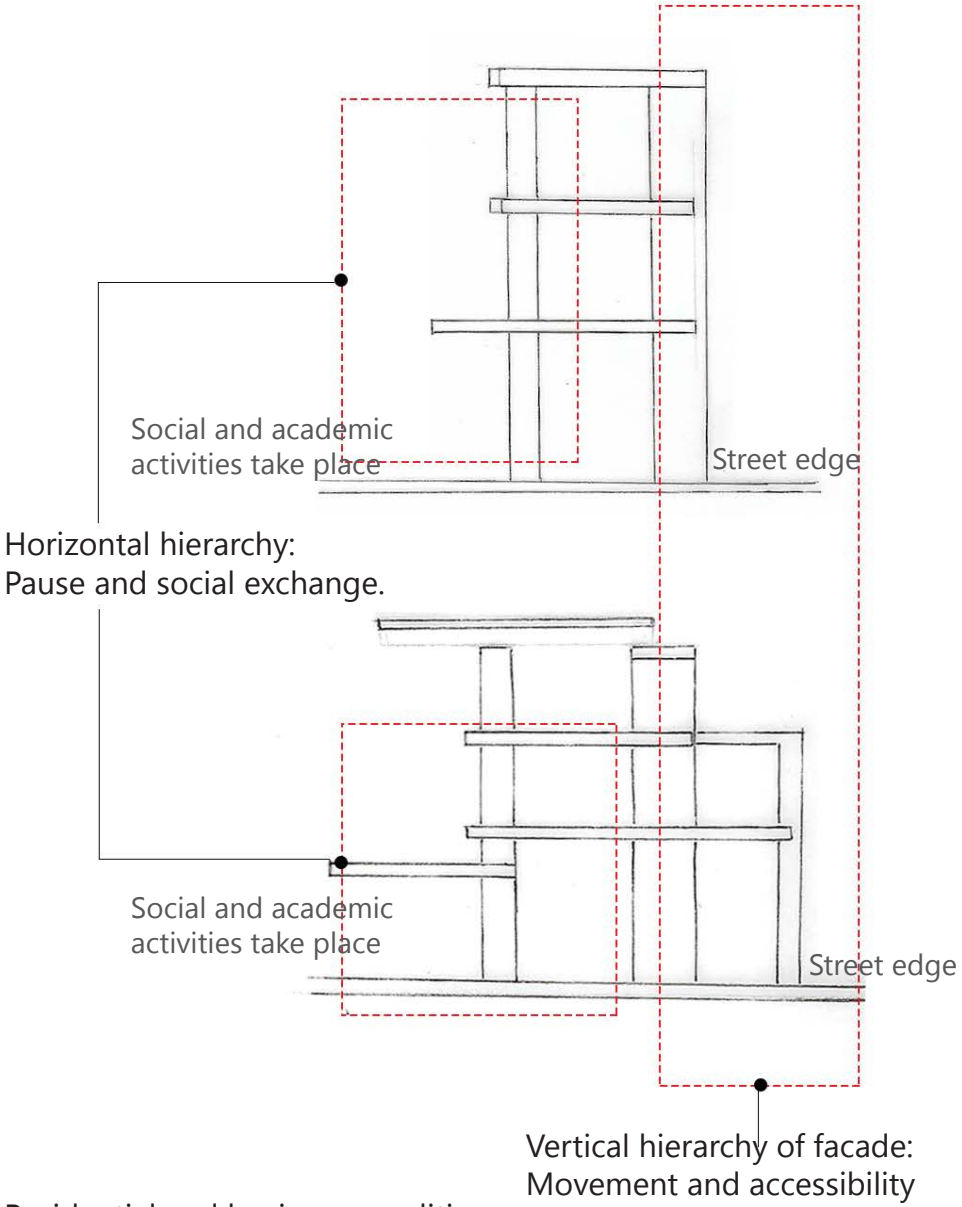


Fig 8.0 Technical exploration, Sketches, Author (2016)

8 Technical Resolution

8.1 Structural Intention

Public and communal condition



City in miniature:

The dissertation explores the components that a city comprises of by which the design is interpreted and developed as a *city in miniature.*

> *Make buildings less like objects and they become, shall we say, more open. This resembling greater accessibility comes from reading them as assemblage of components on the one hand and making them more as part of the greater totality of the city on the other* (Hertzberger 200:218).

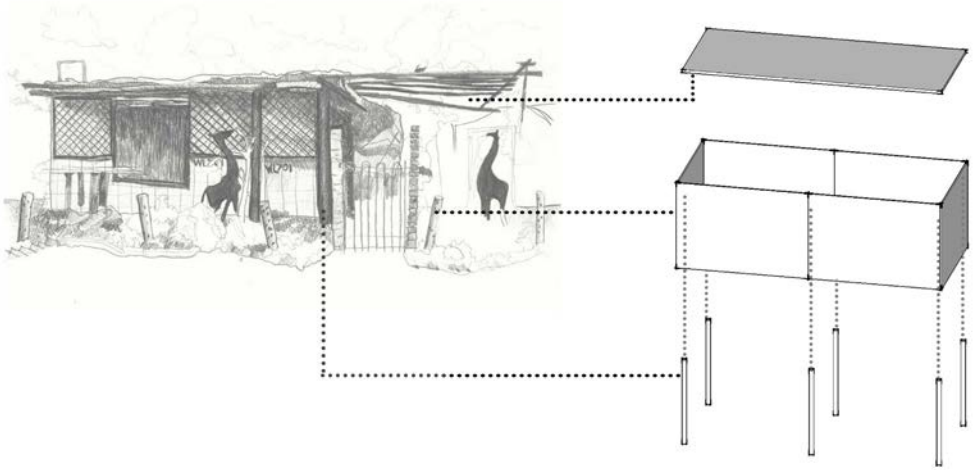
Conceptually , the proposed facility aims to strengthen social exchange between the learners and community. This translates into a spatial relationship between the building and its surrounding urban fabric. Structurally this is achieved by creating volumes of space that are layered and constructed with a hierarchy of intent in order to create a number of thresholds between users where social interaction can take place socially and academically.

In order to create an environment that resembles that of the city theorists such as Hertzberger (2000) and Lefebvre (1987) suggest that the habitable space between the structure is where *ordinary day-to-day lives* are led (Hertzberger 2000:234). Therefore the structure frames and suggests the type of activity which takes place in that space. The structure indicates movement and pause of the users throughout the design by guiding users through space and then containing the users in a central public space. This is done hierarchically by highlighting the verticality and horizontality of the structure. Thus protruding vertical elements suggest movement and accessibility into space where as horizontal cantilevered elements highlight social encounters between people, where one pauses and gathers socially.

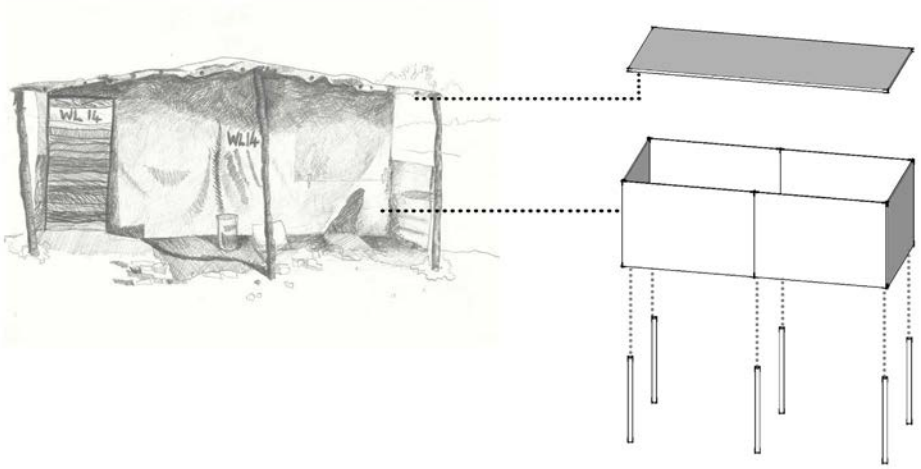
> *We have to look for space where it remains or has been left, inbetween, shaped to this end, constructed with spans or cantilevers, recesses, indentations...* (Hertzberger 2000:234).

Fig 8.1 Structural intent, Diagrams, Author (2016)

Exposed frame and infill



Hidden frame and infill



Contextual informants

In support of studying the spatial patterns created by those that live and create spaces within informal settlements, the structural techniques are explored and studied further. Similar construction techniques have been identified in Alaska, Mamelodi and Plastic View in Moreleta Park thus indicating a similar building typology.

Two structural conditions have been identified: the first consists of an exposed frame and infill technique, the second a hidden frame and infill technique it used.

This approach to building construction implies that the frame, which is structural, is more permanent and frames that of the infill which is adaptable and more temporary in nature. This form of construction informs the structural composition of the project as the primary components are the structural elements and the secondary components the infill.

Fig 8.2 Exposed and hidden frame and infill, Diagrams, Author (2016)

Urban framework

The urban framework identifies that Plastic View in Moreleta Park is situated on a site which is spatially fragmented and segregated from its surrounding urban fabric. The intent of the urban framework aims to improve spatial integration between the site Plastic View is situated on and it's urban surroundings.

The urban intention of creating a site of conciliation has a direct implication on the language that the projects speak as a whole within the urban vision. Therefore the material choices have been determined as a group as this visually ties a thread between projects suggesting a continuity and spatial wholeness throughout the context.

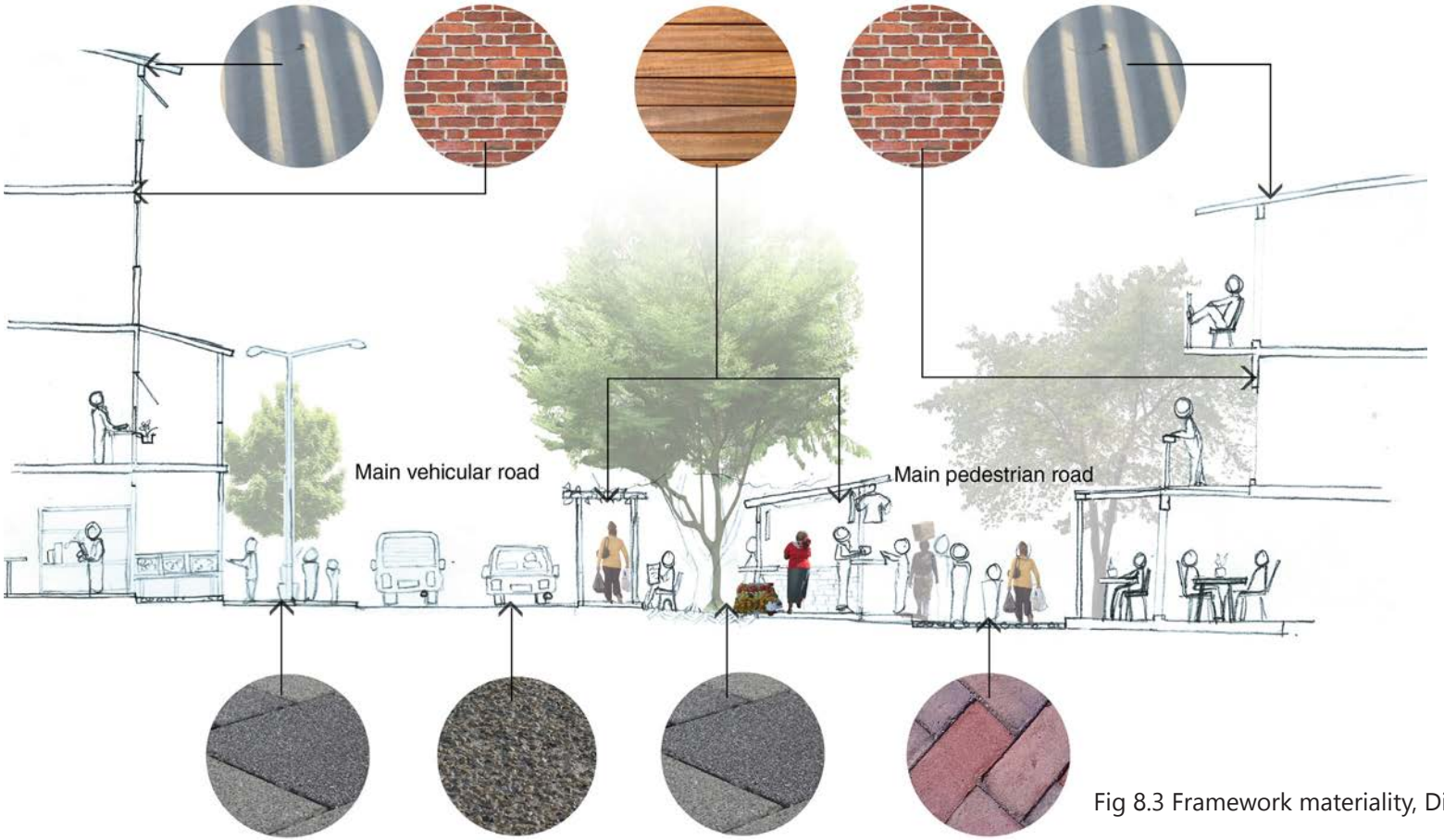


Fig 8.3 Framework materiality, Diagrams, Author (2016)

Layering, heirarchy and depth of space

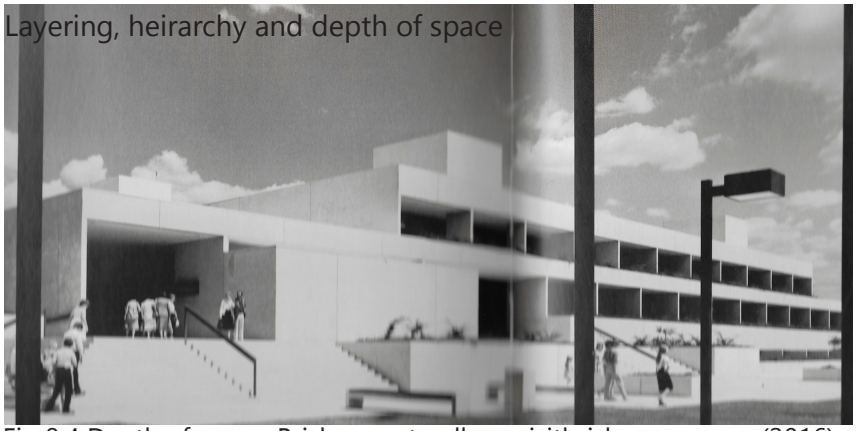


Fig 8.4 Depth of space, Brisbane art gallery, visitbrisbane.com.au (2016)

Horizontal structural elements

Fig 8.5 Horizontality is expressed, Forum Homini Hotel, architizer.com (2016)

Light weight steel roof

Fig 8.6 Light weight roof structure, Picture, Author (2016)

8.2 Structural Composition

Primary Components

Horizontal and vertical structural concrete elements: The horizontal and vertical structural elements of the building frame space and activities which takes place. As mentioned above the vertical elements signify movement and access into space. The horizontal elements signify pause by containing people in space.

- Vertical structural concrete column sizes: 300x2000mm, 300x1000mm and 300x300mm. With an off shutter concrete finish.
- Horizontal 255mm reinforced concrete floor slabs are cast in place. The slab is either power floated or a 25mm screed is put on top of concrete surface with flooring material as a finish.

Concrete roof structure (resource centre): the intention of the roof structure is to become an extension of, and finish off the facade of the building. The concrete roof over the resource centre can also, in the future, become a floor slab to a new level if more space is required.

- 255mm reinforced cast in place concrete roof with 80mm "lambda board" insulation layer, followed by screed to fall min 25mm, a "Torch on" waterproofing layer on top of screed, the entire waterproofed area to have a crushed stone overlay.
- 500mm Reinforced cast in place concrete up stand beam on inner concrete roof edge, with precast concrete coping over concrete up stand.

light weight steel roof structure (Live/ work units): The reason the roof over the live/ work units is of light weight construction is to allow for the spaces to be able to be adapted and changed more easily over time, a leading theme within the dissertation which supports the need for space to be adaptable in the future if need be.

- "Klip-lok" 406 profile roof sheeting @ min 2 degree pitch with global coat finish
- 150x75x20x3,5 Cold formed lipped channel purlins that offer support for the roof sheeting, 80mm structural "lambda board" insulation to be installed over the purlin.
- 254x146 Galvanized mild steel parallel flange section with tapered ends used to support purlin and roof sheeting.

Fig 8.7 Primary components, sketch, Author (2016)

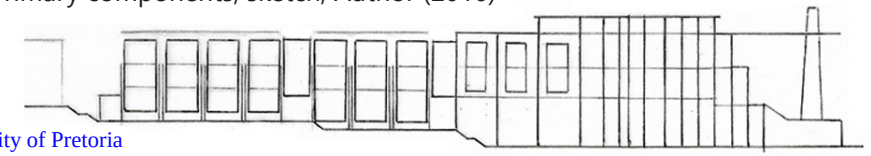
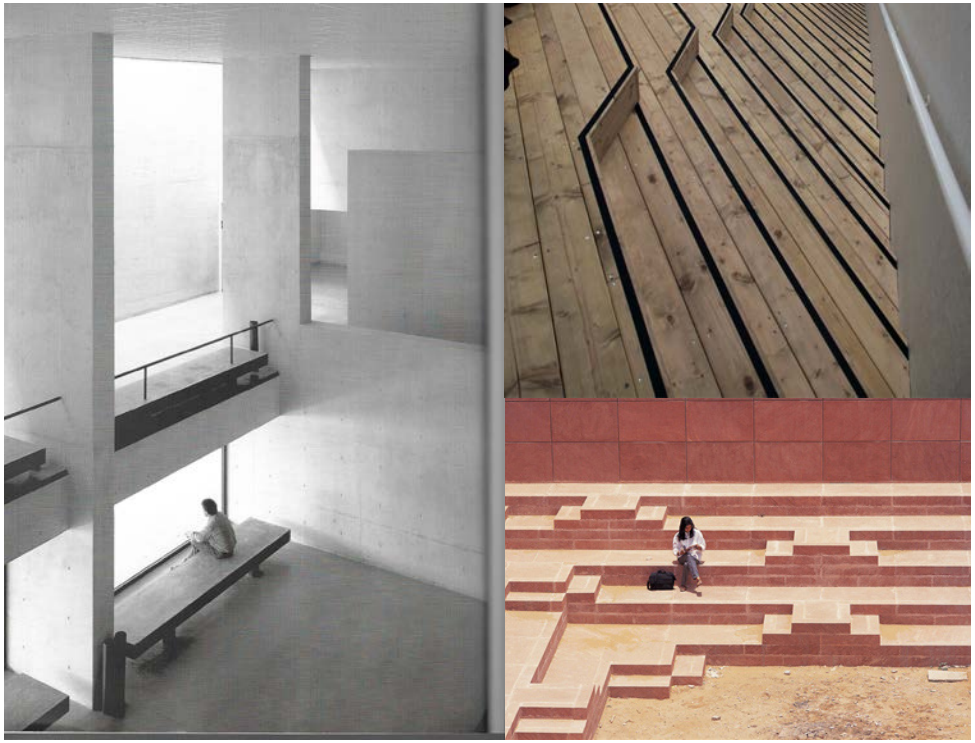


Fig 8.8 Secondary cotmponents, Brick Tongjiang Recycled brick school, archdaily.com (2016)



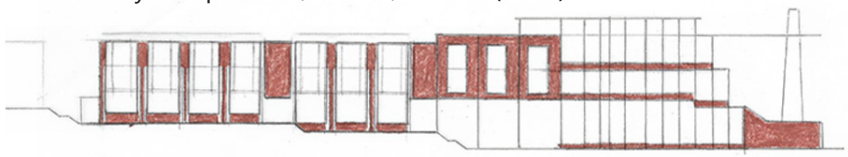
Secondary Components

Brick: The infill which either conceals or exposes the primary elements. Concealing elements emphasize a language of flow and movement through space which is not broken up by the primary components.

Exposing elements suggests a hierarchy in space specifically when the components are layered within space.

- Non load bearing 230mm brick walls to acts as infill structure.
- Face brick Roan travertine red brick, stretcher bond, racked joint finish.

Fig 8.9 Secondary components, Sketch, Author (2016)



Tertiary Components

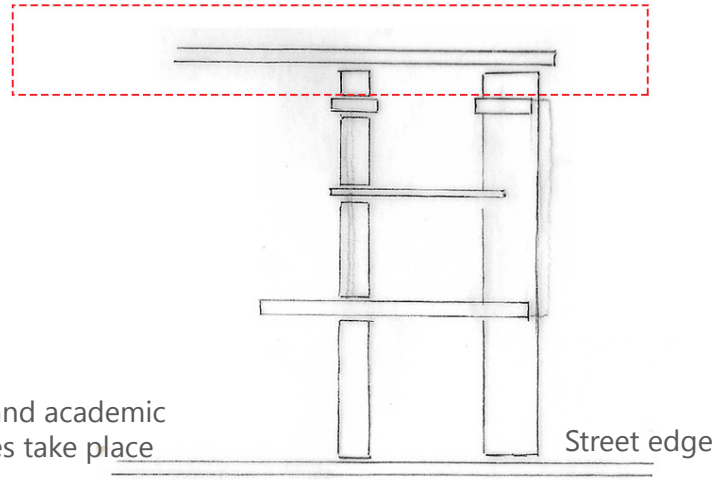
The finishes of the building have specific haptic and tactile qualities as they are the components of the building which suggest social significance and encounters (seating, eating, working). The components which highlight spaces for social exchange is expressed through materiality change keeping in mind the robust quality needed.

- Precast concrete seating with intermediate concrete support
- Brick on edge stair nosing
- Intensive green roofs are used that act as roof insulation as well as help dampen sound produced in the workshops.

Fig 8.13 Tertiary components, Sketch, Author (2016)

Fig 8.10 Brick steps used to create seating, Charles Corres, pinterest.com (2016)
Fig 8.11 Timber finish on seating, Photograph, herzogdemeuron.com (2016)
Fig 8.12 Concrete seating, Photograph, Bennett (2001)

Public and communal condition



Residential and business condition

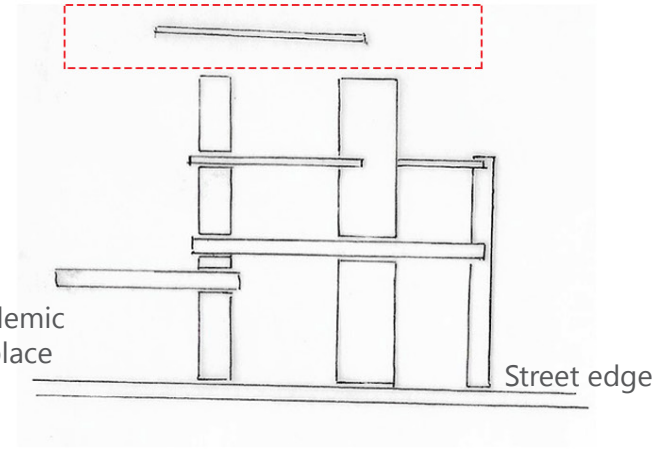


Fig 8.14 Structural intent proposal 1, Diagrams, Author (2016)

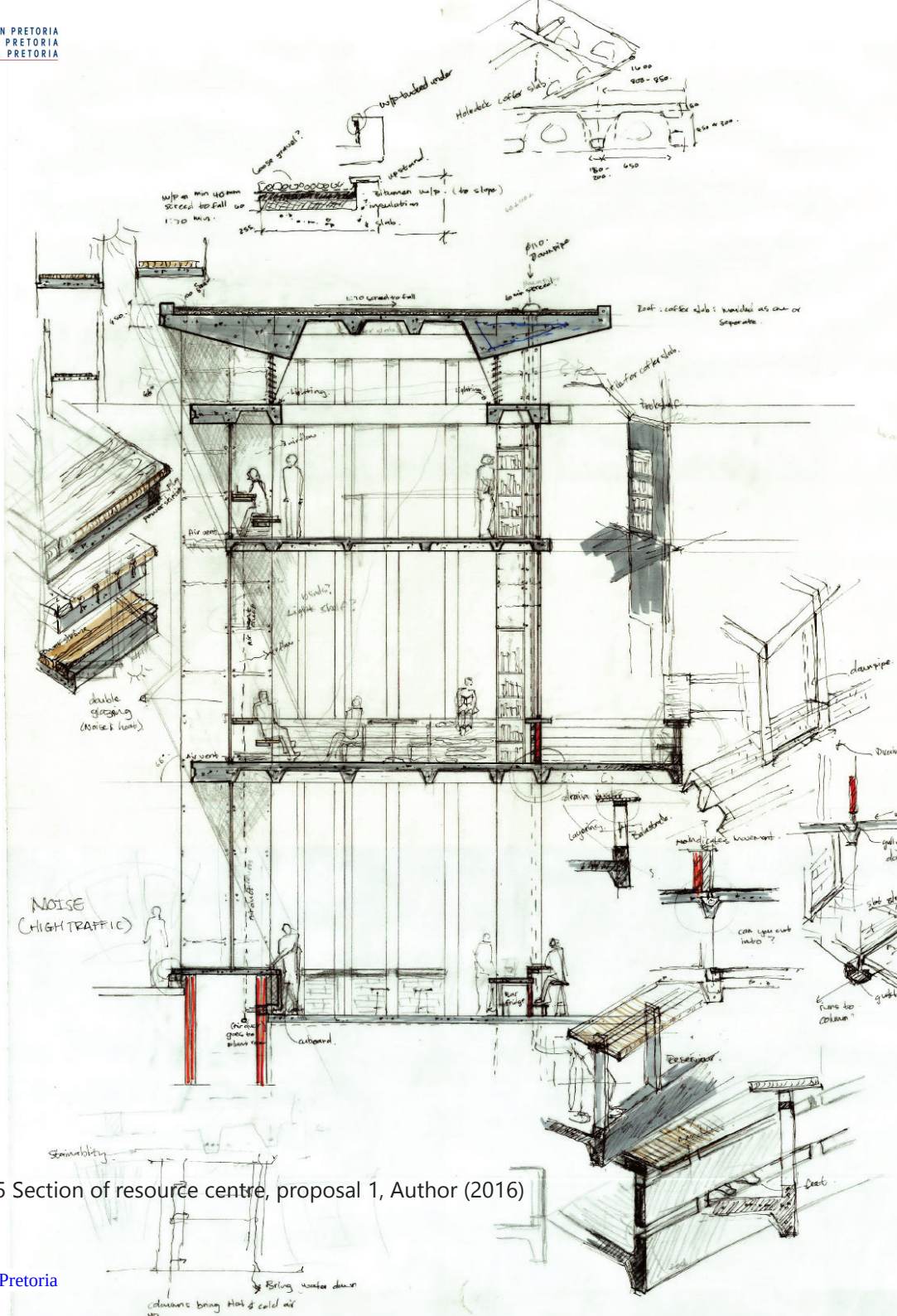


Fig 8.15 Section of resource centre, proposal 1, Author (2016)

8.3 Structural Iterations

Roof Development

First Iteration: coffer slab construction

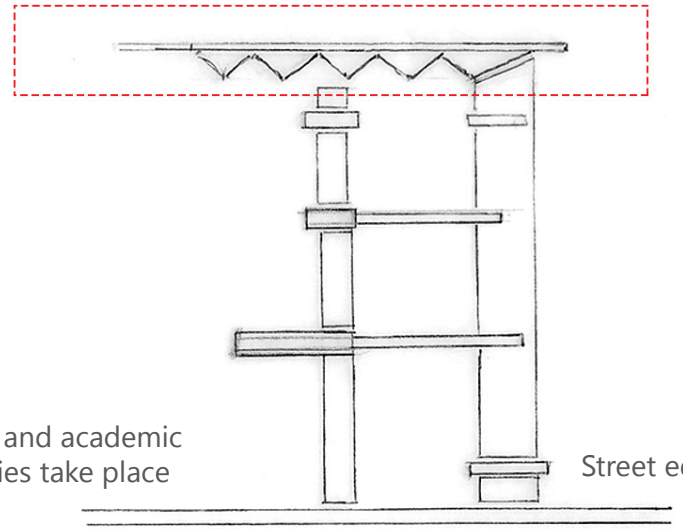
Coffer slabs were used throughout the design in order to express the design and structural intent, which was to frame and define space through the structure. The idea was that the coffer slab could be manipulated to shape space.

