HIGH STREETS
Constructing the public realm in a low income area

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This dissertation is presented as part fulfillment of the degree of Master of Architecture (Professional) in the School of Architecture, Planning and Geomatics, University of Cape Town

Date 18 October 2015

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Acknowledgements

I would like to express my appreciation to my supervisor, Melinda Silverman for her patience guidance over the last year. My gratitude is further extended to the Faculty of Engineering and Built Environment staff and MArch Class 2015 for their contribution made to my intellectual growth during my years of study at the University of Cape Town.

The residents of Macassar and Delft, I am grateful for providing me the environment to execute my architectural studies over the last year.

I would also like to thank Carin Smuts and Urs Schmid for their mentorship and support over the last 15 years.

I'd be remiss if I didn't acknowledge the innumerable sacrifices made by my parents, Martin and Shirleen Hopley while I pursued this degree. To Shaun Hopley and my siblings, thank you for always believing in my ability.

Finally I give thanks to Christ who has been the source of all my strength.

Abstract

The lack of high streets in low income areas negate the socio-economic vitality of these towns. Through understanding how a high street functions one is able to appropriate the aspects of good streets to low income areas. Locally referred to as main streets, these streets are where most shops and other businesses and transport modes are found. Diversity is key in making a functional high street. Components that must be considered to create street diversity are; the pace of the street, adaptability to rapid change and a concentration of things.

This dissertation investigates the components that enable diversity by looking at how high streets exist within the Cape Town context. Developed high streets, emerging high streets and areas where there are no high streets are compared to further understand the components of street diversity. The dissertation proceeds to identify Main Road, Delft as an emerging high street. Main Road, Delft is then further analysed and findings reveal that the informal and institutional uses constitute the street. From further analysis, the institutional buildings reveal a lack of positive street making characteristics. The dissertation attempts, through a design of a Further Education and Training College, how to construct an institutional building that aids a positive public realm. The objective is to reinforce the emerging high street in Delft by facilitating diversity. The components of street diversity are explored by developing three building types that make various street conditions namely; a building onto a town square, a building as a thoroughfare and a building as an edge.

Brick construction is adopted to construct the public realm and creates an enduring new civic image that speaks of robustness and low maintenance. The construction methods are appropriated to available skills and thus create job opportunities.

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Introduction

My investigation of high streets and how these function stems from a personal dispossession from the socio-economic benefits that these provide those fortunate enough to live and work within the vicinity of these street types. The inconvenient experience studying and working in Cape Town, while living in Macassar, a township 38km's from Cape Town and 12 km's from Somerset West, revealed the lack of amenities within my home town. Only after living in Observatory from 2007 up till 2014, I experienced the benefits of these life-giving arteries that sustains cities' social and economic vitality. Spoilt with the latter 6 years of convenience supplemented by Victoria and Albert road, locally referred to as Upper and Lower Main Roads in Observatory, I was abruptly awakened to the disconnectedness of Macassar from the City. Its lack of economic opportunities became apparent while studying in Macassar in 2015. In Macassar the town centre has little cohesion between its essential parts and struggle to meet the socio-economic needs of its residents. When observing the busy Upper and Lower Main Roads of Cape Town one is confronted with its locality. A locality that is made up of different familiarities. [The familiarities are all things and events and the relation between these that makes a place unique. For example the built fabric, transport modes, demographic, land use, significant past events and daily activities.] This results in a complex essence that gives the place its unique quality of life. The street becomes an assembler of people as depicted in figure 1, an anchoring device to which the neighbourhood gravitates. [Hall: 2012]. Dewar notes this sense of assembly by saying; *"Deprived communities in a city are dependent on access to the economic opportunities and the social and commercial services which can be generated through the agglomeration of large numbers of people (Dewar 1989: 1).*

Figure 1
Voortrekker Road, Parow, a high street assembling people in larger numbers

Sadly this is not the case of the apartheid township. The absence of a socio-economic, high street within the apartheid town still negates healthy socio-economic development in areas such as Macassar as evident in figure 2. These towns remain subservient long after apartheid. Tomlinson notes this sense that townships are in some ways subservient, saying, *"The township urban structure has been a deliberate artefact of apartheid policy whose primary purpose has been the attempt to keep non-whites at a safe distance from the centres of production and the white residential suburbs, except of course for labour purposes."[Tomlinson R; 1990].*

A pairing up of the apartheid town and the street developed town has seeded ideas of possible solutions that may remedy this urban condition within the township. In these engineered towns, people are required to instantly co-exist in a built up area whereas the street developed town gradually grows over time and adapts itself to the culture and life of the community that lives along it. The engineered town is also designed to prevent economic growth within itself as stated earlier. This has led me to undertake a study of functional high streets in the pursuit of discovering what the components are of a functioning high-street. The objective is to identify an architectural program that can initiate the development of such streets in lower income areas**.**

The dissertation seeks to reveal what the components are for a functional high street. The Cape Town context is then analyse to determine how a high street manifests in a lower income area. Delft South is identified as an emerging high street and is further analysed to reveal what constitutes the Main Road as a high street. The informal versus the institutional is looked at and concludes that the institutional lacks positive street making characteristics. The dissertation then explores a institutional building that creates better street conditions through the design of a Further Education and Training College. The components of a functional high street are then address by 3 separate buildings that facilitate diversity.

To aid my intervention, understanding how a high streets function are essential. I started to research how others described high streets and drew my conclusion by connecting the literature with the actual events found in certain streets.

Figure 2
Macassar town centre fenced off. No high street connects the centre to the larger urban

Understanding a functioning High street.

High streets which are the economic and social spine that connect smaller towns to the city, are an essential part of the city structure. These streets are in some countries referred to as main streets and they are traditionally the street along which most shops and other businesses and transport modes are found. High streets are the life-giving arteries that sustain cities' social and economic vitality (Jacobs 1960). The code of city may be found within the makeup of these streets. High streets mimic the city at a precinct scale and the city in turns mimics the high streets at a metropolitan scale. A mixture of uses is evident when travelling along these streets and reveal the necessity for diversity to make high streets functional. Diversity of people, land use, building typologies, transport and other services all make a high street functional. In this section I will focus on the aspects that brings about diversity. These are the pace of the street, adaptability to rapid change [changes in social, economic and political fluctuations] and the concentration of things[people, transport, land use, opportunities].

Diversity - Jane Jacobs writes in her book the "Life and death of the American Cities: *"To understand cities, we have to deal outright with the combinations or mixtures of uses, not separate uses, as the essential phenomena".* She asks the question; *"How can cities generate enough mixture among uses, enough diversity to sustain their own civilization"***.** She concludes that big cities are natural generators of diversity and generate these within its streets and districts. The needs she identifies are:

The need for mixed primary uses. [part of the city must serve more than one primary function] When looking at Victoria Road, Observatory, it is clear this street is not just a place of work, but it provides residence as well as recreational activities. People assemble at Groote Schuur hospital for health reasons while students from UCT live and study in the area. Locals and incomers constantly engage. While waiting for hospital assistance, a nearby restaurant at St Peters Square provide a meeting place while factory shops keep the bargain hunter occupied.

The need for small blocks [the frequency of opportunities].The grid intersections into Victoria Road, Observatory, provides easy access from all surrounding areas. Corner shops like Chippies depend on this frequent crossing of roads by pedestrians. This reveals the need for this furthest parts of neighbourhoods to be connected to the high street. The street grid facilitates this.

The need for concentration [density of people]. For any urban condition to be viable, people are essential, how they interact with acquaintances as well as strangers. Urban settings must have the attractions to draw people in. Places that provide entrepreneurial, work, education and health opportunities create the anchor devices that results in high concentration of people. Social housing adjacent to these provide the urban condition to make it viable.

Aspects of diversity are the pace of the street, adaptability to rapid change and the concentration of things. These components must be considered when formulating a functional high street. These facilitates the diversity that characterise high streets.

Pace of the street

Lynch identifies these streets in his book," The Image of the City" as paths by saying *"Paths are the channels along which the observer customarily, occasionally, or potentially moves. They may be streets, walkways, transit lines, canals, railroads. People observe the city while moving throughout it, and along these paths the other environmental elements are arranged and related."[*Lynch 1960]. The elements that make up high streets are experienced at different paces. This determines the different relation between functions. Persons that work along the street may experience it more rapidly than residents. The street thus have to provide different conditions in order for activities of various paces to co-exist.

Adaptability to rapid change

"The High Street is not just for retail….and never has been" [Vaughan 2014].Old houses operate as businesses, industrial workshops that are converted into residential flats are examples of how the nature of the high street uses change. Its swiftness to adapt to change is the real contributor of its diversity. If one then examines this carefully, its resilience suggests that it would adapt to future changes in economy and social patterns as well.

"Cities and buildings need to be made of much more general, simpler ingredients; an evolving fabric easily capable of change that is able to respond… to needs and to become a platform of diversity", with a "degree of redundancy" (Lifschutz 2007). This suggests a more multi-use of spaces where the use of a structure is easily transformed with minimal effort. Its transition time from one use to the next is short, thus the life along the high street continues. The ability to adapt means that the street can accommodate a diverse make up of uses.

Concentration of things

In her book *City Streets, the measure of the ordinary*, Suzanne Hall describes the street locality as a matrix of familiarities. What makes a street is not limited to a singular event of thing but a combination of things and experiences. This then suggest that the physical parameters, memories of past experiences, significant events, daily routines all culminate into what we perceive a street to be. Its locality is thus more than just a set of coordinates but many different things sculpts its locality. Its diversity is made up of the physical as well as experiences lived, within the street.

Conclusion

To conclude the section ,high streets are vital to cities' socio-economic growth. For this diversity of many things are essential. To formulate diversity the aspects , pace of the street, adaptability and concentration of things must be considered to create a mixture of diversity as illustrated in figure 3. A functional high street is characterised by its diversity. While looking at Albert and Victoria road, Observatory, diversity is very evident. Different types of shops, businesses and transport modes all co-exist along a spine that connects the traveller and resident to the city.

When trying to recognise these in Macassar it's easy to see why the area struggles to sustain economic growth. In Macassar there is no diversity. Public buildings are not strung along a street to reinforce it as a high street. The town centre is adopted in Macassar and is made up of scattered buildings that does not define any real strategy towards creating an urban condition that may aid diversity. The South African condition of lower income areas is confronted with the urban remnants of apartheid legislation. In order for streets to become viable a new approach is required. One that is retrospective, a remedial method. Careful understanding of the local context and studies of each case is required to identify how our streets can be adopted in ways that support the characteristics of good streets. Aided with the knowledge of what traditionally constitutes a functional high street I set out to further investigate how high streets manifest within the Cape Town context.

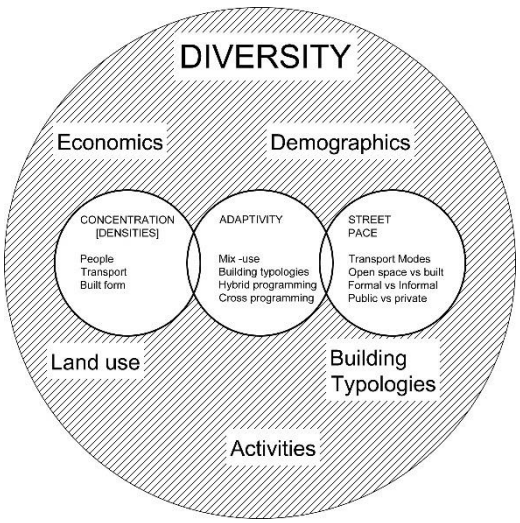


Figure 3
High street diversity diagram

The Cape Town Context

In the Cape Town context, high streets, locally referred to as main streets, are roads that structure a town in a linear arrangement ultimately ending in the city. Examples of these roads are Cape Towns' Upper and Lower Main Roads that stretch from the city all the way to Simons Town. Klipfontein Road is another example that intersects Main Road, Mowbray and stretches all the way to Mitchells Plain as it becomes Eisleben Road. Voortrekker Road connects two cities, Cape Town and Bellville and stretches all the way to Somerset West as illustrated in Fig 4. Along these roads are a mixture of land uses, diverse activities and thriving transport links to the city. These towns' social and economic vitality is dependent on these arteries as they connect the local, the metropolitan and regional scales. They provide all the necessary amenities to the towns along it. Towns are strung along these roads and its centres have a more elongated formation, as opposed to a central nucleus planning found in lower income areas where the town centre model has been adopted.

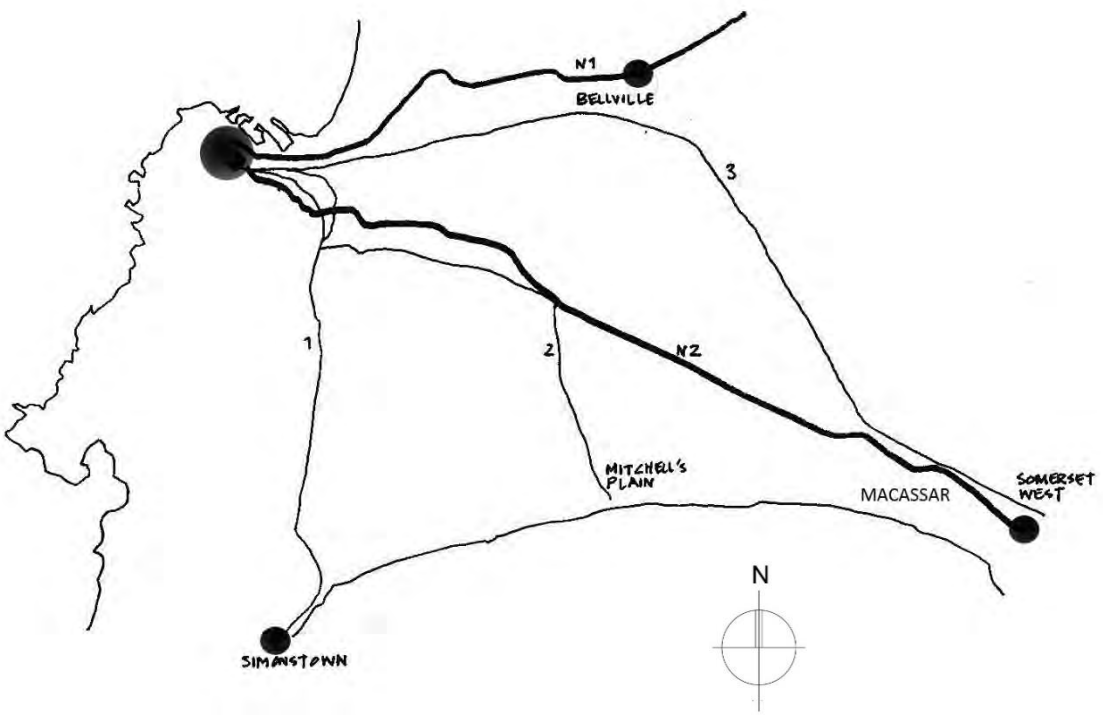


Figure 4
Arterial roads to connecting towns to Cape Town
1 Main Road
2 Klipfontein Road
3 Voortrekker Road

Considering diversity I looked at Victoria and Albert Road, Observatory, a developed high street and Musica and Link Ave, Macassar, a low income area, apartheid planned township. This helped me understand the differences between good and less good streets by comparing these different cases. To broaden the spectrum of my understanding I also looked at Main Road, Delft South which is a low income area developed post-apartheid and shows strong signs of an emerging high street.

Victoria and Albert Road, Observatory is vibrant with activities. The many shops, places of work and the immediate residential vicinity create the high street diversity. The two roads are thus classified as developed high streets. These two streets demonstrates this effortlessly but this is also closely related to the passing of time as well as invested interest. Where diversity is less the street is less attractive. Its adaptability to rapid change however suggest that these areas are inevitability bound for positive change. This is part of its developing nature. All along these roads renovation and new buildings projects are executed and are signs of how the streets adapt to change.

Figure 5
Albert Road [Lower main road], Observatory, active with a variety of shops, business

Macassar is an enclave, reminiscent of apartheid planning and is disconnected from the city as illustrated in fig 6. Macassar lacks diversity. The town centre which generates the enclave has little structure. Musica and Link Ave, the primary roads divert around the town centre as illustrated in figure 6. Activities are not concentrated enough. The vacant space between public buildings compromises any urban structure that can facilitate a closer relation between functions. If these functions were more connected, clearer pedestrian routes would form, along which economic opportunities could develop. Macassar doesn't lend itself to easy remedial action through high street interventions. Its fragmented centre may still hold the key to proliferate social and economic growth. Restructuring movement in terms of pedestrian and public transport through the town centre is one approach. This would take a considerable amount of time to develop a functioning high street as this would have to be done incrementally. The time attached to this process can also hinder its development.

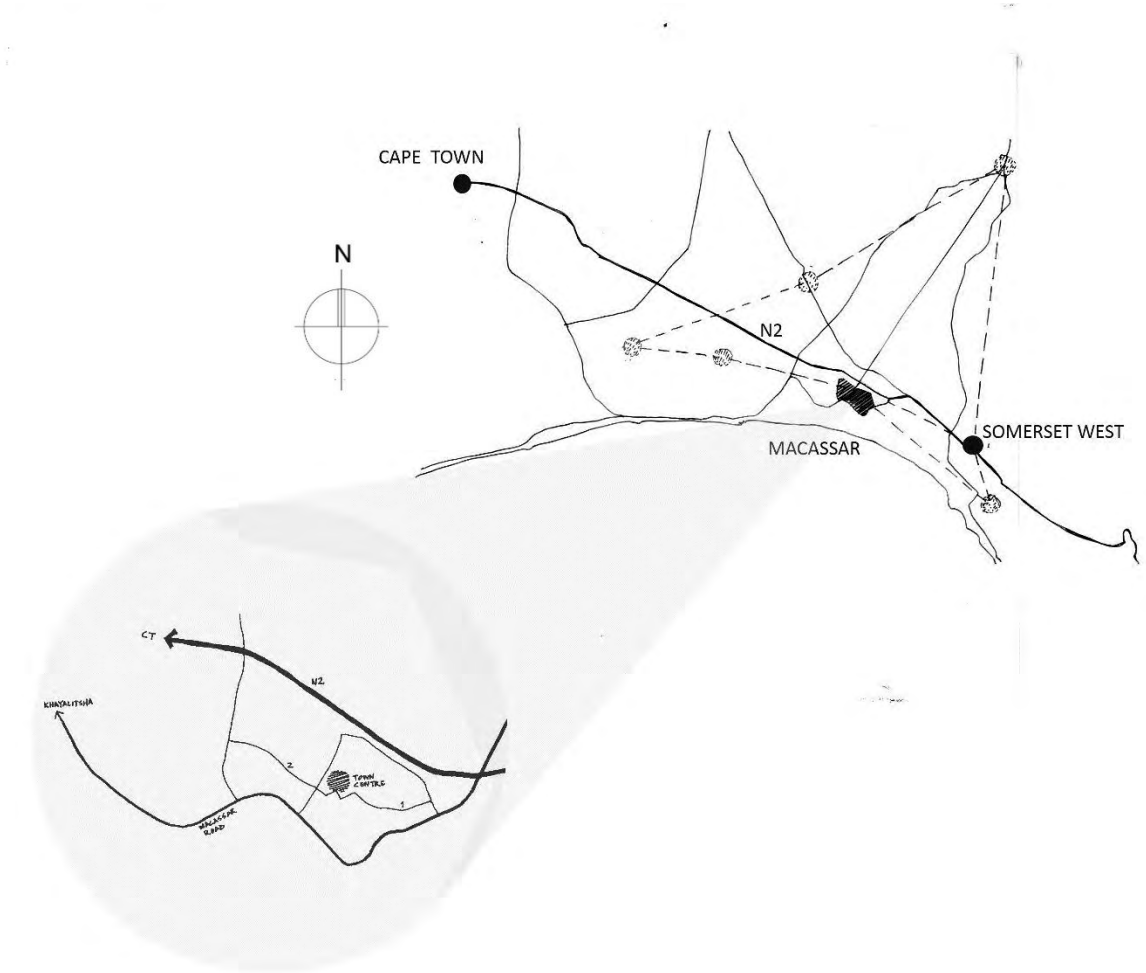


Figure 6
Macassar a township 38km's from he city centre. The national road , N2 connects to Cape Town. Public transport does not connect the town along the N2. Rail way system is the fastest public transport can take 1 to 1 1/2 hours to travel

When looking at Delft South what initiates a high street is the diversion of Main Road from Symphony Way. Main Road [street name] becomes the spine that structures the different neighbourhood parts of Delft South. The road is aligned with Reconstruction and Development Program [RDP] houses that has been adapted by owners and makes retail spaces onto the street for economic opportunities. Open spaces along the street are filled in with informal trade. Containers are used as places of work and spaza shops. These events positively construct the public realm. Open spaces and public buildings make lesser positive street edges. Main Road, Delft is thus categorised as an emerging high street which is attributed to its prolific informal activities along the street. Delft Main Road as an emerging high street lends itself more easily to intervention. Interventions can be strategically used to mobilised existing uses that can assist the reinforcing of the emerging high street.

