

ACCOMMODATING DENSITY

An alternative to Cape Town's suburban model

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(All images to be considered as author, unless otherwise stated.)

Abstract

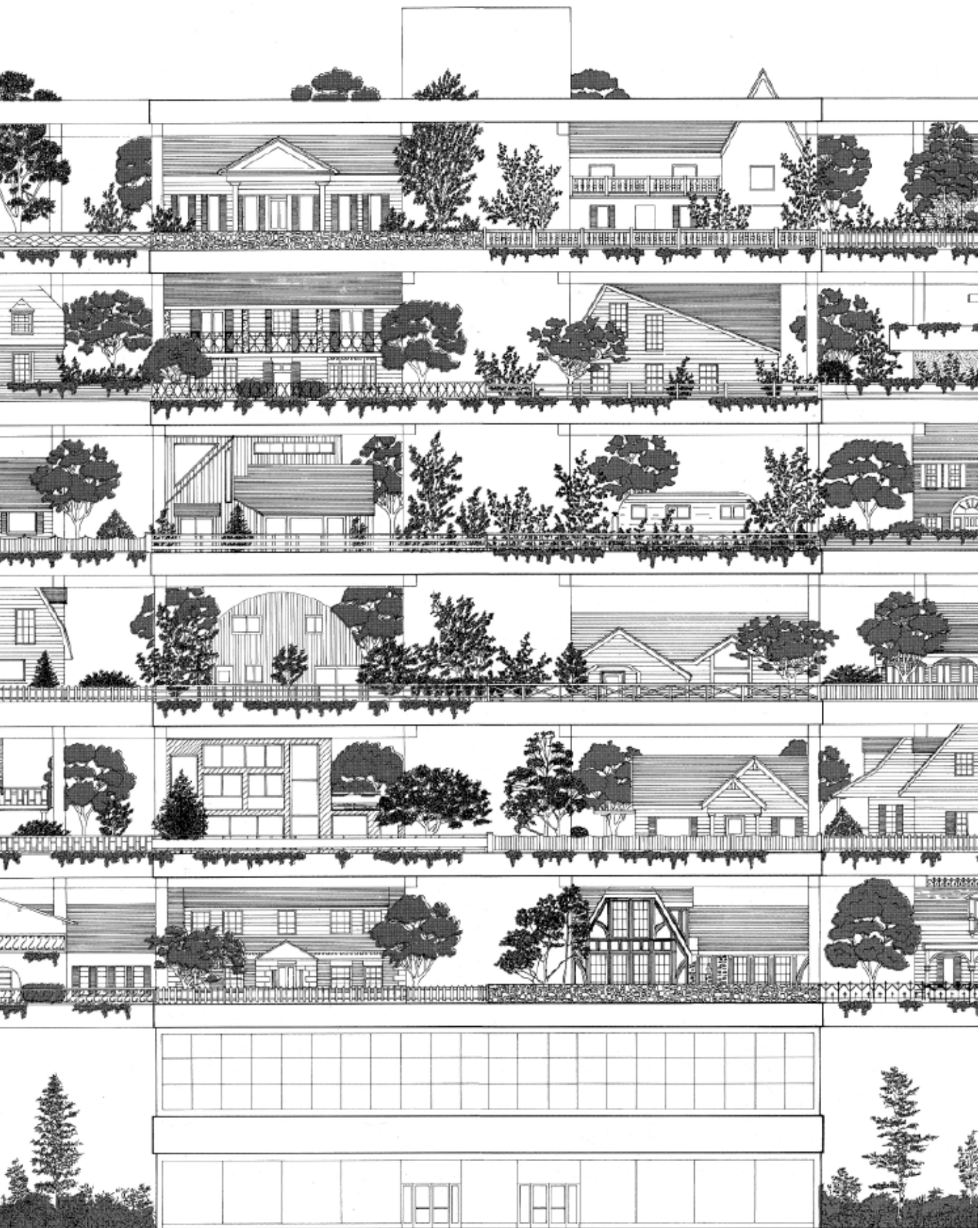
The Cape Town city border is expanding due to rapid urbanisation and further expansion is not the solution. The growth is destroying agricultural land and the provision of transport and services is becoming increasingly inefficient. The new suburbs on the edge of the city are comprised of mostly low density housing and present a dull urban environment.

There is a need to find alternate ways to accommodate a growing population with efficient use of services and facilities. Denser environments present greater vibrancy.

This dissertation addresses the issues around high density housing and how to change South African's negative perceptions regarding density which are based on the lack of parking space, privacy and desire for one's own garden. Perceptions can be changed through transport-orientated design, designing for privacy and the inclusion of balconies or patios. This project also looks at ways to increase a sense of community, which is often lacking in low density areas.

The project is sited within the Two Rivers Urban Park, in Hazendal by the Black River. This area offers a unique opportunity for Cape Town to densify existing areas near the city and redefine how Capetonians perceive rivers, which are often viewed as the 'backyard' space of the suburb. Rivers are neglected, polluted and used as dumping grounds. This dissertation attempts to change this perception and to provide opportunity to celebrate the rivers.

The outcome of this dissertation is an infill project and a catalyst for potential density development in the area. The project surrounds the Hazendal train station. It includes a social housing section with community facilities; a new train station entrance with a community hub; private plots, and market-related housing facing the Black River. The proposed design for the dissertation could set a precedent for ways in which to densify existing low density suburbs near to the city centre.



Introduction

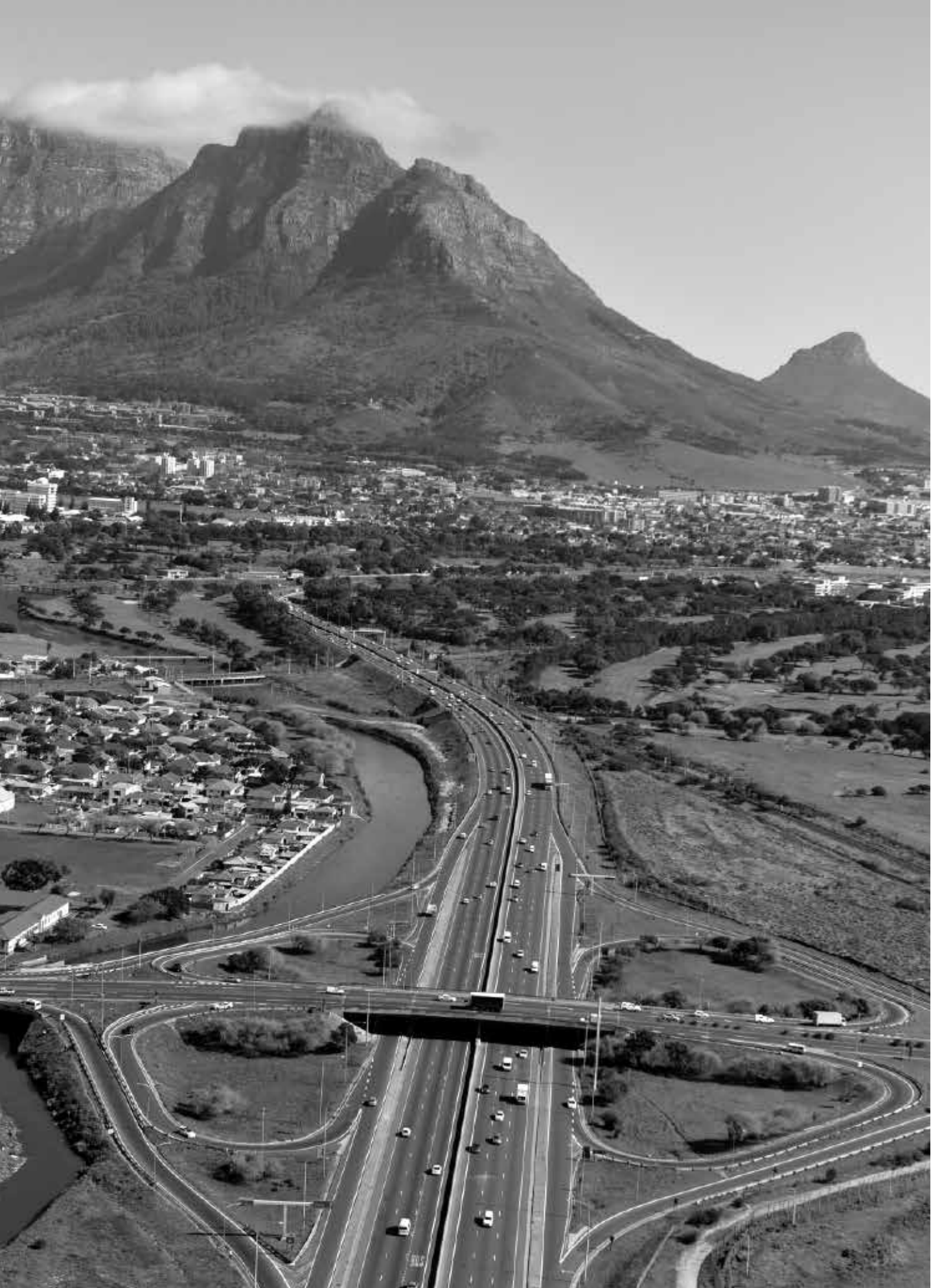
Cape Town is a low density sprawling city owing to Apartheid's spatial policies and the middle-class's ideal of owning free-standing suburban homes. Urban sprawl is producing financial, ecological and social problems (Studio Rotterdam, 2015). Low density urban environments are often dull and lack surveillance. Creating a compact city will allow Cape Town to urbanise rapidly, to grow within its existing borders, and create a more vibrant urban environment.

This design is sited within the Two Rivers Urban Park (TRUP) in Cape Town. This area comprises the open space around the Black River, the Liesbeek River and the Salt River. These rivers, and the highway separate suburbs created by Apartheid planning. This site provides an exciting opportunity to provide high density housing close to jobs and educational opportunities, and to design housing in a manner which celebrates the rivers. These rivers are currently treated as a 'backyard' space. Architectural projects that develop along this site should aim to create a safe urban park for the once separated communities.

Within the TRUP urban scheme, the selected site is on the border of Hazendal and Sybrand Park, and includes the Hazendal train station. This site offers the opportunity to provide high density housing along the Black River which will create positive surveillance. The Hazendal train station offers the opportunity for a public transport orientated design. This includes the potential for retail space and public space. Open space along the railway line can also be utilized for housing.

This dissertation starts by looking at compact housing and the advantages and disadvantages of high density living. The Byker redevelopment project by Ralph

Figure 1: (Left) The concept of high density living having the qualities of a suburban home. (Schittich, 2004: 12)



Erskine in Newcastle upon Tyne is a significant case study from which to learn about the development of positive high density environments. Following this, the dissertation will introduce the TRUP, the potential of this urban scheme for Cape Town and the projects that I was previously involved with in the area.

The dissertation discusses the specifics of Hazendal and Sybrand Park as a site through mapping. Development next to rivers involves potential flooding and thus ways of dealing with water are also addressed.

Lastly, the design response will be discussed. The design is based on the urban scheme for the TRUP and a precinct plan of Hazendal. This infill development will be a catalyst for the redevelopment of the area to achieve greater density. The development includes a social housing project, private plots, middle-income housing facing the Black River, the redevelopment of the train station, including community facilities, and accommodation above the railway.

The design does consider a realistic budget but ignores the constraints of erven boundaries and zoning.

Figure 2: (Left) The Two Rivers Urban Park. Hazendal is located on the right of this photograph. (Briggs et al., 2014)

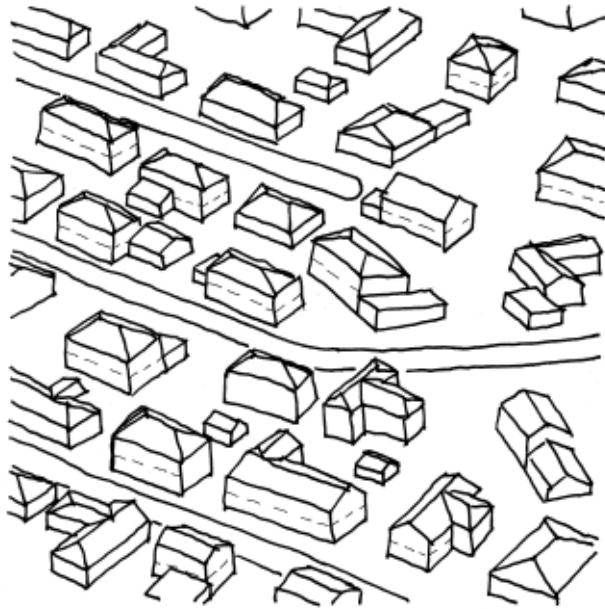


Figure 3: Low density housing - the 'American dream'

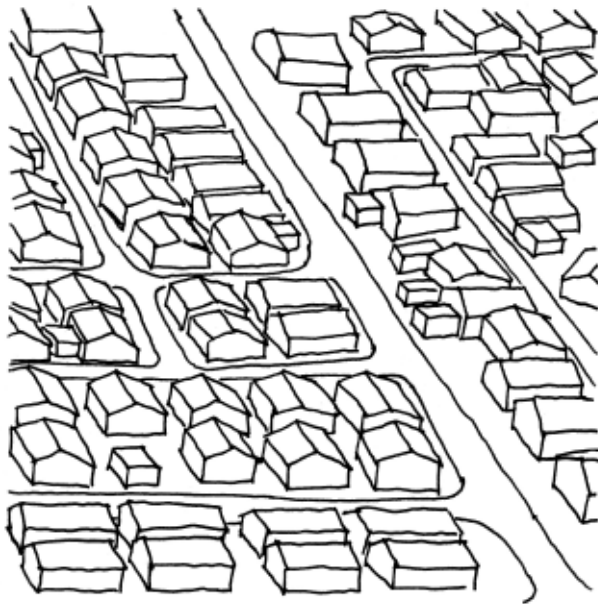


Figure 4: Low density housing - low cost RDP houses

Chapter 1: High Density Housing

Most South Africans desire a free-standing house but this comes at an environmental cost, inefficient servicing and land use. High density housing is often negatively viewed in South Africa because of current perceptions of privacy and open space. However, high density housing is a solution with many benefits. By the careful application of principles of community and privacy, the perception of high density housing can be changed.

This chapter explores the current housing situation in South Africa and the positive and negative attributes of high density living. The Byker redevelopment by Ralph Erskine is a valuable case study to solve issues which high density living can present.

Housing and the Urban Environment in South Africa

The current urban environment in Cape Town is largely comprised of sprawling low density suburbs including walled estates, middle class suburban housing, and government provided RDP housing or informal settlements. Sprawling suburbs often lack character and diversity (Per et al., 2011). Communities lack positive public space and facilities due to the low concentration of people (Jacobs, 1961: 201). This situation calls for a new approach to housing in South Africa.

The following two sections will consider the benefits and downfalls of density. Density in this dissertation refers to dwelling units per ha. Low density areas refer to free standing housing (Figure 3 and 4). Dense areas are anything ranging from row housing to tall apartment blocks (Figure 5 and 6).

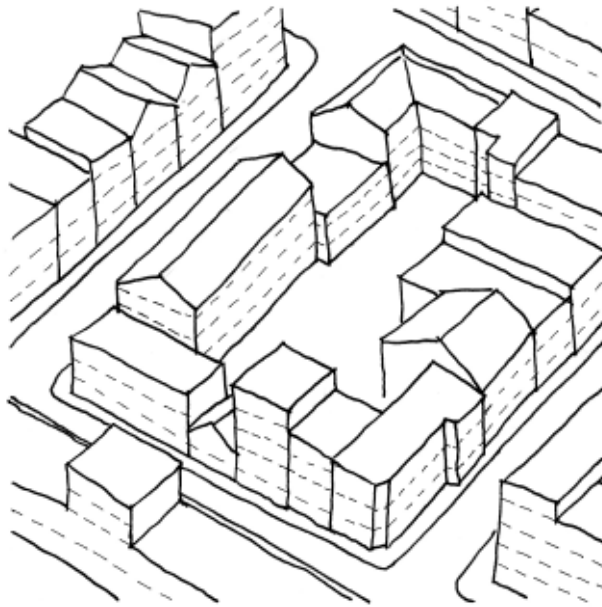


Figure 5: Medium to high density housing - this consists of row houses and small apartment blocks. The dashed lines represent one building storey.

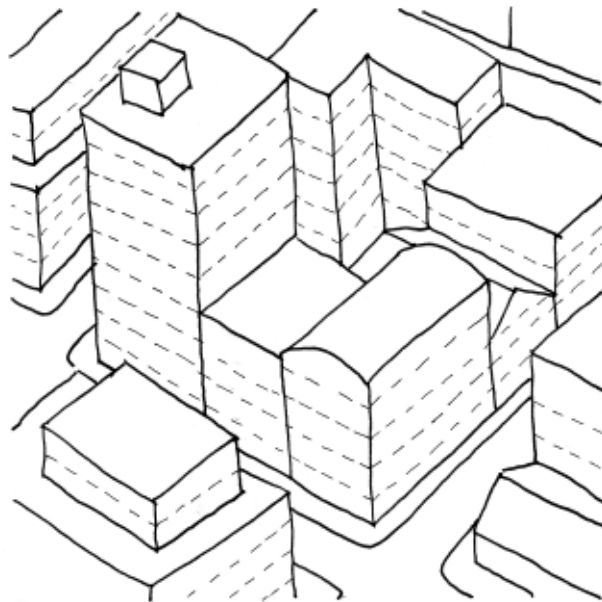


Figure 6: High density housing - the built fabric predominately consists of high rise buildings. The dashed lines represent one building storey.

The Benefits of High Density

Dense cities are environmentally friendlier (Per et al., 2011). They are able to support efficient public transport and provide the opportunity for pedestrian and bike friendly environments. *The greenest car is the one that was never needed.* Increasing density prevents cities sprawling further and using more agricultural land for housing (Per et al., 2011).

Compact developments are cheaper to service. In the short term, the Reconstruction and Development Programme (RDP) houses are cheap to build (Figure 4). RPD houses are low-cost houses which are mass-produced. They are small free-standing houses on the outskirts of cities. However, in the long term free-standing houses, such as RDPs, are expensive to service. Free-standing homes require greater length of pipes for water, sewage and drainage per dwelling. Apartment buildings in the short term are more costly to build than free-standing houses but in the long term they are much cheaper to service city wide for municipalities (Weiß, 2004: 16).

Denser areas have more successful public spaces, including streets, public squares and parks, owing to the intensity of use and the demand for use. Community space is important as it brings people together because it is space open to people of different origins, ages and genders (Woolley et al., 2014). As social beings, we need regular human contact for our well-being (Kovacova, 2012, Smith, 2013). Figure 7 depicts positive communal space amongst high density housing. The denser environment ensures that the space is well surveyed and well used.

Active spaces that are intensively used give people less opportunity to commit crimes. Crime is also reduced in areas which contain both housing and offices or retail which ensure 'eyes on the street' during the day and night (Jacobs, 1961: 34). Therefore, mono-functional areas provide more opportunity for crime.



Figure 7: Diane Berg's illustration depicts how successful communal space around high density housing can be if residents are invested in the space like it is their own private garden. South Africa does not have this culture. (Berg, 2014)

High density housing allows a greater amount of people to be closer to the city centre (Senior, 1984). This ensures people have better access to employment opportunities and education.

The next section discusses the disadvantages of high density living which were taken into account when designing for this dissertation.

The Downfalls of High Density Living

Many people have a negative perception of high density living. Countries such as America, Australia and South Africa, have a culture of living low density suburbs (Schittich, 2004: 9 Campoli and MacLean, 2007: 11). This bias and the recent public housing failures has given density a negative stereotype (Campoli and MacLean, 2007: 11).

High density living can cause problems in terms of noise and privacy. People are often accustomed to having a greater amount of space between themselves and neighbours. This can be accommodated for through the inclusion of greater insulation, screening and by raising houses slightly to create privacy.

Compact housing, such as tall apartment blocks, do not often allow for one to have a garden on the ground floor (Senior, 1984). Having a garden is important for families with young children as they need space in which to play. Children also need to be watched for safety reasons. These factors can be overcome by gardens on ground levels. A survey was done on residents at high density estates in Leeds, Liverpool and London in 1970. Mothers who lived on the lower floors felt more comfortable letting the children play outside without accompanying them (Great Britain Ministry of Housing and Local Government, 1970: 4). Thus, free-standing or row houses are more suitable for families with young children.



Figure 8: The Byker 'wall' creates a sense of a neighbourhood enclave. Small windows face the busy road to reduce noise. (Anon, 2010)



Figure 9: Large windows open out into Byker's open spaces. (World Press, 2010)

High density housing means less people are able to have access to parking and public transport is a viable alternative (Senior, 1984). There is a required cultural shift towards the use of public transport and the willingness to give up the use of privately owned cars. High density development should aim to provide some parking until the city's public transport is efficient.

Large scale apartment blocks often lack individuality in comparison to single houses. By nature, people desire to differentiate themselves from others and to express individual personalities and tastes.

Some high density housing developments lack proper thresholds between the public and private realm. These spaces should be used for meeting and socialising before entering or leaving (Hertzberger, 2005: 32). One needs a threshold to offer some kind of welcome, allow for lingering, interaction and shelter in case of bad weather (Hertzberger, 2005: 32). A simple 'stoep', small lobby or an overhang can easily provide this required threshold.

High density living should have similar qualities of a suburban home including outdoor space, privacy, thresholds and individuality (Figure 1). These principles are demonstrated in an analysis of the Byker redevelopment. This project is a large development of high density social housing.

Creating Community and Privacy within a High Density Environment

The Byker redevelopment project as a case study

The Byker redevelopment project by Ralph Erskine was completed in 1982 in Newcastle upon Tyne. This is a valuable precedent for two reasons. Firstly, the project contains a wide variety of community space, thresholds for privacy and unit types (Harvard University Graduate School of Design, 1988). Secondly, this is large new neighbourhood which is successful, contains variety and was built in a short period of time.



Figure 10: This urban plan of Byker shows the hierarchy of open space. The project has a great range of open space from private gardens to cordoned-off semi-private gardens to community space for the project. (Image adapted from - Harvard University Graduate School of Design, 1988: 15)

Old denser neighbourhoods which were built over a long period have many different property owners which ensures individuality and housing choice. These are responsive to content and culture.

Large developments like housing estates and RDP houses are quickly rolled out by one developer. The 'cookie cutter' design means they lack qualities that old neighbourhoods have. Erskine manages to design a large neighbourhood which contains the same qualities of an older neighbourhood despite the fact the development happened over 12 years (Anon, 1988).

The Byker 'wall' creates a sense of shelter for the neighbourhood. The 'wall' is made up of apartments that are arranged in a long 'snaking' building. The block feels like a wall because it runs for about one kilometre. The 'wall' has punctures to enter the neighbourhood. Small windows face the outer side of the project (Figure 8) and a larger window open up onto Byker (Figure 9). This arrangement operates in a similar way to a typical tall garden wall providing privacy and a noise buffer to the neighbourhood.

This project is very successful in providing different kinds of open spaces with varying degrees of privacy. Figure 10 shows the private gardens, the semi-private gardens for a group of houses, the semi-public gardens that are designed for the Byker project and the public gardens to the edge of the project. This arrangement provides community space for socialising. Private gardens provide threshold to houses to create privacy. The benefit of this arrangement is that mothers can have their very young children play in an open space which is attached to their home and they can let older children play nearby in an open space (see Figure 11) (Gibson 2009: 194).

The Kendal block in Byker is a perimeter block which includes double storey houses, single storey houses, or a single storey house with another unit above. This arrangement allows for private gardens and a semi-private garden in the centre which is only for this block (Figure 12). Some private gardens are raised

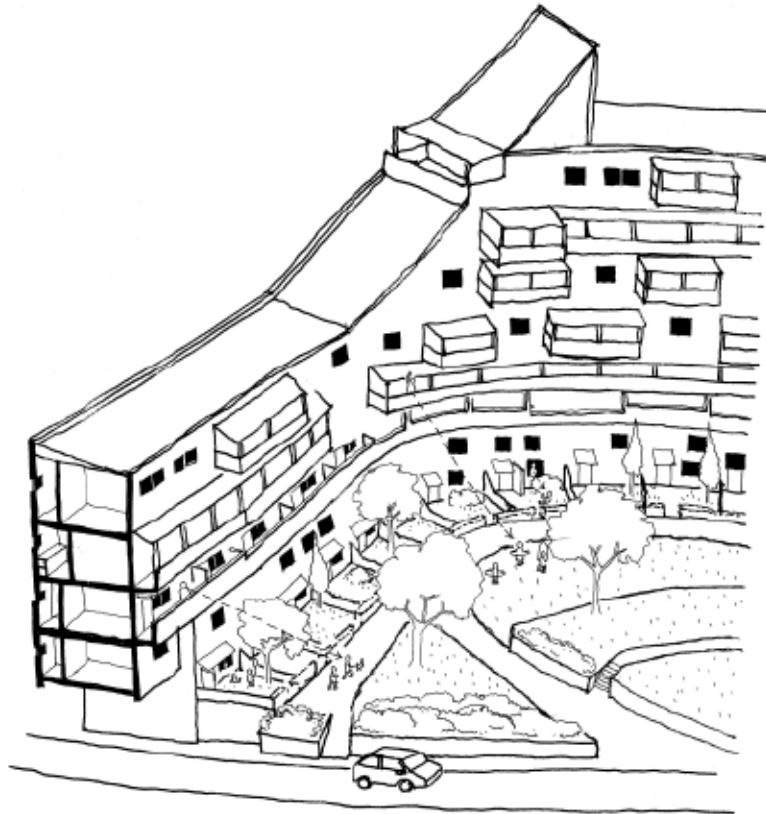


Figure 11: the Byker 'wall' creates an enclosed community space. Residents from the apartments survey this space. High density living is often not suited to families but this project provides play space for young and older children.



Figure 12: Kendal block in the Byker project. This block has a range of units in a perimeter block. Steps, lobbies or private gardens give a threshold to the units. In the centre of the block is a semi-private garden for these units to use. (Adapted from - Harvard University Graduate School of Design, 1988)

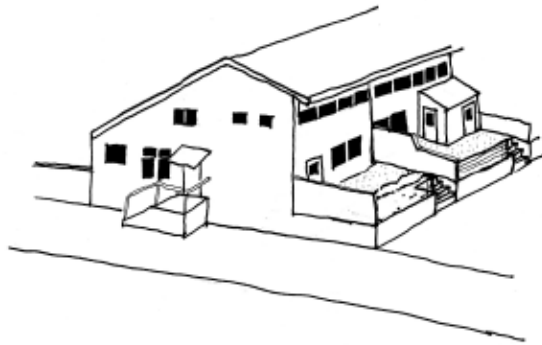


Figure 13: Kendal block in the Byker project. Raised private gardens and entrances ways create a threshold to the housing.



Figure 14: Byker's range colour and materials give the project sections individuality. (Harvard University Graduate School of Design, 1988: 19 - 22)

to ensure a passer-by cannot look into a private home (Figure 13). A small private garden (light grey in Figure 12), a lobby space (dark yellow) or a small overhang give a threshold (Figure 13) to the units which increases privacy for the dwellings. This arrangement not only provides a concentration of people, which helps to create community, but also is suitable for families with young children.

Erskine created a large project with different sections or different housing blocks that project individuality. This is achieved through the use of different colours and materials. Figure 14 shows the eclectic use of bright colour with both face-brick and plaster and paint to give the development diversity and individuality. The diversity ensures that the area is not monotonous and dull.

This project includes a great variety of unit choice. The housing blocks range from double storey units (the terrace houses), three storey blocks (link blocks), to the eight storey perimeter blocks or Byker 'wall'. Unit types range from one bedroom units to three bedroom family units (Harvard University Graduate School of Design, 1988: 16-17). It is important for architects of large projects to present choice as they will never know their individual clients and all their specific requirements.

The one aspect which this neighbourhood lacks is retail space, yet other community facilities are provided including schools and a church. According to Jane Jacobs, retail space is important for a neighbourhood. Stores, bars and restaurants provide surveillance. They give people a reason to use the street creating a more active street. They draw people past other streets with no or little attraction (Jacobs, 1961: 36).



Chapter 2: Two Rivers Urban Park

The Two Rivers Urban Park (TRUP) is located in Cape Town and is comprised of a semi-green field strip around the Black River, the Liesbeek River and the Salt River. I was drawn to the Two Rivers Urban Park because I was involved in two projects in this area prior to my Masters dissertation.

The TRUP has a strategic location close to the city centre and it borders currently disconnected communities. These communities were historically zoned 'white', 'coloured' and 'black'. There are large pieces of open land which are available to develop presenting a significant opportunity for new housing and mix-use buildings in a developed city.

This chapter discusses previous projects which I have been a part of within the TRUP which have influenced this dissertation. The first project, 'The Ribbon', introduced the specific site of this current design response, issues surrounding the Black River and the idea of providing a continuous pedestrian route along the Black River. The second project, the Density Syndicate TRUP, introduced me to a realistic urban scheme of how to densify land around the urban park.

Figure 15a: (Left) The Two Rivers Urban Park. (Briggs et al., 2014)

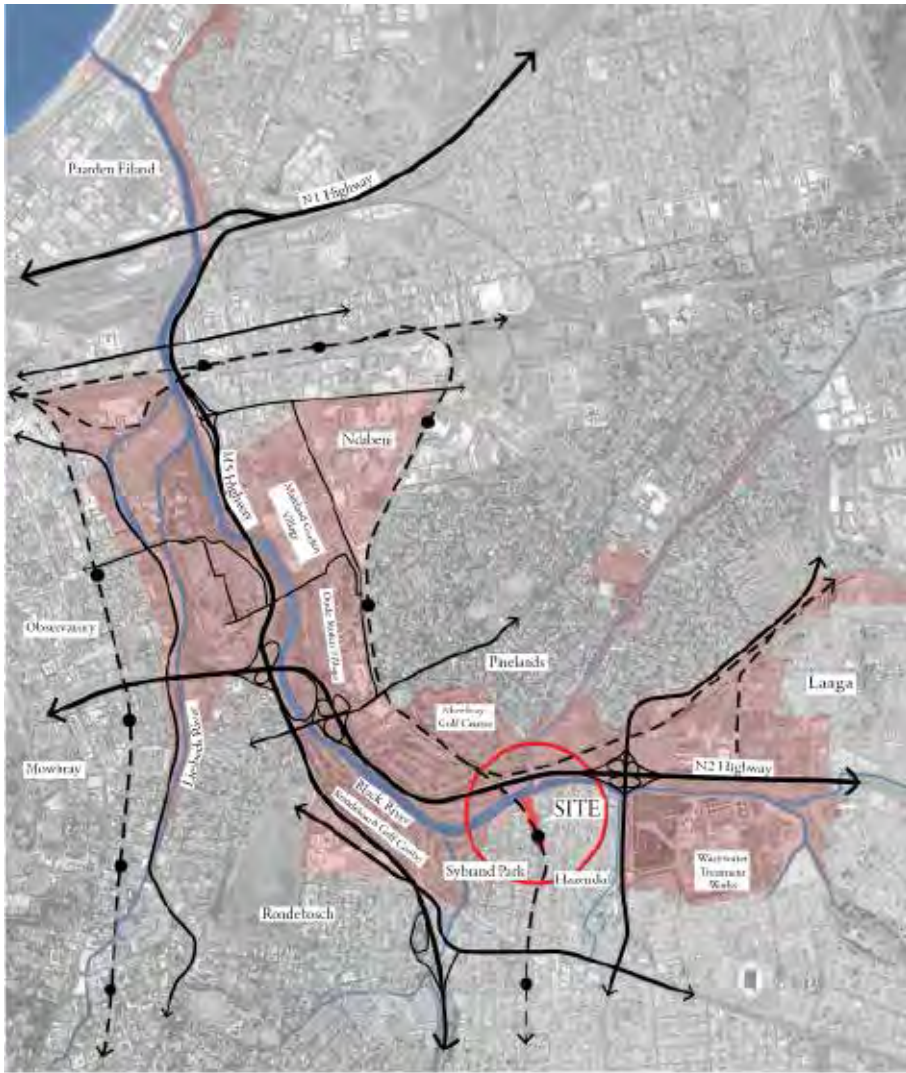


Figure 15b: Two River Urban Park location in Cape Town

- Location of the Two Rivers Urban Park
- Site location
- Rivers
- Train line and station
- Highway
- Roads

Previous Projects within the TRUP

The Ribbon

I was first introduced to the TRUP during a group project in my Architecture undergraduate degree. ‘The Ribbon’ was a group entry to the 2012 Des Baker competition (Coetzee et al., 2012). Our scheme provided a way to re-script the ‘modern project’ (Figure 16). Modernist and Apartheid planning introduced buffer zones via highways. The TRUP contains highways among the rivers, wetlands and open space (see Figure 15a).

