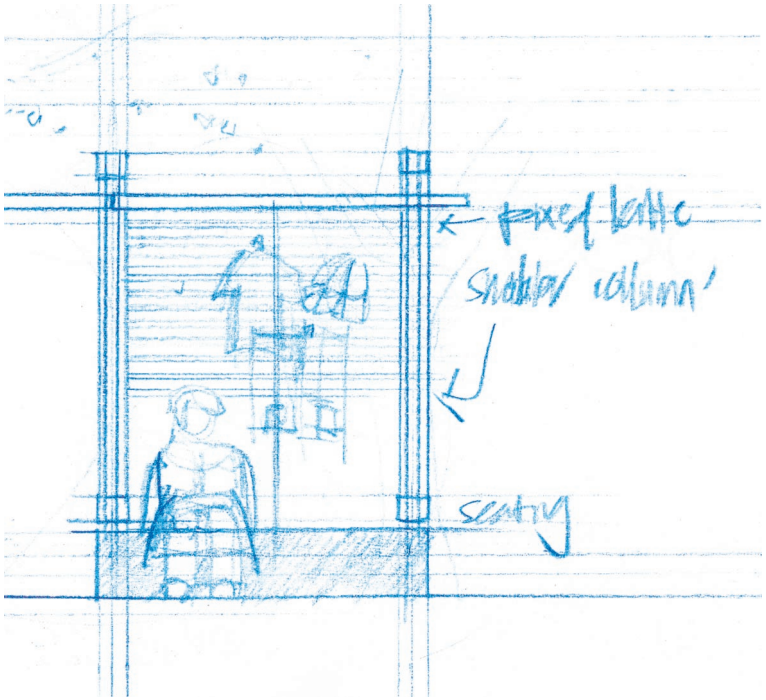

mnemonic diversity

A public building for Makhado, Limpopo Province

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contents

introduction

The following is a recording of an inquisition into site and necessity – serving as design problem, catalysed by a thorough investigation of place. The town of Makhado in the Limpopo Province, serves as the subject of this proposition.

The design problem is comprised of two proponents: Site and building, with the substance of the fore mentioned clarifying the intervention type of built form.
The objective of locale extends to include not only a localised site and attributed programme, but more importantly the understanding of the macro - contextual landscape, of which the town is only a part.

The design narrative begins with identifying those site-specific proponents of context, which comprised of culture and form; help interpret the resulting relationship as that places' "vernacular" (Rapoport, 1989).
The study of "man-environments" throughout a spectrum of time and cultural character is initiated, identifying form making, with specific importance placed on the town itself.
This study will however not remain exclusive to Makhado and its residents, but include it's regional users - Emphasising the large demand by the latter placed on the town.
The investigation thus asks to extend its search of context to these regional users, as the envisaged programme of the Trade and Transport Terminus seeks to include this partisan as permanent and temporal inhabitant.
These users are comprised of long distance commuters, permanent residents and trades-people, currently residing elsewhere.
There will exist then an amalgamation of partisans, whose reference of time and space occupation varies considerably. These references are dictated by their acute visual make-up, founded on identity of home, social and working space, and the conduct of ritual activity within these respective realms.
It is thus by the understanding of these users' contextual composition, ranging from signs and meanings to form making, that underpins the design investigation of this paper.
The aim is to successfully collect and arrange the respective schemata of these users accordingly, making a legible environment within one that is already strictly defined.

_01 context early settlement and form

The endeavour is to firstly understand the cultural composition of Makhado, whose essence is captured far beyond its municipal borders, inclusive of the agricultural and rural land type that supports the town's economic and social dependence.

Makhado (Louis Trichardt) and its surrounding region provide a small-scale prototype of the settlement patterns typical of South Africa's larger metropolitan areas.
The modernist town, surrounded by economically yielding land is strewn with collected pockets of migrant and resident black labour in peripheral locations. These "grouped areas" and townships were and still are comprised of inferior housing and services, with buffer zones and other spatial devices used to minimise interaction among races.

It is by this instance that the unfolding of social polarisation of the region is clarified, identifying the directives of early segregation and later apartheid urban form. Also, the urban condition of post-apartheid Louis Trichardt will be discussed, with reference to the planning generators of the last ten years.

Figure 1.1 The Limpopo River

Figure 1.2 Golden rhinoceros found at Mapungubwe

Figure 1.3 Mapungubwe

Louis Trichardt lies dormant to some of the earliest trade routes in Southern Africa. Jansen (2004) suggests that trade attracted the interest of Venetians to southern Africa as early as 800 AD, with Mapungubwe serving as the earliest documented trade post to the region.
Mapungubwe flourished as a city and trading center from 1220 to 1290/ 1300. Considered by some as the capital of southern Africa's first state, Mapungubwe may have reached a population of 5,000.
The city grew in part because of its access to the Limpopo River, which connected the region through trade to the ports of Kilwa and other sites along the Indian Ocean. This new trade was grafted onto existing regional networks along which salt, cattle, fish, metals, ostrich-eggshell beads, and other items had been flowing for centuries.

The discovery of gold in stone ruins north of the Limpopo River in the 1890s attracted prospectors and treasure hunters to the Limpopo River valley. In 1932, the ruins of Mapungubwe were uncovered. Twenty-three graves have been excavated from this hilltop site. The bodies in three of these graves were buried in the upright seated position associated with royalty, with a variety of gold and copper items, exotic glass beads, and other prestigious objects.

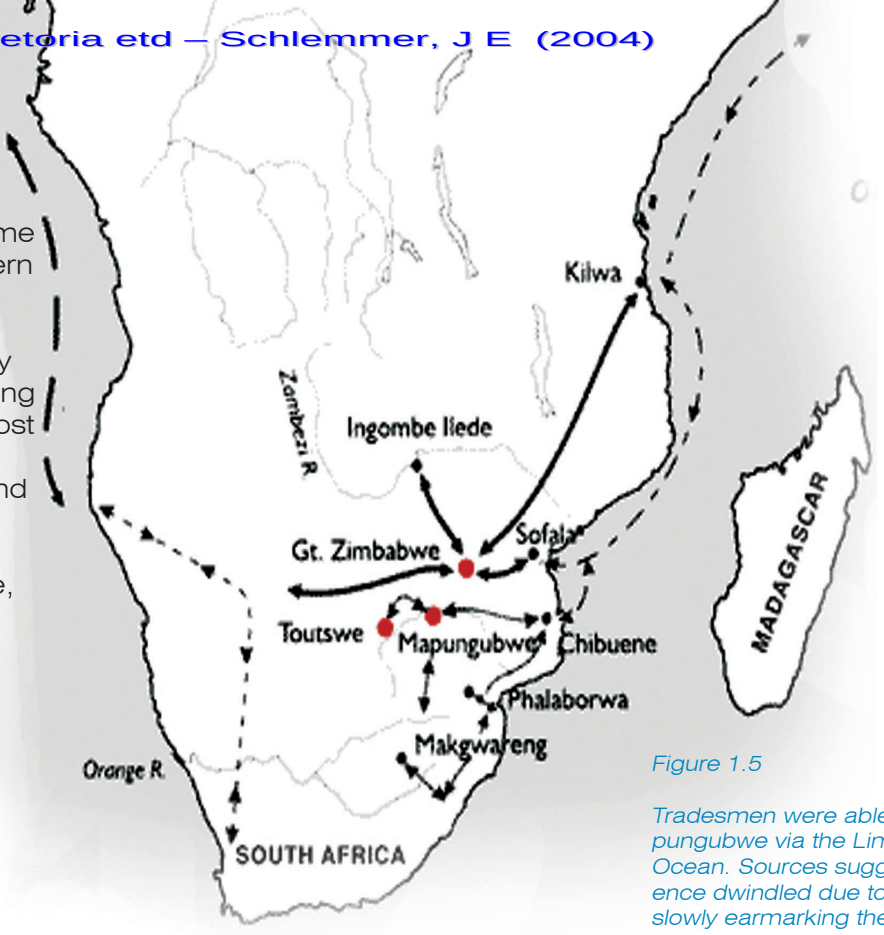


Figure 1.4

Map depicting the trade routes prescribed by early tradesmen. Venetians are the earliest documented foreign people to access the southern parts of Africa. New prestige items, including glass beads and cloth, were introduced through the Swahili trade and were likely exchanged for gold, ivory, and other locally produced goods.

These finds provide evidence not only of the early smithing of gold in southern Africa but of the extensive wealth and social differentiation of the people of Mapungubwe. Most spectacular among these finds is a gold foil rhinoceros molded over what was likely a soft core of sculpted wood.
Thriving only from 1290 to 1300, the city's decline was linked to radical climatic changes that saw the area become colder and drier.

Figure 1.5

Tradesmen were able to access the city of Mapungubwe via the Limpopo river from the Indian Ocean. Sources suggest that the city's existence dwindled due to radical climatic change, slowly earmarking the development of Great Zimbabwe

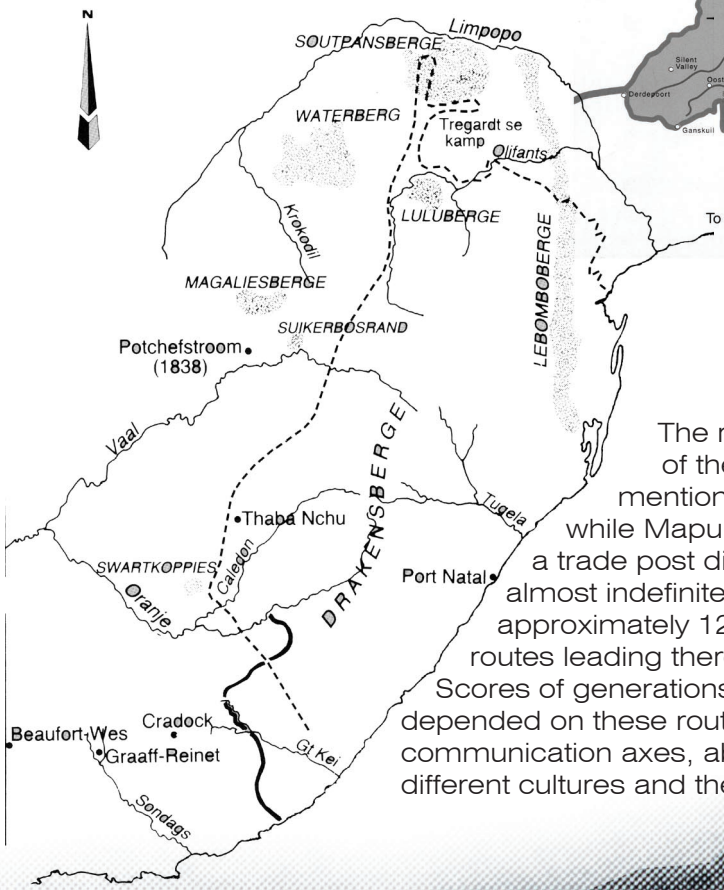


Figure 1.6. Old map depicting the route taken by Louis Trichardt

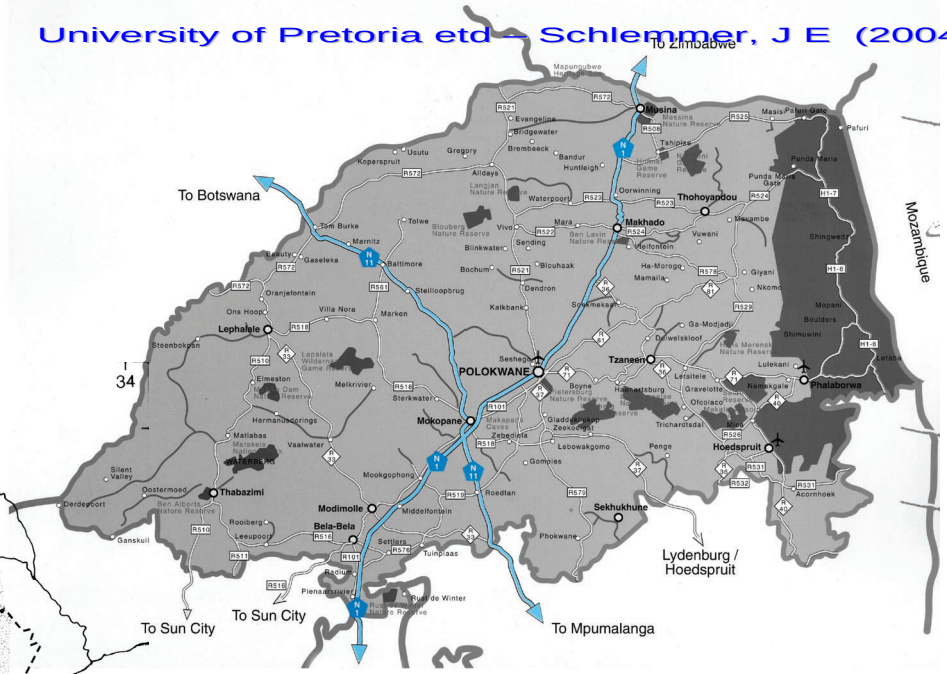


Figure 1.7. The road maps of today that depict the routes first pioneered by Louis Trichardt

The relevance of the afore mentioned, is that while Mapungubwe as a trade post disappeared almost indefinitely in approximately 1200 AD, the routes leading there did not. Scores of generations have depended on these routes as communication axes, abuzz with different cultures and the exchange of resources, which have over time sought alternative paths.

One such pioneer of these routes is the Afrikaner Trek Boer Louis Trlchardt, who penetrated the northern interior in 1836. Founded by the trade of salt harvested from the saltpans north west of the Soutpansberg mountain range, hunting and trade in animal hides, and later agriculture, the town ultimately served as a temporal refuge to the tradesman, who was en route to the east coast of Mozambique, where he was to reside until his death.

Templehoff (1999) explains that trade in the region was lucrative, with interest from the Portuguese of Mozambique, and Brittish traders of the Natal coast and Port Elizabeth respectively. Influx of new residents to the Soutpansberg district was thus substantial, strengthening the now established yet small Afrikaner community. This white community collectively began to undermine traditional authorities by their land occupation, and inevitably catalysed years of civil unrest between themselves and the local African tribes. With military support from the Republican Government, the Venda people were overthrown in the Mhephu War of 1898, rendering the sovereignty of the northern interior to the Afrikaners. Louis Trichardt then, was officially proclaimed on 14 February 1899.

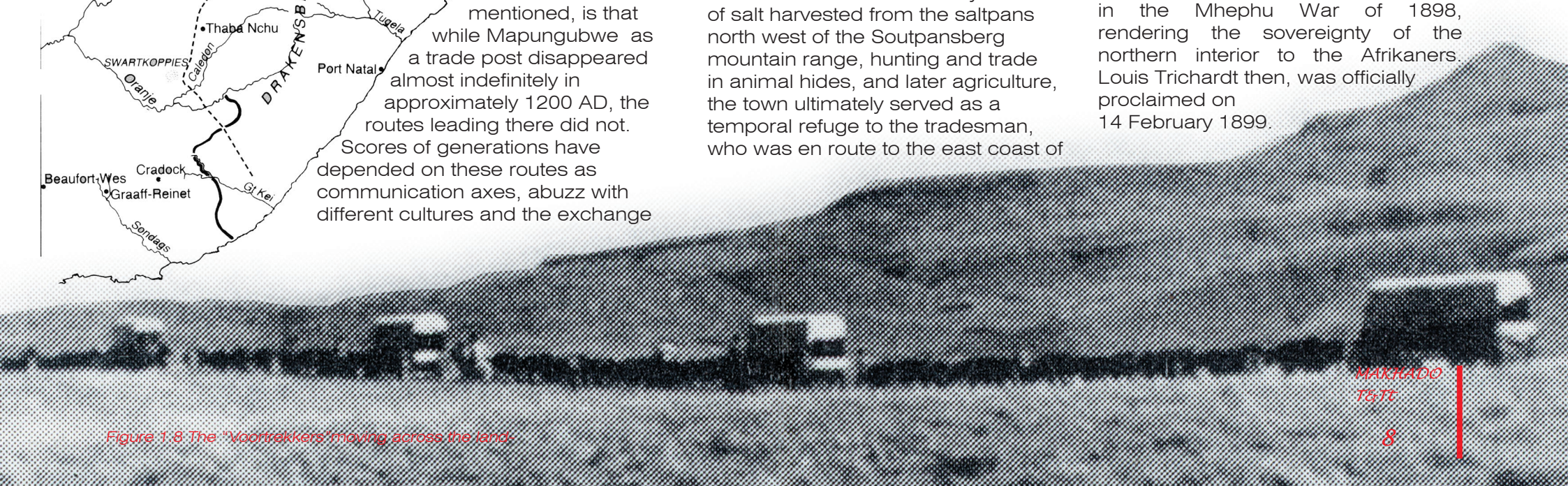


Figure 1.8 The "Voortrekkers" moving across the land-

Figure 1.9 left: Aerial photograph depicting the mountain and farmlands

Placed at the foothill of the Soutpansberg, the subtropical climate proved to be ideal for farming in both livestock and later fresh produce. Sufficient water resources were established in the area too, with the construction of The Albasini Dam, named after Jao Albasini – the Portuguese forefather of trade to the region.

Figure 1.10 Albasini Dam

The development of Louis Trichardt after the Anglo Boer War was subject to the economic growth of the Soutpansberg region as a whole, with the prerequisite that the town had to economically sustain an urban community (Tempelhoff, 1999).

The geographical placement of the town thus ultimately won its development over three other possible ventures (Messina, Spelonken and the Soutpan).

Figure 1.11 Construction of railline at Beit Bridge

Figure 1.12 below: Railway line passing through Louis Trichardt to Messina. It later crossed the border into Zimbabwe

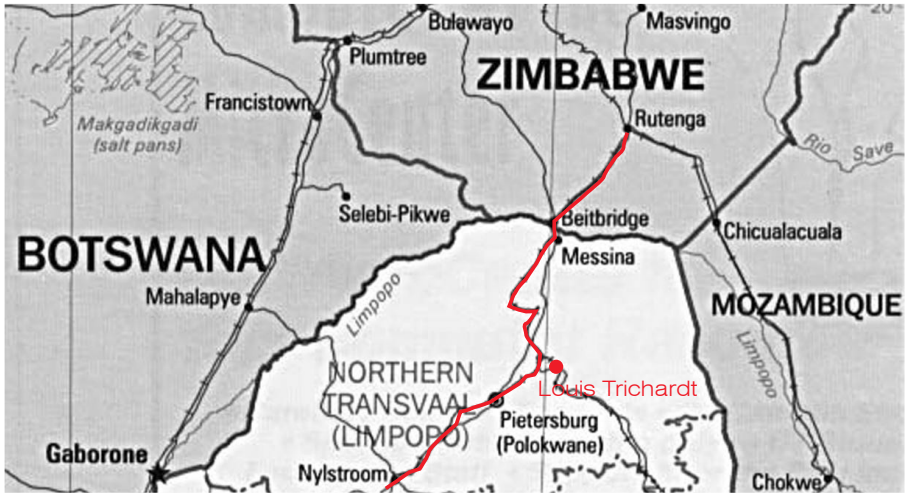


Figure 1.13 above: Homelands of the Northern Transvaal district specific to Louis Trichardt were Venda and Gazankulu

Furthermore, the town was almost directly on the coarse of the north-south trajectory between Pietersburg in the south and the copper mining town of Messina in the north, with the connecting railway line passing through Louis Trichardt by 1914. Forming the nucleus of the east-west intersection for traffic along the southern parts of the mountain range, between Blouberg in the west and the area of Tshivase (Sibasa) in the east, the town was now the culmination of all major lines of transport communication in the far Northern Transvaal, firmly locating it as an economic hub for the upper half of the northern province.

The Occupation Law of 1886 formed the basis of early "land settlement initiatives" in the district, as land could be provided free of charge to prospective owners, subject to them physically developing their properties. One of the first actions of the Union government of 1910 was to effect a legal division describing those areas of the country that were assigned to the indigenous population. The Native Lands act of 1913 prohibited the purchase of land by members of the African community outside the scheduled "land reserves" (Christopher 2001) assigned to them, with the later revised Natives (urban Areas) Act of 1923 re-emphasising segregated areas of African residence under the responsibility of each local authority.
Thus, with legislation firmly in place, as well as strengthened trade routes locating the town within the northern interior and serving the migrating labour force to the district, the foundations of the separate development ideology sought by the Apartheid government were already realised.

the modern

The growth of technology during the 2nd World War transpired into a number of important advances for the town with regard to production in farming of cattle, fresh produce and timber, as well as other industrial activities, such as brick- making and mining (Templehoff, 1999).

But perhaps the most definitive earmark of the post WWII period is that of the change of government in 1948. The National Party introduced the new political theory of Apartheid, which identified a new township for black people, and by the 1950's, was the ordering principle of society in Louis Trichardt – demarcating separate areas for Asians, Coloureds and Indians.

Of coarse racial divide was already inherent in the history of the town, as the first black township was proclaimed on 15 October 1917, north of the current township of Tshikota. But the application of the Apartheid policy would now more consciously govern much of the urban planning for years to come, with their associated problems only surfacing much later. Figure 1.14 illustrates an early map of the town (earlier than 1970), with particular attention drawn to its road layout. Here, it is understood that important transport routes culminated in the town's interior, with Krogh Street serving as the main arterial.

Jansen (2004) suggests that as part of initial settlement, the town was developed on the highest rise of ground elevated from the large river system that lies adjacent to the town's eastern border. This was done to escape breeding mosquitos and the resultant onslaught of Malaria. Easy access to water however was also a determining factor, thus location within walking or horse and cart distance from the river was essential.

The residual portions of land on the outskirts of the town were and remain today land designated for recreational (parks and sports fields) use. This urban planning would later become conscious of enforcing segregation ideals, as depicted in figure 1.14. The Black and Indian communities of Tshikota and Eltivillas respectively are placed at the town's outer peripheries.

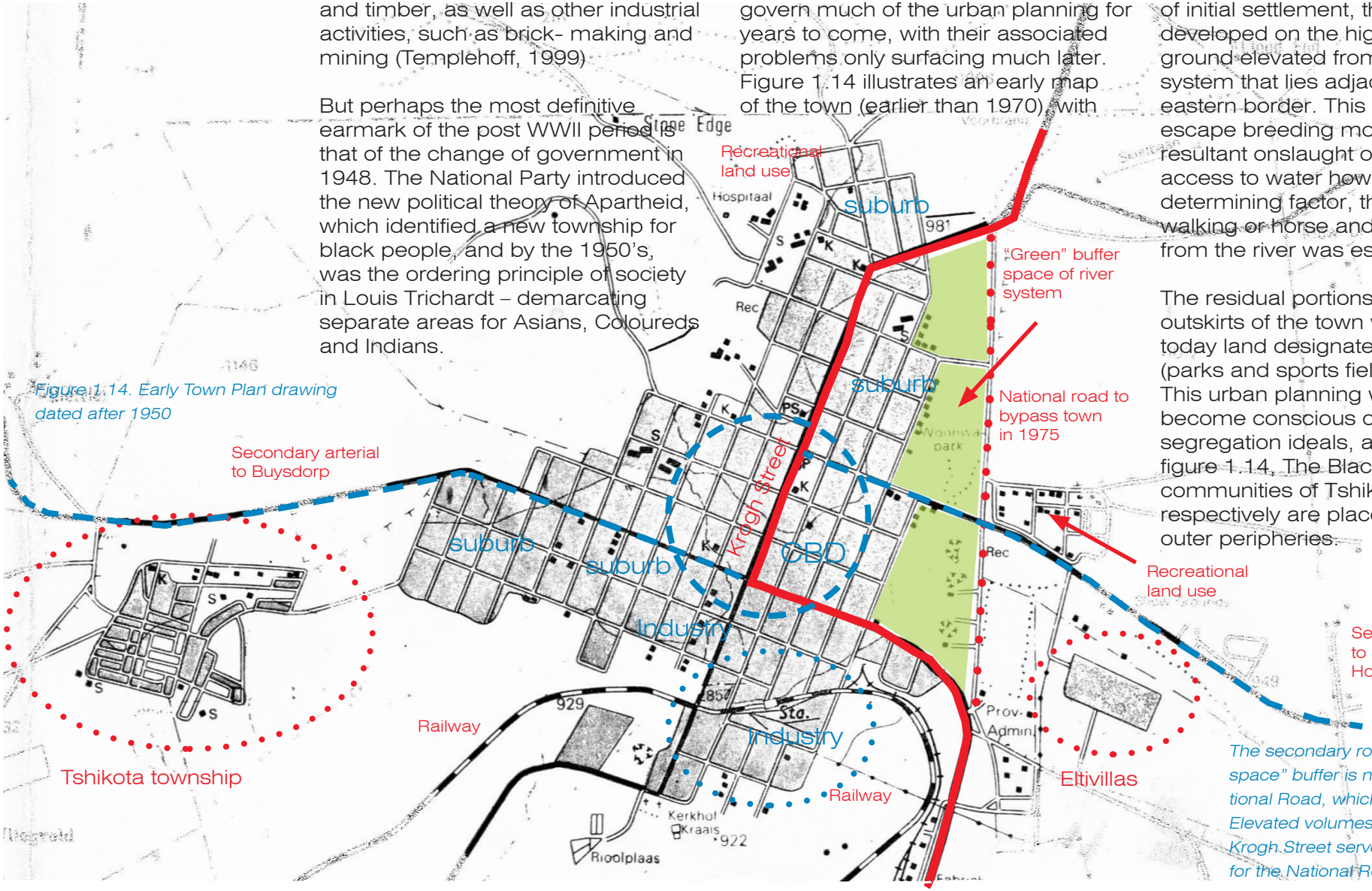


Figure 1.14. Early Town Plan drawing dated after 1950

The secondary road bordering the "green space" buffer is now the new route of the National Road, which was established in 1978. Elevated volumes of traffic in the town's CBD of Krogh Street served essentially as the reason for the National Road's bypass.

Louis Trichardt served as a thoroughfare for people of colour, with migrant labourers commuting to and from the Witwatersrand (Johannesburg). This temporary occupation, together with the ingress of illegal immigrants from African countries north of South Africa, aggravated an already congested township, faced with a shortage of housing and basic sanitary needs. These problems ascribed with the largely unplanned townships were given attention rather sporadically up until the early 1990's. Relocation of residents from overcrowded townships and other areas, such as Gertrudsberg, subject to the Group Areas Act, epitomised the local government's practice of the segregation policy.

Similarly, the Indian and Coloured communities suffered isolation, with Buysdorp serving as the earliest coloured settlement, and Eltivillas to the Indian community.

Templehoff (1999) explains that further relocation of the town's Indian business to Eltivillas took place in the 70's, as a more "sanitised" image of the town was sought after. A new bus and taxi depot serving the large black community who commuted to the town would be provided for here too, with the result that they could then make use of this new business post.

Implementing the Group Areas Act in all its consequences implied that the Central Business District (CBD) would ultimately lose direct access to its Black buying power, which was sourced as far as 60km away. The only Indian traders left in the CBD, were those granted permission on the basis of the nominee system, which lasted as late as 1990 when the Conservative Party refused Indian free trade in the CBD once more.

This decision was ultimately short lived and was the last tool of control the local government could exercise before the new democracy was established in 1994.

The proclamation of the national road to bypass the town in 1975 contended with all communities, but was especially of detriment to the white community.
The new Eltivillas business centre now enjoyed direct access from the national road, and ultimately won obvious economic profit for the Indian community.

The placement of the National road and the development thereafter, ultimately influenced the segregation ideals of the town,and at present day, comprised of contrasted political and economic growth, reveals a number of different urban constituents.

Figure 1.15 below: View of Krogh Street in the 1920's

Figure 1.16 below: 1923 aerial photograph of the town with Krogh street at the centre and the Sout-pansberg mountain range behind

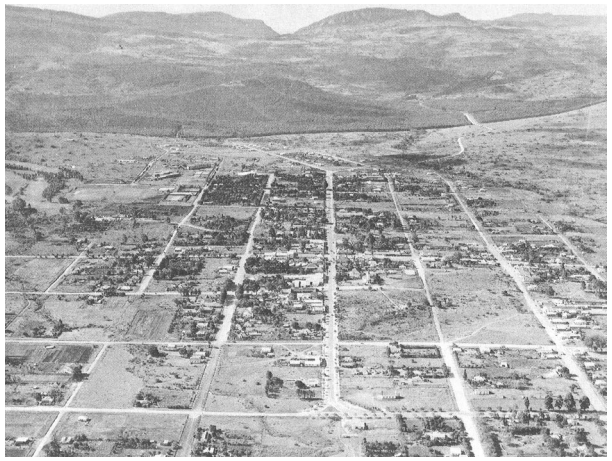


Figure 1.17 below: Roadside sign in Johannesburg proclaims Apartheid paranoia

Characteristic to the Apartheid urban form at a macro-scale is racial segregation. This principle has already been identified, but at closer inspection, development of ultimatelty nonsusutaining environments is revealed by a polarisation of social order, or class.

In *The Urban Challenge and Housing in South Africa*, 1996, Dewar identifies a number of modernist town planning principles devoid of integrating people of a low income bracket into the city, namely; Low density sprawl and Fragmentation

Typical to these themes is the development of activity cells of mono-functional type, placed at distances from eachother that make their access limited to the automobile. The grain of the city is coarse, with activity pockets bounded by freeways and seperating buffers of open space - Dewar (1996)

In Louis Trichardt's application - Figure 1.18, the CBD is circumvented by industrial, suburban and recreational land type respectively, confining programmed activity to different parts of the town.
Dewar explains quite obviously that the costs generated by this type of system are immense, and that there often exists an inefficient and limited public transport infrastructure, denying low-income citizens to basic amenities and small-scale economic opportunities.

The severity of this is best felt at a macro-scale, indicative of the peri pheral townships and rural homelands.

The full potential of these principles would however only be reached in the town itself with the decline of the Apartheid regime.
The now openly accessible service centre would succumb to a long overdue mass of occupation, revealing urban typologies again exemplary of other major metropolitan centres in South Africa.

post-apartheid

Class stratification is further supplemented by Smith (2003) who notes the collection of better housing for the small Indian/Asian and coloured middle-class typical of the apartheid landscape.
This helped relieved the rather monotonous areas built for the non-whites.

He suggests however, that even with the repeal of group areas legislation, this pattern was to persist well into the most contemporary urban form of our cities.
In *Confronting Fragmentation, Housing and Urban Development in a Democratising Society*, Smith makes reference to more urban contexts of "accretions of informal housing…and the spontaneous occupation of unused land" to support his argument.

While this is not necessarily the case in the town of Louis Trichardt, this activity is definitely typical of large scale land use in the agricultural districts within the Makhado municipal borders.
Also, the purchasing of property by the now financially capable Black and Indian community is typical, with interest in land occupation reaching prospective businessmen from the major metropolitan areas, such as Johannesburg.

Smith qoutes David Simon (1989) to have captured change of this nature - "*The vision of the post-apartheid city was thus one of continuing segregation and seperation, or fragmentation,with little impact on the existing highly unequal housing stock…Whites would tighten their belts, but few would be forced down the housing market. The black political elite, bourgeoisie and administrative strata would grow…and gain access to better residential areas, But for the mass of blacks in townships and 'shacklands' , and for many Indians/Asians and Coloureds, little improvement could be appreciated. The prosepct was thus of class divisions stadily augmenting the racial seperation inherited from the past, to produce a city characterised by some as 'deracialised apartheid'.*"

Figure 1.18

For fear of enduring unsafe and insecure working environments, a large constituent of business and commercial interests have vacated our cities' CBD's, for new development elsewhere.
This diaspora from the central business district has left the core of our cities almost economically and socially delapitated, not to mention the physical deterioration of the sub-urban fabric that has had to carry the weight of often sporadically placed and low density office parks and new business centres.
Thus again, just as in apartheid town plannig, activity pockets are realised, over-catering for basic programmes in the sub-urban fabric and leaving the inner city almost obsolete of further economic and commercial investment.

The relocation of the CBD of Makhado is hardly comparable to that of Johannesburg, but there are smaller businesses that have proclaimed rights in the suburbs.
Similarly, internalised neighbourhoods have now only become more isolated by security intervention. Gated communities are not at all present in Makhado, but new development planning in figures 1.19 and 1.20, indicate this principle of cellular development.

New and existing neighbourhoods are detached from the rest of the urban fabric, remaining independent from the services that the already established service centre of the town provides. Individual commercial centres for these respective suburbs are thus developed, all the while lacking a greater mixed-use intensity. The resident is thus again bound to the automobile to reach those activities and amenities needed in other areas of the city.