The critique received highlighted that the concrete coffer roof slab made the spaces feel unnecessarily heavy and that a light weight roof structure should be considered.

Fig 8.16 Section of furnace, proposal 1, Author (2016)

Fig 8.17 Model Development, proposal 1, Author (2016)

Public and communal condition



Residential and business condition

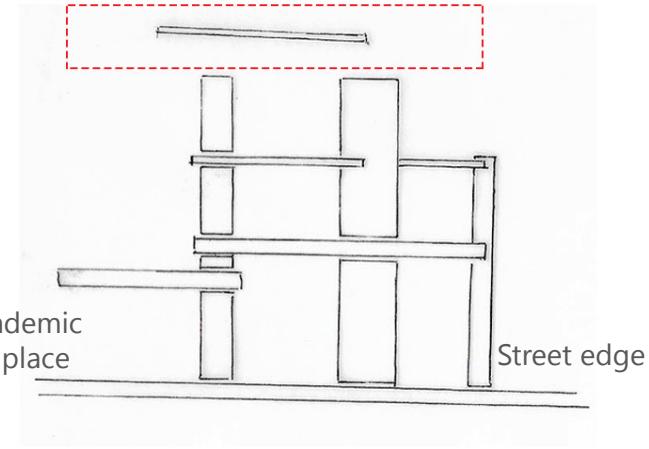


Fig 8.18 Structural intent proposal 2, Diagrams, Author (2016)

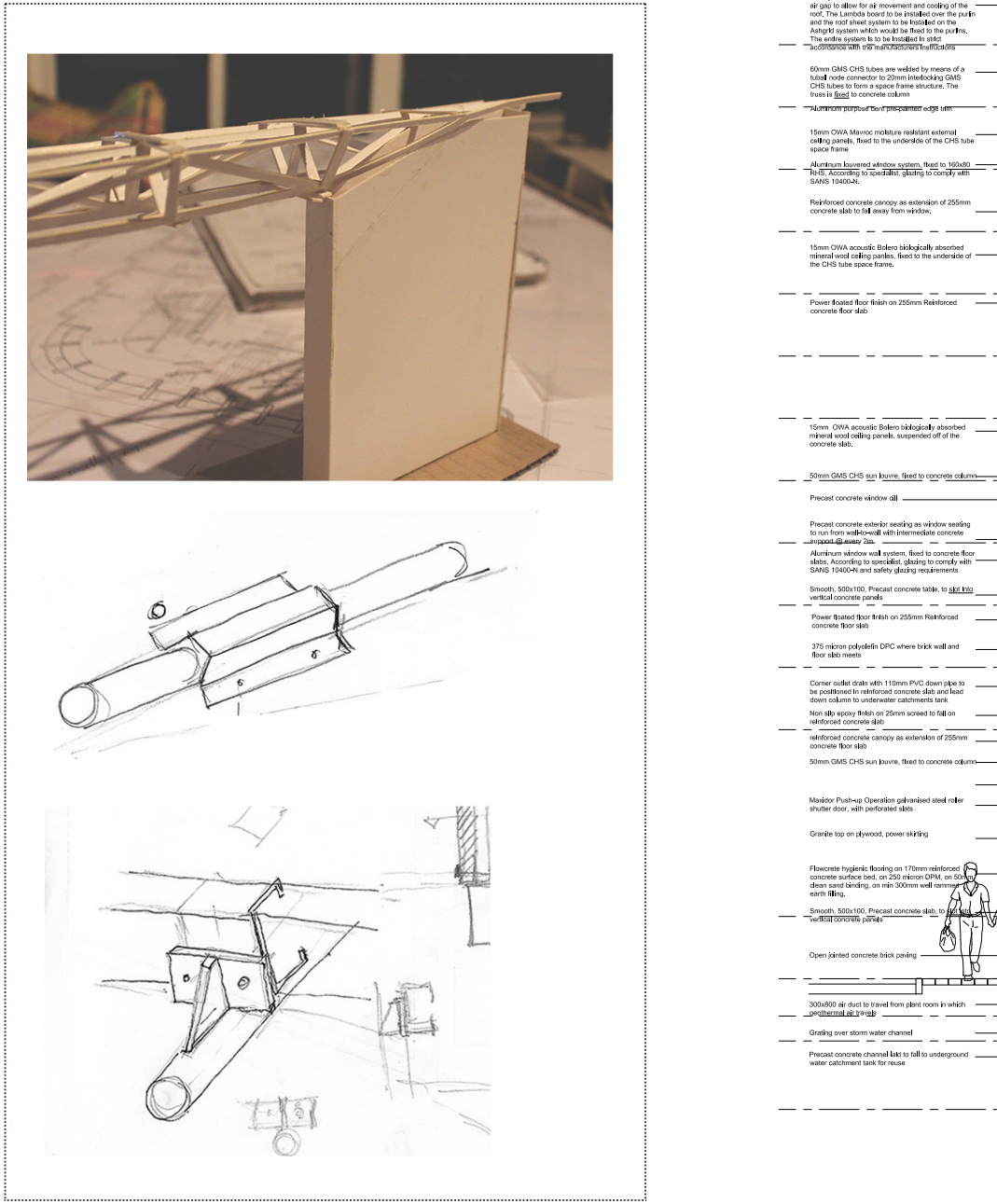


Fig 8.19 Space frame model and detail connections, proposal 2, Author (2016)

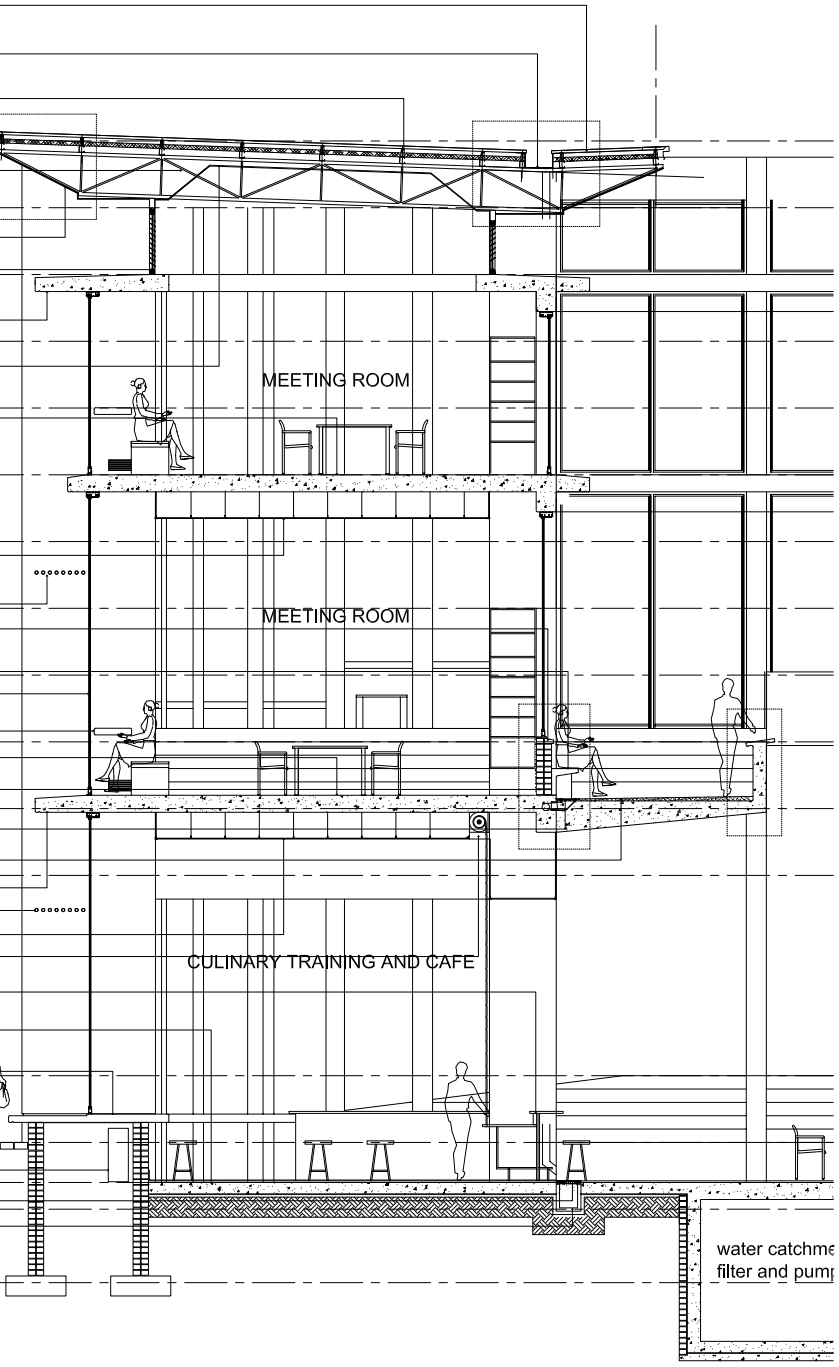


Fig 8.20 Sectional development, proposal 2, Author (2016)

Second Iteration: Light weight steel structure and space frame

The intention of the roof structure is to create a unifying element which ties the spaces together, signifying social cohesion by suggesting that various activities and social encounters take place under one roof.

A Circular Hollow Section (CHS) light weight roof structure and space frame structure were considered in this iteration. The light weight steel structure allowed more freedom with regards to the design of the roof. The roofs over the accommodation were expressed differently (wavy form) in order to define the accommodation as an individual entity within the greater whole.

The CHS light weight roof truss proved to be problematic at junctions where the internal structure needed to be closed from external conditions as thermal bridging would occur. It was proving difficult to fix components, like lipped channel purlins to the CHS frame structure.

Fig 8.21 Model development, proposal 2, Author (2016)

Fig 8.22 Double roof construction, Picture, Francis Kere, Laongo Opera Village (2016)

Fig 8.23 Exploration of roof on elevation, Sketch, Author (2016)

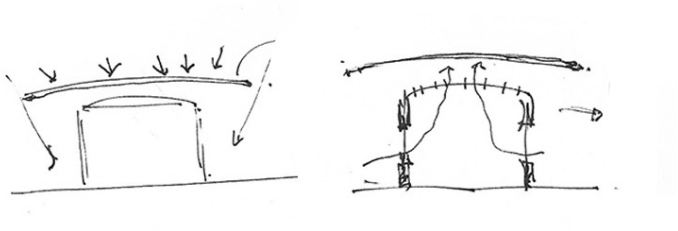


Fig 8.24 Double roof creates stack ventilation effect, Sketch, Author (2016)

Fig 8.25 Roof used as unifying element, Sketch, Author (2016)

Fig 8.26 Exploration of roof, model, Author (2016)

Third Iteration: Space frame structure

Following the critique on the problematic junctions that arose with the CHS light weight roof truss, when trying to close up internal and external spaces, it was suggested that the roof structure be thought of differently. Similar to that of Francis Kere's iconic roofs, the concrete structure should be contained as an entity meaning that a concrete roof be laid and that the light weight roof, held by a space frame truss, act simply as a shading device and unifying element which extends over the concrete roof.

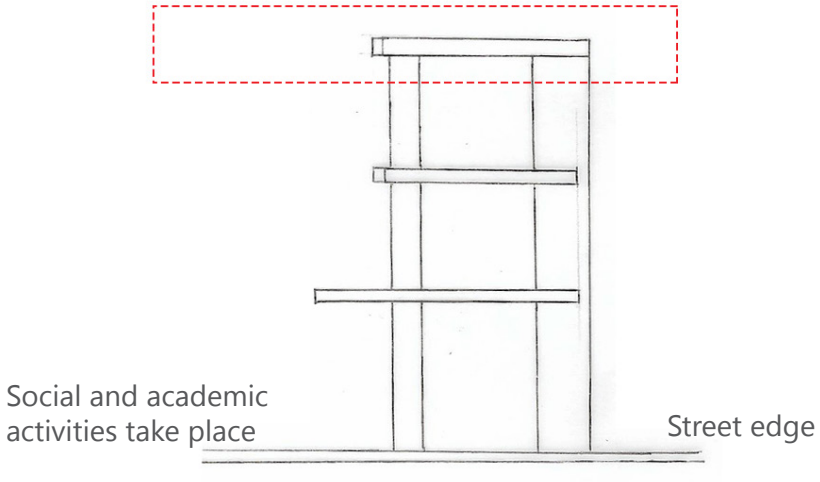
Upon further research on the ventilation principles behind the double roof system used by Francis Kere. It was discovered firstly that the stack ventilation principle works most effectively when the entire building is shaded by the roof in order to cool the walls and air that passes through the space therefore the space frame structure is an ideal solution as it can span great lengths with less vertical structural support (Lan 1999). Secondly in order for the stack effect to occur the first roof has to be perforated in order to release the hot air out and pulling fresh air in (stylepark.com).

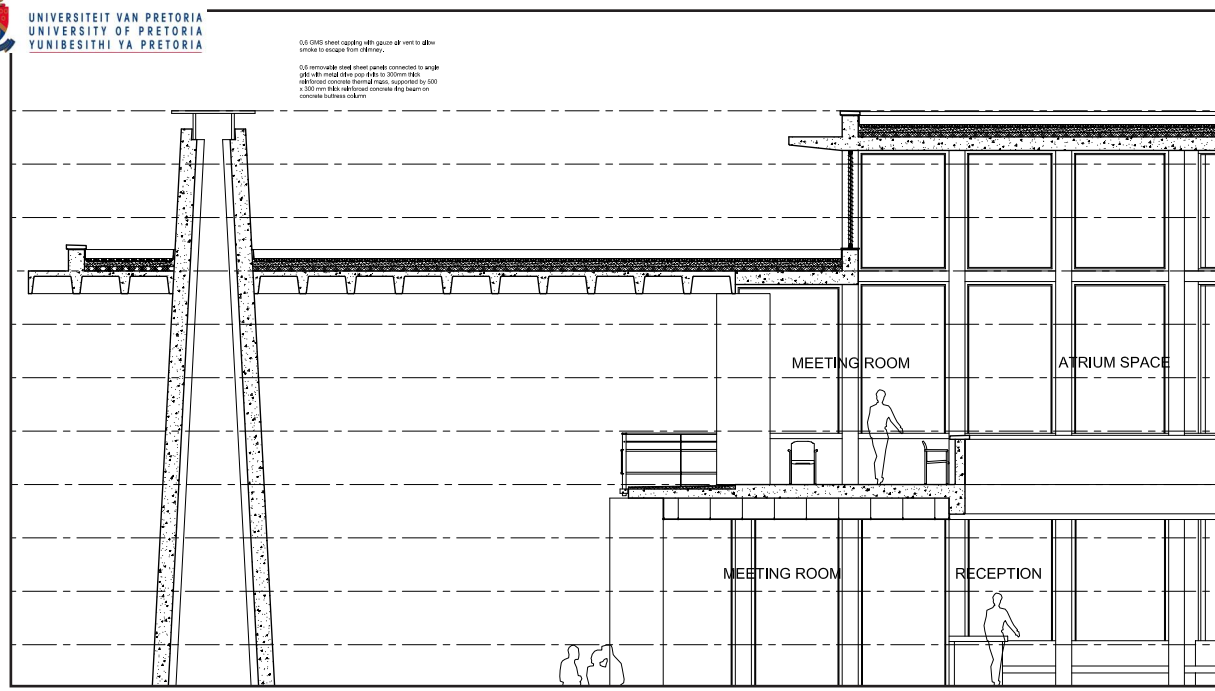
The research proved to be valuable as it allowed the author to reconsider the need for the double roof system. The space over which this system would be used is a resource centre where computers and books are situated and the concern of not being able to waterproof the roof was not practical or sensible. A re-evaluation of the roofs intent was needed.

It was realized that the idea of having the roof as a unifying element needed to be reconsidered as it did not fit the architectural language and intent of the facade.

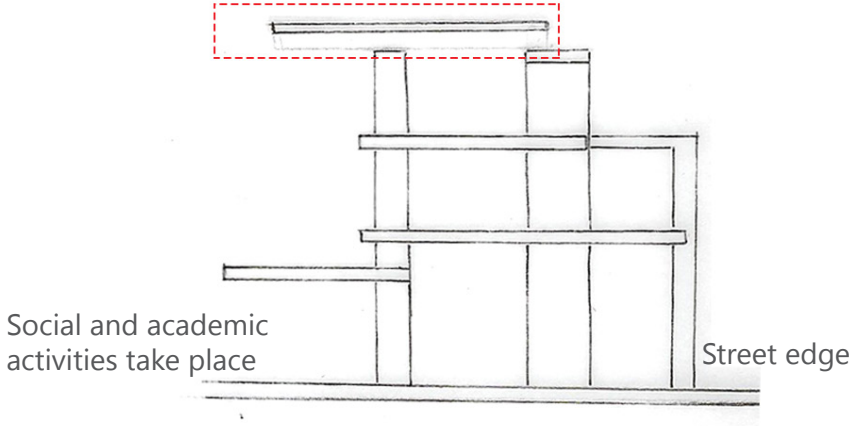
A roof as a unifying element which ties everything underneath it together is fitting for a market for example. Here a mismatch of people, products, stalls are situated underneath one roof, and the roof becomes a unifying element.

Public and communal condition





Residential and business condition



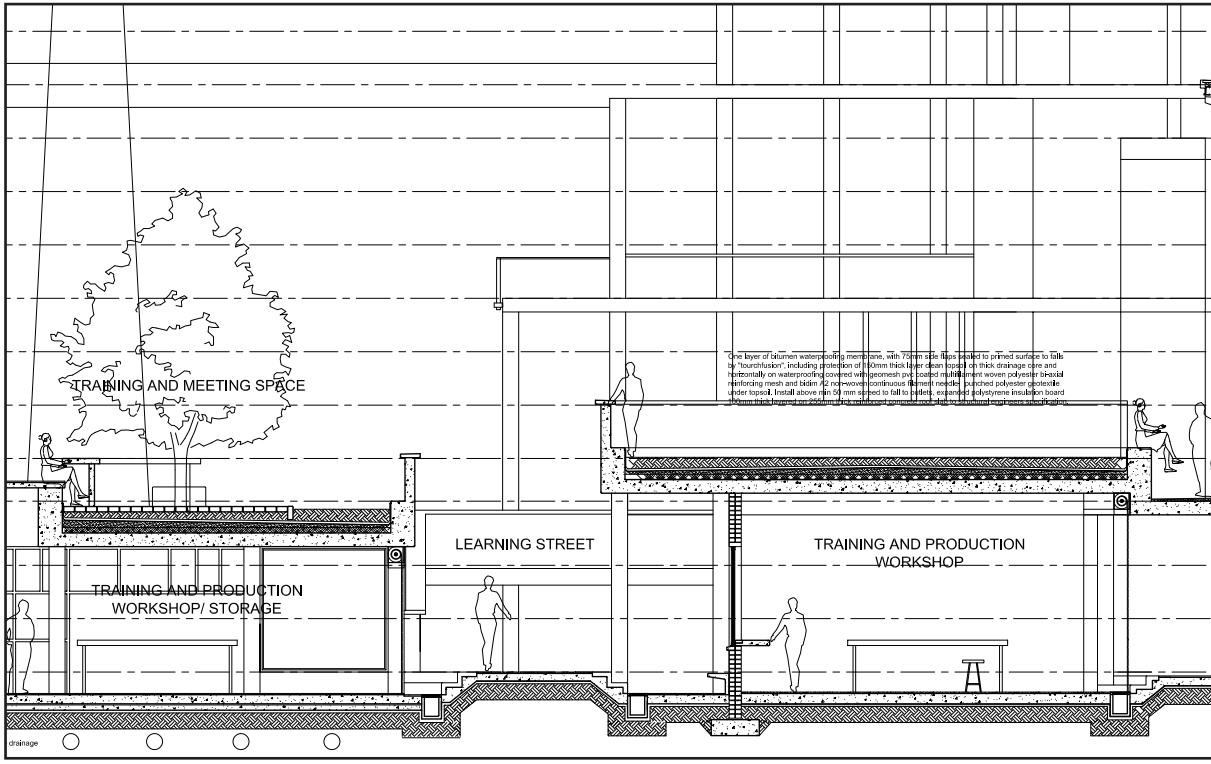
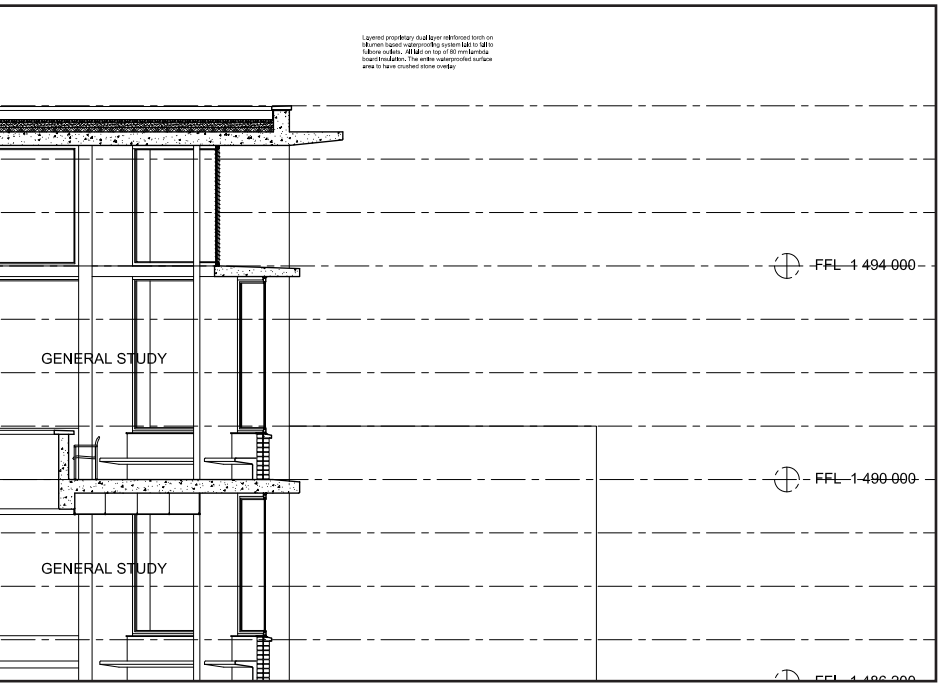
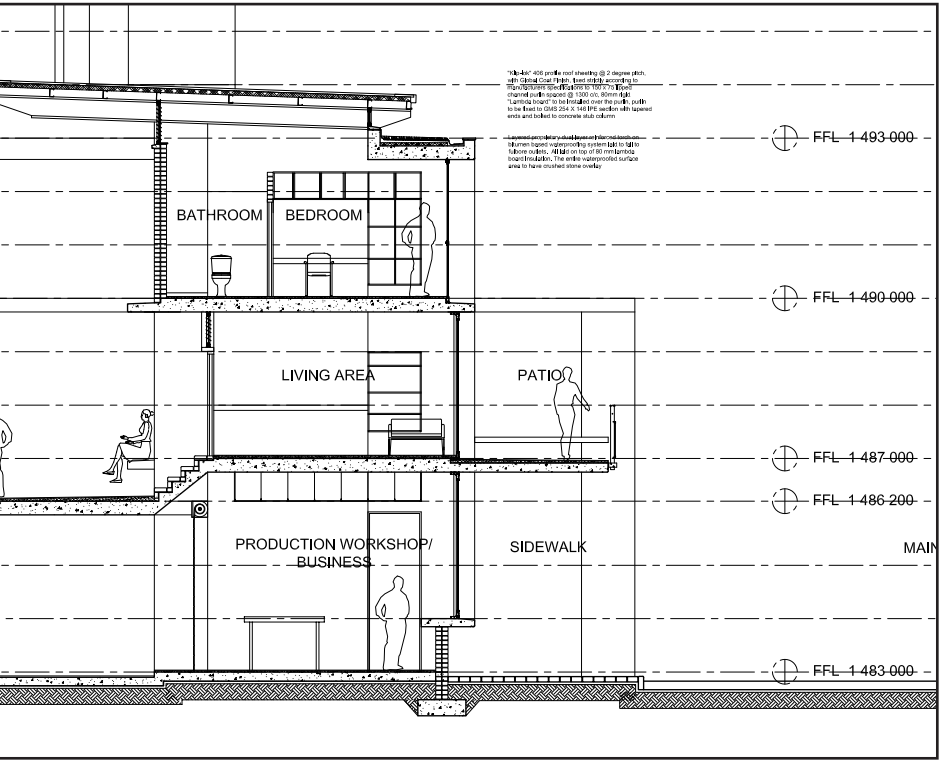


Fig 8.27 Structural intent proposal 4, Diagrams, Author (2016)

Fig 8.28 Roof development on section, Author (October 2016)



Section through concrete roof, Resource centre



Section through light weight roof, Live/ work units and production sp[illegible]

Fourth Iteration: Concrete and light weight steel roof

Concrete roof

The architectural language of the CFV explores the idea of repetition and order throughout the facade, this repetition of elements signifies social cohesion. Therefore a roof that acts as a unifying element is not needed as the ordered facade condition does this already. The roof becomes an extension of and ends off the facade of the building by expressing the individual components that make up the whole. The concrete roof, in the future, can also become a floor slab to a new level if more space is required.