Figure 7
Main Road, Delft.RDP homes are made into shops, informal trade fill in open spaces and creates the diversity that is characteristic of a functional high street

Considering the characteristics of these 3 different towns I have decided to further explore the emerging high street in Delft South. This has led me to establish an analysis criteria through a process of consultation with urban designers and on site observation. This attempts to illuminate diversity and its aspects, street pace, adaptability to rapid change and the concentration of things. The criteria is as follows:

Diversity of land use
Distribution of higher order land use
How public transport supports the high street
Architectural character

The analysis aims to establish how the Main Road, Delft is constituted. How the inter-relations between existing functions can concentrate activities even more along the street, specifically where it is less concentrated. Diverse land use, its distribution, transport, and built form are integrally linked and establish connectivity and adjacencies that result in diversity of street.

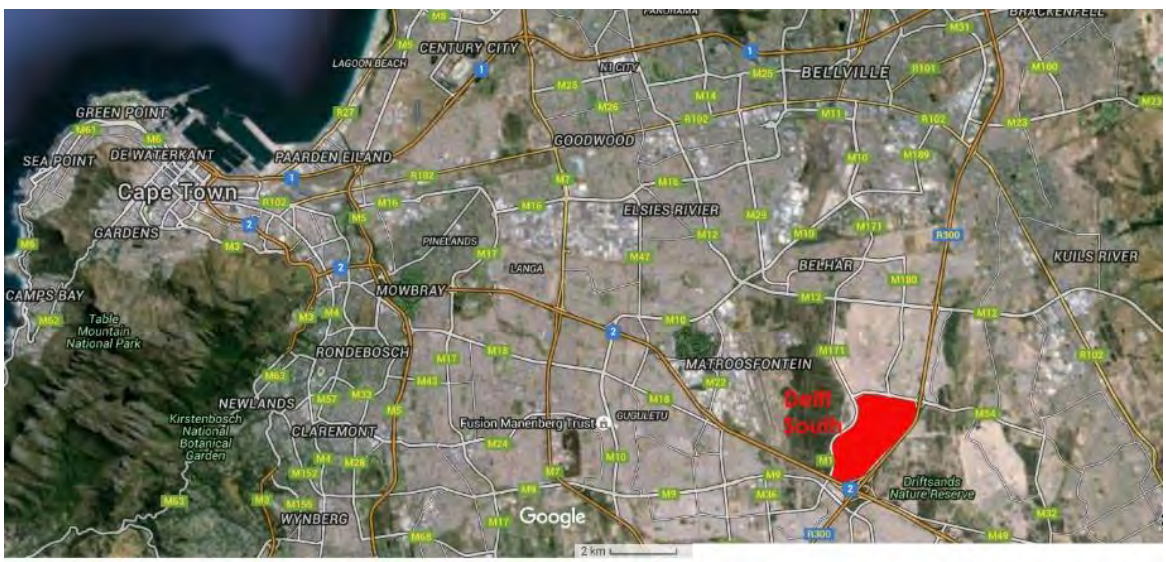


Figure 8
Delft location in relation to Cape Town and Bellville

Main Road, Delft analysis

My objective was to ultimately articulate what constitutes the high street in Delft. In doing so I could develop a program that can initiate an urban condition that can aid the further development of this emerging high street by constructing the public realm.

Figure 9

The image illustrates Main Road, Delft in red. The road is deliberately diverted from Symphony Way on the left, into the urban fabric where it is flanked by informal trading, institutional use and open space.

Diversity of Land use

Main Road, Delft is aligned with residential, commercial and open space properties, see figure 10. The RDP homes with its free standing house per plot enable these to be converted into informal trading spaces. See figure 11. Informal trading are steadily filling in the road lengths between the traffic circles.. Informal trade creates a buzzling urban cohesion along the street and moderate the pace of the street. This provides rich diversity in private, semi private and public use. The street is able to adapt to change and diverse activities co-exist in high concentration as the informal built form defines the street extent.

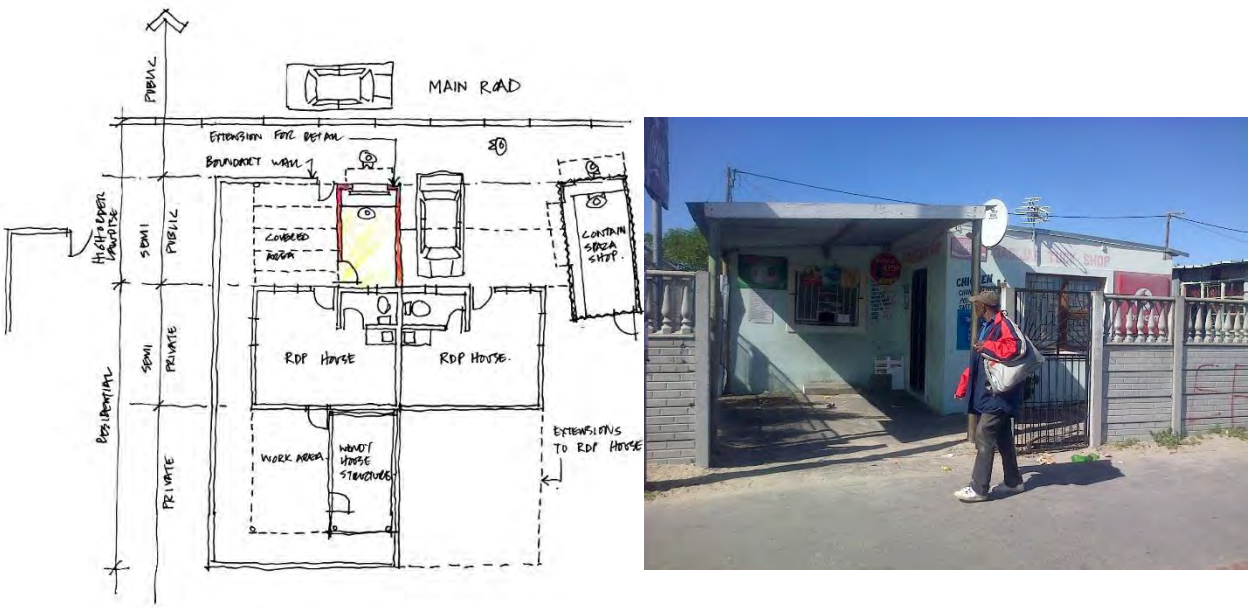


Figure 10
Formal and informal extension to the RDP House

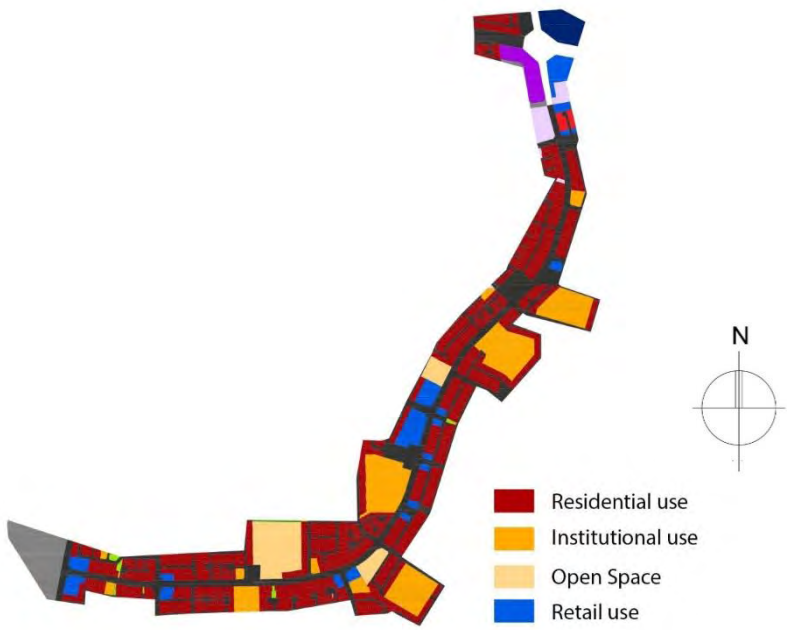


Figure 11
The street is flanked by residential and institutional use.

Distribution of Higher order land use

Higher order land use are all other land uses other than residential. This land use facilitates interaction between locals and incomers. The Map in figure 12 indicates the location of this land use, particularly institution. The inter-relation between these uses results in a communication network that crosses Main Road. These connections aid the movement of people in and across the street and facilitates the collection of public in larger numbers along Main Road. It is important to note that movement is funnelled into Main Road to intensify movement patterns along it. See figure 13. This aids the concentration of people and provide the opportunities for socio-economic growth. Higher order land use gives hierarchal structure to the high street and supports the idea of moderating the pace of the street.

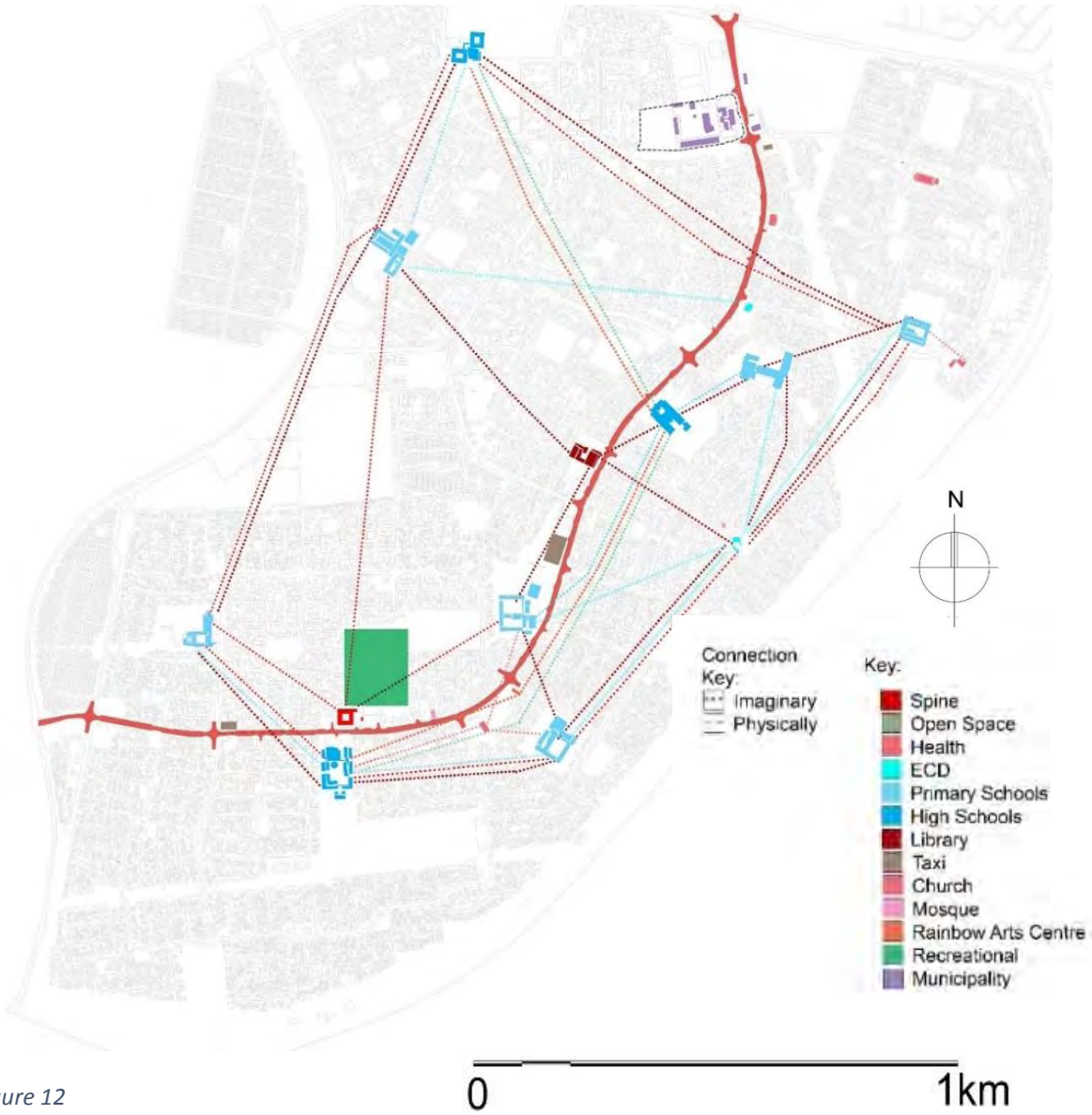


Figure 12

The illustration shows how institutional buildings are connected. These connections' all crosses the Main Road. Intersecting roads do not cross straight over but are funnelled into the street and thus intensifies people along it.

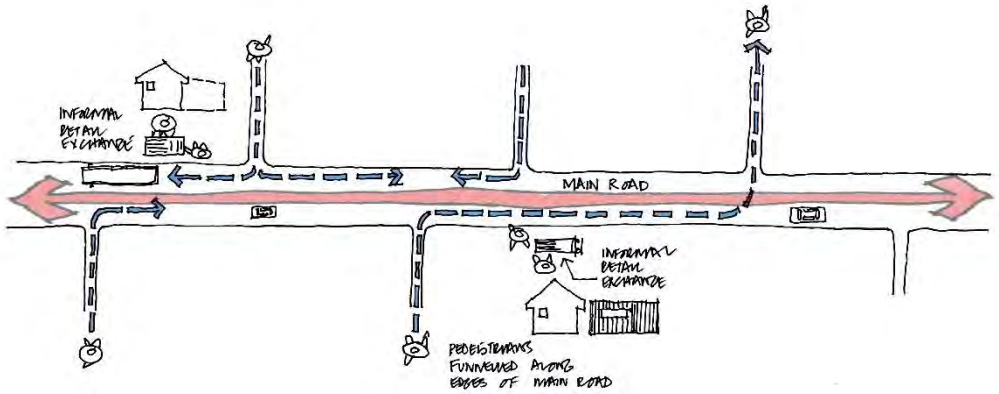


Figure 13
Movement pattern are funnelled along Main Road to intensify people activity.

How public transport supports the high street

Delft is very connected to Bellville and Cape Town in terms of transport with a very developed Bus and taxi transport system. Long distance taxi ranks are evidence of the area being connected to the larger. This ensures a diverse demographic as Delft is occupied by those who work here from elsewhere and those who live here. In Main Road, Delft we find that the road accommodates vehicular movement and is flanked by parallel parking for off loading and taxi stops. Around traffic circles, informal taxi ranks develop as seen in figure 13. This creates viable space for trading. The traffic circle also by its nature slows down traffic and influences the pace of the street. Parking bays are at times used to trade from or to off load goods. This makes the street adaptable to the informal nature of the trading.

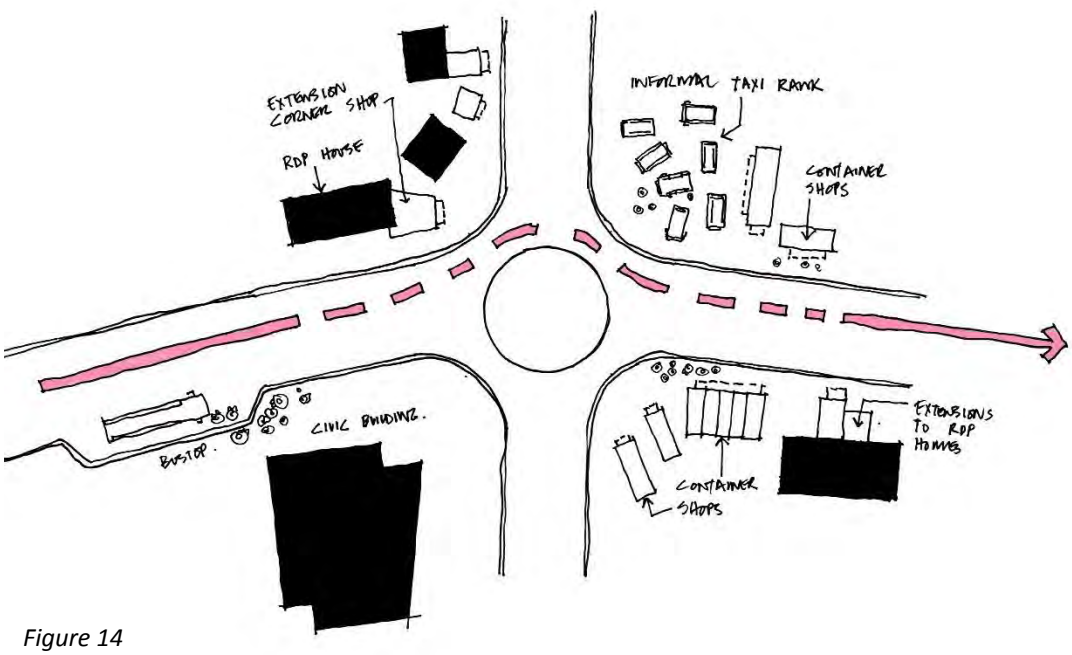


Figure 14
Traffic circles are taxi ranks around which people slow down. Here economic opportunities flourishes.

Architectural character

The architectural character of Main Road, Delft is one that adapts. Homes becomes shops during the day and revert back to private use at night. RDP houses are extended with left over building material. Gates adorn properties for security. Signs above garage walls compete for the attention of passer-byers. The sidewalks are partially covered by canopies over trading hatches. Street façade are rich with texture and colour. Fair face walls, plastered walls, vibracrete walls, timber screening ,corrugated sheeting , shade cloth and shipping containers make up the materiality of the streets as illustrated in figure 15 and 16 Facades constantly changes as the use adapts to economic change. The street adapts to rapid change and this is seen in the constant change in materiality as seen in fig 17 and 18

Most civic buildings are also single storey with the exception of community halls. The urban scale is flat and lacks verticality. Street lighting poles signifies the road route amidst the low rise building fabric.