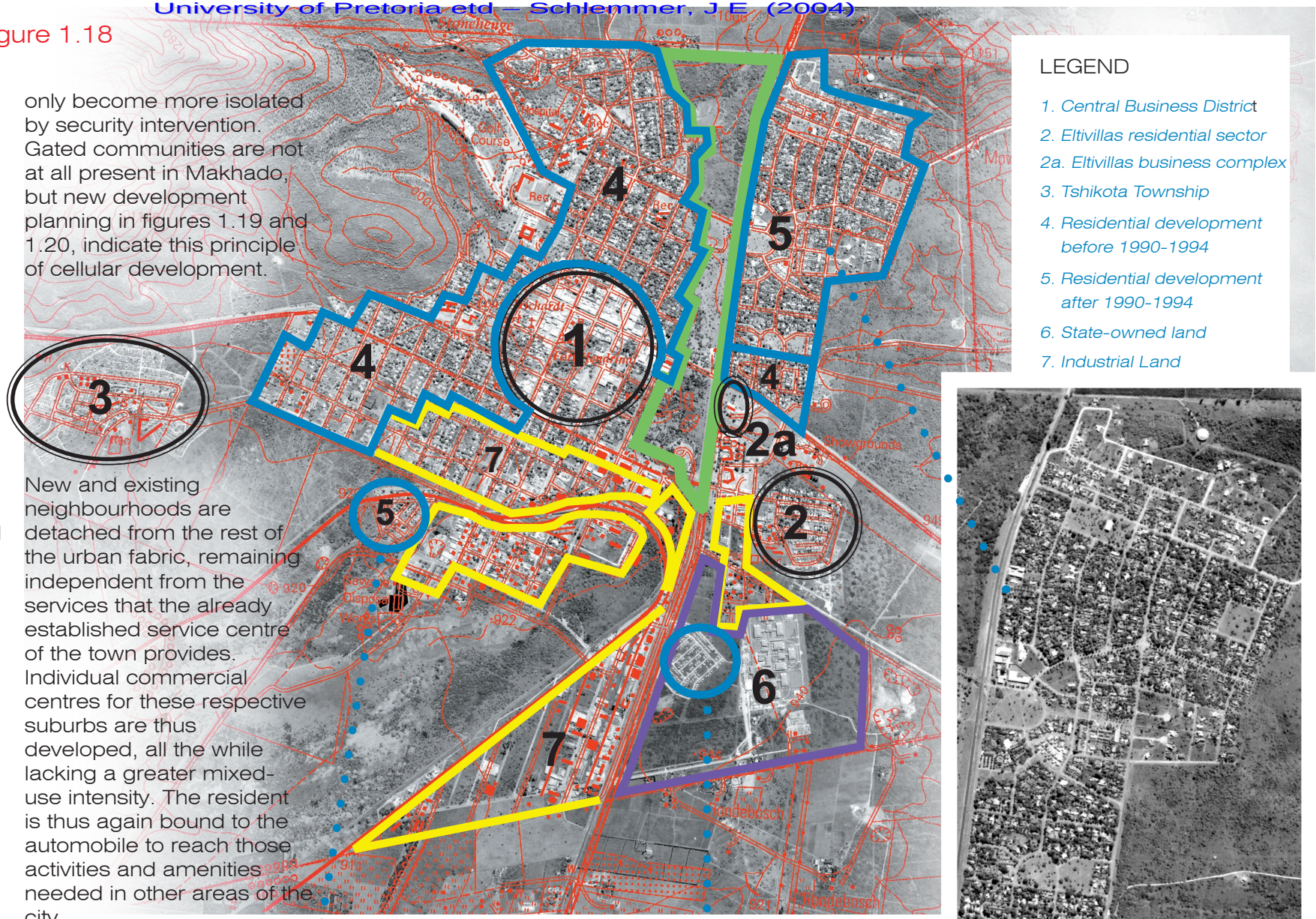


Figure 1.21 Development after 1990

Figure 1.19 Cellular housing develop-

Figure 1.20 Prison housing placed adjacent to N1 Highway

The urban form identified in our housing type is characteristic of the one plot syndrome, typical of the South African city. The misconception is that each household's needs' can be met within the individual dwelling unit. The available financial resources for housing and urban development are however far from sufficient.
The planning and management focus must then re-orientate itself from the individual unit to collective spaces and public institutions, with "Positively designed and celebrated urban public space" supplementing the paradigm shift in urban place-making - (Dewar 1996).

Post apartheid development policies including the Development and Facilitation Act (DFA 1995) and The White Paper on Spatial Land Use and Development (2001) have sought to compliment this change, by "rejecting low-density, segregated, fragmented and mono-functional development, and to rather embrace compact, integrated and mixed-use settlements" (White Paper 2001:6)

Dewar (1996) too identifies several changes that must take place at urban management structures and suggests essentially two principles key to the remediation and future planning methodologies.
The first is to maximise the urban generative capacity by creating more urban systems that generate economic, social and commercial opportunities and facilities.

These include:

a. Demarcating areas of development, differentiating between landscapes of urban, rural and natural landscapes and thereby promoting
b. Compactness and densification of the urban fabric, with the use of housing infill projects principle to achieving this.
c. Integrating, overlapping and combining different land uses, activities and elements as opposed to their separation is another important objective, with Dewar recognising housing projects as infill to the existing urban fabric.

These opportune environments must be made accessible; with most of the daily activities accessible by foot. This obviously does not cater for all needs, and thus other viable and efficient public transportation systems are therefore essential to support the now agglomerated, higher-order activity environments employed. Dewar argues that by the "extroversion" of more intensive activities and facilities towards dominant transportation routes, and in particular more public ones, this objective can be achieved.

Figure 1.22: Home adapted for business rights, bordering on Rissik street


Figure 1.23: Home adapted for business rights, bordering on Rissik street

current issues

Makhado Integrated Development Plan

Issues identified by the Makhado Integrated Development Plan (2002) reveal environments far removed from those ideally described by Dewar and the DFA, with particular reference made to the inadequate provision and maintenance of basic amenities – such as water and sanitation, roads and transport and a severe shortage of housing. The latter of which is a major concern in the townships and informal settlements within the municipal borders.

Makhado is essentially a regional service centre for those who commute from the surrounding townships, rural and agricultural lands. The services provided include basic business and commercial activities (banking facilities, manufacturing), with the bulk of employment indicators attributed to trade and manufacturing.
The labour source to these services is still largely contained to the black labour force on the existing townships and rural lands.
The economies of surrounding townships and rural areas comprise mostly of informal activities and largely serve the immediate consumption needs of local people - IDP (2002)

The Agriculture, Trade and Services sectors largely drive the formal economy of Makhado Municipality, with a portion of the town's economy comprised of the processing of primary products produced in the area. 1997 indicators show that Agriculture contributes 16.4% towards the GGP, predominantly ascribed to the horticulture production in the Levubu Valley and Letaba

The high contribution of trade to the GGP of 25.6% is a function of the town with regional trade supported by the high degree of accessibility due to the N1 highway. The importance of the national road will increase dramatically in the future, as trade links with countries north of South Africa will be augmented even further by the Trans Limpopo Spatial Development Initiative (TLSPDI). This initiative came into being with the signing of a landmark agreement between Zimbabwe and South Africa, the corridor running from Polokwane to Victoria Falls in Zambia.

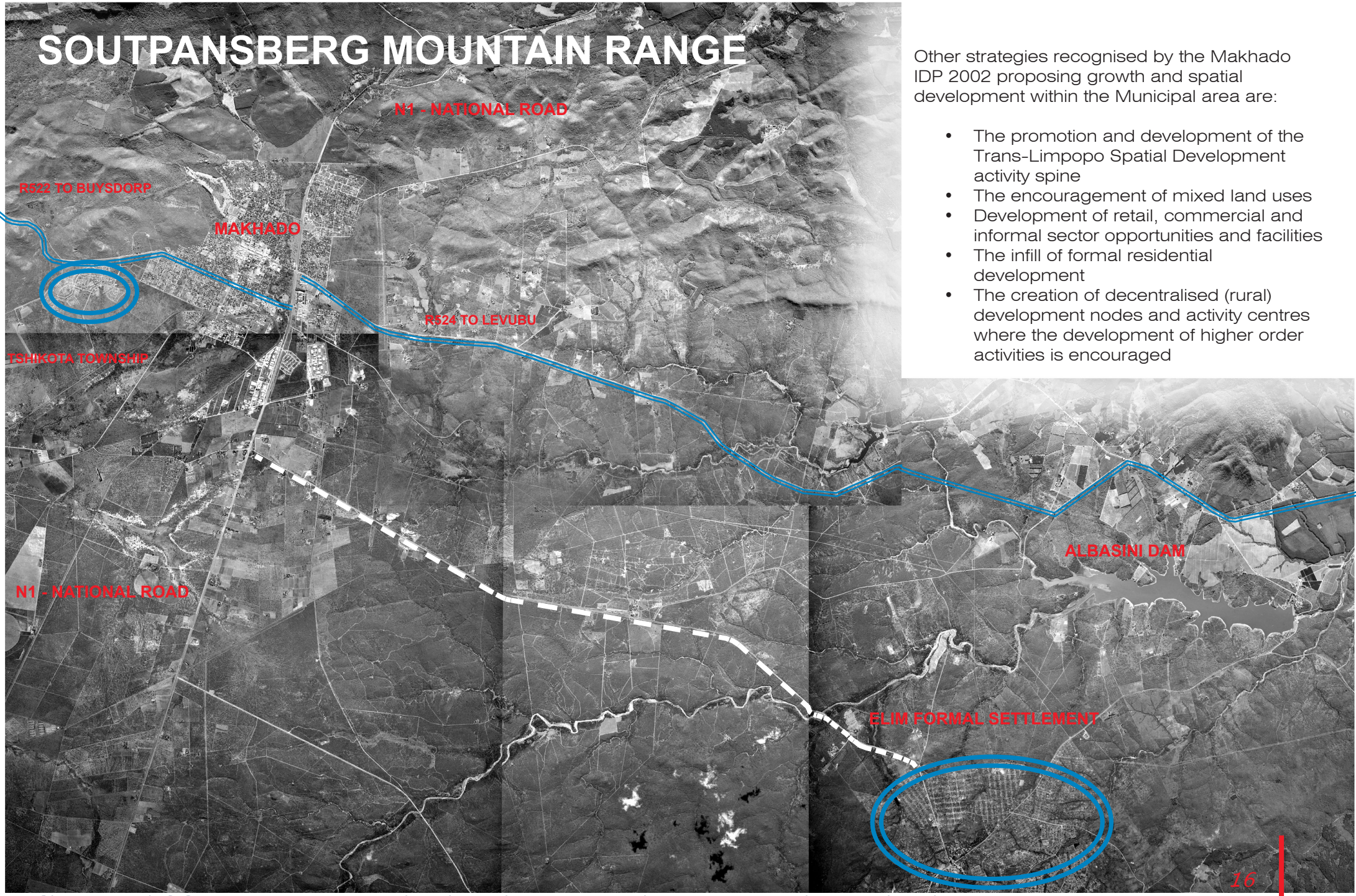
Other local economy contributors are the development of a maximum-security prison, valued at an estimated R350 million, and local tourism. Tourism is one of the biggest generators of income to the Limpopo province, with game farms, traditional and cultural facilities in the Venda areas, the Soutpansberg biosphere and the close location of the Kruger National park being a few examples of tourist attractions close to the town.

Figure 1. 24 Bus and taxi terminus in the town's CBD

Figure 1.25 Wholesale depot

Figure 1.26 Banking facilities

Figure 1.27 The View of Songozwi Street



Other strategies recognised by the Makhado IDP 2002 proposing growth and spatial development within the Municipal area are:

- The promotion and development of the Trans-Limpopo Spatial Development activity spine
- The encouragement of mixed land uses
- Development of retail, commercial and informal sector opportunities and facilities
- The infill of formal residential development
- The creation of decentralised (rural) development nodes and activity centres where the development of higher order activities is encouraged

figure 1.28 - macro scale land use and movement analysis

The IDP (2002) has identified the need for a mixed-use typology, but its literal application is now asked.

The more specific programme envisaged by the council is to allow for major business and retail development that will sell goods and provide services to the general public and commercial sectors.
A culture of wholesale purchase is strongly associated with the community of Makhado, and is thus sought to be endorsed even further, with particular focus on making this market more accessible.
It is wished that bulk supplies can be defragmented into singular consumables at more competitive wholesale prices. Emphasis is specifically placed on including both businessmen and consumers of the low-economic sector in this market.
There definately exists the potential for local employment and business interest to achieve this.

Makhado and its profit yeilding agricultural lands for example are often only used as means to support the growing export market (nationally and internationally), which in turn contributes to the local economy.

There is however a large opportunity to direct this financial income to the local economy first. For example, most of the vegetables bought at leading supermarkets and vegetable stores (Fruit and Veg City) in the town, come from the surrounding area, some as close as 20km, but are first sent to Polokwane and even Johannesburg before returning to Makhado for sale.

The IDP also states, that while the town is used for most service purposes, weak economic linkages exist between activity centres of the rural land type and the more formal economy of the town.

There is also a significant leakage of local buying power to the larger nodes, such as Polokwane.
This again stresses the need for the town to provide for those business and commercial amenities sourced elsewhere.

The town perhaps eminates a static and sometimes unapproachable image for business oportunity from the low-ecomic market. Makhado has become too dependable on the masses of people included in its municipal borders that support it.
Little effort has been directed to local business empowerment from the informal and low-economic market.

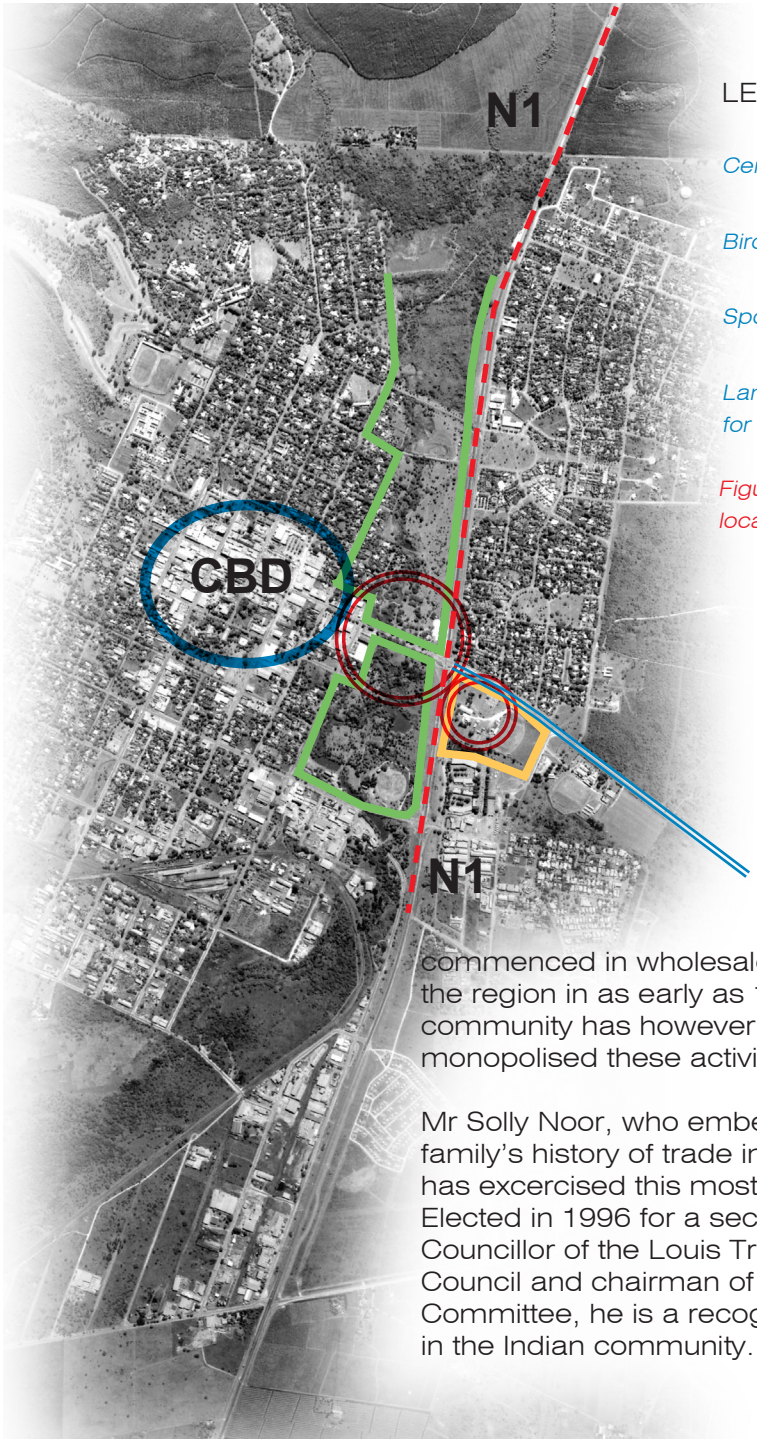
The Indian community on the other hand own the majority of trade and business activity in the town and surrounding districts, a legacy that

Figure 1.32 Vegetables sold at the local taxi rank in town

Figures 1.29 to 1.31 A variety of wholesale depots found in the town

Figure 1.30

Figure 1.31



LEGEND

Central Business District

Bird and Tree Parks

Sports grounds

Land earmarked for development

Figure 1.33 Proposed site location by local investors

commenced in wholesale trade in the region in as early as 1880. This community has however regrettably monopolised these activities.

Mr Solly Noor, who embedded in his family's history of trade in the town, has excercised this most dominantly. Elected in 1996 for a second term as Councillor of the Louis Trichardt Town Council and chairman of the Executive Committee, he is a recognised leader in the Indian community.

It is essentially by his control of the property market that reveals volumes of the business and commercial development of the town, with present and future development prospects of extending the town's business footprint to the national road and over to its more eastern borders.

Some of the decisions contained thus far have caused much debate with the town's residents, specifically because proposed development is of "greenfield" nature, threatening the existing Sports Grounds and Indigenous Tree and Bird Parks bordering the National road - figure 1.33.

Mr Noor's interests are however correct in part, as they reflect those guidelines set out in the Makhado IDP 2002.
Yes, the CBD is too small to cater for the existing and forecasted numbers of commercial and residential interest; and his envisaged building programme of a shopping mall will provide a greater variety for the consumer market and essentially attract the buying power of those Makhado residents spending their money in Pietersburg.
It is however limited by its mono-functionality and will remain a strictly diurnal pavilion, uncelebrated by all spectrums of public activity.
Save for parking lots strewn sporadically alongside the N1and the eradication of important plant and animal life, locality for such a building is quite contentious.

Another concern again is the control the Indian commuinity maintain in the town's trading realm, and would ultimately have on such a new development. Rates of lettable space that Mr Noor owns in town have steadily increased, which will inevitably force those tenants to leave the town for either the subburbs or more attractive rates in the poposed shopping centre.
The property market is ultimately monopolised by Mr Noor, and should be made more acessible to other prospective investors.

_02 building

A numer of details have been revealed as possible contents of programme for the envisaged development, which will support goals of the Makhado IDP.
These include:

1. Wholesale storage and retail space for both consumables and non-consumables.

2. A non-diurnal environment, which must therefore include a full spectrum of activity. Accommodation is thus included to achieve continual passive surveilance, indicating the scope of the development's users.

3. Retail space ownership made accessible to residents of the building.
What follows is the provision for basic amenities within close proximity, including: Public spaces to celebrate the amalgamation of the different users, recreational space and health facilities.

Before this schedule of functions can become more specific, the appropriate site must be located for the scale of a such a development.
An important question that has sustained throughout this brief urban investigation and context study however, is why are vacant portions of land inside the city's CBD not suggested for new development?

Surely further business and commercial interest will help contain much of and increase the density to the CBD, and thus prevent "green-field" development elsewhere?
Yes, the insertion of more mixed-use building programme into an existing system of infrastructure, commercial, business and retail will only support those design guidelines outlined.

The answer however is sourced from understanding the scale of the proposed development envisaged by both council and the author.
A scale of project that requires a large area of ground that can sustain the access requirement of the building's users, accommodating the existing urban fabric and suggestive of future urban development.

Under the auspices of macro-scale site identification and future urban development through to micro-scale, the following text hopes to clarify the eventual choice of site, whose location is not wholly within the bulk of the existing urban fabric, but is still intrinsically interdependent of it and will ultimately predicate future urban development.

Elementary urban planning principles are investigated, in particular, that of nodal development and the identification of strong activity corridors within the urban fabric of Makhado

baseline

The governing design principles focus on key issues of sustainable environments. Challenge to its success is the full interpolation there of, typical not only of the building's programme as a mixed-use type and the resulting design, but its application of the Environmental, Social and Economic systems.

Under the guidance of tools already established by Gibberd, J (2003), the following chapters hope to reveal the application of the tree tiers of sustain-ability.
These will be placed within the context of Makhado, in urban development and site location, the building's design and the technical inquiry foloowing that.
These goals are set out premature to the design process and will thus be monitored in their use throughout, re-vealing the respective tiers' relevance.

To acces this information easily, the baseline response will be indicated in red text.

urban development

in brief

The N1 is the main arterial that passes through the town and ultimately divides it into two portions.
From the historical context and urban compostion already shared, the urban form west of the N1 is now cleary defined.
So too is the resultant development to the national road's eastern border, comprised of both early regime and current urban planning policies.

Bordering either side of the N1 lie large sections of servitude land, possibly for future roadwork?
Within the western portion adjacent to this, is a service road aiding a less than vibrant looking light industrial strip.
Travelling further north, vehicular traffic is brought to two stops, which by sheer local understanding negotiate the bulk of motorists east and more specifically west into the CBD of the town.

There have however been a number of incidents where traffic congestion and fast moving heavy loaded vehicles have caused serious accidents. Ealrier this year, two children sitting on the back of a bakkie were killed as a overloaded truck - travelling south from the Soutpansberg Mountain pass, failed to stop, and crashed into the vehicle. This was not the first accident of this nature in the town, and by protest action of local residents, a traffic circle is to be built at the intersection. The aim is to maintain a continous flow of traffic, accompanied by extra lighting and road signs to alert drivers .
This is depicted in figures 2.2 and 2.3 - placed some 3km from the beginning of the climb up the pass.
The newspaper arcticles referenced, suggest that the council of Makhado and the National Road Agency will also place traffic lights at the two other important intersections with the N1, those of Songozwi and Rissik streets respectively.

Verkeersirkel op N1 'n proeflopie

Dié veiligheidstap binne 'n maand reg

Marietie Louw

'N Verkeersirkel op die N1-hoofweg deur Makhado (Louis Trichardt) in Limpopo sal binne 'n maand in gebruik wees.

Só sê mnr. Alex van Niekerk van die Nasionale Padagentskap.

Volgens hom sal dié sirkel, by die laaste vierrigtingstopteken in die dorp op pad na Musina (Messina), 'n proeflopie wees.

Die sirkel sal verkeer, veral swaar vragmotors wat met die bergpas van Musina in Makhado inkom, dwing om spoed te verminder.

Verkeer in die sirkel sal na regs moet toegee.

Dié maatreël is ingestel ná 'n ongeluk vroeër vanjaar toe twee laerskoolleerlinge van die dorp by dié kruising dood is. 'n Wegholvragmotor het uit die rigting van Musina gejaag en teen 'n bakkie gebots.

Dewald (12) en Chantelle (8) du Preez het agterop die bakkie gesit en is deur die lug geslinger.

Volgens Van Niekerk sal waarskuwingsborde by die kruising opgerig word wat bestuurders sal maan om verkeer in alle rigtings dop te hou.

"Dit moet 'n vrvyloei-toestand wees waar voertuie die hele tyd sal beweeg."

Dit sal voordelig wees vir swaar vragmotors met oorverhitte remme ná die bergpas.

Dit word ook oorweeg om spoedkameras by die stopteken op te rig wat as 'n verdere maatreël sal dien om stadiger te ry. 'n Sandput sowat 3 km voor dié stopteken word gebruik indien voertuie se remme ingee.

Van Niekerk het gesê die verkeersbane op die N1-hoofweg deur die dorp is die afgelope maande verbreed.

Bane is ook aangebring vir links en regs draai.

Dié projek het sowat R8 miljoen beloop.

Die twee ander vierrigting-stoptekens wat Makhado en die N1-hoofweg verbind gaan moontlik verkeersligte en bykomende beligting kry.

Van Niekerk het gesê gesprekke is aan die gang met die Makhado-munisipaliteit om deel van die koste van die verkeersligte te dra.

■ mlouw1@beeld.com

Figure 2.1 View looking north showing the national road and the industrial strip on its western fringe. The Soutpansberg Mountain Range frames the town.

N1 kry dalk sirkel om botsings te keer

Planne beraam vir berugte kruising

Marietie Louw

'N Verkeersirkel op die N1-hoofweg in Limpopo.

Dit is wat beplan word om die talle ongelukke by 'n berugte vierrigtingkruising in Makhado (Louis Trichardt) hok te slaan.

Dié kruising het vroeër vanjaar opslae gemaak toe twee laerskoolkinders van die dorp in 'n ongeluk daar dood is.

'n Wegholvragmotor het uit die rigting van Musina (Messina) gejaag en teen 'n bakkie gebots.

Dewald (12) en Chantelle (8) du Preez het agterop die bakkie gesit en is deur die lug geslinger.

Ontstoke inwoners het die dag van die kinders se begrafnis 'n protesoptog op die hoofweg gehou.

Die kruising dra swaar verkeer van Musina en Polokwane (Pietersburg).

Me. Jana Smith van die Louis Trichardt-sakekamer het gister gesê 'n verkeersirkel word oorweeg.

Sy weet nie of die planne al goedgekeur is nie.

Beeld het by inwoners vernoem dat opmetings vir die sirkel die inweek begin het.

Daar is glo wit kolla op die hoofweg waar die sirkel uitgemeet word. Grootskaalse bouwerk om die hoofweg te verbreed word ook tans gedoen.

Volgens Smith kan dié sirkel verkeersvloei vergemaklik.

"Tot 16 voertuie wag by die kruising wanneer die verkeer druk is. Die sirkel kan verkeer by die kruising moontlik ook stadiger laat vloei.

Nóg 'n oorweging is om 'n ekstra sandput vir swaar vragmotors by die kruising op te rig.

Volgens dié plan sal 'n ekstra verkeersbaan vir verkeer van Musina se kant af aan die linkerkant geskep word wat net deur swaar vragmotors gebruik sal word.

Me. Phuti Mabelebele, woordvoerder van Limpopo se departement van vervoer, het gister gesê die beplanning word deur die Agentskap vir Nasionale Paaie (ANP) gedoen.

Mnr. Aleg van Niekerk van die ANP, wat gemoeid is met dié projek, sal eers later vandeesweek kan kommentaar lewer.

■ mlouw1@beeld.com

Figures 2.2 to 2.3. Newspaper articles sourced from the Beeld

It is behind the buffer of light industrial buildings, cellular state housing, local pubs and fuelling stations, that the "gut" of Makhado is exposed.

Low-rise buildings, with the help of the topographical character of the town, sustain some sense of density within the town's main arterials.
Used predominantly by foot - banks, clothing stores, hair salons, discount and hardware stores and the traditional programme of a low to middle class CBD define more of this town's character.
It is its prevailing source of agriculture however that sustains its survival, displacing the town's borders into the farmlands that circumvent it. It is here that a great proportion of the surrounding rural communities are sourced for labour and included in the client market.
From labourers and predominantly white farmers, to the town's residents themselves – each of these inhabitants play migrant roles, commuting to and from the town, and more specifically the CBD, on a daily basis.

With the bulk of heavy vehicular movement contained on the N1, the town is a crossroad to two other important arterials in the east-west direction. The R524 to the east serves important agricultural districts, such as Levubu, Sibasa and Thohoyandou.

This is also an alternative route to the Kruger National Park gate – Punda Maria.
The road oriented to the west is the R522, which is accessed via one of the main streets in Louis Trichardt (Rissik street).
Trucks and other light delivery vehicles thus use this route, and it especially serves as an alternative route to the Soutpansbeg pass for trucks en route to Musina. This is however illegal, due to overloaded trucks destroying the road, and strict legal action is carried out on truck companies that fail to obey the restrictions imposed on them.

The truck movement confined to the N1 is thus on the increase, and it is important that the traffic of the two main arterials (N1 and R524/R522) is captured – predicating site at macro scale.

_site development

The Central Business district of Makhado is accessed by a composition of 4 main movement lines for both vehicles and pedestrians, namely: the Natinal Road (N1), Rissik Street, Krogh Street and Songozwi Street.

The N1 (norht-south),the R524 (east) and the R522 to the west, predicate the ring-road like movement depicted in blue (figure 2.4), by supplying the bulk of traffic specifically from the surrounding areas to Makhado.
This ring-road circulates traffic in and arround the core of the town's centre, and is accessed by smaller streets from the residential and industrial precincts.

The bulk of the bussiness district is comprised of retail, business and council owned land, reaching its intensity along the length of Songozwi Street and at its intersection with Krogh Street.
Commercial activity found here, includes banks, retail shops and office space.
Just south from this, the same content of activity thins out into a less dense building fabric with; large public open land adjacent to the Municipal buildings, large cash and carry warehouses contained to the fringe of Songozi Street and car service and fitment yards lining Krogh Street.

Moving further south to Rissik Street, many suburban homes have aquired business rights and have added on the necessary rooms, carports and gables to adapt to their new uses - a strip of suburban development not unique to this town.

The length of Rissik Street is comrised of the insertion of this business type, with the collection of more wholesalers, car repair and service yards and light Industrial buildings fronting its southern edge, contained between the N1 and Kruger Street.

The light industrial buildings of milling companies, fuel depots, engineering works and bulk storage buildings reach up to and over the railway line all the way to the agricultural small holdings that border the town's southern edge.

The locality of the railway line and station on relatively flat land in 1914, predicated much of the early industrial building activity, almost positioned outside the more affluent and business oriented portions of town contained to Krogh and Songozwi Streets (Trichardt Street).

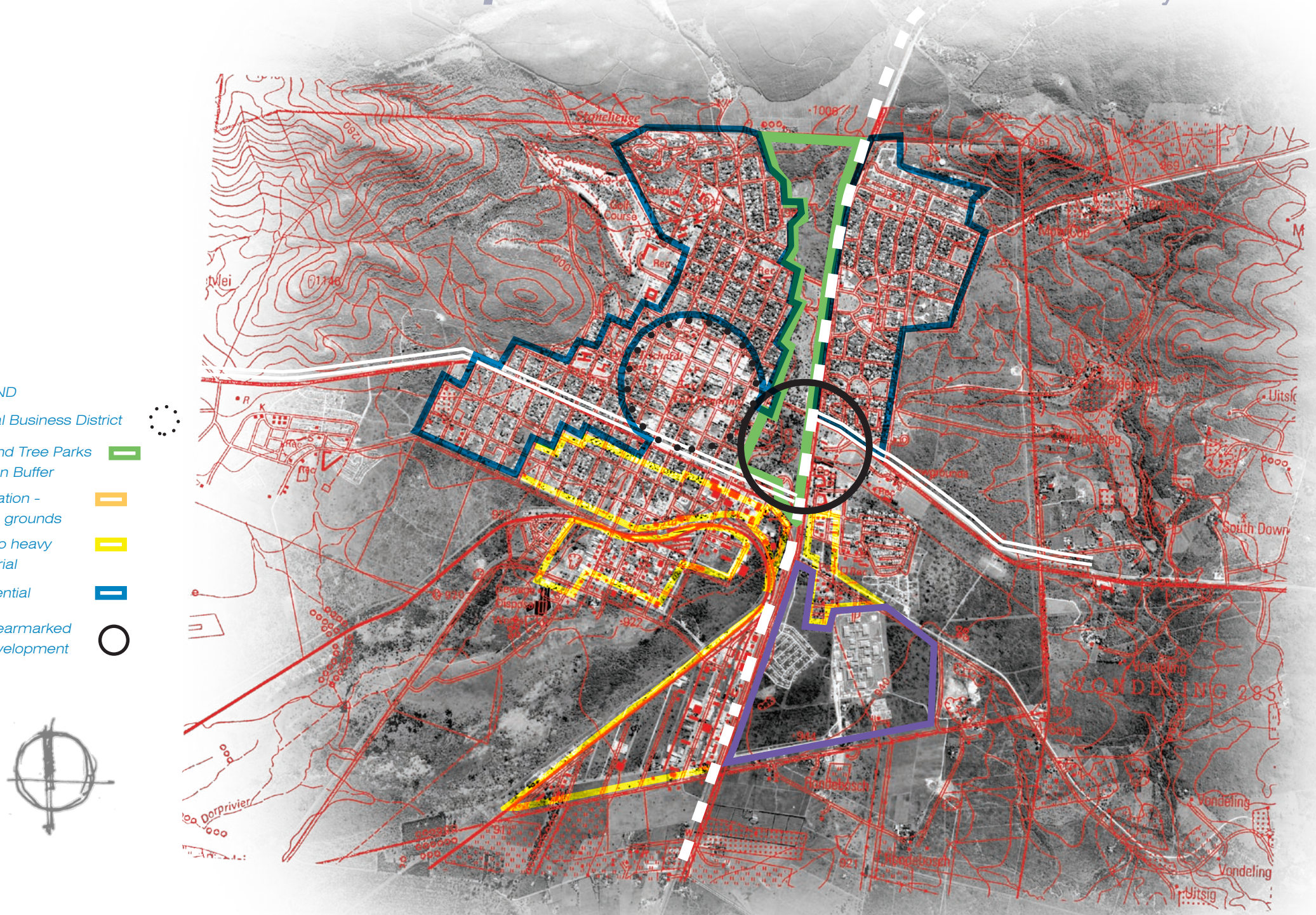
Situated at the centre of the old main road of Krogh Street, the intersection of these two streets was the prominent point of access and trade for those entering the town, before leaving further north or south.

Found here too is the first Afrikaner church of the town - The Church of the Vow, built shortly after the town's independance in 1899.
The first Mosque, and Synagogue (which was later demolished), are also found within close proximity to the Central Business District.
It is here that the town first grew, and has since predicated the resultant form and areas of development visible today.

The demand of retail,commercial and business growth in the CBD has persisted, all the while supported by the industrieal activity to the town's southern half.
A change in local commerce need has also asked for an extended supply of wholesale purchace typical to the region. The result is these buildngs becoming more accessible to the CBD's user, and thus included in the town's urban fabirc.