Cape Town rivers are under-appreciated because city planners in the 20th century did not exploit their benefits. Highways were placed parallel as well as over the rivers which made them difficult to access and less desirable places. The Black River is one of the most polluted and unappreciated rivers in Cape Town. This river is used to dispose of raw sewage by some informal settlements because of lack of proper services. Buildings are designed to face away from the river rather than towards it, making it the ‘backyard’ space. This will be further discussed in Chapter 3.

Our architectural student group solution to the above was a continuous pedestrian route along the Black River starting in Langa and ending at the mouth of the Salt River at Paarden Eiland (Figure 11). The route along the river hoped to change peoples’ perception of rivers. Rivers and highways were bridged via mass produced triangular plastic modules which were suspended through cables. The same module could also be used as a paver or a folded-plate bench. Therefore, a ‘modern project’ of mass production was used to provide an adaptive and dynamic solution to link disconnected areas.

The route of yellow modules – ‘the Ribbon’ - created a continuous path for pedestrians and bicycles. This route could link disconnected sections of the TRUP and give separated communities a space in which to interact. These ideas were also the starting point of the Density Syndicate project that I was involved with.

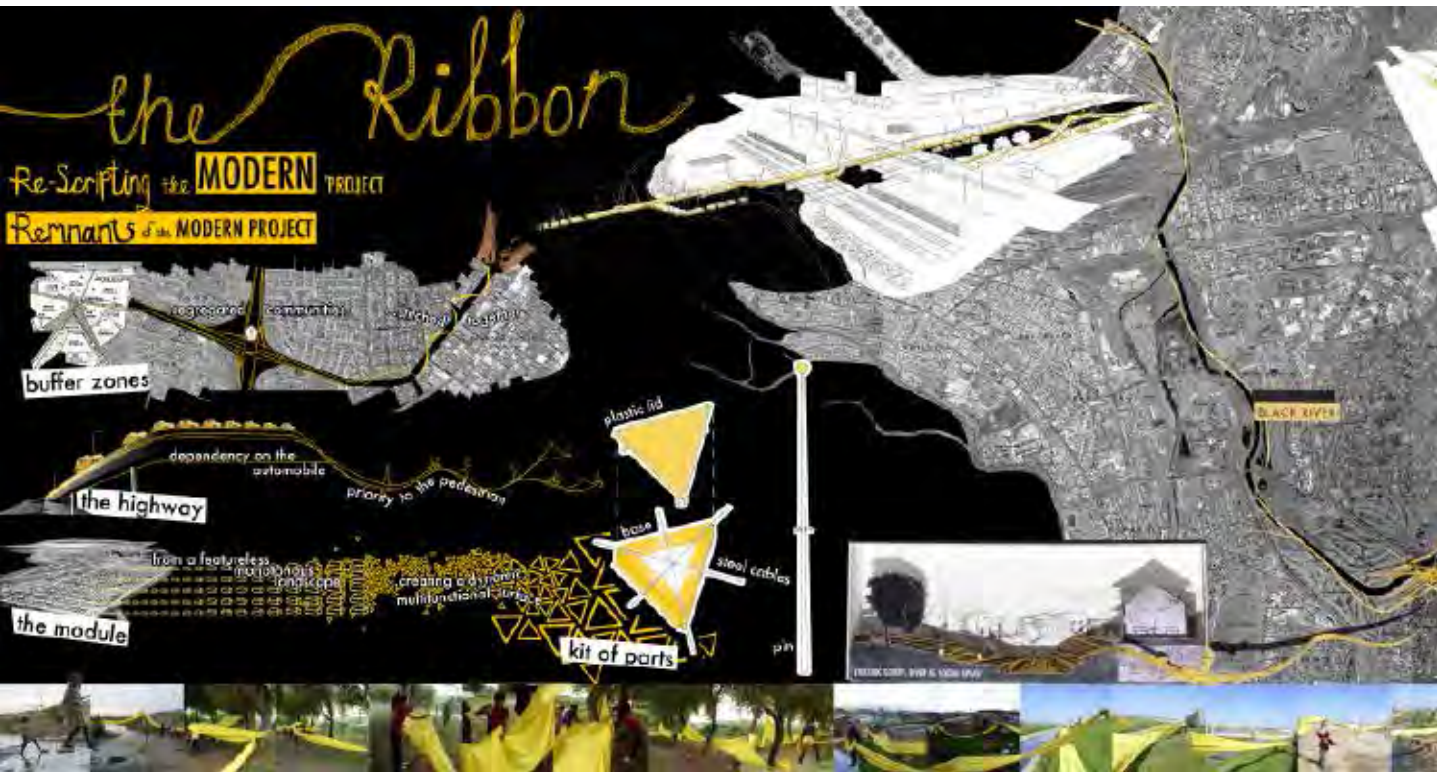


Figure 16: (top) Frames from a short animation which introduces the topic of a fragmented landscape which could be altered. (Coetzee et al., 2012)

Figure 17: (bottom) This display panel depicts our notional route along the Black River and the Salt River. (Coetzee et al., 2012)

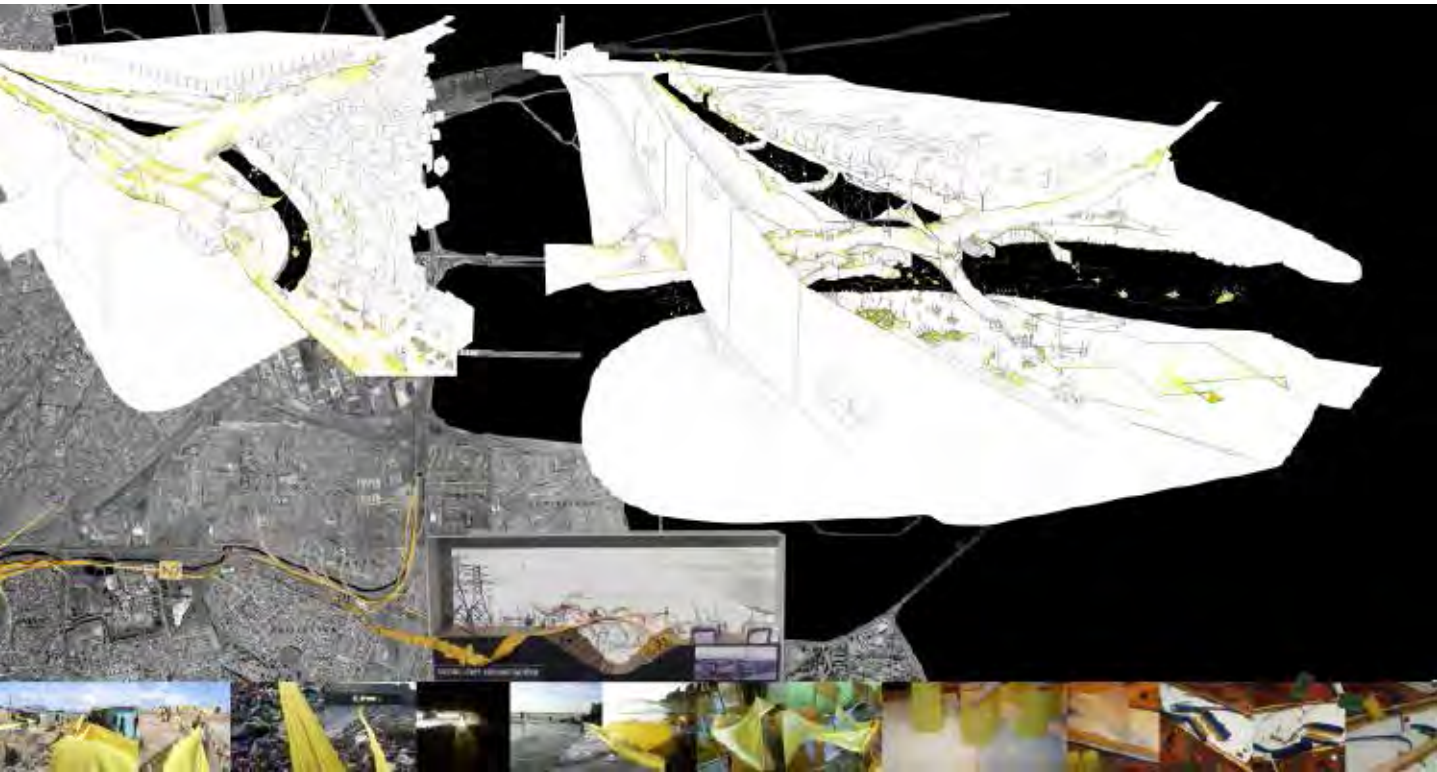
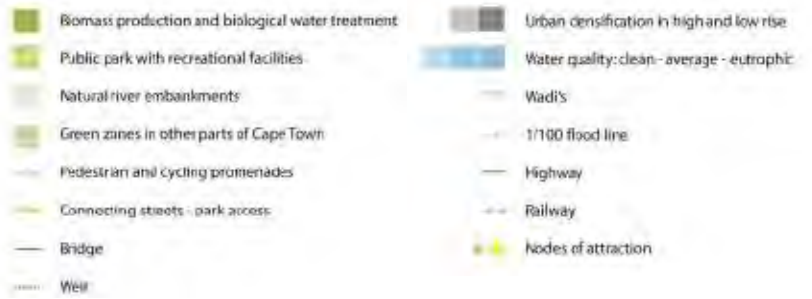




Figure 18: Density Syndicate urban scheme – this design had a major influence. (Briggs et al., 2014a)



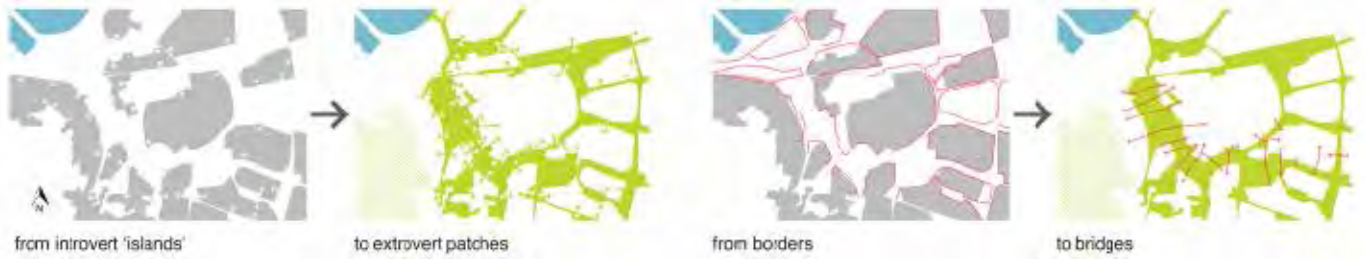
Density Syndicate


I was later involved in the Think Tank Density Syndicate TRUP + project run by the African Centre for Cities in 2014. This urban scheme proposal was the starting point for this dissertation.

This pro-bono exhibition project was conducted by a diverse team of professionals. My participation in the project enabled me to gain a better understanding of the potential of the site as a place to add appropriate density to Cape Town and diversity of use (Briggs et al., 2014a).

The Density Syndicate urban scheme proposal for the Two Rivers Urban Park was comprised of the following developments (this is depicted in Figure 18):

- The introduction of new gateways to the urban park (see in beige). Currently access to the area is difficult;
- The development of new pedestrian and vehicle bridges which connect separated areas (Figure 19);
- The development of pedestrian board walks or route to provide access to the river and a continuous route along the river (see the light brown dotted line);
- The concept of green 'fingers' which continue from the park into the suburbs;
- The development of new mix-use areas on the Mowbray Golf Course, rail reserves, underutilised industrial areas and the Athlone power station site;
- The introduction of additional train stations within new areas at the previous site of the Mowbray Golf Club and at the Athlone power station;
- The zoning of the Rondebosch Golf Club, the Athlone and Borchers Quarry Wastewater Treatment Work as productive landscape;
- The development of the river as an asset and a feature within the landscape. Weirs were to be added along the river at certain points to create a wider body of water. Smaller tributaries were to be re-directed to run past housing;




 Figure 19: Diagrams showing how the areas boarding the TRUP are islands and are segregated due to Modernist or Apartheid planning. This situation could be altered by the TRUP land becoming an accessible urban park with new connections. (Briggs et al., 2014a)

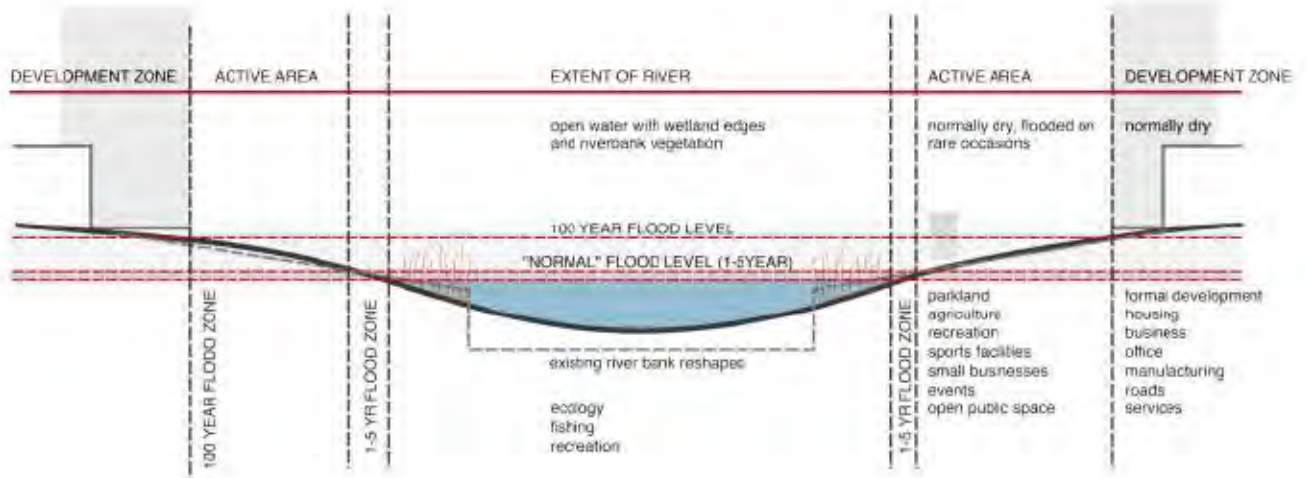


Figure 20: Section depicting how the rivers within the TRUP can be altered from a canalised river to a more natural river bank. Ideally urban development should happen outside of the 1 in 100 year flood zone. (Briggs et al., 2014)

- The development of new buildings of greater density;
- The proposal of the idea of a range of mix-use and mix-income buildings, and
- The location of buildings behind the 1 in 100 year flood line (see Figure 20).

I endorsed this urban scheme as appropriate to the area and have adopted the approach apart from some aspects to be further discussed.

Critique of the TRUP Density Syndicate

I propose the following changes to the TRUP urban scheme completed by the Density Syndicate. Firstly, the new main road should have a different relationship to the railway line to what the Density Syndicate suggested. The densities of the new areas should scale down towards the existing low density neighbourhoods. The Athlone Wastewater Works should be kept rather than become a productive landscape but further intensified. Lastly, instead of never allowing development in the 1 in 100 year flood zone, there should be exceptions to the rule where existing buildings are in the flood zone.

Different position of main road in relation to the railway line

One of my critiques of the Density Syndicate urban scheme is the separation of the new main road from the railway line (Figure 21). This allows for development on both sides of the main road rather than development only on the one side. This will increase the potential for activity within the area. This can be seen in the new area on the Mowbray Golf Course and Oude Molen Village (Figure 24).

Scaling down towards the existing fabric

The urban scheme could be more sensitive to the surrounding fabric. Community approval of the new development is required which will prevent rallies against the development, the slowing down of the approval process and possible damage to buildings once constructed.

Figure 24 shows the grading down of the density to maintain the character of the low density neighbours which surround the TRUP (Figure 23). Tall apartments could face the rivers to maximise views. There could be high to medium density buildings within the area, such as perimeter blocks. There could be row houses on the outskirts which could be similar to the free-standing homes.

Intensify wastewater works

I propose that the Athlone and Borchards Quarry Wastewater Treatment Work should remain as is, instead of the land becoming productive landscape. It would be expensive to move the wastewater works. An alternative is to build additional industries on site, as well as employee accommodation to maximise the use of land. For example, an algae farm could be used in conjunction with the sewage works. Algae needs nutrient rich water in which to grow and would help to clean the water. Algae can be sold and used in a variety of ways (Briggs et al., 2014b).

Building within the 1 in 100 year flood zone

Although often difficult, it is ideal that development should stay clear of the 1 in 100 year flood area. The white outline in Figure 22 depicts how much development is within this area already. Developments should not be right next to the river to provide space for vegetation; to allow for flood mitigation and to ensure that building material is not deposited into the river. I propose that some areas within the 1 in 100 flood area which already have already been developed could be further intensified and modified to accommodate flooding. The development needs to accommodate some degree of flooding. Possible methodologies are discussed in Chapter 4.

The critiqued urban scheme above is the starting point for this dissertation. The following chapter introduces and focuses on a specific site within the Two Rivers Urban Park.



Figure 23: Two Rivers Urban Park exciting density

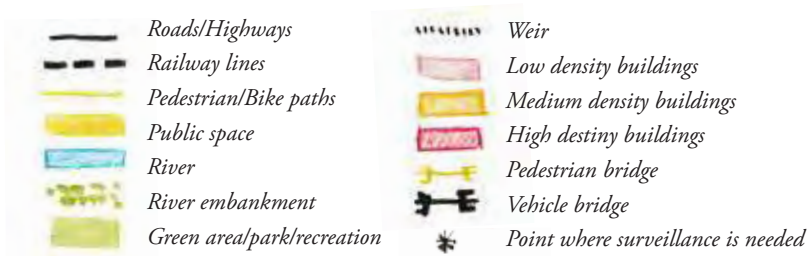
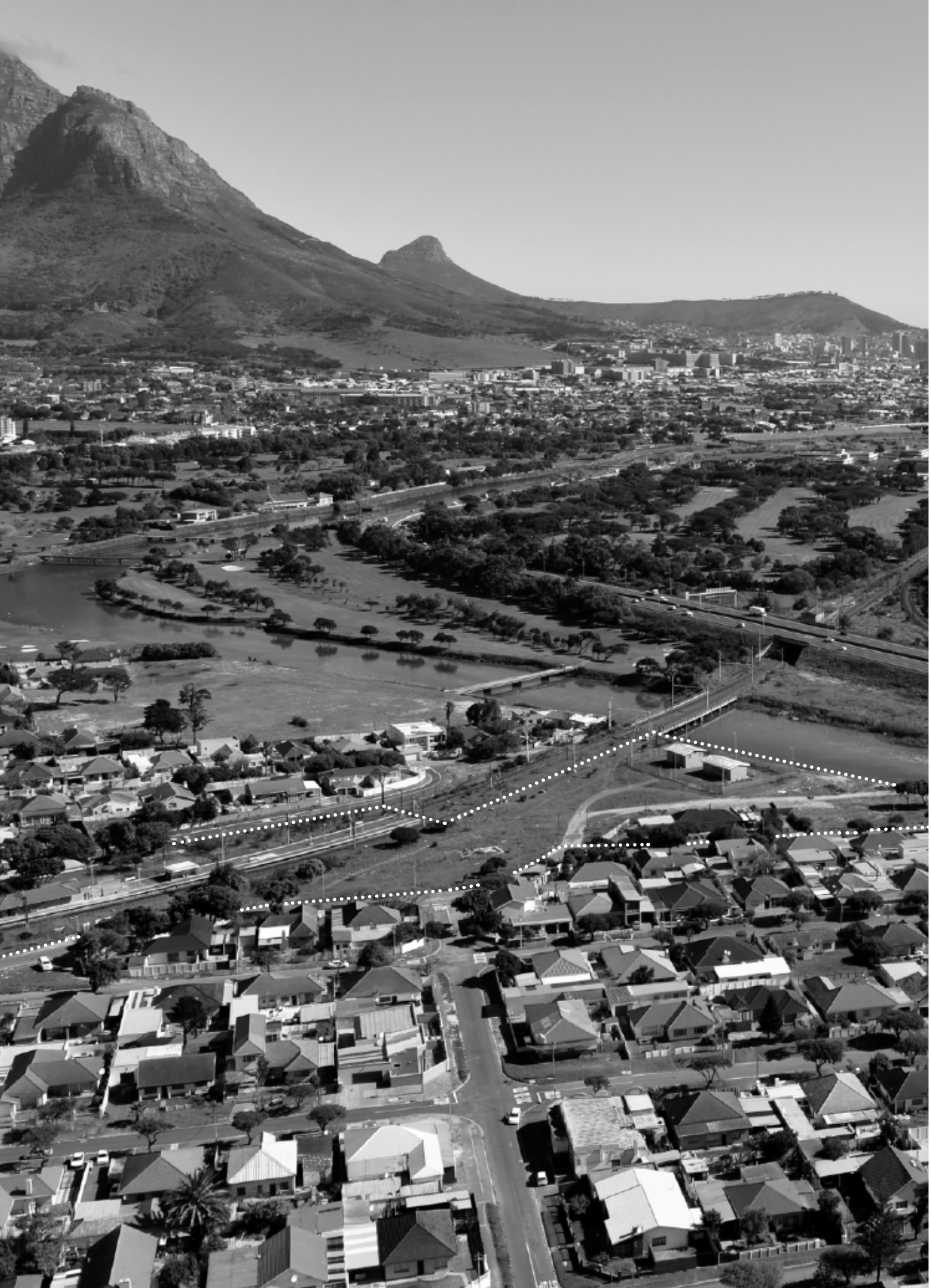




Figure 24: An alternative urban scheme for the Two Rivers Urban Park. This urban scheme depicts the potential densities for this area.



Chapter 3: Site

This chapter discusses the reasons behind the site choice in Hazendal. Thereafter, the Black River next to Hazendal is discussed. Mappings of the area depict the rivers and potential floods, access, public transport, land use, and the socio-economic situation. The housing next to the site and resident profiles will also be explored.

Site Choice

The site selected for this project is situated within the Two Rivers Urban Park and is next to the Black River (see Figure 15b). It is between Hazendal and Sybrand Park. The site presents many unique opportunities to connect communities, challenge the way people view the Black River and to develop an underutilized train station. The space and rail reserve provides a good opportunity to develop within an existing community.

The site is located at a point where infrastructure and the Black River meet. Figure 26 depicts the site as at the juncture of the Cape Flats railway line, the Black River and the N2 Highway. The site is also next to a culvert which acts as a bridge.

This site presents the potential to connect Sybrand Park and Hazendal through new pedestrian bridges. It also has the potential to connect this area with Pinelands by using the culvert as a pedestrian bridge and by extending the railway bridge (see Figure 27).

Figure 25: (Left) A view of the site in Hazendal by the small rail way station and the Black River. (Briggs et al., 2014)

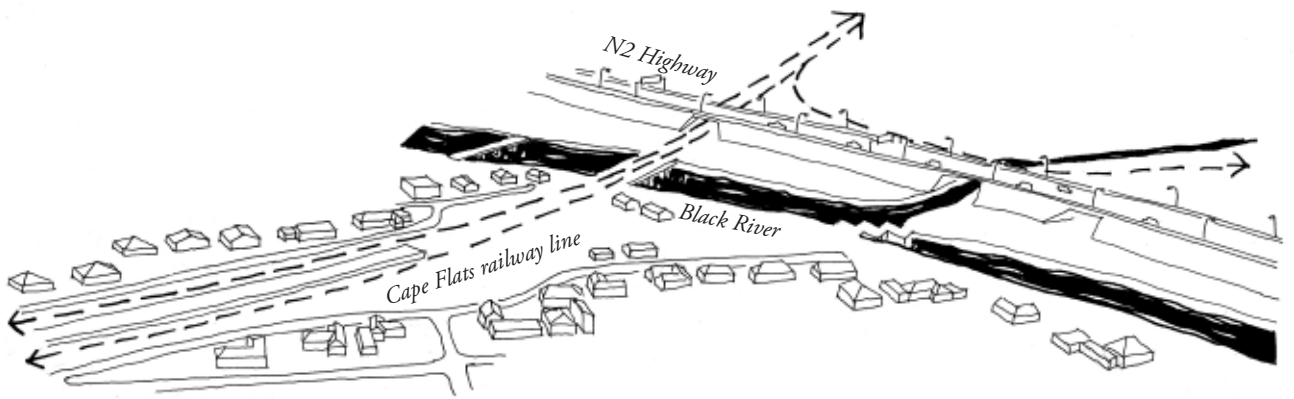


Figure 26: Diagram of the convergence of infrastructure and the river

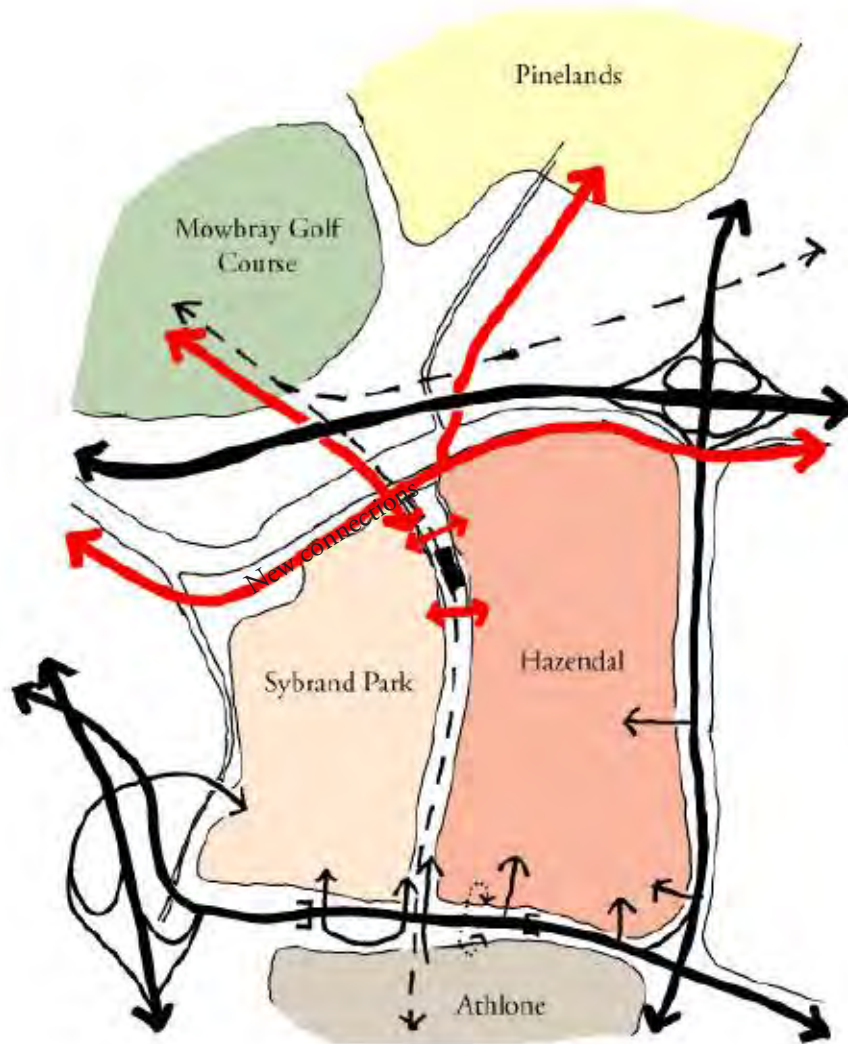


Figure 27: Diagram of the potential connections to surrounding suburbs



Figure 28: Unappreciated green and river space



Figure 29: Inadequate connections to neighbouring suburbs (Briggs et al., 2014)



Figure 30: Dumping ground and lack of surveillance



Figure 31: Underutilised train station

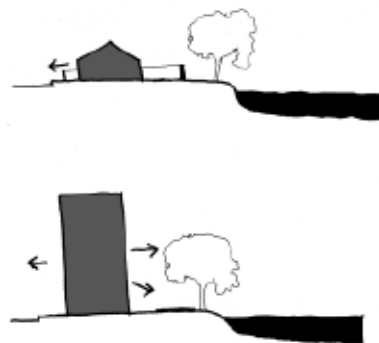


Figure 32: (top) Diagrammatic section depicted how the black river is currently a 'backyard' space. (bottom) This site has the opportunity to face onto the river and to change it into a 'front yard' space.

The Hazendal train station on the site is a great opportunity to increase density with a transport orientated design. The station allows for high density housing. The train station currently lacks an adequate threshold, the convenience of retail space and community facilities around the station (Figure 31).

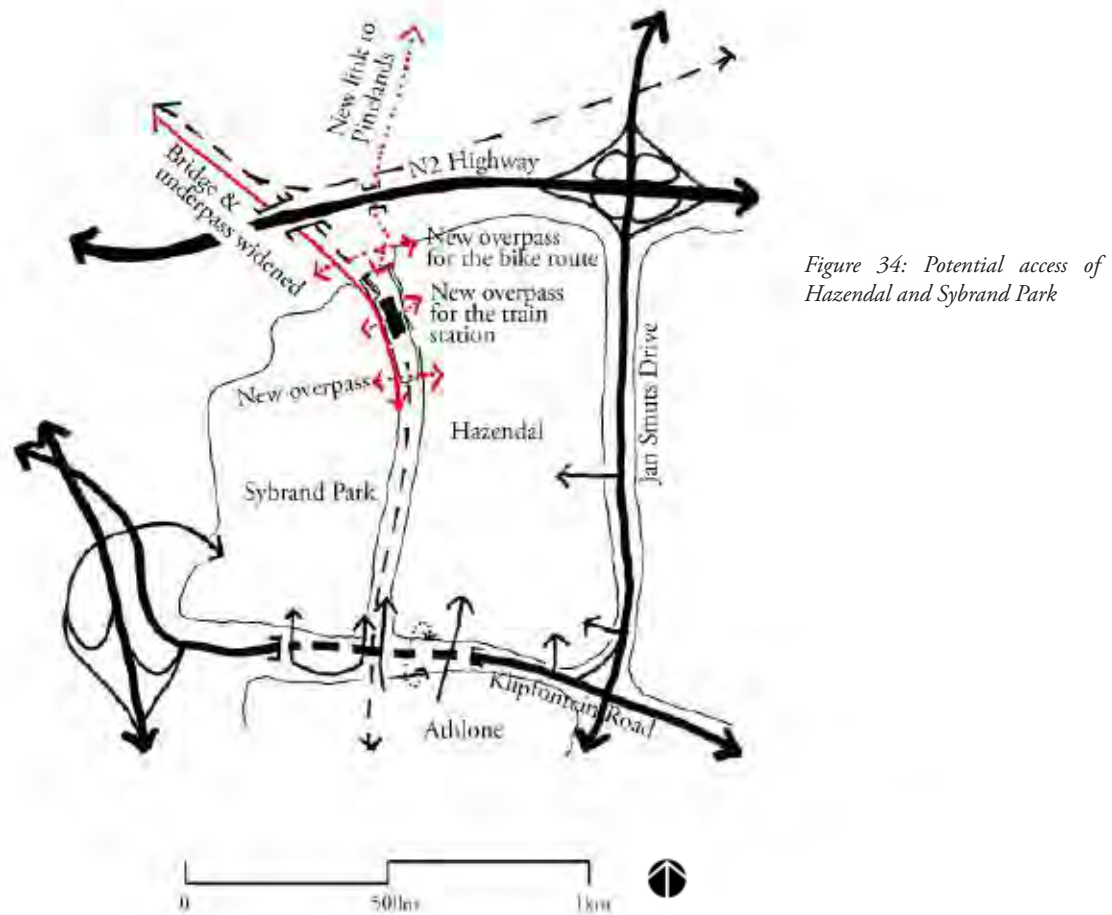
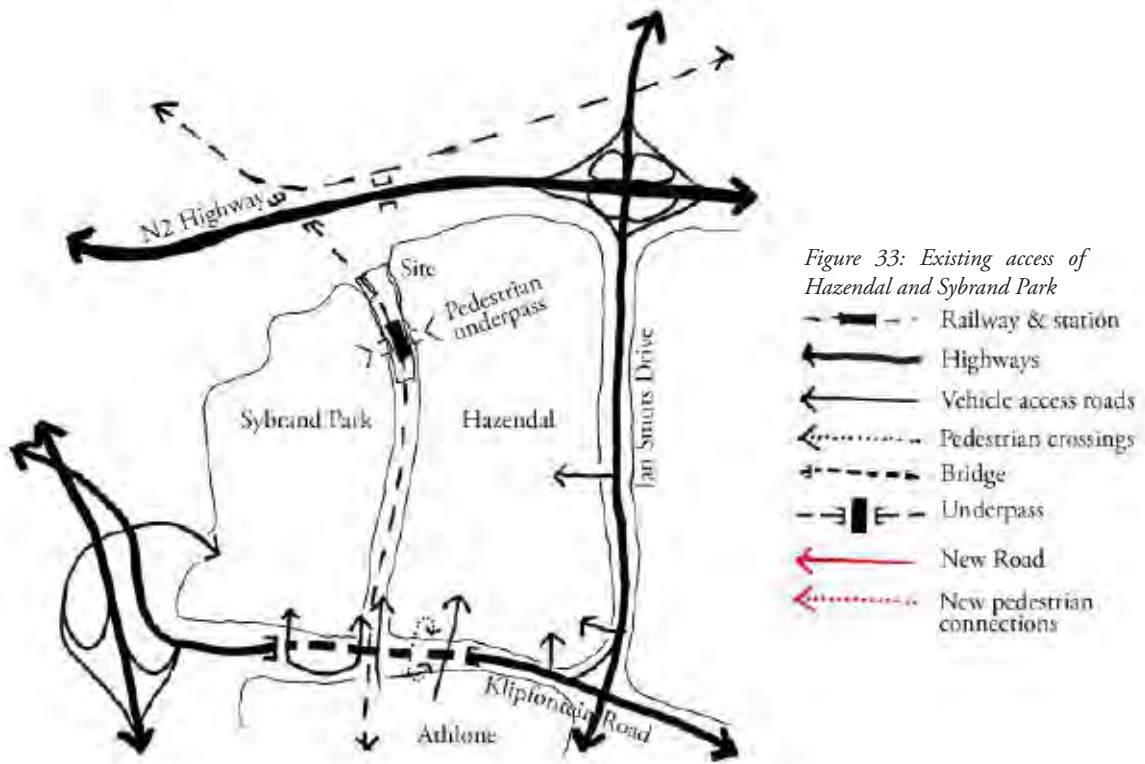
The development of this site will challenge the manner in which people view the Black River, the 'back yard' space. The development of apartments that face the river will provide surveillance and attractive views along the river (Figure 32). This will change peoples' perception of the river to being an asset of the city. This will be further discussed at the end of this chapter.