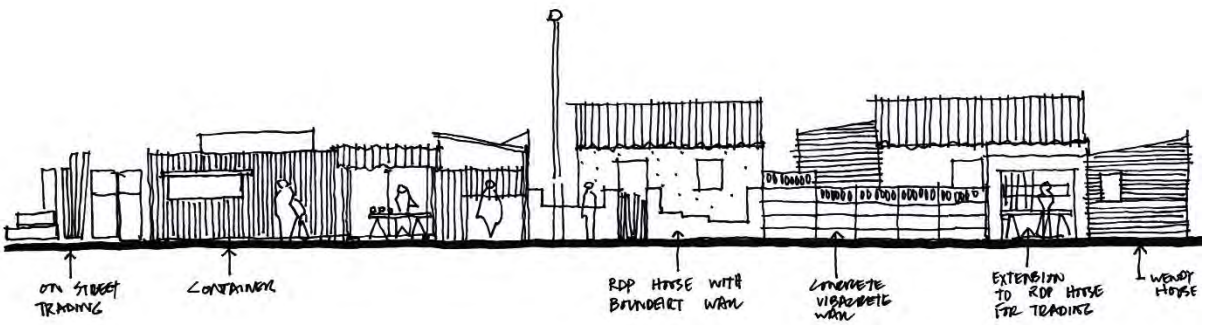


Figure 15
Typical street elevation. RDP house are extended informally with left over building material.

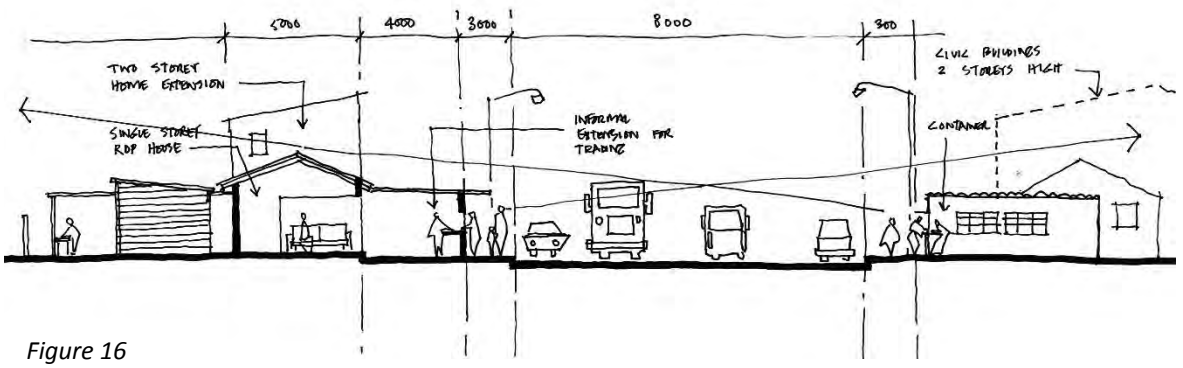


Figure 16
Main Road Street Section.

Figure 17
RDP houses are extended to create trading areas along the street

Figure 18
Containers are placed on public open space and defines the street edge better. One storey high overhangs defines trade space from pedestrian walking space

Findings and conclusions

The land use along Main Road is diverse. This is due to the adaptive nature of inhabitants. RDP homes are extended in various ways and provide the street with a diverse private to public activities . These include living, places to work, places to trade. Residential land use transforms to higher order land use during the day. Informal trade creates a urban cohesion along the street edge. The formal higher order land uses that are found along the street are schools and clinics. There relation to the street compromises their ability to assemble people along the street. Fences are abrupt on the street boundary. Transport is sufficient and connects the street to the larger regions. The architectural character is adaptive and is informed by the informal activity. The urban scale is low rise and the street lacks civic scale. The spatial definition needs attention.

Diversity is evident in use while the urban fabric adapts to these uses. These characteristics is that of an emerging high street. It is constituted by informal and institutional use. The informal creates an positive street edge whereas the institutional lacks this. Open spaces does not provide the space for social activity. These are under developed, not spatially defined and become dangerous spaces for residents to engage with.

Institutional buildings and open spaces must be mobilised to work together with the informal to construct a better public realm. To do this I have aimed in on how institutional buildings can make better street making conditions in low income areas. In order to understand how these function, I have made a comparative study between the informal and the institutional.

Institutional and informal activities.

Currently along Main Road, Delft the energy of the street comes from the informal trade whereas institutional buildings has less of a vibrant quality as discussed previously. The institutional buildings creates pauses along the street which can be a positive experience as it moderates the pace of the street. However, the operating times and boundary demarcation renders institutional buildings as less positive urban edges. Figure 17 illustrates the institutional buildings along Main Road, Delft. The space between these buildings are occupied by informal activities that gives the street its urban cohesiveness.

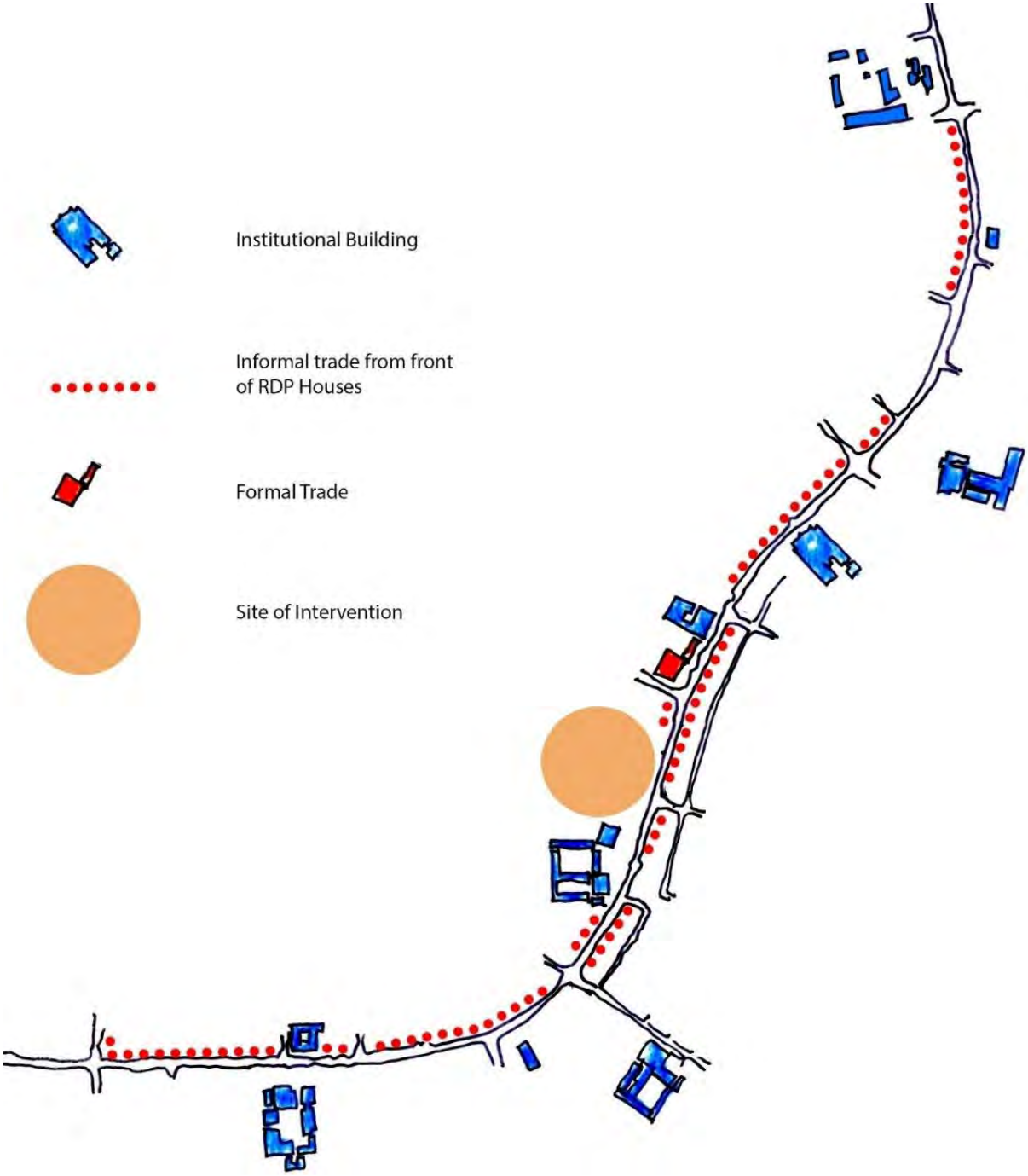


Figure 19
Main Road, Delft. The street is constituted by the informal and the institutional use.

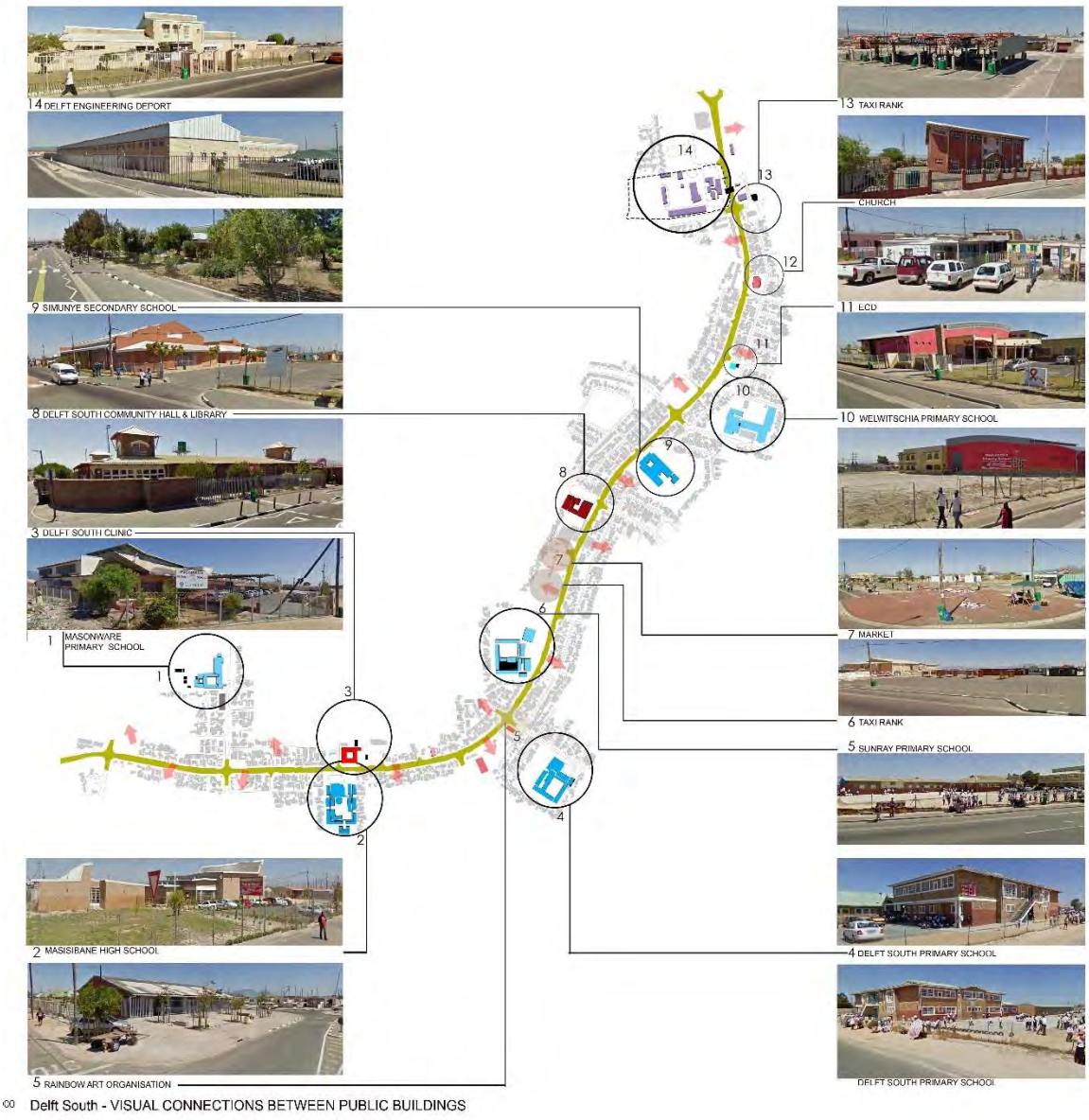


Figure 20

Institutional buildings along the street lacks street making. Boundary fences creates dull unoccupied sidewalks.

From the survey illustrated in figure 20 ,I have selected institutional buildings that represent education, government service delivery and government community facility to compare to the informal activities. These institutions are Sunray Primary School, Delft Municipal Advice offices and Delft South Library. The objective is to reveal how these buildings responds to the street edge.

Sunray primary School

The diagram illustrates the institutional boundary in relation to the street. Learners and vehicles enter at the same gate. This edge along the street is active with people from 7am to 3pm. For 18 hours each day this edge is inactive. The fence creates minimal street interface other than visual transparency. The institutional building shuts itself off from the street.

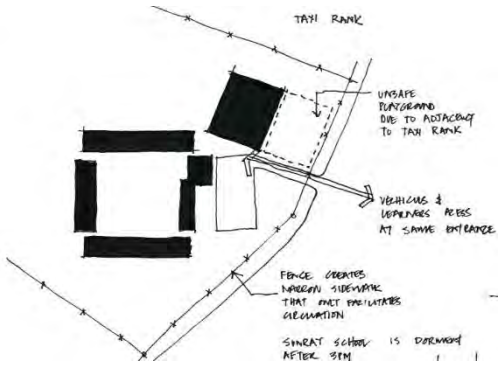
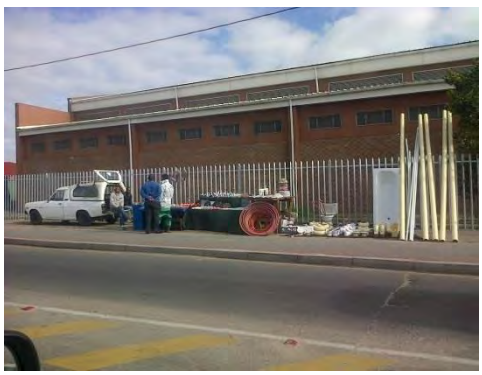


Figure 21

Sunray Primary School street entrance. Learners and vehicles enter at the same gate. The diagram illustrates the narrow sidewalk created by the school fence. This space is inactive after 3pm

Delft South Library

This building operates from 9am till 6pm. Its built form however has no street making characteristics. A blank wall and fence aligns the majority of the site as one approaches. At night this becomes undesirable and unsafe.



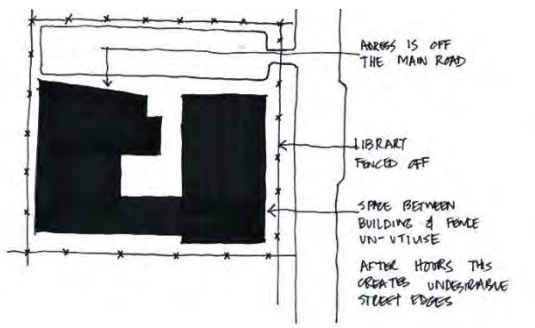


Figure 22

Delft South Library, the building has no public interface to the street. Informal trade occupies the sidewalk.

Delft Municipal Advice Office

This building belongs to the COCT. The Rainbow Arts Organisation rents its from the COCT. Municipal programs takes precedent over arts programs thus any coherent development of the arts is hampered. The building is also fenced of and turns its back towards the street.

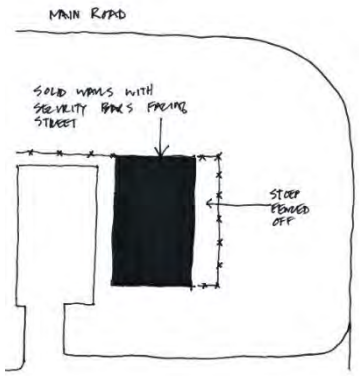


Figure 23

Delft South Municipal Advice Office. The building is use by the Rainbow Arts Organisation. Blank walls and fences cuts off the public building from the street.

When comparing these to figure 10, page 17 and figure 53,page 51 ,the Institutional buildings does very little for street making. The informal additions and trade to the RDP house creates a undulating edge that provides the infrastructure for diverse activities. People concentrate along these edges. This does not happen are frequently at the institutional buildings. Operating times plays an important role in its relation to the street. However, proper planning could facilitate positive urban space attributed to the street even when the doors of these buildings are closed as illustrated in figure 24. This prompted me to design a institutional building that responds and constructs positive street edges, edges that would facilitate street diversity in order to reinforced the emerging high Street. The objective is to design a facility of which the program supports the informal , re-interprets the institutional and mobilises the existing institutional use.

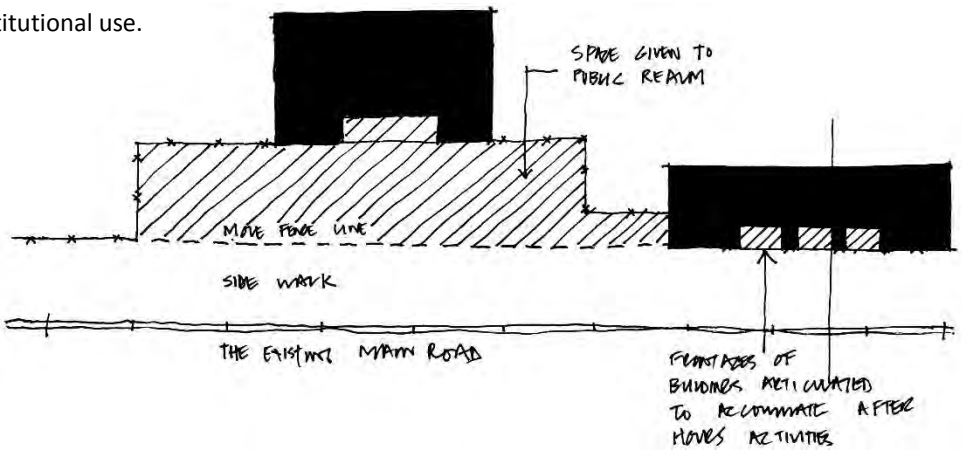


Figure 24

Institutional building can be design to create positive urban edges

Designing the public realm in Delft South

Program

The intervention I propose is a facility that addresses the particular concerns of the community. This facility attempts to mobilise existing programs in particular institutional buildings in order to support the informal through making a better street responsive institutional building. This facility will concentrate people activity and reinforce the emerging high street by facilitating diversity.

While studying the existing functions in Delft South, community members repeatedly suggested learning opportunities to aid their informal entrepreneurial ventures. Basic literacy is also of great concern. Basic adult learning classes is only presented at 2 venues, Sunray Primary school and an undersized community facility. Illiteracy statistics are alarming and by establishing an institution where adults are taught basic education as well as after school learning, is a much desired service by the community.

Currently the Rainbow Arts Organisation operates from a Municipal Advice Office which is not adequate for performances or practicing. This organisation mobilised secondary schools through arts by collaborating with learners on art performing events. These events has decreased due to lack of proper facilities. A portion of the taxi rank is use over weekends to perform plays and other performance arts. The affiliation of the organisation with Artscape Theatre Centre provide the opportunity to design a proper facility for performing arts.

The need for housing is always a concern in all low income areas. By placing social housing adjacent to the proposed facility will create the urban condition to make the project viable.