The need for land to cater for both the commercial, industrial and light industrial sectors placed within easy access of the CBD, has demanded the adaptation of zoning rights. These two respective precincts are now reaching for eachother, encroaching on the residual suburban land, leaving this portion of the town in a state of hiatus.

figure 2.4 **site development - meso scale** land-use analysis



site development

land use and movement analysis

figure 2.7

This grey area lacks a connection between the two portions of town - and is in need of a driving catlyst other than the delapitated activity of business and retail, that will initiate interest of investors to develop more prominantly.

That portion of land earmarked for development by the council - figure 2.7, also represents a lack of activity. It is perhaps for this reason that this site was chosen by them. Some important urban design principles have been negated however, the most prominant being the the continuum of time.

If a large shopping centre complex was to be built there, the implosive character of its implementation will undermine the possibility of a more mixed use building type just north of the R524. The residential neighbourhood will ultimatley face the shopping centre, and perhaps its parking lot and receiving bays.
No time will be available for the edge of this residential precinct to respond appropriately - with for exmaple a more mixed use and increased density building fabric.
The depicted site of the council's interst depicts the least amount of affected radius needed to support mixed-use development, while still susutaining some contact with the existing fabric.

Another factor not considered is the big leap the business district would have to make to reach the new development, even if it were initially of a mixed use programme.
The remaining portions of Bird and Tree Park north-west and south-west of the N1 and Songozwi Street, cannot - merely by topographical nature, support development of the same intensity as found in the CBD.

We can safely assume that a new shopping centre will only exlude these factors and inevitably be built in isolation from the residing built form and activity. Void of housing, the pavilion builidng, guarded by palisade fencing, will remain exclusively accessable by the automobile.

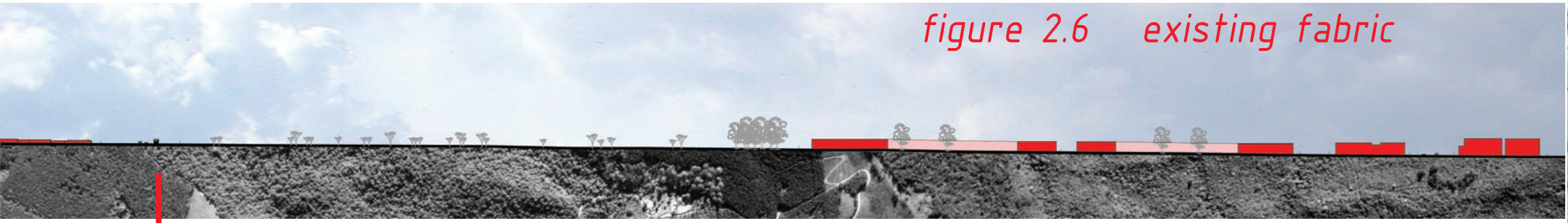


figure 2.6 existing fabric

site development

land use and movement analysis

figure 2.10

That portion marked as SITE in figure 2.10 is chosen to support development of a catalyst nature.

Development of an activity node here hopes to initiate long term development of a density similar to that in Songozwi Street, along Krogh and more specifically - Rissik Street.
This street's importance within the heirarchial network of roads will once again be highlighted, and will serve even larger amounts of traffic of both vehicles and pedestrians.

This urban corridor is supported by making contact through its length with the light-industrial to industrial precincts and train station south of Rissik Street.
The hope is that development along this spine will rejuvenate this portion of the town with a more high-end order of activity.

Access to the interior of the precinct of Eltivillas is already favourable with the N1 and Rissik Street servng as main feeding arterials.

Wholesale and other commercial activity is already established here too, and will only support new development.
One of the major site locality generators is the existing transport node that serves mainly bus commuters who from there, either take a taxi into town or walk.
The site is thus a nucleus to vehicular and pedestrian movement, interdependant of the transport node in town, again accentuating the circulatory movement of both vehicles and pedestrians in and around the town's centre.

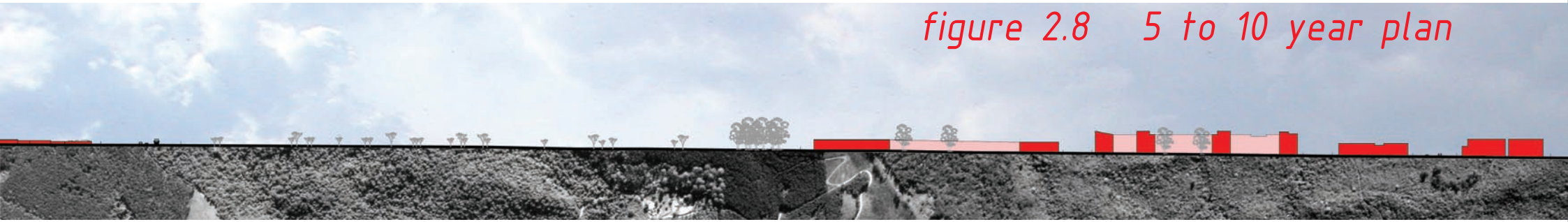


figure 2.8 5 to 10 year plan

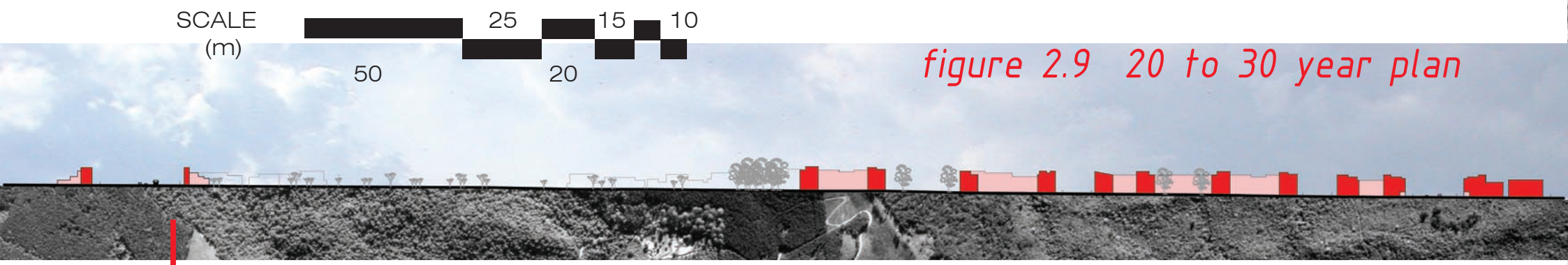


figure 2.9 20 to 30 year plan

The Proposed grid development diagram is largely a figurative attempt to accentuate the development of the site by the support of the the existing urban grid.

The structured grid on the interior is tempored with to test if it could perhaps join the existing road network in the Eltivillas precinct. This would conceptually be possible but is intervened by the large portion of green area that borders the town's eastern border. Comprised of a relatively large water system of river and collection dams, as well as the Indigenous Bird Park, penetrating this region will ask for demanding construction work and will be a detriment to the tree collection and birdlife kept there.

The visual importance of this green portion is also a factor that must be considered for future development, as for many residents it holds sentimental value and identity for the town.

Emphasis is rather placed on accentuating the east-west oriented activity corridor discussed as generator of contact with the residing CBD and interior of the town.

The proposed network of roads on the eastern portion, hope that by the development of the site, a connection between the Eltivillas Precinct to the south and the residential suburbs to the north will be fostered.

Figure 2.12 indicates how the N1 as ring-road movement arterial will be substituted by a road not just used to carry traffic, but a street flanked by development. This then frees the national road for its sole initiative of carrying traffic north and south in the Northern Province.

On a 20-30 year plan proposed in figure 2.9, two centres of activity will have developed, with the streets linking them subjected to consistent development.
From accentutaing one activity corridor along Krogh and Rissik Streets, a dense building fabric and activity will have contact along the length of the corridor in a circulatory manner, spanning from the original CBD to the new development.

Figure 2.11 suggests perhaps idyllically an urban framework of 50 years time, where the Bird Park is circumsribed by development, enclosing it as a more publically active green space of the town.

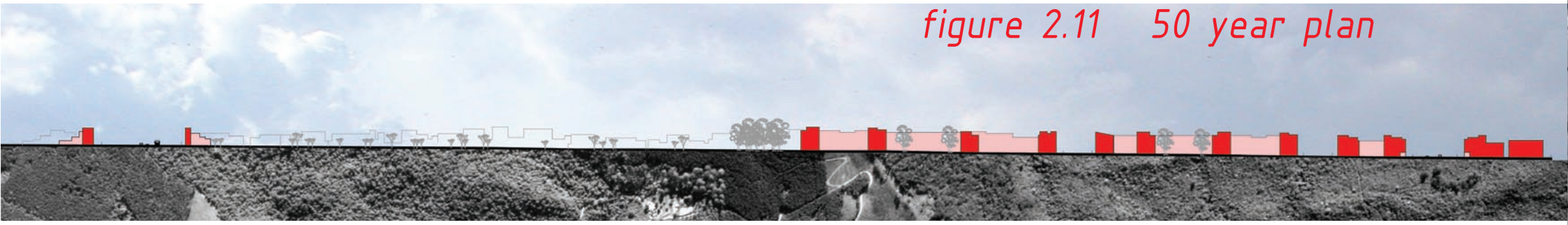
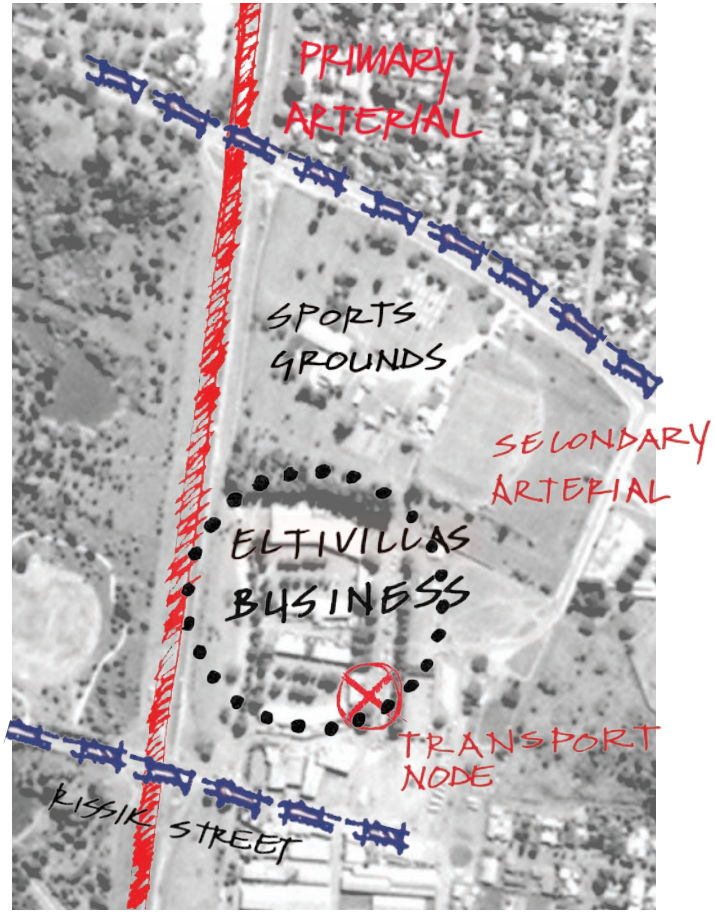


figure 2.11 50 year plan

site development - micro scale

Figure 2.13. Aerial photograph of site



The site chosen is now established by its potential as catalyst at urban development vision.

Located within the existing Eltivillas shopping and business complex, the site is served by a bus and taxi transport node. These builings were built in 1978 for the Indian community, as well as the commuting black population from the surrounding homelands. Since the change in government however, the most successful businesses moved into the CBD of Louis Trichardt. The result has seen the slow and eventual slump of a once abuzz comercial district.
The existing businesses survive merely on the odd visit by a commuter from the transport facilities east of the complex.
The current shop variety is constrained to low-income non-brand clothing and pawn stores, interspersed with the odd liquor store and pool-playing rooms.

The council suggests that if there were a strong consumable brand name reatailer there, as well as banking facilities, the commercial value of this property would be quite different.

Accessability to the site with reference to the envisged urban development plan is favourable, as is vehicular access from the three main arterials of the N1, R522 and R524 that border the site.

With the proposed accentuation of road network heirarchy, the site is also well portioned for maximun land coverage.
The scale and density of the new building fabric is however more overpowering than the existing builidngs on site.

Figure 2.17. Interior parking court of the complex

Figure 2.18. View of the existing bussiness complex

Figure 2.14. The backside of the existing complex faces onto taxi commuters. Informal trading of predominantly fresh-produce is found here

Figures 2.15 and 2.16. View of the taxi rank and informal trading stalls

Figure 2.19 The collection of eucalyptus borders the sportsgrounds

Figure 2.20. Aerial photograph of site depicting the existing trees

The business complex is built predominantly with load-bearing masonry and the odd structural column. Lack of maintenance to the one story buildings and unfavoured footprint orientation, prescribe that they be removed. This could however be rather contentious, not just because that there may be the opportunity to use some of the existing materials, walls and structure, but largely because these builidngs reperesent a legacy rich in the town's historical context.
The new builidng seeks not to be a memorial to "what was" however, and salvaging parts of walls or floor slabs for use for exhibition purposes is rather ephemeral.

The important visual iconography of the complex and district as place is however acknoweledged, whiich can be reatined by using only parts of the existing roads, making use of the transport terminus and keeping all trees.
The trees are specifically important, as the large portion of eucalyptus north of the complex was planted as buffer to hide the "unsanitised activities" (Templehoff), and the large trees within the complex itself are placed on old town planning principles. These are Harpiphylum Caffrum (wild plum), and will be used as indicators of new site orientation and scale for buildings.

The existing buildings were placed to front the National road and catered for vehicular parking inside their U-shaped forms. This beaconed off the different users and essentially, the builiding turned its back on the bulk of the users from the bus and taxi ranks that served it.

Figure 2.21 to 2.24. The Harpiphylum Caffrum trees were planted on town plannig principles. They are also used by the trucks collected there for shade

The N1 also always remained a hard edge, playing inactive to development either side of it, largely because of the Bird Park to the west.
This characteristic is evident still today, as the National road has only become strengthened in its role as a primary vehicular movement arterial.
Between Songozwi and Rissik Streets, it is however used by residents with little concern for its regional imortance, becoming just another road in the town.

The diagram to the right depicts rather the acnoweledgement of the N1 as a hard edge, and initial experiementation of new building form turns its inactive side to the road, with full exposure facing the transport node.

By urban design intervention discussed earlier, the concentration of development and movement activity is hopefully by now contained to Rissik and Main Street, and Orient road.
The responing builidng form now accentuates and strenghtens this initiative by facing onto it.

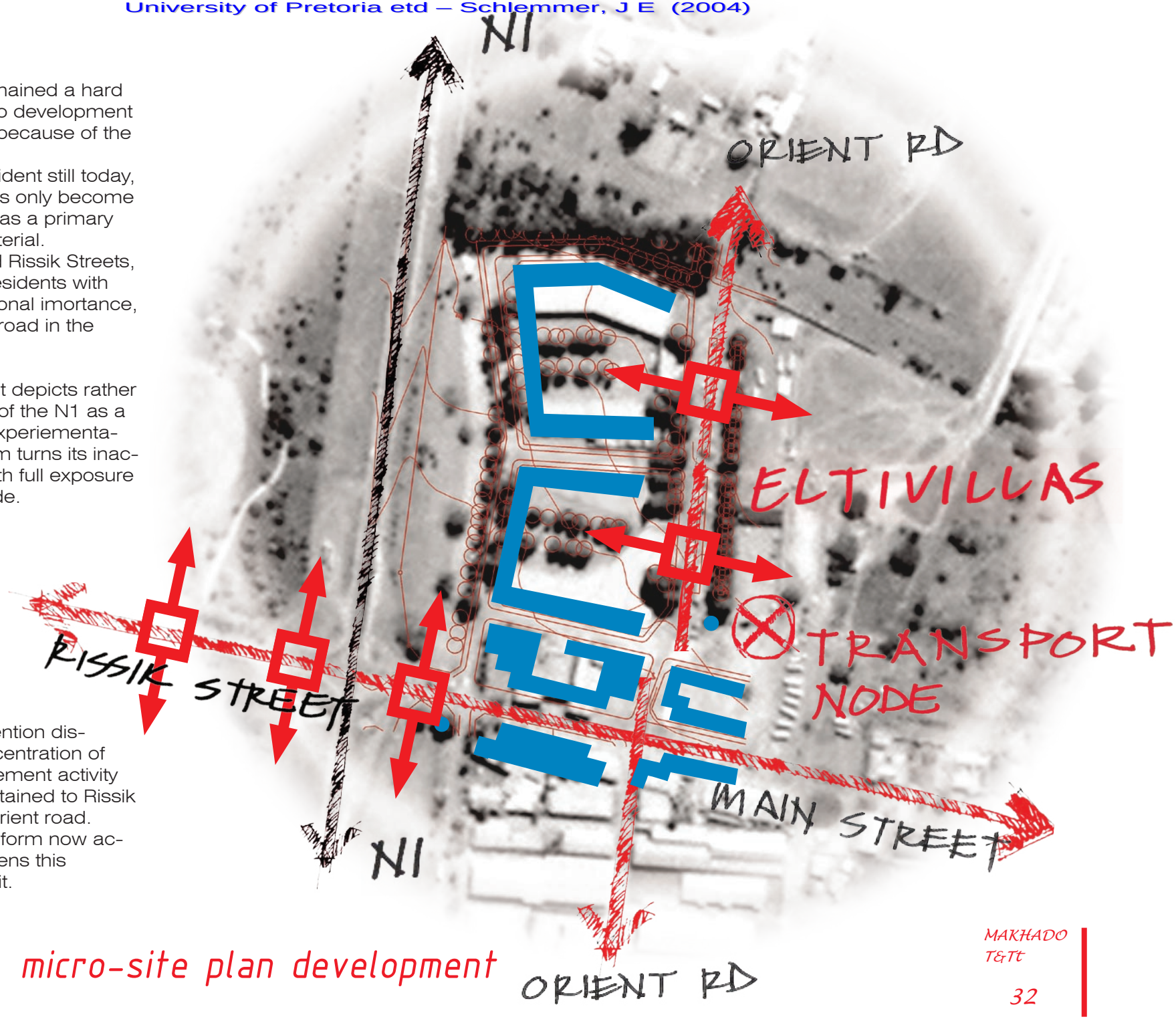
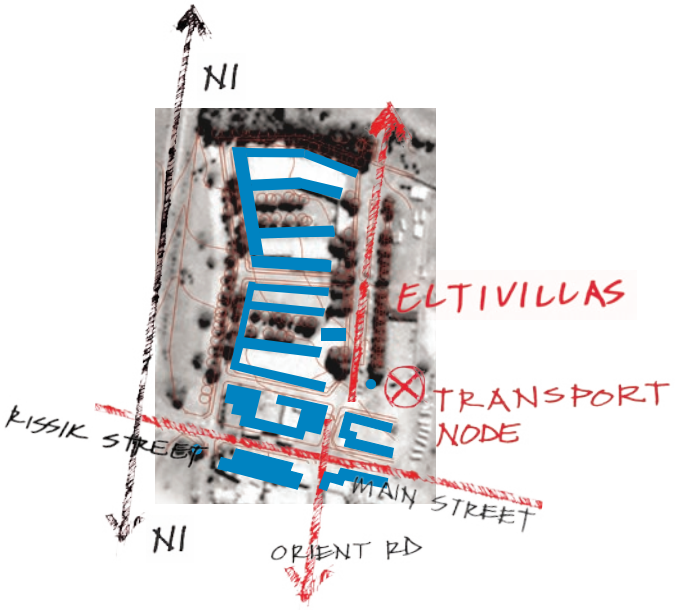
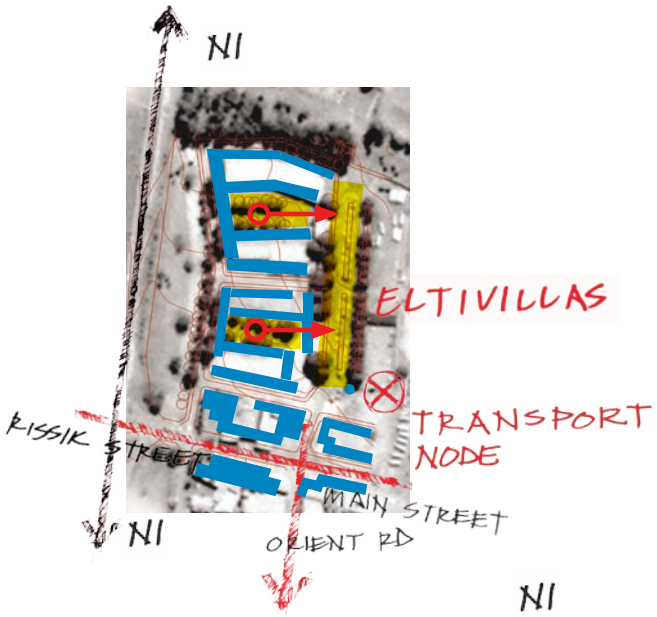


figure 2.25 micro-site plan development

Figures 2.26 and 2.27. Conceptual exploration of the site's develop-





Again the point of focus is capturing people from the transport node (yellow) into the softer interior of the building (yellow to orange).
This space was chosen for this function because of its centred access from the transport spine, and the large potential of design that the trees exhibit - specifically landscaping.

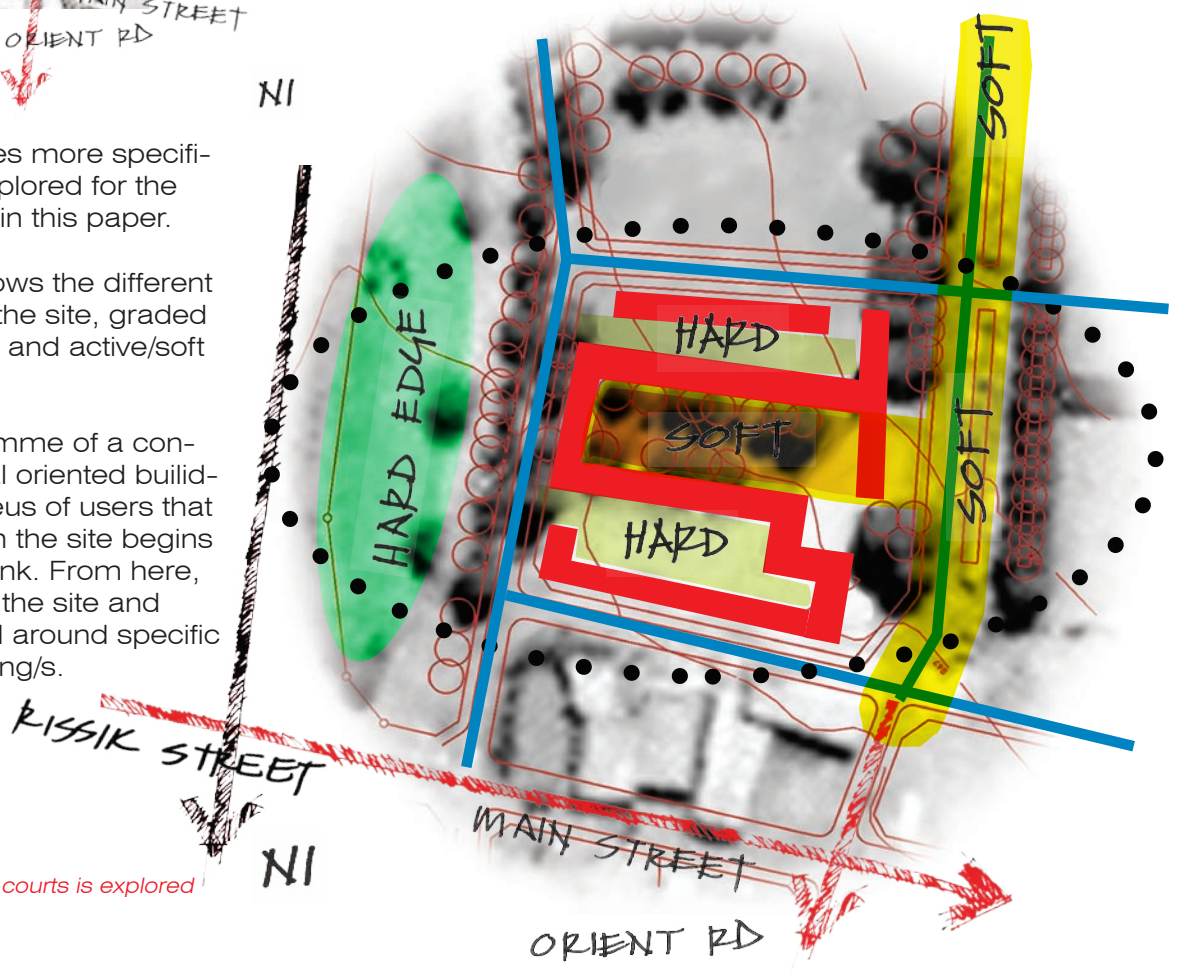
Further conceptual footprint diagrams explore maximum coverage with 10m-12m wide portions of building, while still revealing ample space for possible soft interior spaces for courts or parking.
Building form development at the intersection of Rissik/Main Street and the N1 is also investigated, to accentuate and establish the corners as gateway markers into the Eltivillas precinct.

In figure 2.28, particular importance is placed on developing such courts in and around the collections of trees oriented east to west.
Shaded in yellow, these spaces are seen as similarly active public or soft spaces.

This figure also locates more specifically the site to be explored for the building programme in this paper.

The use of colour shows the different space use layout on the site, graded from pubilc to private and active/soft to inactive/hard.

With an initial programme of a consumer and residential oriented builiding in mind, the nucleus of users that will support activity on the site begins at the bus and taxi rank. From here, users will filtrate onto the site and ultimatley be oriented around specific functions of the building/s.



Figures 2.28. The development of soft interior courts is explored

figure 2.29 *The acctentuation of movement space definition is investigated*

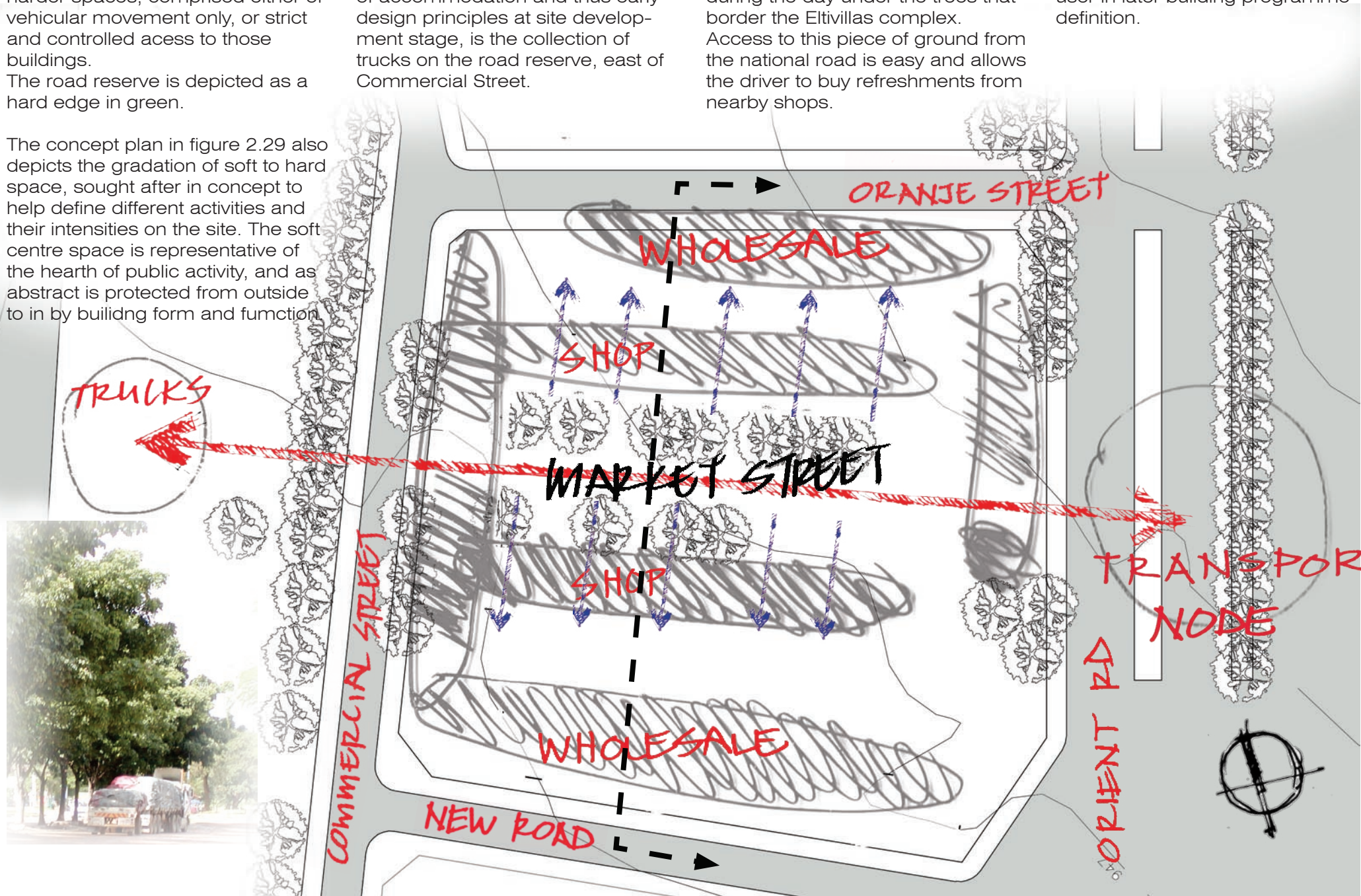
Portions north and south shaded in lime green-figure 2.28, indicate harder spaces, comprised either of vehicular movement only, or strict and controlled acess to those buildings.
The road reserve is depicted as a hard edge in green.

The concept plan in figure 2.29 also depicts the gradation of soft to hard space, sought after in concept to help define different activities and their intensities on the site. The soft centre space is representative of the hearth of public activity, and as abstract is protected from outside to in by builidng form and fumction.

A revealing characteristic of the site pertinent to informing the schedule of accommodation and thus early design principles at site development stage, is the collection of trucks on the road reserve, east of Commercial Street.

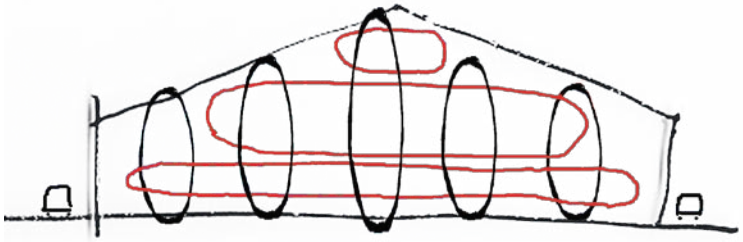
Trucks travelling north and south on the N1, often overnight or rest during the day under the trees that border the Eltivillas complex. Access to this piece of ground from the national road is easy and allows the driver to buy refreshments from nearby shops.

This activity is acknowedged, and suggests the incluision of this user in later building programme definition.



Figures 2.30. Conceptual sketch of portal frame construction

Figures 2.31. The use of space of the portal form is explored



The building's programme now extends to detail the collection of: wholesale storage and purchase, small scale retail, and housing.

Initial concept sketches depict the exploration of the portal-framed warehouse, often used for storage and wholesale purchase.
This form is investigated purely as genrator to ordering the building's programme collectively on the site.