Vegetation can be used as a sound and visual buffer to the N2 highway. This will aid in changing the perception of residents towards the urban park.

The site produces many challenges including the following:

- Part of the site is within the 1 in 100 year flood zone;
- The railway line creates an awkward backing for housing;
- The neighbouring buildings are low density suburban houses, most of which are only one storey. This provides a challenge to responding to the context when one is trying to accommodate density;
- The train line will be noisy at peak times.

The disadvantages and advantages of the site are explored in the next sections of site mappings.



Boundaries and Access

Currently Hazendal and Sybrand Park are surrounded by major highways or buffer zones. The N2 blocks the suburbs off from connection with Pinelands and Langa, and any access from the north. Athlone is much more accessible due to the pedestrian bridge (Figure 33).

The railway line separates Sybrand Park and Hazendal. Currently the underpass of the train station is the only pedestrian crossing between the suburbs. This underpass floods in winter (Hendrix, 2015).

To rectify the limited access between neighbouring suburbs it is proposed that a road be built to connect to Pinelands should the golf course be re-zoned in the future. It is also proposed that connections be established between Sybrand Park and Hazendal including a new bike route over the railway, a new overpass for the train station and a new pedestrian overpass at a major road intersection (Figure 34).

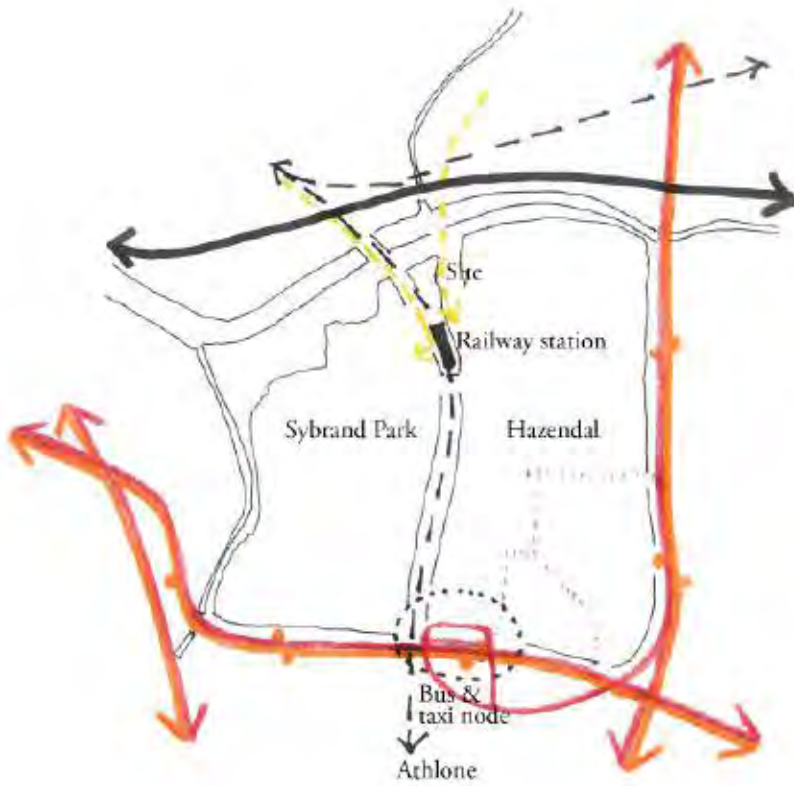


Figure 35: Existing public transport of Hazendal and Sybrand Park

-  Formal taxi routes & taxi rank
-  Informal taxi route
-  Bus route & stop
-  Pedestrian access
-  Bike route
-  Railway & station
-  N2 Highway

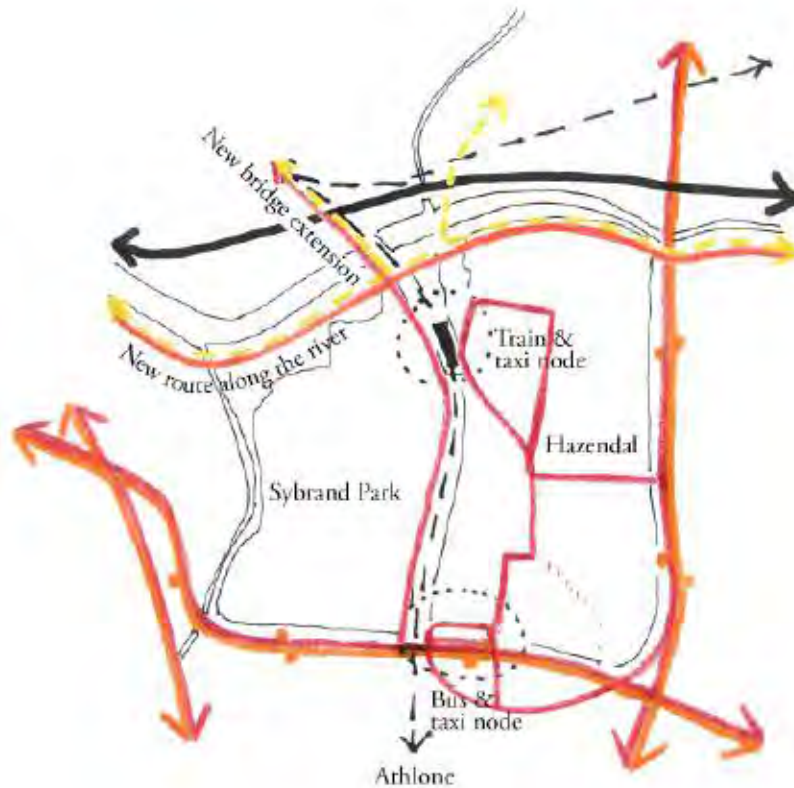


Figure 36: Potential public transport of Hazendal and Sybrand Park



Public Transport

The east and south sides of Hazendal and Sybrand Park have access to bus and mini bus taxi routes. There is an existing taxi and bus stop with a small shelter on the south side of Hazendal. Unfortunately the train station is not near the current taxi routes (Figure 35).

It is proposed that the amount of public transport be increased to accommodate the development. The potential new road connection to Pinelands from Sybrand Park will allow for an easy taxi route from the train station so that people can use multiple types of public transport. Taxi's will also be encouraged to circulate through Hazendal as well (Figure 36).

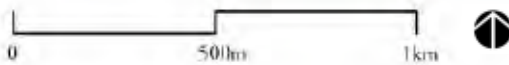


Figure 37: Existing land use of Hazendal and Sybrand Park

- Retail
- Schools
- Community
- Health
- Residential
- Religious
- Roads
- Railway & station
- Highways



Figure 38: Potential land use of Hazendal and Sybrand Park



Land Use

Presently the land uses in Hazendal and Sybrand Park are residential. There are some small scale commercial businesses which are close to Athlone in which the business district is currently under-utilized (Hendrix, 2015, Phyfer, 2015). Owing to this, Hazendal, which lies below Athlone, should not become a commercial hub. The suburb would benefit from a few small scale businesses such as internet cafés, small restaurants and small convenience stores by the train station (Phyfer, 2015). Around the train station residential zoning could be changed to mix-use spaces to encourage people to start up home businesses such as crèches (Figure 38).

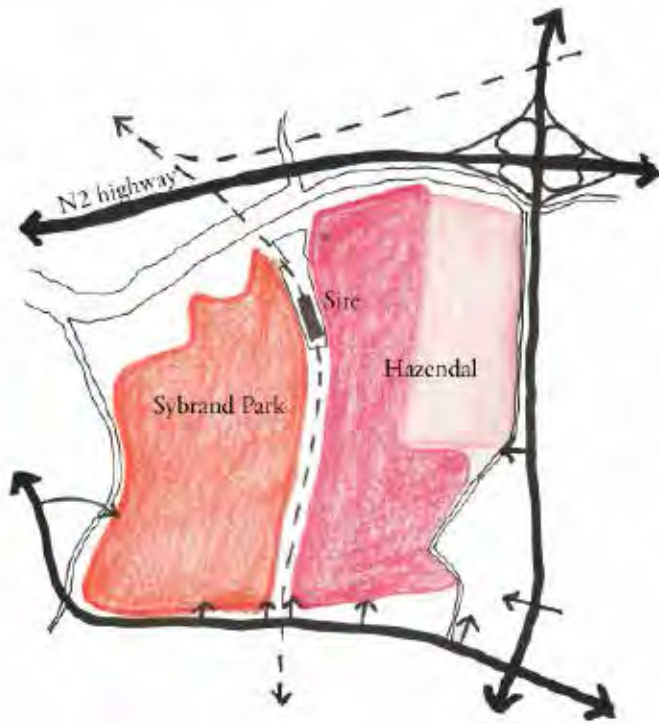


Figure 40: Existing Socio-economic situation in Hazendal and Sybrand Park

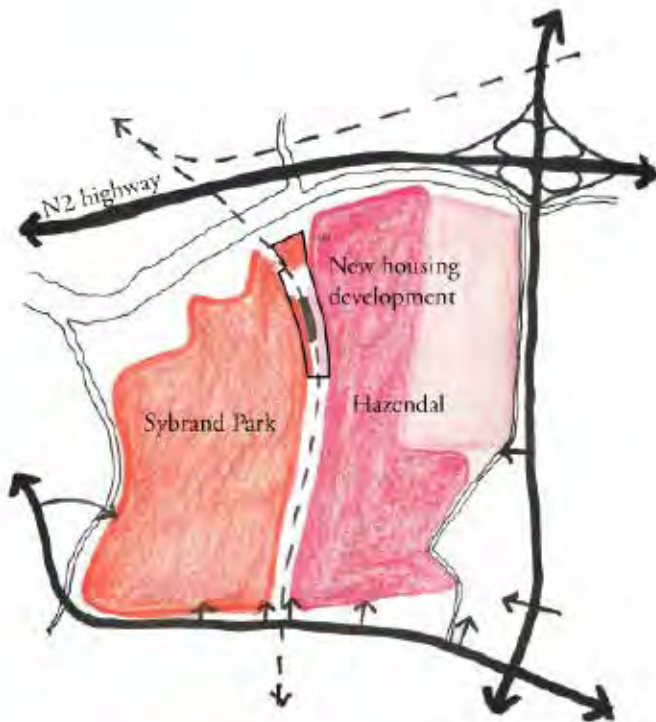
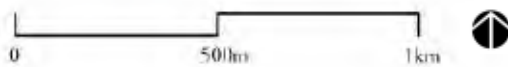


Figure 41: Potential Socio-economic situation in Hazendal and Sybrand Park



Socio-economic

The area presents communities from significantly difference income levels. Sybrand Park is a historically white area (Cape Town: Provincial Administration, 1967). Today the area is a middle-income mixed-race area (Frith, 2011). Hazendal was a historically coloured area (Cape Town: Provincial Administration, 1967) and today the majority of the population has remained coloured (Frith, 2011). Half of Hazendal is a low-income area comprised of previously government provided housing, which are small one storey semi-detached houses. Today these duplexes have backyard shacks which extend the houses for family members and/or tenants (Latief, 2015, Steenkamp, 2015). The other part of Hazendal is made up of low to middle income free-standing homes (Figure 40).

The new proposed development will provide housing for the middle-income earners as well as low-income earners. The two market rate sections of the development are located next to the Black River and on the west side of the site, in Sybrand Park. Social housing will be developed along the eastern side of the site along a tight piece of land against the railway line (Figure 41).

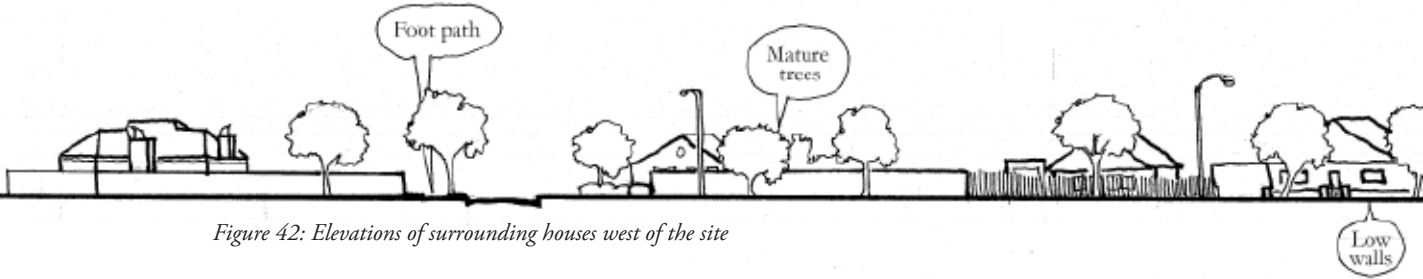


Figure 42: Elevations of surrounding houses west of the site

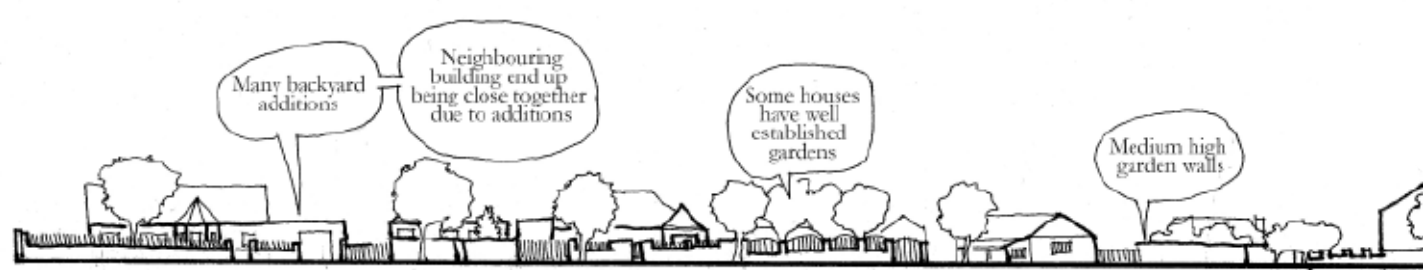
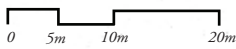
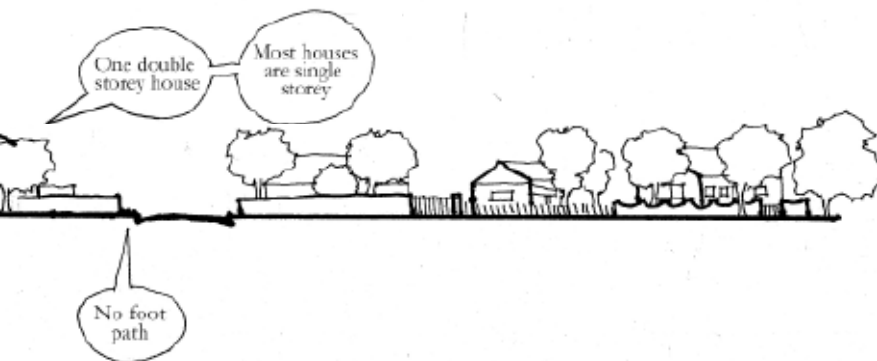
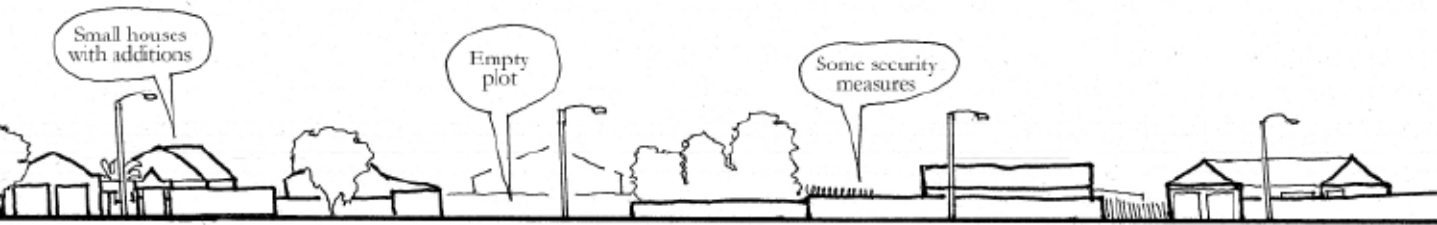


Figure 43: Elevations of surrounding houses east of the site



Existing context

Figure 42 and 43 depict the free-standing housing directly adjacent to the site. The pitched roof suburban houses have garages and backyard extensions. Like many areas in Cape Town, the elevation is dominated by walls and fences. This creates streets which are often quite uninteresting and lifeless.



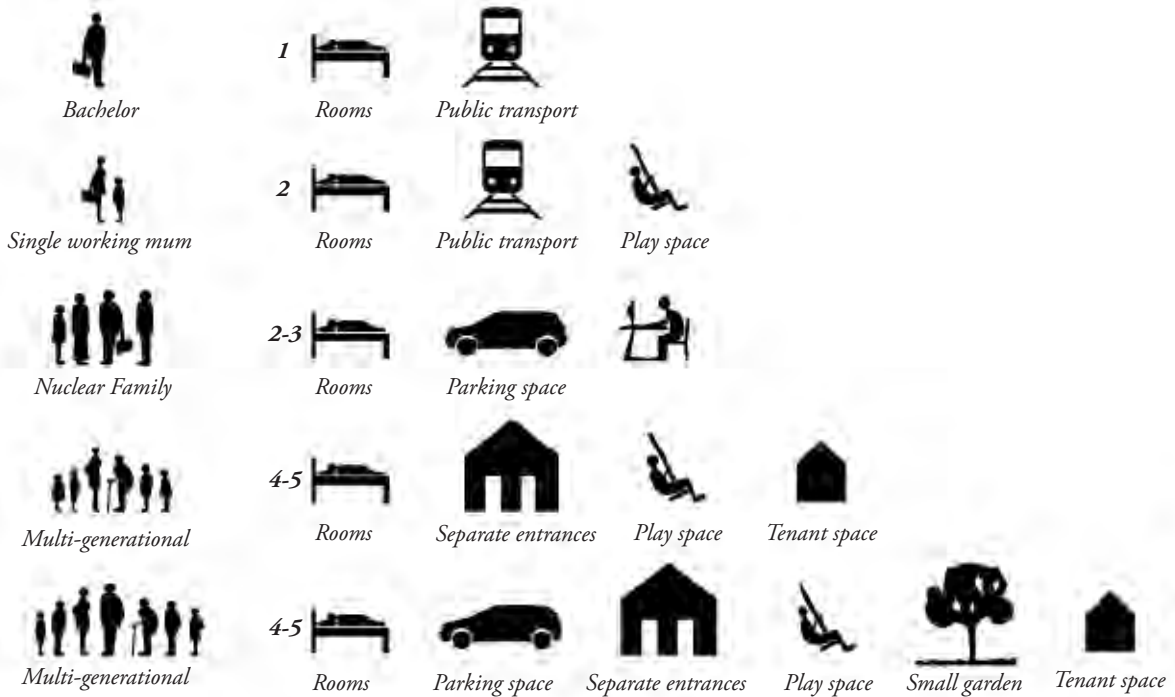


Figure 44: This diagram depicts different families interviewed in Hazendal and their living requirements.

Resident profiles

The project included direct marketing research and the interviewing of residents which enabled the formulation of resident profiles within Hazendal (Figure 44). This data lead to the confirmation that the nuclear family is not always the norm. This resident profile mapping calls for the provision of a variety of houses to provide for different types of families.



The Black River

The Black River 'backyard' is depicted in Figure 45. It is a place of pollution and dumping. The river is fenced off from the community and no houses face the river. The government put up vibracrete walls for the houses which did look onto the river when the river was made wider (Steenkamp, 2015).

The area was used as park space prior to the erection of the fences. There was play equipment by the river and residents used to walk along the river (Phyfer, 2015). Now it is a space which is neglected and seen as a danger rather than an asset. This is in direct contrast to the Amsterdam canals or the Ganga River in Varanasi, India. These two rivers are celebrated spaces within the city and are intensively used and enjoyed.

The Black River water is of poor quality. This river runs past informal settlements which do not have proper sanitation provisions and raw sewage is often thrown into the river. Recycled water from the Athlone and Borchers Quarry Wastewater Treatment Work is also drained into the Black River (City of Cape Town, 2005: 28). This could add to the pollution levels. The Black River and the Jakkelsvlei River, another tributary, pass through industrial areas which further exacerbate the pollution.

Figure 22 shows how many built up parts of Hazendal and Sybrand Park, including part of the site selected for this dissertation, are situated within the 1 in 100 year flood zone area.

Development in this area has to accommodate the unpredictable nature of climate change and potential flooding.

Figure 45: (Left) This illustration depicts the current condition of the Black River by Hazendal. This is a left over space which is used for dumping.

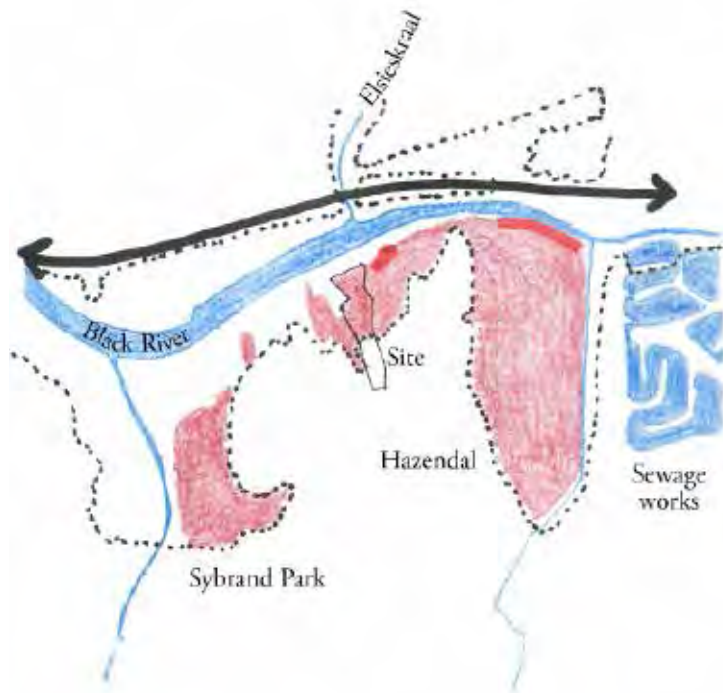
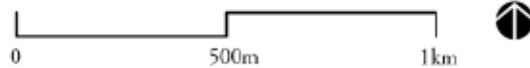
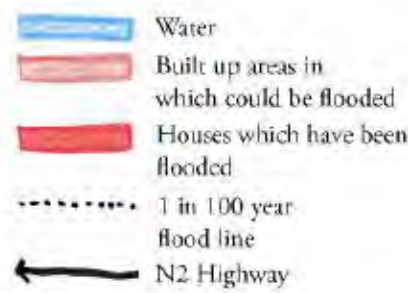


Figure 46: Rivers and Flood zone in Hazendal and Sybrand Park



Some houses next to the Black River in Hazendal have previously been flooded (Phyfer, 2015, Steenkamp, 2015). Since then, the river was made wider to accommodate the increasing volume of water. The size of this river has increased due to the growth of the city and the increase of hard surfaces which produce more run-off during rainy seasons (Spirn, 1984: 130). Recycled water from the Athlone and Borchards Quarry Wastewater Treatment Work also increases the river flow (City of Cape Town, 2005: 28).

The following chapter provides solutions to cope with flooding using different methodologies.



Chapter 4: Building for Floods

A challenge of the site is accommodating flooding. In this chapter two extreme examples will be given to demonstrate two very different methods of dealing with water and flooding. One is letting water in and the other is keeping water separate from the built fabric. Following this, it will be demonstrated how these principles could be applied for this project.

Norderson and Seavitt (2011) suggest there are two methods to dealing with flooding. Water can be kept out of the built fabric of the city through traditional hard infrastructure; or water can be let it in and dealt with it through soft infrastructure and various other methods. Soft infrastructure is a new approach towards flooding that “buffers or absorbs flooding” (Norderson and Seavitt, 2011: 44). Hard infrastructure includes traditional storm water drainage of asphalt roads, concrete storm drainage and canalisation of rivers. Canals allow for a city to be built right up to the edge of the river. This is a space efficient method of flood prevention, but can cause flooding downstream (Spirn, 1984: 131) and prevents flora and fauna from growing.

The Tiber River in Rome and the tidal currents in Venice are helpful examples to explain both of these methods (Norderson and Seavitt, 2011: 43).

Prior to the canalisation of the Tiber River, the city touched the boundary of the river (Figure 48). Rome accepted some degree of flooding for over 2 500 years. Severe floods from the Tiber River in 1870 prompted the construction of the uniform 100m wide canal with 12m high walls (Figure 49). This ensured the city was safe from flooding. On the average day one cannot see the water from the

Figure 47: (Left) Venice when the tidal waters flood a public square. Raised platforms are erected so people can navigate the water. (Gold, 2012)



Figure 48: (Before) The Tiber River in Rome, shortly before it was canalized through embankment walls. Buildings were built close to the river and therefore had a connection to the river. (Nonderson and Seavitt, 2011: 43)



Figure 49: (After) The Tiber River in Rome after the river was canalised with tall walls. Buildings were demolished to create this canal. (Nonderson and Seavitt, 2011: 43)



Figure 50: (Left) The neighbourhood of 'Make it Right' houses. The houses in the foreground are raised high enough to create parking space under the building. (Right) The 'Make it Right' house by Frank Gehry. (Make it Right, 2012)



neighbouring street because the river is far below the street level (Norderson and Seavitt, 2011: 43). Therefore, the city is separate from the river.

Venice is a city built on water. Water and flooding is part of the Venetian daily life. The tidal waters are allowed to enter the city. When this occurs new pathways are created through elevated wooden platforms which are strategically placed to deal with the increased water level (Figure 47) (Norderson and Seavitt, 2011: 43).

The following section outlines methods for letting water into the city through the management of soft infrastructure:

Letting water in | Soft Infrastructure

Raising the building

Simply raising the building on stilts can make a house much more flood resistant. This method was used in 'Make it Right' homes in New Orleans, a non-profit organisation created by actor Brad Pitt. A building could be raised for less than one meter off the ground to an entire storey above the ground. One can see the height difference of stilts in Figure 50.



Figure 51: A diagram showing how swales can direct water away from buildings to avoid water damage. (Drawing based off: Schultz, 2013)



Figure 52: suburban swale

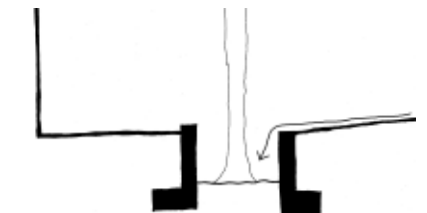


Figure 53: Iranian urban swale

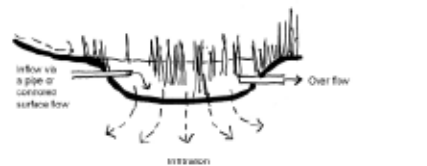


Figure 54: a cross section through an infiltration basin. (The drawing is based on: ARC)

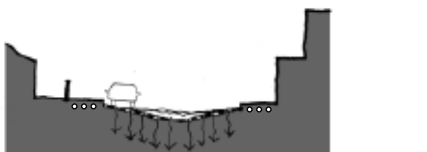


Figure 55: Diagram of infiltration road with services within the side walk. (Drawing is based off: Cassell et al., 2008: 67)

Swales

A swale is a linear ditch or open trapezoid channel which directs water in a certain direction (Figure 51). This ditch is planted with erosion and flood tolerant plants. This system allows storm water to infiltrate the ground and filter polluted water. A typical swale is built within a lawn (Figure 52) but a swale can also exist within an urban environment (Figure 53).

Infiltration basins or surfaces

An infiltration basin is typically a recessed grassy surface which stores water runoff. In this basin water can gradually infiltrate the soil below. Infiltration basins have an inflow pipe and can have an emergency outflow pipe in the event of extreme rainfall (Figure 54) (ARC). Extra water could possibly flow into a second basin.

Alternatively, an infiltration basin could be a permeable road or car park which is sloped with the lowest point in the centre (Figure 55). This is quite different from typical road construction. This method can decrease floods and the expense of storm water drainage systems. Additionally, this method can treat urban runoff (Spirn, 1984: 145).

The above method was used in 'New Urban Ground', a theoretical model for Lower Manhattan's infrastructure. The porous green streets are designed to act like a "sponge" (Cassell et al., 2008: 60). Services run in waterproof vaults under the sidewalks, which allow the streets to be wet.

By allowing water to infiltrate the ground it puts less pressure on traditional hard infrastructure. As a city continues to grow with hard surfaces, the rivers might not be able to cope with the increased storm water runoff which may cause flooding downstream (Spirn, 1984: 131).

Soft infrastructure is an environmentally friendly option in comparison to canalisation, but canalisation can create very successful urban environments.