By combining these community needs and concerns I propose a Further Education and Training College [FET] facility that comprises of learning facilities with specific focus on adult learning and the performing arts. In an addition to this student housing is accommodated and social housing. Rather than creating one building I propose separate buildings that can be assembled in such a way that they create various street edge conditions .

Role players

While investigating how best to do this , my investigation led to discussions with representatives of FET College, Northlink, Western Cape department of Higher Education, Rainbow Arts organisation, Artscape Theatre Centre and Sunray Primary School. This allowed me to develop an architectural brief. Fig 25 illustrates an inter-relational organogram between role-players, allowing the intervention to facilitate a diverse program. This is aimed at formulating a facility that assumes high order land use. Fig 26 ,27 and 28 demonstrates how this is developed into architectural program for the design intervention.

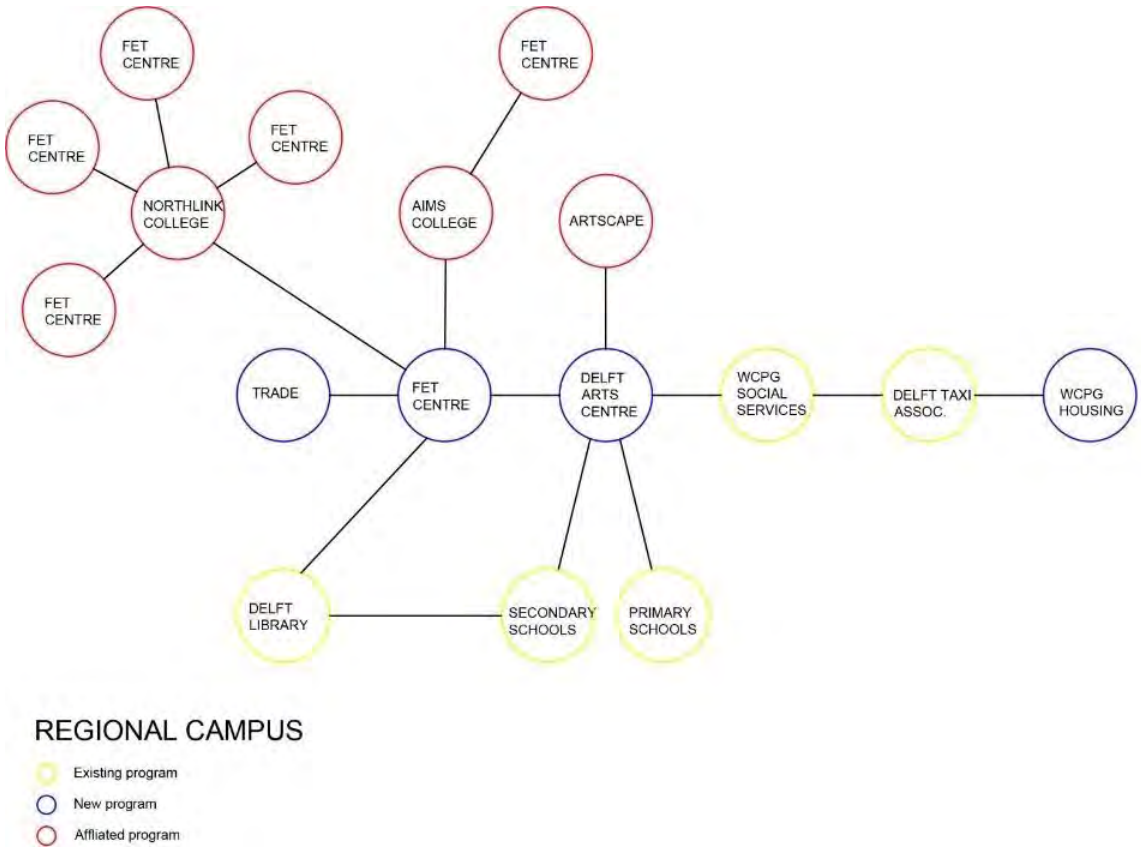


Fig25

The organogram shows the relation between the primary role-players .This speaks of how the Main Road Delft can be connected to larger Metropolitan scale in terms of program. This resembles a high-street connectivity to the city.

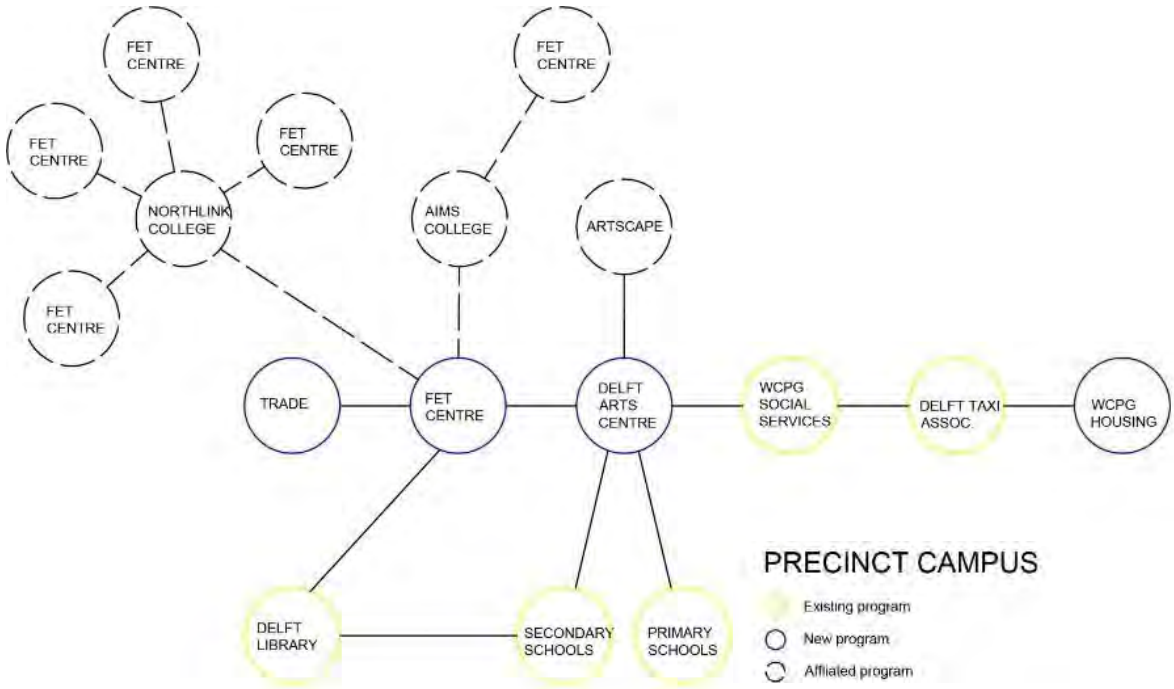


Figure 26

The diagram shows the inter-relations between the new and existing program along Main Road, Delft. In this way the existing institutional buildings are mobilised.

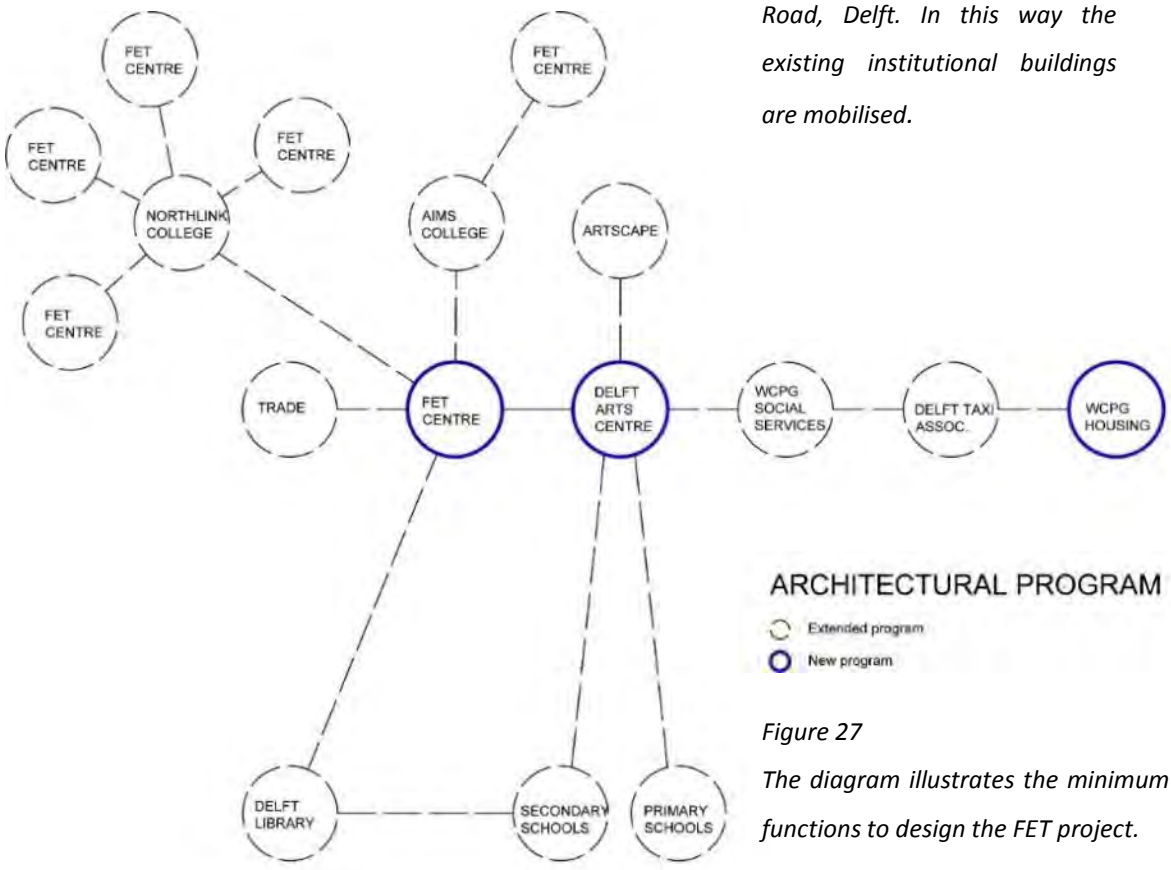


Figure 27

The diagram illustrates the minimum functions to design the FET project.

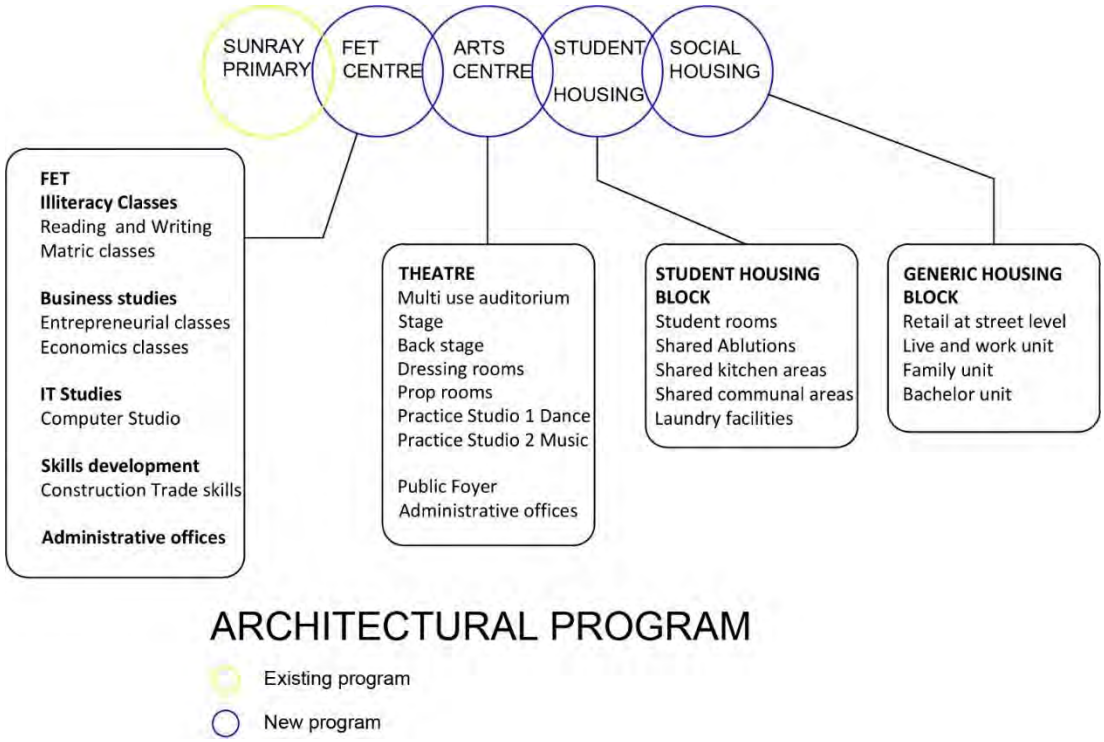


Figure 28

Preliminary accommodation schedule for the FET Facility

Architectural Program

I propose a FET college comprised of a Theatre, student housing and social housing block. This new program together with existing program for example the Delft Library, Simunye High School as well as the Municipal office will constructs a campus along the Delft Main Road. The inter-relation between these programs will intensify the activities along the street and will thus aid the required diversity which makes a high street functional.

With this in mind I sought to find the most appropriate site to execute the FET design. To identify the site I looked at the continuity of Main Road, Delft and where it lacked urban continuity. Establishing a central area was also a consideration. Its position central to other institutional functions was thus important in order to mobilise existing programs.

Site Selection

Erf 1004 along Main Road, Delft has been selected as the site for the FET design project. After studying the street I discovered that here the street lacks spatial definition, civic scale and creates 500m long gap along the street edge. The site is currently a long distance taxi rank adjacent to Sunray Primary school and an open public space. The site is surrounded by the Delft South Library, Simunye Secondary School, Municipal Advice Office and Spar Supermarket all within a 700m radius. Geographically it is central to Delft South as illustrated in figure 29.

Once the site was selected I proceeded to document the site in order to establish design informants to aid the design decision making process. This was done by means of site visits and a site analysis.

Figure 29

Erf 1004 central to Delft South.

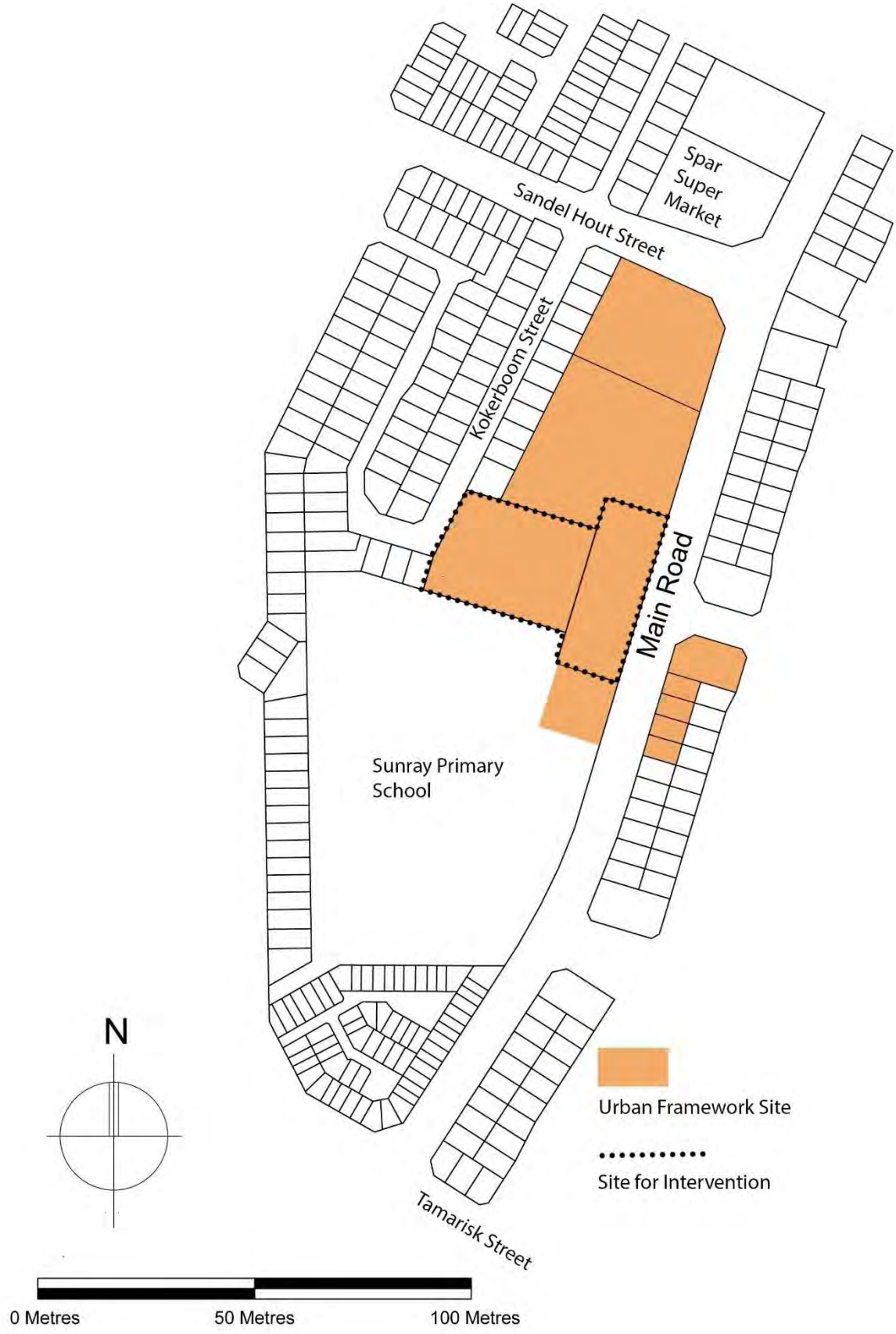


Figure 30

Erf 1004 Site diagram

Figure 31

Arial view of site.

Figure 32

Street view of site. Empty taxi rank adjacent to school playground. The concentration of people are less here. There is no formal spatial definition to the site

Figure 33

Sunray Primary with shared vehicular and learners entrance. The site is adjacent to the school with no formal structures.

Figure 34

The street lacks spatial definition and civic scale.

Figure 35

Informal trade occurs closer to the site corners where the concentration of people are more due to the Spar supermarket across the road.

Figure 36

Informal trade edging end of site adjacent to Supermarket. The opposite side of the road illustrates the vibrant denser street edge created by homeowners.

Site analysis

After selecting the site, I conducted a site analysis through a series of site visits. The objective was to establish design informants that can aid my urban and architectural design decisions. This further revealed the site's lack of spatial definition and how its interrupts the urban cohesion generated by the informal. The site has a flat topography with a loose sandy ground plane and is subjected to weather. Strong south easterly winds travels across the site due to low single storey buildings. Trees are invasive with the exception of the urban landscaping project done by the City of Cape Town 5 years ago. Pedestrians cross the site in all directions. The site mediates pedestrian movement between both halves of Delft South by means of footpaths.

These findings made me consider urban strategies that addresses spatial definition that can protect the site from weather conditions and give it civic scale. The spatial condition also reinforces the street edge along Main Road, Delft and moderate the pace of the street. This can be further moderated by introducing a new town square. The informal pathways connecting the site to Main Road, Delft and to the other parts of Delft suggest a new connecting street. Along with adjacent school and rationalization of taxi rank the site can mobilise these existing infrastructure by connecting these.