Light weight roof structure

The accommodation is defined differently to the public facilities by using a light weight roof structure. The light weight roof extends over the units while allowing soft light into the accommodation through clerestory windows. The light weight roof structure also allows the spaces to be able to be adapted and changed more easily over time, a leading theme within the dissertation which supports the need for adaptable space within the facility.

Fig 8.29 Model development, Proposal 3, Author (2016)

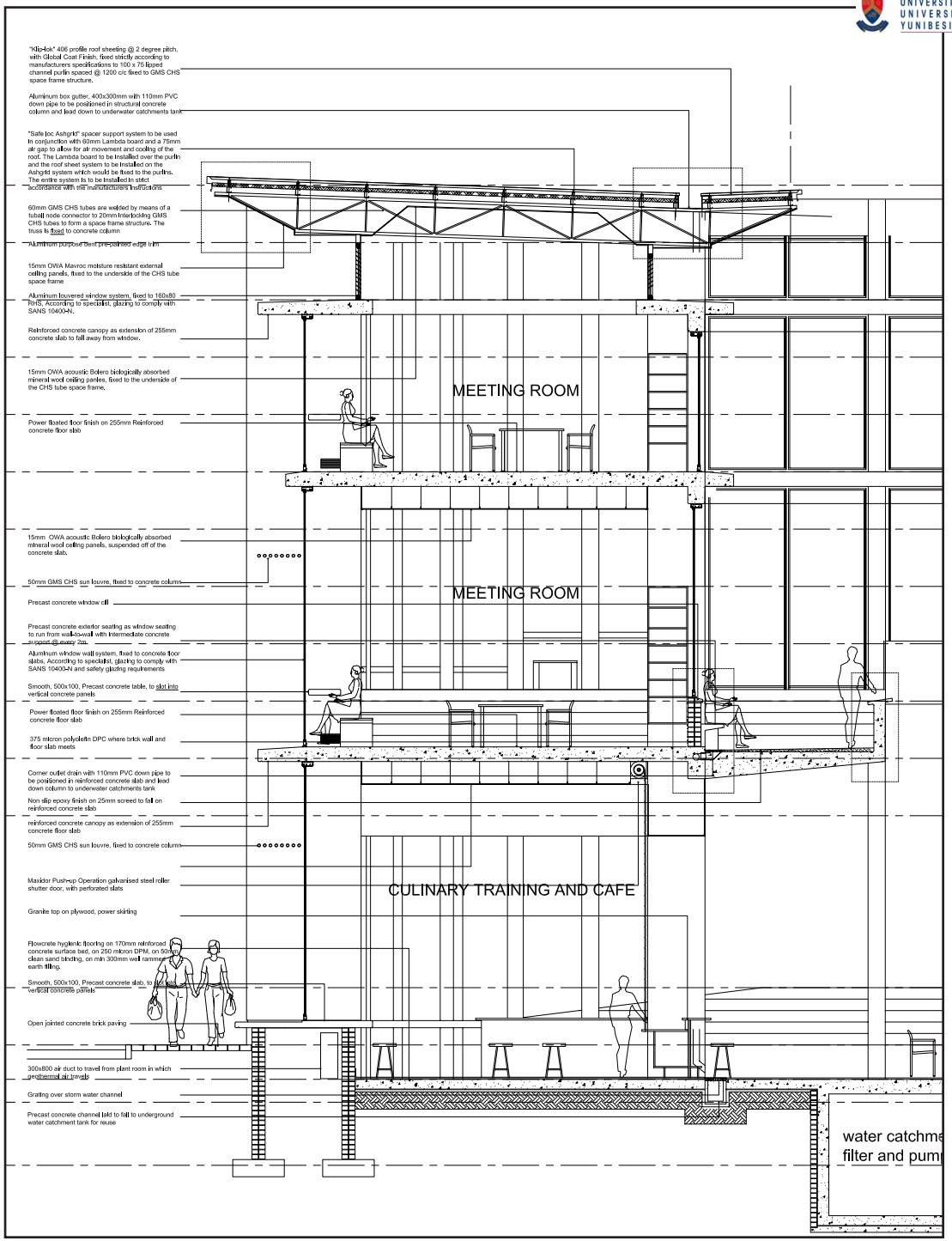


Fig 8.30 Section iteration 1, Author (August 2016)

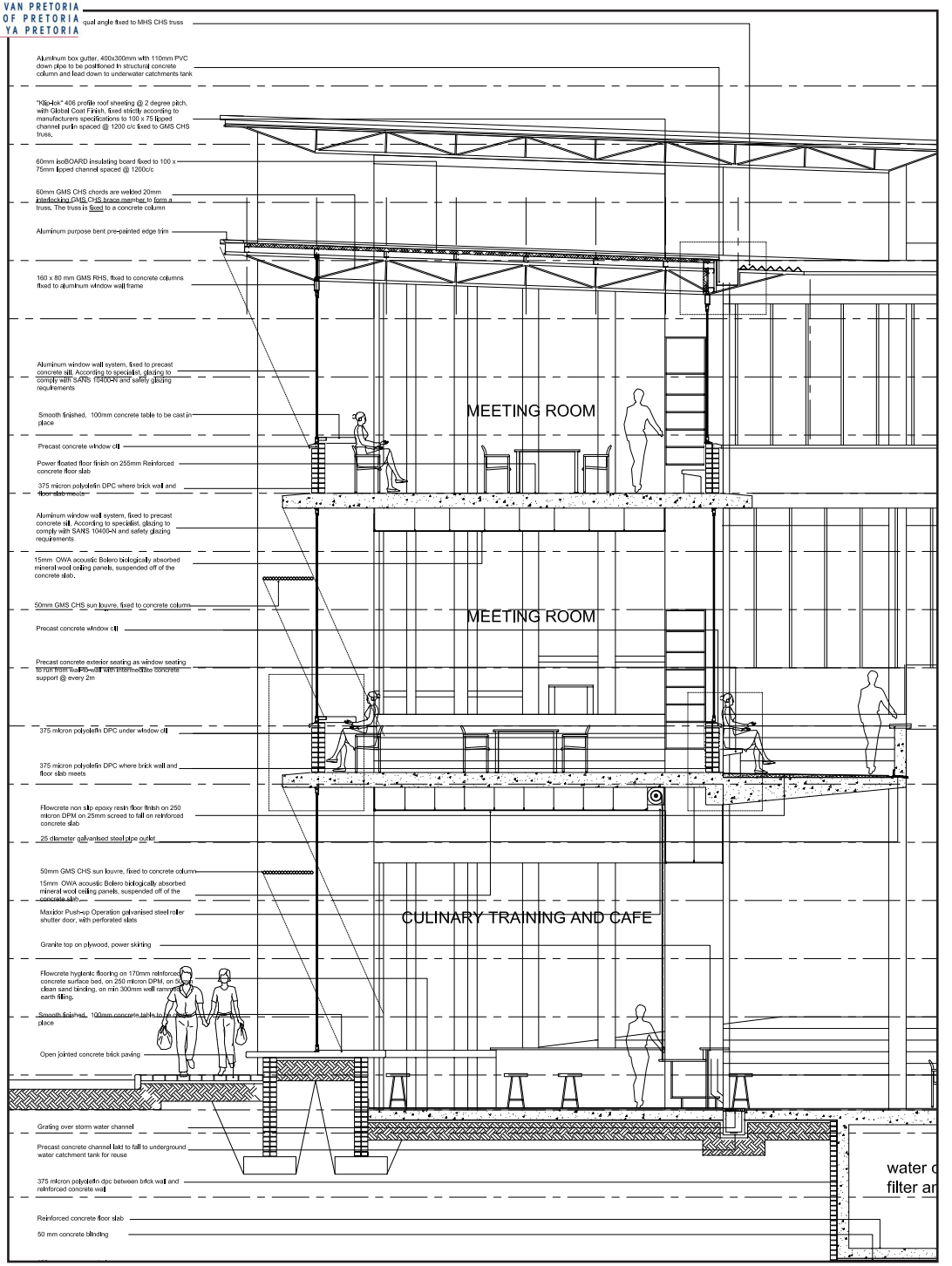


Fig 8.31 Section iteration 2, Author (September 2016)

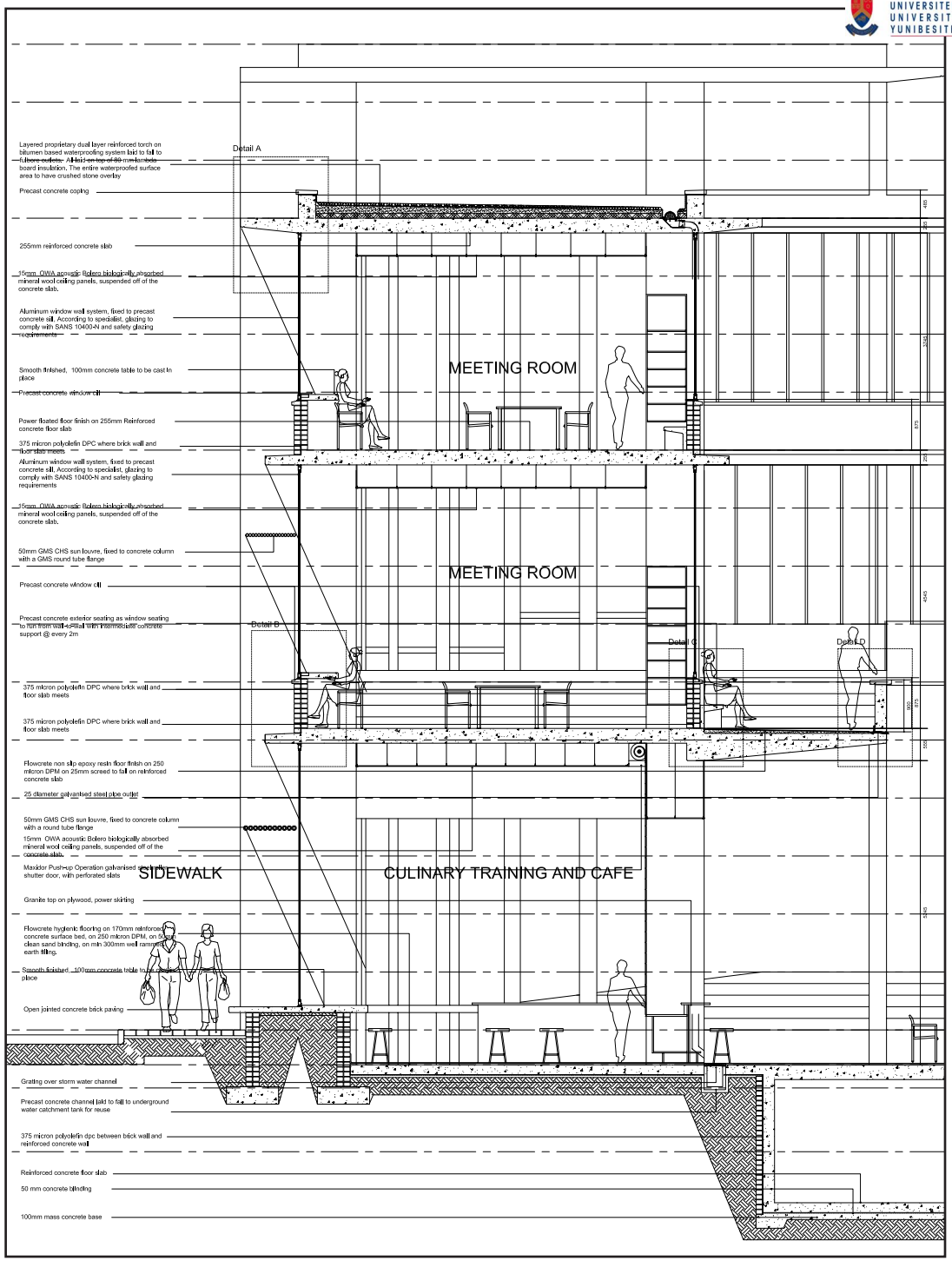
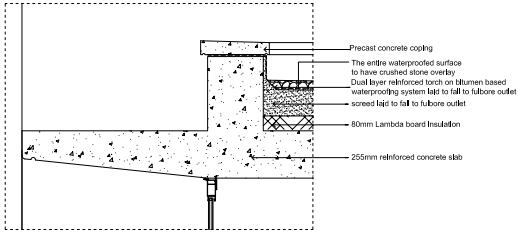


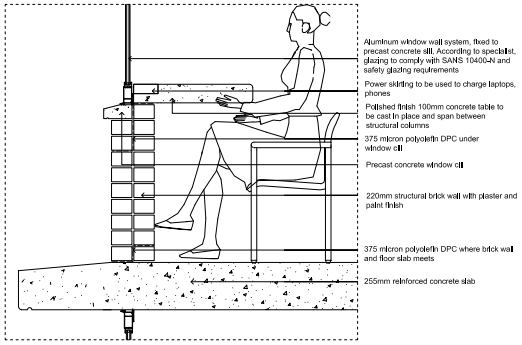
Fig 8.32 Section iteration 3, Author (October 2016)

Sectional Development



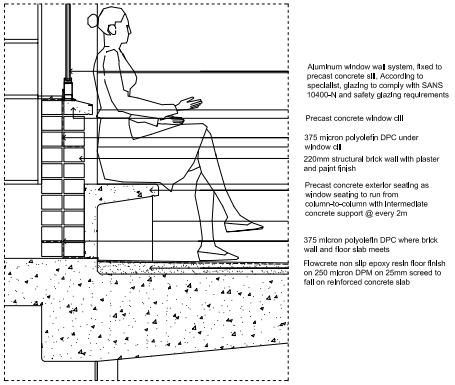
1:10 Detail A

Concrete roof and up stand detail



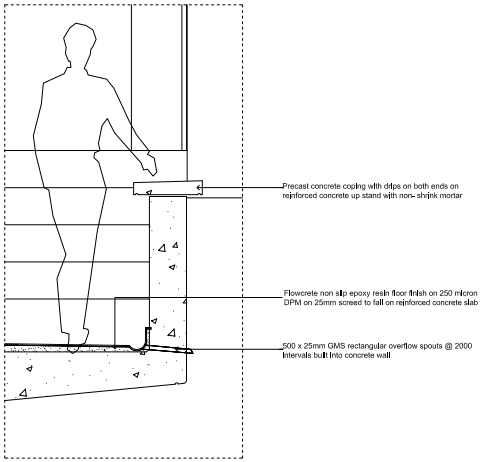
1:10 Detail B

Desk and wall connection



1:10 Detail C

Detail of public seating



1:10 Detail D

Parapet balustrade and walkway gutter

Fig 8.33 Details, Author (2016)

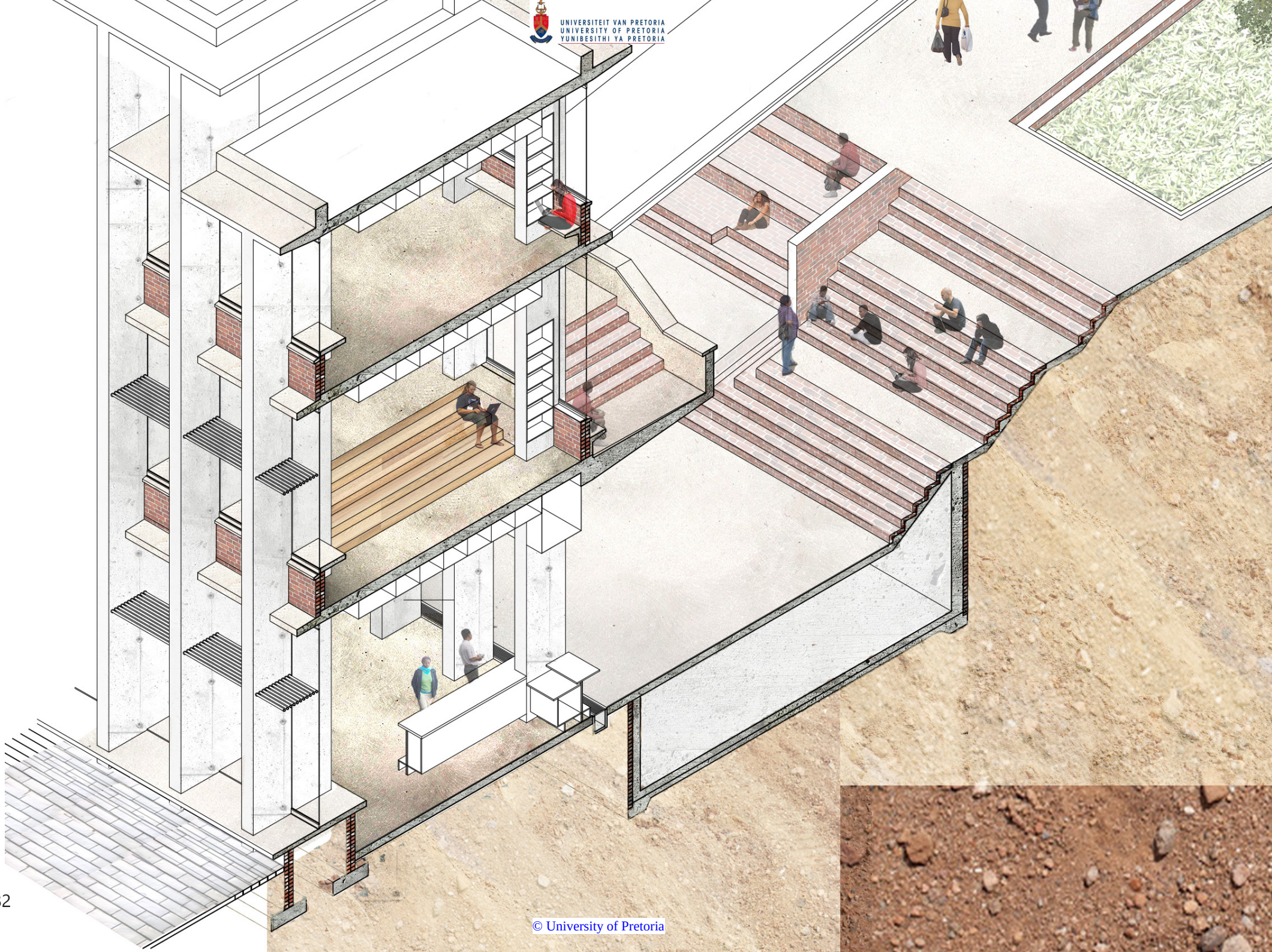


Fig 8.34 Axonometric of Resource Centre, Author (2016)

8.4 Environmental Considerations

Water Strategy

The water strategy includes collecting rainwater from roof surfaces, floor surfaces and planted roofs throughout the facility. The water is stored in an underground reservoir tank which is located at the lowest point of the site. The water located in the underground reservoir (2nd tank) tank is then pumped up to a smaller tank (3rd tank) located between the residential units which is used daily for portable use by the residents. The water from the underground reservoir (2nd tank) is also used in the kitchen and public ablutions in the facility. A reservoir tank (1st tank) is located on the main island and forms part of the greater urban vision. This tank mainly collects surface runoff from the broader urban surroundings. This underground reservoir tank serves as a backup water supply and when needed will pump water into the underground reservoir (2nd tank) tank on site and used accordingly.

It is proposed that low consumption fittings and appliances be used to reduce the volume of water used.

The rain water is pre-filtered through various means of filters (gutter screen, downspout) which helps reduce the sediment backup as well as smells (rainharvest.co.za) . A biological filter purification system is then used to purify the rain water that is collected. The water is purified by means of a biosand purification filter (rainharvest.co.za) that is located next to the second underground storage tank. The rain water, and water collected from the first tank goes though the biosand filter before being collected in the second tank. The uncontaminated water is then used on site and pumped up to third tank.

Grey water from the hand basins is stored under the basins and used to flush the toilets. The excess grey water (kitchen) is diverted and contained underground (in the same basement as the second tank is located) from which it is filtered through a sand filter and then used for irrigation purposes. Fat traps need to be installed in all drains in order to trap the fats (soap, food) that cause the water to smell and negatively affect the vegetation it is used to water (rainharvest.co.za) .

Water calculations:

(gauge.co.za)

Rainwater harvesting capacity: Roof: 745 m2x 90% = 670.5 m2
Paving: 961 m2 x 80%= 770 m2 lawn: 772 m2 x 10%= 72 m2
Total catchment area: 1513 m2
Annual rainfall: 573mm x 1513 m2 = 870 000 L

Grey water:
150L + 280L + 400 = 830 L per day
Toilets require 450 L of the grey water per day.