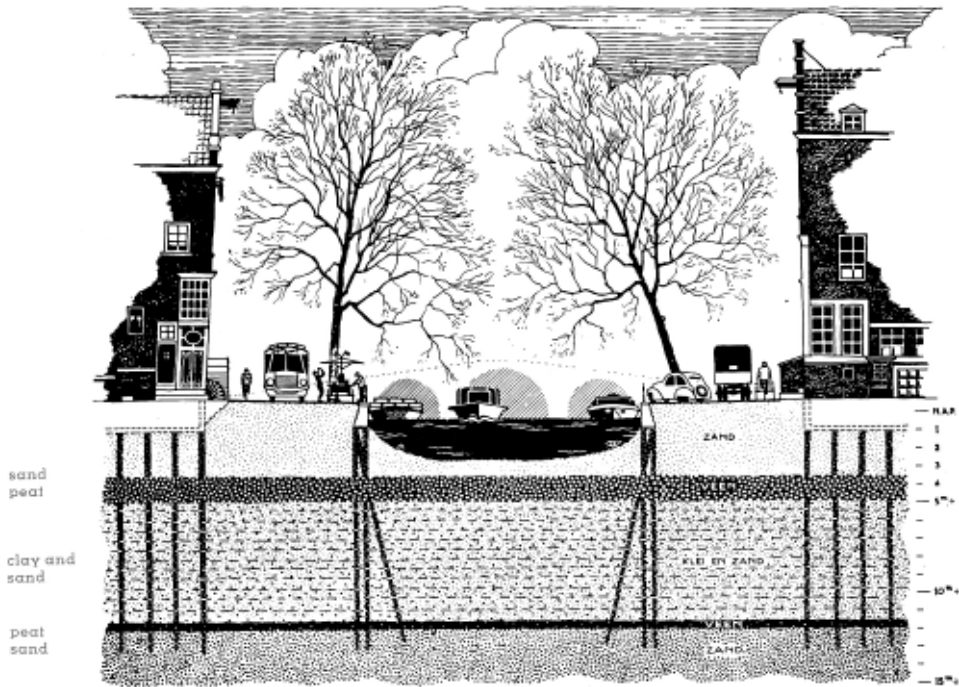


Figure 56: section through a canal in Amsterdam showing the access to the canal and how the houses are raised (Amsterdam Physical Planning Department, 1983: 6)



Figure 57: Section through the ghats embankment. Stone piers lead off the wider platform to create a viewing space.

Keeping water out | Hard Infrastructure

Canalisation

If canalisation is designed correctly people can still have access to the water, unlike the Tiber River in Rome. The Ganges River terrace steps in Varanasi, India, called ghats (World Monuments Fund, 2013, Faridi, 2014), and the canals in Amsterdam keep water separate from the city, but allow for interaction with the water.

The Ganges River

The ghats on the side of the Ganges River form an embankment to prevent flooding but also allow for easy access to the river for bathing, washing clothes, religious ceremonies and fishing (Faridi, 2014). The steps are broken up by wider platforms which are used for meetings, as space for stalls, and to create viewing platforms (Figure 57).

Buildings face onto the Ganges River to celebrate the river (Figure 58). The celebration of a river, in this context, means to appreciate the river. For example, people desire waterfront properties. This is a contrast to the Black River and how people shut their houses off from the river views and the urban park.

The Amsterdam canals

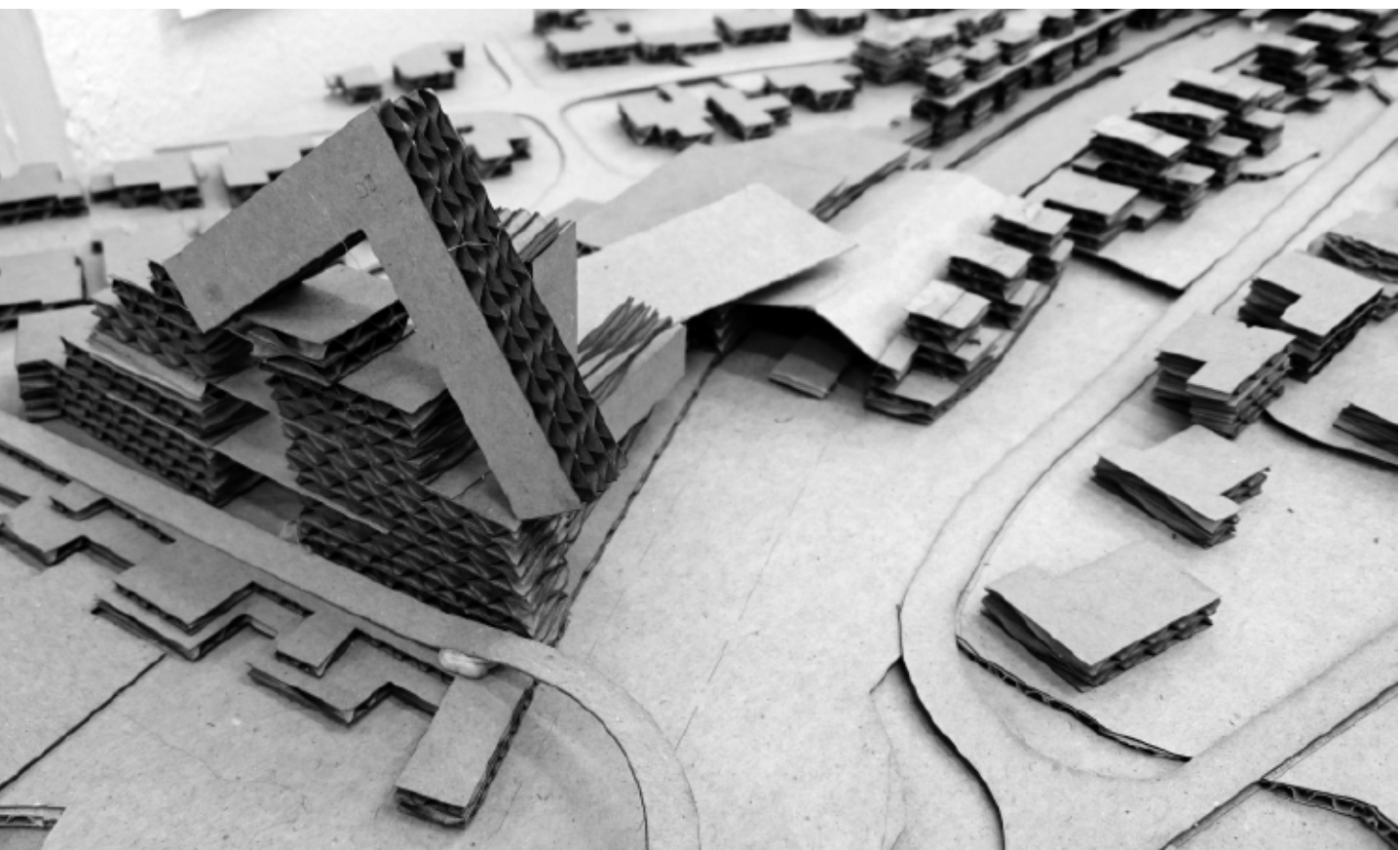
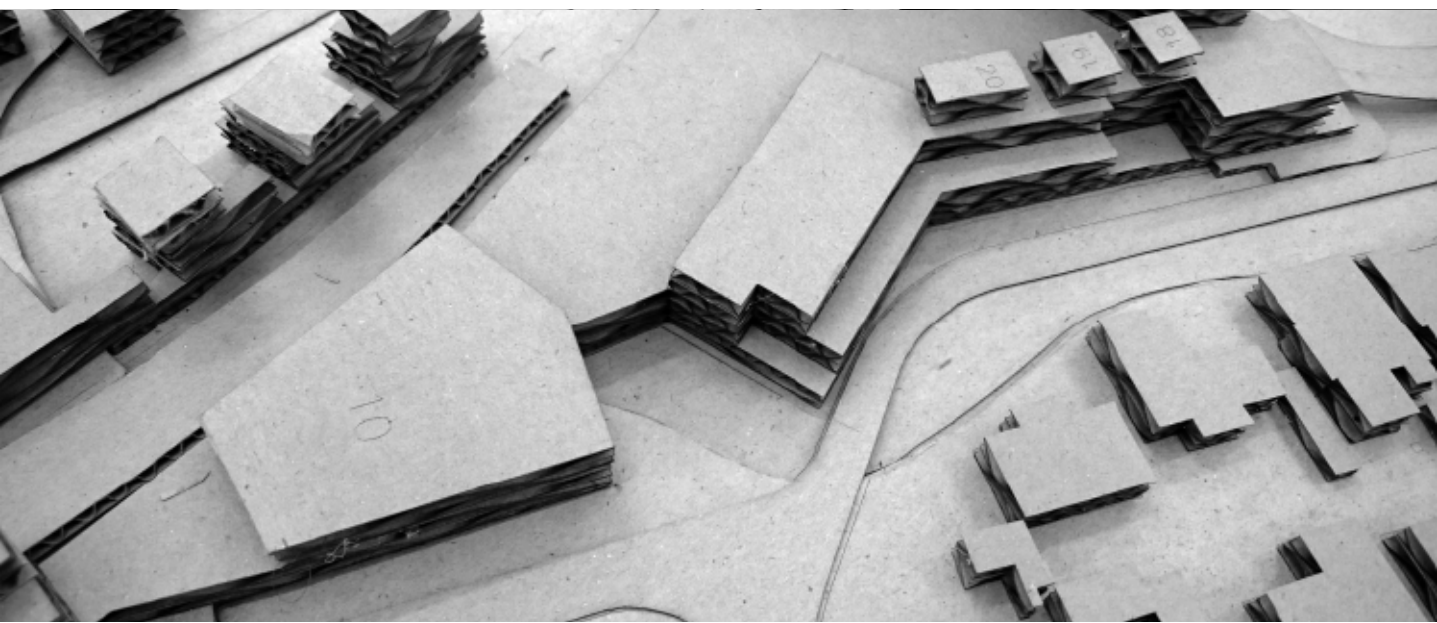
The Amsterdam canals, in comparison to the canal running through Rome (Figure 49), have a much better connection to the buildings and the street. The canals are narrower and the walls are lower (Figure 46). Most of the time there are no balustrades or up-stands between the road and the canal, giving the canal a better connection to the city. This enables people to have a small boat or house-boat and dock it in different places along the canals.



Figure 58: The Ganges River in Varanasi, India. The steps run for almost 5km.

Houses along the canals are raised by roughly 70cm above the street level to prevent flooding (Figure 56). This also provides privacy in a positive manner because it allows pedestrians on the side walk to have an idea that people are around, unlike the effect of a two-meter high perimeter fence.

To create an edge to the urban park it was decided to develop within the 1 in 100 year flood zone and use the soft infrastructure principles. Even though canalisation creates wonderful river edges this type of flood prevention does not allow flora and fauna to grow and it can cause flooding downstream (Spirn, 1984: 131). Based on the above, this dissertation suggests raising buildings. This solves the issue of flooding but also provides greater privacy for homes. Urban swales and infiltration basins are also used to put less pressure on traditional drainage infrastructure.



Chapter 5: Design Response

The design outcome of this dissertation is an in-fill mix-use housing development around the Hazendal train station. This design is made up of four new housing components. The proposed development of the Hazendal train station will create a suitable entrance, public space and provide community facilities.

This chapter addresses the precinct plan of Hazendal and Sybrand Park. The overall plan and the massing will be explored. Project sections will be detailed to describe the client base, development circulation, response to the railway, and the privacy architectural technique.

Precinct Plan

The precinct plan for this project was developed very early during the design phase. Its beginnings come from the TRUP urban scheme discussed in Chapter 2. Three precinct plans are shown of Hazendal: a plan now, soon, and in the future.

Figure 60 depicts the existing fabric of Hazendal and Sybrand Park. The site is empty apart from two substations. The existing houses within these two suburbs exist in a low density scheme. There is opportunity for densification.

This dissertation focuses on an in-fill project of the site. Figure 61 depicts the overall form of the project, and the five new connections, the overall urban design and the project parts, which are discussed in a later section.

Figure 59: (Left) Process massing models

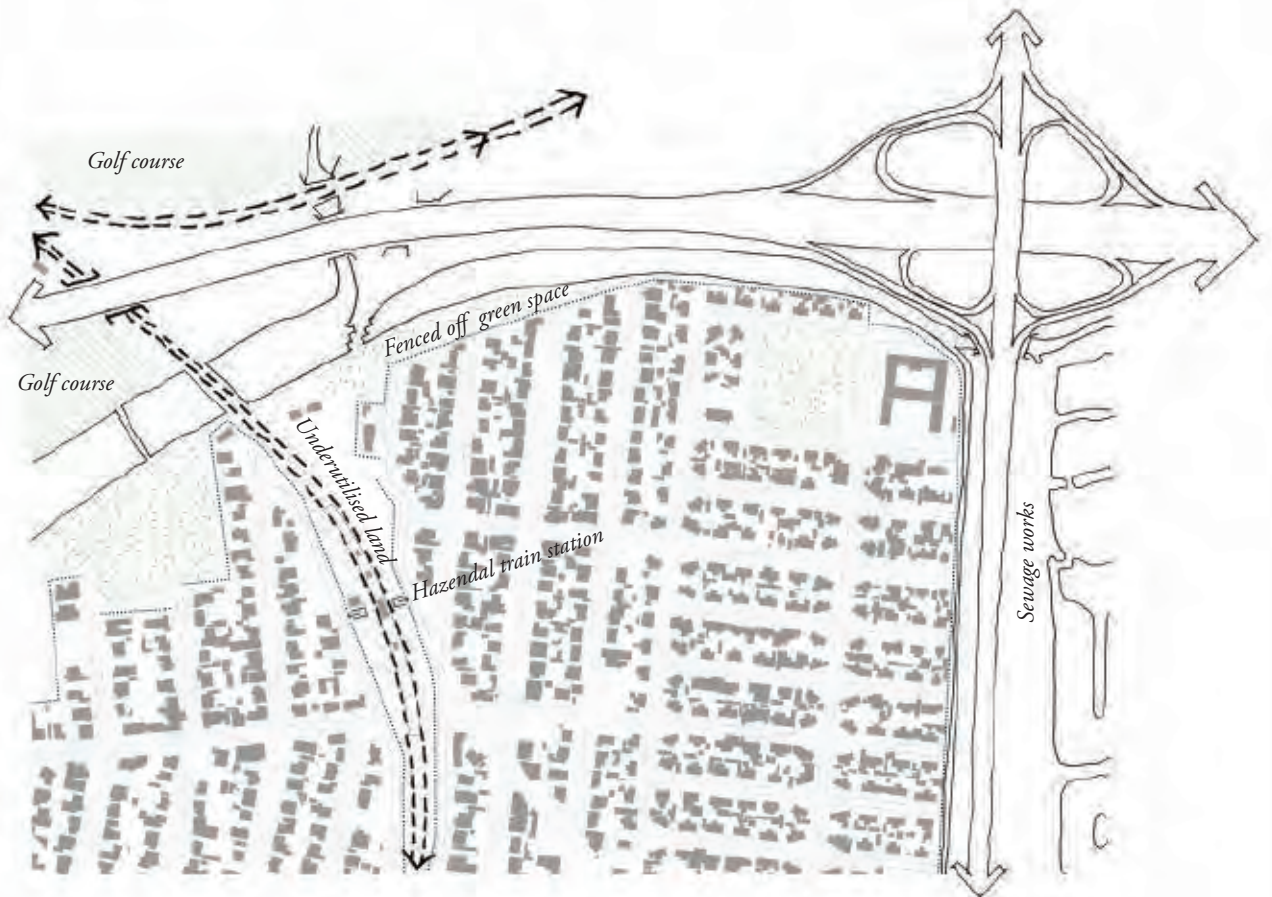




Figure 60: (Now) Hazendal and the existing site currently.



0 100m 200m 300m

-  Existing buildings
-  Other potential sites to densify near the design
-  Green space
-  New pedestrian route
-  New vehicle and pedestrian link

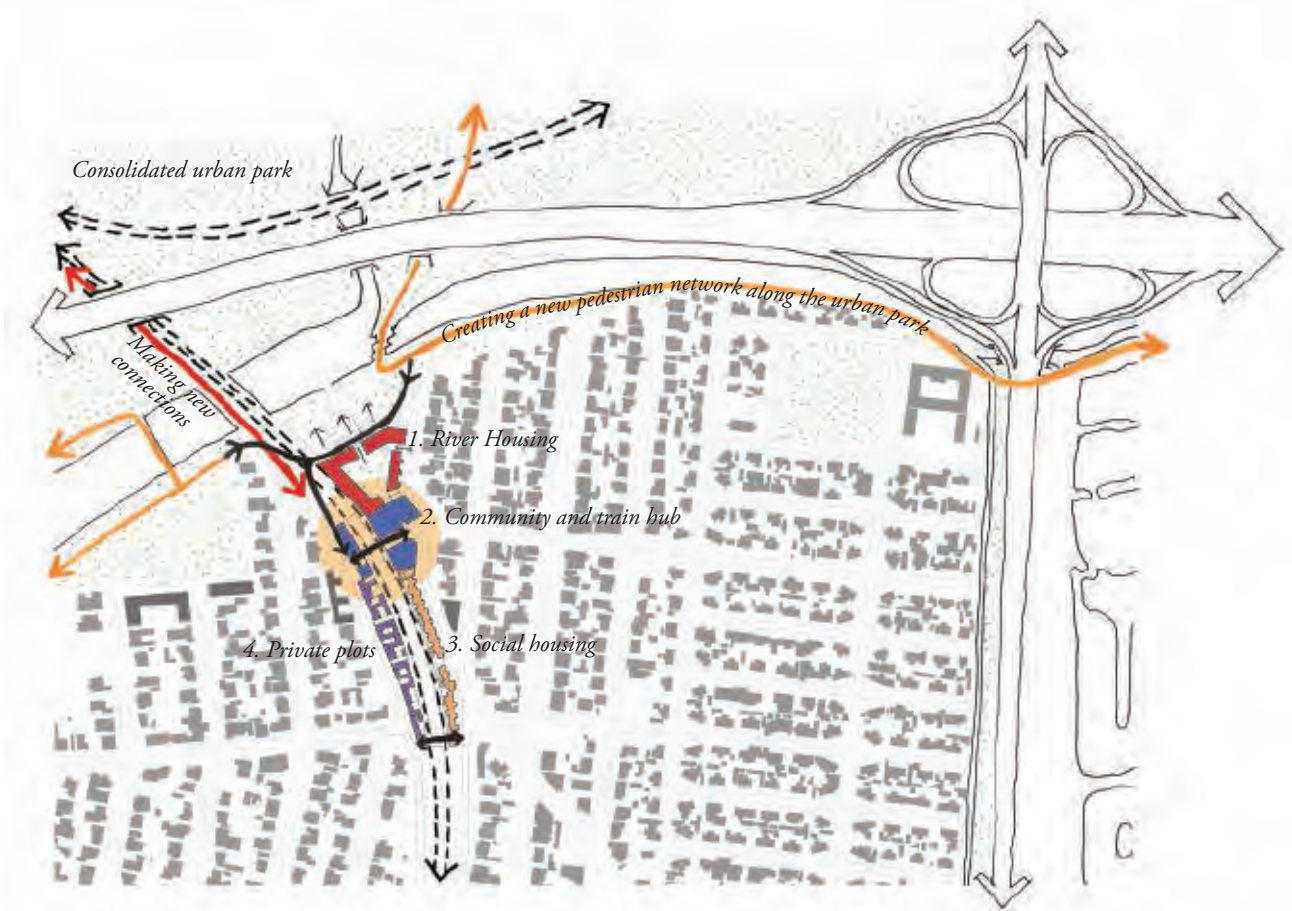


Figure 61: (Soon) Precinct plan of the design response.

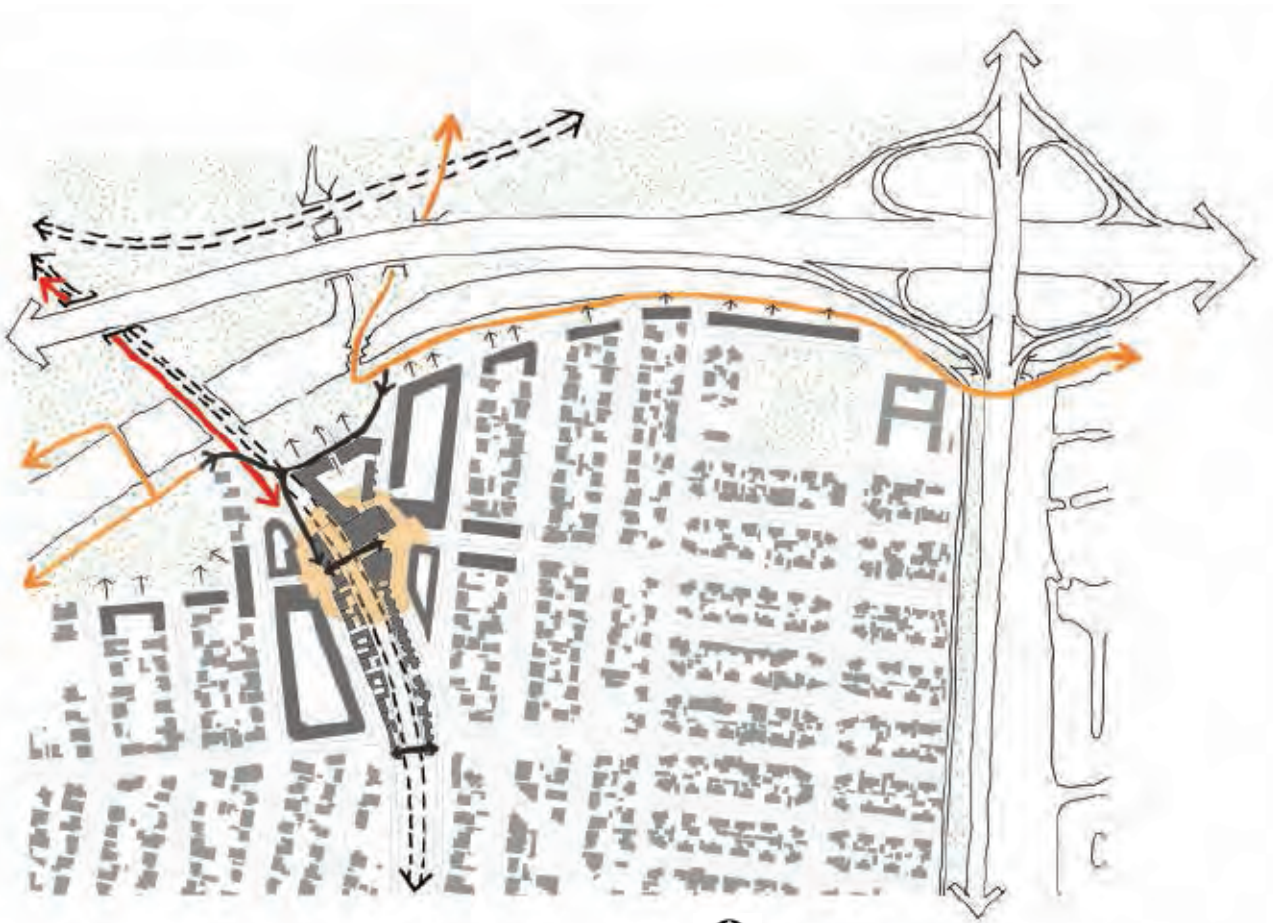


Figure 62: (Later) Precinct plan when the rest of Hazendal and Sybrand Park starts to redevelop.



0 100m 200m 300m

- Existing buildings
- Other potential sites to densify near the design
- Green space
- New pedestrian route
- New vehicle and pedestrian link

The new connections depicted in figure 61 are as follows:

1. A continuous route along the Black River for bikes, pedestrians and wheel chair access. This bridges the railway line;
2. A new road next to the train line which connects Sybrand Park with a potential new suburb on the Mowbray Golf Course;
3. A new pedestrian route over the culvert to connect the area with Pinelands;
4. A new railway crossing and entrance to the Hazendal train station, and
5. A new railway crossing at the tail of the project, where many roads converge.

The main concepts of this dissertation design are depicted in figure 61 and include:

1. The creation of River housing, an urban edge towards the river with good views and surveillance;
2. The movement of the new train station entrance to a wider part of the site to allow for retail space, community facilities single occupancy housing and public space at the entrances of the station. This creates a new node within



Figure 63: (Later) Urban room diagram



Figure 64: (Later) Public and private diagram

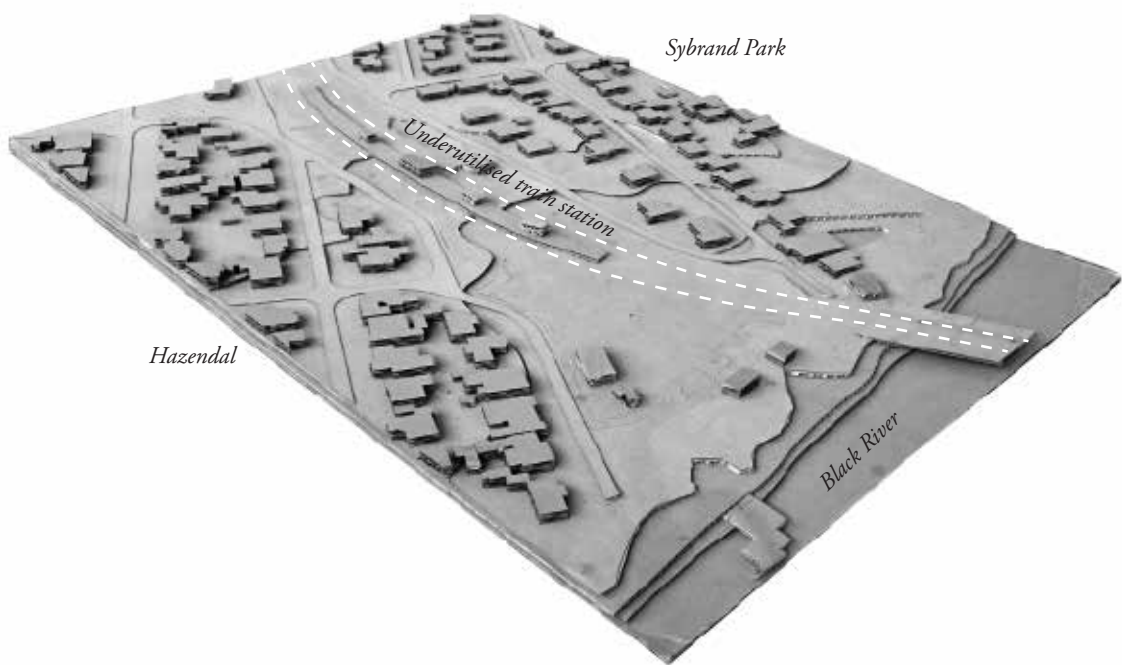


Figure 65: Site model of the site currently

the area;

3. The construction of social housing strip along the railway line reserve, and
4. The placement of private plots along edge of west side of the railway line.
Their design is similar scale to the existing neighbouring houses but more compact.

Figure 62 depicts how Hazendal and Sybrand Park can be further densified. The proposed in-fill development encourages denser urban regeneration. It is proposed that developers buy up urban blocks and develop more community facilities, retail and perimeter housing. Perimeter blocks are an efficient urban typology. They create positive spatial and social qualities, and this typology has proven to be resilient over time (Briggs and Hedley, 2014).

This future development can help reinforce the idea of designing the ‘urban room’ of neighbourhoods. This concept is depicted in Figure 63.

Massing

One of the challenges of this project was to design the overall plan and the massing of the in-fill development. In particular, increasing density and considering the one-storey free-standing houses surrounding the site proved to be challenging. A series of rough massing models aided the design process.

Massing model of the existing site

Figure 65 depicts the existing low density context and the empty site. The two houses which are highlighted in Figure 65 will be incorporated into the development. In addition, the substations are relocated to avoid damage from future flooding. The existing railway platform remains in the potential design, however the train station entrance will be relocated to create an improved threshold.

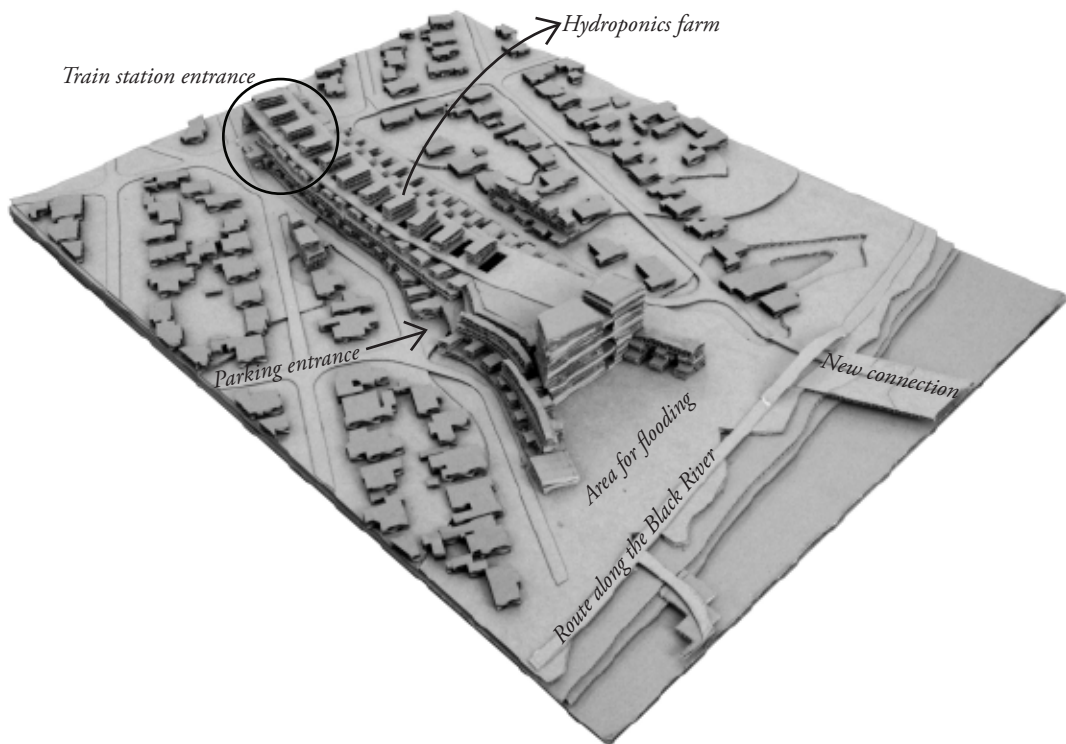


Figure 67: First massing model

Massing Model 1.

Housing along the railway line

The first massing model revealed the shortcomings of repeating one housing type down the length of the development. This created a regular, spine like form. This version contained hydroponics on the roof which added to the spine character, which is undesirable as it creates a monotonous and repetitive nature and an uninspiring street.

Housing along the railway line steps backwards in section and is built over the railway line. This was done to create the illusion of the housing being of only two stories instead of three to four stories.

River housing

This version's tower block stepped away from the river. This allows for generous landscaping and flood control.

Railway station entrance

The railway station entrance was moved from the centre of the site to where many roads converge to provide better access. A new bridge gives access to the station. The previous underpass flooded during winter, so basement levels were avoided. Retail space surrounds the entrance.

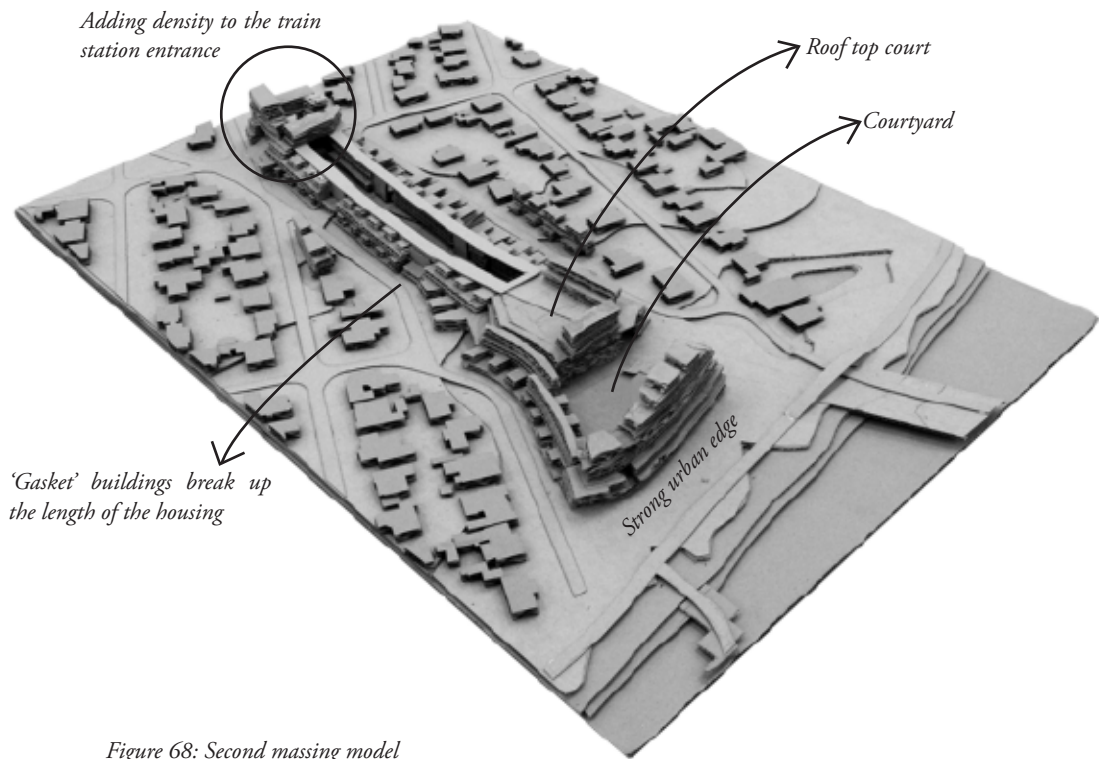


Figure 68: Second massing model

Massing Model 2

Change of programme

The hydroponics farm on the roof was removed because it was disrupted by the sky lights for the railway station. This programme also disrupted the main aim of the project to increase densities and to provide a positive high density urban development with neighbourhood qualities.