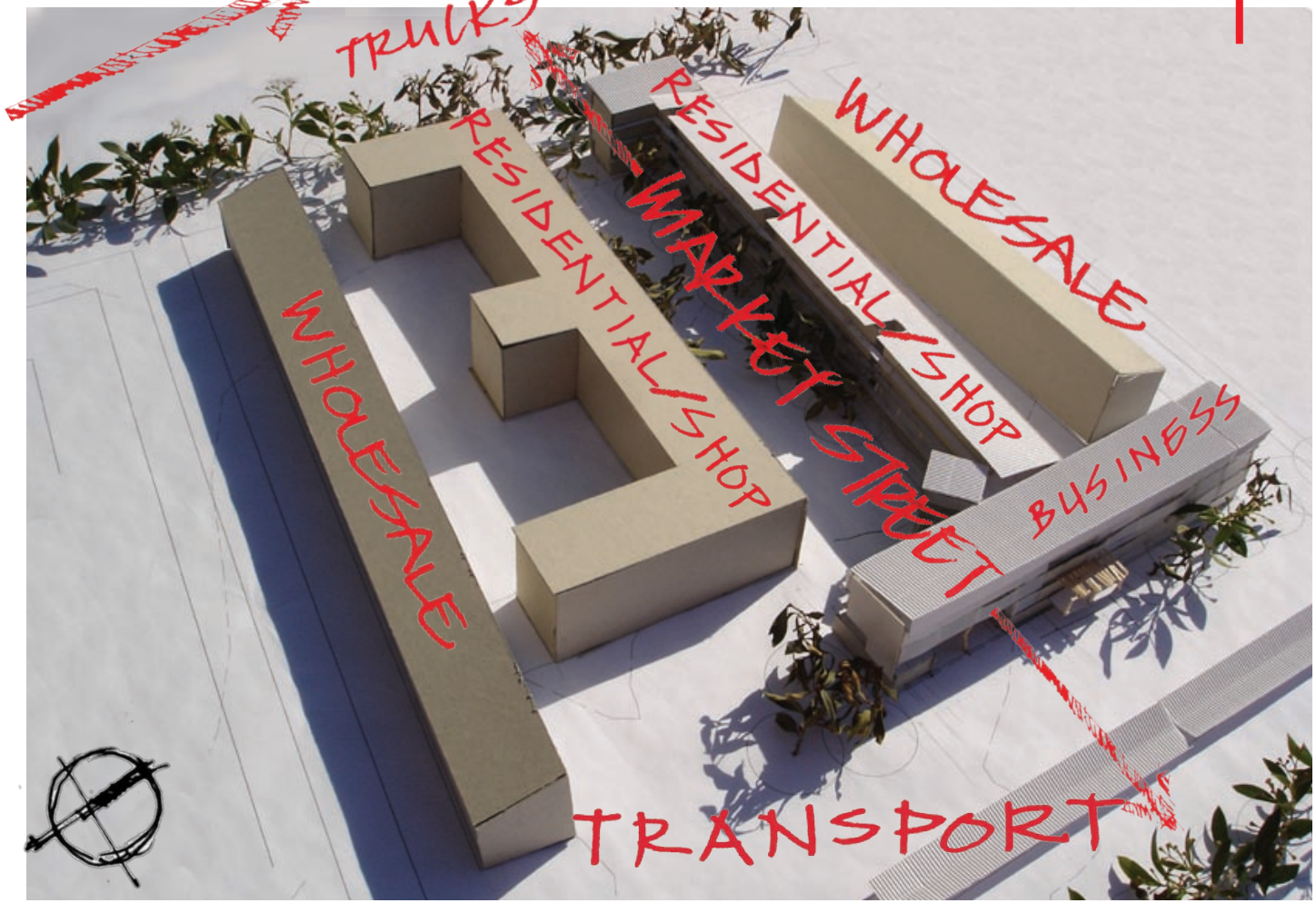
Figures 2.30 and 2.31 depict the questioning of use of space of the portal frame building, where finally a full spectum of functions can be contained, using the maximun potential of space provided.
Unused spaces are challenged, asking for a resolution of space definition, if a mixed-use programme was inserted therein.
These sketches also suggests the lexical value of such a form - typical of many other buildings in the town and the light industrial precinct of Eltivillas.

This form study, together with the size of the existing trees, help prescribe scale in height, of between 10m to 12m (4 storeys).
Another imformative of scale, not only in height but intensity of site coverage, is the catalytic nature of the buildings, placed in the invisaged spectrum of urban devellopment of the town.

The outcome is clear volume definition to cater for the complexs' preliminary programme - figure 2.32.

Figures 2.32 Development of the market street

Figure 2.23. Market street develpoment

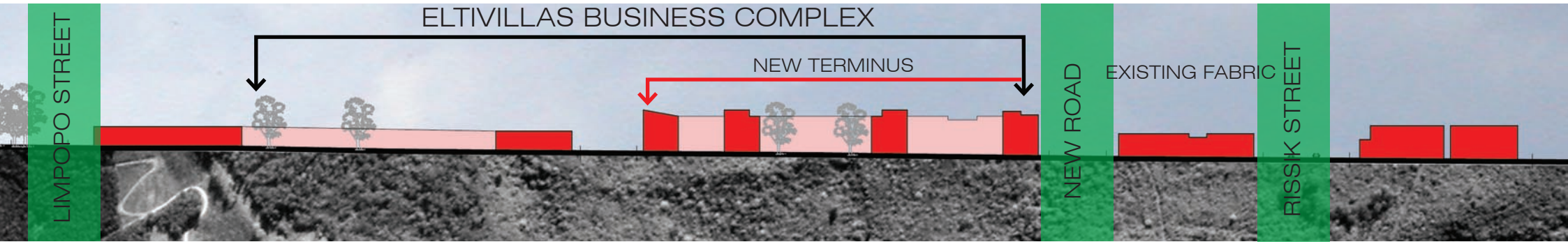


The market street centre to the arrangement reflects the zoning of different space use and quality - ranging from public to private of trade and housing, through to the harder activities of wholesale storage and purchase. The site is bound by roads (New road, Oranje Street and Commercial Street) circulating traffic, with the interior court/street shielded by the progression of hard to soft activity. The portion assigned as bussiness is done to accentuate Orient Street as the new favoured commercial and movement spine.

The progreesion of scale and detail is similarly prescribed as design guideline through the section of building programme, responding proportionately in building texture, colour and form.

What may at first seem overpowering in isolation, the new buildings ultimately continue a scale and density not too far removed from the surrounding buildings in the precinct, and predicate these principles for future development.

Figure 2.24. Eastern elevation from the Nartional Road



The wholesale and storage building in figure 2.25 is served by the bulk supply of either fresh produce, from the agricultural districts of Makhado, or non-consumables from other major wholesale centres.
Retail traders will then use this facility as the local wholesale depot.

The “hard” court where trucks and other small delivery vehicles will access the wholsale builidng, serves as interface between the bulk supply of goods to smaller retailers fronting the market street.

The defragfmentation of the wholesale market to smaller reatail shops is thus initiated to give competitive retail prices for the market street’s user.

Housing is included on the first to third floors, making up a softer and more detailed building that provides the enclosure to, and interaction with the market street.
Residents now have the possibility of renting shop space, providing further incentive for occupation.

Questions such as noise and access control are answered by the allocation of time of use for these respetive functions.
Delivery to the wholosale depot takes place either at night or the early hours of the morning, and can result in aggravated noise levels for the housing residents.

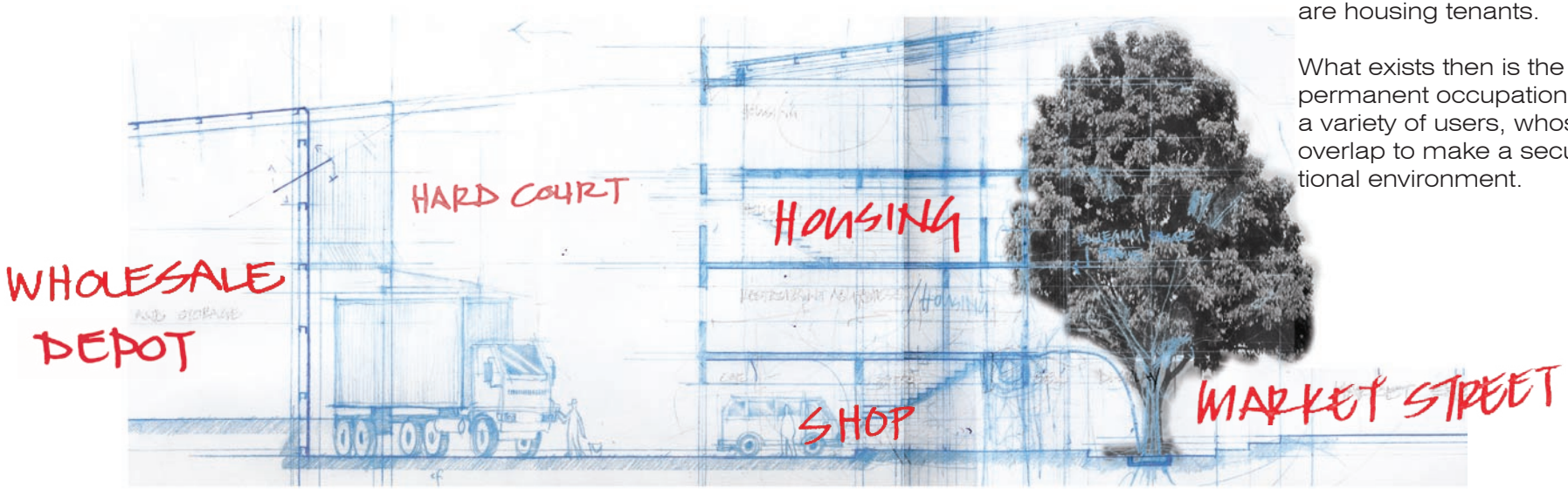
This is partly resolved by assigning delivery points to the depot on Oranje Street, giving easy access and sufficient turning space for large trucks.
The portal framed building thus acts as a noise buffer for the housing.

The purchase of wholesale goods is concentrated to normal retail hours of- 06:00 to 15:00. During this time, many of the housing residents will be at work or shool, thus avoiding not just problems of noise, but possible traffic conjestion in the hard court.

Passive surveilance must be exercised in order to restrict access of unwanted users to certain spaces.
A variety of housing types is thus explored to attain non-diuranl occupation of some residents.
Older family members of an extended family unit for example, will always reside here and become familiar with those partisans of the complex who are housing tenants.

What exists then is the temporal and permanent occupation of spaces by a variety of users, whose time frame’s overlap to make a secure and functional environment.

Figure 2.25. Development of the concept



baseline feedback

What follows is a brief description of sustainable tools set out by Gibberd, J (2003) and their implementation within the respective tiers of Environment, Economic and Social, specifc to the urban and site studies conducted.

Environment

The impact the project asserts environmentally is not solely confined to its immediate footprint, or the site of proposed development. It includes pockets of land and manufacture not even within walking distance from the site. Energy is expended on materials, water and building components for their delivery to site, suggesting the daunting spectrum of these elements' life-cycle even before they are used.

Hereunder follows a brief description of guidelines pertaining the access to and use of these elements within the project and site.

1. Site

The given site of any project serves as generator to a number of design outcomes, sourced from actual biophysical information. These and other factors need be considered to support the most sensitively accurate choice or potential of site as a sustainable environment.

- Locality – distances travelled either to source materials and water, or simply as a site accessible by foot or other means of transport.

_Locality

1. Choice of site with regard to accessibility proved paramount at the beginning of the project, with the national road and other main arterials circumventing the site revealing ideal locality for the desired programme.

2. Regeneration of a Brownfield site also scores well, with the potential of reusing materials from the buildings to be removed.

Existing municipal connections of water and electricity also diminish costs.

3. With regard to access by public transport, the existing bus and taxi node adjacent to the site make the site choice ideal for access to the town's CBD, and walking distance there too does not exceed 1km.

2. Water

Even though the site is connected to the local municipal water reserve, and the district itself receives between 500mm and 700mm of rain per year, the preservation and efficient use of water is paramount to the project, as Louis Trichardt is periodically placed under water restrictions.

_Invader Plants

Invader species local to the site will for obvious reasons be removed. The most notable however is the potential clearance of the wood of eucalyptus north of the site

Removing these trees will indefinitely contribute to the number of staff employed for site clearance and possibly, the timber can either be taken to a pole treatment yard to be prepared for use, or simply sold.

Recycling and reuse

Energy consumption levels can be constrained and controlled by monitoring and practising the reuse of waste. These include:

- Inorganic waste – collected and disposed responsibly
- Organic waste – recycled
- Sewerage – composting toi lets or methane gas harvesting systems.
- Construction waste – used as ground fill elsewhere and In corporating modular construc tion systems.

_Construction waste

1.The residual building rubble from the demolition of the existing buildings on the site can either be used as ground infill for site development, or by money rendering be sold to other building contractors who are developing elsewhere.
All other materials attained during the removal of existing buildings, such as corrugated sheeting from the roof, window frames, light fittings and attachments can be used for the new buildings, or similarly sold to other contractors or manufacturing businesses. If the material cannot be recycled by its use on site, it should be sent to be recycled.

Economy

There exist a number of Economic parameters pertinent to achieving sustainable building performance. By their implementation - efficient, self-governed and maintained building developments that are accommodative of physical change and diverse economic input, are attained. The following text will briefly identify these parameters applicable to this strudy of site.

1. Local Economy

Development should acknowledge the potential of the local economy as contributors to the development in the following ways:

- Local contractors
- Local building material supply
- Local component manufac ture
- Maintenance

It is important that “local” be a variable measured against comparative costs to those of a more regional nature. Also, the area defined as local should be constrained to between 40 and 60km – this applicable to Louis Trichardt, who’s next closest service centre is Polokwane, 100km away.

Social

The indicator that perhaps bares the most weight on the three tiers of this Baseline study, is that of the Social dependability and quality that firstly the building initiates, and secondly,

during the working life cycle of the building.

1.Inclusive environments

The overall objective of the project has already been outlined, with integrated and exclusive environments serving as overriding principles.

Aspects such as location to existing Public transport nodes, with the proposed mixed-use type - both in urban development and building activity, further supplements the application of this principle. By nature of the project too then, access to facilities is largely accommodated for, with those that are lacking easily accessible via the public transport system in place.

_03 precednts

The location of site is now established, as is a possible building programme. An inquisition is now launched into those projects that exist - specifically focusing on trade and transport amenities.
This analysis hopes to support the building type concept outlined, and possibly inform an accommodation schedule. The arrangement of the building's contents within a project as a whole is also studied.

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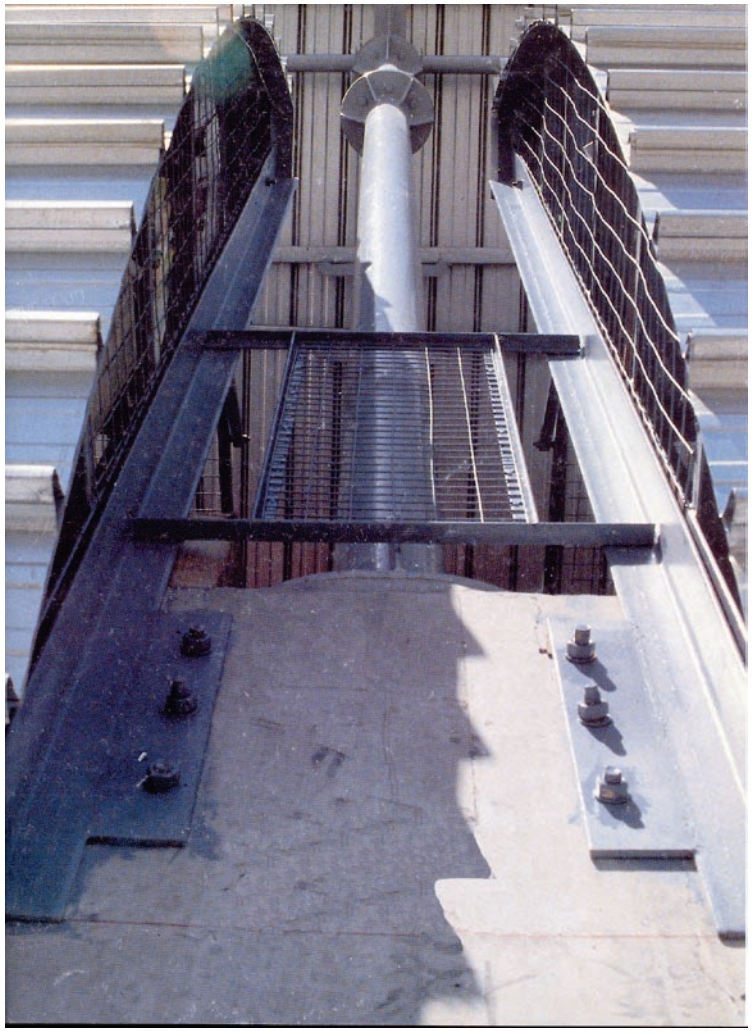


Figure 3.1. Steel coposite detail at Nyanga Junction

Figure 3.2. Advertisement boards fixed to steel tubing

Nyanga Junction Shopping Centre
Guguletu and Manenberg,
Cape Town
GAPP Architects and
Urban Designers
GAPP ARCHITECTS & URBAN DESIGNERS. 1994 Nyanga Junction Shopping Centre, *Architect and Builder*. December 1994, vol 94/12, pages 2-11.

Placed in-between and accessible by the N2 highway, GAPP were commisioned to design a building that would essentially capture commuters and 650 000 potential users to the highway's eastern borders, at Nyanga Junction in Cape Town.

As station precinct, the brief asked for accommodating the mixed range of users and money earners, an estimated 35 000 of which use the public transport of train and taxi provided there.

One of the driving concepts to this venture was the focus of empowering and serving those people previously denied access to convenient shopping and business facilities.
Job creation during construction and operation phases of the project was a major factor as well - principles complimenting goals described already in this paper.
Admirable of the project was the solution to the tight budget constraints, with financial aid received by support of the corporate and community bodies respectively, all working in conjunction with Black developers.

The black businessmen who recognised the potential of the site founded an entrepreneurial spirit. This theme oriented the occupation and empowerment of a variety of commercial users in the terminus.
Specific of the brief, and most notable in application to the Trade and Transport Terminus in Makhado, was the provision of some 12 000m^2 of building capable of housing major retailers, national, regional and local traders in a single "all embracing structure".
For GAPP architects, the roof was to achieve this, allowing any number of facilities to be placed under the structure, unifying and orienting the programme contained therein.

A very imortant retailing and marketing strategy employed is the positioning of Pick 'n Pay with a high and expensive market profile as anchor tenant at one portion of the building, and in another portion, a number of traders renting on a daily basis.
While the retail type content of the building in this paper is defragmented, branding and identified brand names are still important consumer orienting tools that need to be employed.
The differentiation of retail type and locality is also important, as user movement is initiated throughout the entirety of the building.

Aspiration of the architects also, was to liberate the building from established norms of "themed retail experiences", producing an "honest architectural expression of the necessary building components". Ostentatious devices were thus avoided, with the majority of materials

Figure. 3.3 Aerial photograph of the complex, showing roof as enclosing element

Figure 3.4 The simply detailed structure encloses the concrete block and frame buildings

comprised of exposed block, off-shutter concrete and steel work, with finishes limited to brick an porcelain tile, Nutec painted panels, roller shutters and Klip-lok bulkheads.
The industrial aesthetic characteristics of the building are applied robustly, with the modular structure exploited to create innovative detailing. Exposed services, and natural lighting and ventilation were used where possible, further supplementing the concept.

The colour of the malls contained under the roof structure are also understated so as not to retract from the identities brought by the traders, both formal and informal, as well as the shoppers.

The building successfully captures the bulk of pedestrian movement from the surrounding main arterials.
Pertinent to this is the anchor tenant of Pick 'n Pay, whose users then spill over to other smaller formal and informal traders.
The building also successfully conveys people over into other modes of transit in the terminus.
This aspect has particular relevance, as the new Trade and Transport Terminus will have to attract movement to and within it, independent of natural cross movement to other transit types.
Thus, the new building is not a link between different transit types, but rather a link to a new mixed type comprised of amalgamated users, predominantly dependent on the public transport terminus already established there.

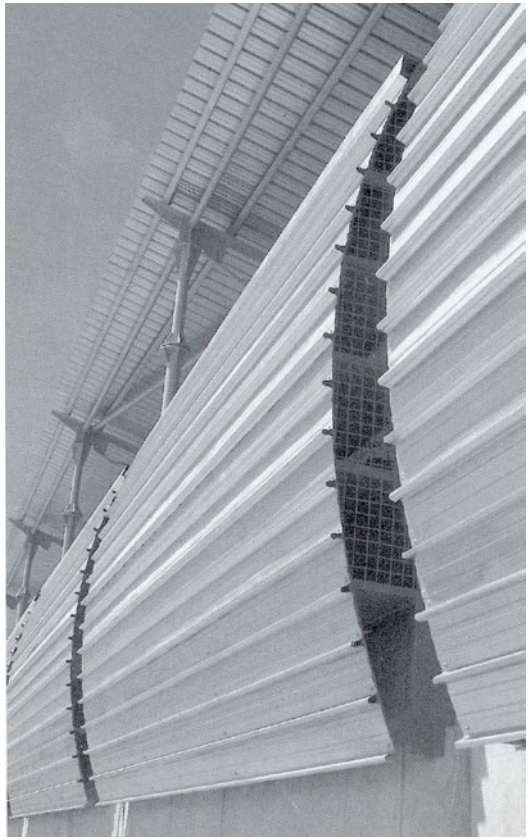


Figure 3.5
The robust matal cladding skin compliments and maintains the overall aesthetic of the complex

Figure 3.6
The roof structure helps define the public passage. The pitch of the roof opens this facade, celebrating the funcions that align it

By the brief description above, Nyanga Junction is free of cultural stereotypes or preconceptions, and in abstract only, refers to the engineering of rail and station architecture, striving to humanise the commuters experience and providing a common social platform in a politically neutral environment.
Reflective of the context described in previous chapters, this element of social security must ultimately be applied to the proposed Transport Terminus in Makahdo, as cultural tension is still very prominent.

Figure 3.7
The drums of industrial waste sold quite aptly by the "Drum ladies"

Mansel Road Bus Facility
Greyville, Durban
Harber Associates
HARBER, R. 1997. Return of the Poor Man - Mansel Road Bus Facility. *Journal of the Kazulu-Natal Institute for Architects*, 1997, vol. 22, no 4, p.6-7.

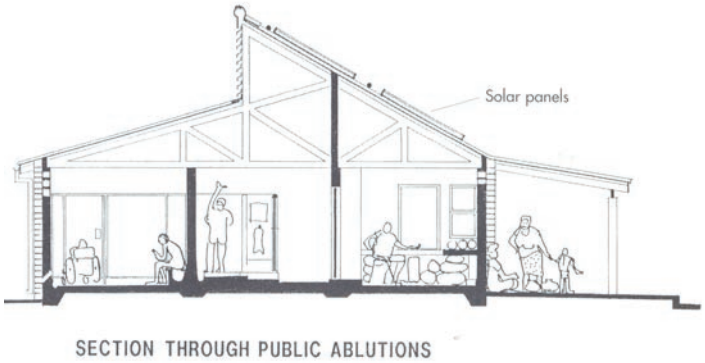
The first example denotes the accommodation of different users of different types of transit to a avtivity of trade. Also, the potential for empowering a community, advantageous to both the developer and lessee was realised. The next precedent is similar with respect to economic empowerment and the facilities provided for, but encompass the trade point as a pavilion/ destination point reaching far further than the immediate public transport facilities provided.

A large portion of vacant land in Greyville, Durban, owned by SARRC was identified as a possible site to accommodate the relocation of a growing and needy trading community who have since the relaxation of exclusion laws flocked to perceived opportunities offered by the CBD.

With these traders, the influxes of long-distance bus charters that have contributed to the trade activity are catered for too. Groups of villagers as far a field as the Limpopo Province (Northern Province) band together and send representatives on overnight bus excursions with cash to buy from Indian traders and street vendors in Durban.

Women selling industrial waste were most influential to the project, as they and there dependents lived on the streets. Up to forty families shared one tap and two chemical toilets provided by the "apprehensive" Health Department.
The majority of these families have since been allocated living, storage and selling space within the new bus facility.

Figure 3.8 depicts the different space allocation, with the storage court favourable for more private outdoor space for the renters of the living/trading unit.



SECTION THROUGH PUBLIC ABLUTIONS

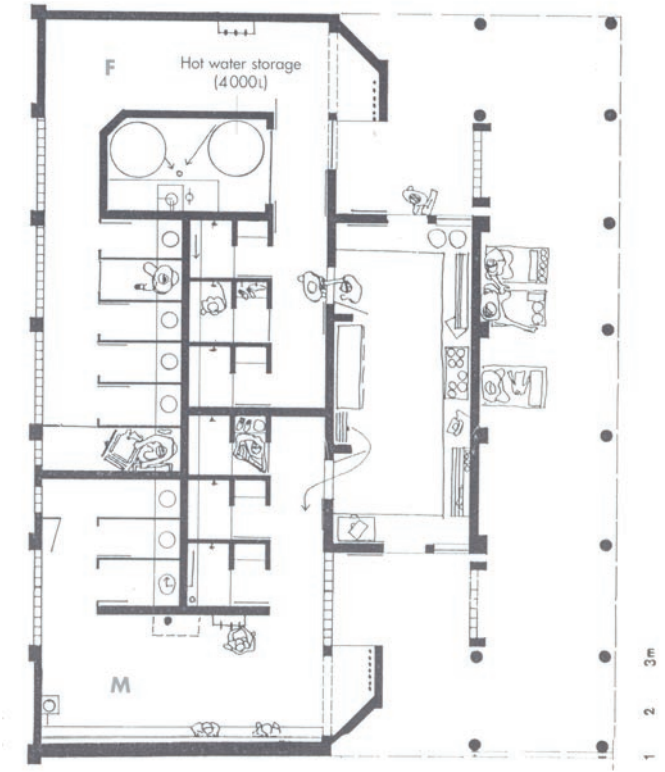


Figure 3.8 Above: A section and plan of the public ablution facilities. Solar panels fitted to the roof provide cheap harvesting of power, used to warm the water used.

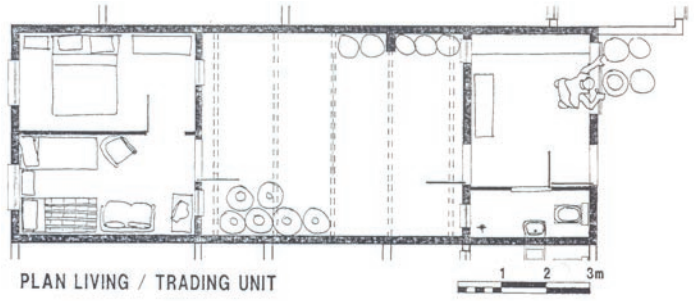


Figure 3.9: Plan of the living and trading unit, with the strorage area used as private dweeling space for the unit's residents. The structure overhead is made of blue-gum poles with a removable tarpaulin cloth to regulate solar gain into the cour.

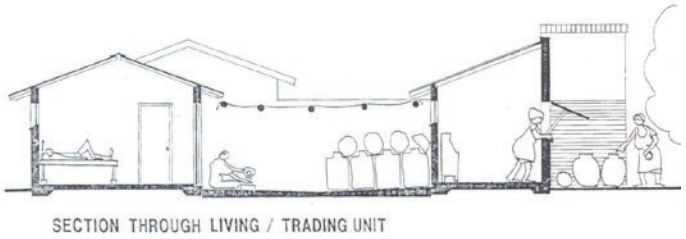


Figure 3.10: Section revealing the description given Figure x, as well as the interface the unit shares with the public realm of the trader and buyer.

Communal toilets were rejected by all families, which pushed up the development costs considerably. The ablution facility is comprised of a small central "shop" where luggage can be left or items bought, and the "shopkeeper" keeps the toilets clean to stimulate trade. Hot water showers are also provided at R1 for two minutes. An applicable solution that provides incentive for a self-regulated and well-kept facility.

As programme component to the Trade and Transport Terminus in Makhado, the application of a structured ablution facility described above will be considered.

The site also provides 180 covered stalls for "car-boot sellers" - (Figure 3.11), 180 bays for pinafore ladies, a 24-hour crèche, learning centre and accommodation for drivers in which to relax.
This precedent is also of particular relevance, by example of the labour source used. "Emergent contractors" were used to build the units, and interested black contractors who tendered on their mark up took part in a workshop on the Bills of Quantities, providing education in skills management and not merely the physical building process.

The Mansel Road Bus Facility ultimately offers sufficient facility for the poor people resident to this part of Durban, by its mixed-use application

Figure 3.11: The carboot traders market

of trading, living and training. Simple yet effective construction is employed to cater for basic amenites, whose spacial definition is also well defined.

warwick junction

Warwick Junction
Urban Renewal Project
Berea, Durban
Architects: Lee and Short, Kooblal and Steyn, OMM Design workshop, Langa Makhanya and Associates, Laren Beni Architect, Barbara Van Zyl, Mike Legg Architects CC

DOBSON, R. 2001. Warwick Junction Urban Renewal Project. *Journal of the Kwazulu-Natal Institute for Architects*, 2001, vol. 26, no 3, p.6-13.

Bisected by "urban freeways" and the N3 Eilat Viaduct overhead, Warwick Junction is one of the country's busiest transport and commercial nodes. Berea Road Rail Station, Victoria Street Bus Terminus, taxi ranks and numerous markets of both formal and informal nature constitute a rather run-down area of Durban. In 1997 the municipal council, together with an agglomerate of urban designers and architects, began to address the rejuvenation of this precinct in consultation with the various user groups found there.

The junction accommodates two thirds of Durban's informal traders in the inner city with some 300 000 daily commuters sustaining an annual turnover of approximately R1 billion. The existing roads and railway station, and their aspired connection determine the structure of Warwick Junction, an array of various trading type making the infill of these spaces. These are comprised of trader's stalls on main streets and pedestrian bridges utilising existing structures as framework to adapted form of infill. The application of more formal structures to previously derelict informal trading now collects the activity, allowing for robust infill of user material and the display of goods. The remains of vehicular on and off-ramps to an uncompleted freeway adapted by the OMM Design Workshop is of special mention, whereby sheltered stalls and connecting bridges were placed on the abandoned structures to cater for herb traders lining the pavements. This development then also allowed for access to the CBD from the

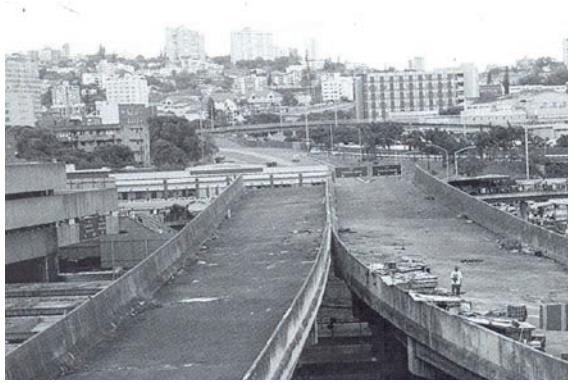


Figure 3.14: View of the abandoned high-way before occupation by the Herb Traders

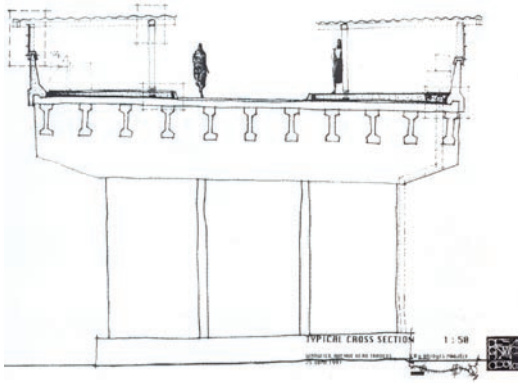


Figure 3.15: Concept sketch of the proposed development by OMM Design Workshop.

Figure 3.12 Left: A simple robust canopy structure protects the informal vendors from the elements and allows room for free expression of display character there-under.

Figure 3.13 Right: A view towards the city of the now established Herb Traders. Note how the street lights suppliment a market street character and suggest an overarching enclosure to the middle portion - defining more trading space.

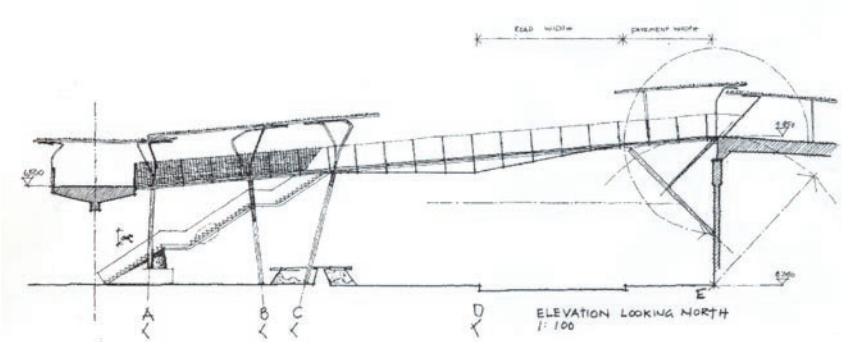
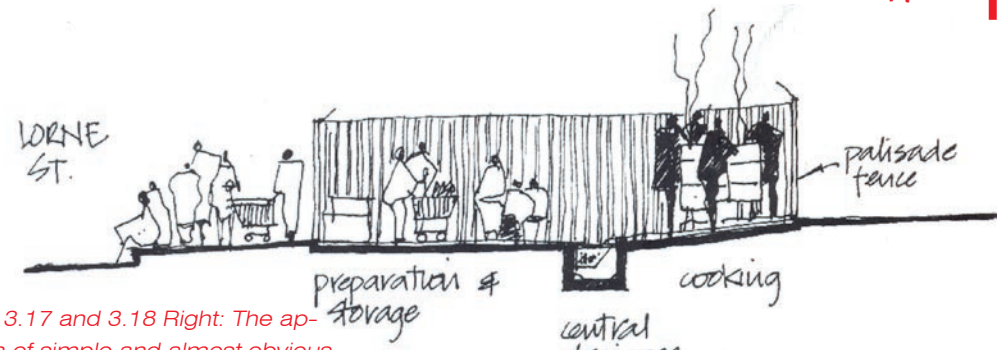


Figure 3.16 Above: Concept sketch by project architect of OMM Design Workshop, Andrew Makin - for the structural addition to the pedestrian bridge.

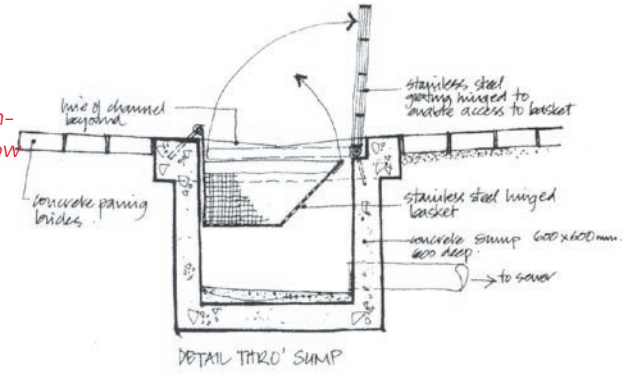
Victoria Street Bus Terminus and various other taxi ranks.