Rain water harvesting tanks:
Required capacity: No. of month low/no rainfall: 5 x 38 400 = 192 000 L
(2): Tank size = 8m x 8m x 2m
(3): Tank size= 4mx4mx3m

Water consumption:

Water consumption device	Water consumption (L)	No. of uses per day	Water consumption (L)
Flush toilet	9	50	450
Hand basins	3	50	150
Shower	40	7	280
Washing/ cleaning	20	20	400
		Consumption per day	1280
		Consumption per month	38 400

Urban framework

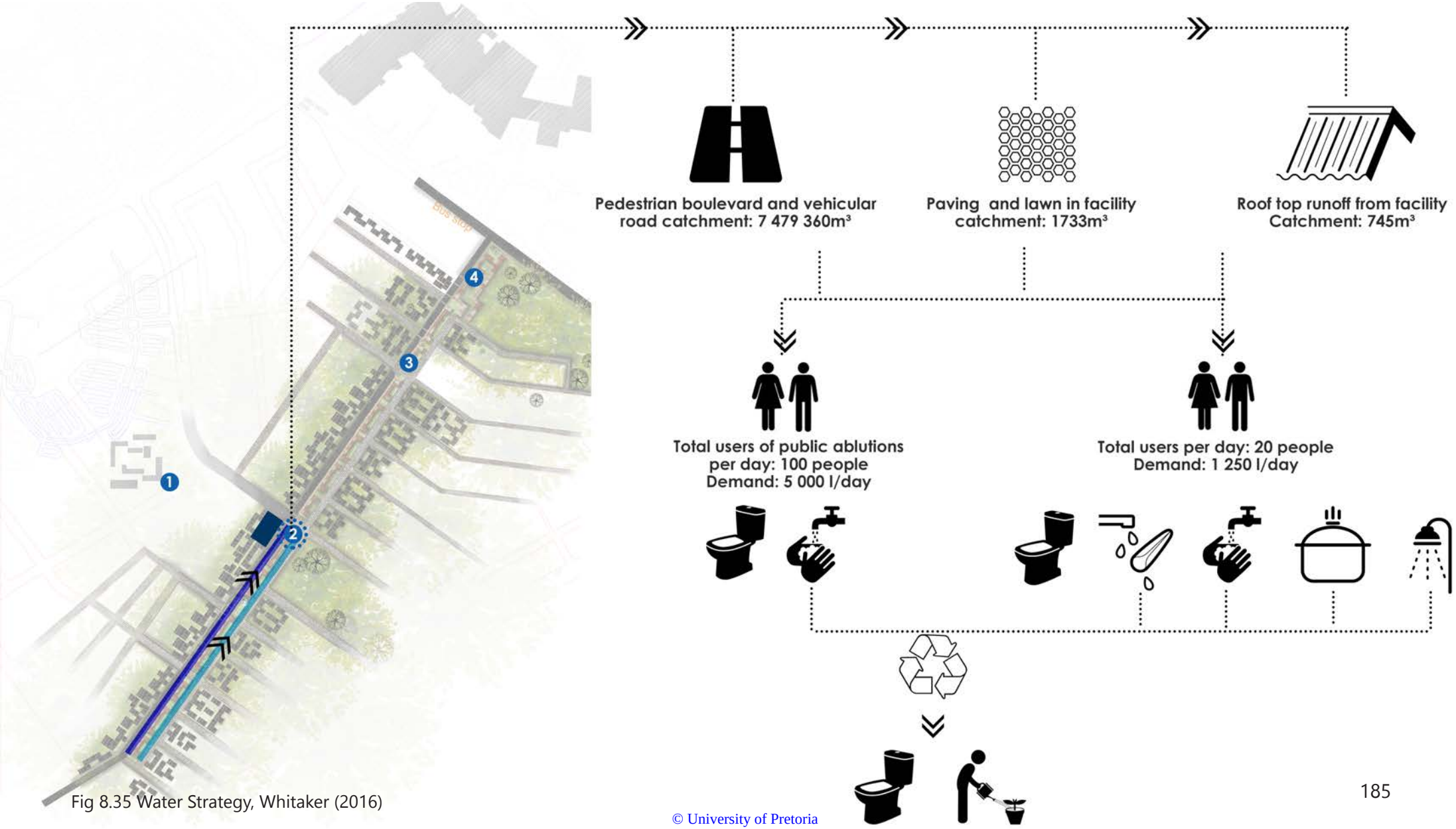


Fig 8.35 Water Strategy, Whitaker (2016)

On site

186 Fig 8.36 Water strategy, Diagrams, Author (2016)

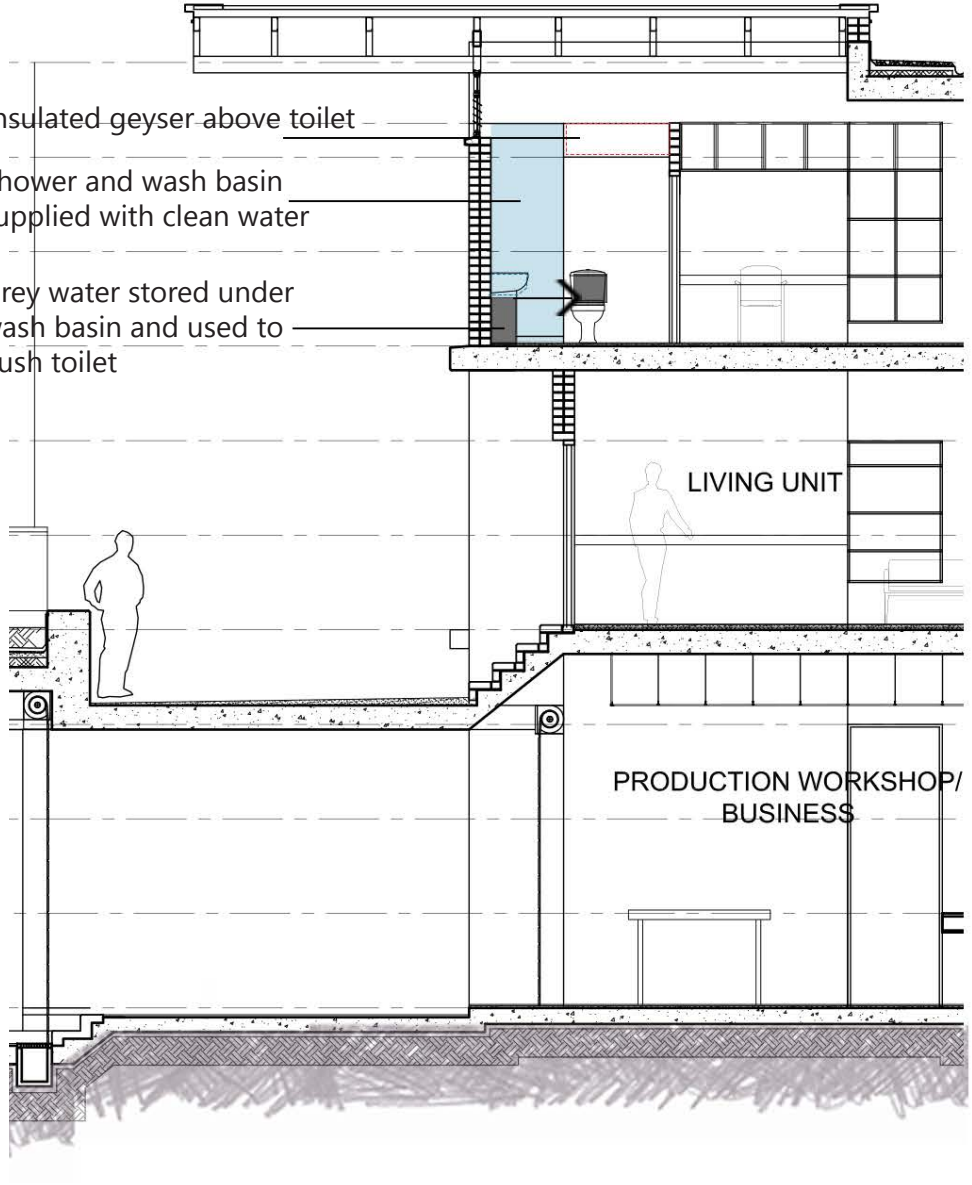


Fig 8.37 Section through accommodation unit highlighting grey water strategy, Author (2016)

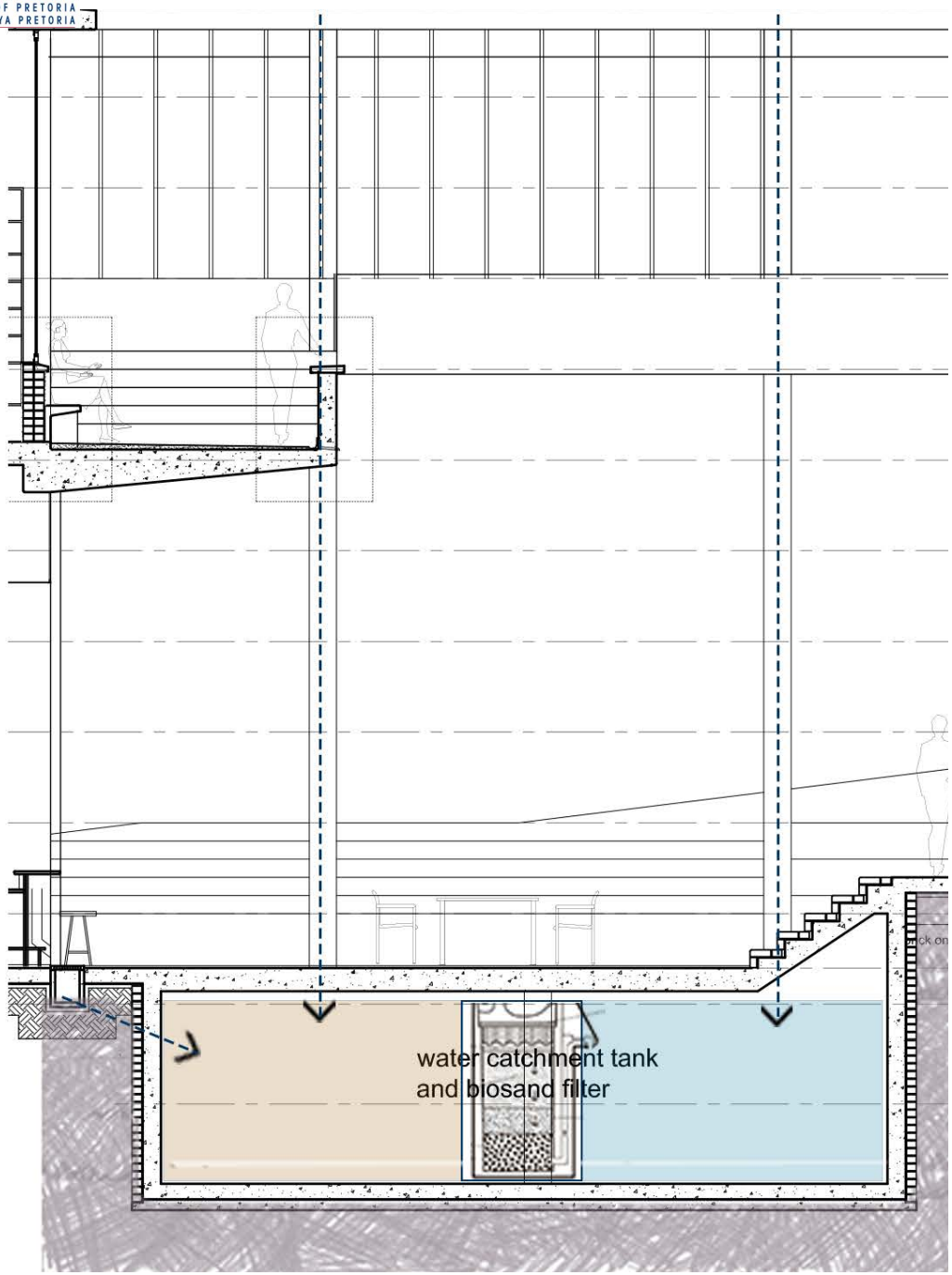


Fig 8.38 Section through underground water catchment tank, Author (2016)

Biosand filter: practicalaction.org/image/bio-sand-filter-technical-plan.jpg

Energy Strategy

A biodigester is a self-sustaining alternative energy generating process that allows the users to reduce their dependency on grid electricity. Biodigesters decompose organic material in an anaerobic process, meaning that it is a closed system that doesn't need oxygen for the process to occur. The anaerobic process produces methane and carbon dioxide known as biogas. The biogas is then converted, by means of a methane generator, to electricity for lighting and the heat energy for heating of water (Src.sk.ca 2015) (Simgas 2015).

The Biodigester is located on the main island and forms part of the greater urban vision which suggests that three biodigesters are located along the main island, providing alternative energy to the three projects on site.

The biodigester is stored under the main boulevard where it is able to be accessed for maintenance purposes. It is a closed system and therefore smells are only an issue when the biodigester is opened.

Calculations:

(Mukumba. J, Makaka. G, et al. 2013: 12-21)

Total electricity demand a day: 253 kwh
Manure: 500 (amount of people use ablutions per day) x 0.7 = 0.35 m3
Urine: 500 x 1 = 0,5 m3
Kitchen: 0.404 m3

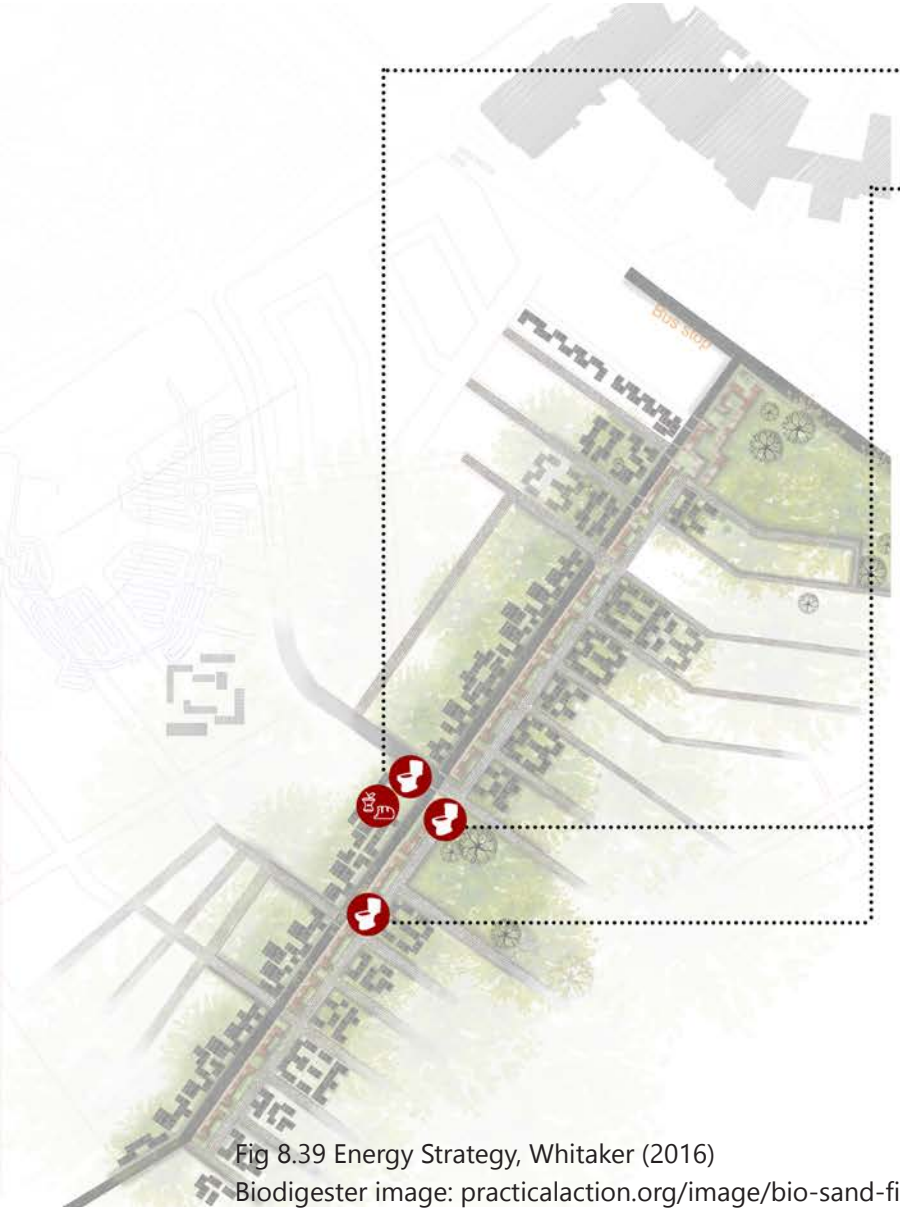
Total waste produced daily: 1,254 m3 per day
Kitchen: 0.5 x 0.404 = 20.2 m3
Manure: 350 x 0.078 = 27 m3

Total gas produced daily: 47.5 m3
If 1m3 of gas gives you 9 kwh:
Total energy produced per day: 47.5 x 9 = 427.5 kwh
Thermal energy 60% = 258 kwh
Mechanical energy 40% = 172 kwh

Grid electricity needed: 253-172= 81 kwh per day
Tank size (7 x 7 x 2m)
Because waste is wet 1:1 ratio, volume of daily waste: 2,508 x 40 = 100 m3

The facility would receive 172 kwh a day of usable energy from the biodigester. A total of 253 kwh per day of electricity is needed to run the facility therefore the biodigester will not be able to meet the full energy requirements of the facility but does contribute extensively to the facilities dependency on grid electricity.

Urban Framework



24 Public ablutions part of urban framework

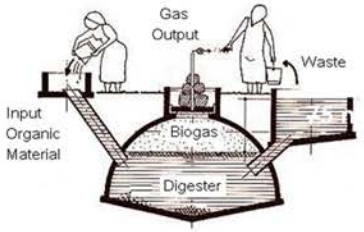
36 Ablutions in facility

organic waste, kitchens and gardens in facility

Solid waste: 0.35m³
Wet waste: 0.5m³

Kitchen waste: 0.404 m³

Total waste: 1,254 m³/day



Total gas produced: 47.5 m³/day

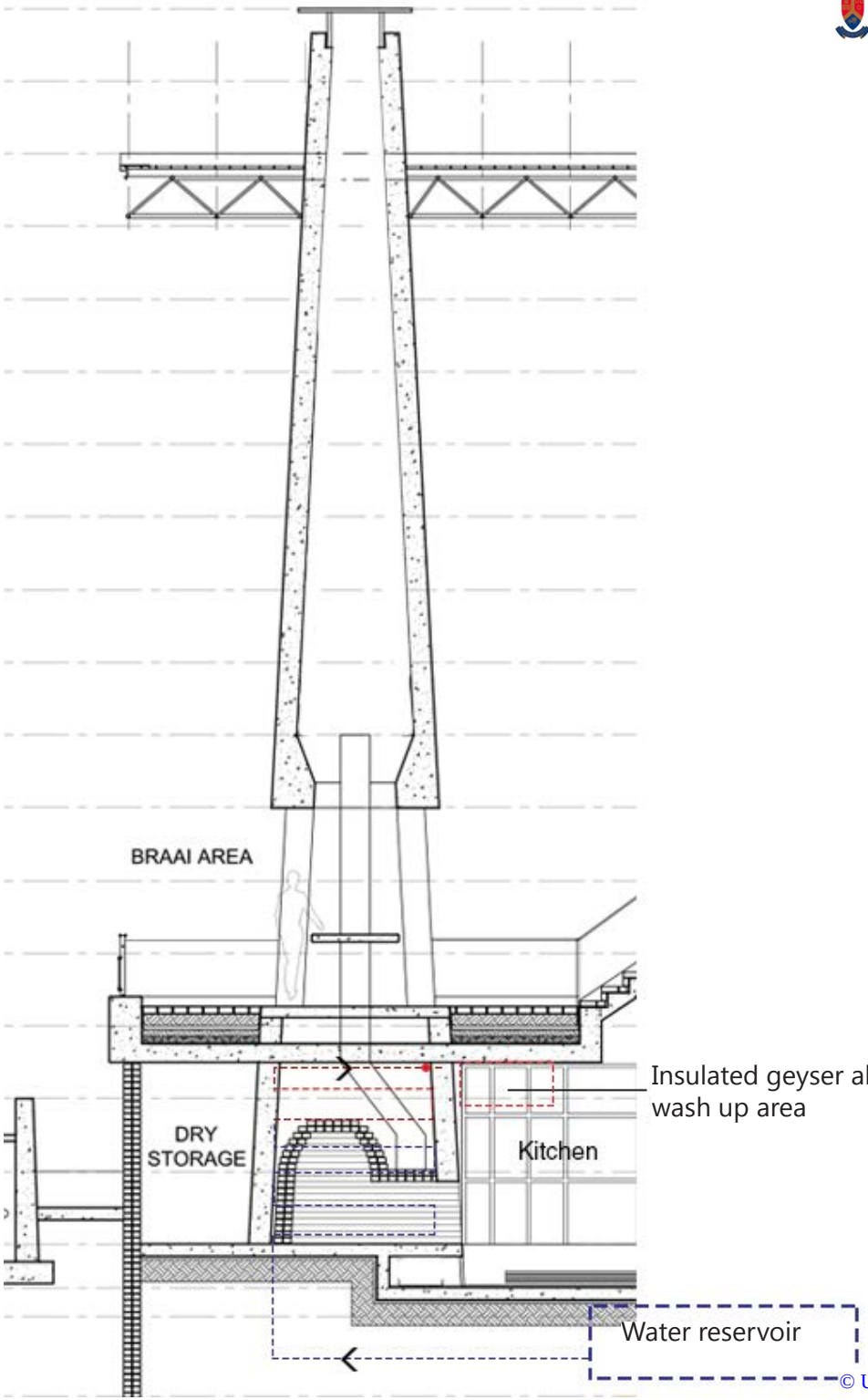
172 kWh/day — 40%

258 kWh/day — 60%

Fig 8.39 Energy Strategy, Whitaker (2016)
Biodigester image: practicalaction.org/image/bio-sand-filter-technical-plan.jpg

On site

 Fig 8.40 Energy strategy, Diagrams, Author (2016)



Heating water by means of the furnace

Purified water, that is collected and stored in underground reservoir tanks, is pumped through copper coils, the coils are heated by the fire of the pizza oven and stored in insulated geysers. This water can then be used in the kitchen for cooking, washing of dishes and cleaning.

This method of heating water is an alternative option to heating water by means of the biodigester which can use up to 258 kwh of energy per day to heat water through thermal energy.

Accommodation: Solar geysers

Solar geysers offer an alternative means of heating water and decreasing the facilities dependency on grid electricity. A direct solar geyser system is used which pumps water into the solar panels which is heated and stored in an insulated geyser (sustainable.co.za).

Two solar geysers of 300 L each (ecosales.co.za) are situated on a concrete roof above the third water tank which supplies the accommodation units with water. The solar heater is used to warm the water needed in the accommodation units.

Fig 8.41 Section of furnace that heats water. Diagrams, Author (2016)

Natural Ventilation

Within Pretoria the windrose indicates a predominant North East to South East summer wind direction (Holm 1996:70).

Ventilation Strategy:

• Natural cross ventilation is the primary passive ventilation principles used in the design. Outside air movement and pressure difference is used to cool and ventilate the interior spaces. The interior spaces are mostly shaded with overhangs which allows the air to cool before entering the interior.

• Courtyard landscaping and green roofs help cool air down before entering the interior cross ventilated spaces.

• The principles of stack ventilation and wind are applied to the resource centre. The stack ventilation principle uses air pressure difference due to height to pull air through the building. The hot air rises, becoming lower in pressure as it heats which helps pull in air from lower in the building which is of a positive pressure (cooler) (Autodesk sustainability workshop 2016) . The atrium space is used and extended higher than the opposite roofs in order for a greater stack effect to occur. Air from both sides of the resource centre is pulled in and drawn through the atrium space which is located in the middle, therefore keeping all the spaces well ventilated. When Pretoria is windy the Bernoullis principle can help the stack effect as the difference in air speed helps move air through space. The extended atrium space is located on the NE corner (the windward side of the building) therefore the faster air on windy days will help pull air up and out of the building.

• Night purge ventilation is used to flush hot air out of the building and cool the thermal mass for the next day. The air is flushed by wind ventilation and stack ventilation by leaving the clerestory windows open on the highest floor.

(Autodesk sustainability workshop 2016)

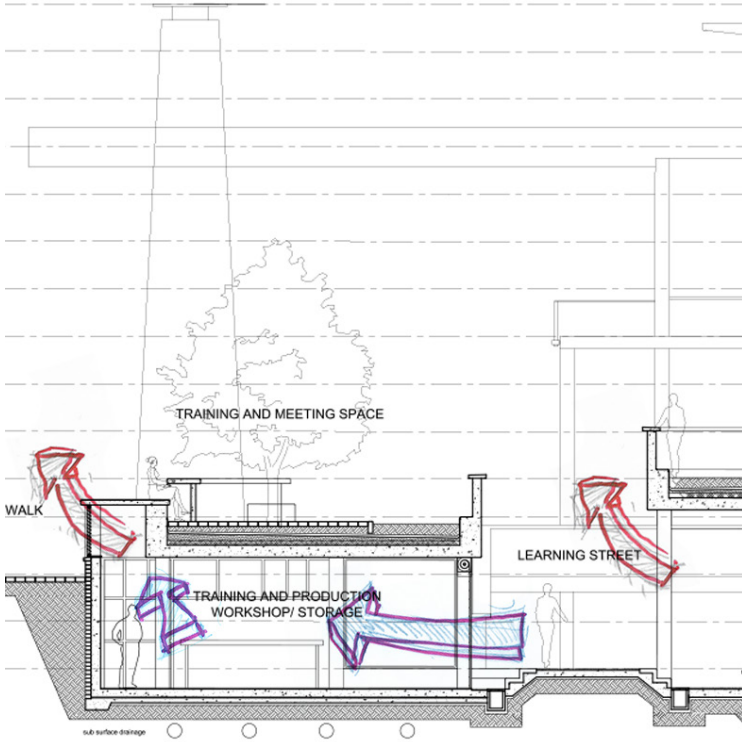
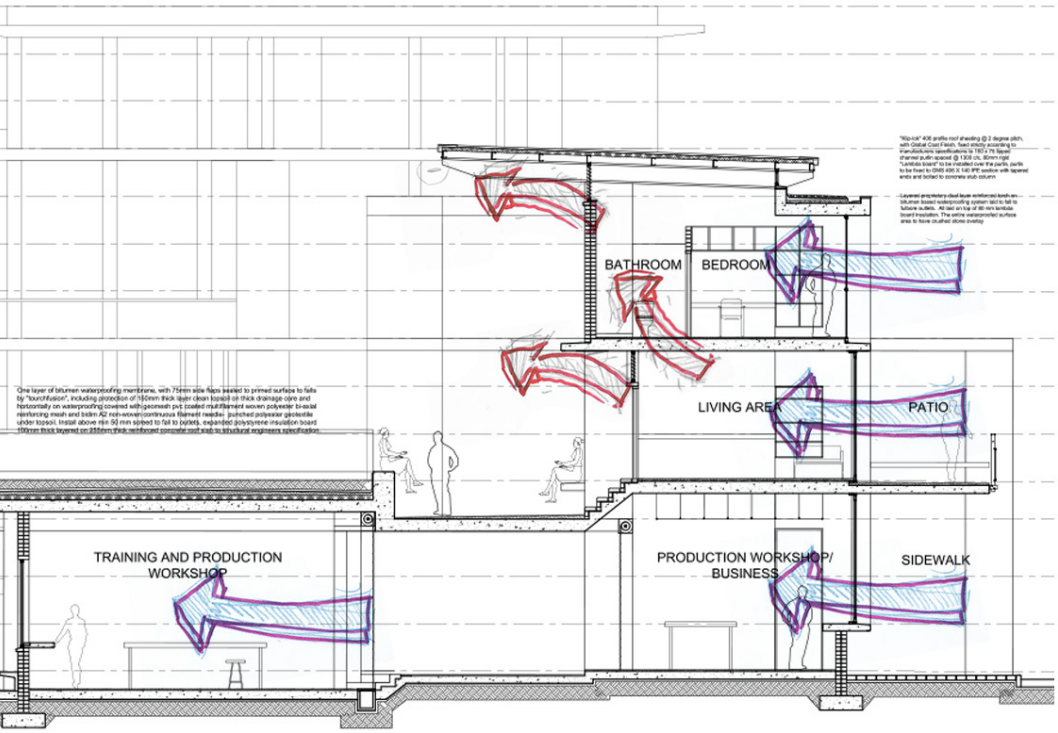
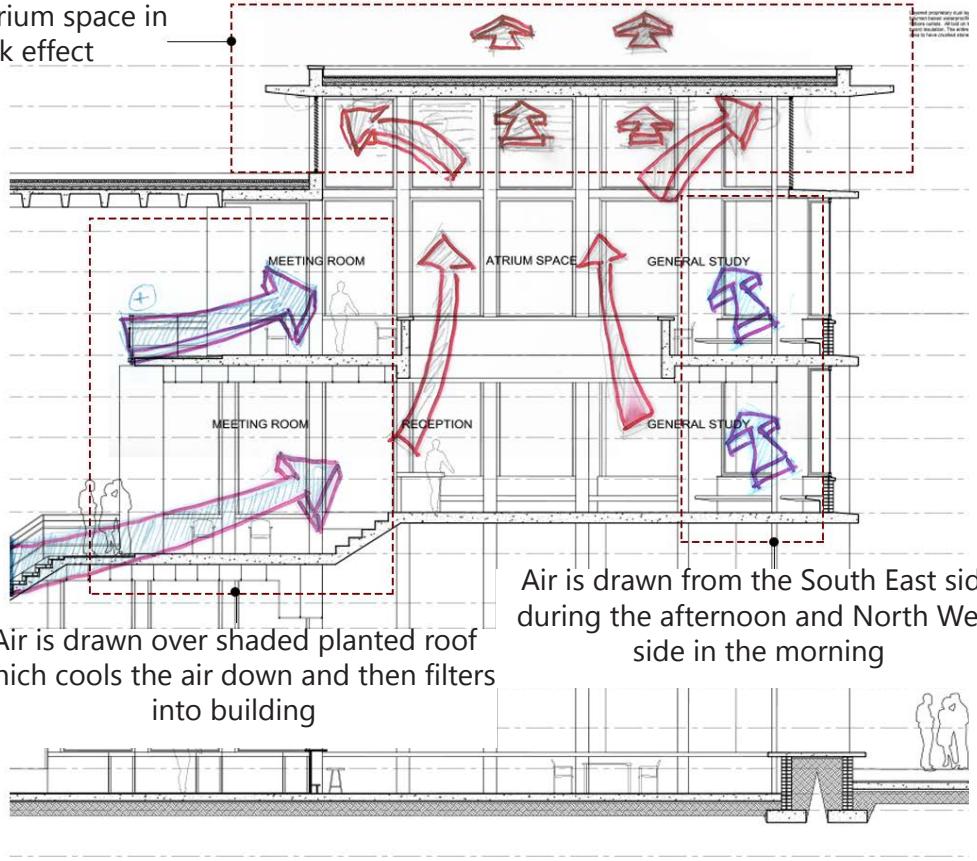