Housing along the railway line

The housing along the railway station included breaks where facilities could be located (like washing lines).

River housing

This version's tower block creates a strong edge to the urban park allowing for better surveillance. The tower block also slopes down towards the one storey houses so that it appears to be less tall.

Railway station entrance

Above the railway station entrance single occupancy apartments were added to give a civic presence which is simply created through additional height for the apartments.

Landscaping along the Black River

This model depicts the landscaping concept of the project. Permeable terracing is used to step down from the raised river housing. A bridge with a general slope provides a pedestrian crossing to connect the route along the Black River. A lightweight pier extends from landscaping into the Black River. These improvements to the urban park will encourage people to use the area and view the space in the new light.

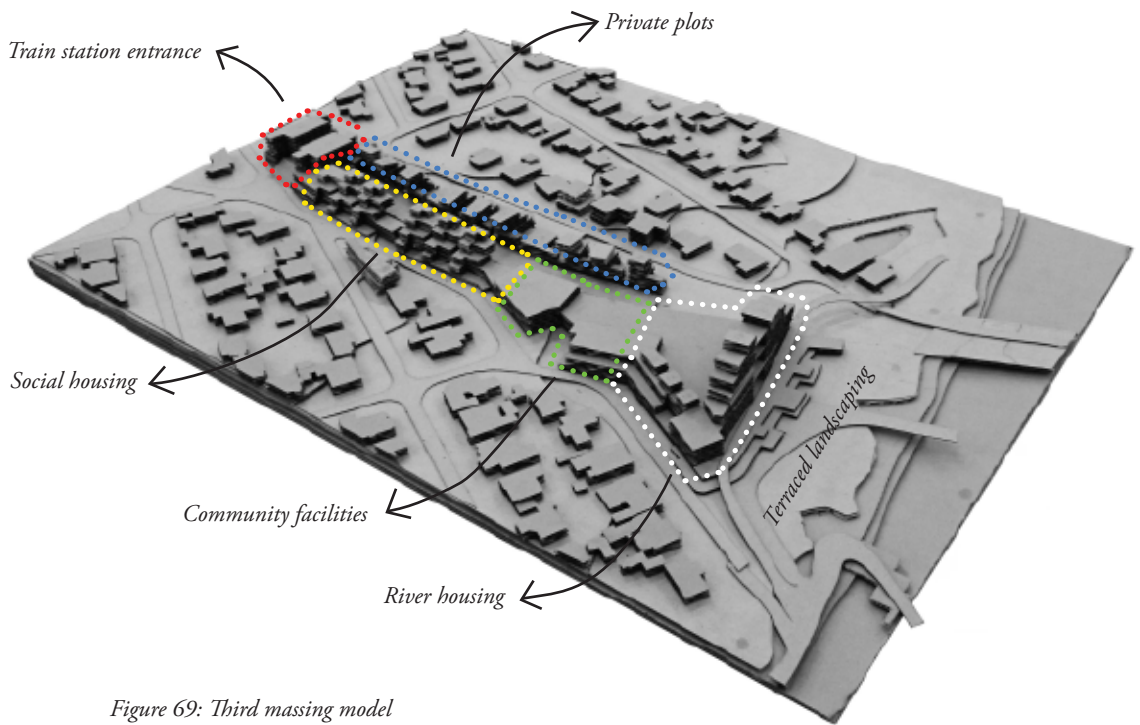


Figure 69: Third massing model

Massing Model 3

Clients

This version of the model includes invented clients for different parts of the scheme. This will be further discussed in the next section. The development is broken up into four parts: the river housing, the social housing, the private plots and the community hub (Figure 69). This ensured different parts of the site were had different qualities and a variety of housing types and other uses. Additionally, this made the project more manageable.

Ownership and Management

A social programme was added to the social housing to manage an increase in population and reduce antisocial behaviour. There is often a negative perception associated to social houses and rental collection presents a potential problem. This can result in the decay of the housing development. This can be prevented if management is located on the site, involving residents regularly, and considering their desires. This results in social housing becoming as asset to the community. Steenvilla social housing in Steenberg, Cape Town, is a good example of how this is achieved (Govender, 2015). Based on these reasons, management offices and a counselling rooms are provided as one enters the social housing. A small library and indoor sports court is located just outside of the entrance of the social housing.

River housing

The river housing was punctured to create views from the courtyard to the urban park. This creates a continuum of green space from the raised courtyard to the urban park.

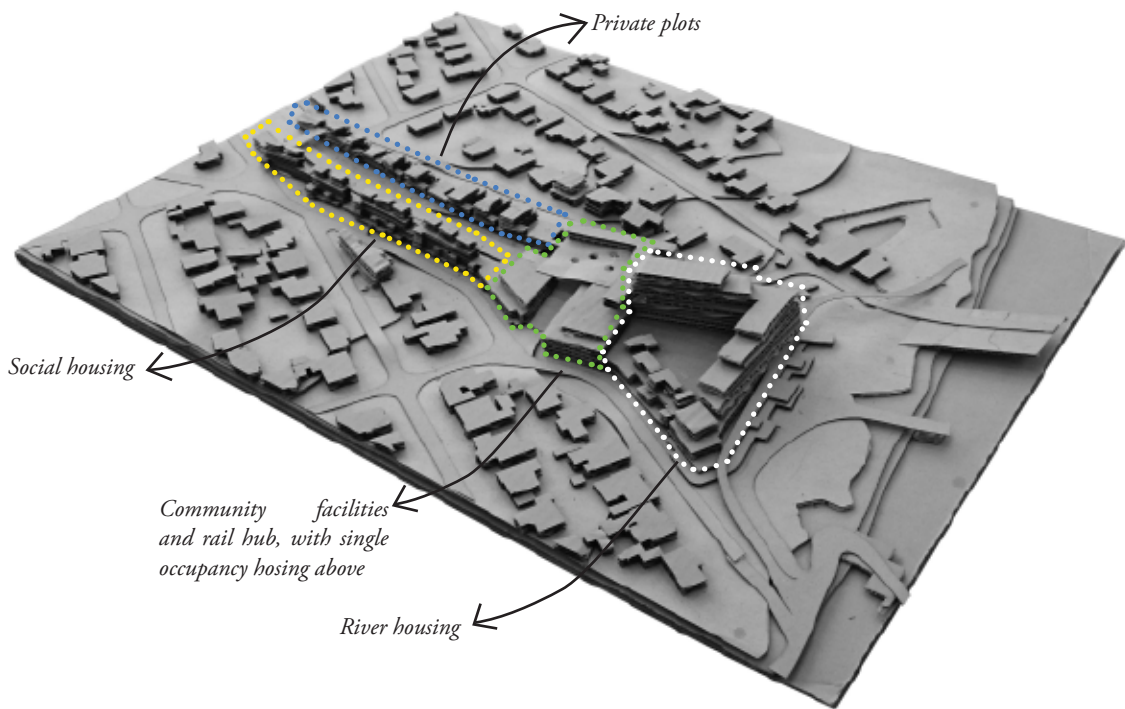


Figure 70: Fourth massing model

Massing Model 4

Social housing

Research on the existing conditions along the Southern Suburbs railway line in Cape Town led to a different response. Circulation and services can create a buffer to the railway line instead of the use of a solid wall. This is further discussed in the next section.

The social housing was not constructed over the railway line due to cost not justifying the space gained (see Figure 70). Density on this portion of the site was also reduced due to narrowness.

Community hub

The railway entrance and community hub were consolidated with the wider section of the site. This creates the opportunity for an intensity of activities. As people enter the train station from Hazendal they pass shops, have a view into the library and the indoor sports court.

River Housing

Density was added to the river housing which steps down to the east. This addition to the river housing was possible because there are no houses located directly on the west of the site. This will be further explained in the 'project components' section.

Tail of the development

The tail of the development is a simple railway crossing, where many roads converge.



Figure 71: Overall urban plan of the in-fill development (progress drawing)

Density

This design comprises of an average density of 47 units per ha. This is higher than the current density of Hazendal of 15 units per ha. The table bellow depicts the different densities of each part of the project.

	Site area (ha)	Number of units	Density: units/ha
Hazendal currently	1	15	15
Social housing	0.34	35	102
River housing	0.54	32	59
S.O.H.	0.29	16	80
Private plots	0.29	21	72
Overall	2.2	104	47

Urban Design Framework

Figure 71 depicts the overall urban design of this in-fill development. This is a key drawing within the design process to develop a successful street space.

The community hub is a cluster of public facilities. The eastern side is the most interesting public square where the library, indoor sports hall and train station entrance are located. The social housing and river housing entrances are near the community hub. This allows for easy access from the train station. These entrances will also add to the activity of the community hub.

The social housing along eastern side of the railway line has been nuanced to break up this long building. This also means the social housing is not alien to the neighbourhood.

The first floor of the river housing family units have a small private garden and open out onto a communal green space. This ensures that the high density housing should attract families.

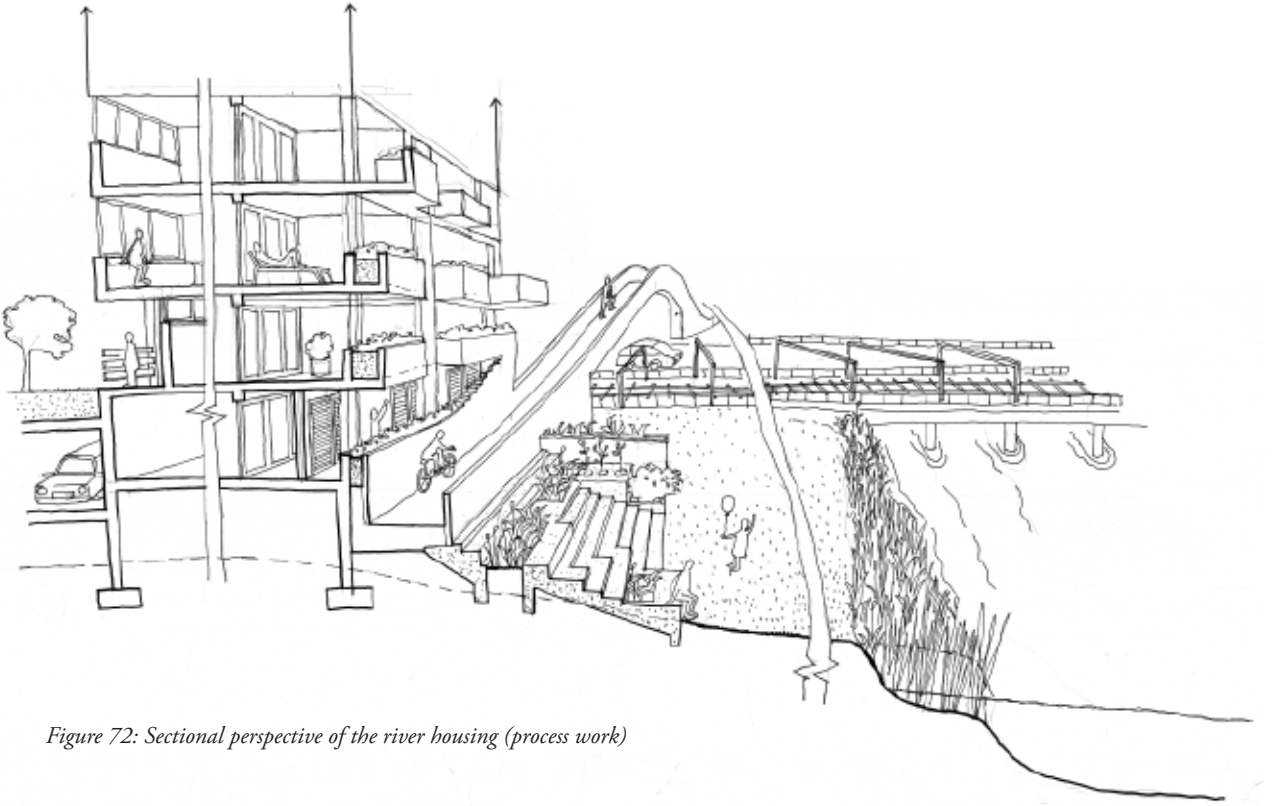


Figure 72: Sectional perspective of the river housing (process work)

A restaurant which faces the Black River is incorporated in the river housing. This restaurant provides extra surveillance during the day. It should also encourage people from elsewhere to come to this part of the Black River project.

Project Components

This scheme is broken up into four different sections for different types of clients. In reality a project this large would be designed by an urban designer who would set up guidelines. Different architects and developers would develop different portions of the project. The guidelines would ensure coherence and individual design responses would create variety.

The different aspects of the project, the clients, circulation, methods of privacy and key design concepts are described below. This section explores the river housing, the social housing, the community hub, and lastly, the private plots.

The main focus of this design is the river housing and the social housing within an overall urban design framework. The community hub that includes a library, indoor sports court and retail are additional uses to support the housing.

River housing

This part of the development abuts the river to provide an urban edge to Hazendal and to provide surveillance for the urban park. The housing would have northern views of the river or western views of the mountains. This component is one of the two main focuses of the design development within a larger urban design framework.

Management and Ownership

This portion of the scheme is managed by the developer with a government partnership for the public landscaping in front of the building. This market-

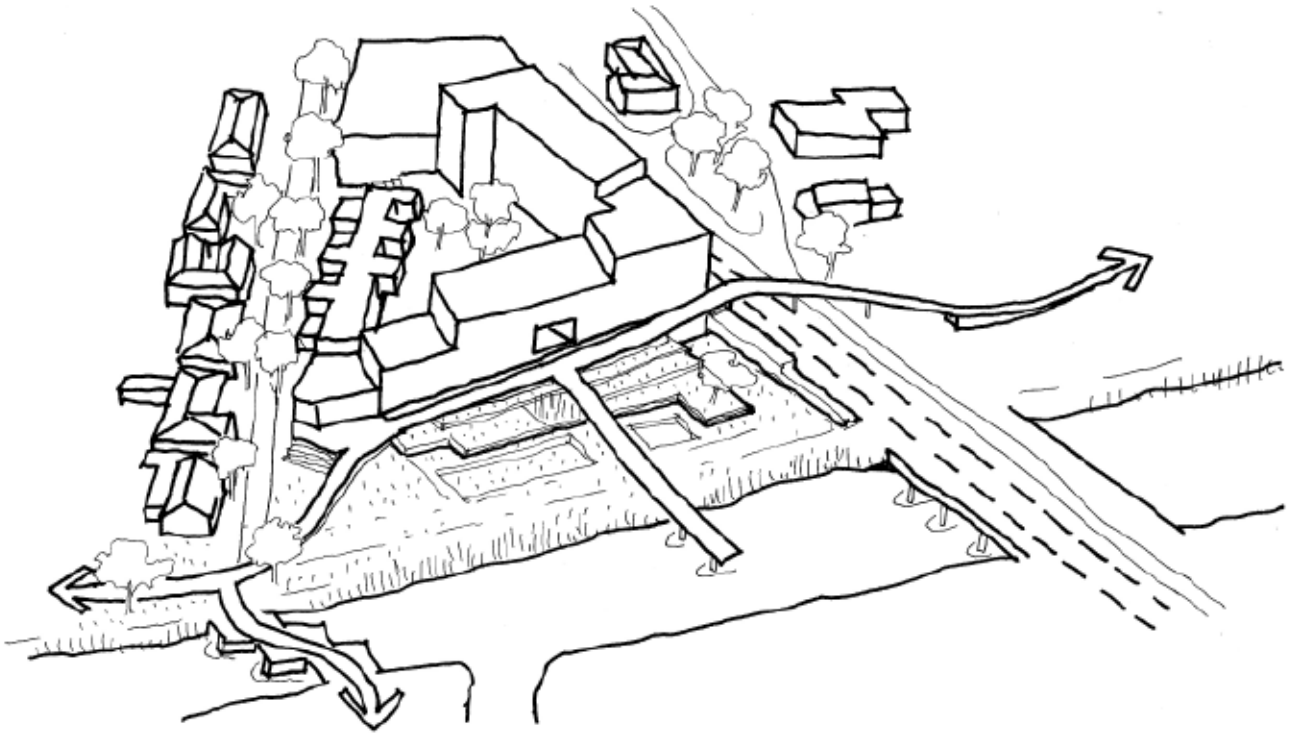


Figure 73: Massing of the of the river housing

related development would be aimed at middle-income earners. The developer would sell apartments with sectional titles.

Parking

At least one secure parking bay would be provided to each unit. This allowance is a compromise. Currently, market-related buyers or tenants desire parking because Cape Town's public transport is not yet efficient. Increasing densities in Cape Town will however produce a shift towards public transport.

Design response

This portion of the project is based on the Narkomfin Housing in Moscow. This duplex style arrangement allows for circulation every second to third storey. Apartments thus have a view both over the urban park and the courtyard above the parking.

The same apartment arrangement repeats around this part of the scheme, however there are special units on the corners and some units open out onto a patio space where the block steps up. Unique moments are created through the communal garden and a void in the building, leading off from the garden, which allows for a view towards the river (see Figure 71).

Privacy and Flood prevention

The river housing is raised by one storey to give the units privacy from the urban park. This design also prevents potential damage from floods. The raised space is utilised by a covered car park (see figure 74). Privacy is also created through planters and the depth of the balconies (figure 74) within the concrete frame.

Massing

Figure 73 depicts the massing of the river housing. This tall block steps down to the east side where one storey houses are located. The bulk is added on the north and west side where the existing houses are located further away, and as such, the tall block does not overshadow the neighbouring houses. The partial

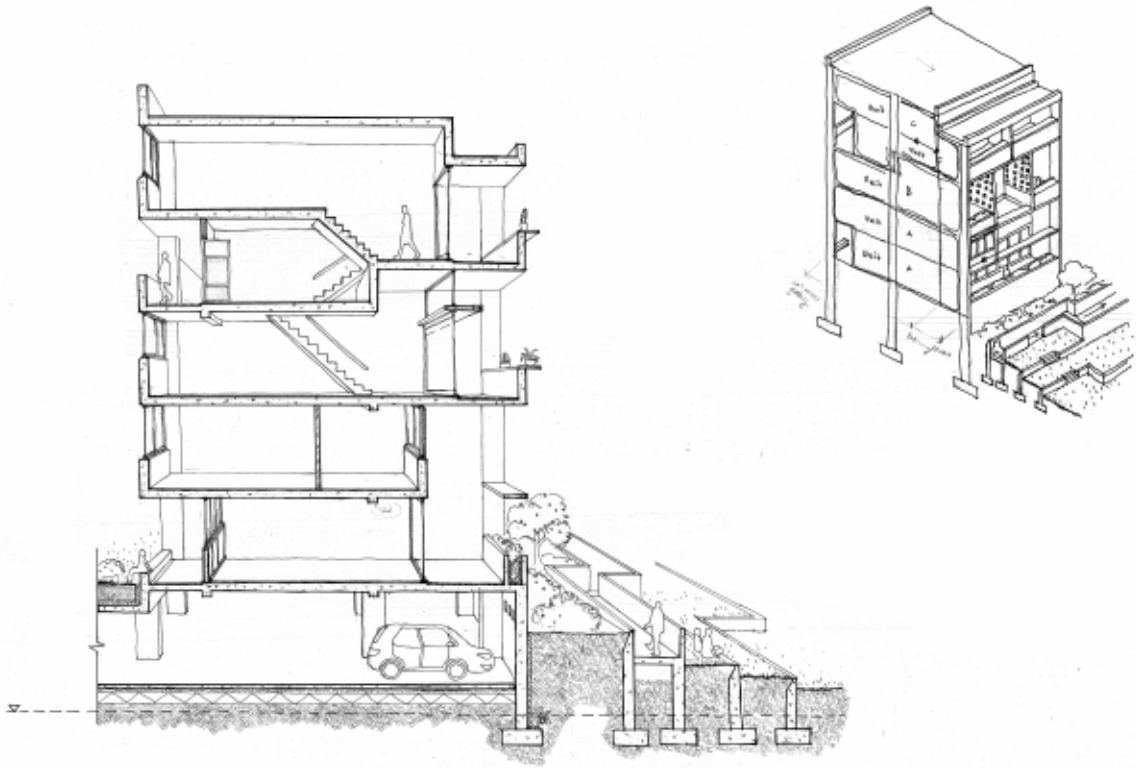


Figure 74: Section through the river housing which faces the Black River (work in process)

Figure 75: Isometric of a portion of the river housing depicting the exposed frame of the building and balcony space (work in process)

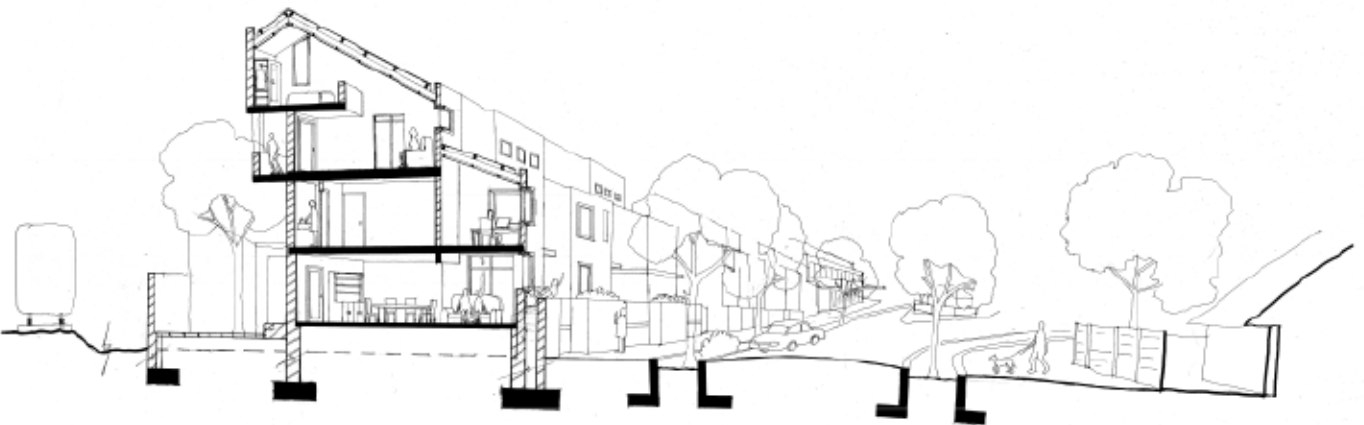


Figure 76: Section through the social housing (drawing in progress)

perimeter block forms a courtyard on top of the parking. This creates a semi-public communal space for the river housing residents.

Materiality and Construction

The river housing's north and western façades, the gentle ramping bridge and the terracing down to the river make use of exposed concrete. This creates a common language between the landscaping, the bridge and the building. This concept is also applied to the concrete planter boxes which continue up the building. The platters continue the idea of the green landscape up the building.

Figure 72, 74 and 75 are process drawings which begin to explore the construction of this portion of the building. Emphasis is placed on the balconies within a deep frame which differs for each apartment style.

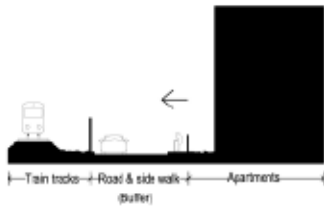
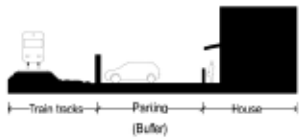
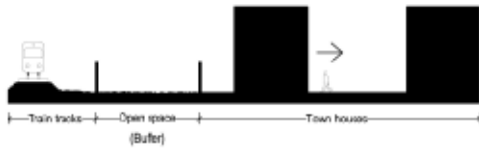
Social housing

The social housing component is located on the east side of the railway line in rail reserve land. The 12m wide rail reserve site created a challenge, thus the site was consolidated to one part of the project. This section of the development is one of the two main focuses of the design development within a larger urban design framework.

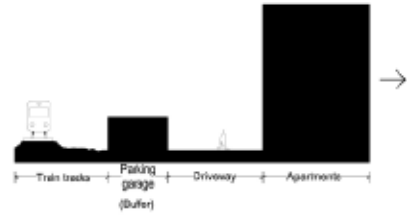
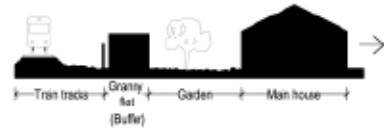
Management and Ownership

This portion would be developed by a social housing company who would build and manage the housing. An example of this type of company is SOHCO. As discussed previously, management would be located on site and include counselling rooms to ensure that the social housing would not create additional issues for the area.

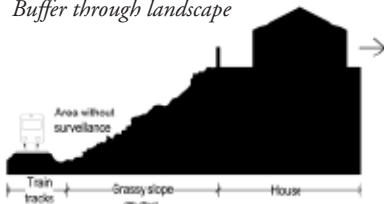
Buffer spaces via a road or open space



Buffer building

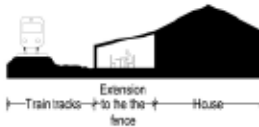


Buffer through landscape



The slope creates a buffer

No buffer



This plot lacks a buffer - the exception to the norm

Figure 77a: Diagrammatic sections of responses to the railways line along the southern suburbs line (from Claremont to Salt River).

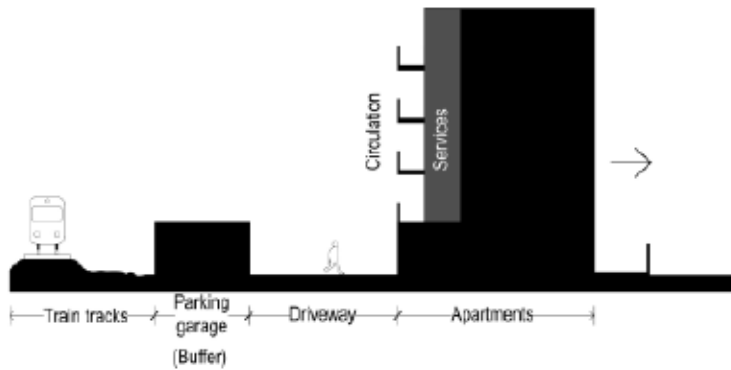


Figure 77b: This diagrammatic section inspired the social housing response to the railway line.

Residents enter through an entrance near the library. A central entrance allows for better control of rent collection which is often an issue in social housing in South Africa. Should the tenants be reliable in the future, the residents of the houses on the ground floor can enter through a separate entrance from the street.

Design response

The design response to the railway line is adapted from existing responses along Cape Town's southern suburbs train line (Figure 77a). These methods are worth retaining because they are well tested and simple. Figure 77b is the section which inspired the social housing's method of buffering. For example, garages or storage spaces are placed on the boundary of the site. The services and circulation act as a sound buffer to the apartments and thus the apartments open out towards the street.

To ensure that the small suburban homes are not overshadowed, the social housing steps back in section after two stories. In addition, pitched roofs are used so there is a similar language between this social housing and the existing houses. This is depicted in figure 76.

To design around a curved site and to break up a long row of houses, the units are grouped into threes. In between the groupings are 'gasket' spaces (see figure 70). These unique spaces are used for a playground, an extra room for extended families or washing yard spaces. This arrangement ensures units do not become too repetitive. Additionally, units on the north side of the groups of threes step down to create unique balcony spaces.

Furthermore, the units are an 'L' shape (Figure 79). This allows for north light to enter the units due the east-west orientation. This shape also breaks up the long façade along the street.

Figure 78 depicts the unit arrangement. To allow for enough space between the jutting out piece of the 'L' shape units, the units had to be long rather than tall.

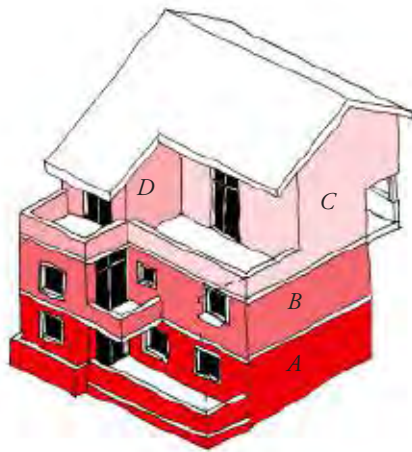


Figure 78: Social housing unit types

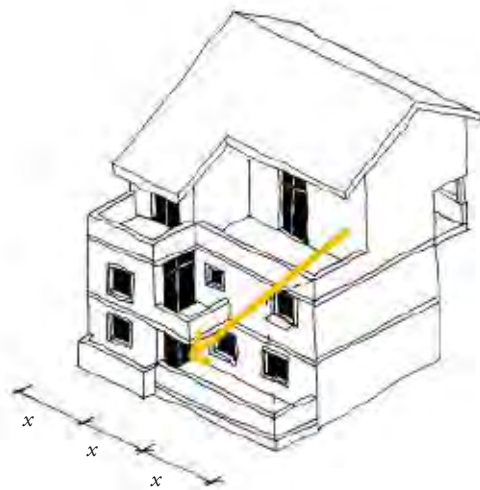


Figure 79: Social housing north light

Two similar units are stacked on top of one another. After two stories there is a setback. Unit C and D are mezzanine arrangements.

To make high density living an attractive living option, housing should provide private outdoor space similar to suburban houses. Therefore, all units have a patio or balcony which also assists to create privacy as shown below.

Designing for privacy

Privacy is created through three methods:

1. Houses are raised and make use of planters to provide a buffer between public and private realms;
2. Outdoor patio spaces also create a threshold between public and private realms, and
3. Large concrete sills on the upper units ensure that people cannot view downwards into their neighbour's patio.

Parking

Parking is kept to a minimum and street parking or some outdoor bays would be utilised. This maximises the space and financial efficacy of the site. Less parking is also needed because of the proximity to the train station.

Materiality and Construction

The construction of the social housing is load-bearing brickwork and concrete slabs. The three and a half storey building can be load bearing with quadruple brick walls leading to foundations, triple skin brick walls for the ground storey portion, and double skin walls above that. This results in no concrete columns needing to be used.

The exterior walls and patios push in and out to give lateral support to the brick walls. On the west façade this provides overhangs and space for pot plants. On the street façade this breaks up what could be a long monotonous façade.