Other specialised infrastructure includes lockable water points and pre-paid electricity points accessed by various traders. Chemically spoilt floors are maintained by provision of "specially designed sumps lined with stainless steel sleeves to catch solid waste", with trading bans handed out to traders if these and other trade principles are not practiced.

Of particular interest to this thesis is the application of formal type systems that cater for the growth of the informal. Often, new systems are employed that only provide more secure and hygienic footholds in which to participate – achieved by a process of mere observation and thorough consultation with the various trade types. Underpinned by economically viable development, the resulting architecture is not sacrificed of quality, but allows the freedom of creativity and expression within a robust structure.



Figures 3.17 and 3.18 Right: The application of simple and almost obvious material and mechanical systems help define different areas of space use within the Mealie cooker's facility, The detail depicted of the sump reveals an effective solution to cleaning and waste management. The materials used are firmly fixed to the concrete structure, making them theft and vandal proof, while at the same time allow for easy access and maintenance.

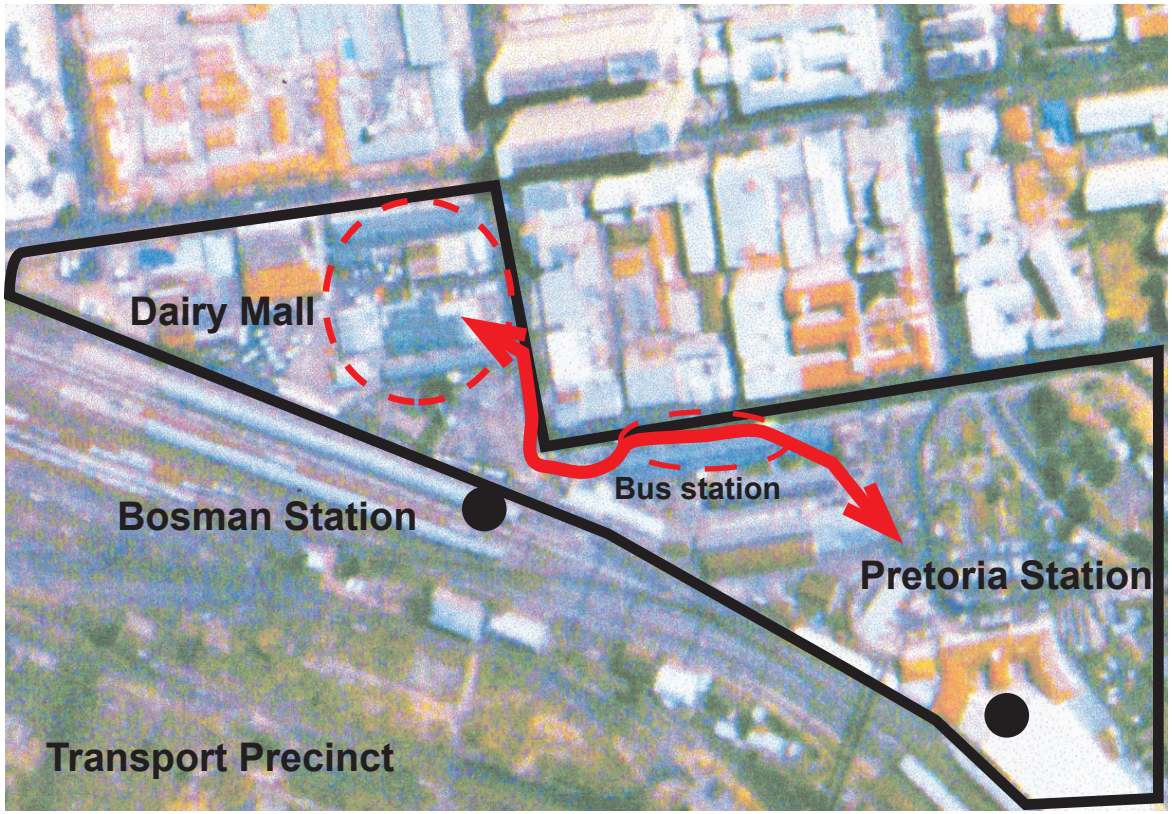


Figures 3.19 and 3.20 depict the spatial qualities achieved by filitering light through wattle lats. Also, the detailing of the loadbearing structure overhead is sculptural and of free form, creating a morph like element along the movement channel.

Figures 3.19

Figures 3.20

Figure 3.21: Locality photograph of the staion precinct



The following precedent is set amongst the transport precinct of Pretoria and Bosman Stations in Pretoria.

This analysis investigates the amalgamation of users of different transport types along the length of the movement spine indicated in figure 3.21. Emphasis is placed on the compilation of user activity in, and the progression of these spaces attributed to the respective travelling modes.

These include: rail and bus commuters moving from Pretoria and Bosman Station into the city's CBD. A large collection of taxi's circulating this precinct that provide for the bulk public transport are found here too.

Beginning just west of the main station, clever and simple design of seating supports the design language of the precinct.

scheidng street bus station

Figures 3.22 and 3.23: The use of old rail lines for street furniture copm-pliments the overall image of the

Figure 3.24: View of Scheiding Street bus station

Figures 3.25 and 3.26 depict the ordering of social to hard space by the mass and collonade arrangemnt of the columns

The Bus Station serves commuters travelling in and out of the CBD from the surrounding townships of Atteridgeville and Mabopane.

The station building itself is an awesome structure that houses the collection of busses and their passengers, as well as informal traders serving these users.
Exposed roof trusses help accentuate the scale of the internal volume, complimenting the building's scale for its function. The front view of the station in figure 3.24, depicts this principle, collecting the busses within one continous form, while also sustaining the scale of the urban fabric.

This northern facade's spacial definition is clear, with the progression broken by basic lines from road and bus stop zone, to sidewalk and trading space. Thick walls define outside and inside activities - figures 3.28-3.29 , and perhaps for climatic conditions, control the solar gain from the north into the interior.
Lettable shop space is also provided here, further accentuating this as the active edge.
The column and pediment configuration of this facade and its visual mass responds well to the language prescribed by the Pretoria Station building, and equally well to its own proportioning system.

The configuration of these components, as well as the skylight above the exposed trusses, help illumi-

Figure 3.27

nate the interior of the building.

Figure 3.25 shows the adaptation of seating arrangements.
The ballustrading is preferred, as it faces directly onto the active edge of Scheiding Street, sustaining visual and social interaction.
The seating provided within the same architectural content of the building is less used, as its configuration is circular, thus users would turn their backs onto the busses. The seating is also placed to far into the sun's reach and thus avoided. The scenario would perhaps be quite different on a cold day, as the brick benches would retain heat, and make warm seating areas.

Figure 3.28

Figure 3.29

bosman station and dairy mall

Figure 3.30.

bosman Station and the bare piece of land in front of itis an important urban space, as hundreds of commuters pas through it every day.
The edge of this derelict land plays subjext to a spine of informal trading (fgure 3.30), that serves the passing commuters and those en-route to Diary Mall.

Figure 3.32.

Dairy Mall was originally developed as an industrial complex for the "Transvaal Koelkamers" who produced a variety of dairy products.
The industrial character of the builgings is still visible, while the function within have been totally redefined.
Serving as taxi depot for both local and long distance travellers, the buildings at Dairy Mall are now occupied by a variety of tradesmen and storage space. These facilities support the large numbers of people moving through the site.

Most notable is the applied character of the buildings and spaces inbetween that the users have created against the industrial backdrop

What makes this site extremely appealing is the density and close proximity of activities, ranging from trading stalls and larger retail shops, to taxi waitng and collection areas and eateries.
A vibrant and symbiotic relationship is shared between all, experienced at surging intervals of arrival and departure times of both the taxis and trains at Bosman Station.

Figure 3.33.

The Mall is essentially a collection of builidngs that by space arrangement and connectivity, are perceived almost as one.

The builidngs merely provide the formal structure from which the users animate the spaces and surfaces while performing their daily roles.

Figure 3.31. Photograph of Dairy Mall from the fire station

Figure 3.34.

Figure 3.35. View of the Mall's main trading street.

Figure 3.36. Unused street furniture.

Figure 3.37. Inside the trading street

Efforts to intiate this character early on, such as the traditional pattern painting to walls and columns seems uncomplimentary at first, and perhaps a little patronising. What is revealed however is the canvas of colour that these surfaces provide, resonating the colours found in the rest of the visual spectrum.

Street furniture and manufactured trading stalls in figure 3.36 try to compliment the archtectural language of these buildings, but fail to be used largely because they are placed in a dead area.

Figure 3.38 depicts fruther adaptation of space. What used to be a large shop is now converted into communal space adjacent to a take-away restaurant. The result is somewhat crude, but speaks of the nature of retail there and the need for such a space. A space sheltered from the elements that reaches full occupation before long-distance taxis depart for other provinces in the country.

Understanding the application of components and allowing for adaptation to an eveironment that is predominantly informally created is difficult, but important for this paper.

This study of the Staion Precinct has revealed a number of important design determinents both for building programme and design.
While the buildings analysed carry an architectural content reaching further than just its adapted application, images reveal how the consequential design of surfaces and spaces are performed simply
Presented against the backdrop of these builidngs' basic form and space defining characteristics, the user is by their everyday activities an informant of texture, colour, material and spatial qauality.

Figure 3.38.

Figure 3.39

rocky street market

Figure 3.40.

Built by Urban Solutions, Rocky Street Market in Yeoville, Johannesburg, was opened in 1999 to cater for informal traders of the area.

This study serves as precedent for its building type and programme, but more importantly for the materials used.
As already identified, Makhado's surrounding districts play home to a large industry of tree plantations, namely pine and eucalyptus. A variety of timber products and the acompanying workmanship is thus readily available, and thus considered for the Trade and Transport Terminus.

The market in Yeoville consists of two large roofed trading and storage areas and trading cubicles surrounding a courtyard - where items are sold also. The cubicles align the peripheries of the main streets and advantageously engage with pedestrians along the streets' active edges.

Items bought here differ in type and quantity from those for sale to the interior of the market. The spectrum of products is thus not limited to one edge (the street) and partially ilimi-natescompetition of buying power. Single purchases of small items are conducted on the periphery and perhaps generate a better turnover than stalls inside the market.

If bulk purchases are required however, buyers are quickly directed to the appropriate stall inside, where that difference in turnover is compensated for.
There are also other incentives for trading within the roofed spaces, such as easier access to ablutions, and cleaning facilites specifically for foods.

The courtyards house social spaces where food and drink can be purhcased and enjoyed, as well as a pay-on-entry bathhouse. Traders surrounding these spaces enjoy the purchasing power of these users.

As in the study of Dairy Farm, a relationship of mutual understanding and respect is maintained by the different trraders who essentially need eachother to survive - the smaller traders attract buyers from the bussling sidewalk, who are then enticed to buy other goods inside the market.

The compostion of volumes both within the larger roofed trading areas and the street cubicles are cleverly detailed with simple materials in an almost raw state. The tresholds of spaces occupied by passing and purchasing pedestrians respectively, are well define.
Figure 3.42 depicts the compostion of timber column and beams used to support this principle on the street edge, with lathes making up the canopy cover.

Figure 3.41. View of courtard walls made of lathes

Figure 3.42. Trading units fronting the street.

Figure 3.43. View of courtyard

The structural compostion of the interior trading spaces is such that the volume is elevated, leaving a deep roof cavity for hot air to escape. Clerestory windows puncture this volume aslo, and allow light to penetrate the interior.
The thick nasonry columns are proportioned well to compliment the scale of the volume also.

A covered walkway connects the streets of Hunter and Rocky that run on the markets eastern and western boreders respectively. Again, simple detailing to a well arranged composite of materials express an honest clarity of structure. The cobination of masonry, timber and steel members are well executed, each revealing their function - figure 3.46.

This triple volume movement spine also predicates the height and material finishes of the courtyard “walls.” At every possible section, the structure and its added skin is exposed, and is sustained throughout the market building.

This study reveals the potential of timber construction from structural component right through to deatailing., complimented with masonry and steel work.

Figure 3.44 Inside a covered trading area

Figure 3,45.

Figure 3.46.

Figure 3.47.

_04 design development

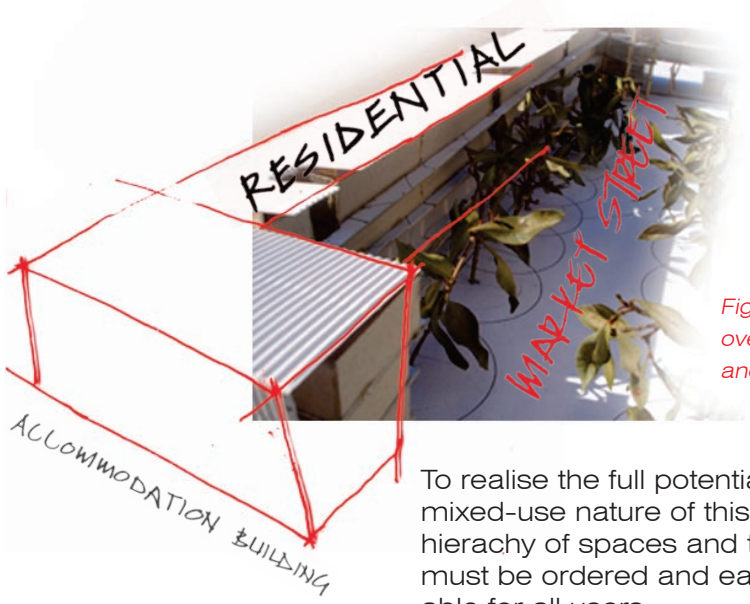


Figure 4.1. Model photograph of overnight accommodation building and market street

To realise the full potential of the mixed-use nature of this complex, the hierachy of spaces and their functions must be ordered and easily identifiable for all users.
The advantages of a mixed-user environemt are exponential, but challenged by access control, security and most importantly, identity.
Housing residents need to attain a measure of privacy, while still partaking in the social and economic values the terminus offers.

Figure 4.2. Aerial photograph of concept model

Figure 4.3.

Similarly, overnight commuters must engage comfortably in the non-temporal genres provided, as do the users of the trade facilities who commute there daily.

There exists then an amalgamation of partisans, whose reference of time and space occupation varies considerably, reaching extremes superseding just the building programme.

Thus for true spatial quality of the repsective users' acute spacial domain to be realised - form, composition and planning of both the buildings' physical and vsiual content must orientate their partisans accordingly.

The development of the concpet begins with the site, and the ordering of the programme content at this level, as it is almost always engaged by all users.

As discussed, the transit collection of taxi's, and busses further east of the complex needs to be connected to the main movement structure, to sustain trade to the interior of the complex. This is achieved not just by proximity of complimentary functions, but by their strict heirarcal arrangement, which as anchors dictate movement throughout the Terminus.

These respective anchors are identified as those that the general user will want to have access to as priority. These then presuppose the placement of secondary spaces, fostering an interdependent reationship between them.

The obvious primary programme is the trading stalls, with the eatery/ restaurant acting as secondary collector to the trading street's users - figure 4.5

The eatery is accompanied by a bathouse to its north-eastern fringe, and by their compostion collect the market street's partisans, forming an important gathering space for these users.

Traders, as well as any truck drivers or long distance commuters who occupy the bulk of the complexes' western half use the bathouse, and market, sustaining cross-movement in the market street.
To suppliment this longitudinal movement further, a collection and drop-off point for taxi users is proposed at the terminus' crossing of Commercial Street.

The combination of users to the terminus is then captured in an enlclosed form, marked as "square".
The footprint of the building marked as "south" has also now evolved to support this square or court formation.

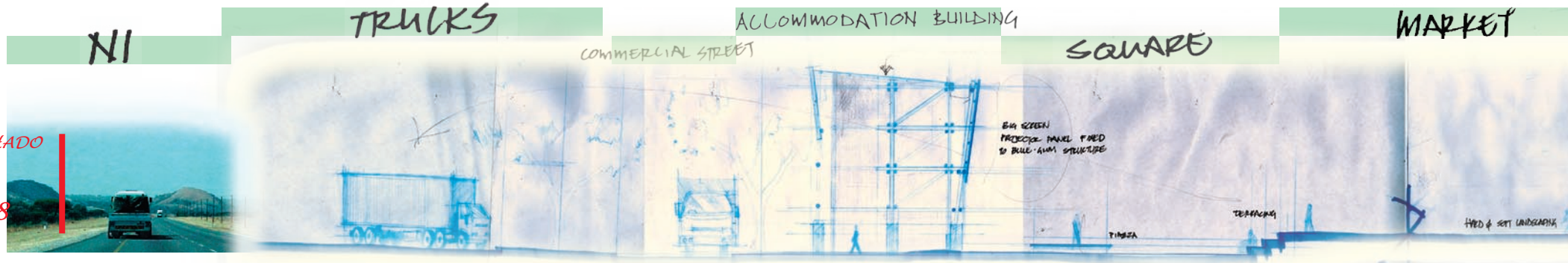
That zone marked in black, acts as a treshold space to the square for those moving from east of the complex, making the progression and definition of outside to inside space (square activty) more legible.

The double volume captured by the administration/bussiness building seen in figure 4.4, similarly acts as a treshold to those entering that building, and the market street from the transit node. This space is then extended onto a square as collector, pronounced in landscaping by the fall of the site. This square then also collects people from the designated parking area south of the admin/ business building.

The public abblutions building houses only toilets and thus does not compete with the bathouse facility.
By its placement as a focal and orientating point, the abblutions are easily accessible by the transit users and traders of the market street.

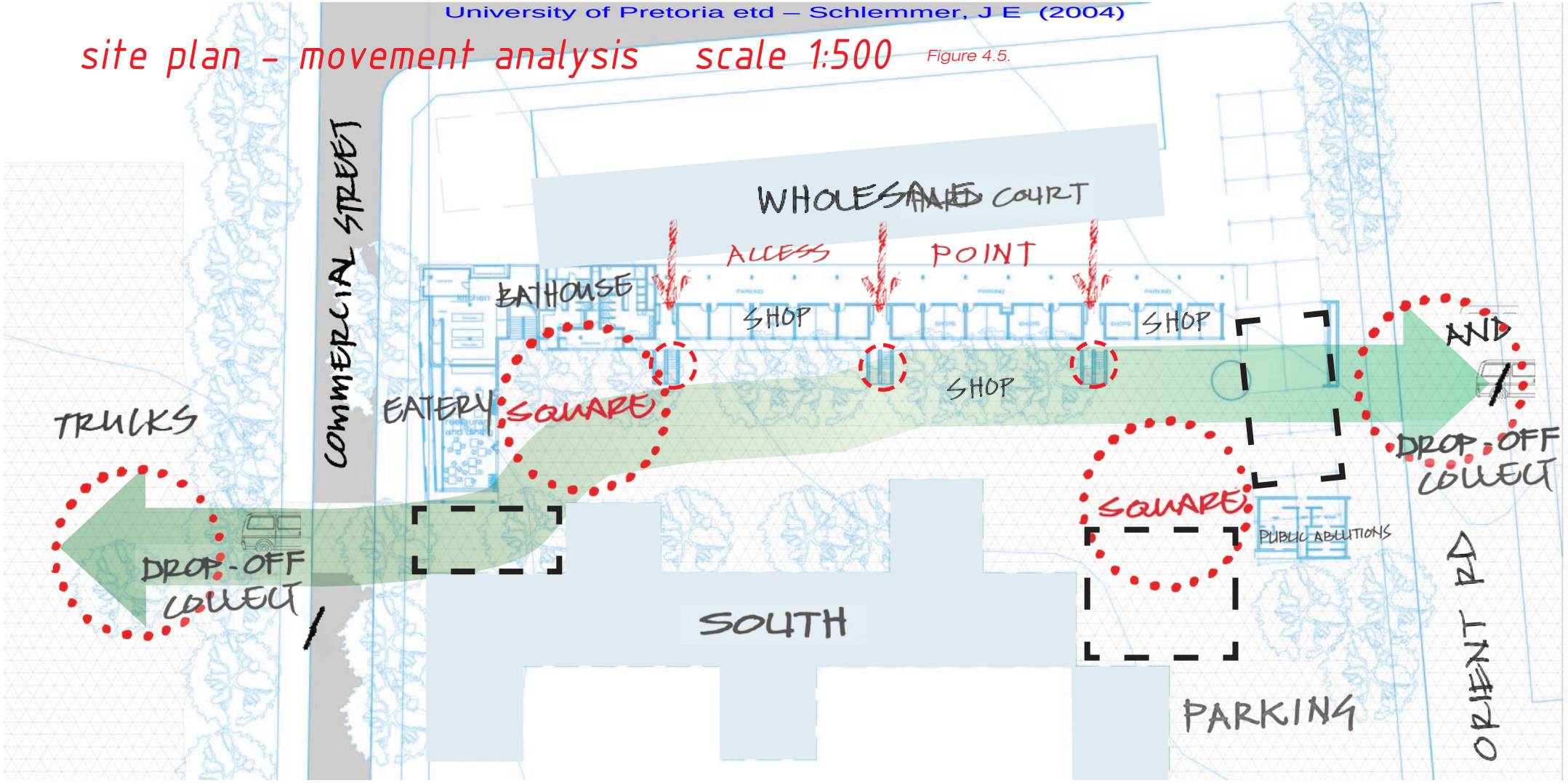
Controlled access is provided for traders and residents accessing the market street and residential units from the "hard" court. These entrance corridors are easliy located by the staircases serving the housing above, and are legible by the collective spacial function of movement.

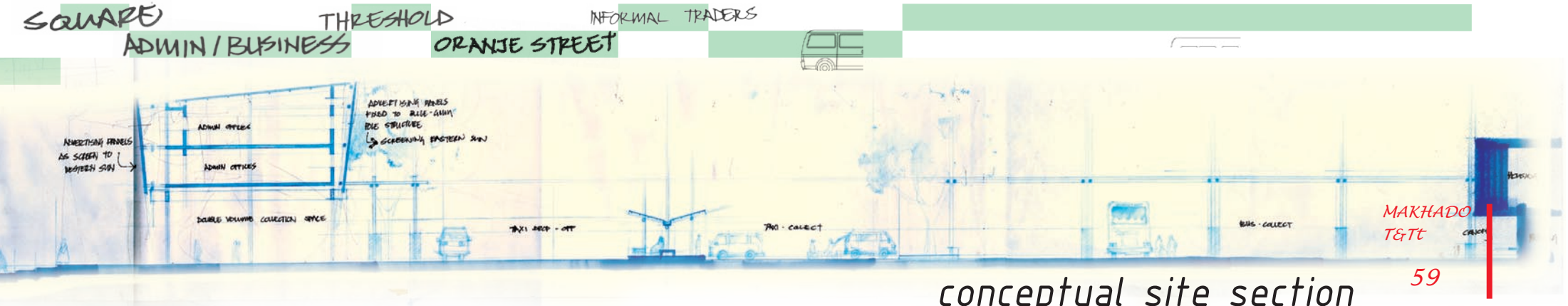
Figure 4.4. Concept sketch - longitudinal section



site plan - movement analysis scale 1:500

Figure 4.5.





conceptual site section

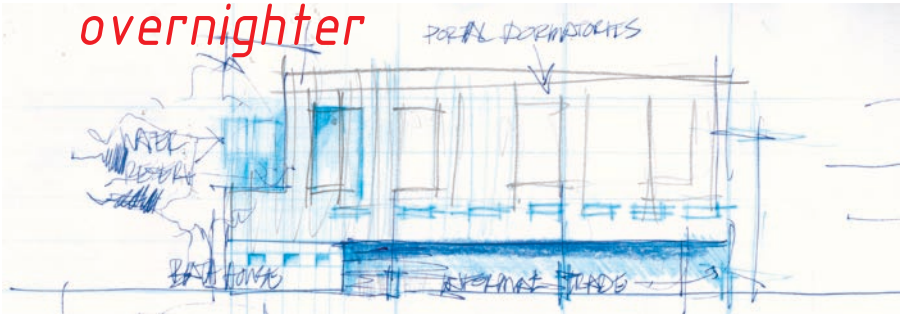


Figure 4.6. Concept sketch of western elevation

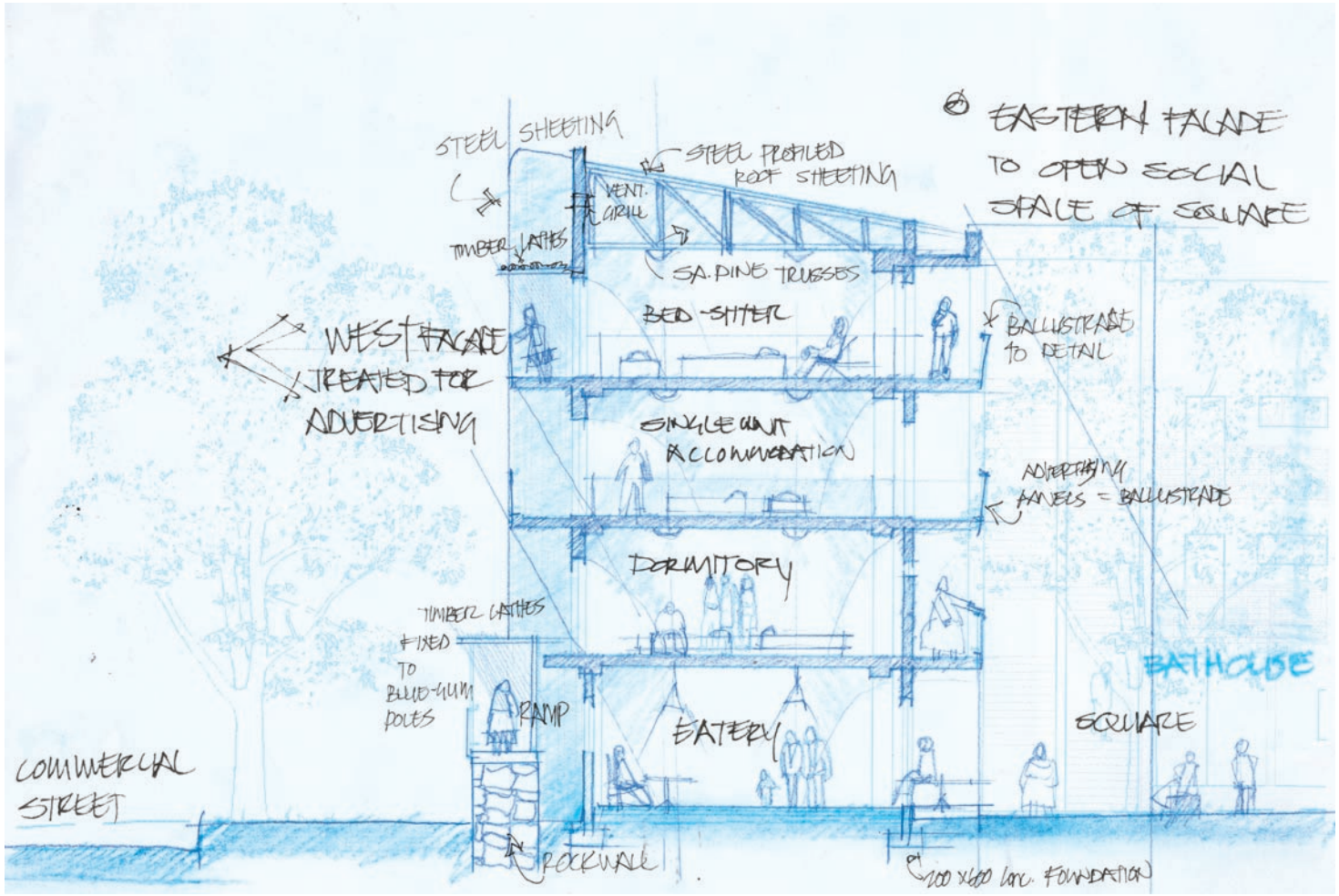
Its visual content is therefore interpreted semantically by the Terminus' respective users, which include both the literal (truck drivers and long distance commuters) and the extended visual user of the national road and town resident.

It is by this principle that the building hopes to respond mnemonically, with particular emphasis placed on the temporal and fixed natures of its users.

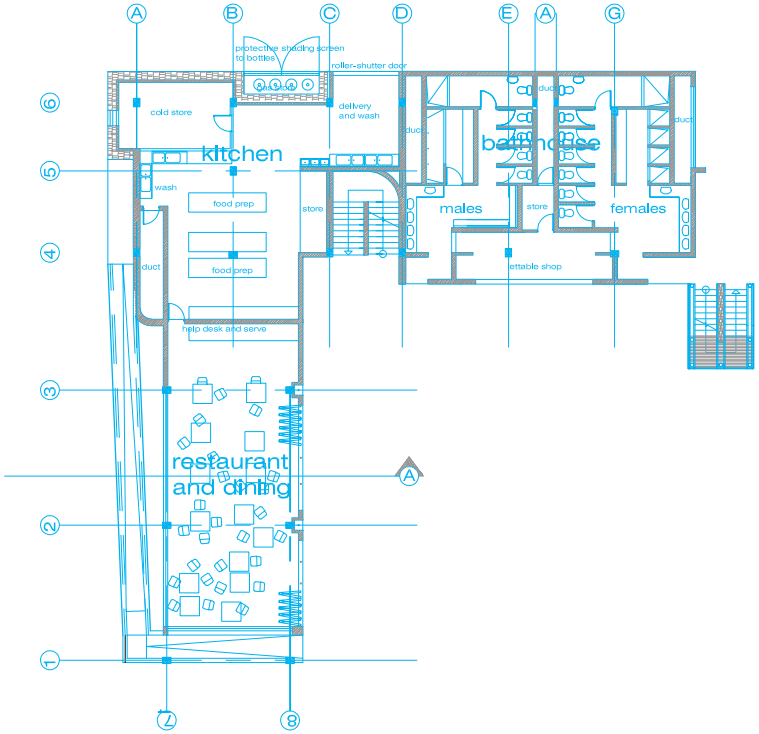
Figure 4.7. Section of overnighter building

The overnight accommodation building is designed in anticipation of both its spacial and visual content.

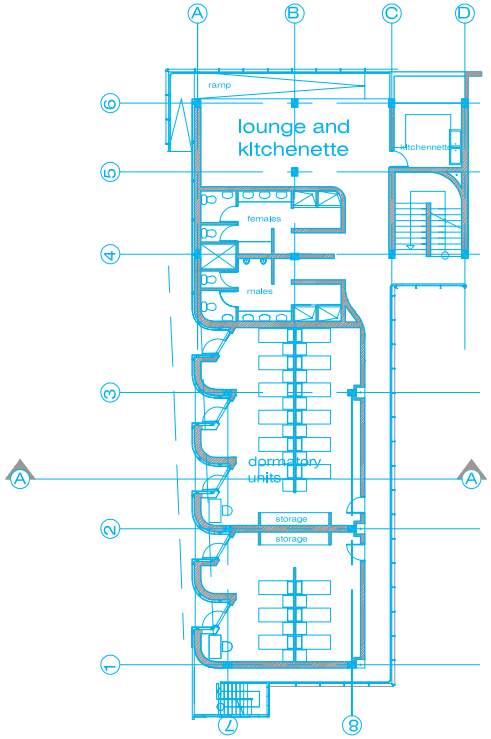
Facing the N1, the building seeks firstly to maintain the guidelines of urban design development in response to scale and orientation.
The national road has been acknowledged as a hard and almost impenetrable line, dictating the internalised acivity of the Terminus.
However, as the complex will largely remain as a catalyst for some time, the building in question will be viewed inevitably for the time-being as an active and responsive facade of the complex as a whole.
Its didactic performance will similarly continue to be studied throughout the life of the building also.



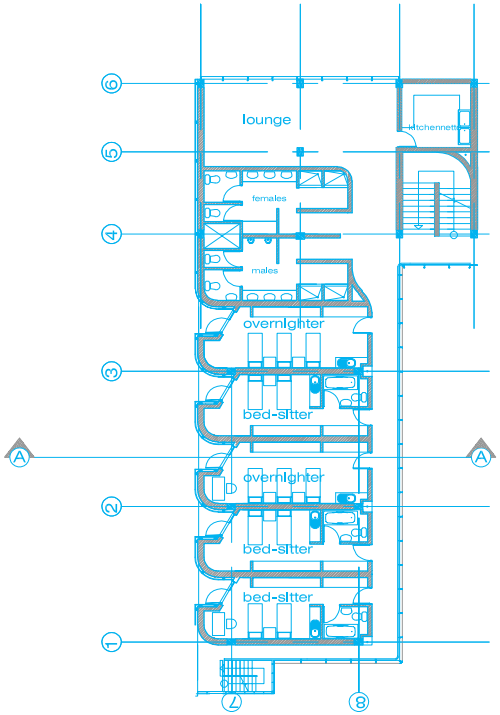
Ground floor plan



First floor plan



Second/ Third floor plan



The building's programme is comprised of a variety of sleeping spaces with supporting communal facilities, such as ablutions and kitchenette, and the option of making use of the eatery at ground floor.
The dormatory units are arranged for either small or large touring groups, with smaller units on the 2nd floor catering for smaller groups of people. This accommodation unit is repeated on the 3rd floor, with the intention however that these may be easily converted into bed-sitter or bachelor units for permanent residents.
As this builing's occupation will very often not reach its full potential, the inclusion of permanent accommodation is pertinent to maintaining an element of passive surveilance and thus security to this building
Access to these units are oriented to the east, initiating a level of social engagement with other partisans of the square the building faces onto - figure 4.7.

The main staircase serves this building only, restricting access to the housing. Placed to specifically orientate this builidng's users within the sqaure, the access point also initiates social interaction with other users in the square.