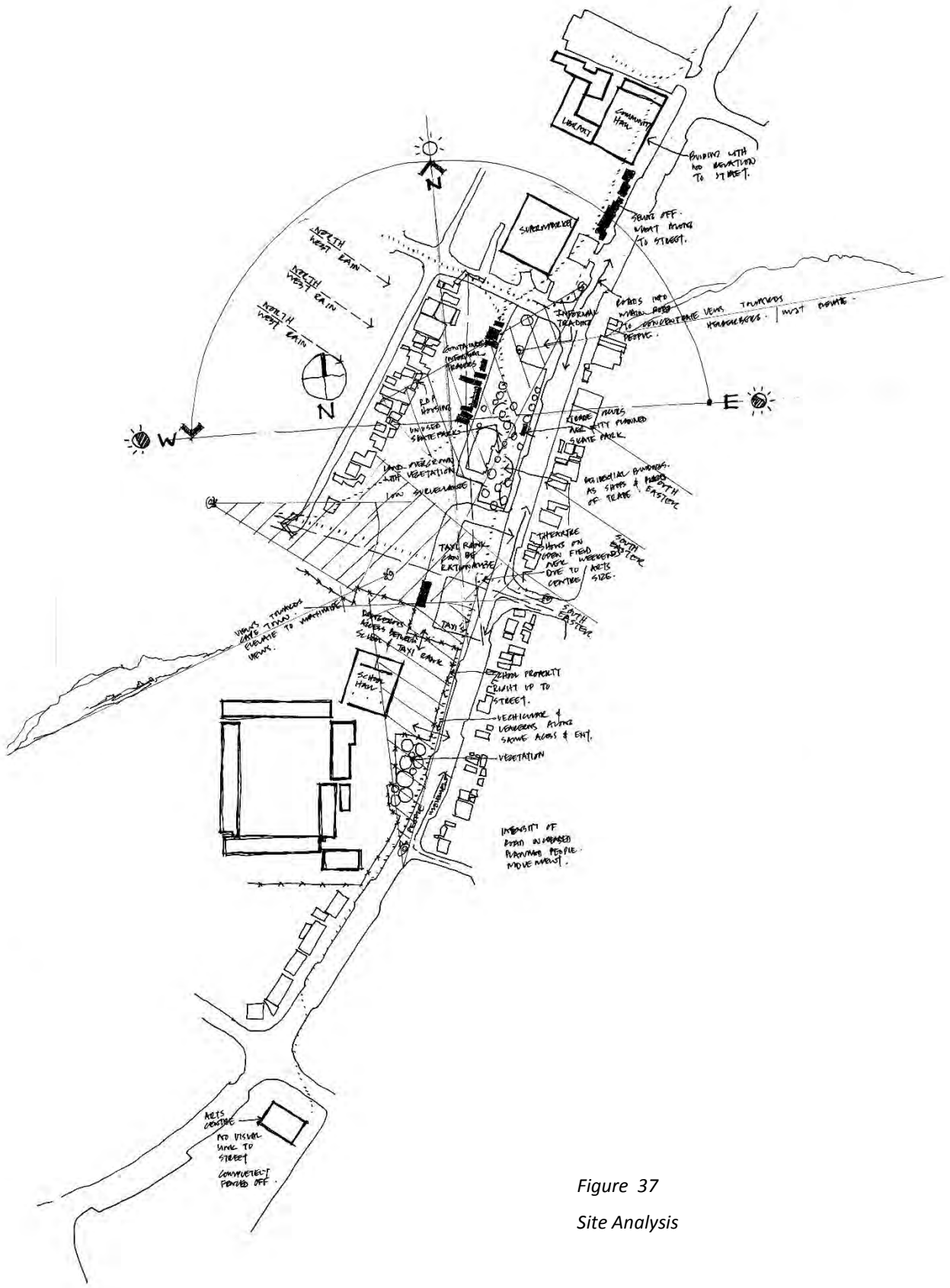


Figure 37

Site Analysis

Urban Strategies

By understanding the site and how it relates to the surrounding urban, I want to create an urban condition that concentrates activities along the emerging high street, Main Road, Delft. This will result in the urban diversity to make this part of the street a much more functional high-street.

To do this my objectives are to create;

Spatial definition

Moderating the pace the of street [Re-enforcing the high-street]

Civic scale

Connecting the urban [the connecting street]

Mobilising the institutional [Assembling of Campus]

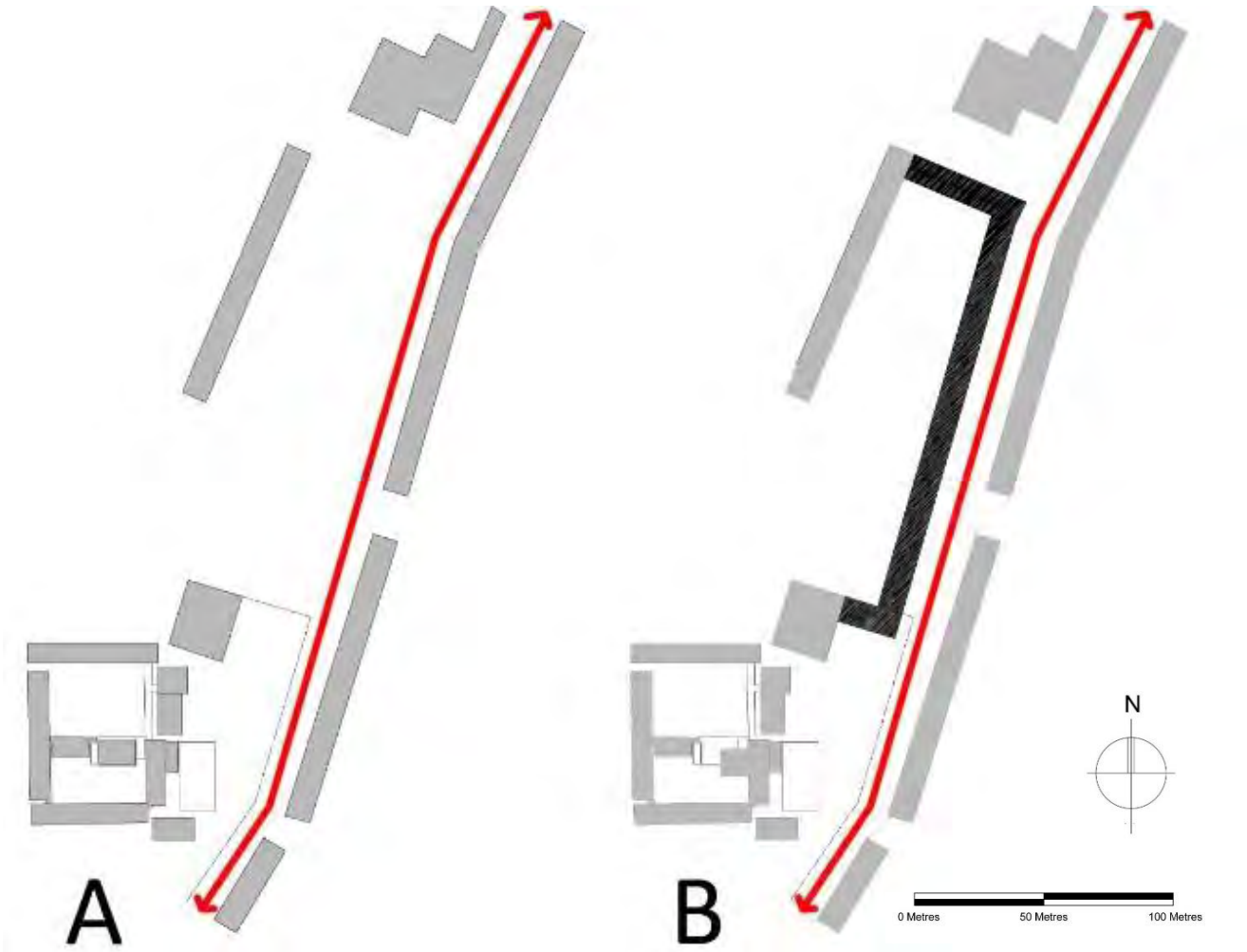


Figure 38

Development of Urban Framework

A – Existing Site with little spatial Definition

B – Defining the street

Spatial definition

To reinforce the emerging high street, the boundary of the street needs to be clearly defined. For this verticality is essential as it contains the street space. I explored this by developing a series of diagrams that illustrates the progression from the existing A in figure 38, to the urban framework D in figure 39

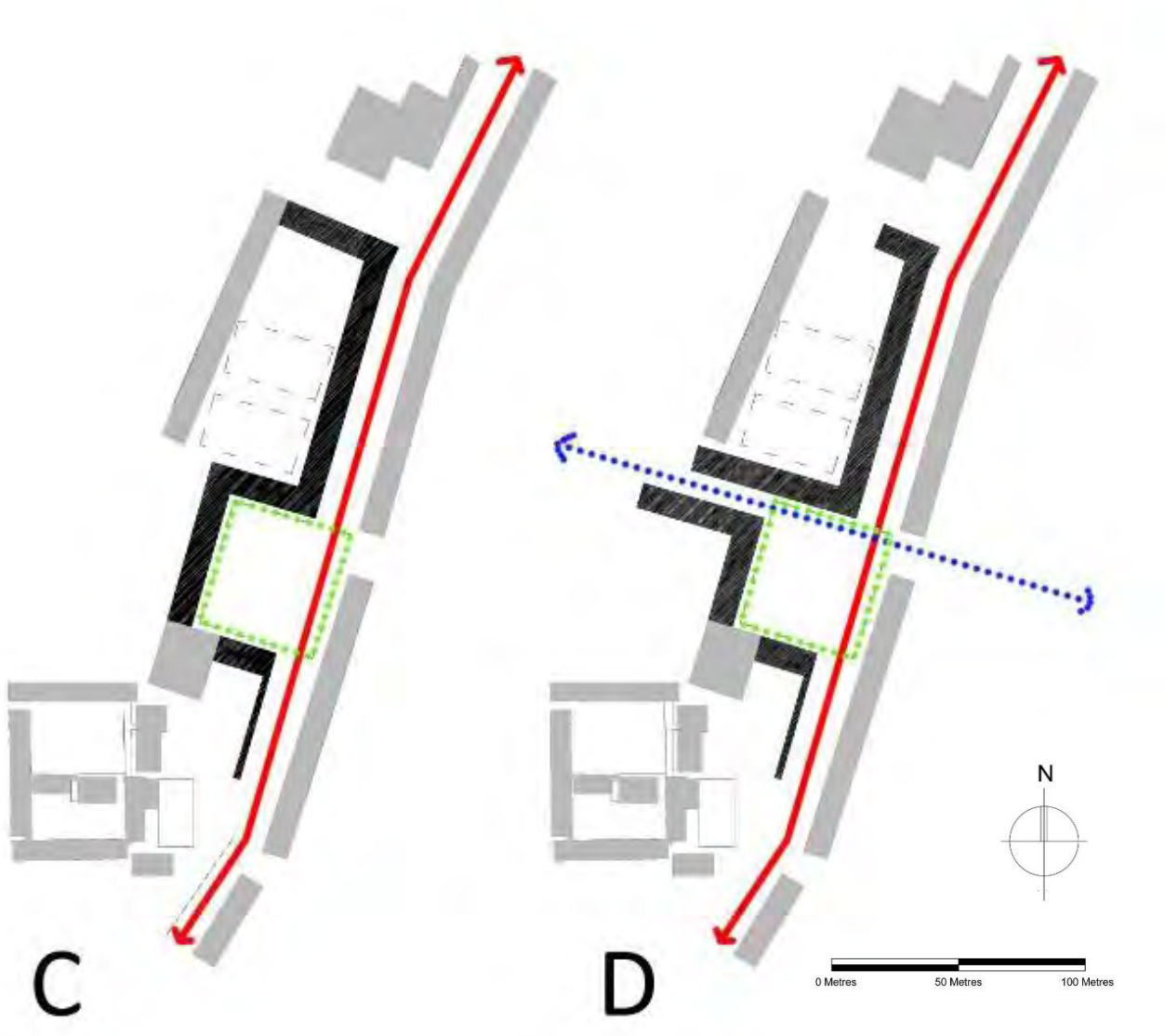


Figure 39

C – Moderating pace of the street[creating public square

D – Introducing the connecting street

Moderating the pace of the street

By introducing a public square, the pace of the street is moderated. The long distance taxi rank is re-located closer to the supermarket and creates a safe distance between learners and vehicles. The square also connects the other parts of Delft to the site in 4 directions. Social housing is introduced and creates the urban condition to make the architectural program viable. This is done by developing a housing block that can be repeated along the street to tighten the dimension thus increasing the street intensity. This together with the square creates different paces along the street.

Civic Scale

A new civic scale is introduce that challenges the existing civic buildings. This is done by creating a new public square that creates a new forecourt to the primary school. The new FET buildings are then strategically placed to be approached from the new square. This larger civic building connects the smaller urban fabric. This is reminiscent of a medieval cathedral around which the built fabric develops. When looking at Rome's nolli map, one can see how the public buildings are approach from a public square. These squares are part of a network of squares connected by streets and knit together the adjacent urban fabric. See fig 38, Rome nolli map

Figure 40

Nolli of Rome, The fine grain of the medieval city is broken by public squares.

Connecting the urban [the connecting street]

Connecting the high-street to other areas of the Delft South is important to facilitate access to it. The site acts as a mediator between the east and west halves of Delft South. An informal pathway is reinforced as a connecting street that intersects with the new public square. The site mediates movement from one area of Delft across Main Road to the other areas. The site is also part of a series of open spaces. This informs the idea of reinforcing these connections by introducing a connecting street. This street's geometry is informed by the informal pathways that currently crosses the site. See figure 41. This connecting street also facilitates movement into the town square similar to the streets that intersect into Greenmarket square found in Cape Town. See Figure 42 and 43. The connecting street feeds the square with movement patterns.

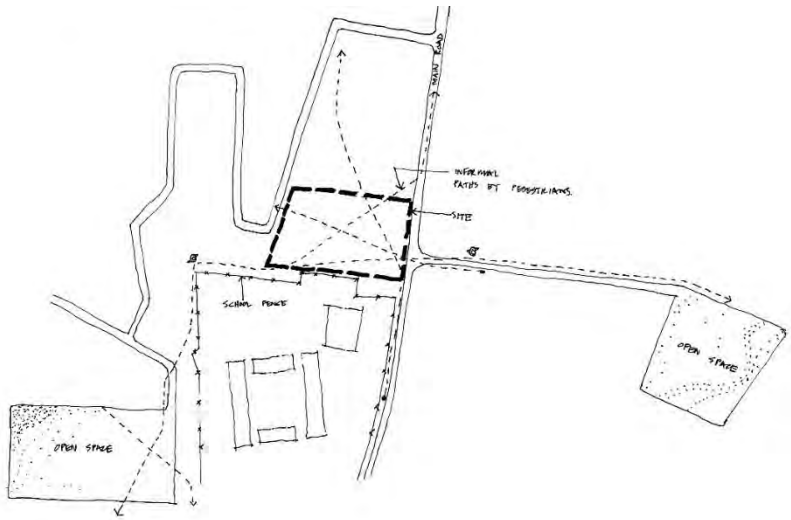


Figure 41
Diagram indicating footpaths across the site which acts as design informant for the making of the connecting street

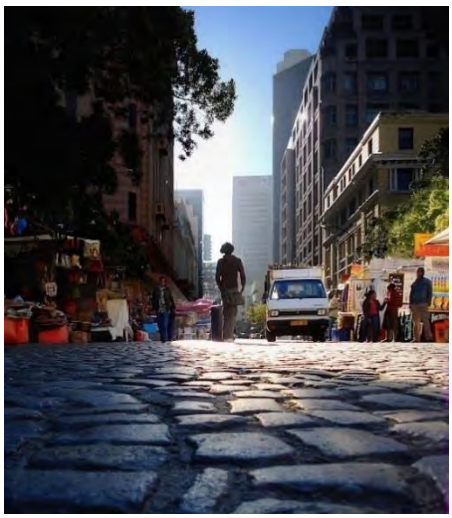


Figure 43
Green Market Square, Cape Town with inter-leading street connecting the square to the extended urban

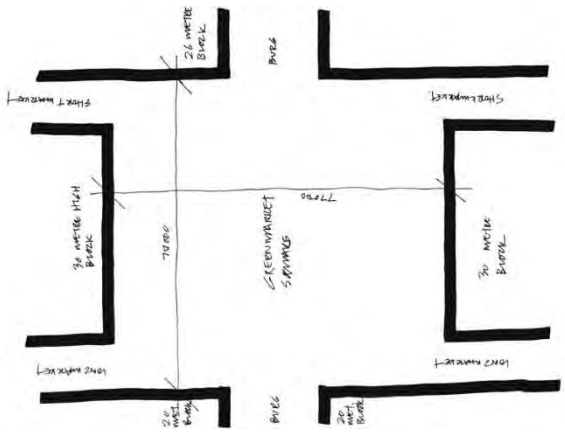


Figure 42
Green Market Square, Cape Town with inter-leading street connecting the square to the extended urban

Mobilising the Institutional.