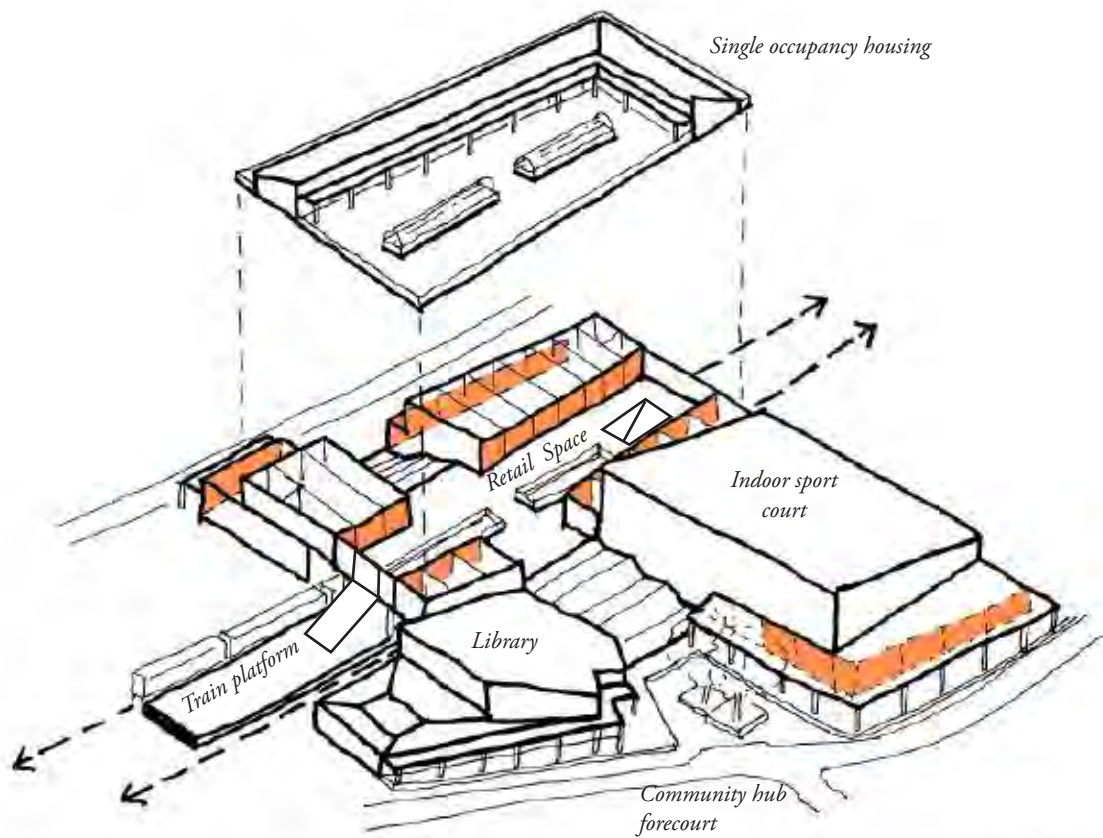


Figure 80: Diagram of the Community Hub. The orange show the retail space frontage.



Figure 81: Section through the community hub and the library looking towards the sports hall.

Community Hub

Community facilities, retail and the train station are all located in a cluster to ensure intensity of use and well used public space (Figure 80). They are located where the site widens out to allow for many different uses in the same area. This would encourage interaction within the community.

Management and Ownership

This portion of the project has two stakeholders but each of the parts need to speak to each other so it works as one node.

The first stakeholder is PRASA. They would develop a new entrance to the train station, retail and a new covering for the train platform. There is single occupancy accommodation above the platform for those who want cheap units close to public transport. Currently the train station lacks proper covering for winter, toilets, staff accommodation and retail space (Mothapo, 2015). This design address these needs.

The second stakeholder is the City of Cape Town. They would develop a small library and home work space, which would connect to the social housing. Opposite this would be an indoor court for basketball, netball, tennis or indoor soccer. These amenities are in response to the negative social behaviour which occurs in Hazendal (Latief, 2015, Mothapo, 2015). These amenities should create social cohesion for the new residents and the existing residents of Hazendal.

Design response

Figure 80 and figure 81 depict the design of the retail space, the train station and the community facilities. People will walk past shops as they enter. On the east side there is a view into the library and indoor sports court. People will go up a large public staircase to another level of retail space before entering down onto the train platform.

Private Plots

Small private plots are located on the west side of the railway line. These would be plots sold to individual buyers.

Design response

The plots would have guidelines attached to them to ensure that people build to create a positive street edge to provide surveillance. The plots would be narrow to encourage people to build to the boundary. All houses should be built up to the southern border. When building above two stories, setbacks would be required to ensure that the existing character of Sybrand Park is not damaged. This is all depicted in figure 82.

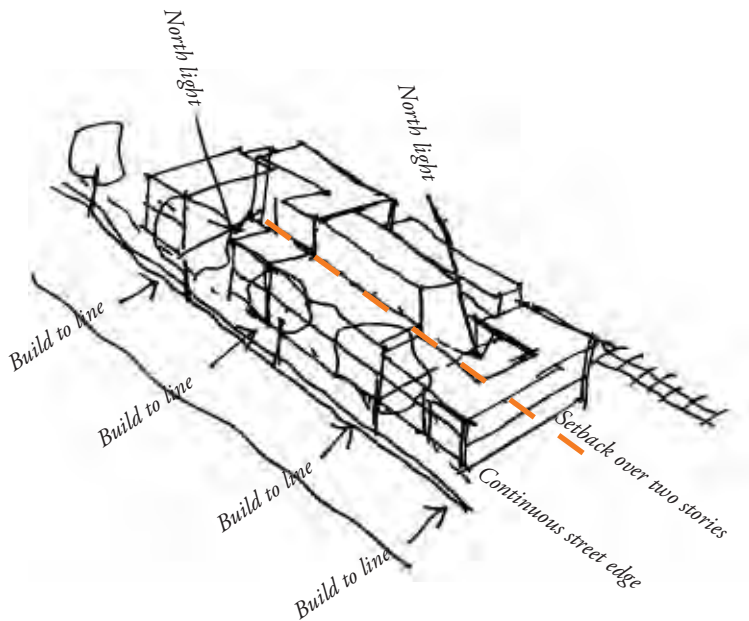


Figure 82: Private plot massing

Conclusion

At the beginning of the year I set out with the challenge of designing an alternative housing solution for a rapidly urbanising, sprawling city that lacks character. I applied this goal to a section of the Two River Urban Park (TRUP) due its strategic location and its underutilisation. I wanted to create housing which was rich in community, rather than the current low density, urban sprawl.

To address urban sprawl I have looked at relevant examples of how cities have densified underutilised land. In doing this, my design dissertation creates new connections, enhances the TRUP, challenges the perception of rivers, produces positive streets and variety within a large development. Each of these points are described in more detail below.

Connecting and Upgrading

This design initially started with the precinct plan that made five new connections between neighbouring areas. These connections are important due to lack of access between communities such as Syrband Park, Hazendal, Pinelands and potential new areas. This disconnect is due to buffer zones from Apartheid planning to separate parts of the city. In addition, this project faces the Two Rivers Urban Park which is a space for further integration. It is a space for people from different communities to interact. It is proposed that the river housing faces the urban park to provide surveillance and improve safety.

Changing perceptions

This project abuts the Black River and provides the opportunity to change peoples' perception of rivers. Currently many rivers in Cape Town are treated as a 'backyard' space. This view can be altered through new dwellings facing onto the Black River, removing fencing preventing access to the urban park and general upgrading of the park. This project can be an example of how other neighbourhoods can upgrade the river within their community.

Creating Positive Street

This development creates positive street space. Many of Cape Town's urban environments are comprised of dull streets of free standing houses with high walls. This can be altered by retail space and facilities which have active street fronts, as well as houses having direct views onto the street and no boundary walls. Thus it creates a vibrant urban environment which is also safe.

Designing with Variety

This large development is made up of four components: the river housing; social housing; the community hub including retail, communal amenities and the Hazendal railway station entrance; and lastly, the private plots. This ensured that the project offered a range of housing types and gave different parts of the site different qualities to create interesting streets. This is a reaction against the many dull South African urban environments which are only made up of 'cookie cutter' houses due to financial restrictions. To counteract monotonous environments one should include unique collective spaces in between repetitive housing. This creates a more vibrant environment.

This design could be a catalyst for the site to be developed in a way that regenerates the area and increases density. Some sectors of the community may resist change and high density living is often viewed negatively. If the benefits of the design are communicated, then the existing community and prospective new residents should appreciate the benefits of the design.

This dissertation is also a precedent for increasing densities in similar suburban areas in Cape Town. As the city population grows we will have to find ways to increase density without expanding the city border. There are many sites available in Cape Town which are similar to the one discussed in this dissertation, including other left over spaces along railway lines or rivers. Harnessing this dissertation's design approach could have a positive effect on future projects.

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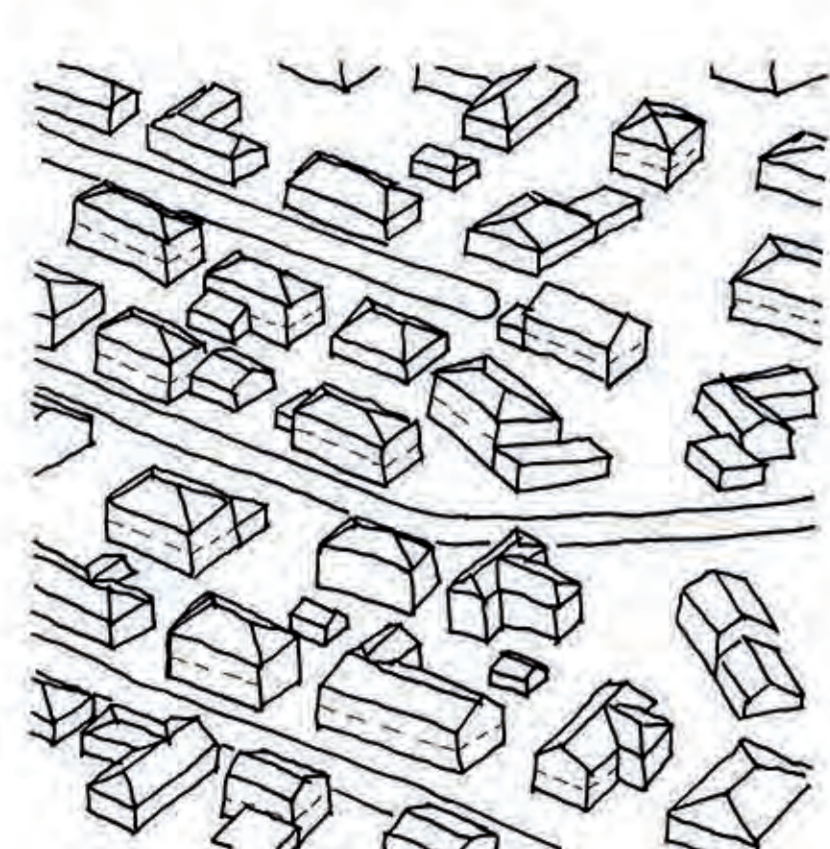
Note: interviewees' names have been changed

Final Drawings

ACCOMMODATING DENSITY

An alternative to Cape Town's suburban model
 Laura Graham

INQUIRY



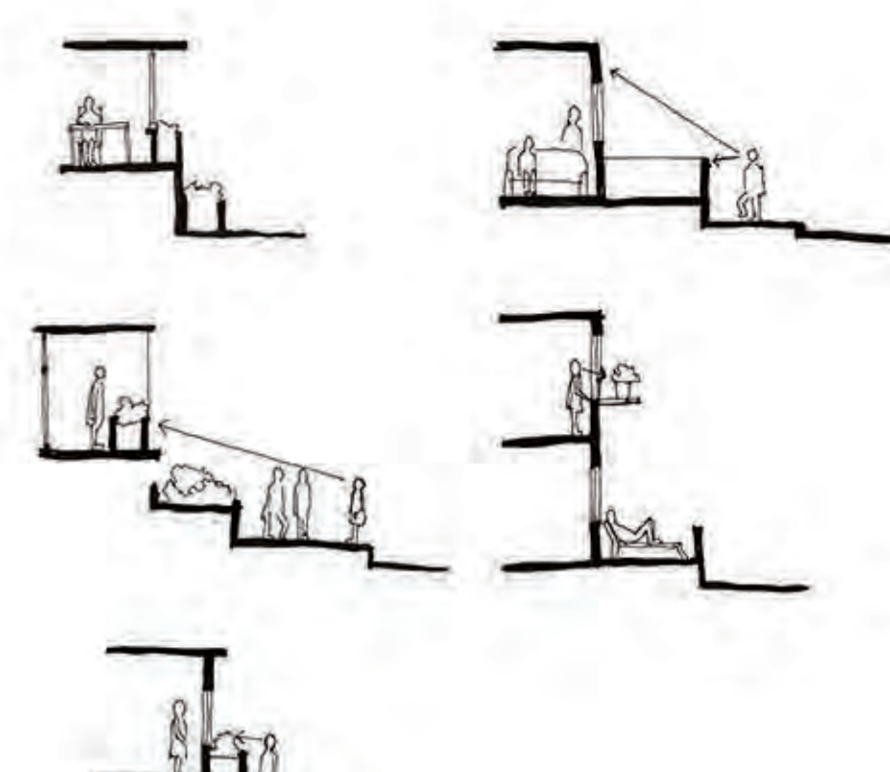
HOW TO DENSIFY SUBURBIA?



HIGH DENSITY HOUSING
 The ideal type of high density housing provides privacy, individuality and easy access to outdoor space.
 (Schittich, 2004: 12)

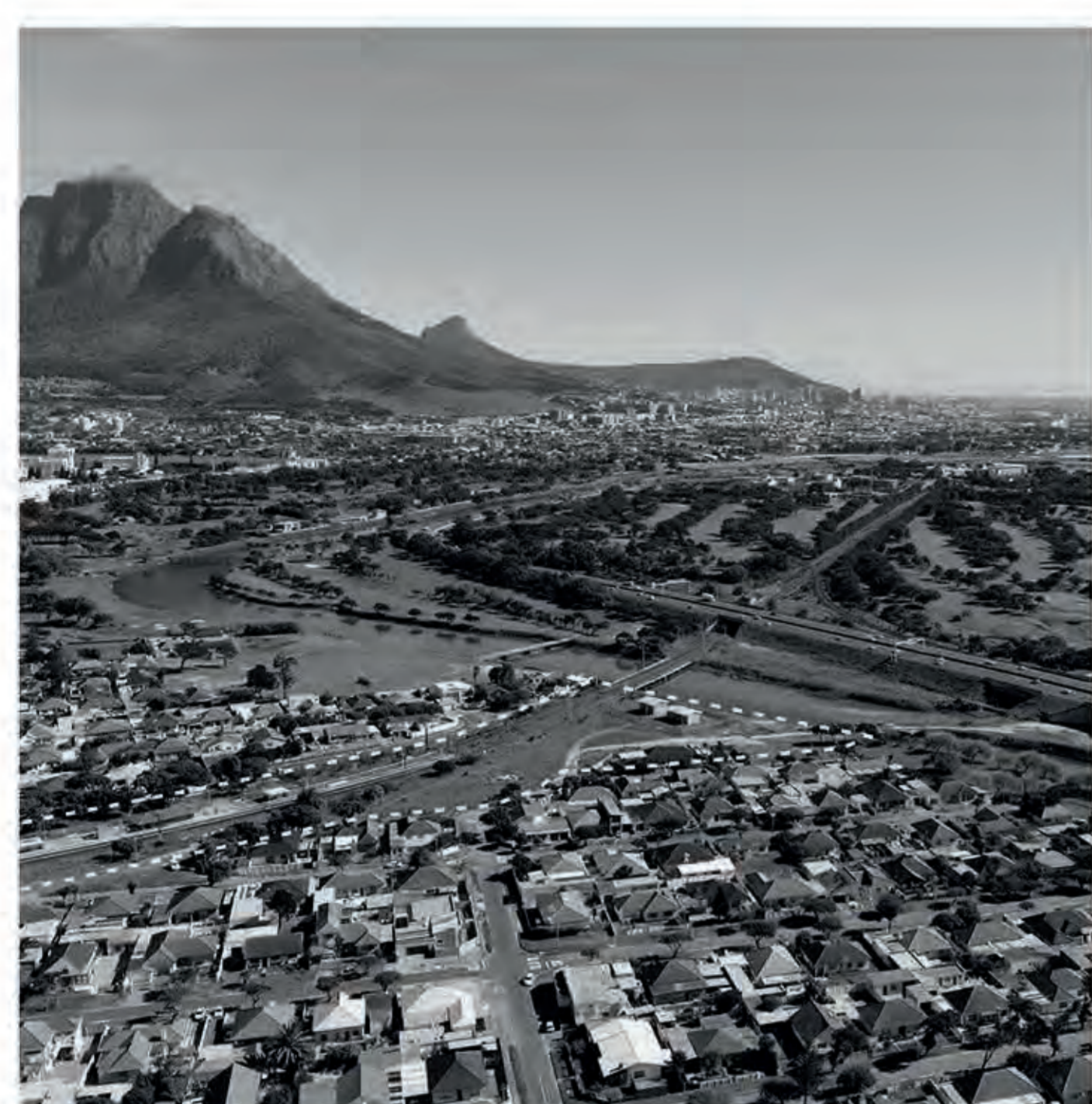


COMMUNITY
 (Berg, 2014)



PRIVACY

SITE - HAZENDAL TRAIN STATION & SURROUNDS BY THE BLACK RIVER

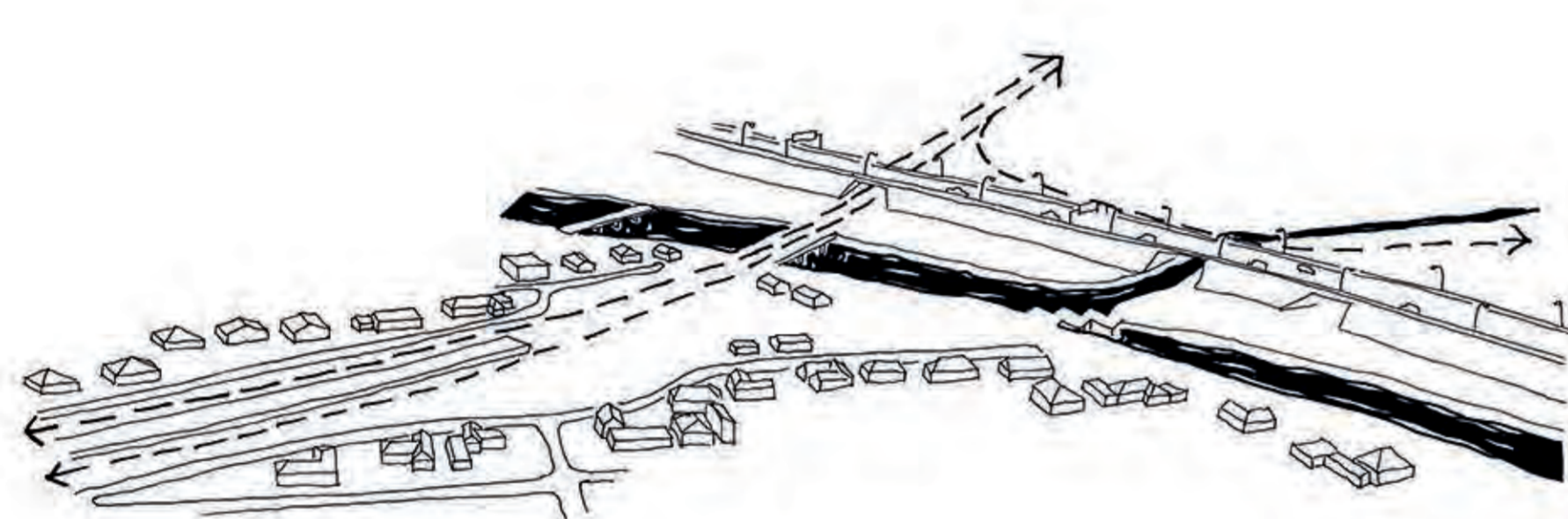


SITE LOCATION
 (Briggs et al., 2014)

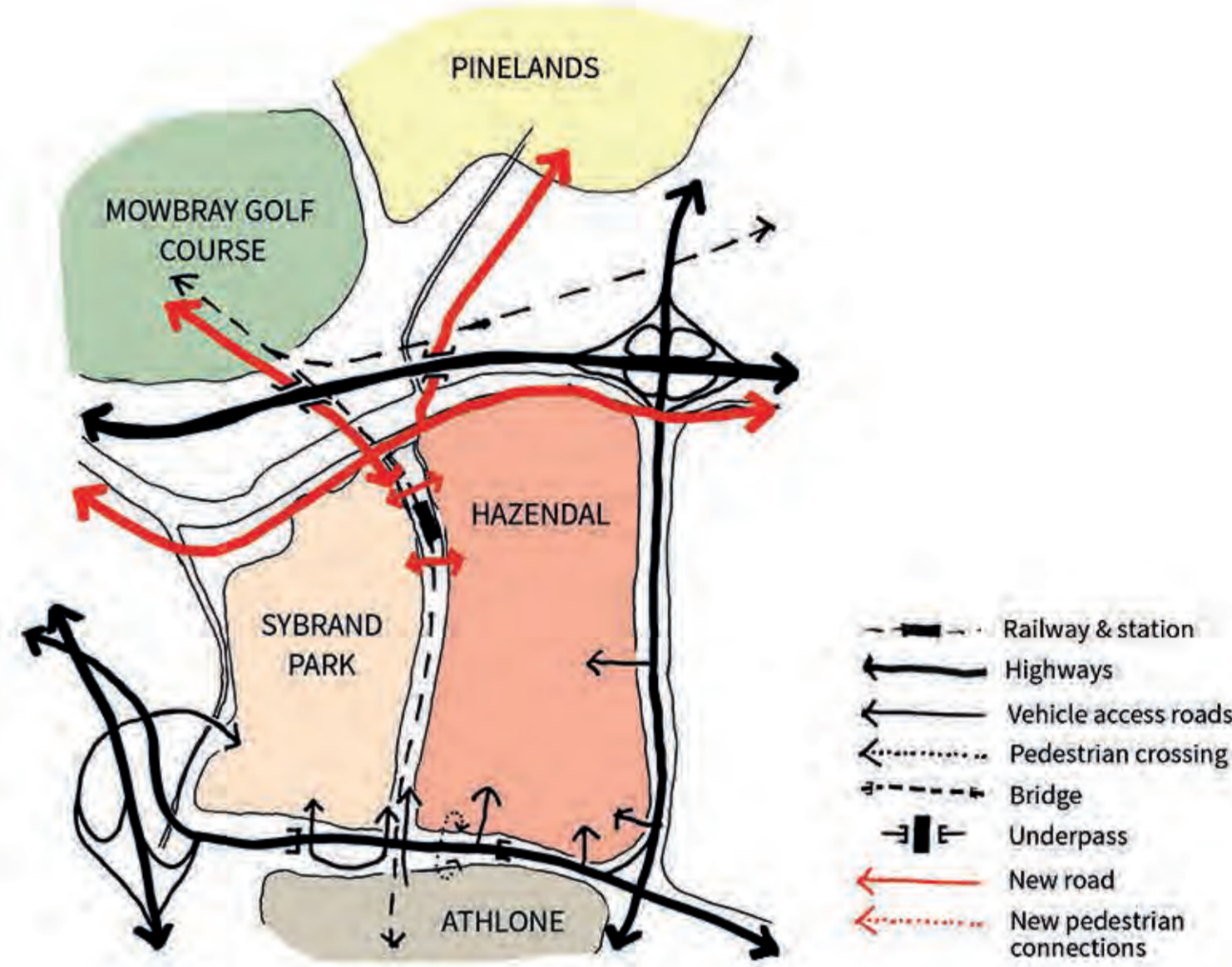


SITE CONDITION
 The Black River is the 'backyard' space of suburb

REASONS FOR SITE CHOICE



An interesting site where the Black River meets the N2 highway and the Cape Flats train line



Potential to connect separated areas



DUMPING GROUND AND LACK OF SURVEILLANCE



UNAPPRECIATED GREEN AND RIVER SPACE



INADEQUATE CONNECTION TO NEIGHBOURING SUBURBS



UNDERUTILISED TRAIN STATION

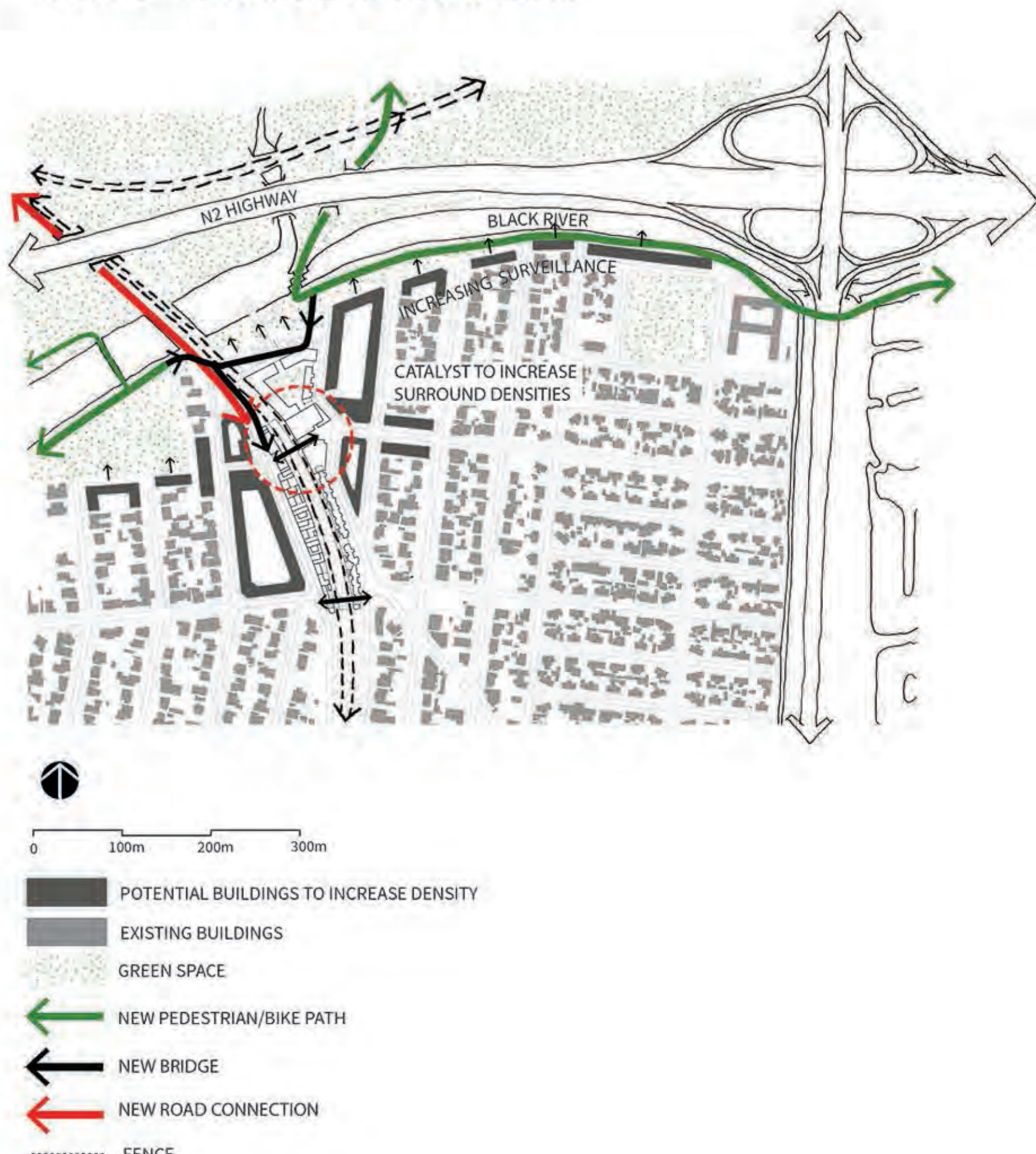
(Briggs et al., 2014)

1. HAZENDAL CURRENTLY



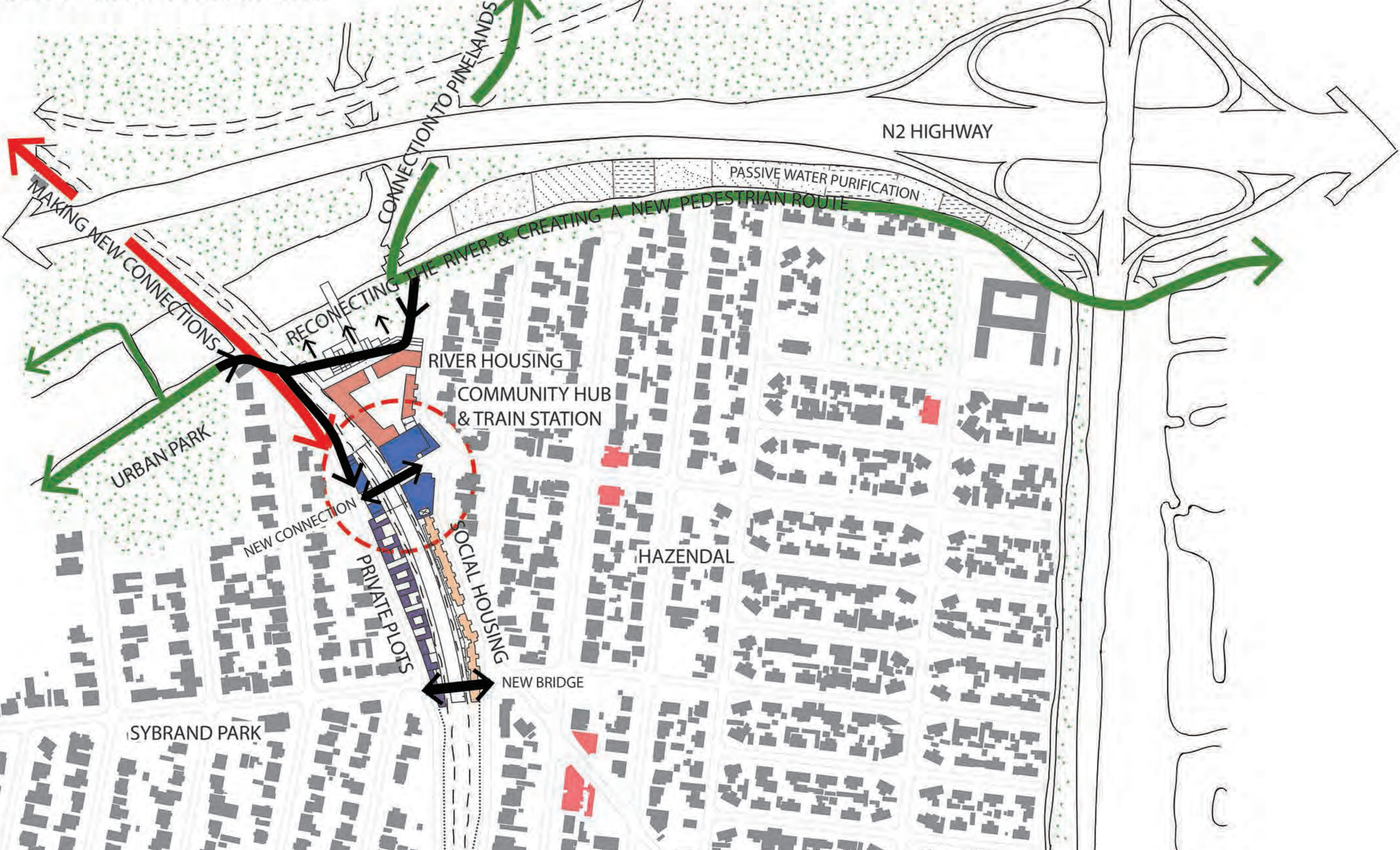
Currently Hazendal is a low density residential suburb.