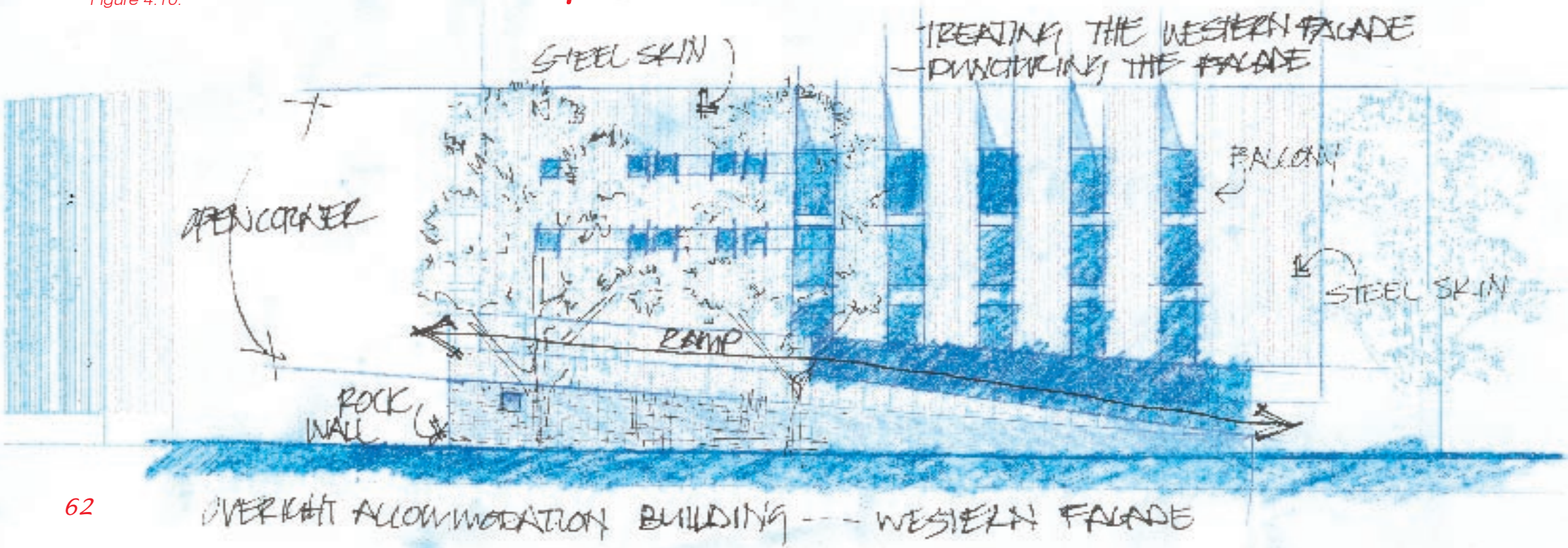
Wheelchair access is provided for the bulk of the complex in this building, with the ramp circumventing its south, west and northern exteriors. An alternative route via the eastern portion was explored, but was omitted because of interference with the spacial quality of the square.
Surveilance of the ramp is maintained through the eatery's western wall. This permeability and the solar gain to the interior, is controlled by a compsite of blue gum poles and lathes -figure 4.7

Figure 4.8 A bridge connecting two informal settlements crosses the N1 - a common element sighted throughout the journey from Pretoria to Makhado. The concrete and steel bridge is clad in profiled channels and steel mesh to stop people throwing objects at passing traffic

Figure 4.9 Portions of the landscape are cut away for road construction exposing the crude texture of the rock. This is sighted spceifically in the Waterberg mountain range en route to Makhado

inspiration

Figure 4.10.



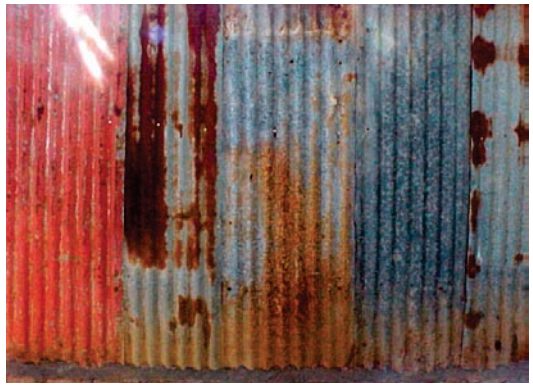


Figure 4.11 Second-hand profiled steel sheeting is used to build houses in both informal and formal settlements. The untreated material ages over time due to harsh climatic conditions, leaving it stained.
The dialogue of this material is to be continued on the skin cladding system of the overnight accommodation building

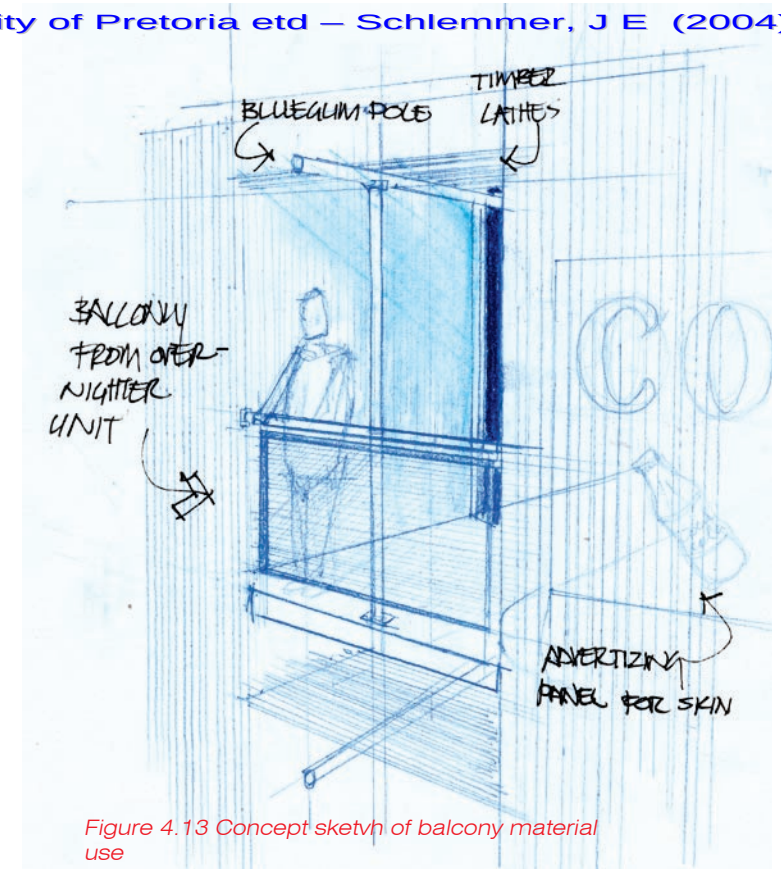


Figure 4.13 Concept sketvh of balcony material use

Figure 4.12 A combination of steel and timber reveals an interesting aesthetic

The western facade is attenuted to reflect the overall industrial nature of the precinct, and suggests material dialogue of the truck drivers.
An over-arching metal profiled skin covers the building, which is punctured by balconies of the units. A more detailed surface of face brick and timber is revealed representing humane attributes of “home” and “shelter” - figure 4.13.

In response to the visual content of this facade, the metal skin is defragmented in covering to allow advertisement panels to be attached to it.
The generic application of materials or advertisement boards to this surface by memebers of the public is achieved.

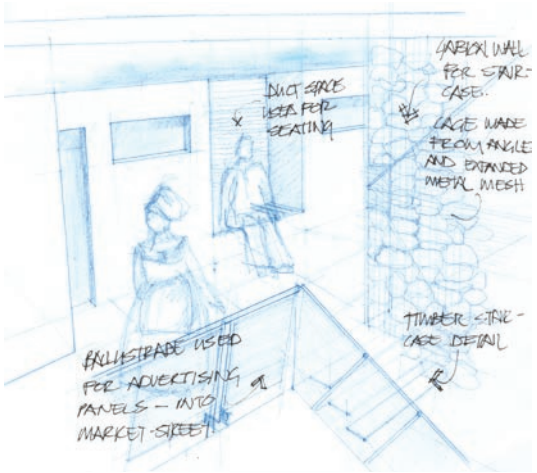
The development of the housing component to the Terminus is directed by its relationship to the soft and hard activities that flank its southern and northern boundaries, and its composition as a successful mix of units that will sustain non-monofunctional tenant activity.

Family, extended-family and smaller bachelor units are grouped into portions of the housing building, with a suffucuent number of access points serving them.

These units share a common area of the passage and staircase as social space, which fronts the market street.

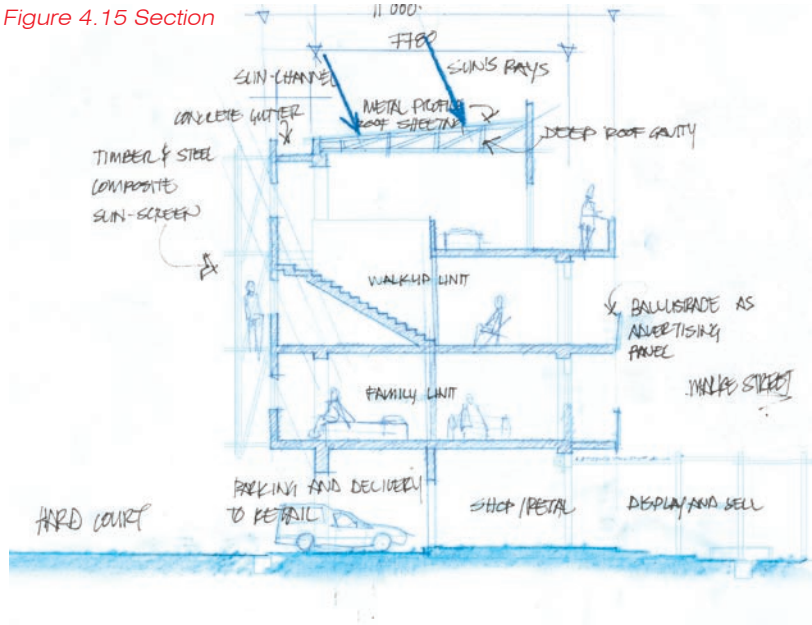
An element of security is initiated, as access to the units is visible by large numbers of people from the market street.

Figure 4.14 Concept sketvh of housing balcony and passage

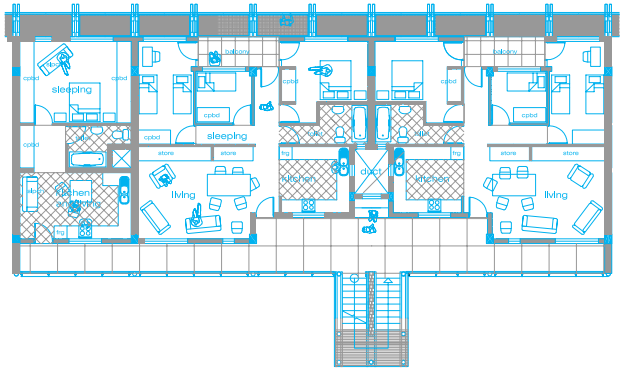


The sleeping areas of the units are oriented to the northern half, to take advantage of the solar orientation. A more private space is attained as the living area acts as noise buffer to the socail activities of the market street, and thehard court to the north provides reduced noise levels also. Noise resolution of this court and the wholesale depot has already been discussed.

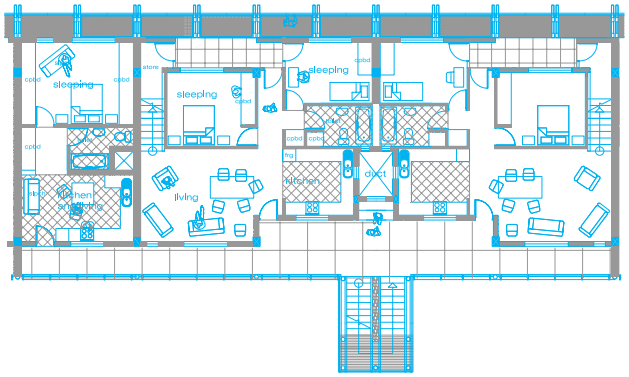
Figure 4.15 Section



Solar control to this facade is treated by two components.
Firstly, a figurative sun channel is placed as a heat retardent in each unit. This channel is easily adaptable to either add more space to the respective rooms, or to be used as a private retreat area for any of the unit's residents.



Housing plan arrangment



Plan of walk-up and bachelor units

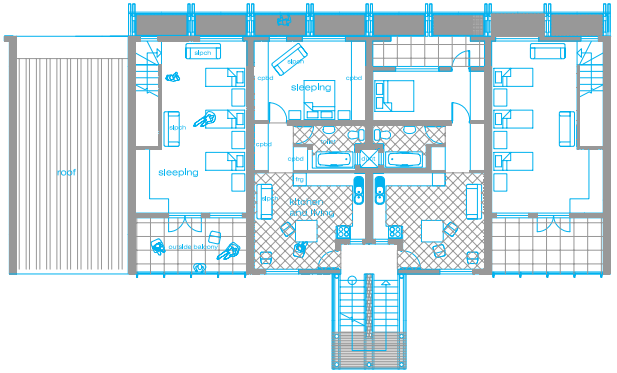


Figure 4.16 Above: Local application of materials for sun-screening

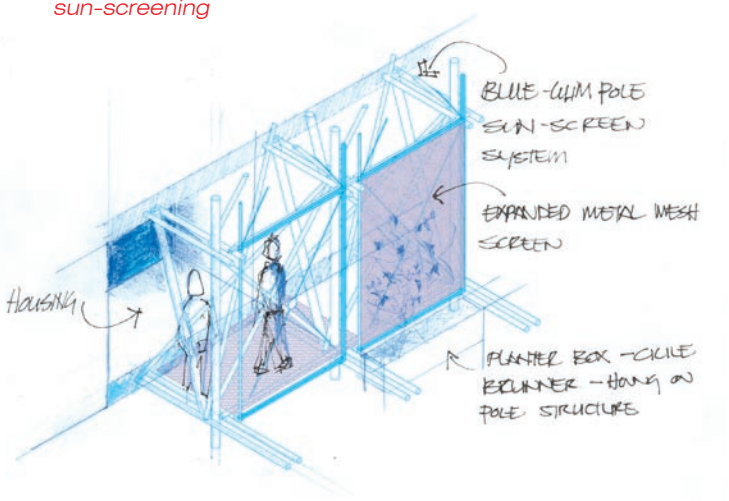


Figure 4.17 Above: Concept development of sun-screen

The second component, is the fixture of a timber pole and steel mesh composite structure. This structure is comprised of expanded metal panels that are fixed to a sliding rail, allowing users to determine the quality and quantity of sunlight to the interior of the units.
The northern facade is thus animated by the respective units' tenants, alleviating an otherwise monotonous facade.

Individual colouring of units' walls also help assign a sense of ownership to tenants.
Fugure 4.18 depicts the red sand found in site as possible colour, applied as pigment to the plaster finish on walls.

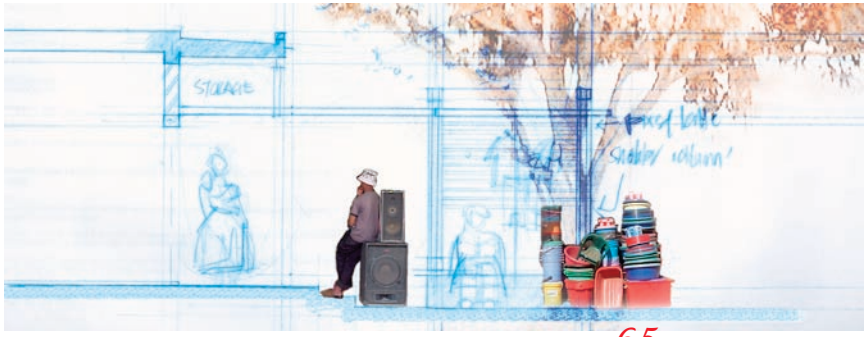
The shops at ground floor level are simply detailed volumes that are either used as retail space, or storage of goods.
In the latter arrangement, the display of goods is displaced in to the market street itself.

Figure 4.18 Below: Red sand at the bus depot

Figure 4.19: Trading stall found at the side of the road in a the formal settlement of Elim , 30km east of Makhado

Blue gum pole detailing of this facade sustains the continuity of materials used elsewhere in the complex. The structure and compostion of these timber elements is executed to define different zones of the market street, and in abstract continues the texture and density predicated by the trees.
The southern facade is thus graded in detail from the trees to the concrete building.

Figure 4.20 Below: Concept development of shop front

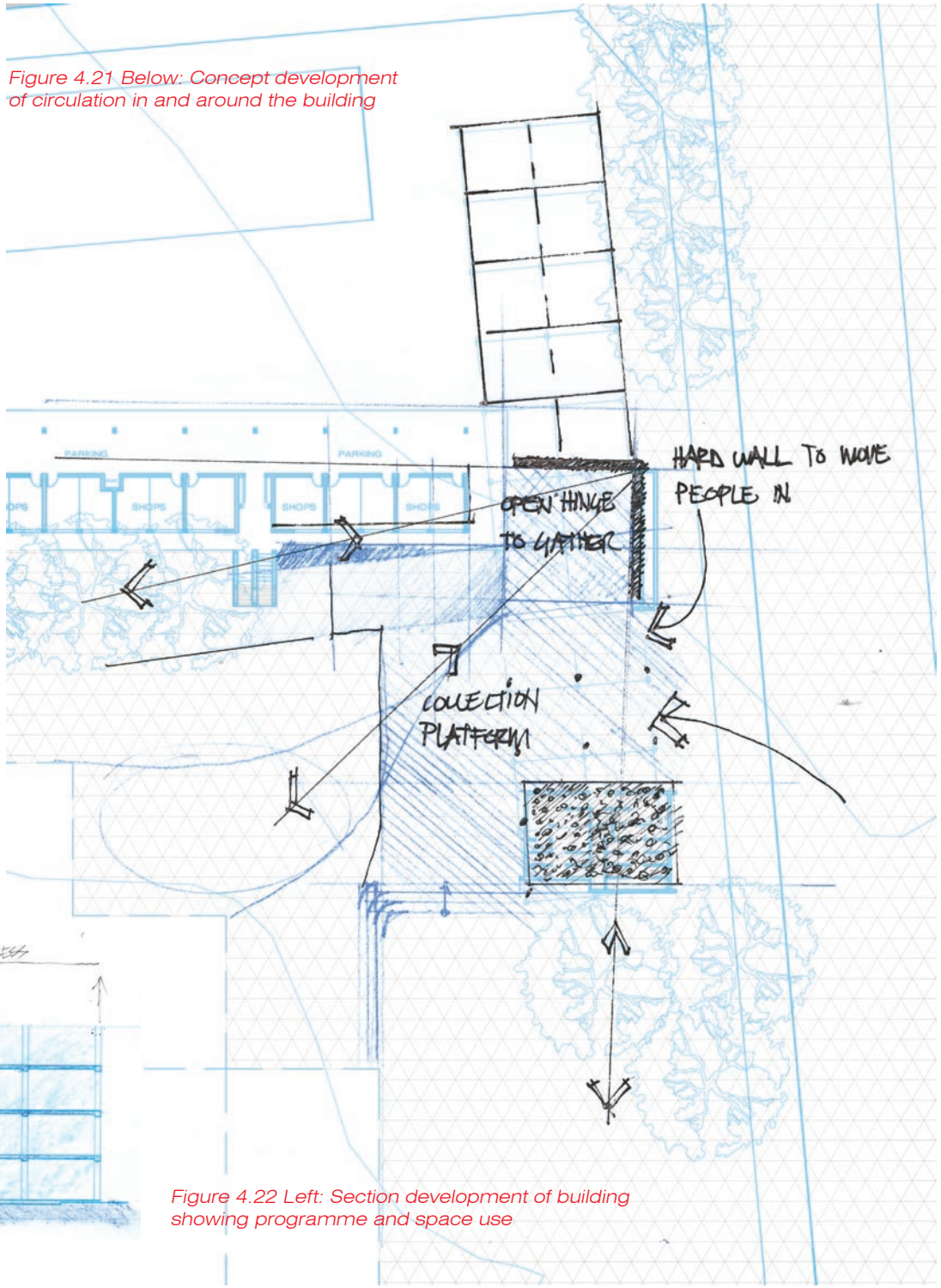


The administration/ business building is bound by Orient Street and the taxi and bus facilities to its east, and the market street to its west. As discussed earlier, the programme allocated to this building is done to strengthen Orient Street as the new high order street.

The builidng is comprised of easily divisible lettable office area. Pertinent to its spacial and circulation development, is the four-storey volumed atrium at its centre. This space plays a number of roles. The first, is its connection with the housing building: the atrium is to act as a hinge of these two buildings. Secondly, this hinge is to be visible from the market street, acting as a focal and oreinting point, making access to the builidng legible - figure 2.41

The toliet and kitchen services line the circumference of the atrium, with the main staircase placed therein as well. The result is the collection of all users of the builidng - both tenants and visitor, in one meeting place - figure 2.22

Figure 4.21 Below: Concept development of circulation in and around the building



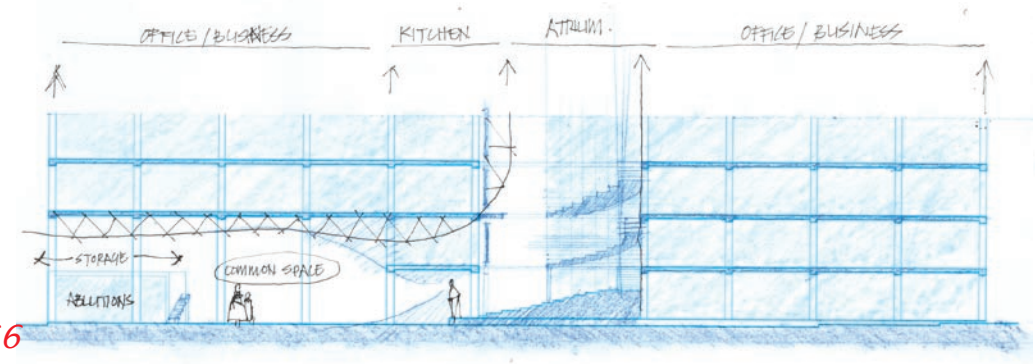


Figure 4.22 Left: Section development of building showing programme and space use

Figure 4.23 Below: Cross-section

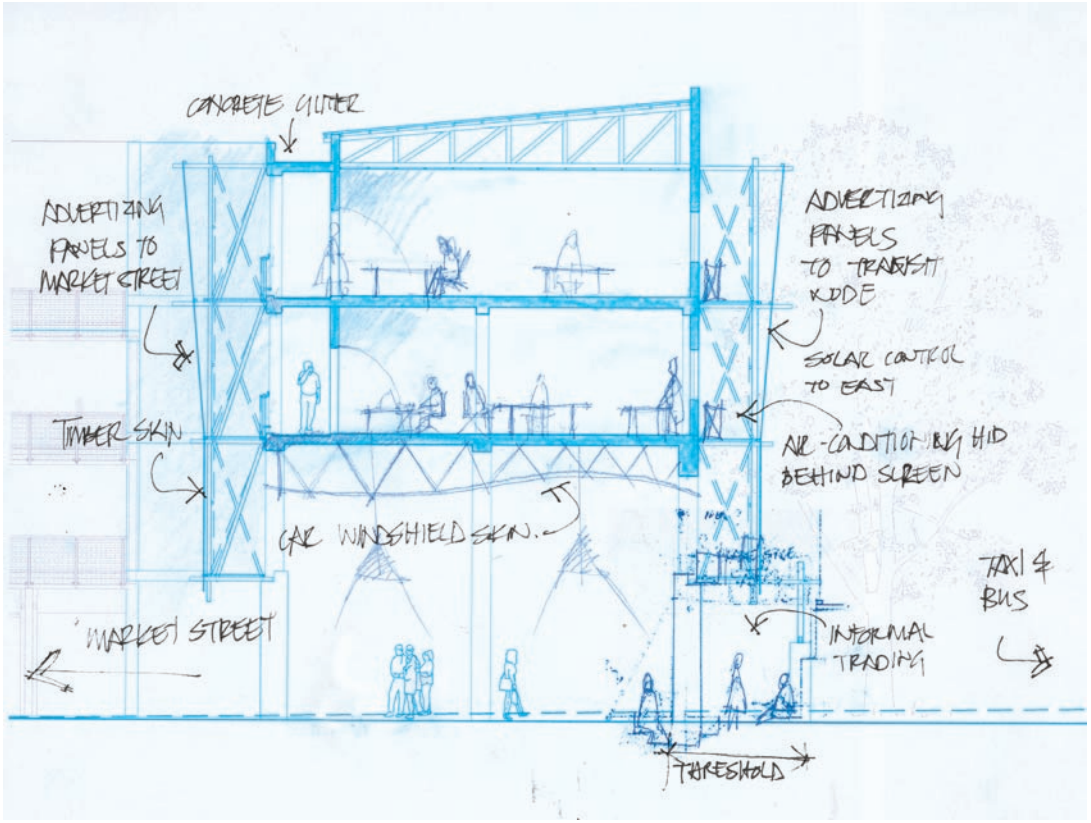


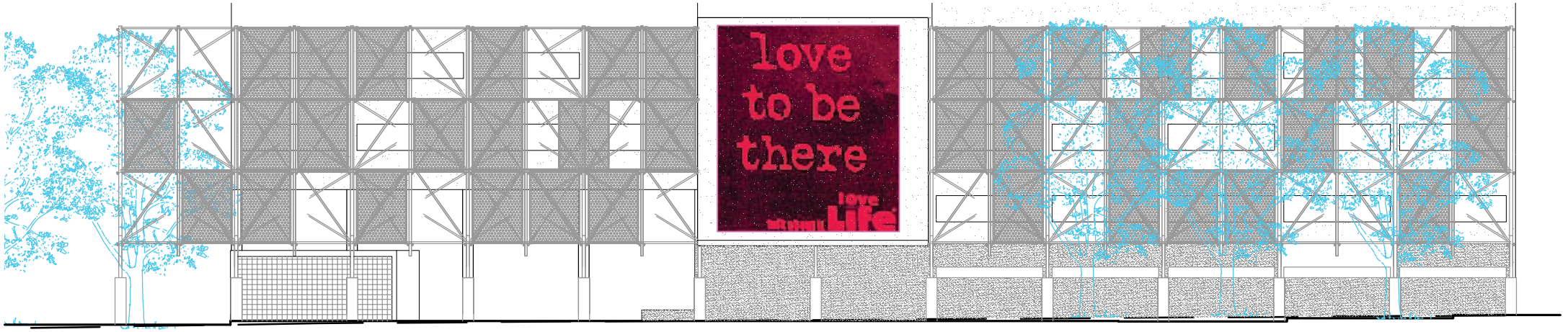
Figure 4.24 Below: Preliminary eastern elevation, depicting the use of the sun-screen system

Social interaction is dictated, with the shared services of the offices helping to sustain this activity.

By its orientation (east -west), the solar gain into the builiding is similarly re-solved with the timber pole and steel composite structure.
Advertising boards are fixed to the panels that are also movable to allow control of light quality.
The wall of the 4-sorey volumed atrium helps define the concentration of movement into the complex, and acts as a mountable surface for other advertisements.

The double volume under the builidng is a collector space for those moving from the transit facilities to the market street - figure 4.23

The underside of this volume is clad with unused car-winshields sourced from local scrap-yards. Its linear form helps dictate longitudinal movement, and serves as an acoustic skin for a space that may double-up as a multi-purpose gathering space.



accommodation schedule

The precedents researched have revealed a number of programme contents, both by their specificty and overall arrangement.
The site and user analysis thus far also informs the accommodation schedule, asking for strict arrangement of functions that respond to different user movement in and around the respective builidings.

The new Trade and Transport Terminus is to accommodate a range of basic public services and amenities to sustain user interest within the mixed-use application.

Only selected buildings are chosen for this paper - Phase 1.
The contents of which include:

1. Wholesale storage and retail space for consumables - providing for both informal and formal traders.

2. Housing for prospective owners of retail space and intersted members of the public.
   This provision of housing must include units of standard family size, extended families, bed-sitters and bachelors.

3. Overnight accommodation for long distnace travellers and tourists.

4. Basic public amenities which include:
   _ablutions and a bathouse seving the users of the transport facilites exclusively, and the users of the market itself.
   _restaurant and communal eatery.
   _laundromat services

5. Management and admistration offices for the terminus, which includes security servces.

6. Lettable offce space for businesses.

The remaining spectrum of commercial functions and facilities not described above, such as banking and health services, will be provided within the other buildings, marked as Phase 2 in figure 3.58.
The retail of non-consumables is to be included in this phase also.

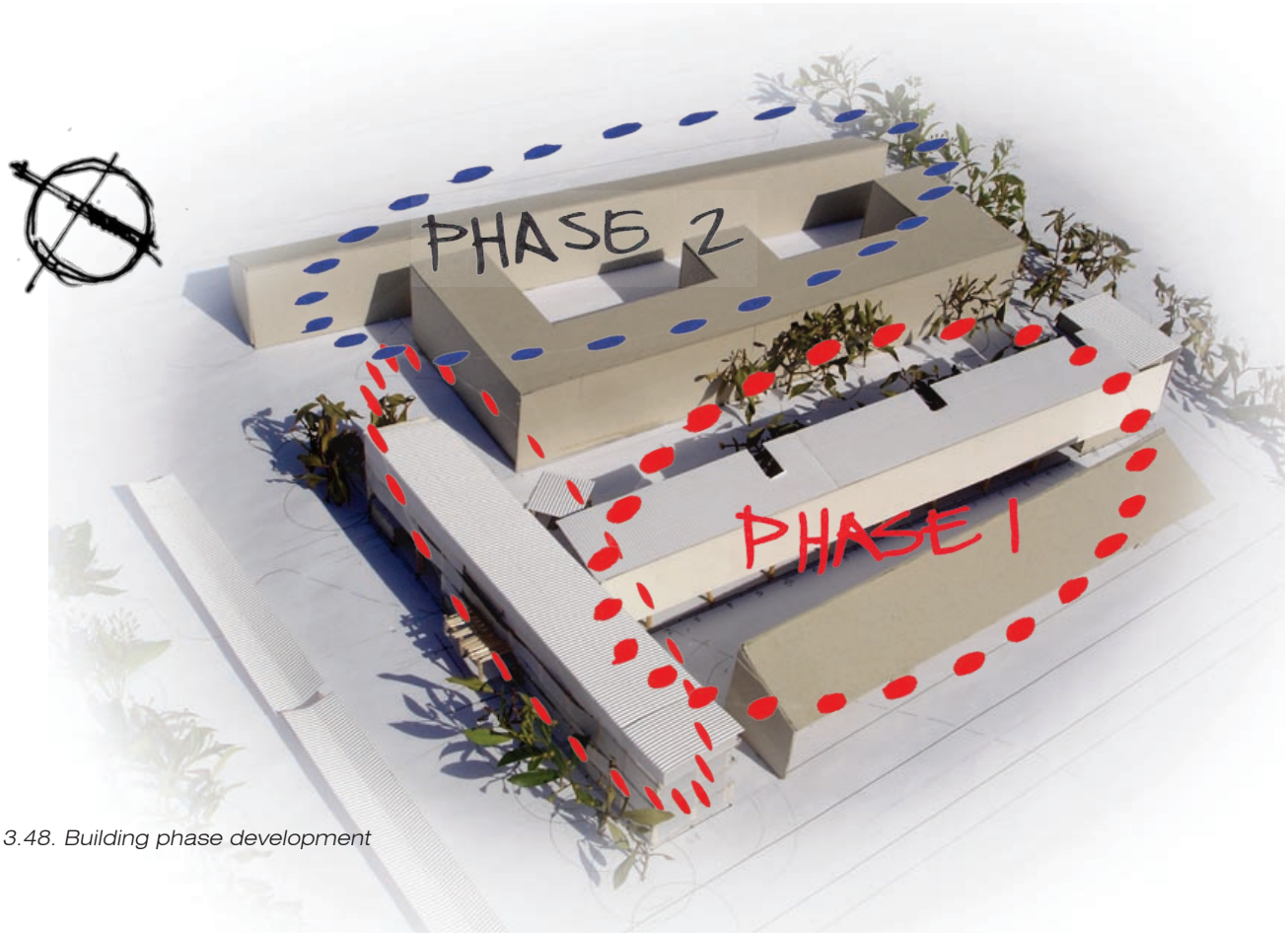


Figure 3.48. Building phase development

interested and affected parties

Client Profile

The project is proposed as a Local Government Initiative, investing in economic development not only for the town itself, but for the greater community of informal economic type it supports also - as recognised by the IDP (2002).

Funding for the development will attract more formal interest from the commercial and business sector foreseeing the growth potential ascribed to those objectives sited by the Municipality and Local Government in the IDP (2002).
Particular emphasis is placed on the development of the Trans Limpopo Spatial Development Initiative, which will similarly be supported by government and private investors.

Affected Parties

The primary public user group is not only those residents of the town itself, but also the greater populace of the Makhado Municipality. Those users traversing from Zimbabwe en route to other major metropolitan areas in South Africa hope to supplement the regional user type too.
The private sector user is comprised of commercial and business interest making use of the facilities provided there.

biophysical

The town and its surrounding areas are contained by the Soutpansberg mountain range to the north, with agricultural and mixed sour bushland making up the remainder of its circumventing land type of undulating plains. This character of the veld type falls under the biome of the Savannah.
With a relatively moderate erodibility index, the eutrophic soils found in the area prove to be beneficial to the activities of farming in both livestock and fresh produce, as they are soils that contain an excessive supply of nutrients (mostly nitrates and phosphates).