Incorporating the existing programs which consist of the Delft South Library, Simunye Secondary school and the Municipal Advice Office will allow an inter-relational program that will concentrate people and activities along this stretch of road. The existing hall of the Sunray Primary School becomes an auxiliary space to the new theatre building. Access via the square also activates the existing school play courts. This is done by creating an interface between the square and the school. The other institutional buildings becomes affiliated programs to the FET College. The assembly of these results in a campus infrastructure that is strung along Main Road and reinforces the emerging high street through its inter-relational dynamic. See fig 45 illustrating this assembly of institutional parts. This arrangement of buildings divides up the larger site and creates forecourts and inner courts to the different buildings. At Seinajoki, Finland, Alvar Aalto strategically places buildings to structure the larger urban framework. Here the front and backs of buildings addresses the street positively. See figure 44

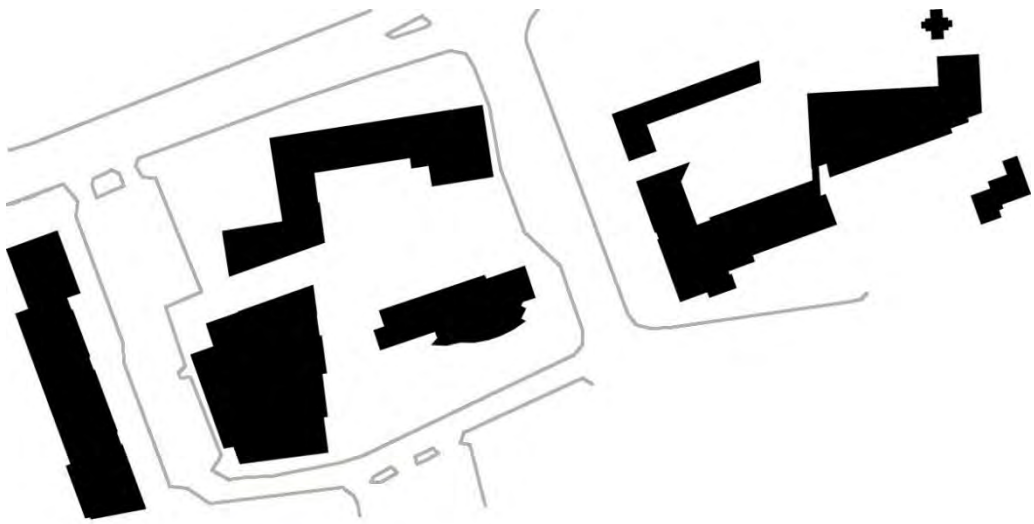


Figure 44

Seinajoki , Finland plan by Alvar Aalto

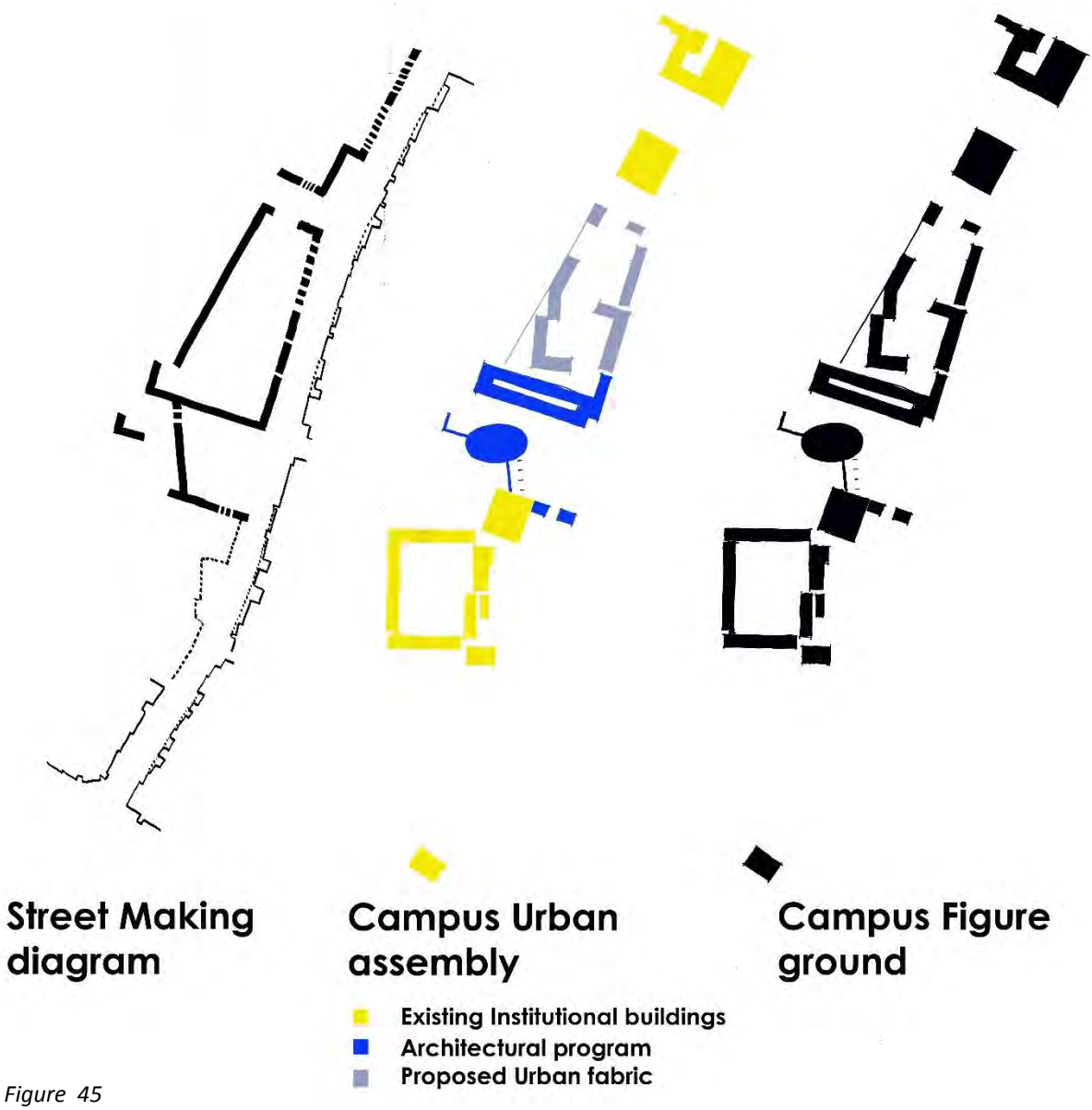


Figure 45

Mobilising the existing Institutional buildings

Urban framework

In answering the urban strategies as set out I developed an urban framework. Figure 46 and 47 illustrates a consolidation of all these ideas. Figure 48 demonstrates 3 dimensional qualities of the Urban framework. The existing taxi rank is relocated closer to the supermarket. This provides a safer space next to the school. The old taxi rank becomes the new public square. The learner entrance of Sunray Primary is separated from the vehicular access. Learners enter and exit in and from the new square. The square becomes the forecourt to the Performing arts lecture venue. This building becomes the large civic buildings that connects the smaller scale urban fabric with each other. A Student housing block defines the connecting street from east to west. Social housing block with retail at ground level edges the street and creates a more private court for residents towards the west. Servicing and residents vehicular access is from Kokerboom Street. Access into the taxi rank is from Main Road.

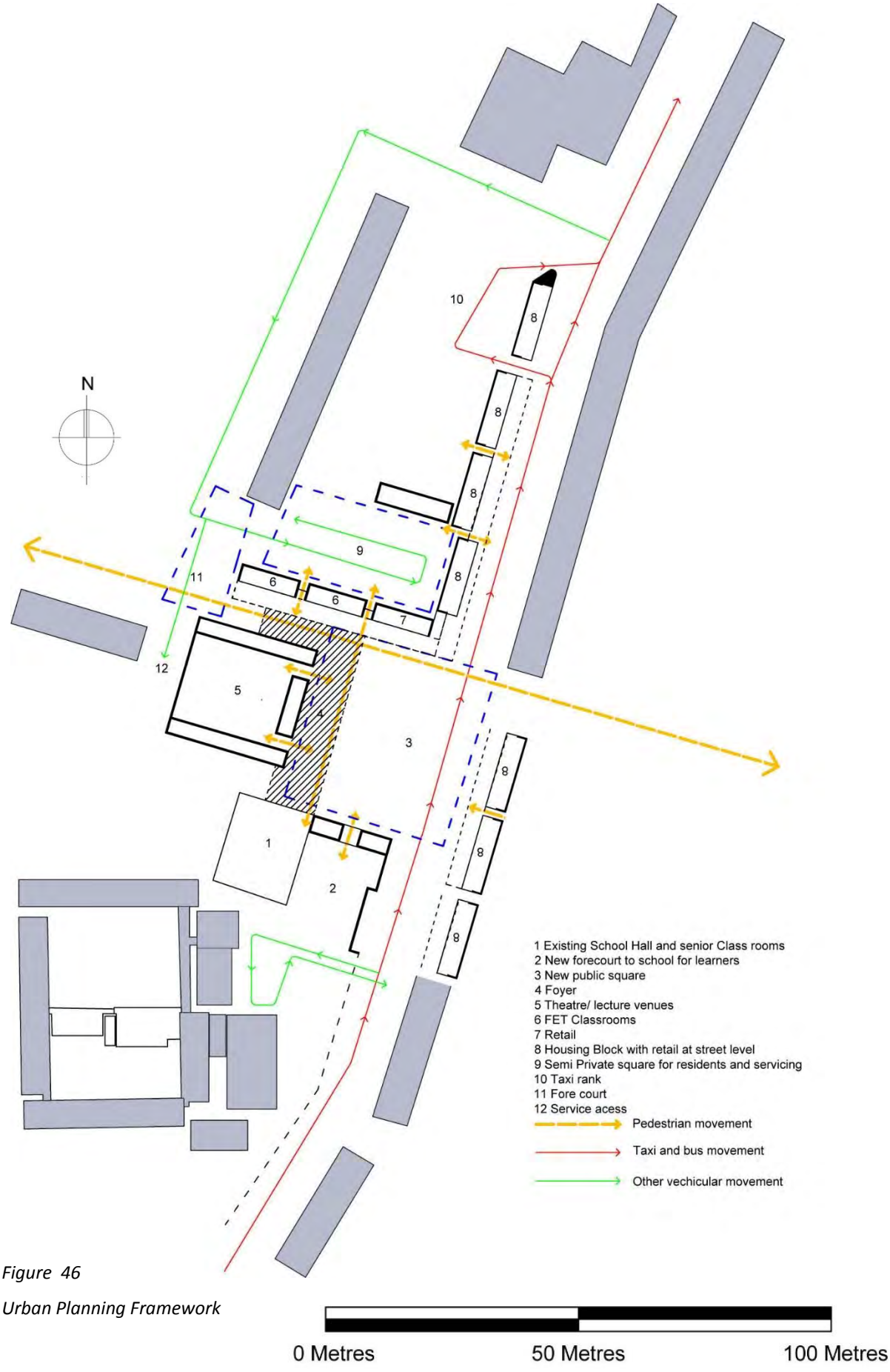


Figure 46

Urban Planning Framework

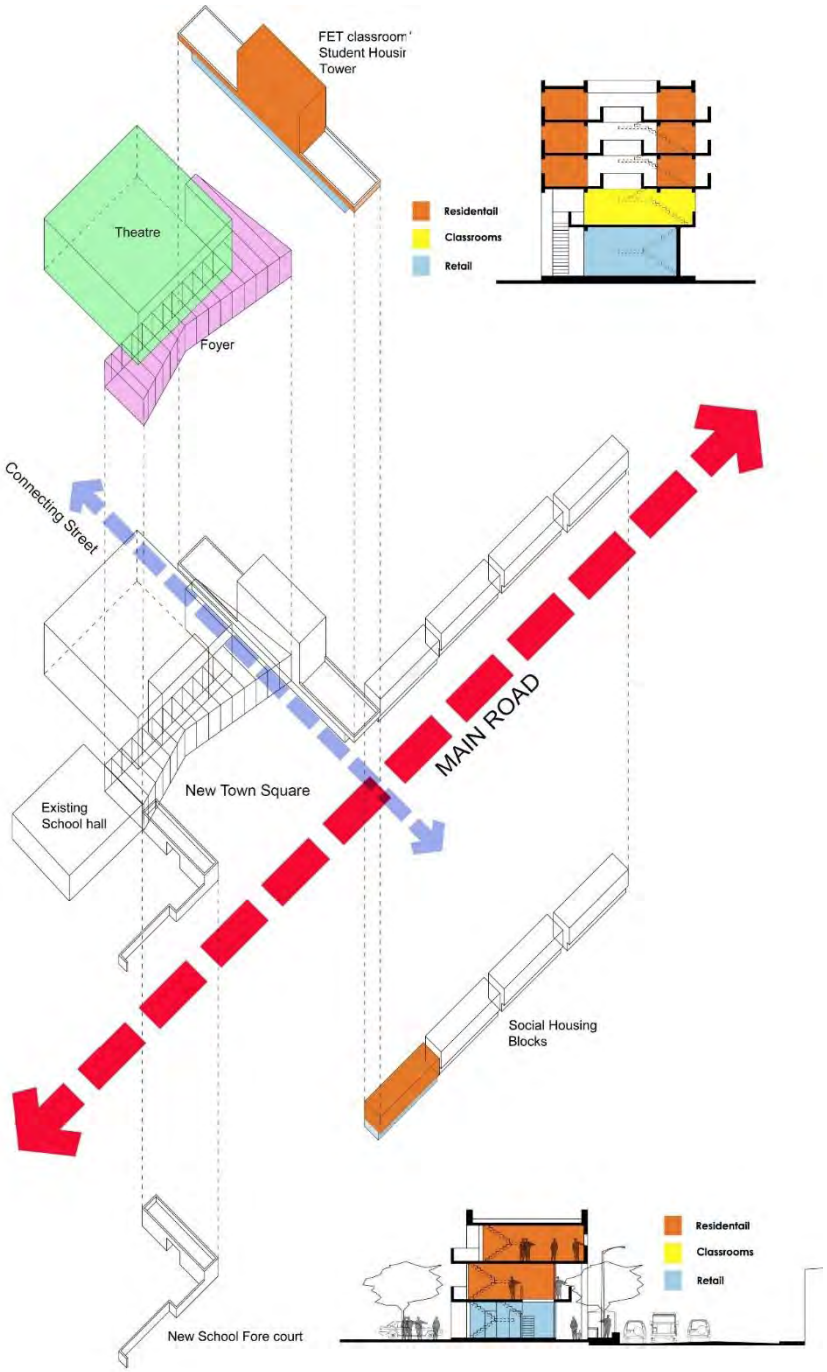


Figure 47

Isometric building assembly. The buildings arranged along the Main Road and new connecting street as the 2 axis. The student housing blocks consists of workshops and performing practice room at ground level, teaching venues at 1st floor level and student rooms above. The social housing consist of retail at ground and living units above. The performing theatre is approached from the square and doubles up as lecture venues

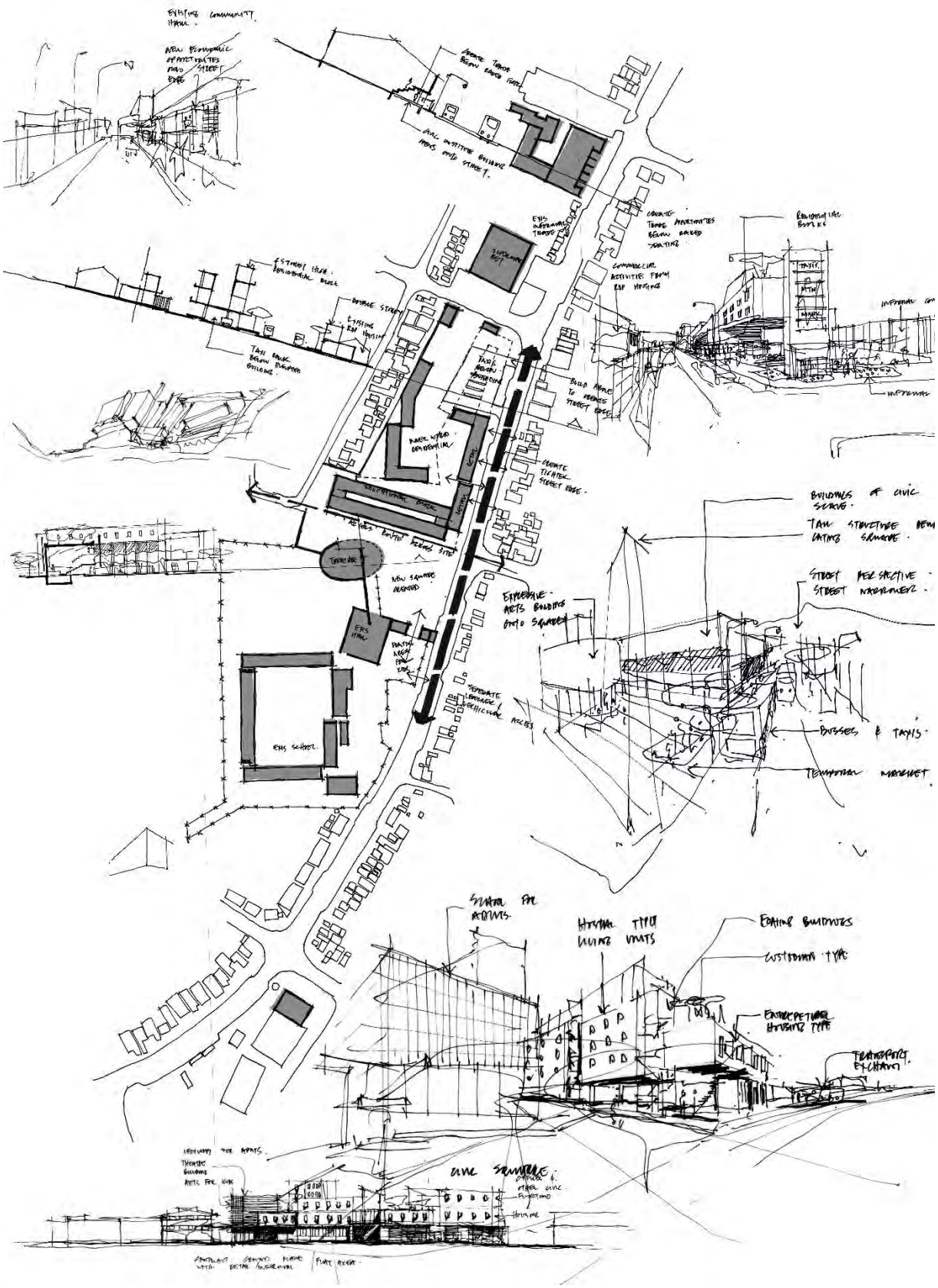


Figure 48

Initial explorative ideas of urban concept

Architectural Design ideas

After establishing the urban framework I focus on designing the FET Facility. In order for the FET design to be effective I have decided to assemble the facility out of three different buildings namely the theatre building, Student housing/ workshop and classroom building and social housing building. These three building types explores 3 architectural ideas:

Building on to square

Building as thoroughfare

Building as edge/border making

Building on to Public Square [Theatre building]

Here I have explored how the town square becomes building and the building town square. The facade of the theatre creates a stage like façade which orientates the approaching pedestrian. The building becomes a temple onto the square. The theatre becomes the internal public room which is entered by means of the front façade that also connects the existing adjacent school to the theatre as well as the tower housing block as illustrated in figure 49. At Chandigarh Le Corbusier places the Assembly building central to the development. This placement results in a forecourt. A monumental canopy is constructed as a interface between inside and outside. This gives the building civic presence. See figure 50 and 51

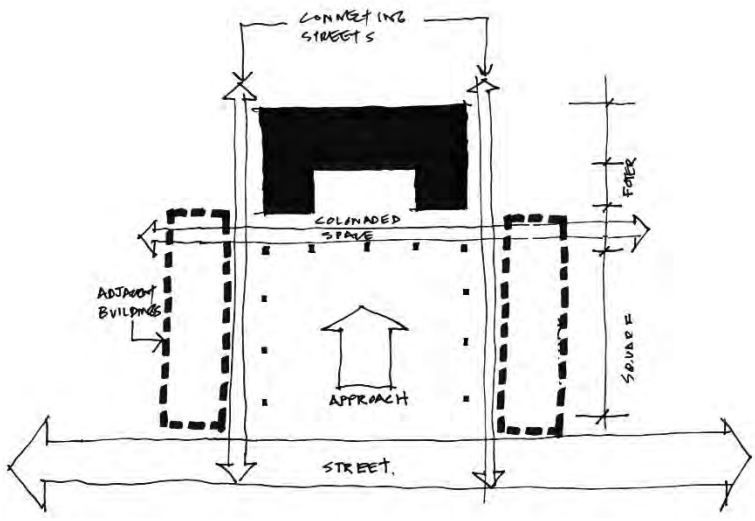


Figure 49

Town square diagram

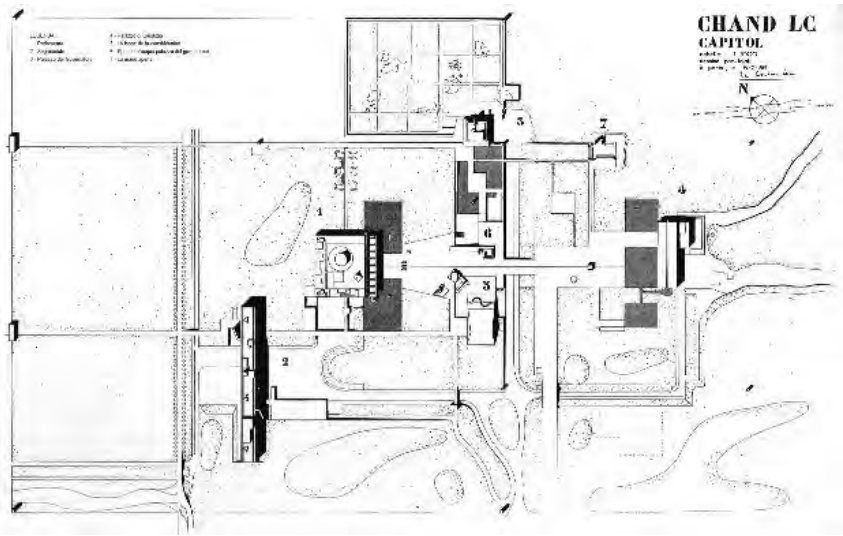


Figure 50

Chandigarh by Le Corbusier. The assembly building central to the development has a forecourt as approach.