3. URBAN SCHEME FOR HAZENDAL LONG TERM DEVELOPMENT



0 100m 200m 300m

2. URBAN SCHEME FOR HAZENDAL SHORT TERM DEVELOPMENT

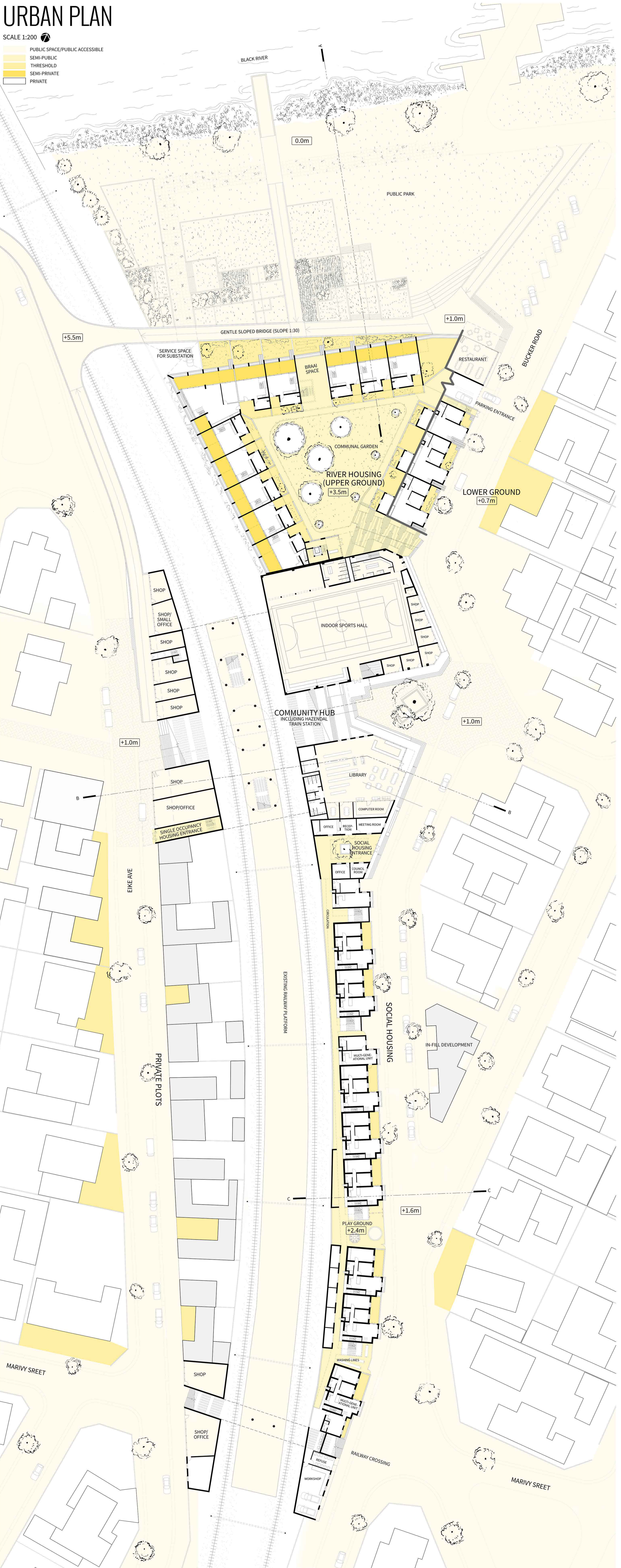


0 100m 200m 300m

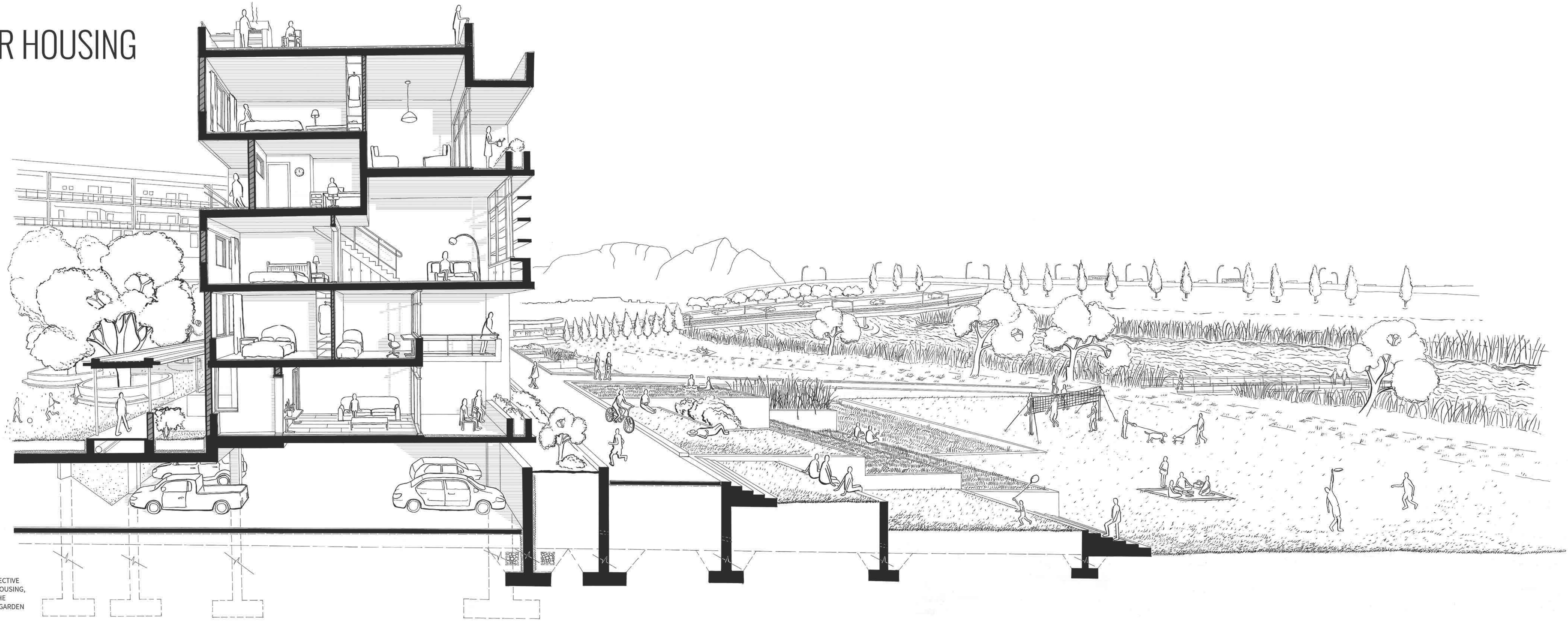
URBAN PLAN

SCALE 1:200

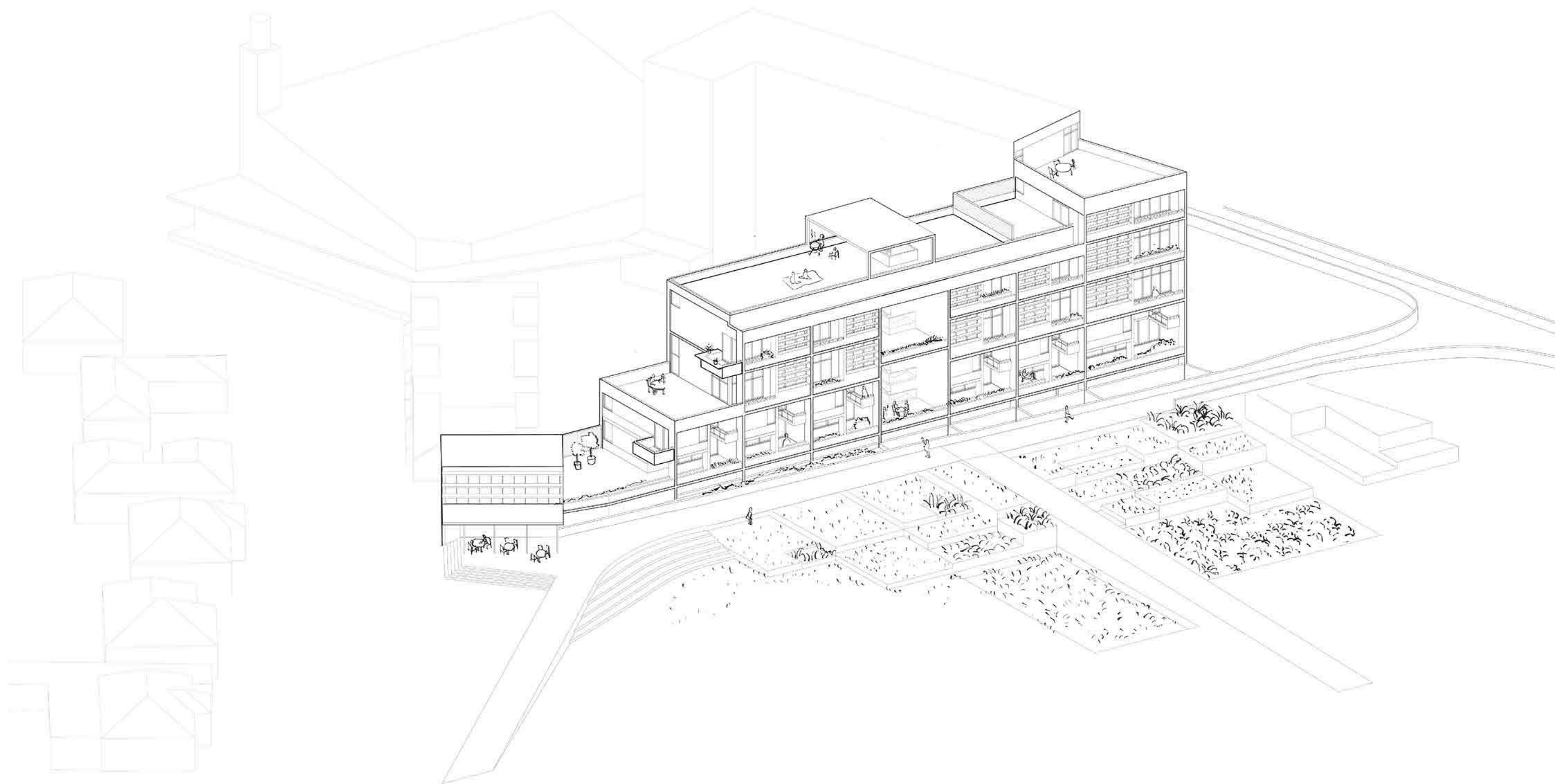
- PUBLIC SPACE/PUBLIC ACCESSIBLE
- SEMI-PUBLIC
- THRESHOLD
- SEMI-PRIVATE
- PRIVATE



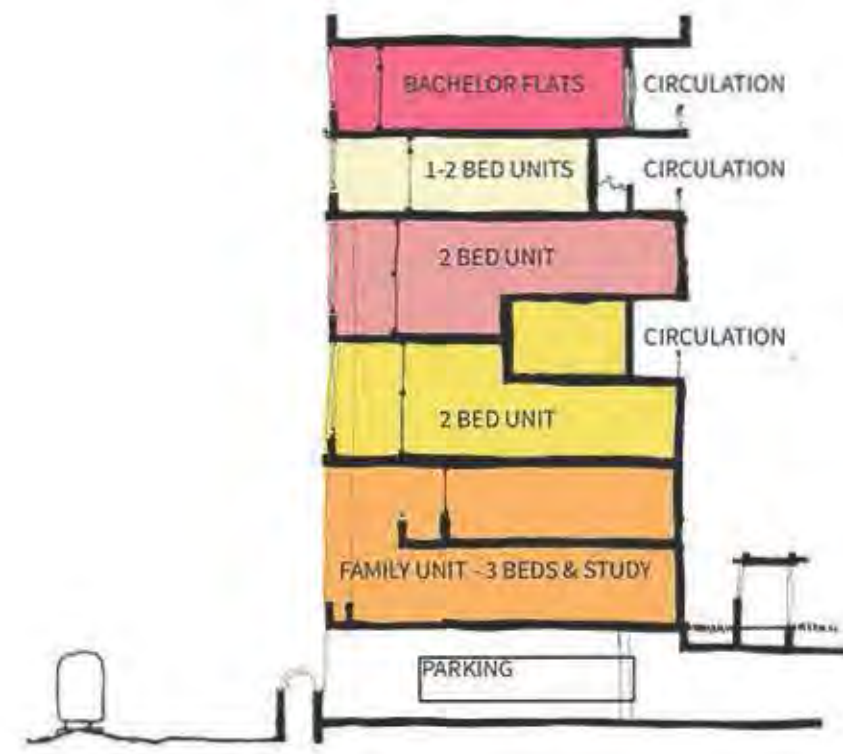
RIVER HOUSING



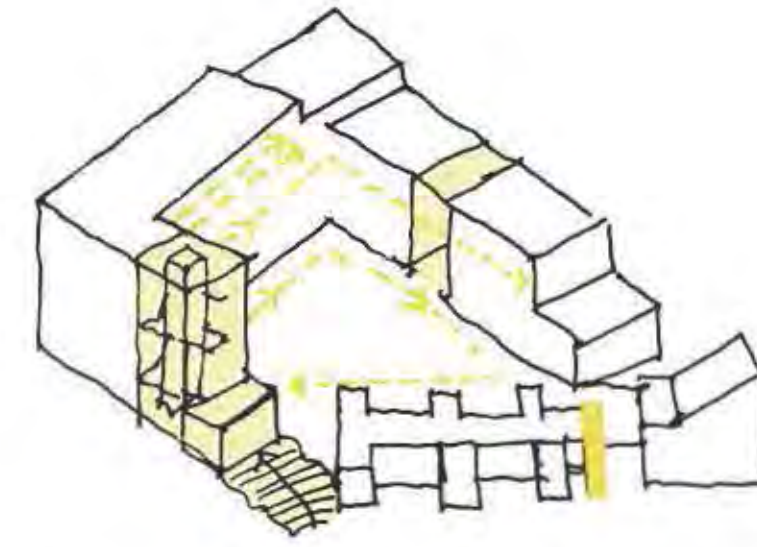
SECTION A-A
SECTIONAL PERSPECTIVE
THROUGH RIVER HOUSING,
LANDSCAPING & THE
COMMUNAL ROOF GARDEN



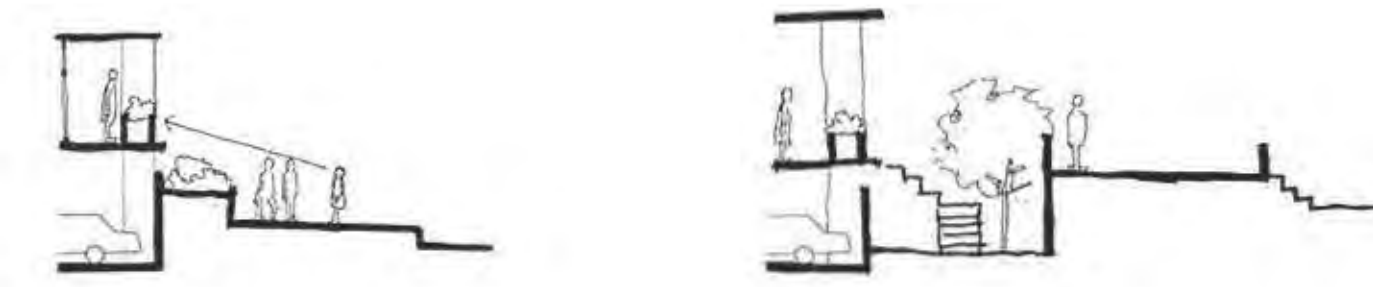
RIVER HOUSING NORTH FACADE
SCALE 1:200



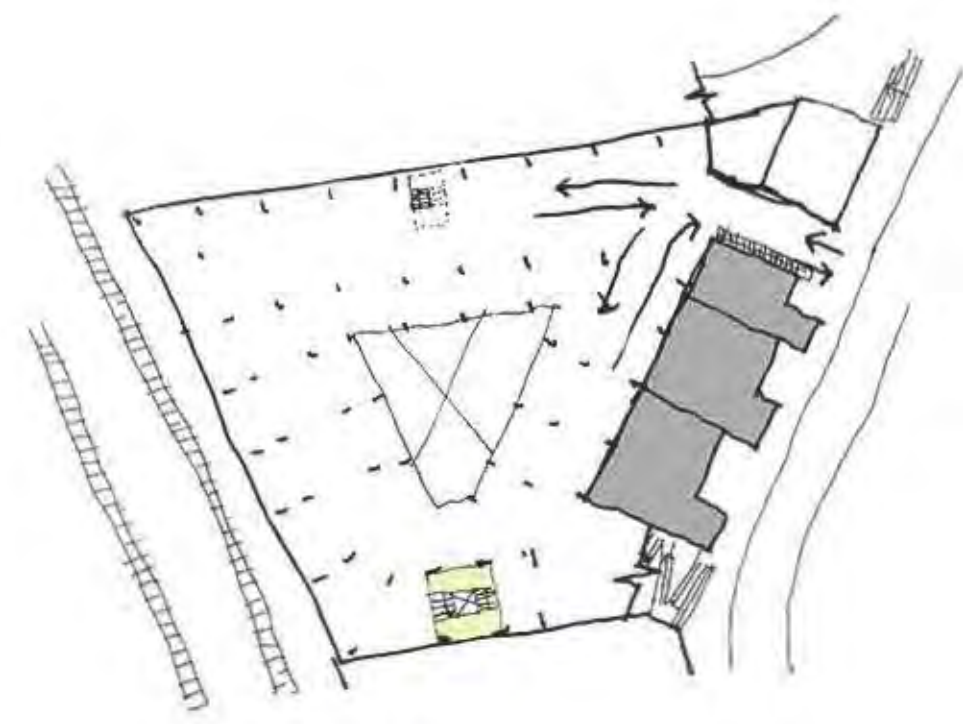
VERITY OF UNITS
SECTION THROUGH THE WEST SIDE



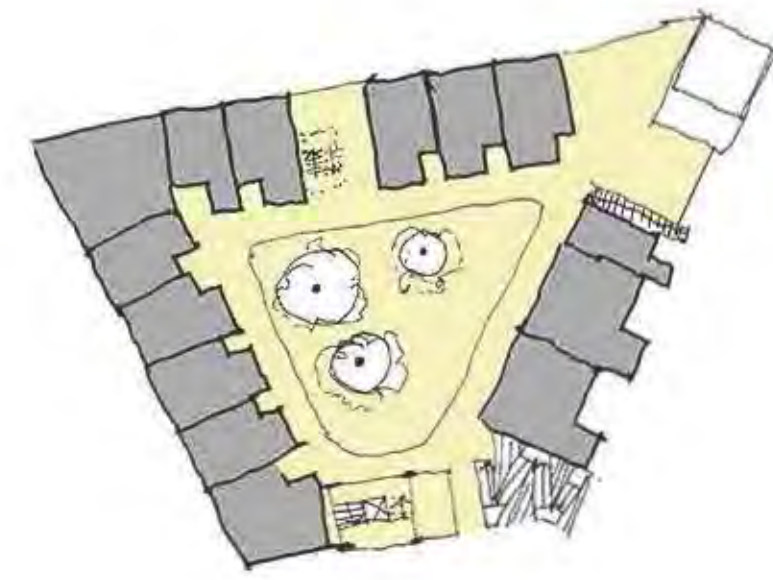
CIRCULATION



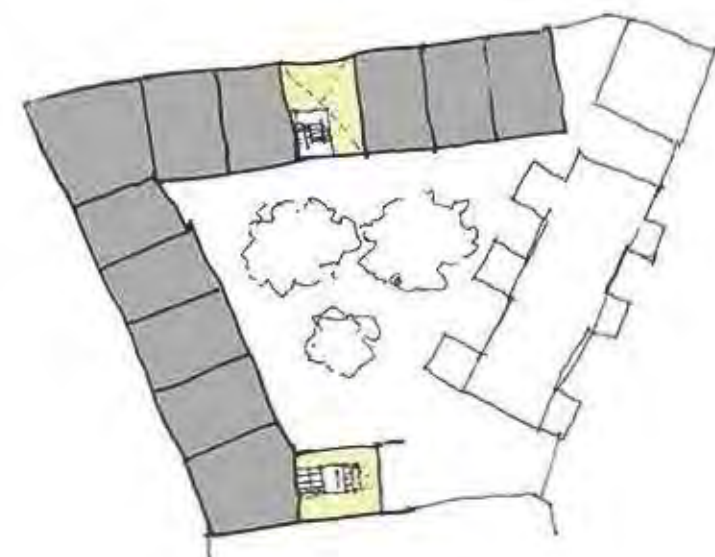
PRIVACY
CREATED THROUGH RAISING THE UNIT OR A GARDEN SPACE



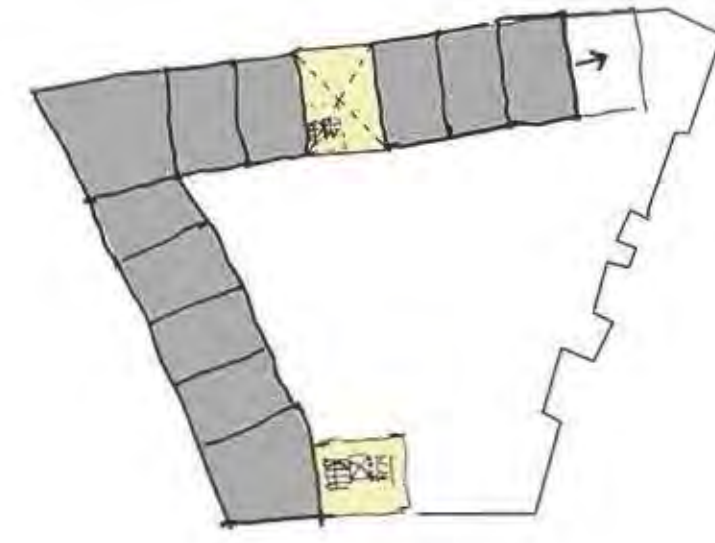
GROUND PLAN
PARKING



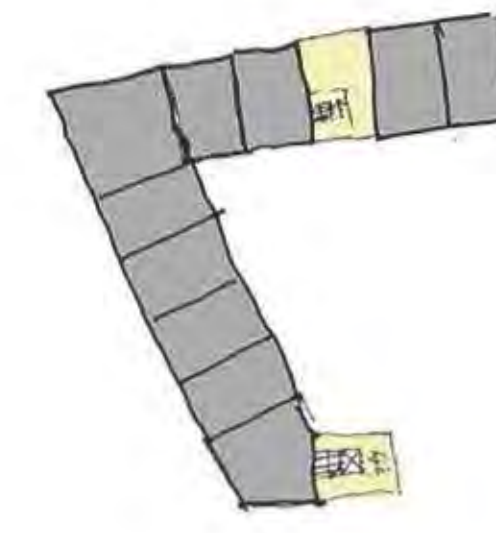
FIRST FLOOR PLAN
FAMILY UNITS & COMMUNAL GARDEN



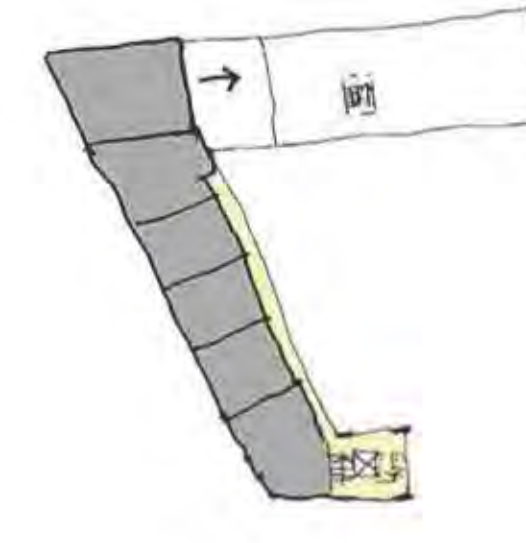
SECOND FLOOR PLAN



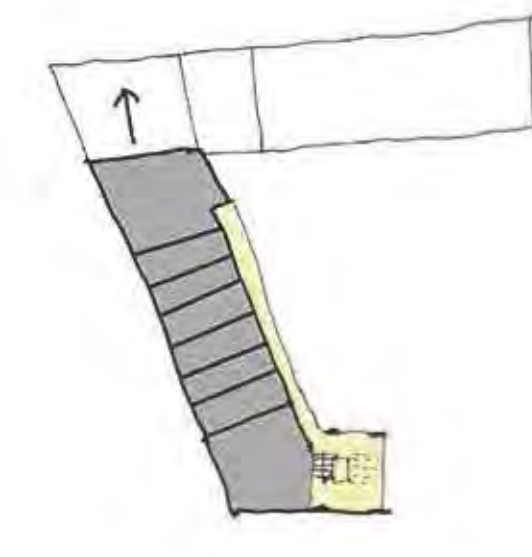
THIRD FLOOR PLAN



FOURTH FLOOR PLAN



FIFTH FLOOR PLAN

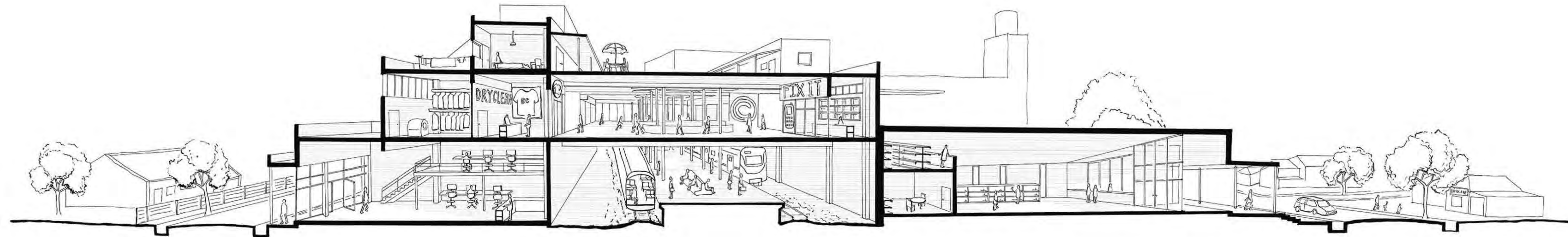


SIXTH FLOOR PLAN
BACHELOR FLATS

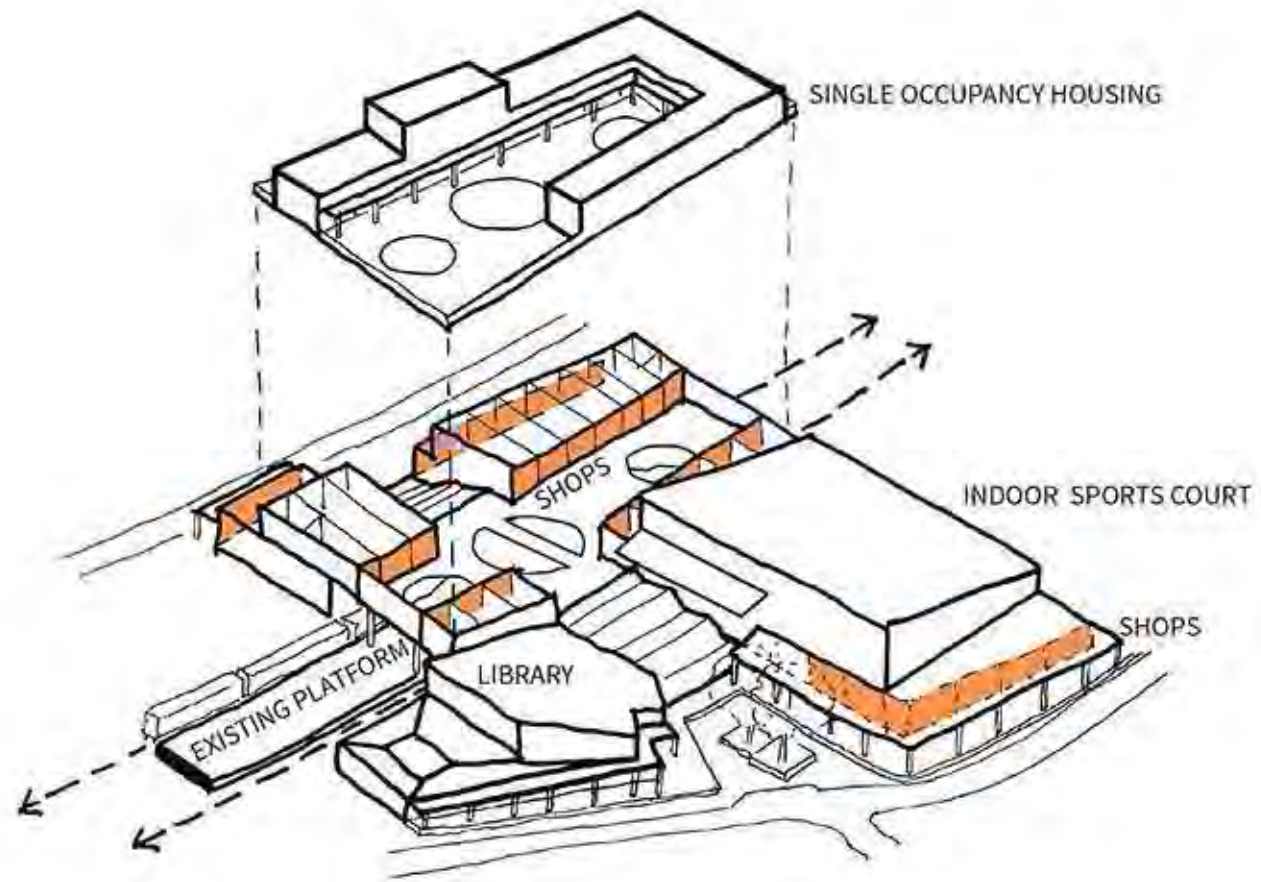


RIVER HOUSING PLAN S
SCALE 1:500

TRAIN & COMMUNITY HUB



SECTION B-B
SECTIONAL PERSPECTIVE THROUGH THE COMMUNITY HUB,
TRAIN STATION AND LIBRARY



EXPLODED AXONOMETRIC OF COMMUNITY HUB

Retail space is shown in orange. Retail space and community facilities activate the train station.