Figure 3.49. Orientation and wind activity on site

The mean annual precipitation of between 560mm and 700mm per annum reveals ultimately why this largely subtropical climate is favourable for agriculture. The bulk of this water is then dispatched to its primary catchments of the Limpopo River.
Wind activity is described by Holm (1996) as predominantly east northeasterly to east southeasterly in the summer. Winter winds are predominantly southwesterly with a fair amount originating from the northeast.

Makhado's subtropical climate has a relatively high humidity content, thus aggravating high temperatures. Maximum and minimum temperatures reach an average of 29° and 18°in the summer, and winter temperatures of 21° and 8°.

There is an average of 13K difference between day/night temperatures, with winter temperatures reaching 15K below the comfort zone and 3K above in the summer months.

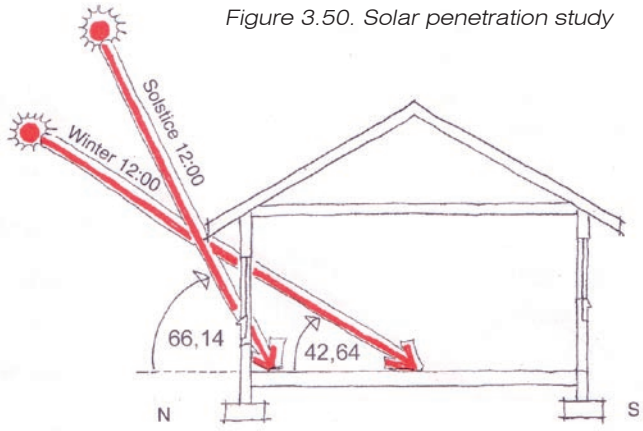
The treatment of solar ingress to buildings is determined by the summer solstice and winter sun angles for Louis Trichardt
These are:

Summer(21 Mar/23 Sept) - 66,14 and
Winter (22 June) - 42,64

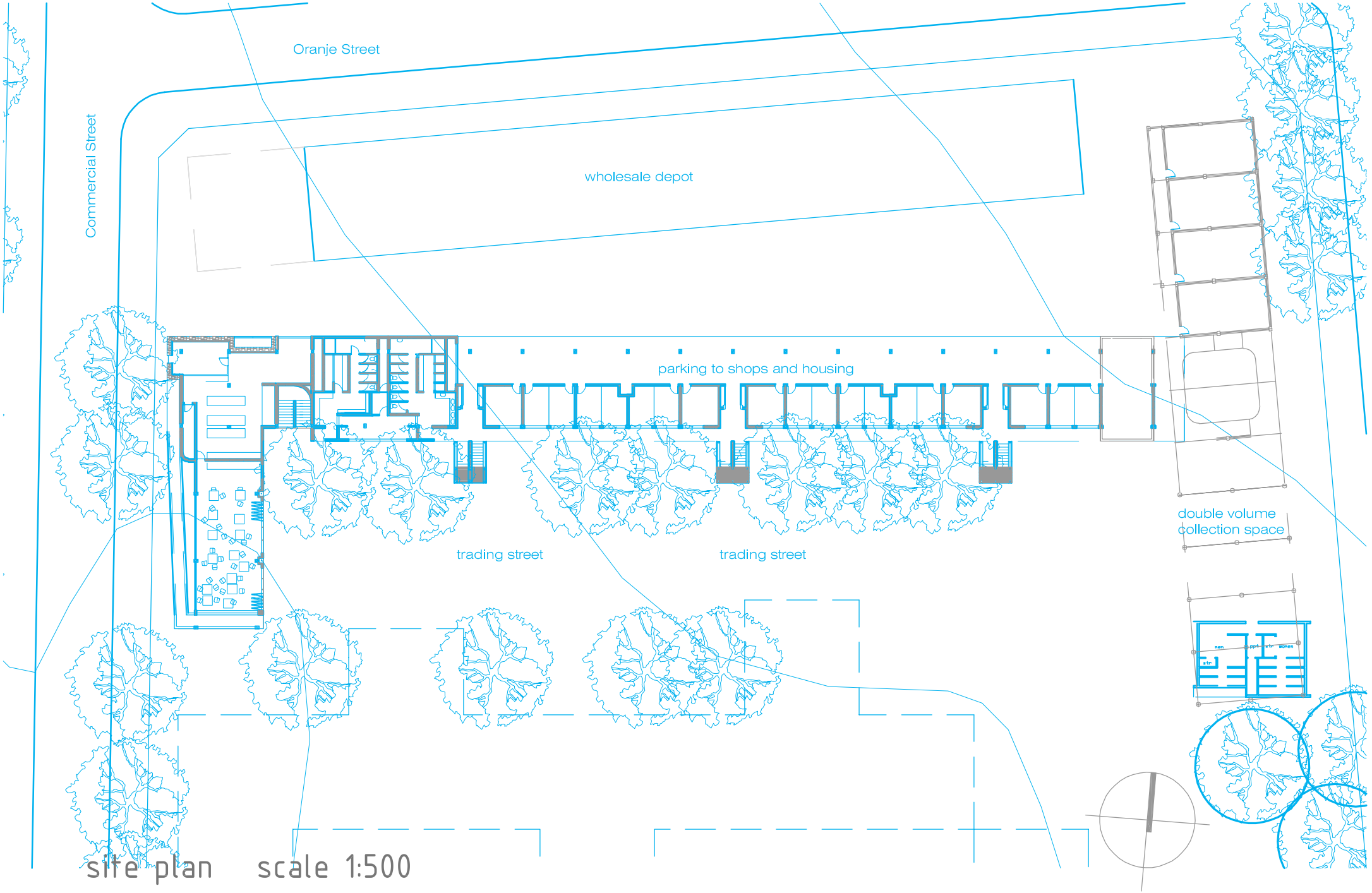
As described earlier, a large number of Harpiphylum Caffrum trees located within the Eltivillas shopping complex, and the collection of eucalyptus on the northern portion of the Eltivillas business complex.
A number of acacia (thorn trees) are sporadically placed on the road reserve portion of the national road also.

Section drawings studied of the existing builidngs on site reveal simple strip foundation construction and thus no problematic soils