Fig 8.42 Section showing cross ventilation through workshops and accommodation. Diagrams, Author (2016)



Windward side (NE) creating negative pressure

Roof is raised over atrium space in order to create a stack effect



Air is drawn from the South East side during the afternoon and North West side in the morning

Air is drawn over shaded planted roof which cools the air down and then filters into building

Fig 8.43 Section showing stack ventilation principles in the resource centre, Diagrams, Author (2016)

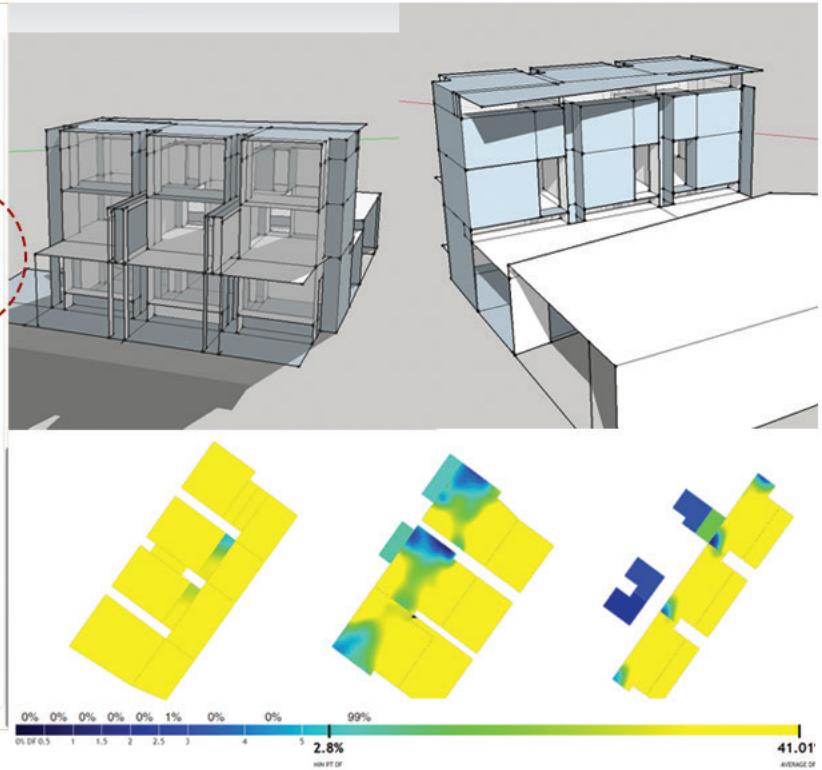
Sefaira®: accommodation units

Sefaria®, which is a performance based analysis, was used to pick up problem areas in the design. Sefaria® is used to measure interior daylight factors, the energy usage and whether or not it is a cool or heat dominated space. The accommodation units which face an undesired South East and North West angle were analysed further.

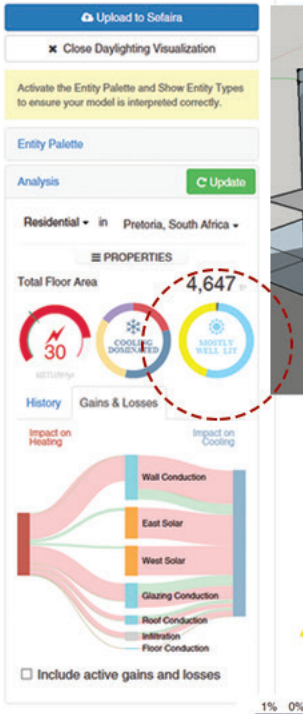
Daylight Factor:

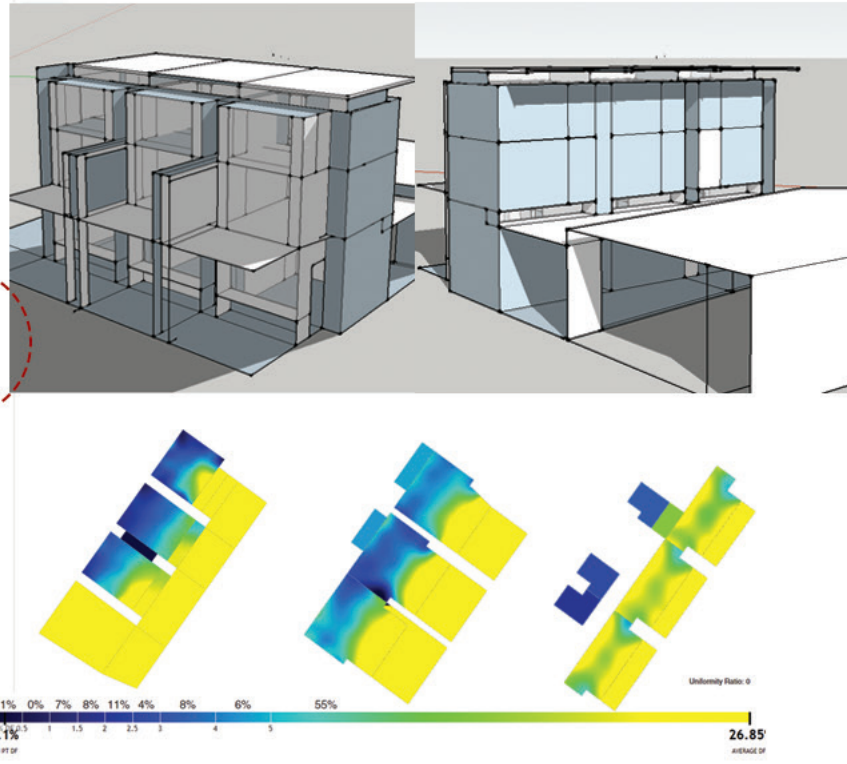
Original Design: The spaces are mostly over lit with a daylight factor of over 5% in some of the internal spaces. The desired daylight factor for internal spaces is between 2-5%, anything more than 5% begins to cause glare (Sefaria 2016).
Containing heat in the accommodation units was of most concern and needed to be considered in the iteration.

Iteration: Design improvements were needed in order to decrease the interior daylight factor, this was done by minimizing the glazing and increasing the wall area and altering the roof condition which shades the unit more.
The spaces are shown to be well lit with a daylight factor of above 2 % and below 5%.



Original design





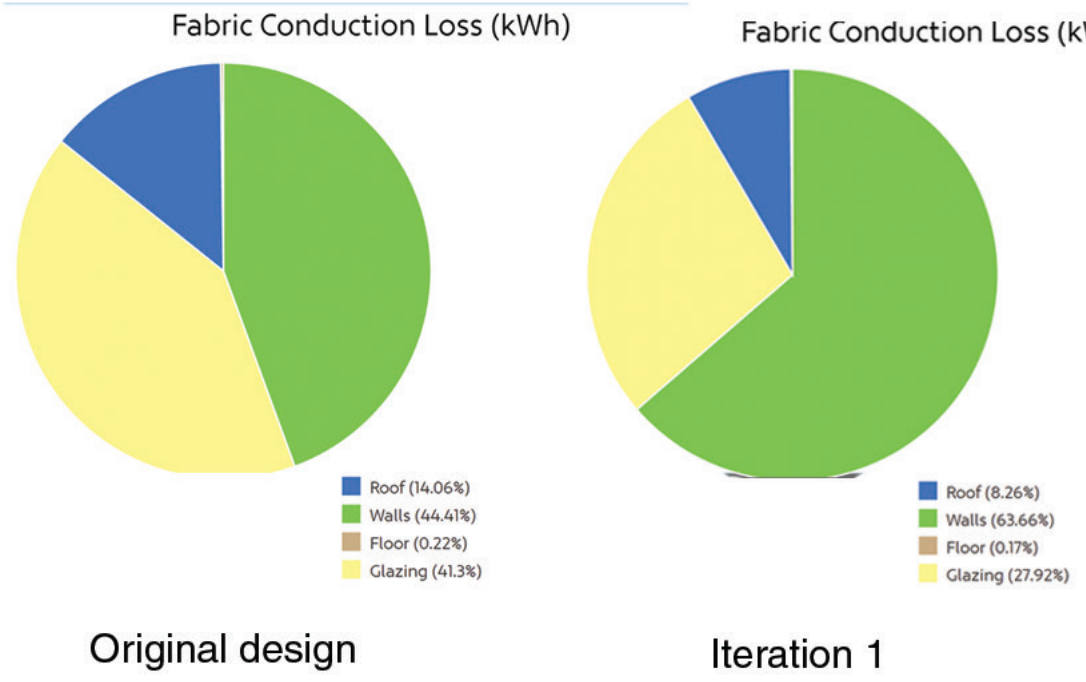
Iteration 1

Minimizing heat loss in winter:

In an attempt to minimize heat loss in winter the materials that lose heat due to conduction were targeted. The roof according to SANS 10400- XA (SANS10400.co.za 2016) needs a minimum R-value of 3,2 m2k/w in Pretoria, a concrete slab has a R-value of 0.4 m2k/w therefore additional insulation is needed that amounts to more than 2,85 m2k/w. A 80mm lambda board insulation with an R-value of 3,33 m2k/w was used which is more than the SANS requirements.

The heat lost due to conduction through glazing was minimized by recommending that uPVC window frames are installed as research suggests that the frames are more air tight than aluminum or timber frames (Mybuilder.com 2011) with U values as low as 3.2 W/m2k when using single low E glazing. Low E glazing is recommended as the coating minimizes heat gain and heat loss by reflecting the heat either back into the external or internal spaces.

And finally the floor conduction loss is minimized by introducing additional insulation. SANS 10400- XA (SANS10400.co.za 2016) states that a minimum floor R-value of 1 m2k/w is required, a 255mm concrete slab has a R-value of 0.17m2k/w, bearing in mind the unit is located on the first floor, additional insulation is needed. A 25mm Lambda board insulation with an R-value of 1,04 m2k/w is suggested.



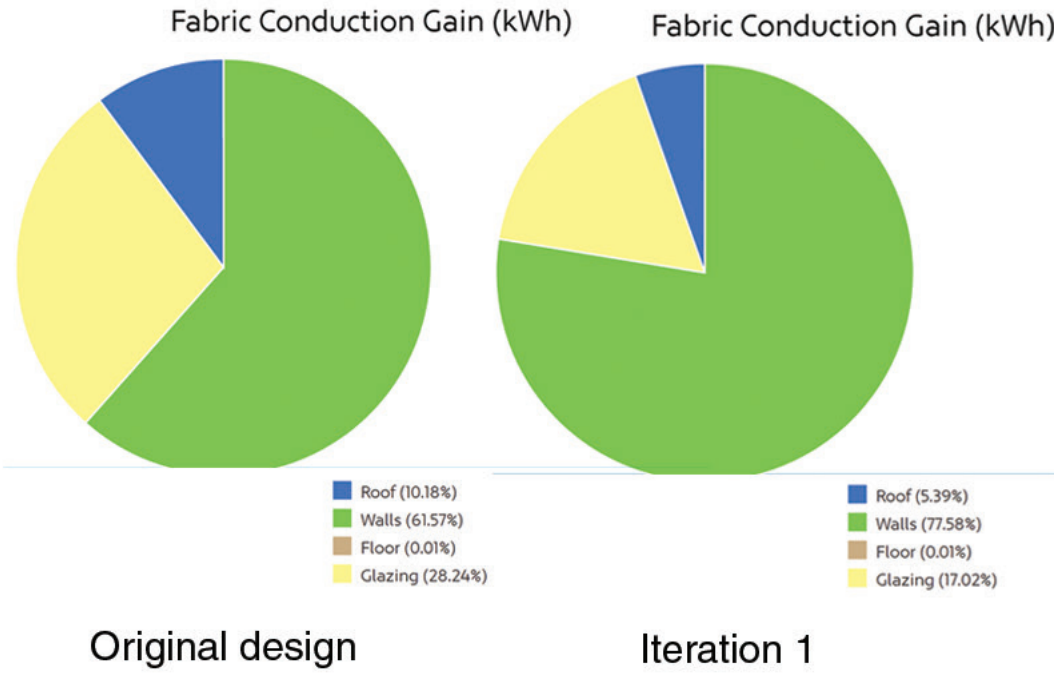


Fig 8.44 Sefaira analysis showing heat loss and gain, graph, sefaira.com (2016)

Fig 8.45 Sefaira analysis showing daylight factor, graph, sefaira.com (2016)

- Minimise roof conduction loss
SANS 10400: Min roof R-Value 3.2 m2K/W
Additional isulation needed min R= 2.85 m2K/W
80mm lambda board insulaiton used R= 3.33 m2K/W

- Minimise glazing conduction loss:
uPVC frames are used as they are more air tight than aluminium or timber frames.
low-E glass is used.

-Minimise floor conduction loss (on first and second floor):
SANS 10400: min floor R- value 1 m2K/W.
255mm concrete slab R= 0.17m2K/W.
Additional 25mm insulation (lambda board) R=1.04 m2K/W
Total R- value= 1.21 m2K/W

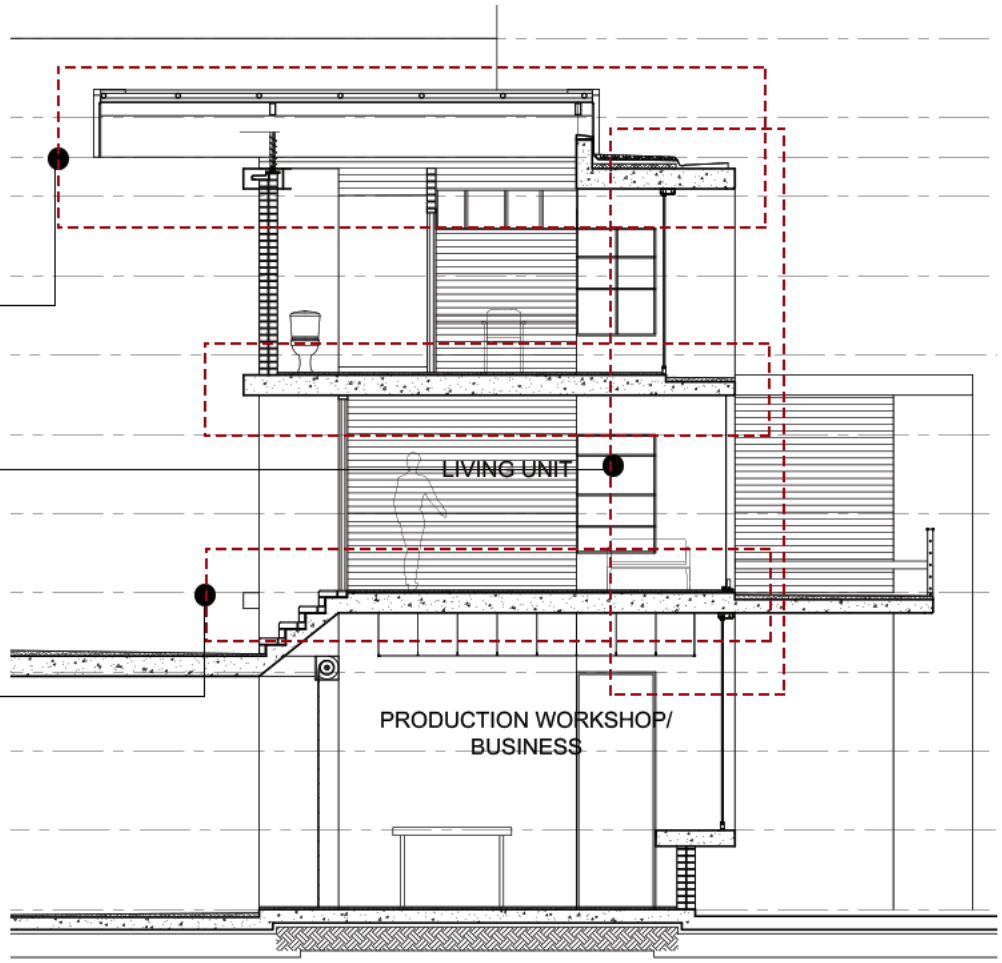


Fig 8.46 Sefaira analysis and material specifications, Section, sefaira.com (2016)

SUSTAINABLE BUILDING ASSESSMENT TOOL RESIDENTIAL

1.04

SBAT Building Saftey Assessment Tool

SB SBAT REPORT	Achieved 4.4

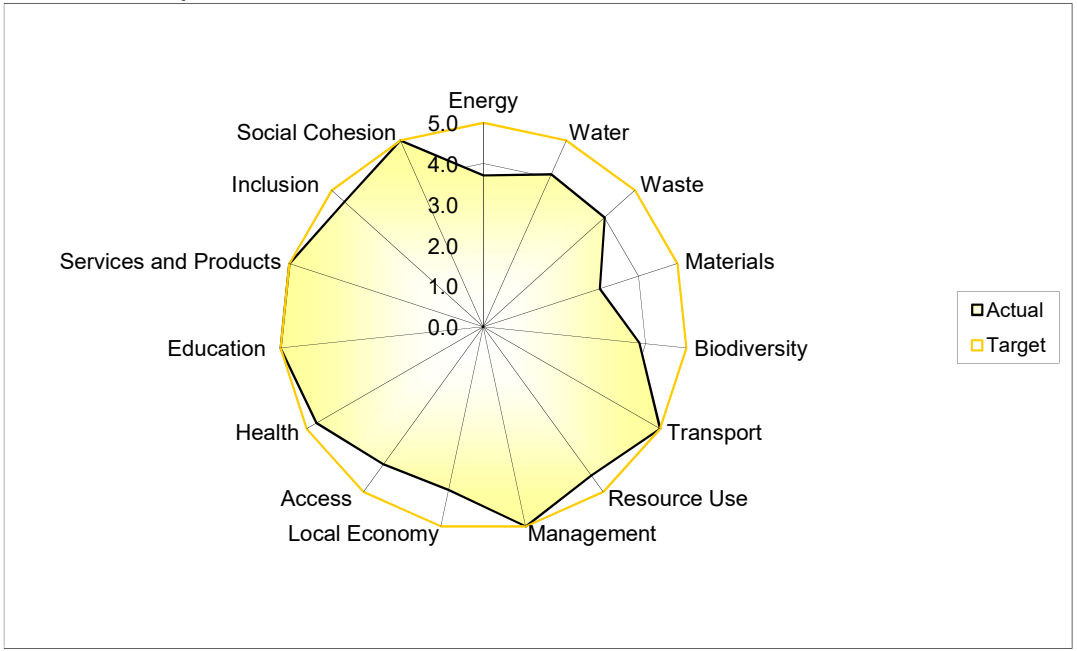
SB1 Project

Plastic View, Common Ground

SB2 Address

MoreletaPark

SB3 SBAT Graph



SB4 Environmental, Social and Economic Performance	Score
Environmental	3.7
Economic	4.6
Social	4.9
SBAT Rating	4.4

SB5 EF and HDI Factors	Score
EF Factor	4.2
HDI Factor	4.6

SB6 Targets	Percentage
Environmental	75
Economic	91
Social	97

Fig 8.47 SBAT Analysis, gauge.co.za (2016)

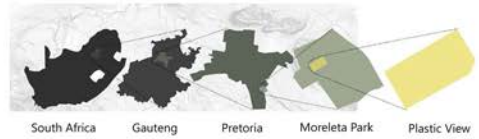
Figure 9.0: Final Presentation, Photograph, Author (2016)

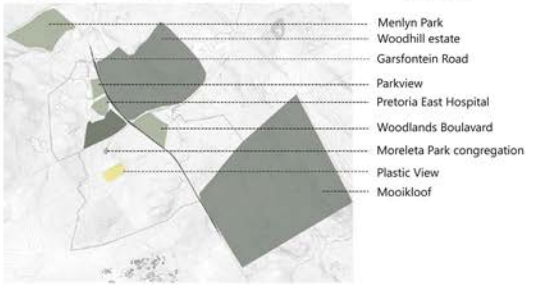
9 Final Presentation

Common Ground

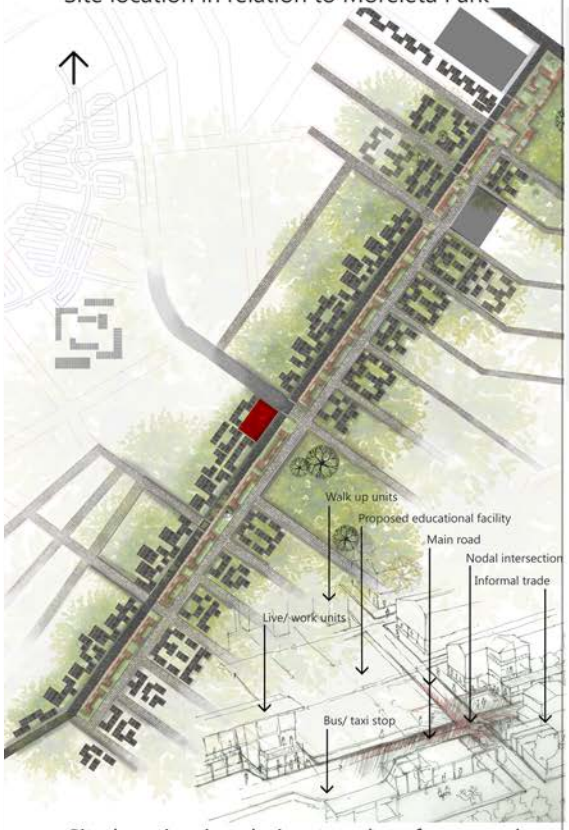
Finding commonality in an integrative communal educational environment

Site location



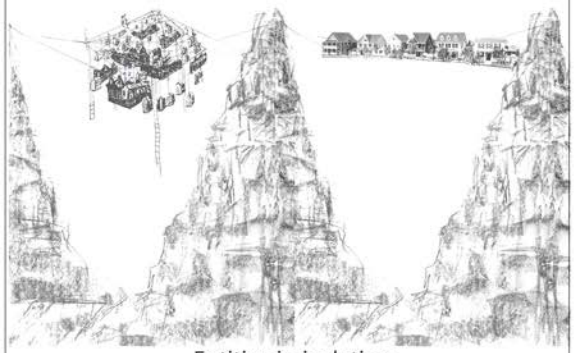


Site location in relation to Moreleta Park

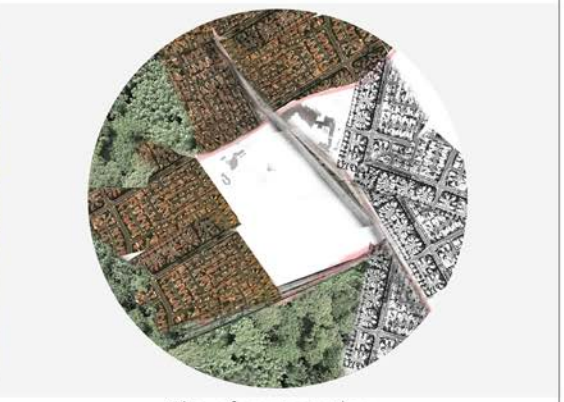


Site location in relation to urban framework and surrounding fabric

Issues



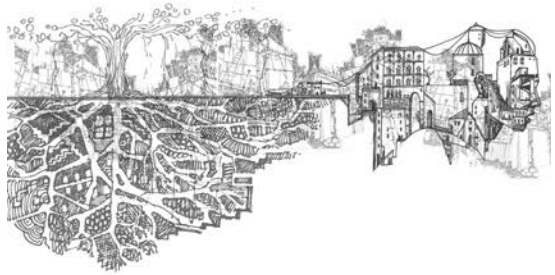
Entities in isolation



Site of contestation

Lack of access to basic amenities

Urban Intentions



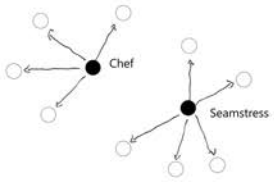
Integration of entities

Site of conciliation

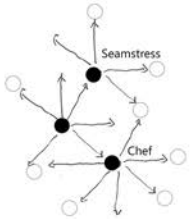
Access to basic amenities

 Figure 9.1: Final Presentation page 1, Author (2016)