BUCKNER ROAD ELEVATION

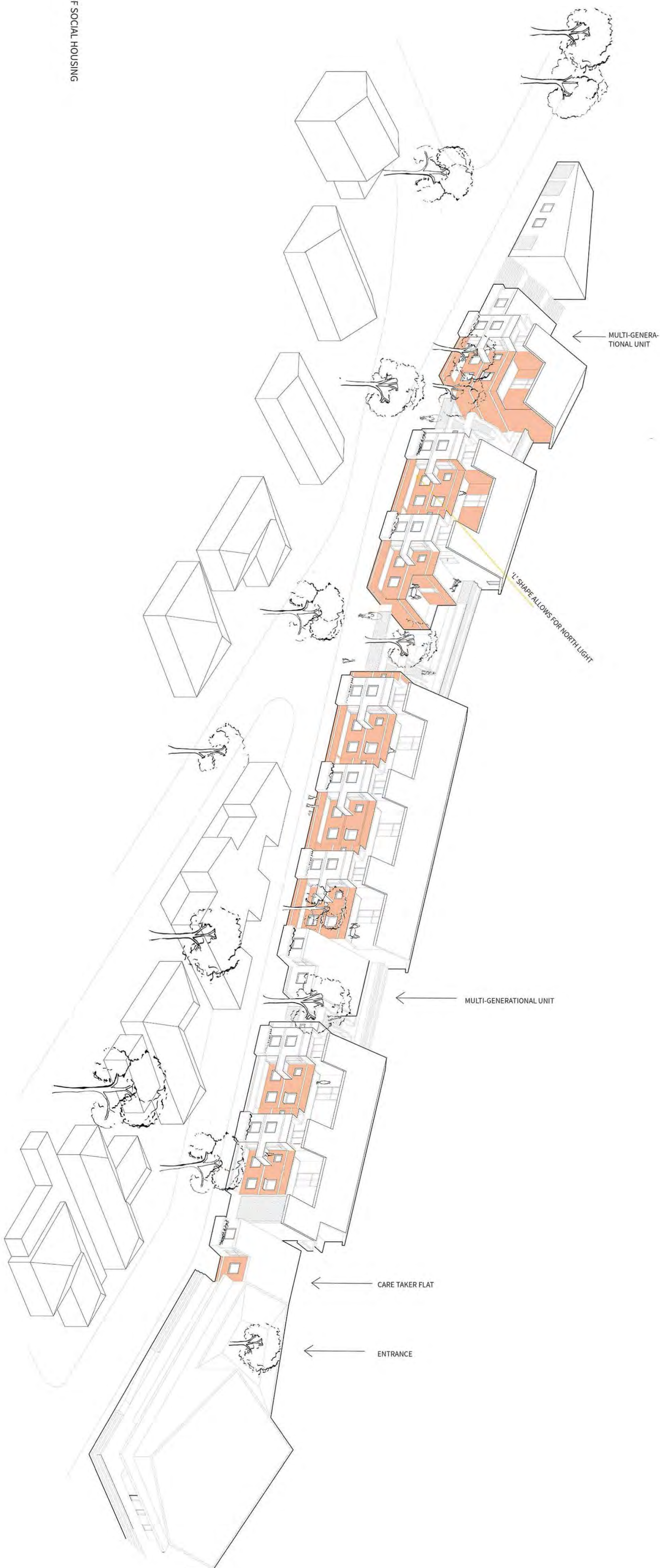


NORTH-EAST ELEVATION
SCALE 1:200

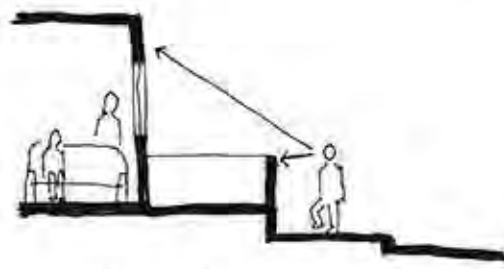
SOCIAL HOUSING



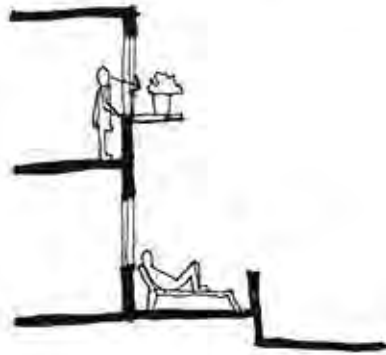
SECTION C-C
SECTIONAL PERSPECTIVE
THROUGH SOCIAL HOUSING



DIAGRAMS OF HOW PRIVACY IS ACHIEVED



BALCONY OR PATIO SPACE

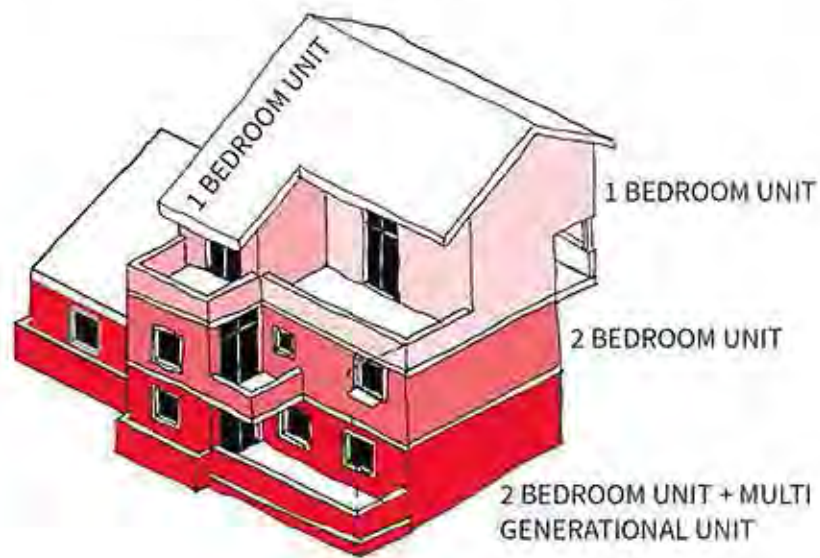


LARGE SILLS SO NEIGHBOURS CANNOT LOOK ON TO THE PATIO

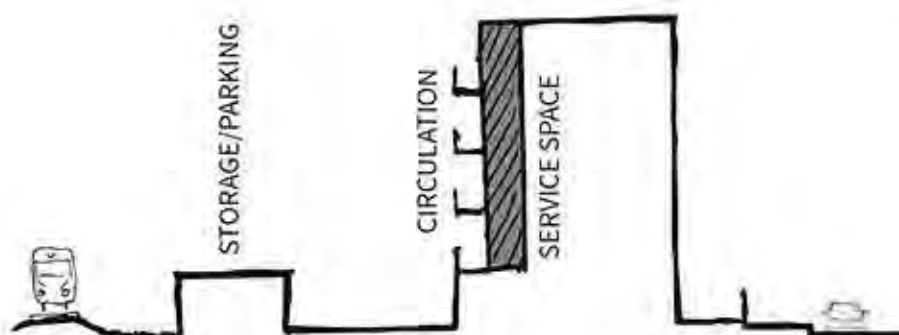


PLANTER & RAISING THE UNIT ABOVE STREET LEVEL

VARIETY UNIT TYPES



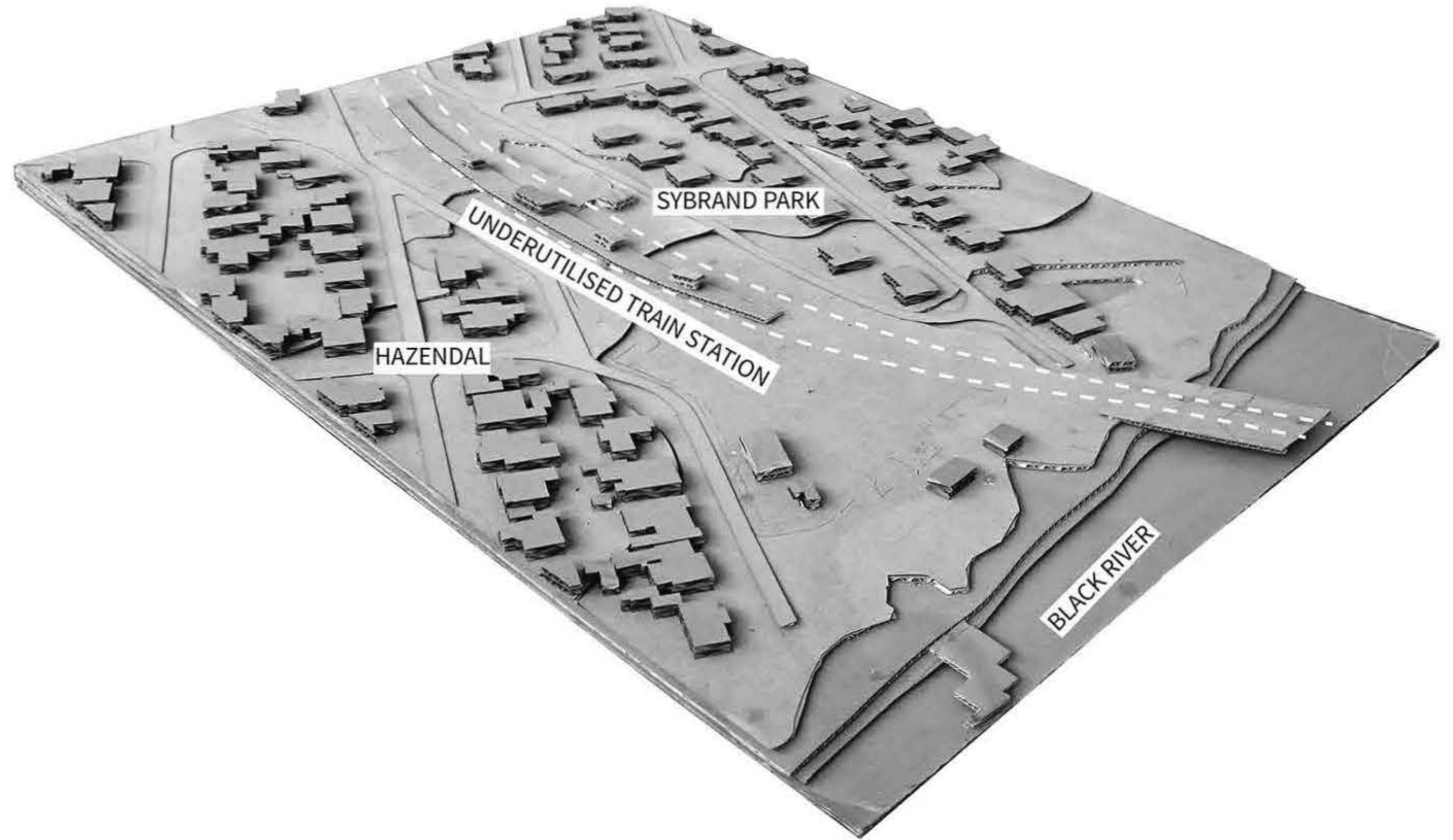
SOUND BUFFER



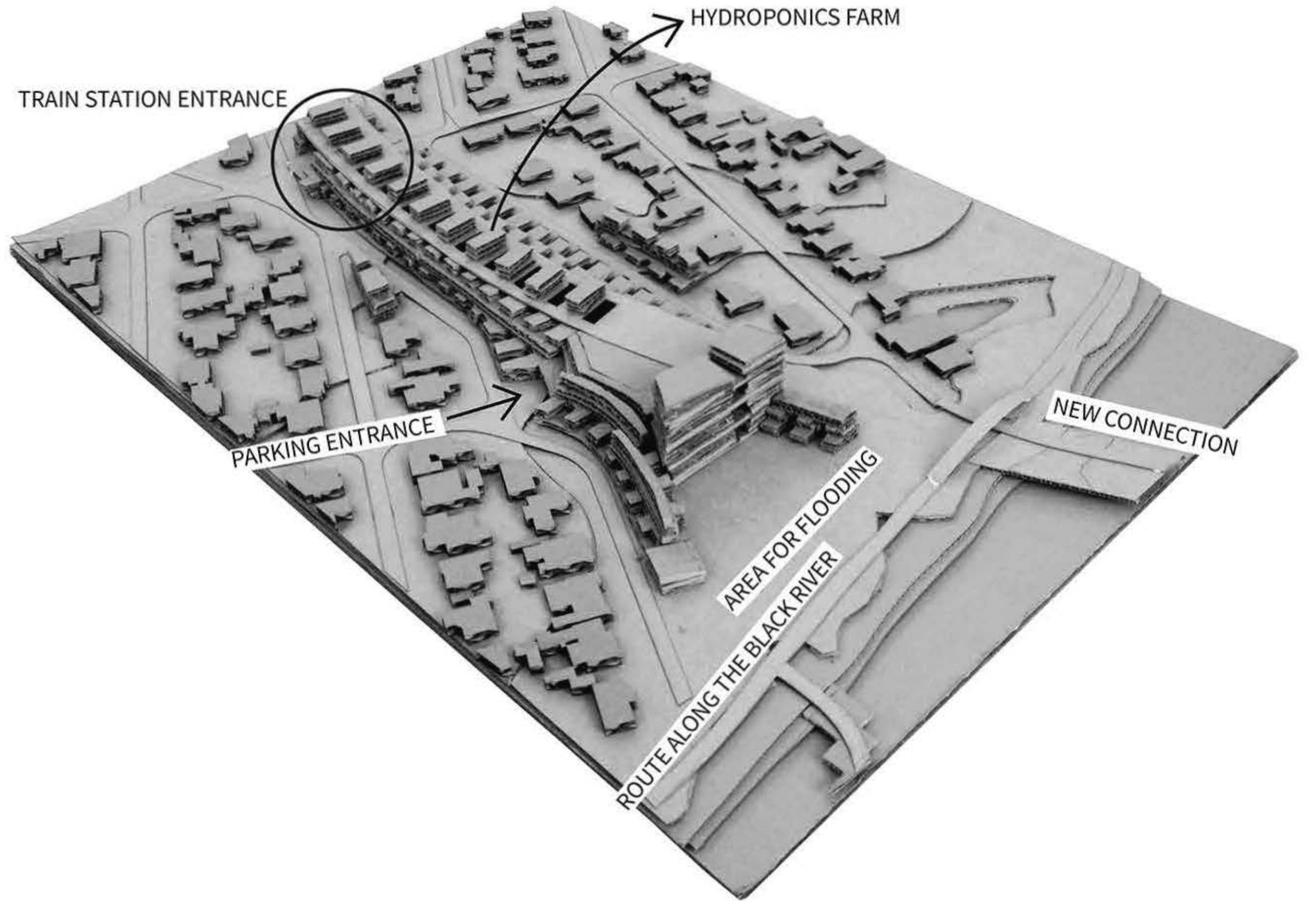
EXISTING RESPONSE TO THE RAILWAY LINE IN CAPE TOWN

PROCESS WORK

THE CURRENT SITE CONDITION



FIRST MASSING MODEL



SECOND MASSING MODEL

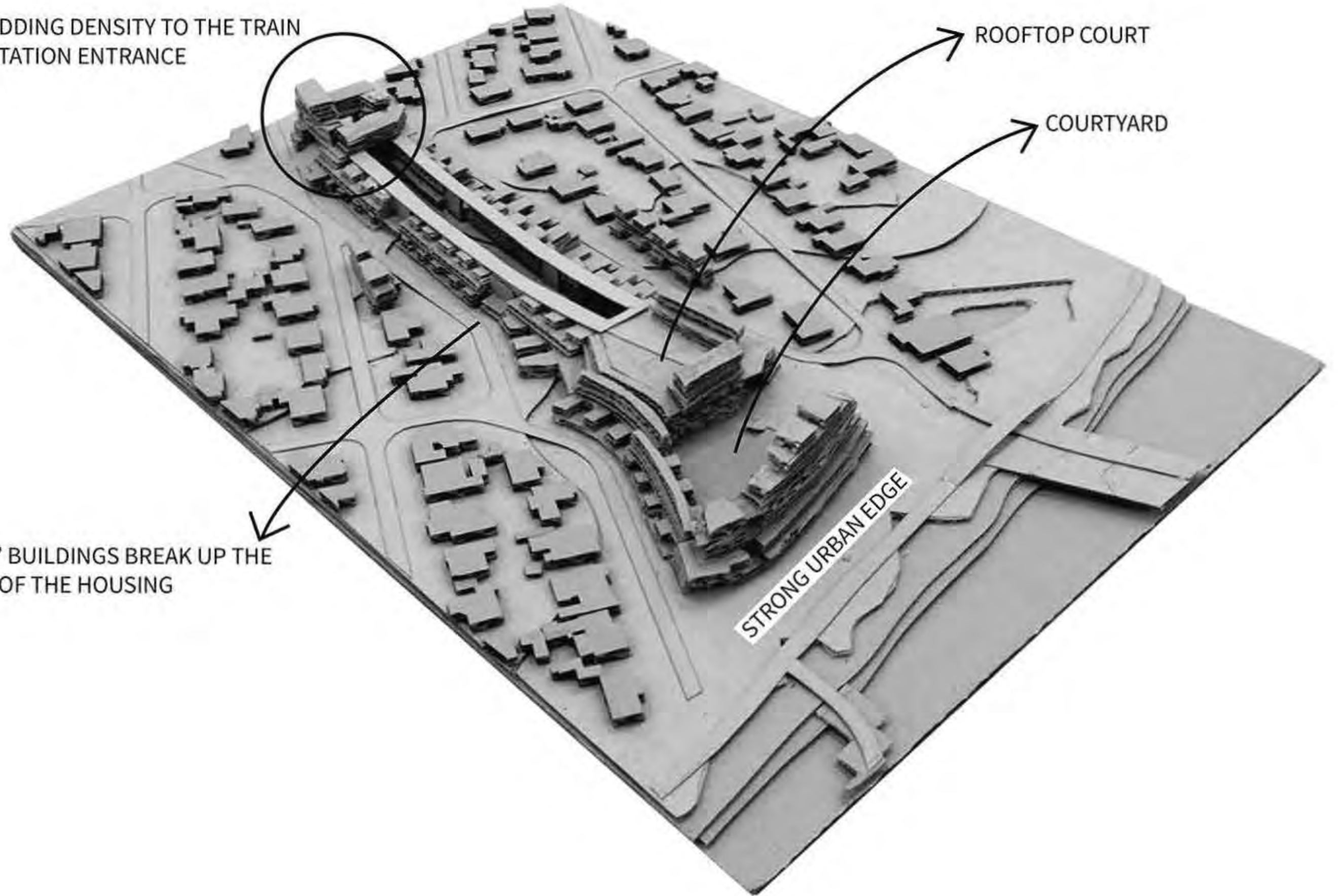
ADDING DENSITY TO THE TRAIN
STATION ENTRANCE

ROOFTOP COURT

COURTYARD

'GASKET' BUILDINGS BREAK UP THE
LENGTH OF THE HOUSING

STRONG URBAN EDGE



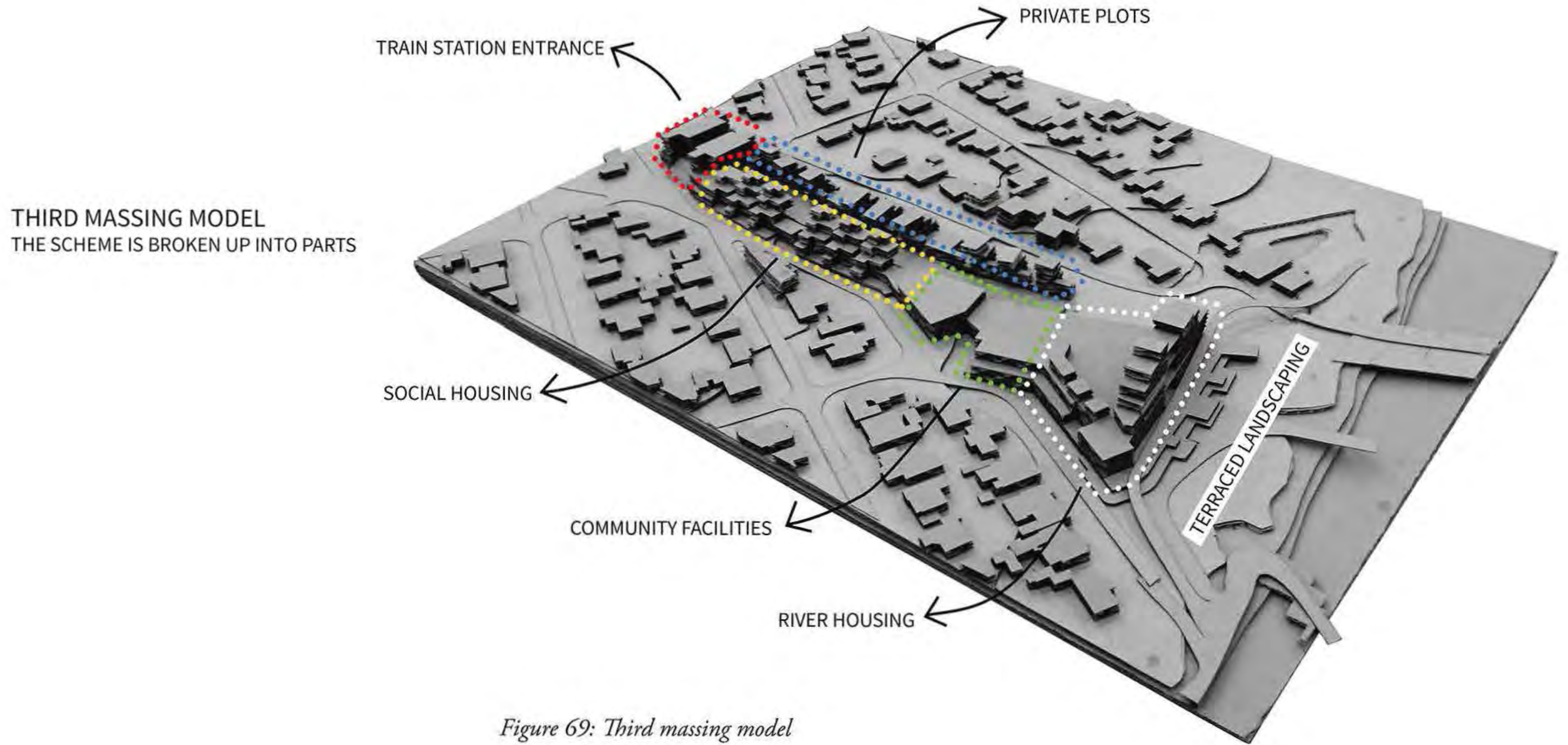
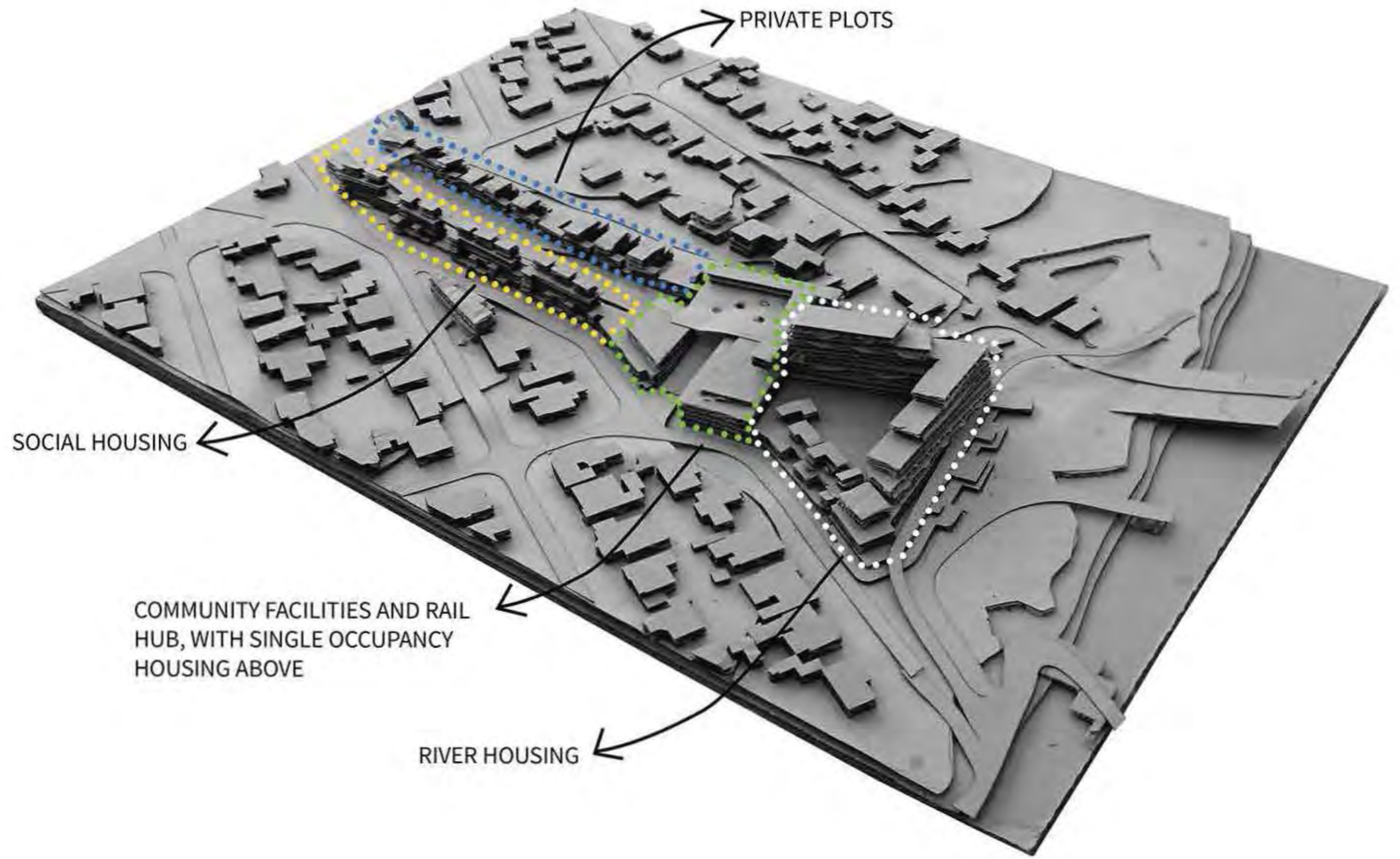


Figure 69: Third massing model

FOURTH MASSING MODEL



PRIVATE PLOTS

SOCIAL HOUSING

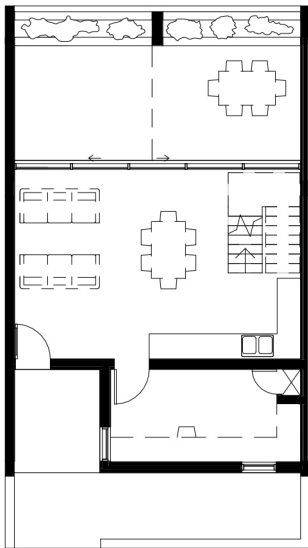
COMMUNITY FACILITIES AND RAIL HUB, WITH SINGLE OCCUPANCY HOUSING ABOVE

RIVER HOUSING

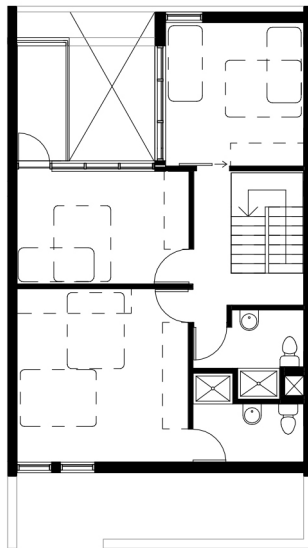
RIVER HOUSING UNIT TYPES

Scale 1:200

Level 1-2



Lower level

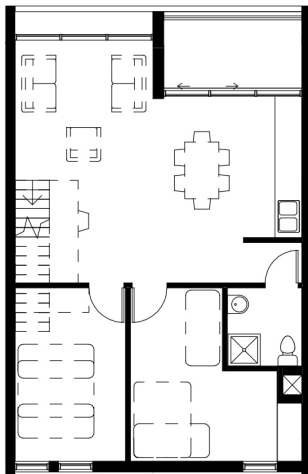


Upper level

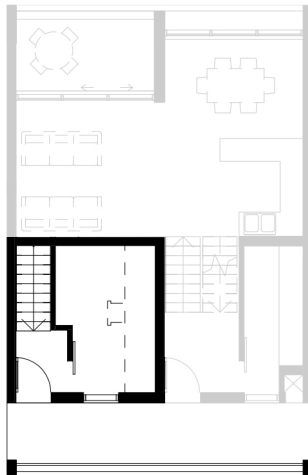
Family unit: 3 bedrooms, study & access to garden space
North-east & west orientation



Level 3-4



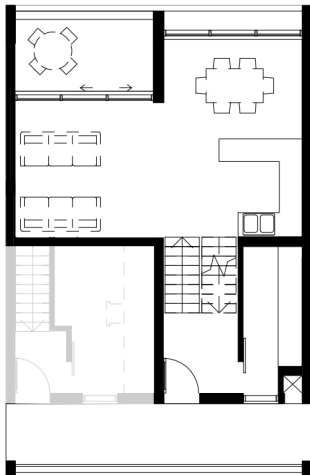
Lower level



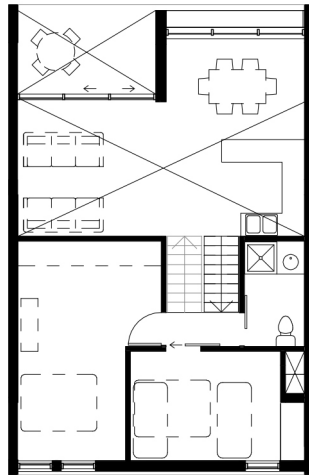
Upper level

2 bedroom unit type 1, including a study

Level 4-5



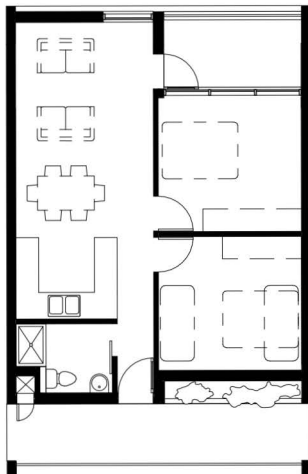
Lower level



Upper level

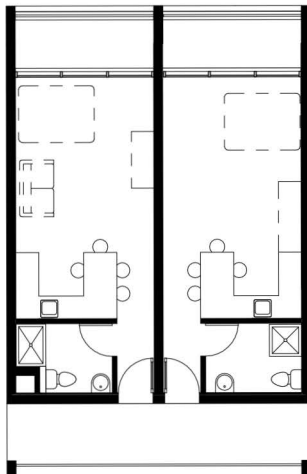
2 bedroom unit type 2, double volume living area

Level 6



2 bedroom unit type 3

Level 7

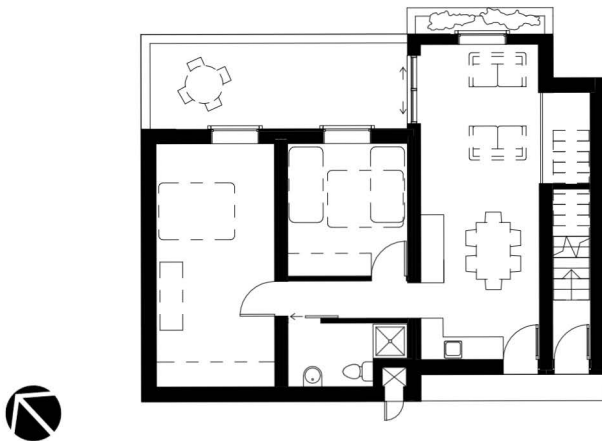


Batcher units

SOCIAL HOUSING UNIT TYPES

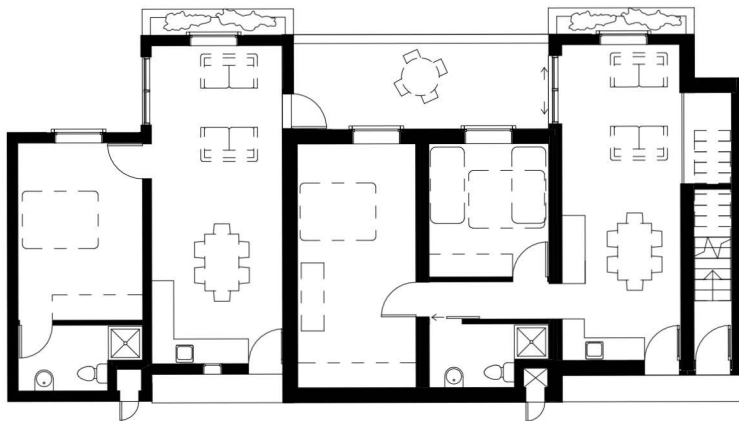
Scale 1:200

Ground level



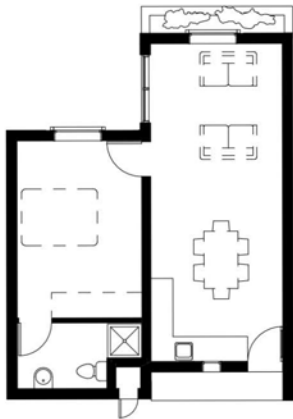
Two bedroom unit
North-east to east orientation

Ground level



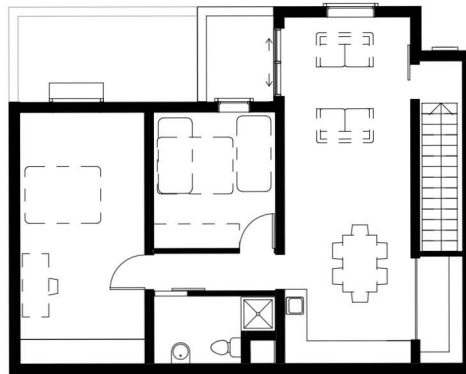
Multi-generational unit with septate entrances - 3 bedrooms

Ground level



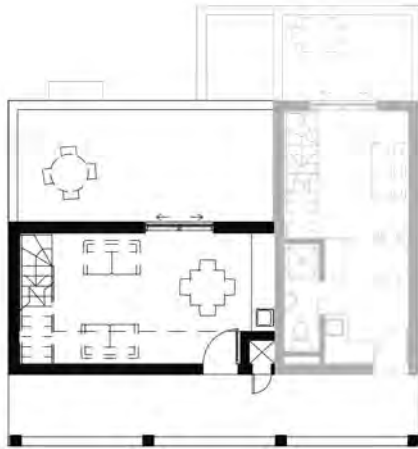
One bedroom unit

Level 1



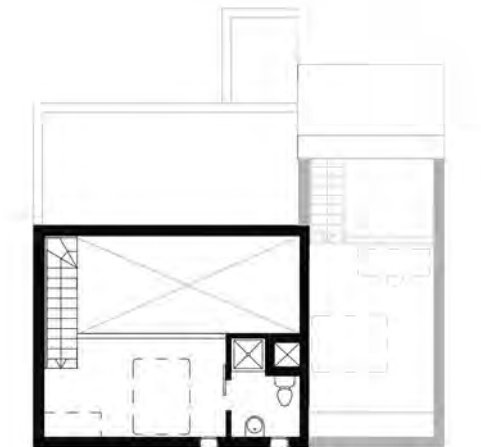
Two bedroom unit

Level 2



One bedroom unit type 1 (lower floor)

Level 3



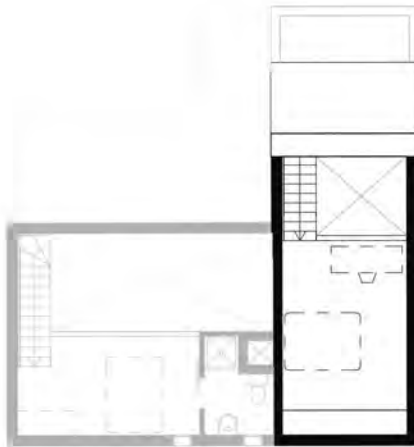
One bedroom unit type 1 (upper floor)

Level 2



One bedroom unit type 2 (lower floor)

Level 2



One bedroom unit type 2(upper floor)