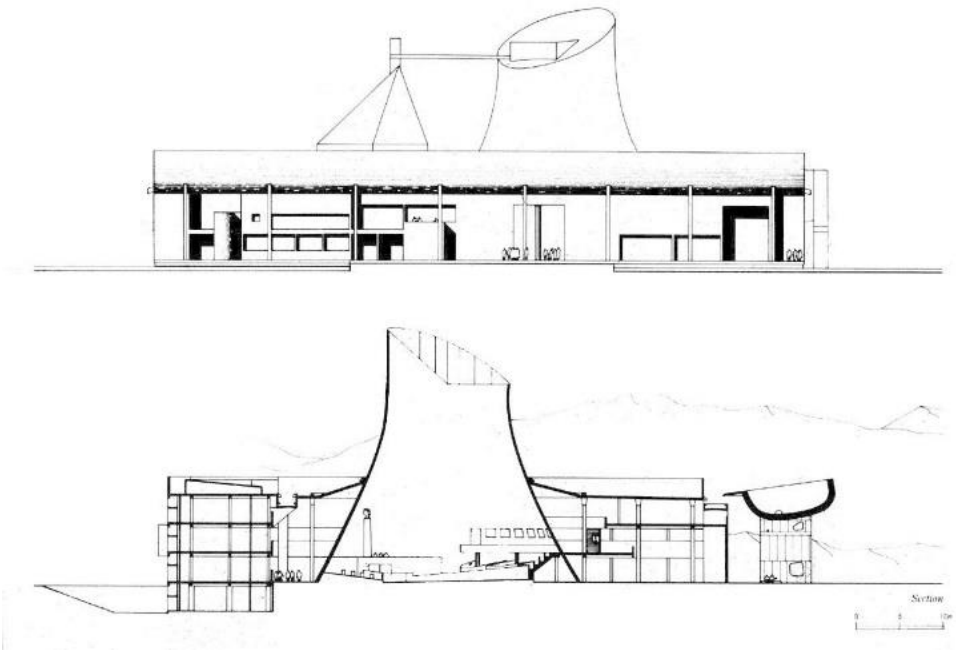


Figure 51

Chandigarh by Le Corbusier. A Large canopy adorns the façade and gives the building civic scale.

Building as thoroughfare [Student housing/ workshop and classroom building]

The tower building is used as a linear element that juxtaposed the expressive building form of the theatre. The two opposing building enclosure line gave shape to the connecting street. This results into a geometry that resembles the organic informal pathways that currently zigzag over the site.

The building front is articulated with civic scale columns that demarcate the pedestrian movement space. This is overlaid over the thresholds of practicing and performing rooms. The activities along the ground level animates the connecting street. All vertical circulation to the tower block is along this axis. The vertical access to the Theatre building is also along this and reinforces the connecting street as a circulation route. Class rooms are located at first floor level and the more private student accommodation is from 2nd floor level.

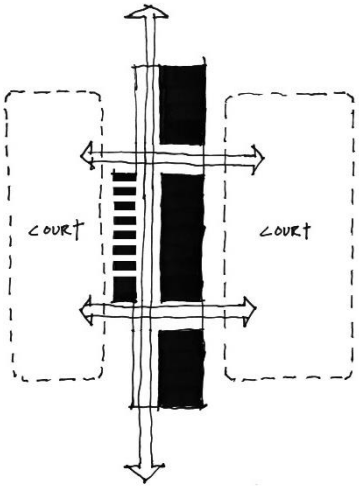


Figure 52

Building as thoroughfare

Building as edge/border [Social Housing unit]

The social housing component is crucial to the viability of the project. Allowing the centres of settlement to be occupied by its people ensures security, surveillance and a sense of ownership of the public realm by the locals. I have developed a housing block unit that can be repeated along the edge of the street. This will give the street the much needed spatial definition is requires. The unit address the ground plane by accommodating retail as well as live work units. Together with the sidewalk it creates and interface between building enclosure and street kerb that also allows for informal trade to exist, see figure 54. This idea comes from how existing informal trade manipulates the sidewalks, see figure 53. The buildings thus becomes a backdrop to in the informal. The corner of the units are articulated in such a way that it makes corner shops. These provide the surveillance over secondary access routes into the more private residential courts.

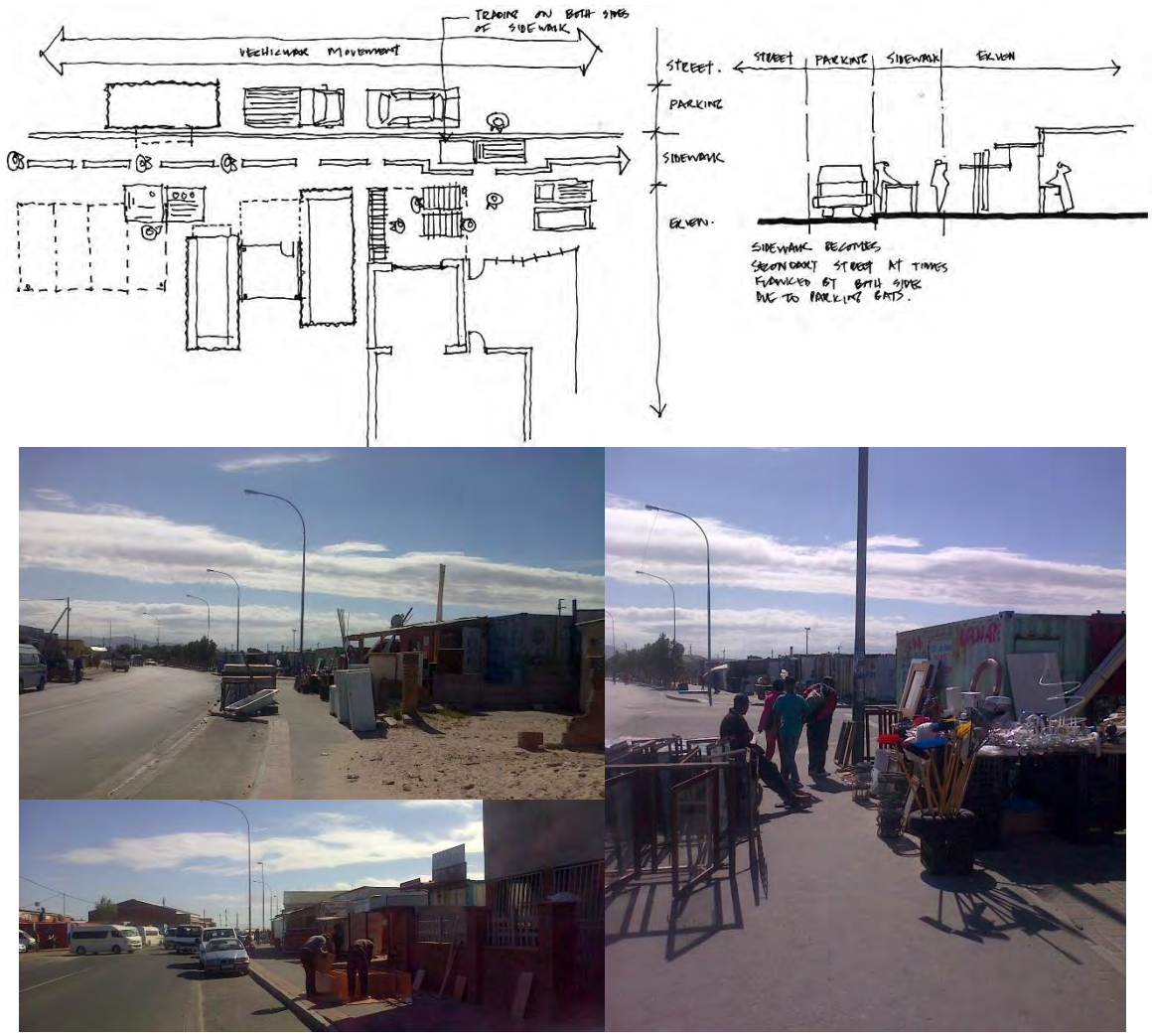
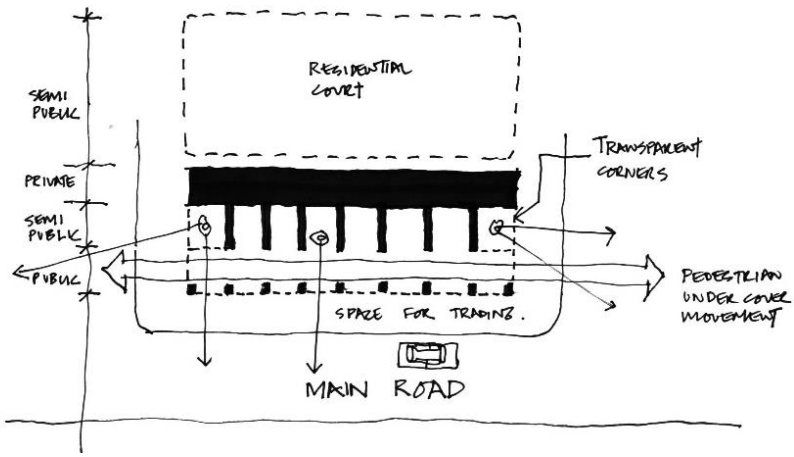


Figure 53

Informal trade occupies parking bays in certain cases. This creates a route along which trading occurs from both sides.



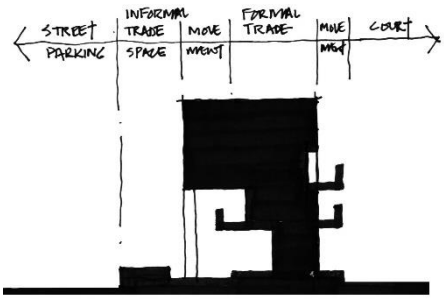


Figure 54

Street edge building diagram. The plan and section responds to the street by creating trading space and movement adjacent to the building frontage

Considering these architectural ideas set out to assemble these by drawing the intervention in relation to the existing urban fabric. Figure 55 demonstrates how the new fabric works together with the existing urban fabric to reinforce the emerging high street.

To merge the new built fabric with the old, the selection of construction method was my next focus. The following section focusses on the making of the FET facility.

Figure 55

Main Road Delft Street

Constructing the Public Realm in Delft South

Brick construction is adopted for the making of the FET facility. This construction is widely practice in the Western Cape region. Local skills are available and this will create further job opportunities for tradesmen of the immediate area. Considering the making of the public realm, robustness and low maintenance and versatility are key aspects for material choice when constructing the public realm.

My reasons with opting for this construction are bricks' viability and structural performance. When used in an artistic manner, brick construction can challenge the mundane use of the existing institutional buildings that are found along Main Road, Delft. For this reason my focus was to use bricks in a fair face finish. My intention is to use a single colour palette which will be given depth through shadow and light. The vibrancy of the informal activity will create a diverse colour display against the backdrop of the brick buildings. I believe that by using this material will demonstrate the inherit craft found amidst the local labour and will be representative of the tenacious creative spirit demonstrated by the informal activities.

In this section I try to understand how brick construction finds itself amidst the township and how it is represented. This allowed me to re-imagine the conventional use of bricks, particularly that of institutional buildings. How feasible brick construction is for the Western Cape was my next investigation. Considering the architectural idea of 3 building types, I decided to adopt two structural systems. Loadbearing brickwork to construct the simpler social housing buildings and a hybrid structural system where brick is used alongside steel and concrete construction in order to construct a civic scale. This allows the transfer of skills from other more complex trades. Brick construction is then further explored as enclosure, screening, ground cover and ornament to create the desirable new civic image along the emerging high street.

Brick Construction in the township

While I was visiting various townships across Western Cape I was drawn to the variety of brick colours and textures that are favoured in the area. There is an immediate appreciation for the variety of clays that constitute the complex geology of South Africa. At first glance the inconsistency, unfinished walls, half plastered brickwork blunts one appreciation of the material and the inherent skills found in the township. When talking to local labourers one's imagination is intrigued by the clarity at which built works are described by those who have built elsewhere but live here. Residents build as more rooms are required for living as see in figure 10. The passion that you are confronted with upon listening to local masons compels you to appreciate the talents of local labour.

In apartheid towns, many families livelihood are supplemented by building trades. These skills have however been practiced mainly to build up wealthier areas as opposed to the hometowns of these labourers. These skills are only apparent within townships as an ad hoc event thus its beauty and appreciation of this art is seldom recognised within the township. Instead it resemble a built fabric of and impoverished people. Tomlinson notes that labour skills are practiced outside the township by saying: *'This urban structure has been a deliberate artefact of apartheid policy whose primary purpose has been the attempt to keep non-whites at a safe distance from the centres of production and the white residential suburbs, except of course for labour purposes. [Tomlinson R; 1990]*

To inform the brick construction making I looked at how the existing formal and informal built fabric makes up Delft South's materiality. Historically to the township the face brick construction is representative of institution and government. It represents oppression, control and adversary. Fig 56 of Advice Office relays a defensive image. This is in stark contrast to the creative use of leftover building material by the adjacent homeowners and traders as illustrated in figure 59. My objective is thus to re-imagine the brick constructed institutional building. The use of brick must compliment the vibrancy of the informal activity. In this way the image of the institutional building is more inclusive of the spirit of the residents . The feasibility of this material is however important to handle the frequent and diverse use of the public realm by the locals.

Figure 56. Delft municipal Advice office

Figure 57

Sunray School Hall. Here fair face brick is used for maintenance reasons. Its lacks articulation the building consists of class rooms around a central hall. The use of bricks does not indicate any hierarchy of space.

Fig 58

Delft South Library. Here Fair face brickwork is used together with plastered brick work. Its lack contrast between the two surfaces. This comprises hierarchy of functions.

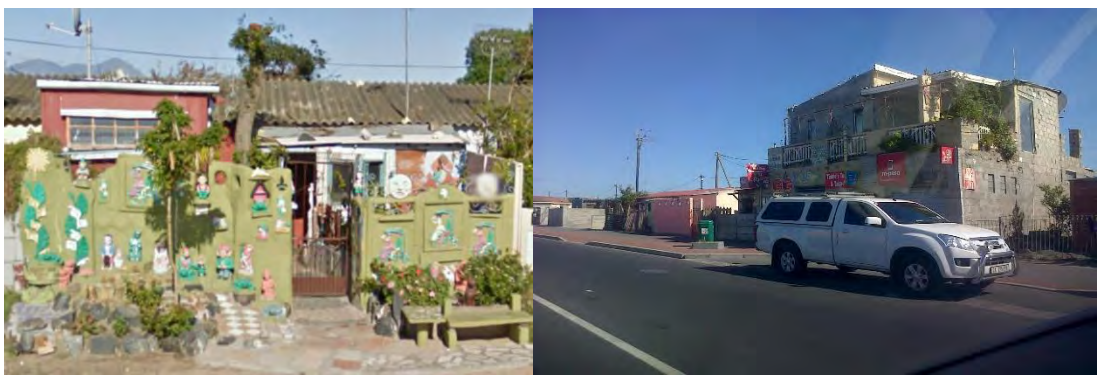


Figure 59

Creative use of recycled building materials

Feasibility of brick construction

Clay bricks don't fade, twist or warp, rot or decay, erode or dent and pest can't damage them. For hundreds of years, no material shows so few signs of ageing. In most constructions they do not need re-sealing or re-painting. Routine maintenance is limited. When selecting material, the life cost of material is important. It's here where clay brick construction has the upper hand over most other materials. Bricks are manufactured within a 50km radius from Delft with distributing centres as close as Philippi 15kms away. This greatly reduces the embodied energy required to construct the FET facility in Delft. Labour skills are also available within Delft.

Climatic responsiveness

The density of bricks enables quieter buildings by reducing sound penetration. When building in cavity brick, adding insulation helps further by absorbing resonating sound. Internal partition walls made of brick can reduce noise transfer further when used between rooms of the house.

Clay bricks absorb water quickly and in the cape winter building envelopes will remain wet as long as its rain. It also dries out quickly when the sun is out. Standard details to prevent water ingress are cavity walls in rainy areas or the application of a moisture retarded product like a brick sealer.

Structural investigation

Structural strength of bricks are 7mpa and 14pma for structural use [Corobrik]. This allows for 2 storey building without any structural devices of other materials. Buttressing and brick columns can be introduced as building height and size increases. Beam filling with brick force and wall ties enables the construction of horizontal beams while still allowing the brick to read as façade treatment. Concrete and steel are very compatible with the brick module and provide excellent structural support without compromising the aesthetic character of the brickwork. With this in mind I adopted 2 structural systems, load bearing brickwork structural system and a hybrid structural system in order to construct the 3 different building typologies.

Loadbearing and Hybrid structural systems

The Load bearing brick construction

The idea is to use standard load bearing brick construction to construct the social housing unit. Here the brick detailing is develop to minimise the additional re-enforcement other than masonry work. This will enable shorten construction time and detailing would be more appropriate to the available skills found in the area.

Hybrid Structural system

In order to create civic scale a hybrid structural system is opted for to enable height and larger spatial spans. This also allows specialised skills such as steel construction and concrete construction to be executed together with brick construction. This will promote skills transfer. The student housing and theatre building will be constructed with this method. Considering these two I proceeded to develop a structural layout as illustrated in fig 45. This is set up by creating a structural grid that places structural columns and loadbearing walls. The social housing has a 3.5metre grid that is informed by the living units. The student and classroom block has a 9m structural grid that is informed by classroom design standards. The columns along the public interface are sized to give civic scale along the building envelope. This creates a colonnade along the street and square that differentiate between pedestrian route and informal trading space as illustrated in fig 42. The theatre building geometry is juxtapose against the linear form of the student classroom building. Loadbearing brickwork is constructed as a cavity wall and reinforce with concrete columns. This allows the brick work to be constructed as a skin towards the inside and outside. The theatre building brick work is artistic to reflect the expressive nature of the theatre program. Here I explored the poetics of brick construction through the making of an acoustic curtain constructed from bricks.