Project Intentions



Current learning networks



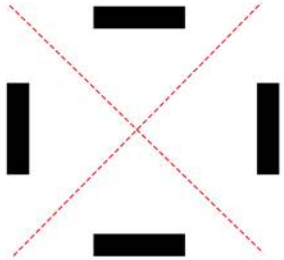
Finding commonality in a place of learning

Strengthen currently active learning networks

Components organised in extended school to form architectural unity

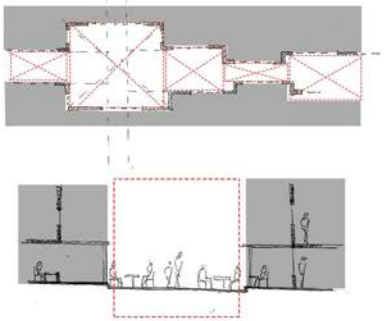
Space that permits common use | Components accessed from communal space | And take on the character of a central square

Community school integrated within environment



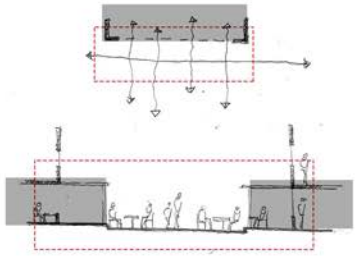
Extroverted educational approach

Programmatic Intentions



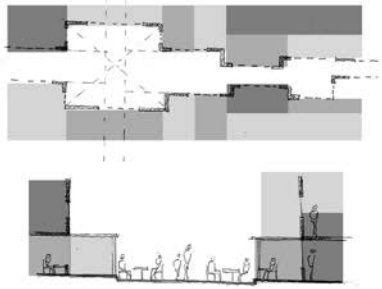
The programmes frame in-between space where interaction between the learners and community can take place

Spaces of interaction



Local amenities are situated on the main axis in order to create an accessible environment which caters for the needs of the whole community

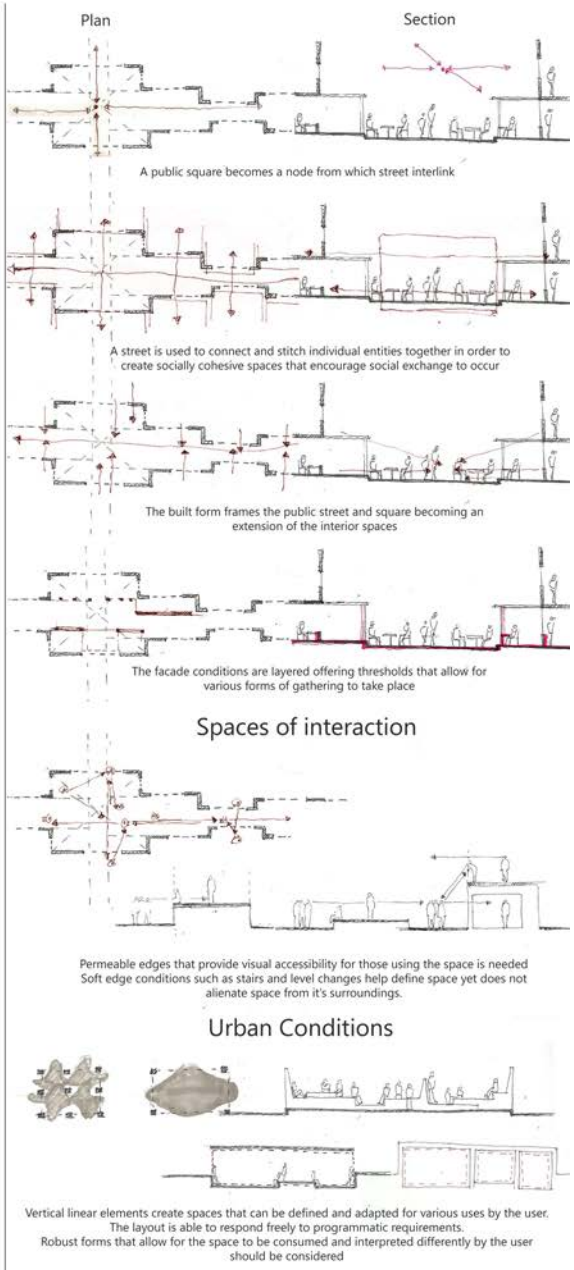
Urban Conditions



The programmes need to be able to be adapted and transformed in oder to suit the needs of the community

Multifunctionality

Architectural Intentions



Contextual informants

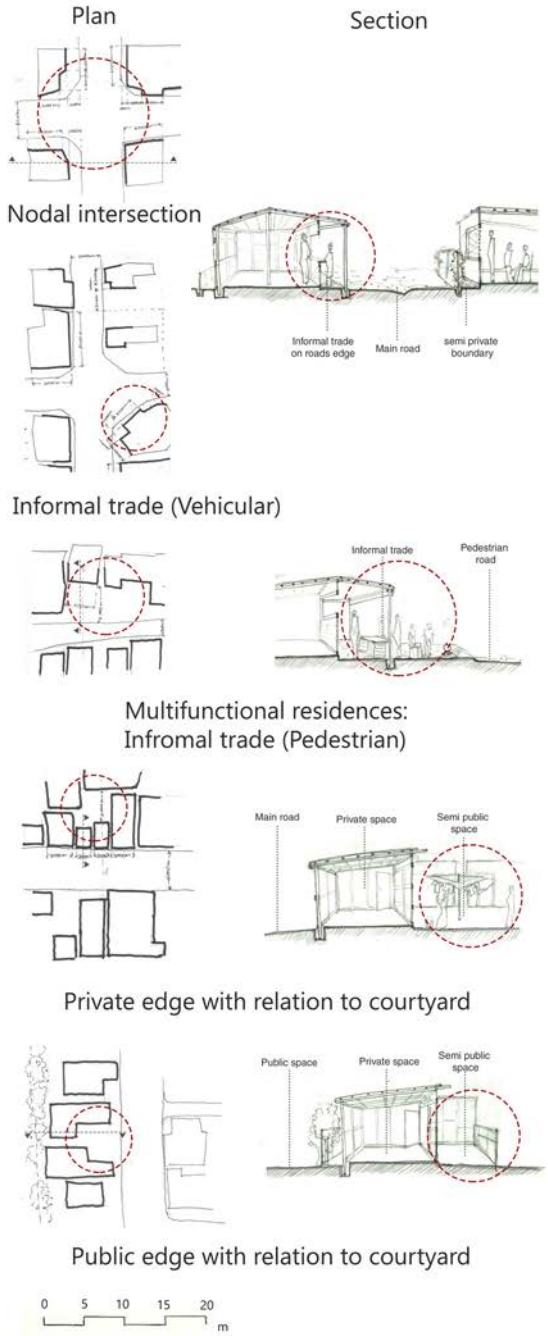
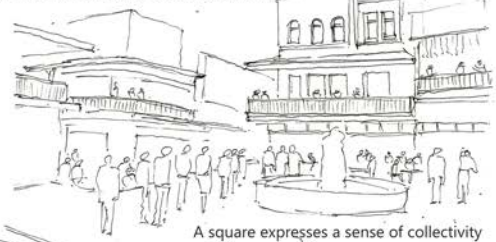


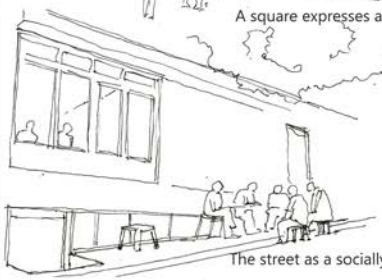
Figure 9.2: Final Presentation page 2, Author (2016)

Theoretical support and conceptual development

The street as a socially cohesive element



A square expresses a sense of collectivity



The street as a socially interactive element

Learning environment seen as a mico city

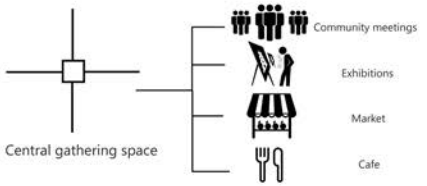
Street in Alaska, Mamelodi

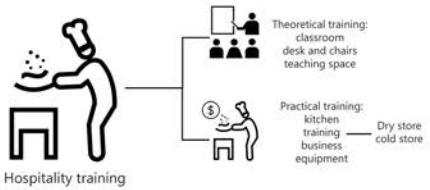
Street in Plastic View, Moreleta Park

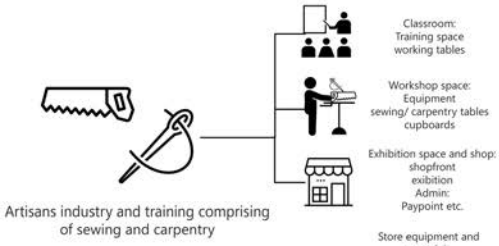
Learning street

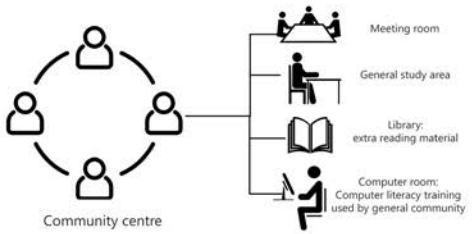
Educational facilities should consist of both streets and squares forming a small city which encourages the greatest amount of social contact between people. (Hertzberger 2008:123)

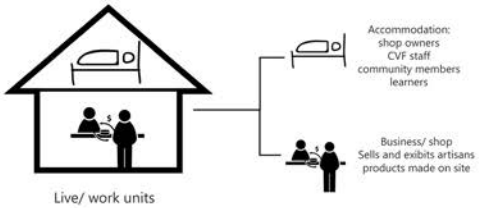
Programmatic approach: first design proposal

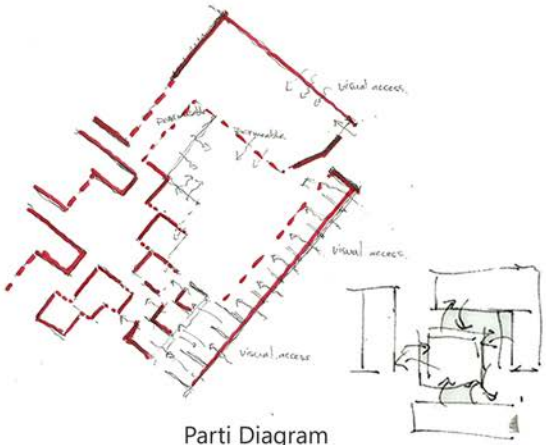




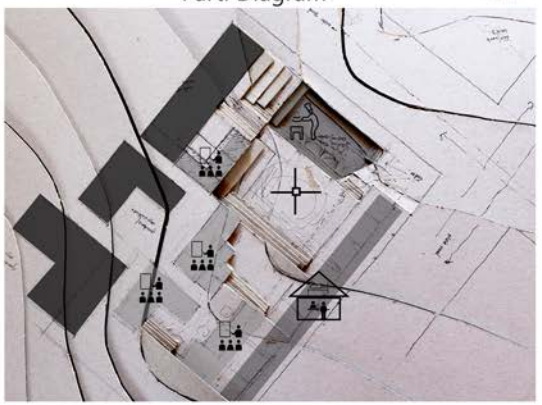




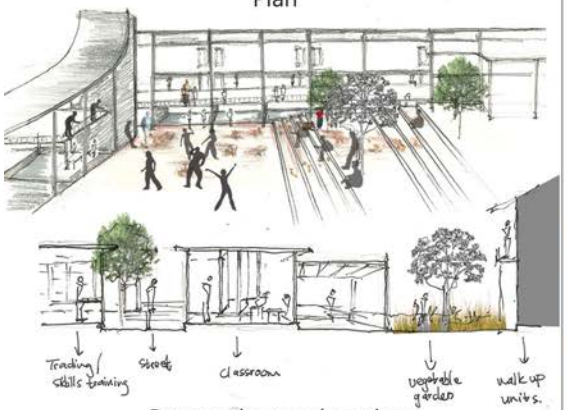




Parti Diagram



Plan

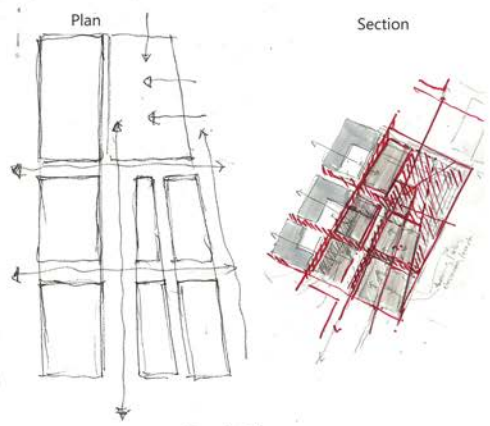


Perspectives and section

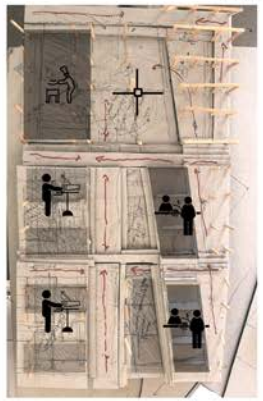
The first design proposal was an intuitive reaction to initial theory by Hertzberger (2008). It responds to the notion that public meeting spaces can act as a catalyst in order to find common ground between the users of the building and the surrounding community.

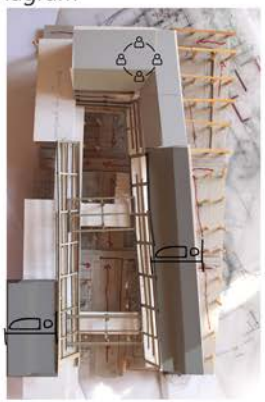
The model begins to explore how the in-between space can be framed by walls and columns, level differences and thresholds thus spatially exploring how a building frames negative space. The model also investigates how the edge conditions can be activated in order to draw people onto the site.

Design Iteration 1



Parti Diagram





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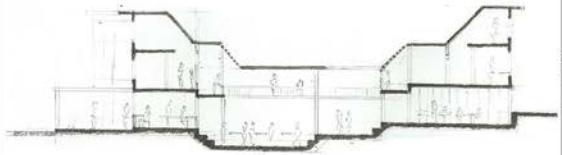
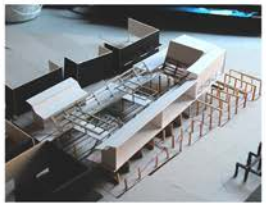
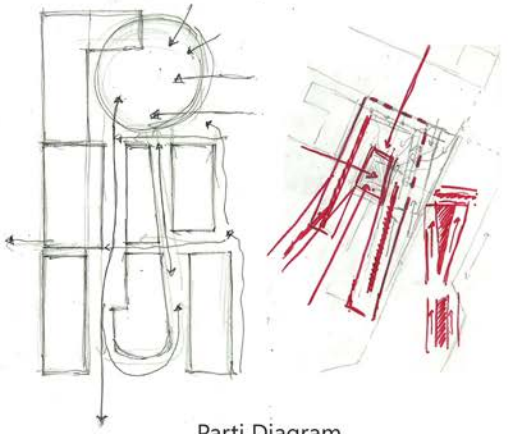




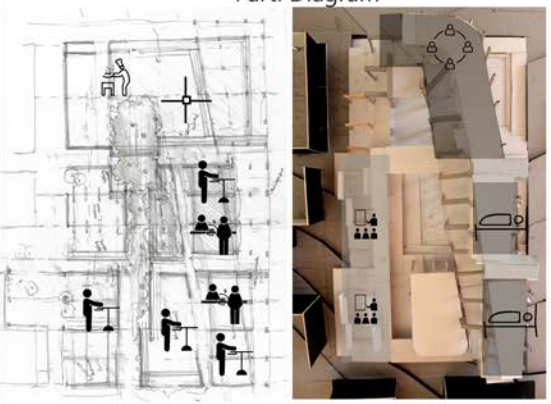
Section and model

A rudimentary approach to this iteration was taken as the architectural intent was still being explored and discovered. This proposal explores how the roof can become a defining element. The roof is interpreted as an element which moulds and defines spaces where interaction can take place between people which relates back to theory on an extended school approach (Hertzberger's 2008).

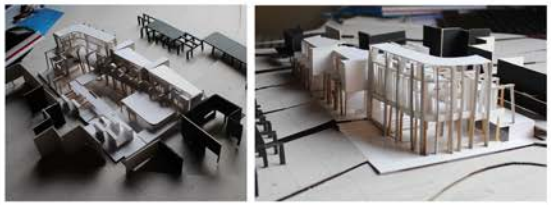
Design Iteration 2



Parti Diagram



Plan

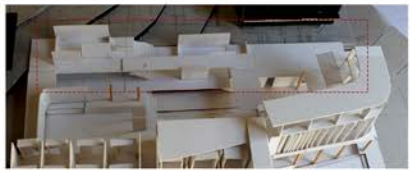


Sketches and model

In support of considering the facade of the building as a defining element, a relation is drawn to Lefebvre's (1987) theory on the production of space. Lefebvre (1987) suggests that people shape space naturally, socially and simply by how they use it every day. It is then intended that the architectural form explored defines space and programme well not limiting the extent to which the structure can be inhabited, changed and appropriated by the users. Lefebvre's (1987) theory of how space can be perceived supports the notion of the facility as a microcosm of society where people are able to socially interact with one another in society.

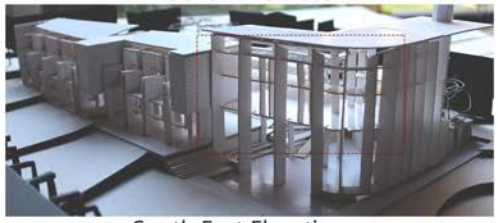
Model Development

Accommodation units



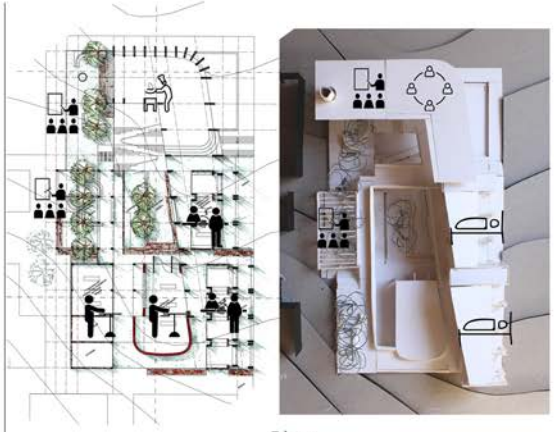
Theoretical training

Roof and furnace



South East Elevations

Design Iteration 3

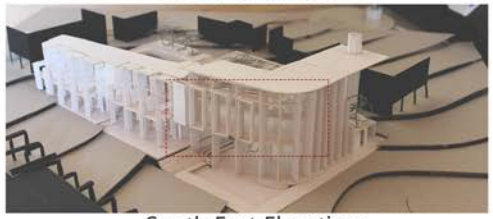


Plan

Accommodation units

Theoretical training

Roof and furnace

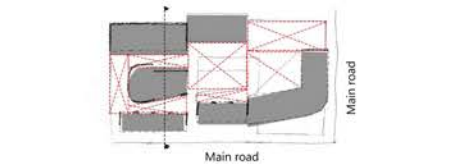


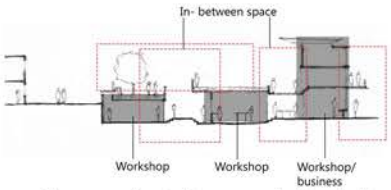
South East Elevations

Figure 9.3: Final Presentation page 3, Author (2016)

Figure 9.4: Final Presentation page 4, Author (2016)

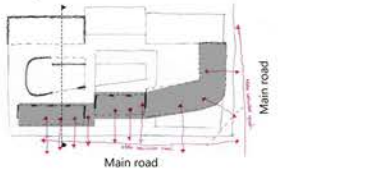
Programmatic Reflection

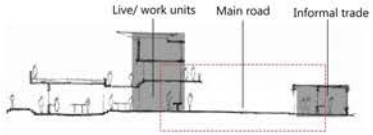




The programmes frame in-between space where interaction between the learners and community can take place

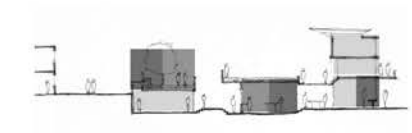
Spaces of interaction





Local amenities are situated on the main axis in order to create an accessible environment which caters for the needs of the whole community

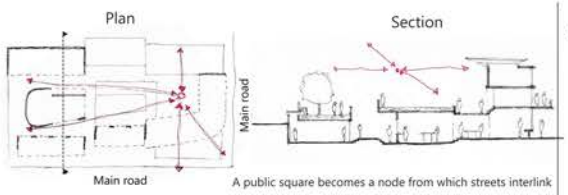
Urban conditions

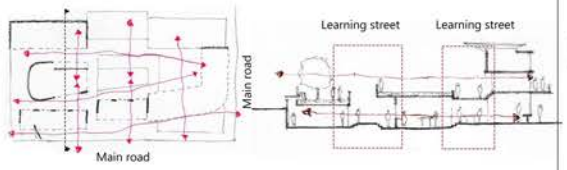


The programmes need to be able to be adapted and transformed in order to suit the needs of the community.

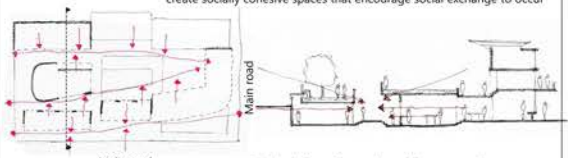
Multifunctionality

Architectural Reflection

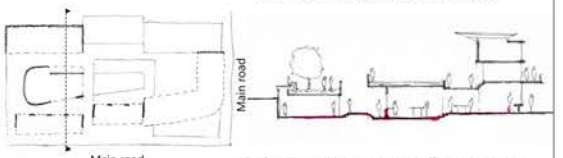




A street is used to connect and stitch individual entities together in order to create socially cohesive spaces that encourage social exchange to occur

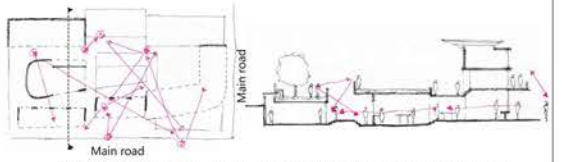


The built forms frame the public street and square becoming an extension of the interior spaces



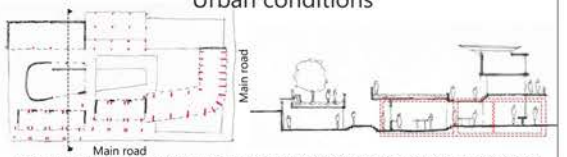
The facade conditions are layered offering thresholds that allow for various forms of gathering to take place

Spaces of interaction



Permeable edges that provide visual accessibility for those using the space is needed.
Soft edge conditions such as stairs and level changes help define space yet does not alienate space from its surroundings.

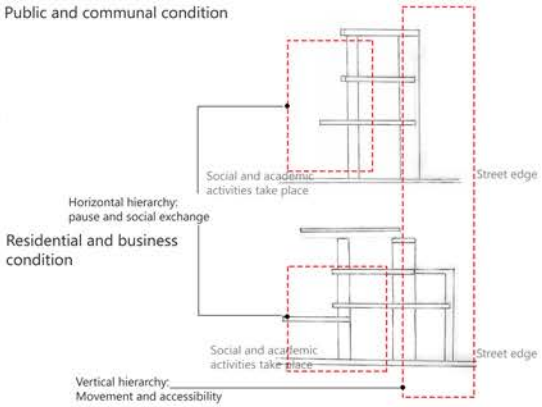
Urban conditions



Vertical linear elements create spaces than can be defined and adapted for various uses by the user.
The layout is able to respond freely to programmatic requirements.

Multifunctionality

Structural intent

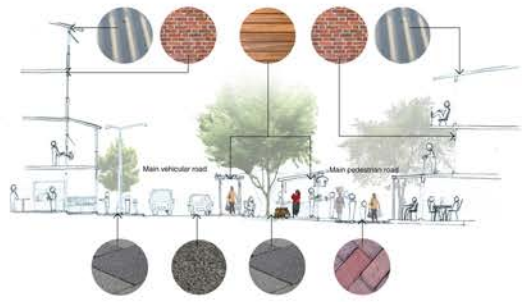


Structural intent

Exposed frame and infill

Hidden frame and infill

Contextual informants



Urban framework materiality

Structural Composition

Horizontal and vertical structural components:

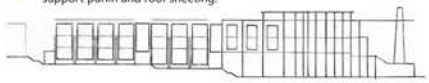
_Vertical structural concrete column sizes: 300x2000mm, 300x1000mm and 300x300mm. With an off shutter concrete finish.
_Horizontal 255mm reinforced concrete floor slabs are cast in place. The slab is either power floated or a 25mm screed is put on top of concrete surface with flooring material as a finish.

Concrete roof (Resource centre)

_255mm reinforced cast in place concrete roof with 80mm "lambda board" insulation layer, followed by screed to fall min 25mm, a "Torch on" waterproofing layer on top of screed, the entire waterproofed area to have a crushed stone overlay.
_500mm Reinforced cast in place concrete up stand beam on inner concrete roof edge, with precast concrete coping over concrete up stand.

Light weight roof structure (Accommodation)

_"Klip-lok" 406 profile roof sheeting @ min 2 degree pitch with global coat finish
_150x75x20x3.0 Cold formed lipped channel purlins that offer support for the roof sheeting, 80mm structural "lambda board" insulation to be installed over the purlin.
_305x165 Galvanized mild steel parallel flange section with tapered ends used to support purlin and roof sheeting.



Primary Components

Brick in fill:

_ Non load bearing 230mm brick walls to acts as infill structure.
_ Face brick Roan travertine red brick, stretcher bond, racked joint finish.

Secondary components

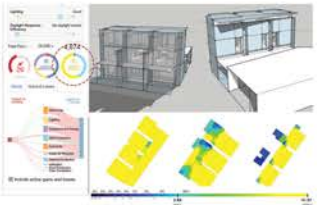
_ Precast concrete seating with intermediate concrete support
_ Brick on edge stair nosing
_ Intensive green roofs are used that act as roof insulation as well as help dampen sound produced in the workshops.

Tertiary components

Figure 9.5: Final Presentation page 5, Author (2016)

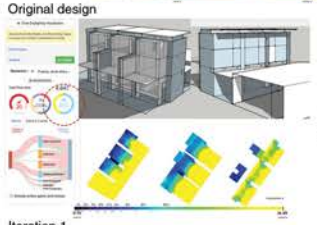
Figure 9.6: Final Presentation page 6, Author (2016)

Sefaira



Daylight factor over 5% causing glare in internal spaces

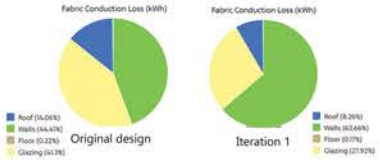
Original design



Daylight factor of above 2% and below 5% indicating they are well lit

Iteration 1

Daylight factor

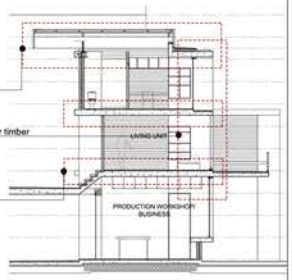


Minimising heat loss

- Minimise roof conduction loss
SANS 10400: Min roof R-Value 3.2 m2K/W
Additional insulation needed min R= 2.85 m2K/W
80mm lambda board insulsiton used R= 3.33 m2K/W

- Minimise glazing conduction loss:
uPVC frames are used as they are more air tight than aluminium or timber frames.
low-E glass is used.

-Minimise floor conduction loss (on first and second floor):
SANS 10400: min floor R- value 1 m2K/W.
255mm concrete slab R= 0.17m2K/W.
Additional 25mm insulation (lambda board) R=1.04 m2K/W
Total R- value= 1.21 m2K/W

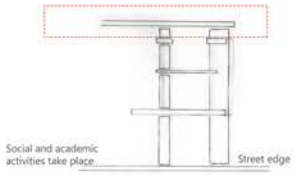


Section of accommodation

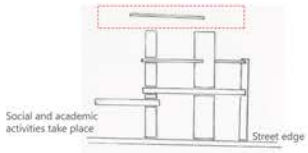
Sefaria, which is a performance based analysis, was used to pick up problem areas in the design. Sefaria is used to measure interior daylight factors, the energy usage and whether or not it is a cool or heat dominated space. The accommodation units which face an undesired South East and North West angle were analysed further.

Structural Iteration 1

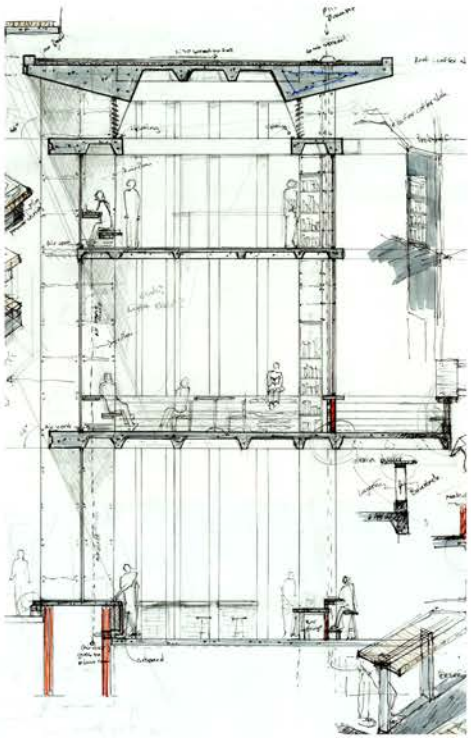
Public and communal condition



Residential and business condition



Structural intent



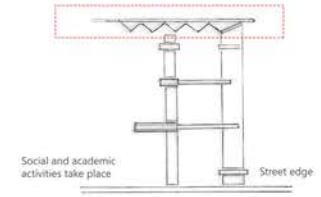
Section scale 1:50

Coffer slabs were used throughout the design in order to express the design and structural intent, which was to frame and define space through the structure. The idea was that the coffer slab could be manipulated to shape space.

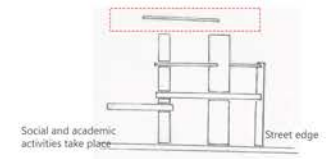
The critique received highlighted that the concrete coffer roof slab made the spaces feel unnecessarily heavy and that a light weight roof structure should be considered.

Structural Iteration 2

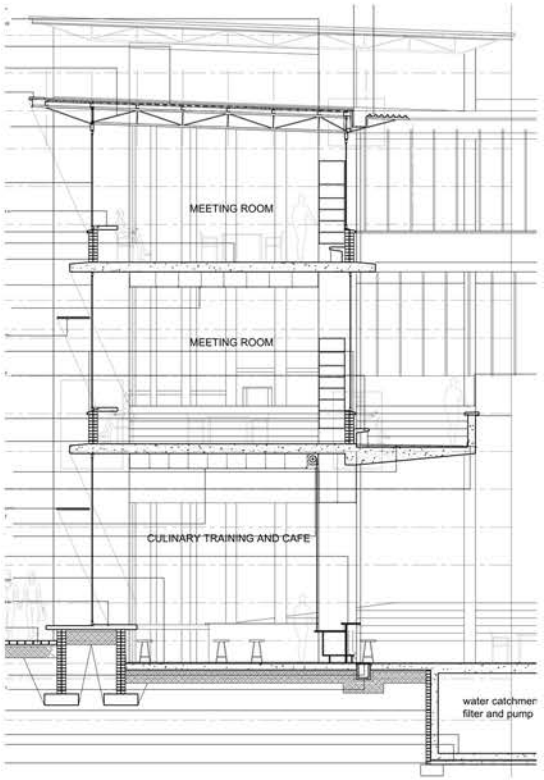
Public and communal condition



Residential and business condition



Structural intent



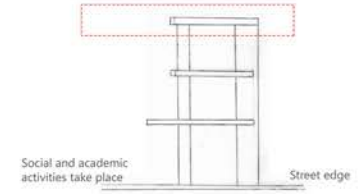
Section scale 1:50

A Circular Hollow Section (CHS) light weight roof structure and space frame structure were considered in this iteration. The light weight steel structure allowed more freedom with regards to the design of the roof.

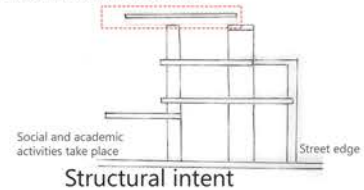
The CHS light weight roof truss proved to be problematic at junctions where the internal structure needed to be closed from external conditions as thermal bridging would occur. It was proving difficult to fix components, like lipped channel purlins to the CHS frame structure.

Structural Iteration 3

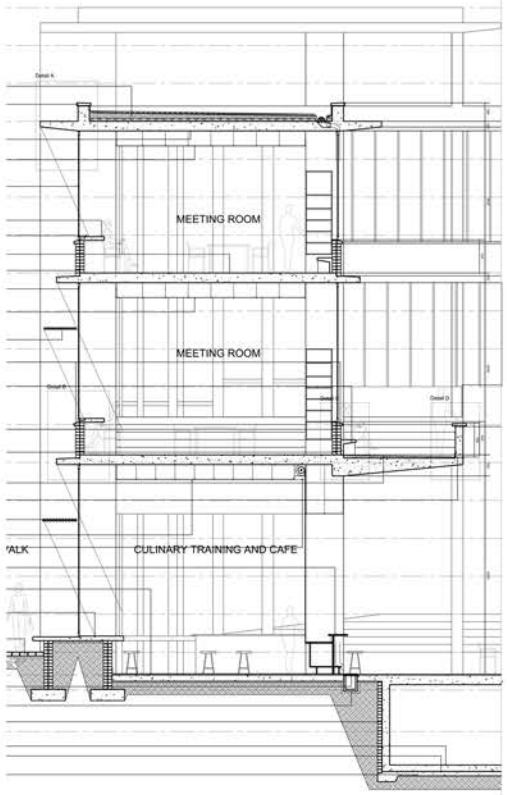
Public and communal condition



Residential and business condition



Structural intent



Section scale 1:50

The architectural language of the CFV explores the idea of repetition and order throughout the facade, this repetition of elements signifies social cohesion. Therefore a roof that acts as a unifying element is not needed as the ordered facade condition does this already. The roof becomes an extension of and ends off the facade of the building by expressing the individual components that make up the whole. The concrete roof, in the future, can also become a floor slab to a new level if more space is required.

Systems Calculations

Rainwater harvesting capacity: Roof: 745 m2x 90% = 670.5 m2
Paving: 961 m2 x 80%= 770 m2 lawn: 772 m2 x 10%= 72 m2
Total catchment area: 1513 m2
Annual rainfall: 573mm x 1513 m2 = 870 000 L

Grey water:
150L + 280L + 400 = 830 L per day
Toilets require 450 L of the grey water per day.

Water consumption:

Water consumption device	Water consumption (L)	No. of uses per day	Water consumption (L)
Flush toilet	9	50	450
Hand basins	3	50	150
Shower	40	7	280
Washing/ cleaning	20	20	400
		Consumption per day	1280
		Consumption per month	38 400

Rain water harvesting tanks:
Required capacity: No. of month low/no rainfall: 5 x 38 400 = 192 000 L
(2): Tank size = 8m x 8m x 2m
(3): Tank size= 4mx4mx3m

Water

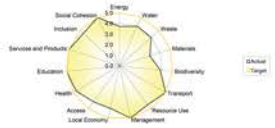
Total electricity demand a day: 253 kwh
Manure: 500 (amount of people use ablutions per day) x 0.7 = 0.35 m3
Urine: 500 x 1 = 0,5 m3
Kitchen: 0.404 m3

Total waste produced daily: 1,254 m3 per day
Kitchen: 0.5 x 0.404 = 20.2 m3
Manure: 350 x 0.078 = 27 m3

Total gas produced daily: 47.5 m3
If 1m3 of gas gives you 9 kwh:
Total energy produced per day: 47.5 x 9 = 427.5 kwh
Thermal energy 60% = 258 kwh
Mechanical energy 40% = 172 kwh

Grid electricity needed: 253-172= 81 kwh per day
Tank size (7 x 7 x 2m)
Because waste is wet 1:1 ratio, volume of daily waste: 2,508 x 40 = 100 m3

Energy

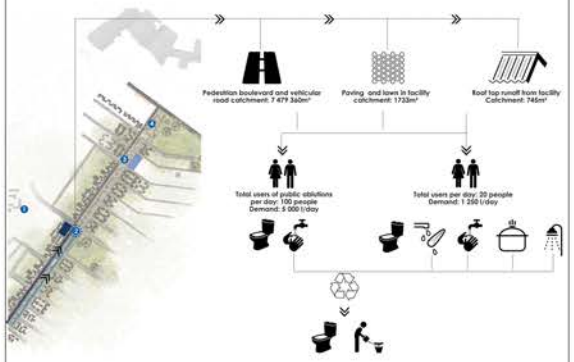


SBAT rating

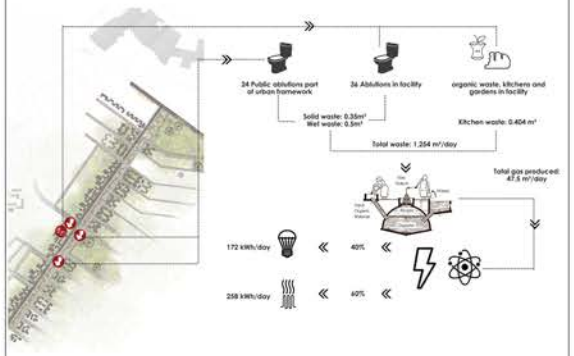
Programme	M2	Building classification	Sans 10400	Users according to SANS	Male wc	Female wc
Formal shops	210	F2	1 person/10m2	21	1 wc 1 uri 1 whb	2 wc 1 whb
Public space	100	A1	1 person/1m2	100	3 wc 5 uri 4 whb	7 wc 4 whb
Admin	20			2	2wc 1hwb	
Kitchen	130			14	1 wc 1 uri 1 whb	2 wc 1 whb
Restaurant	200		No. of fixed seats			
Library	167	C2	1 person/20m2	10		
Places of instruction	480	A3	1 person/5m2	60	2wc 3 uri 3 whb	5 wc 3 whb
Residential accommodation	420	H3	2 person per bedroom		1 wc 1whb	
Storage		J2				

Accommodation schedule

Urban framework strategy



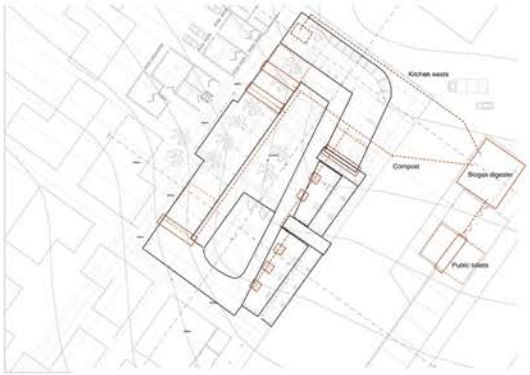
Water



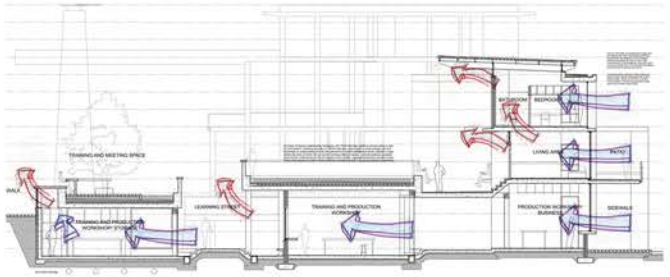
Energy

On site strategy

Water



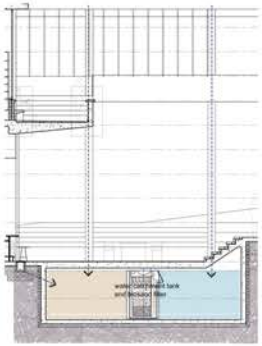
Energy



Natural Ventilation

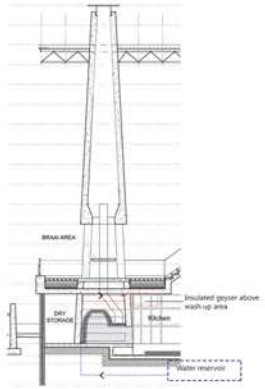
Application

Grey water strategy

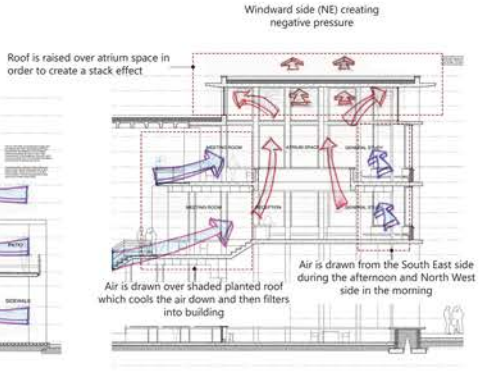


Water catchment tank

Water



Heating water by means of the furnace



Stack Ventilation

206 Figure 9.7: Final Presentation page 7, Author (2016)

 Figure 9.8: Lower ground floor plan, Author (2016)

Figure 9.9: Ground floor plan, Author (2016)

 Figure 9.10: First floor plan, Author (2016)

Figure 9.11: Second floor plan, Author (2016)

South East Elevation
Scale 1:200

North East Elevation
Scale 1:200

North West Elevation
Scale 1:200

Figure 9.12: Elevations, Author (2016)

 Figure 9.13: Section 1, Author (2016)

Section 1
Scale 1:50

216 Figure 9.14: Section 2, Author (2016)

Section 2
Scale 1:50

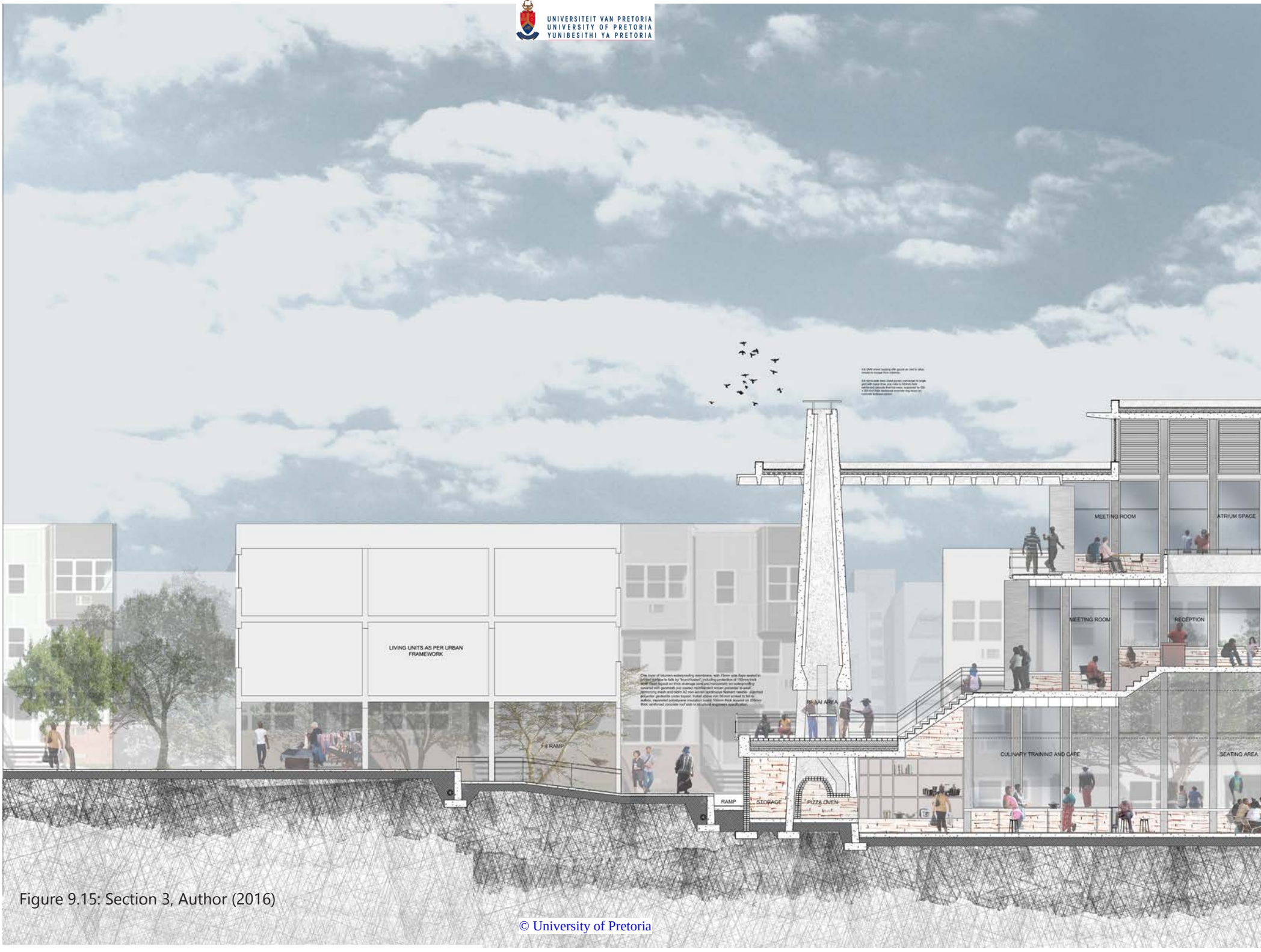


 Figure 9.15: Section 3, Author (2016)

Section 3
Scale 1:50

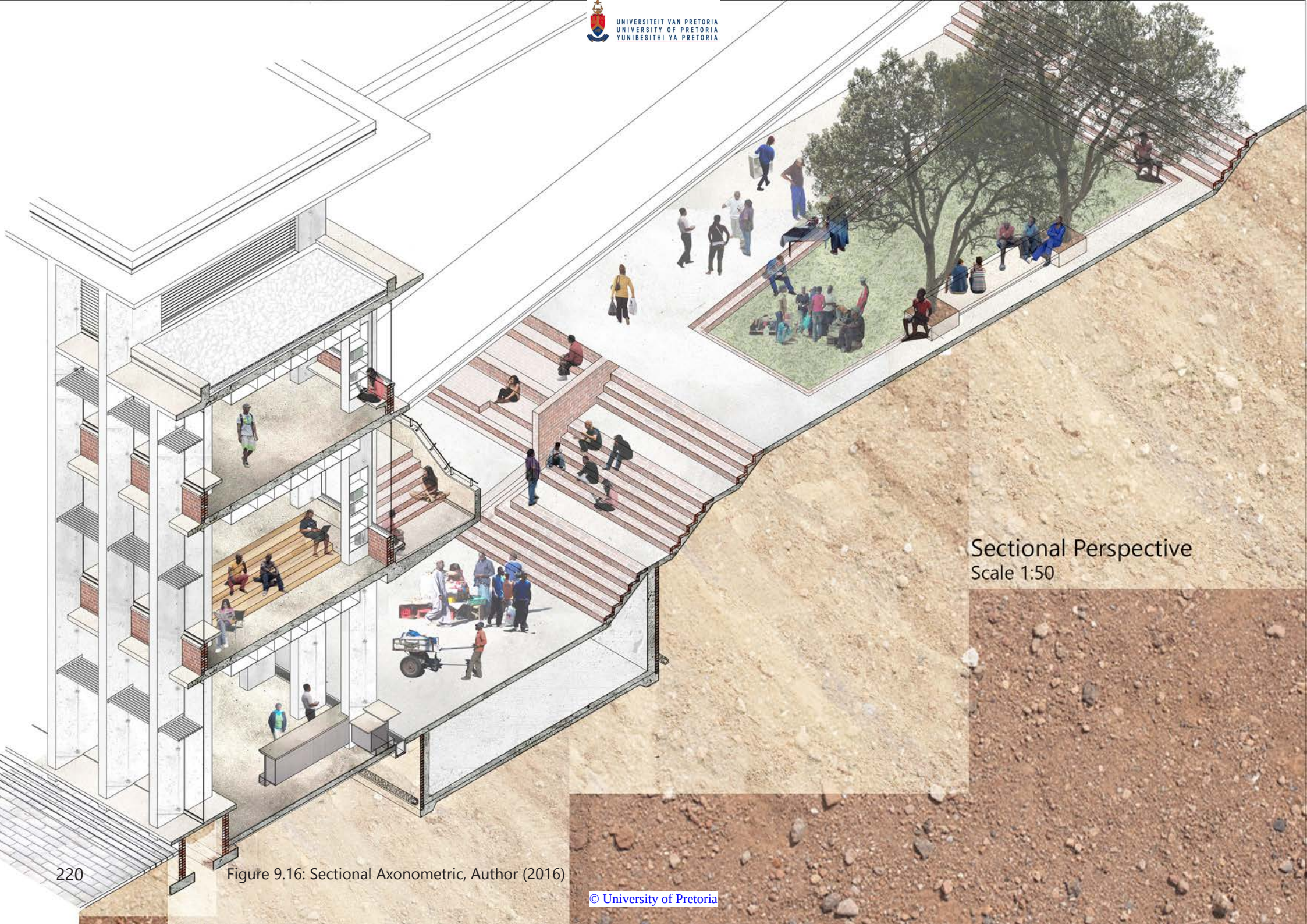
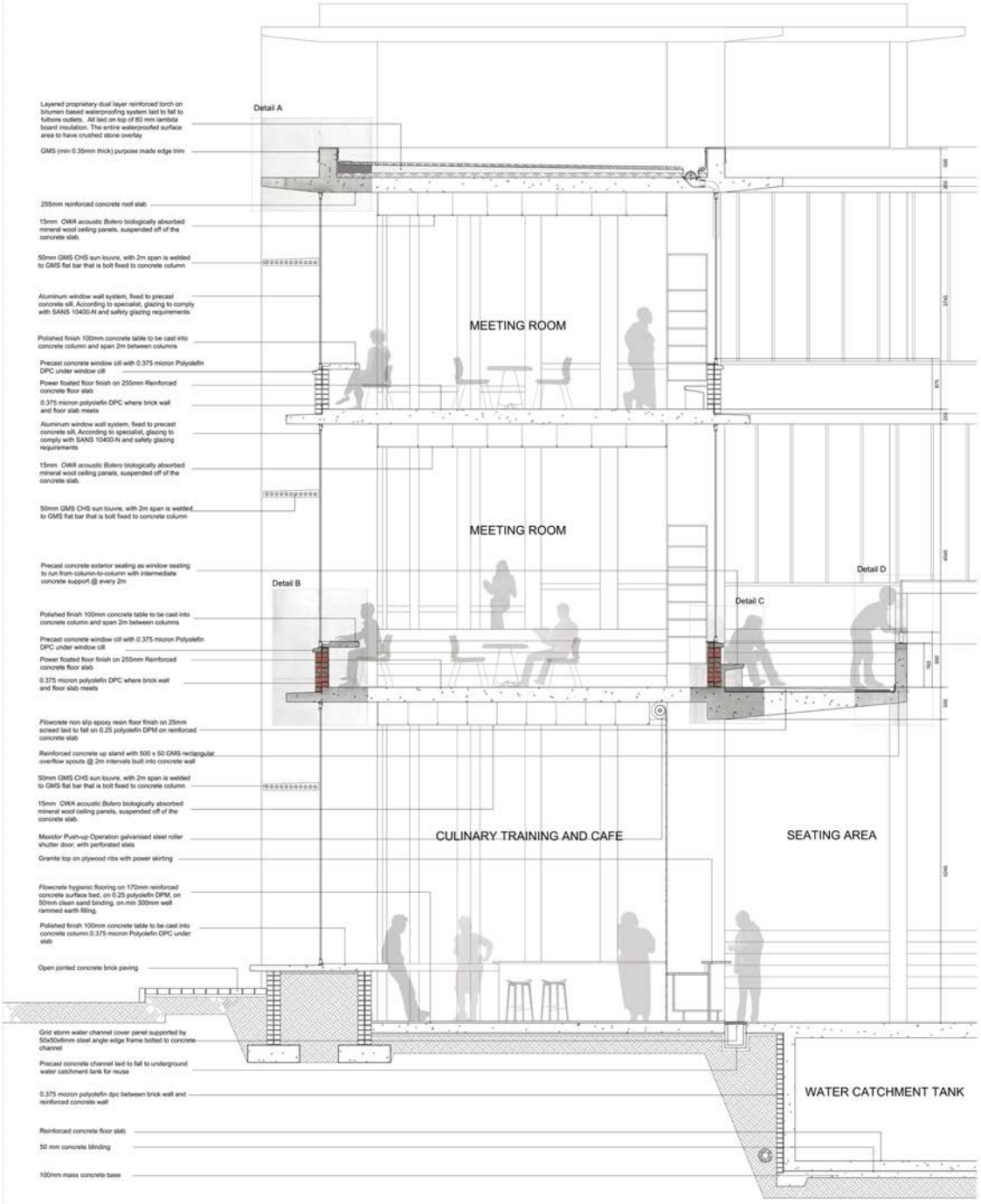
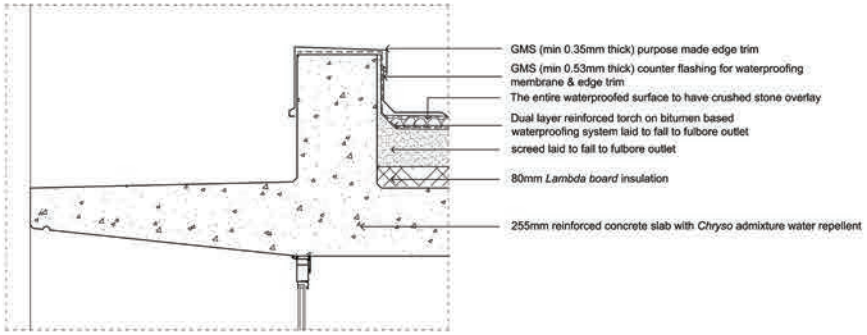