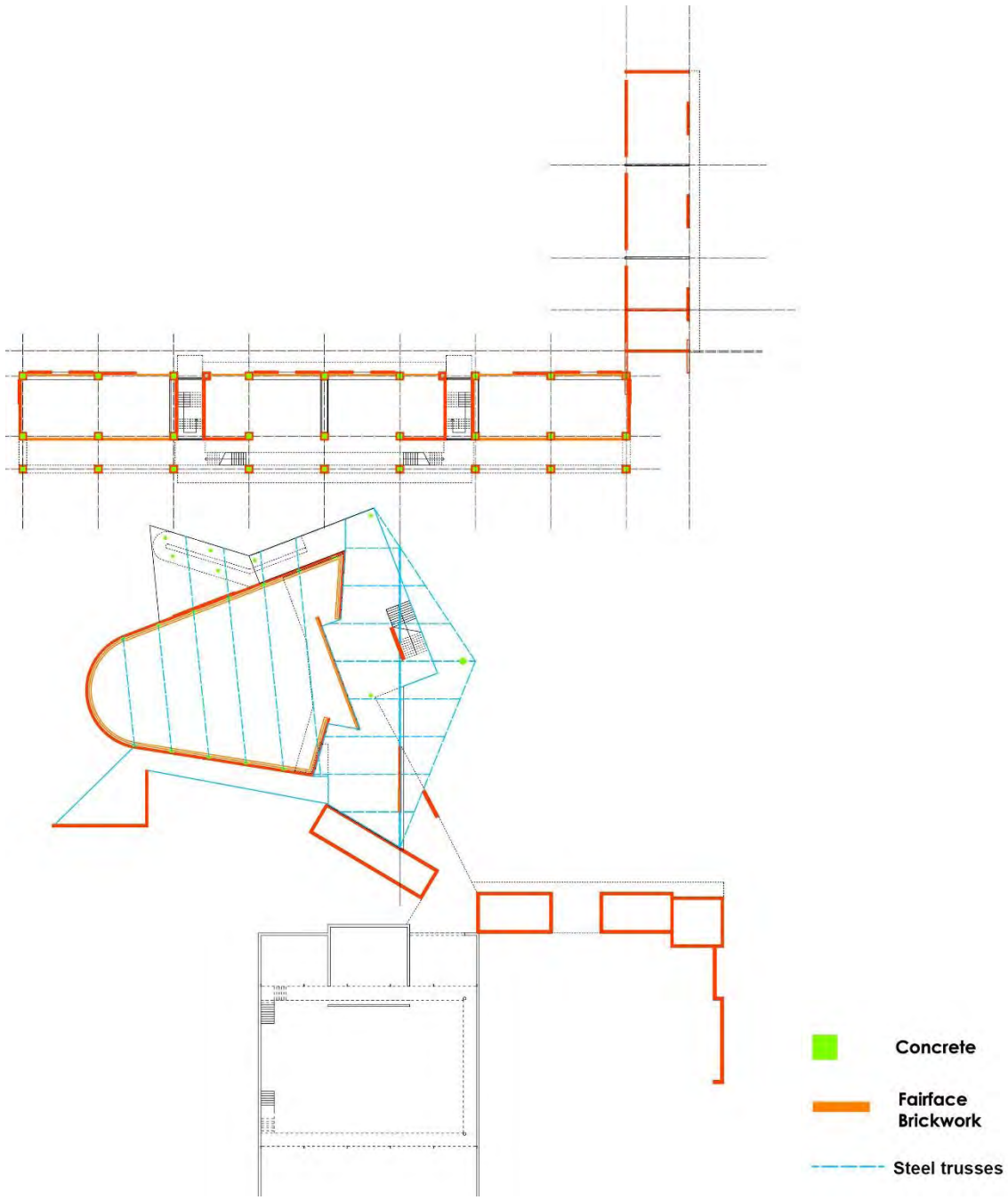


Figure 60

Structural layout

With the structural concept in placed, I then looked at brick construction as enclosure, screening, ground cover and ornament to create the desirable new civic image.

New civic image

Enclosure

Using brick as enclosure will ensure security, robustness and maintenance in a high trafficking area. The idea is to construct an enduring image. At timber yard housing, architects O Donelle and Tuomey uses bricks in a fair face finish. Here the envelope of the buildings are completely made in bricks. The result is building that are created by craving away at a monolithic surface. This gives a enduring image as seen in

Figure 61

Timberyard housing, Dublin Ireland by O' Donelle and Tuomey Architects.

Brick is use as single material and creates a enduring civic

Figure 62

Timberyard housing, Dublin Ireland by O' Donelle and Tuomey Architects.

Brick façade surface is carefully articulated with fenestration

Screening

Constructing screens with bricks enables me the design to control sun and light quality. North facing facades are treated with perforated brick walls. This is a further exploration of ornamentation which as a practical function. Architect Rogelio Salmona uses brick construction to create surface harmonious surface by mixing screening with solid wall. This is a effective way to create depth to facade by creating playful shadows. See figure 63

Figure 63

The Graduate School Building of the Faculty of Human Sciences at the National University campus in Bogotá, Sreenwall design by Rogelio Salmona

Brick as ground cover

The cape flats ground plane is sandy and not very fertile for landscaping. Marsh areas, locally referred to as “vlei” areas, appear randomly and are the oasis amidst the sandy planes. To enable a sturdy surface for the public realm the sandy soil must be stabilised. The design adopts bricks as a ground surface to demarcate the public realm. Its contrast with the road tar enables the spatial definition between pedestrian, trading and vehicular movement. The brick surface is good for creating sloped surfaces for the runoff of surface water. In Colombia architect Rogelio Salmona controls storm water in channels constructed from bricks. This creates spatial definition on the surface of the ground plane. See fig 64

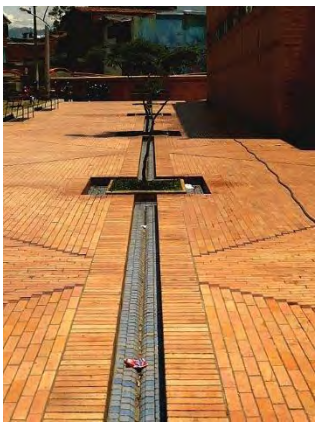


Figure 64
Nueva Santa Fe housing complex stormwater paving detail by Rogelio Salmona

Ornamentation

The construction of the theatre can be of an expressive nature. Here the curved walls can be constructed creatively to reflect the theatre activities. Architect, Niall McLaughlin uses bricks in a dog tooth pattern to create the elliptical shape of Cuddesdon chapel. See figure 65 ,66 and 67

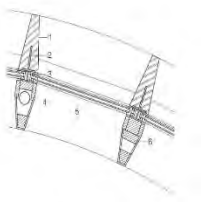


Figure 65
Cuddesdon Chapel wall composition

Figure 66
Cuddesdon Chapel Dog tooth wall

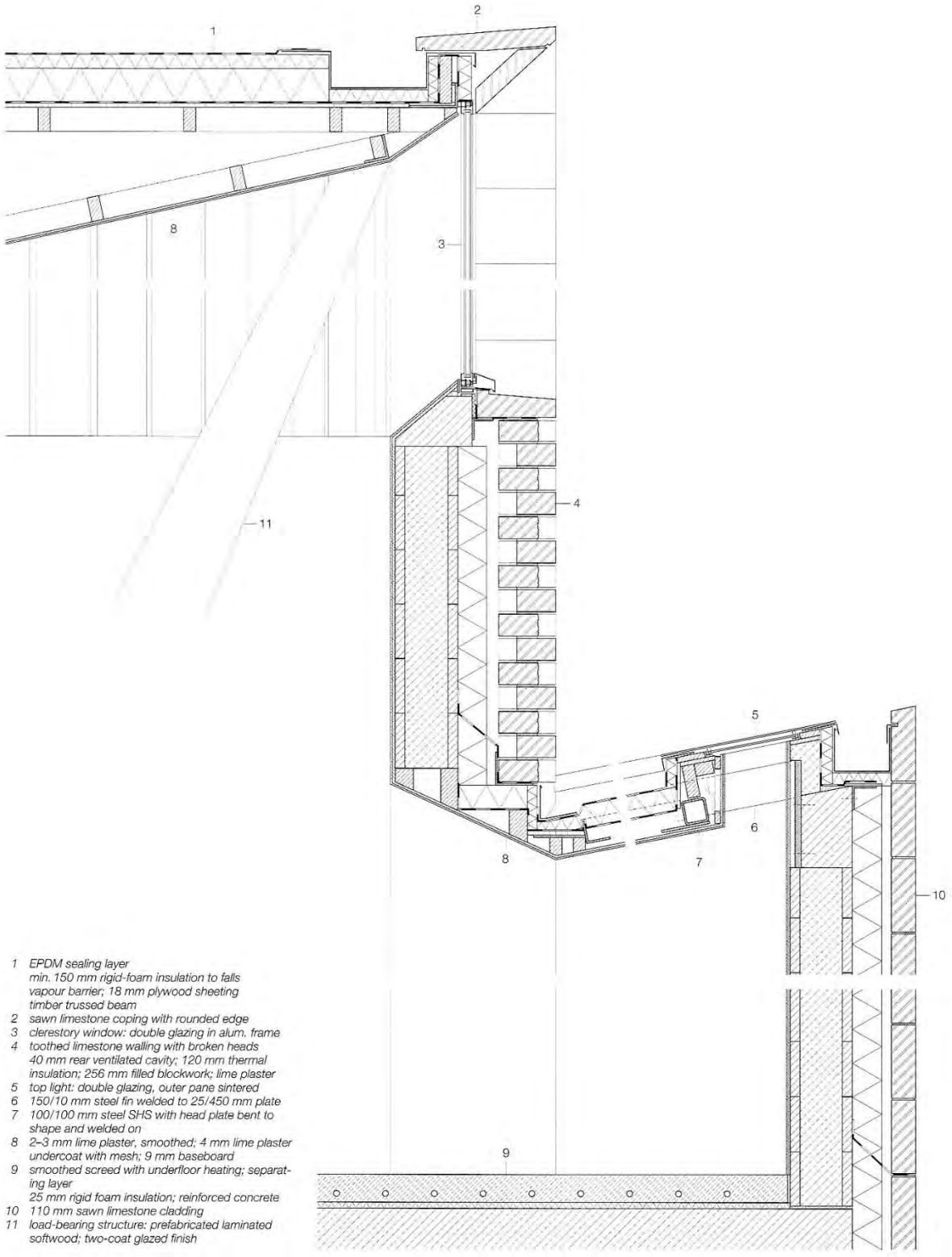


Figure 67
Cuddesdon Chapel construction section showing assembly of wall

Figure 68

Brick constructed civic image as back drop to informal activity

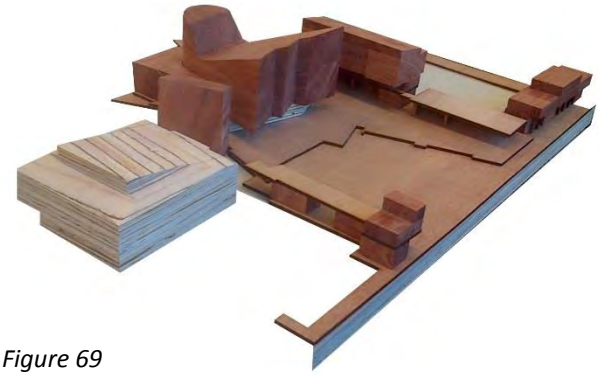
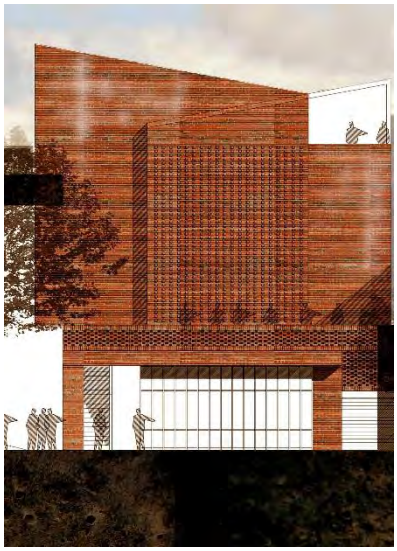


Figure 69

Brick walls are articulated with brick patterns. This sets up a dialogue between light and shadow and creates depth to the single colour palette facades.



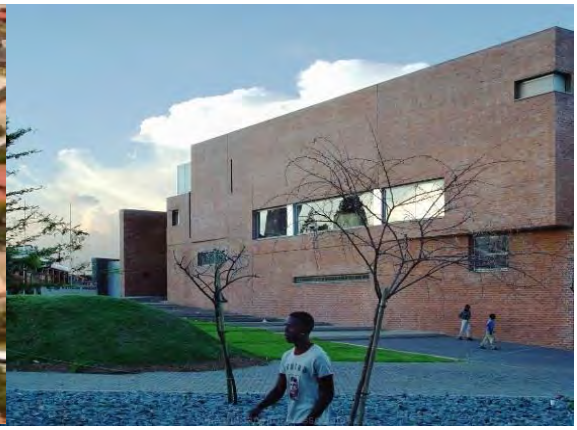


Fig 70

Use of brick at Hector Pieterson Museum, Soweto by Mashabane Rose Architects.

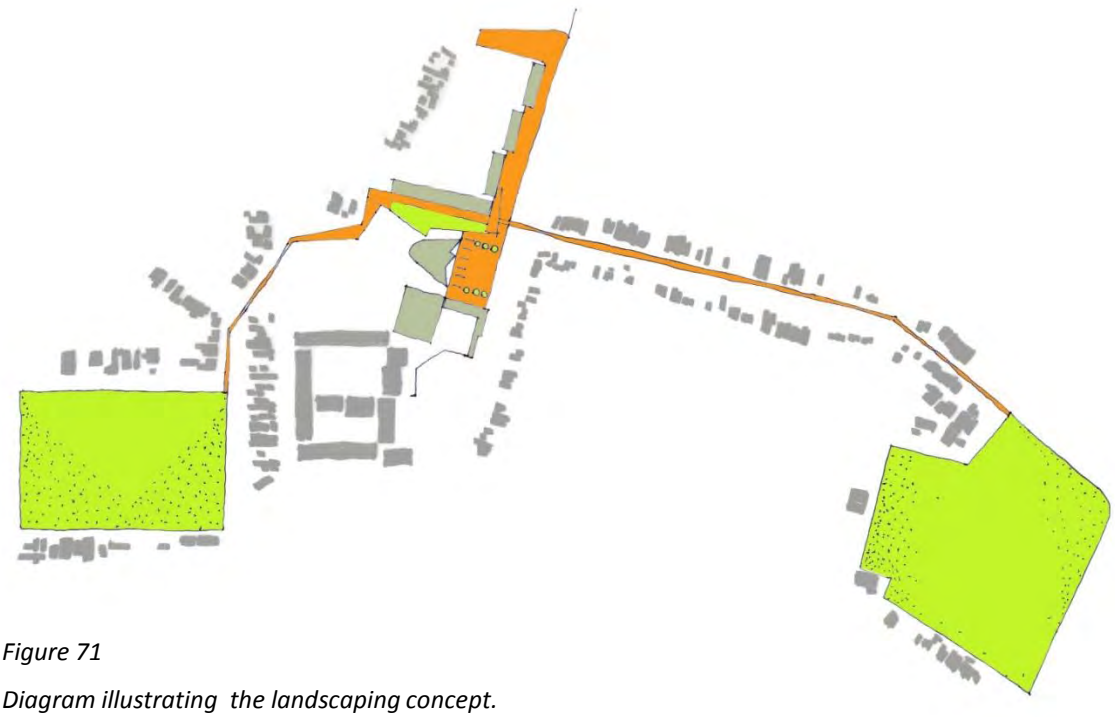


Figure 71

Diagram illustrating the landscaping concept.

Landscaping

When considering the landscaping design looking at the storm water system was my starting point. The cape flats has natural dispersion areas that relate to the aquiver. Open space areas are allocated around these areas in order to act as a natural drainage point for storm water. When analysing the open space areas I discovered that erf 1004 is located between to open space areas. These are natural dispersion areas. The connecting street as proposed in my urban design framework provides pedestrian movement across Delft with these two natural dispersion areas at either end. With this in mind I opted to make the connecting street act as a dispersion area to accommodate the storm water runoff generated by my proposal illustrated in figure 61. This area becomes landscaped with indigenous plants reminiscent of vlei areas. This re-enforces the idea of the connecting street as an informal generated geometry. Brick paving is laid to fall to this area.

Trees are planted to shade informal trade. Tree surrounds are designed to act as a seat or an elevated surface to place trading goods on. This re-enforces the idea of the formal supporting the informal.

Trees in the public square are kept to a minimal to enable inhabitants to occupy the space as required. These are placed to create forecourts to the school entrance and to set up pedestrian routes across the square. These 2 rows of trees creates a symmetry which enhances the approach to the theatre building .

Conclusion

Apartheid planning has created an imbalance in socio-economic spaces in lower income areas. Post-apartheid the effects of this is still evident. A lack of amenities in these areas still negate socio-economic growth. The imbalance of space can be remedied. In the case of Delft this imbalance is being rectified by the informal habitation of the street. This is why I have focused my research at understanding what makes a high street functional. My findings in Delft have led me to conclude that the area has created its own diverse nature without formal intervention except for the diversion of Main Road from Symphony Way. This diversion has concentrated activities along the street. These various activities has created different paces to the street. The informal nature constantly adapts to rapid change. These are all evidence of a high street. In the case of Delft, an emerging one. To reinforce this, the formal intervention should allow and facilitate these informal events. As urban planners and architects we must consider these aspects of street diversity when making or taking remedial action of the public realm in lower income areas.

As professionals we must seek opportunities within these areas, understanding how positive public space is made and translate this in a formal means that our disciplines have trained us to do. With current housing demands, budget allocations and restrictions, designers are often bullied into neglecting proper public space making. We must challenge this and creatively find solutions that can aid its development. By introducing basic amenities strategically we may be able to let informal activity spawn and reinforce our streets. When making these spaces, technologies that aid local labour skills development must be considered.

Why is this important? Considering the CBD of Cape Town's boundaries, there is very little space to expand. Job and other Economic Opportunities in the CBD will eventually reach a threshold. We need to thus make our townships inherently economically self-sustainable. Places where its inhabitants can meet there livelihoods. Our roads to the city cannot deal with the influx of the car to the city for very long and with our unreliable train system commuters find it ever more difficult to commute from areas outside the city. Globally cities are struggling to accommodate incomers. A re-look at developing our smaller towns could relieve the pressures that we place on city infrastructure. To conclude we ultimately must create durable public realm that facilitates diversity, adapts over time and concentrates activities that will meet our socio-economic needs.

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Figures

All figures has been done by the author with the exception of the figures listed below.

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Figure 7, page 14, Main Road of Delft South, Google Maps, viewed 16 October 2015

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Figure 50, page 48,Chandigarh, Urban plan by Le Corbusier, viewed 16 October 2015, from www. Studioblue.com

Figure 51,page 48 – Chandigarh, Assembly Building façade and section by Le Corbusier, viewed 16 October 2015, from www.archweb.it

Figure 61, page 59,Timberyard housing , Dublin, Ireland by architects O Donelle and Tuomey, viewed 16 October 2015, from http://odonnell-tuomey.ie/

Figure 62, page 59, Timberyard housing , Dublin, Ireland by architects O Donelle and Tuomey, viewed 16

Figure 63, page 59, The Graduate School Building of the Faculty of Human Sciences at the National University campus in Bogotá by Rogelio Salmona, Photo by Ricardo L Castro, viewed 16 October, from http://www.villegaseditores.com/libro.html?isbn=9589393578#slide1

Figure 64, page 60, Nueva Santa Fe housing complex stormwater paving detail by Rogelio Salmona, Photo By fraramirez, viewed 16 October 2015, fromhttps://www.flickr.com/photos/23973798@N02/4373518705/

Figure 65 page 60, Cuddesdon chapel by architect, Niall McLaughlin, Detail, Edition 12, pg. 1397

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Figure 67, page 61, Cuddesdon chapel by architect, Niall McLaughlin ,*Detail, Edition 12, pg. 1394-1398*

Figure 70, page 62, Hector Pieterson Museum, Soweto by Mashabane Rose architects, viewed on 26 April 2015, from http://mashabanerose.co.za/