Figure 9.16: Sectional Axonometric, Author (2016)

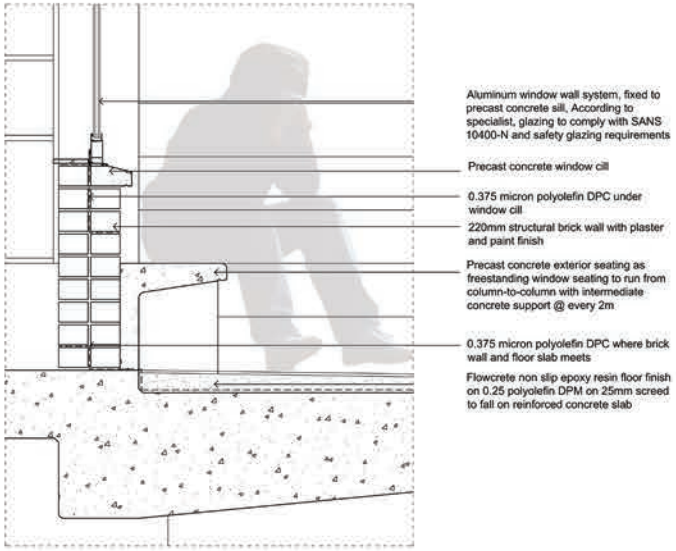


1:20 Se

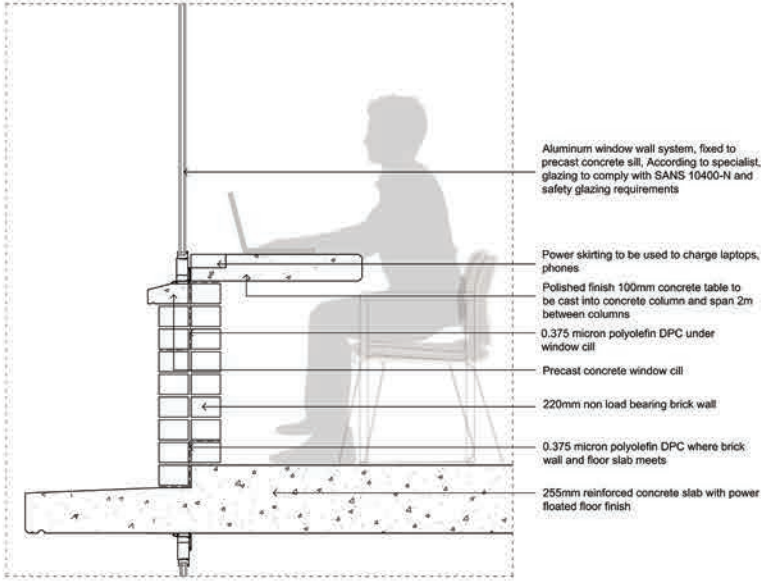
Figure 9.17: 1:20 Section, Author (2016)



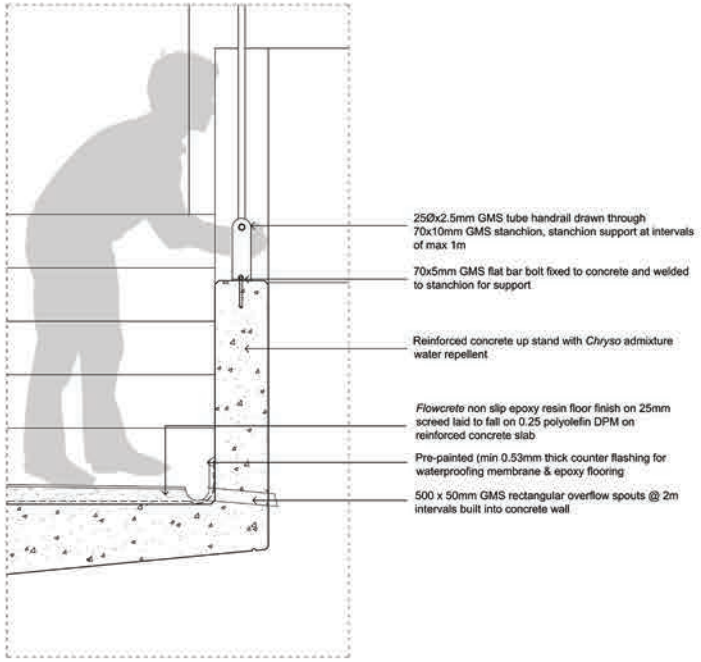
1:10 Detail A
Concrete roof and upstand detail



1:10 Detail C
Detail of public seating



1:10 Detail B
Desk and wall connection

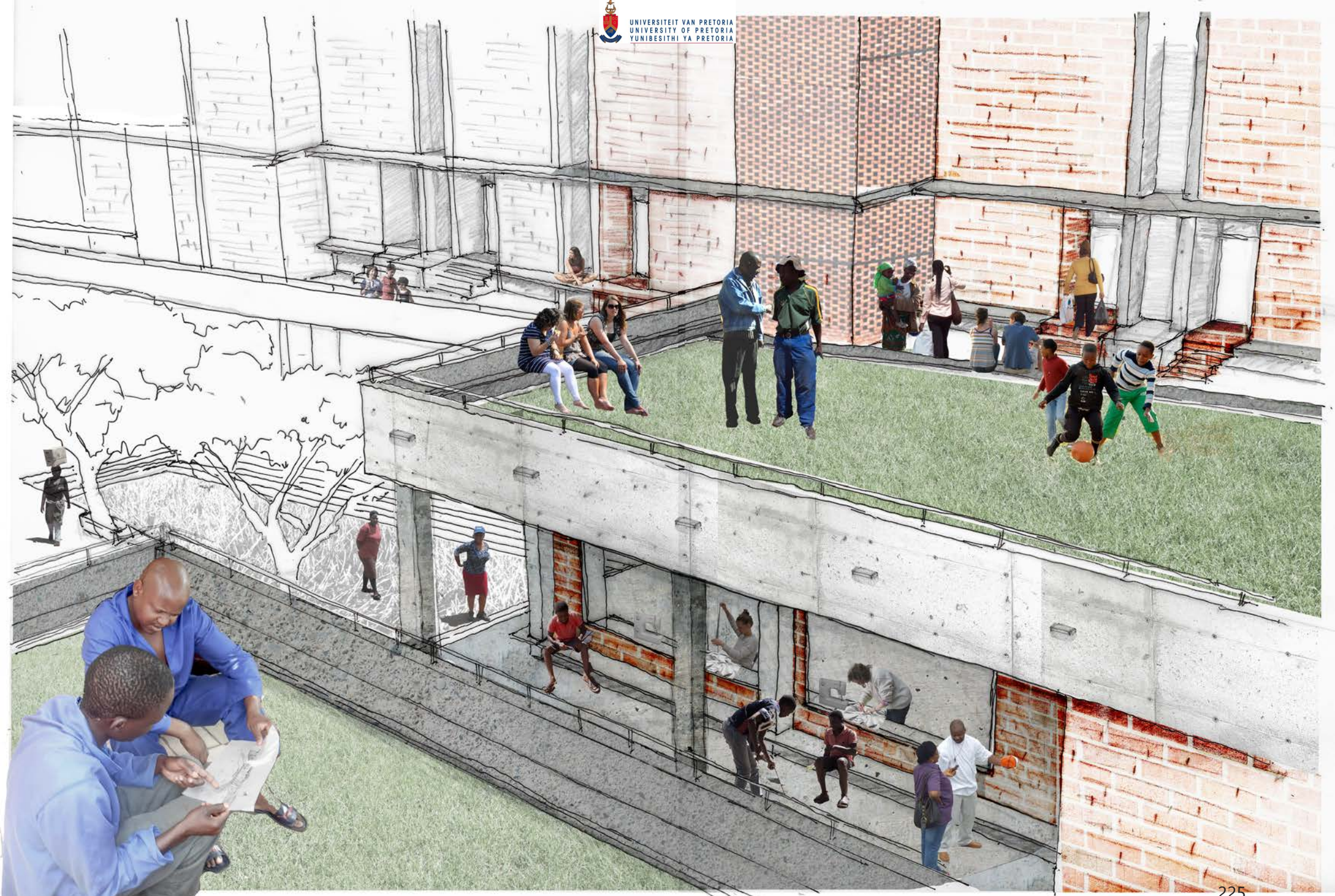


1:10 Detail D
Parapet balustrade and walkway gutter

Details

222 Figure 9.18: Details, Author (2016)

View of the CVF from the main road



View of green roof, accommodation and workshop spaces

View of kitchen training/cooking and cafe area

View of workshops and courtyard space

Resource centre/ meeting space

 Figure 9.25: Final model, Photograph, Author (2016)

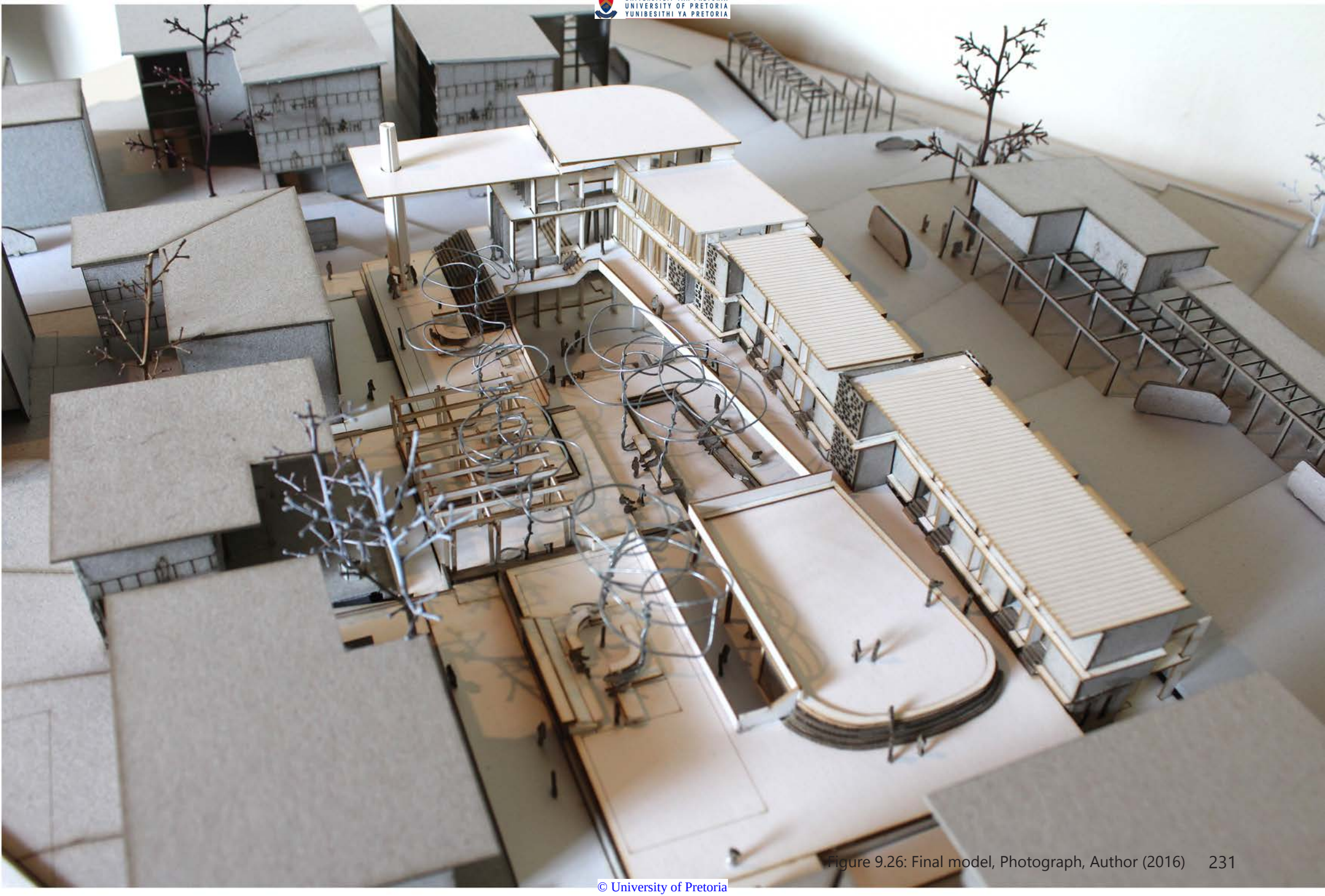


Figure 9.26: Final model, Photograph, Author (2016)

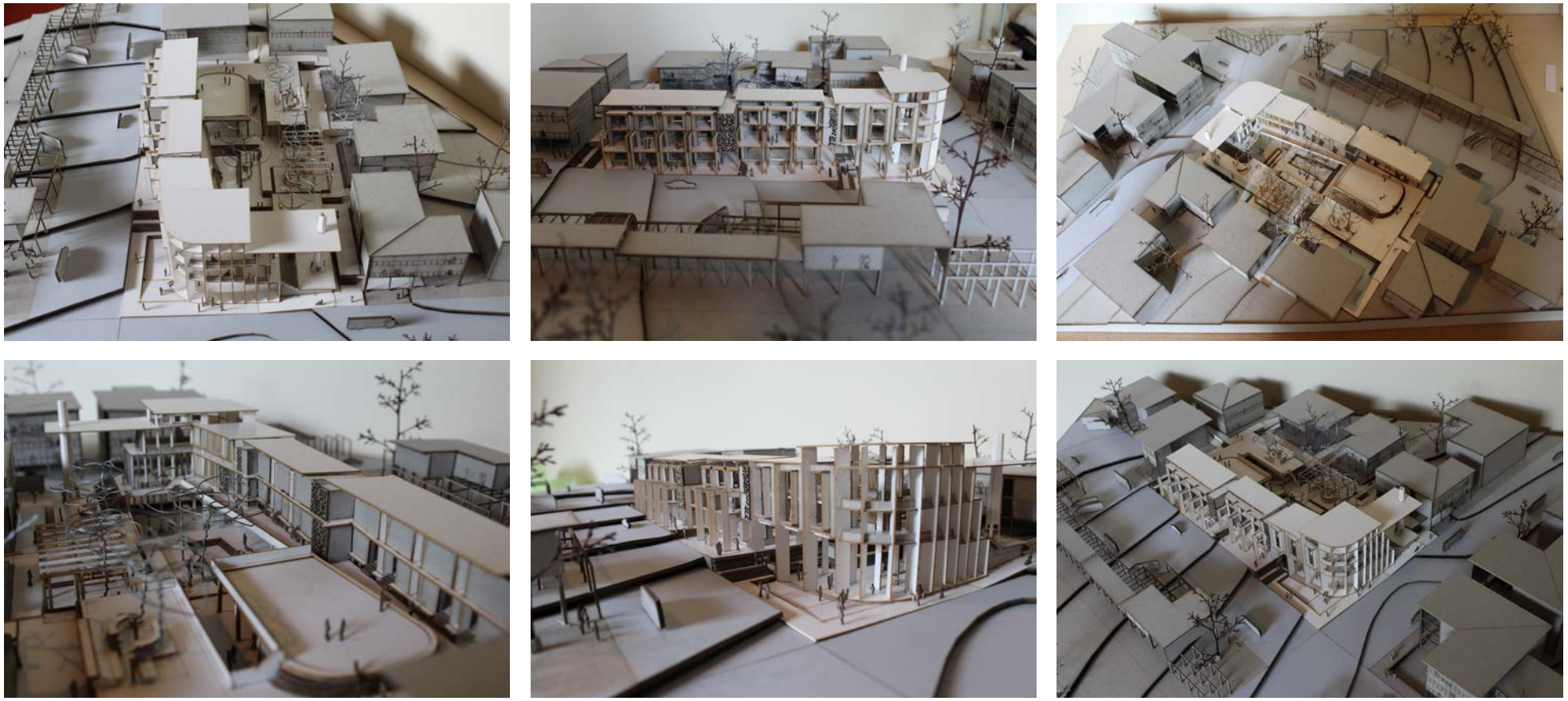
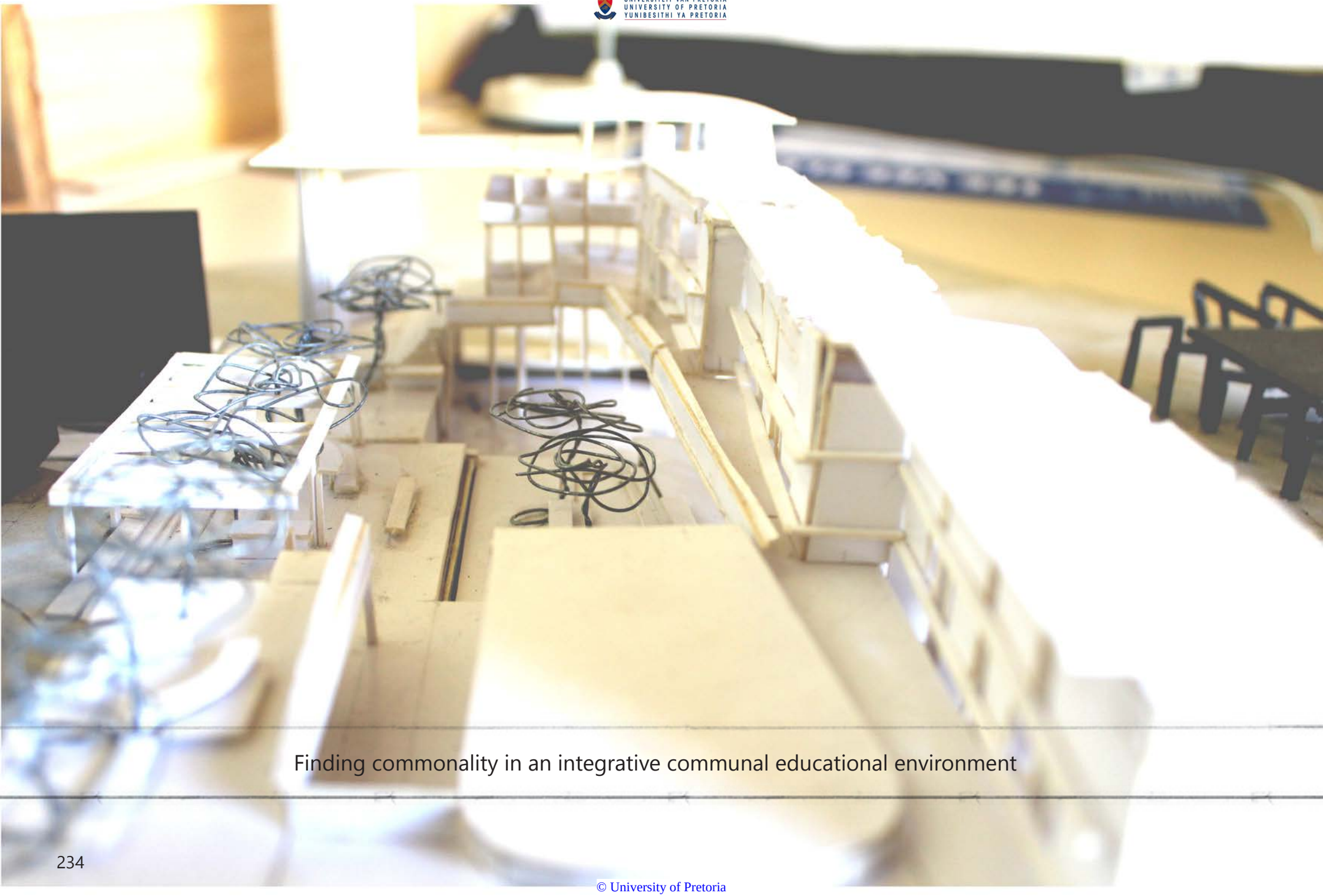


 Figure 9.27: Final model, Photograph, Author (2016)

Figure 9.28: Final presentation, Author (2016)

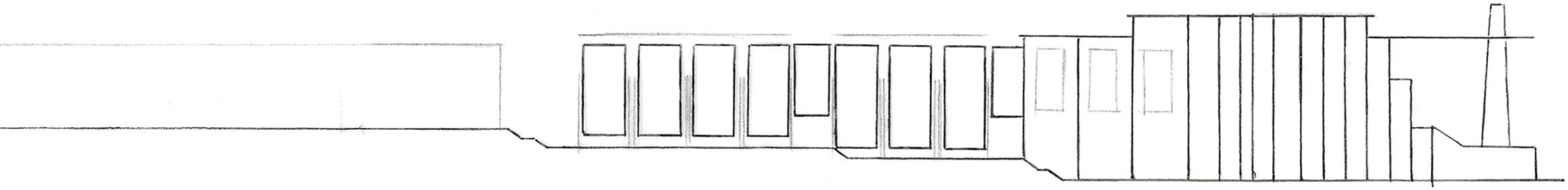


Finding commonality in an integrative communal educational environment

Conclusion

The dissertation concludes that an educational environment can be integrated within a public, mixed-use environment that encourages interaction and engagement to occur between learners and community. By creating an interactive and integrative learning environment, social cohesion and commonality between one another is proposed.

It is essential that citizenship education becomes a key component of the educational curriculum. The dissertation suggests an approach to how this policy can be implemented spatially, this is done by spatially and programmatically addressing and considering three main principles which include: spaces of interaction, the urban condition and multifunctionality. These principles would allow for the facility to merge with and form part of the community, while not limiting education to a formal learning environment but encouraging active community engagement.



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Chapter 2

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List of Figures

Finding commonality in an integrative communal eductional environment

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Common Ground

Finding commonality in a place of learning