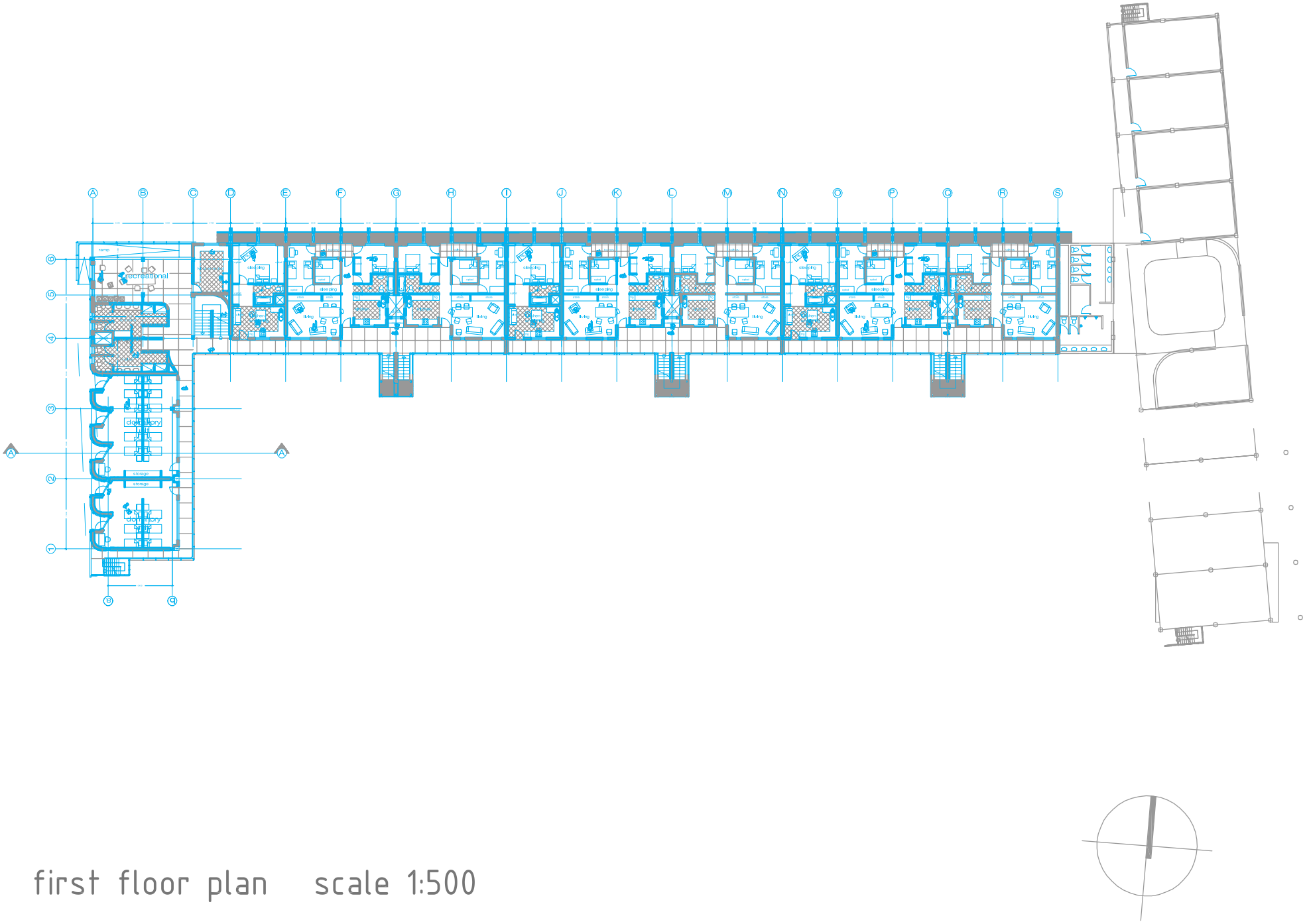
Figure 3.50. Solar penetration study



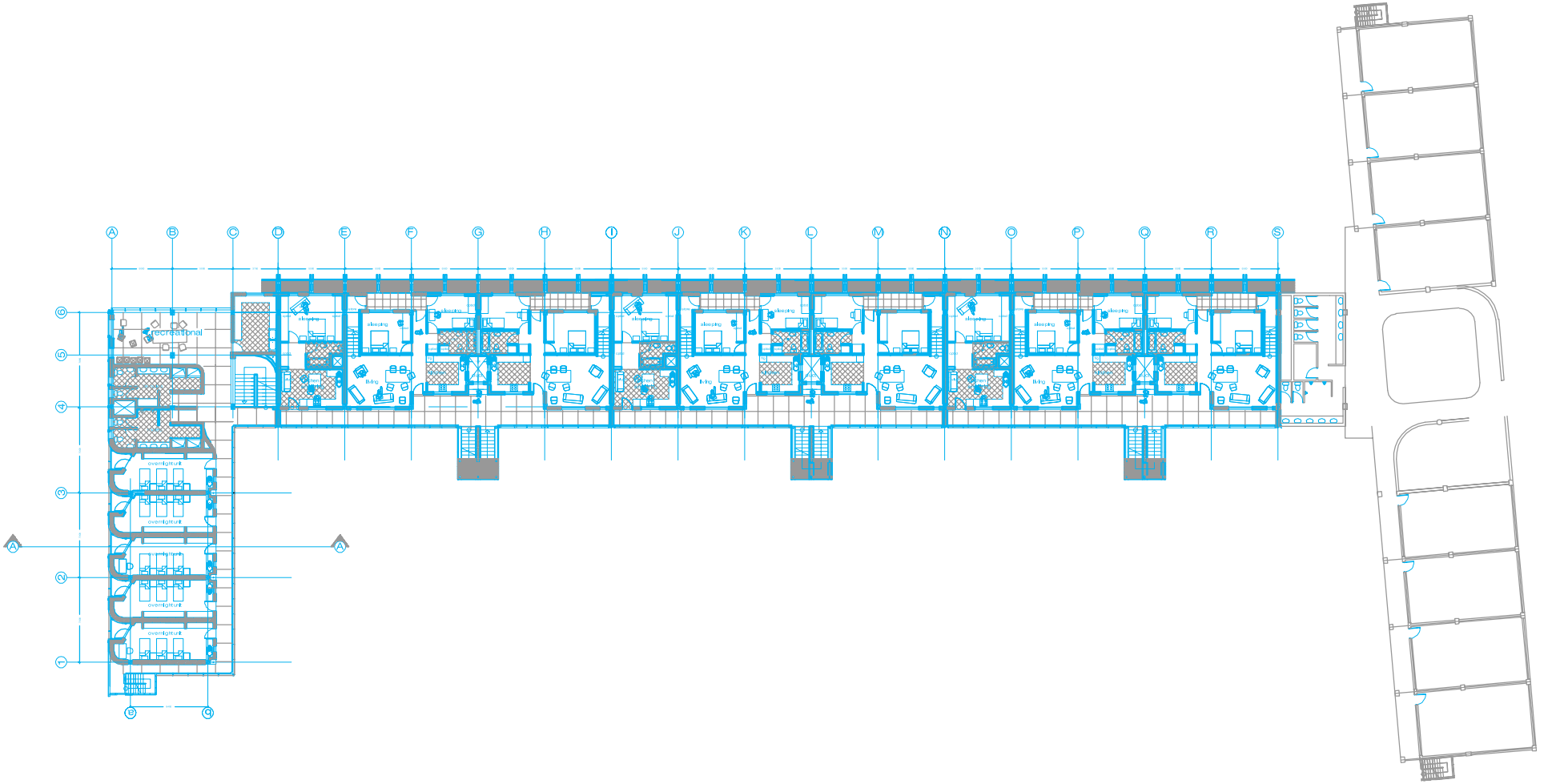
drawings



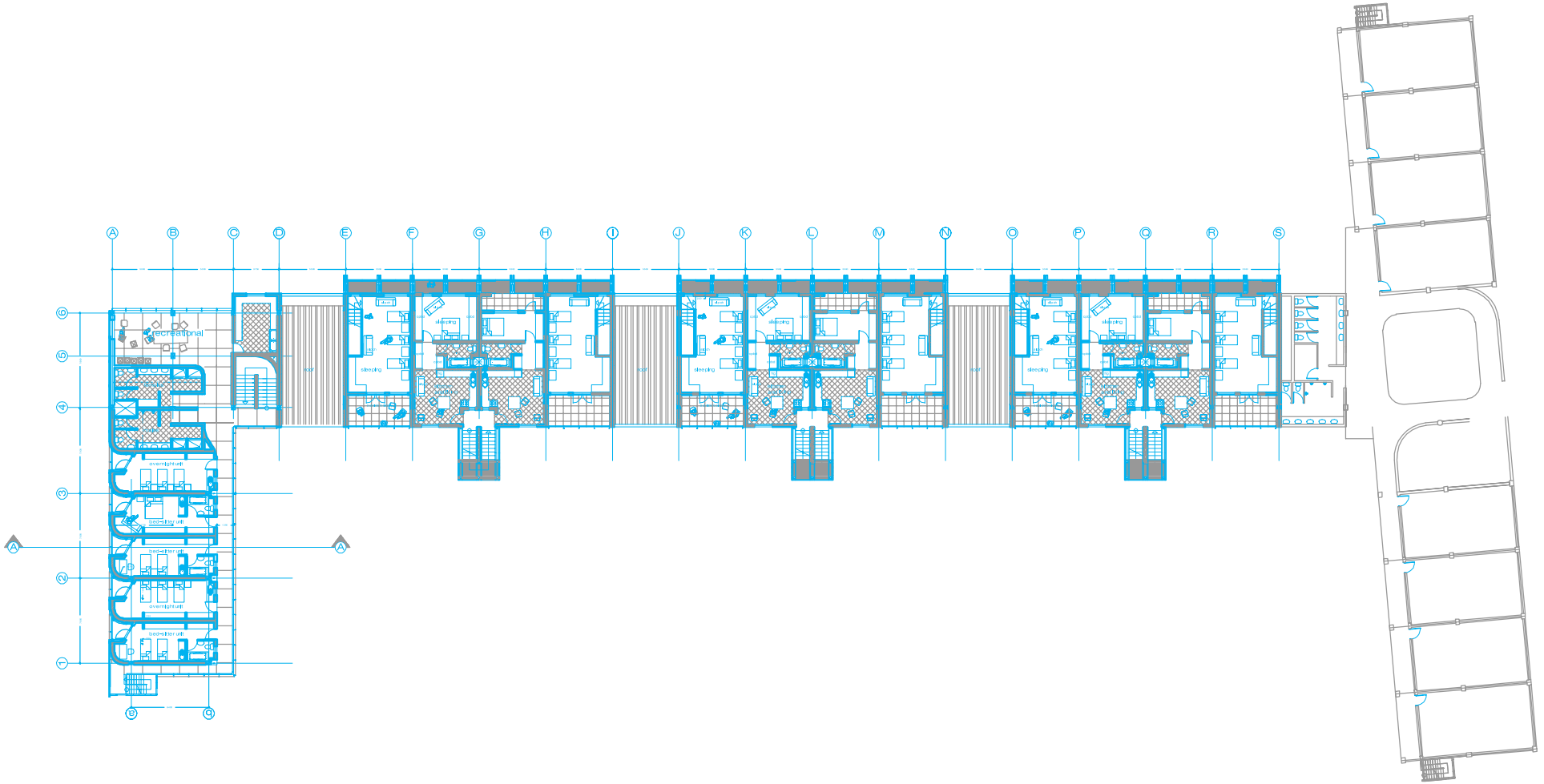
site plan scale 1:500



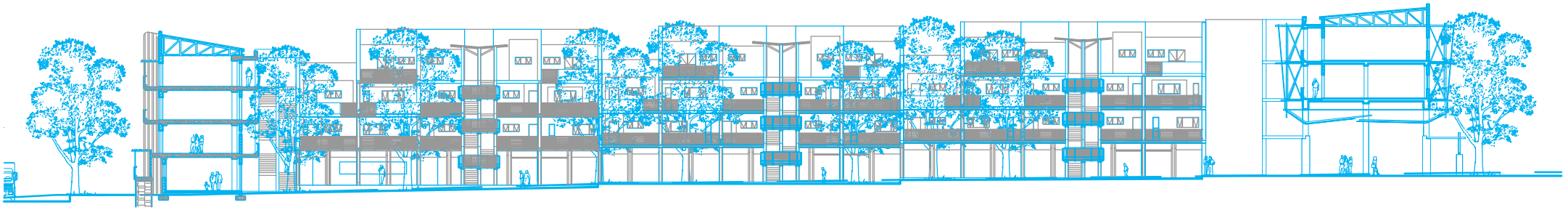
first floor plan scale 1:500



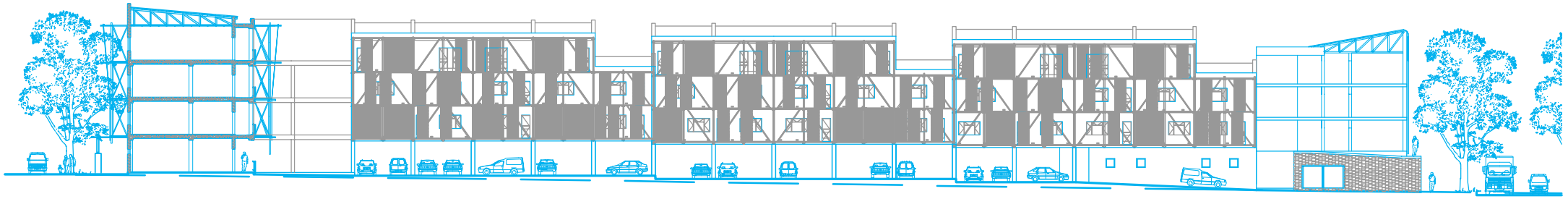
second floor plan scale 1:500



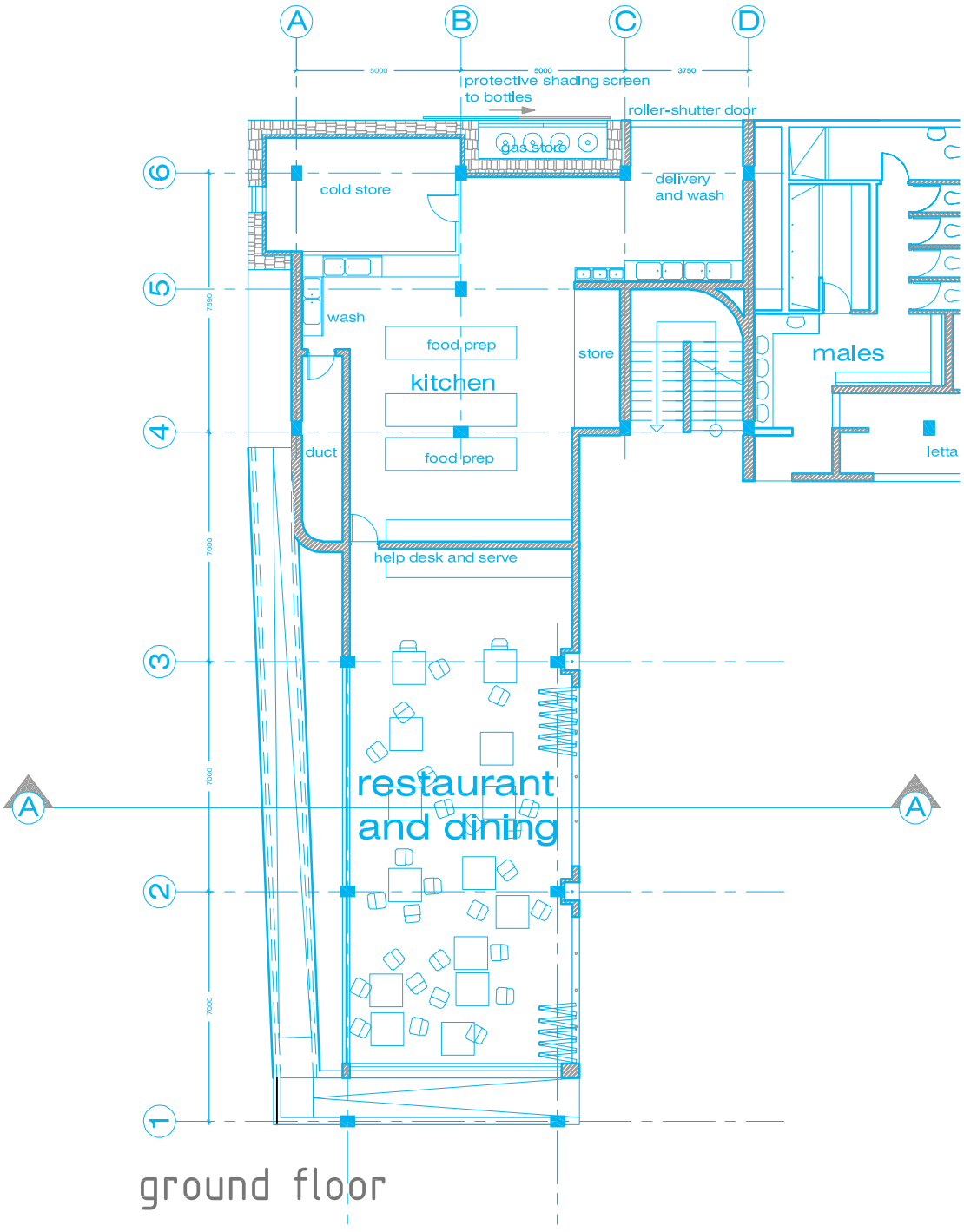
third floor plan scale 1:500

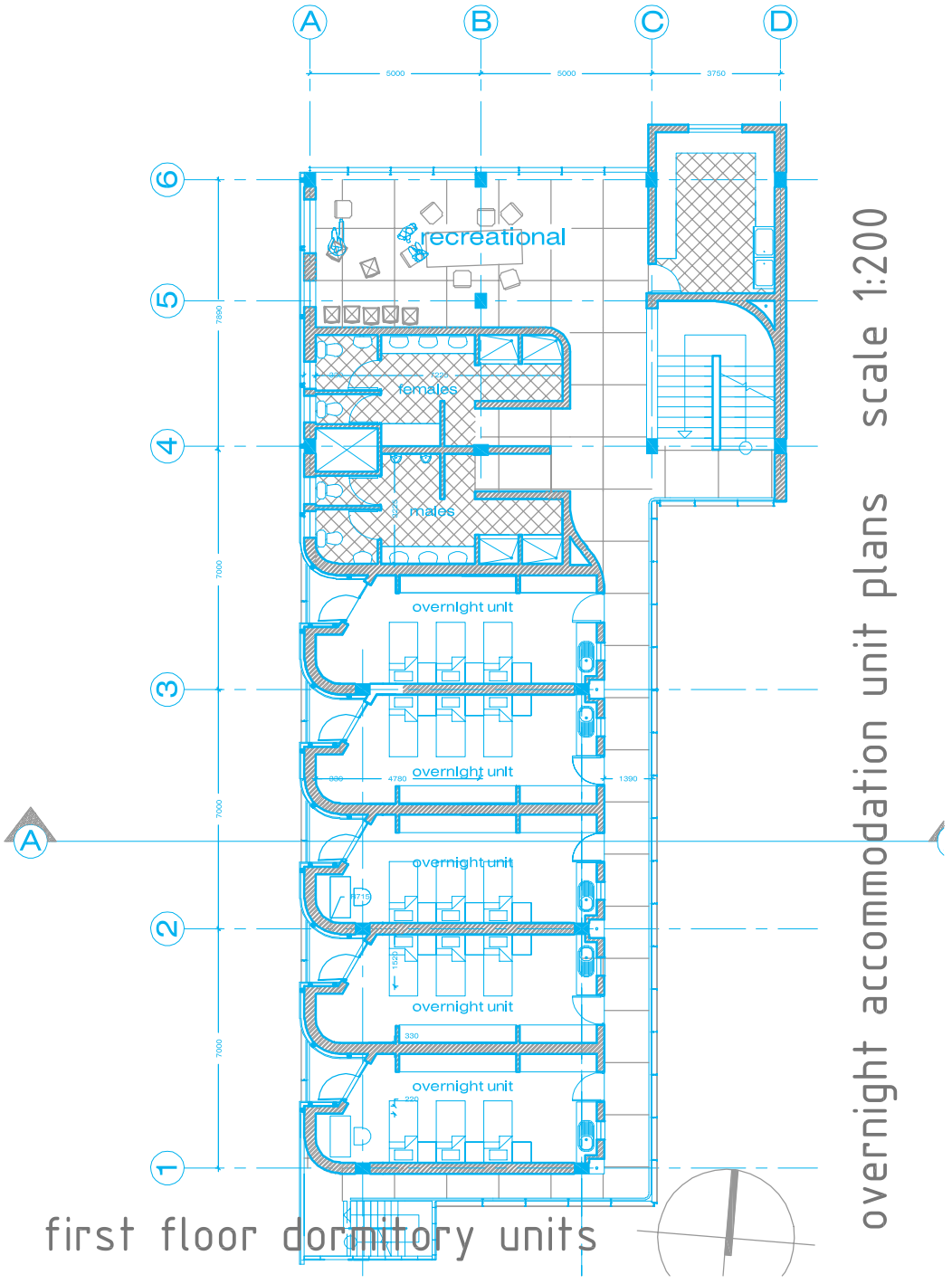


south sectional elevation scale 1:500

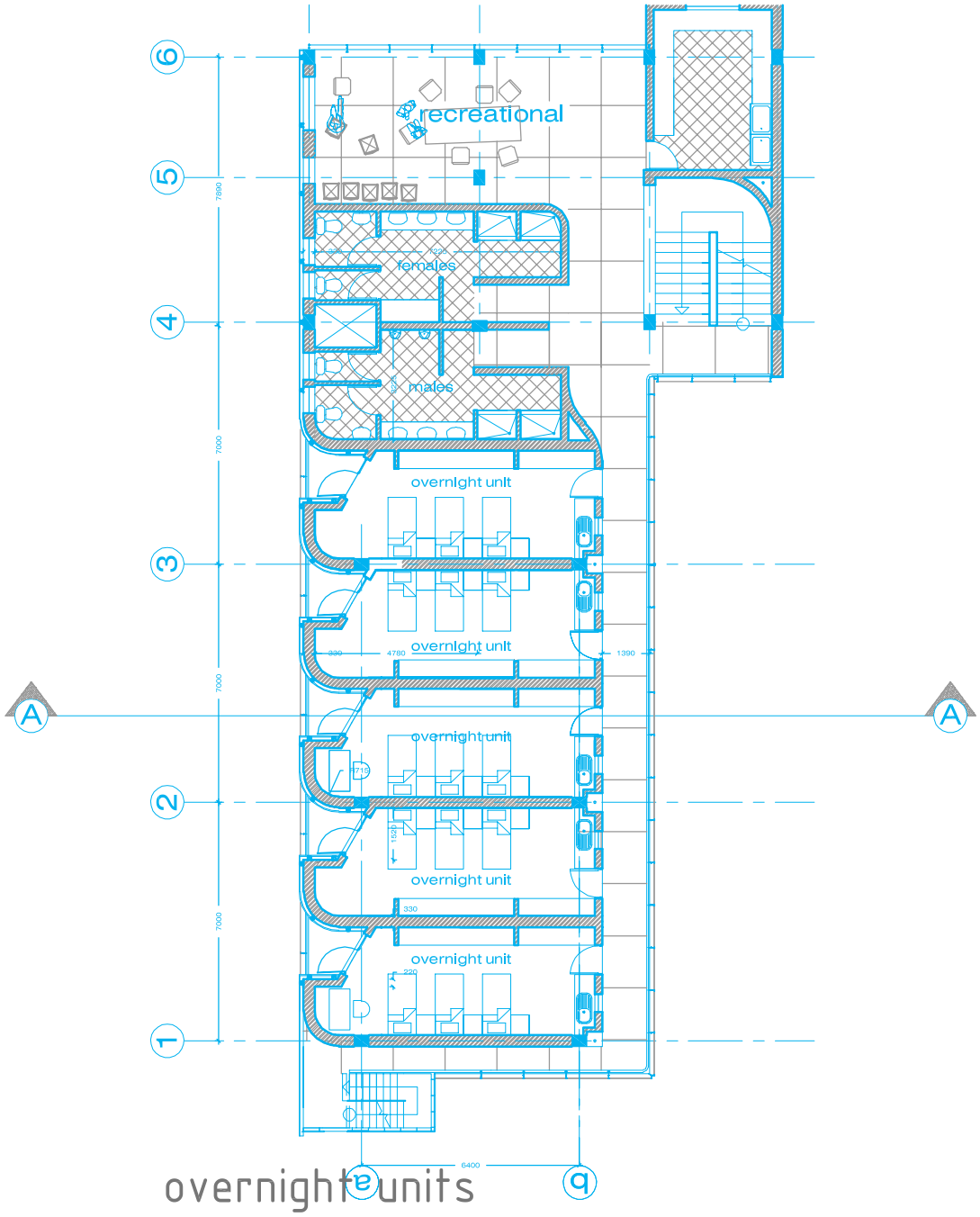


north sectional elevation scale 1:500

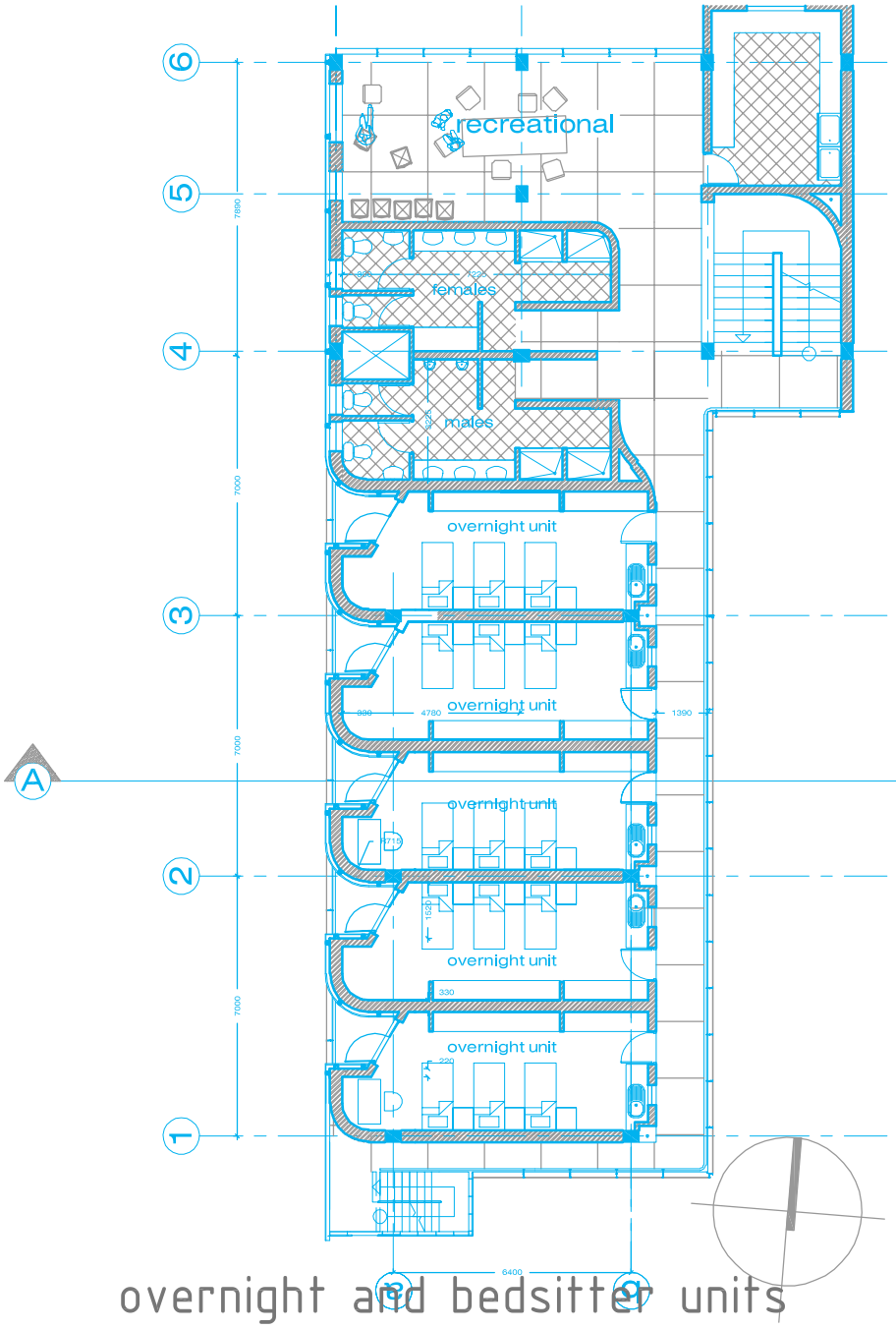




overnight accommodation unit plans scale 1:200

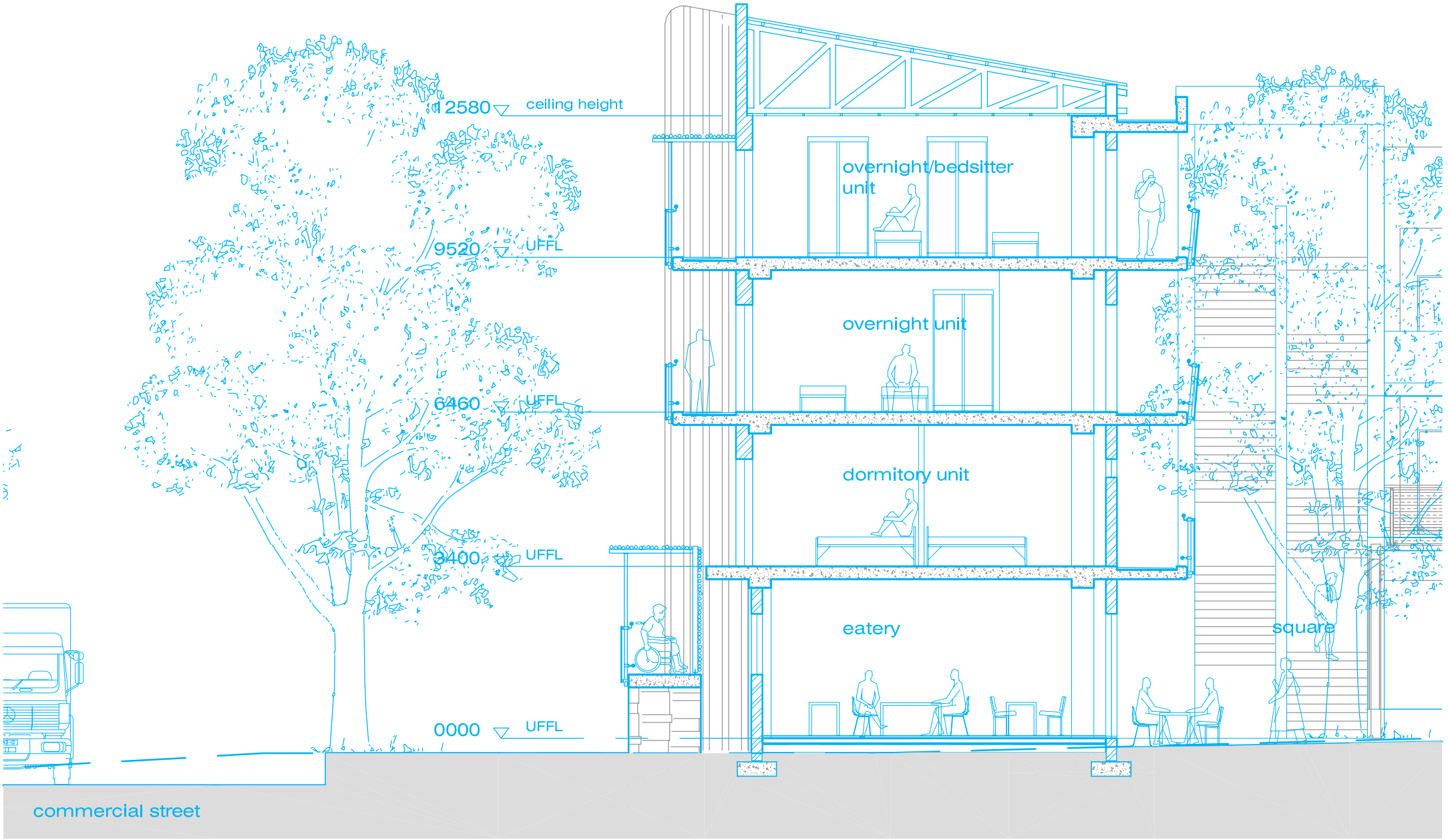


overnight units



overnight and bedsitter units

overnight accommodation unit plans scale 1:200

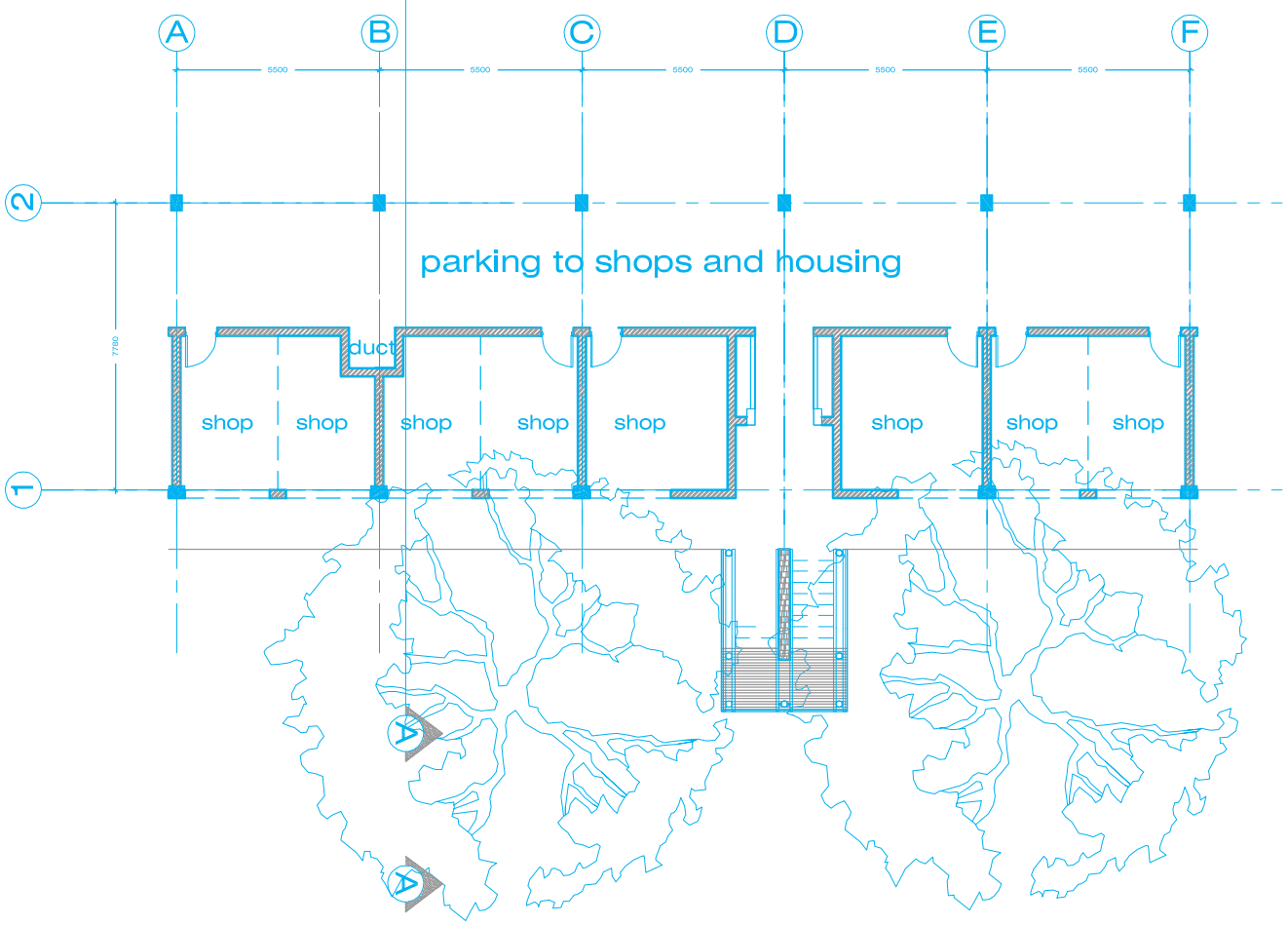


section a-a (1) scale 1:100

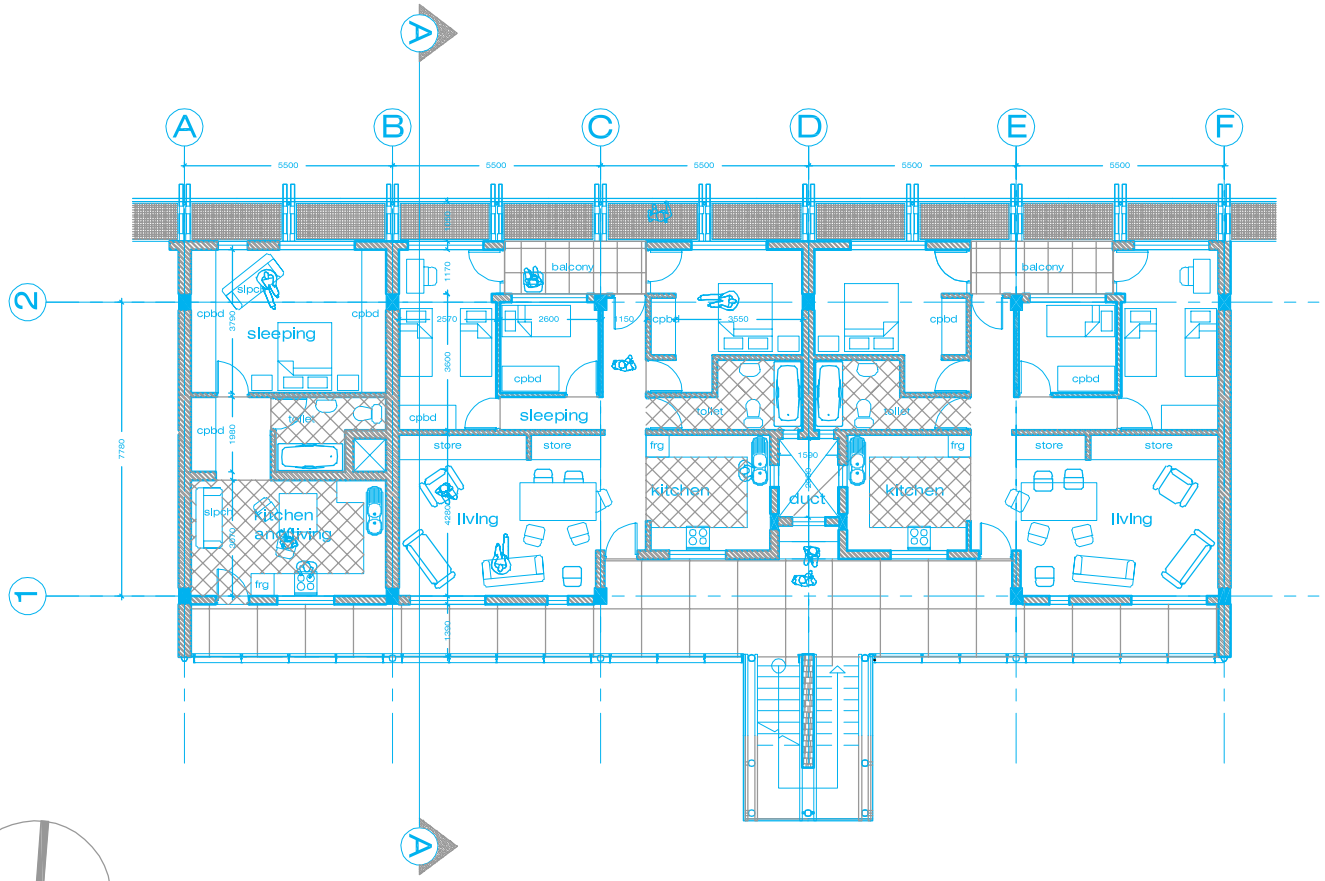
west elevation scale 1:125

shop and housing unit plans scale 1:200

University of Pretoria etd – Schlemmer, J E (2004)



shops on ground floor plan

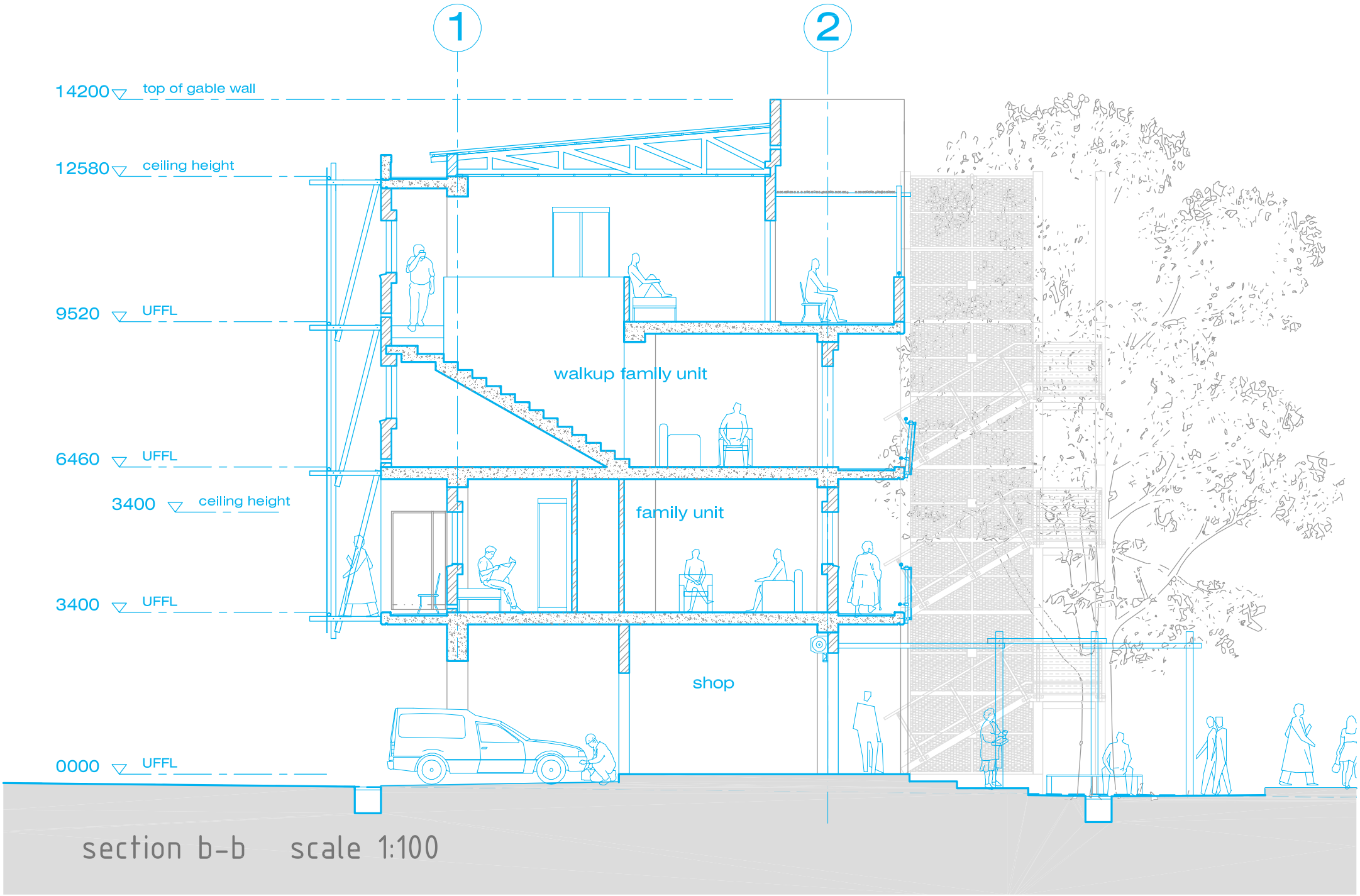


first floor family and bachelor units

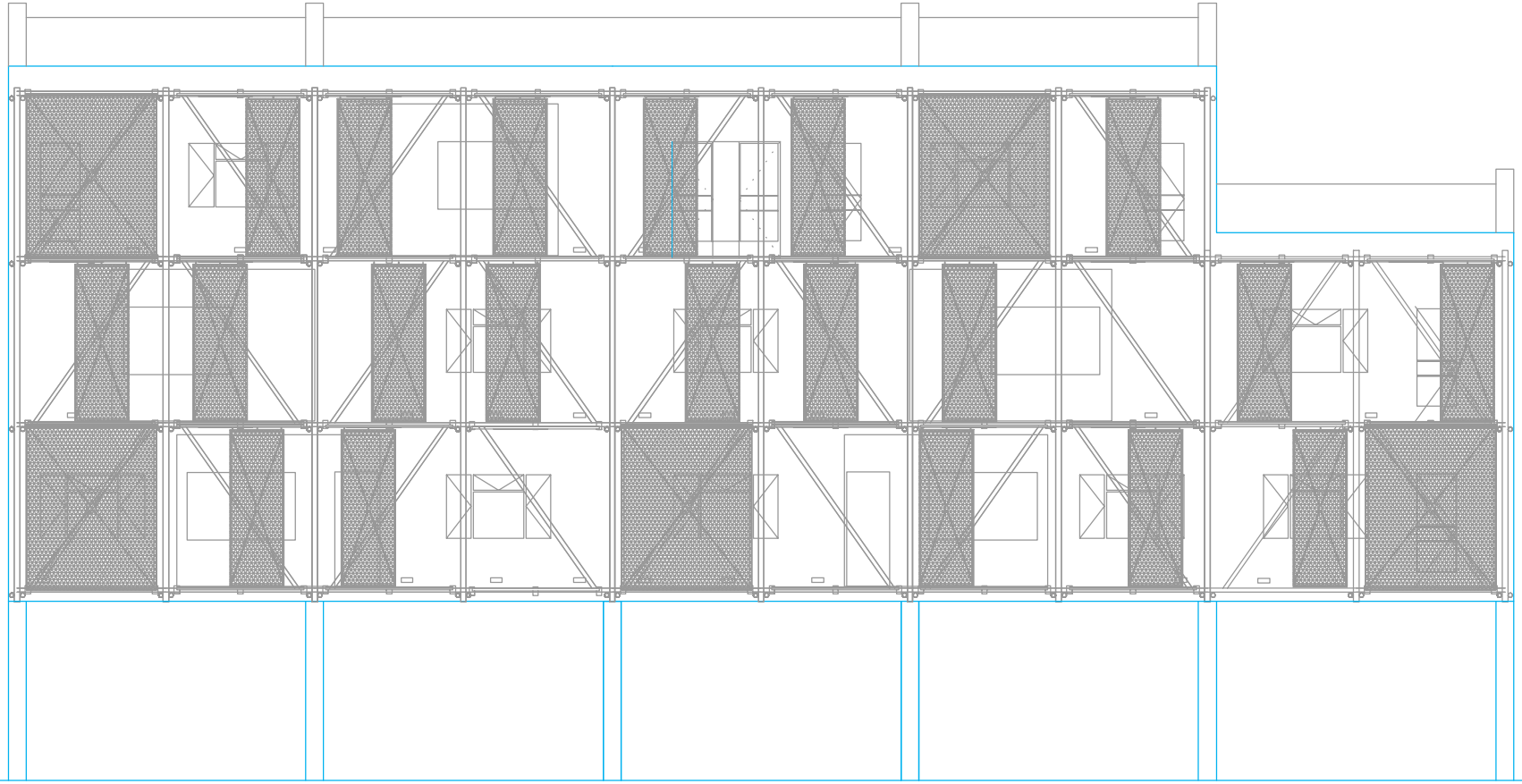
shop and housing unit plan scale 1:200

extended family walkup and bachelor units

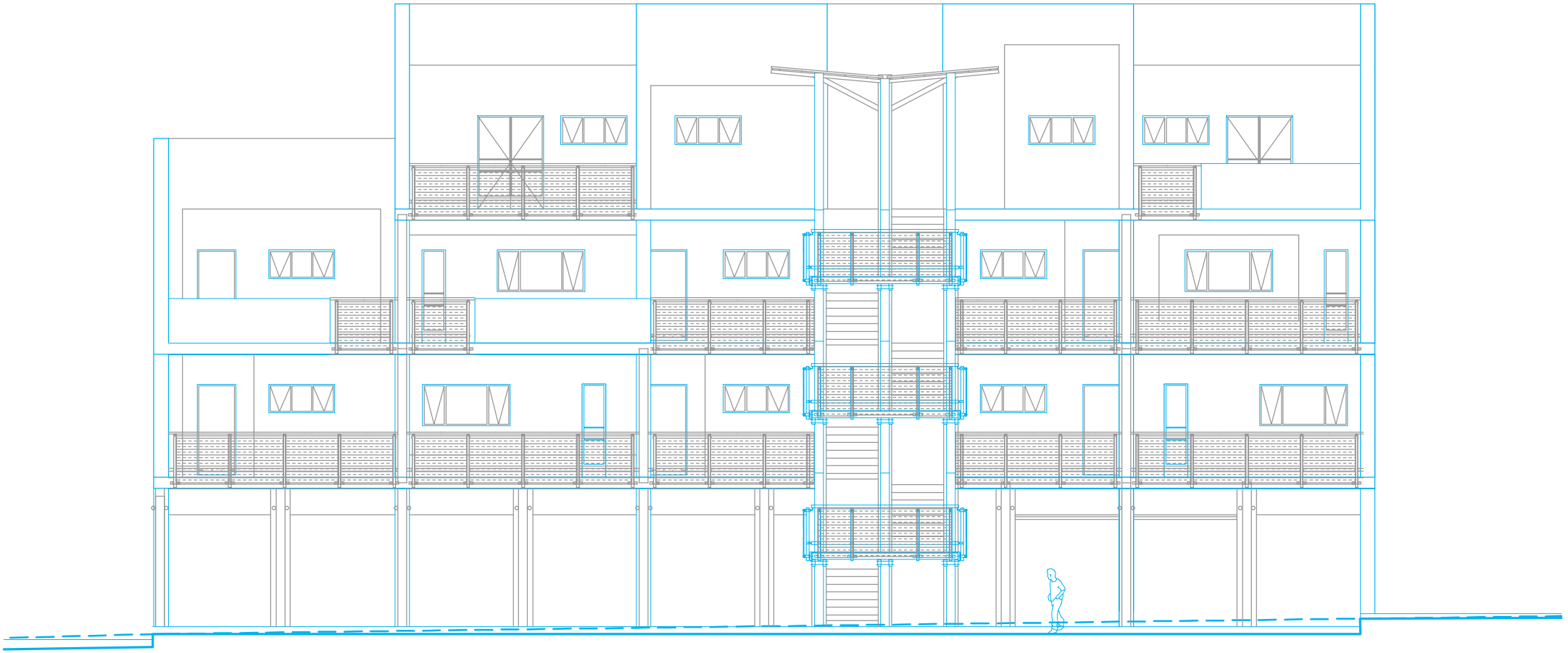
extended family walkup and bachelor units



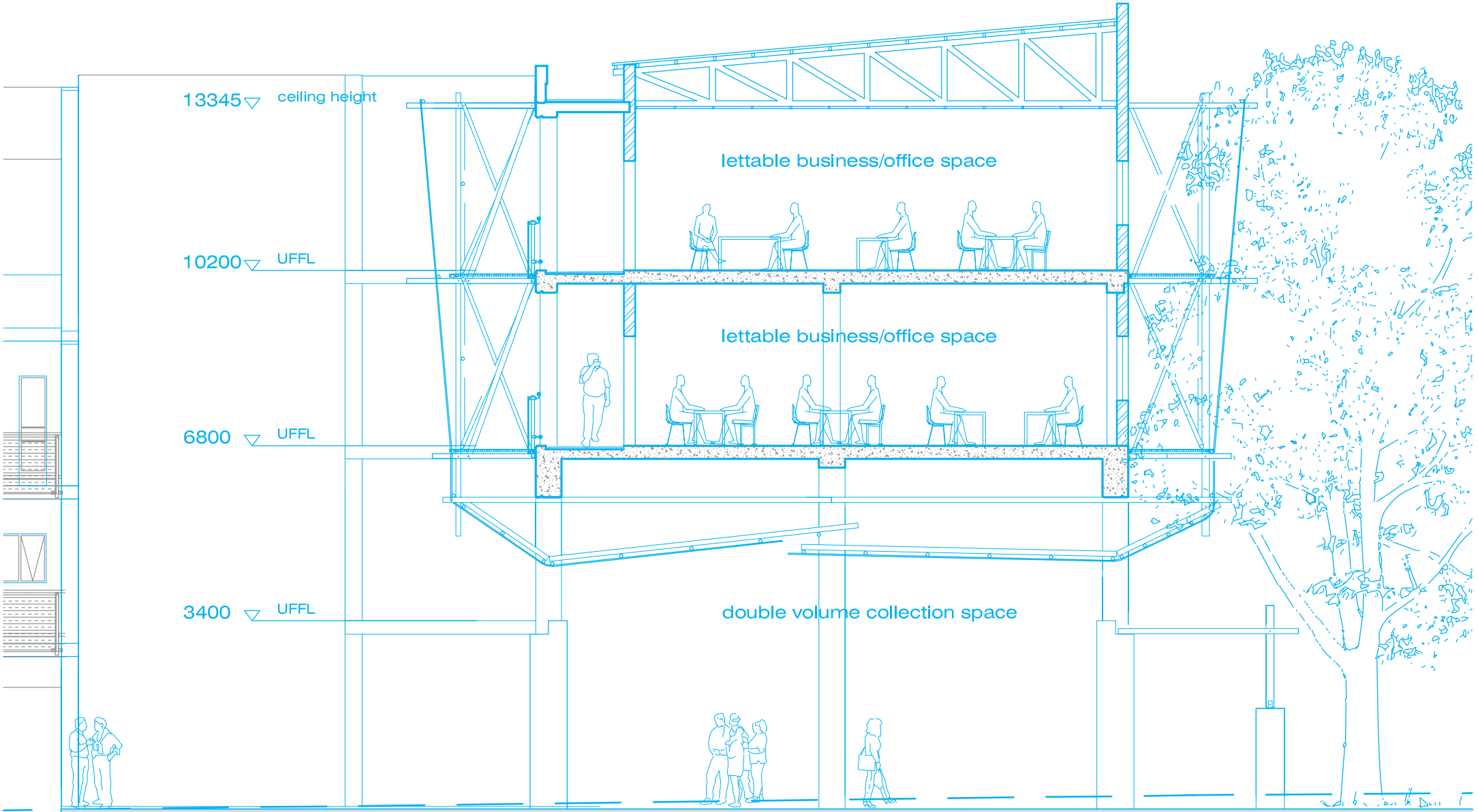
section b-b scale 1:100



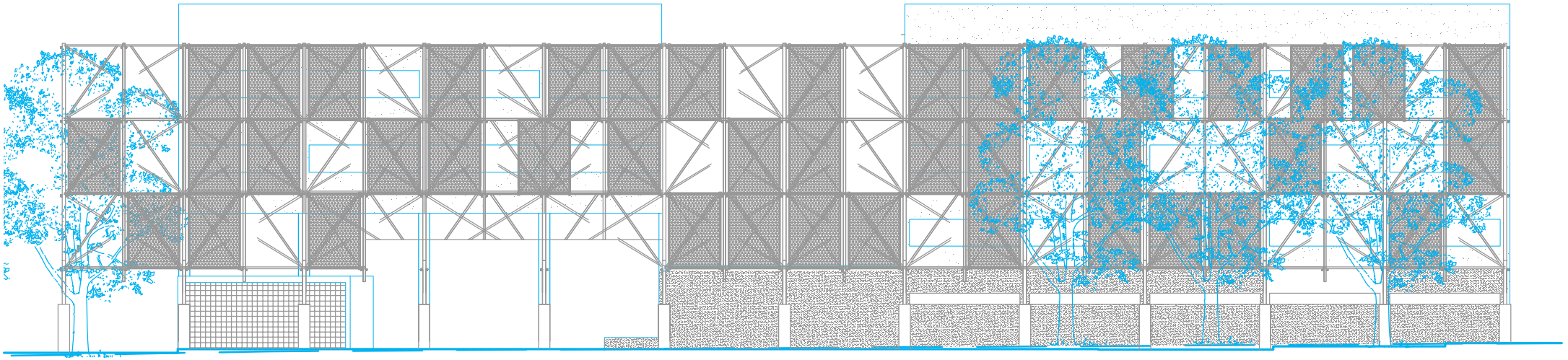
north elevation scale 1:125



south elevation scale 1:125



sectional a-a (2) scale 1:100

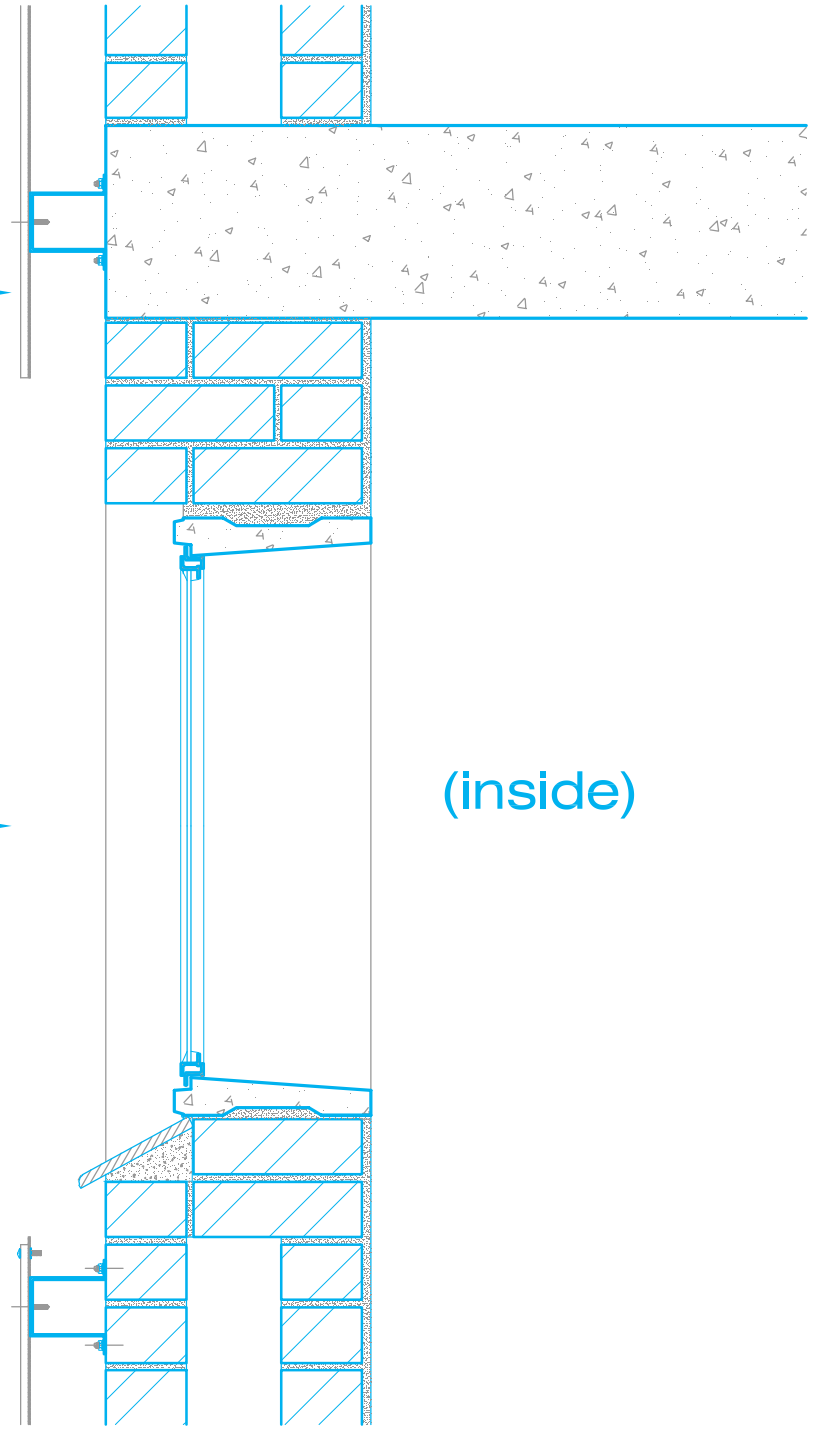


east elevation scale 1:250

2.0mm galv. steel expanded metal screen, fixed to 100 x 75 x 25 x 3 galvanised steel lipped channel rail with 6mm Ø self tapping screw and washer
Rail fixed to wall with M6 chemical bolt

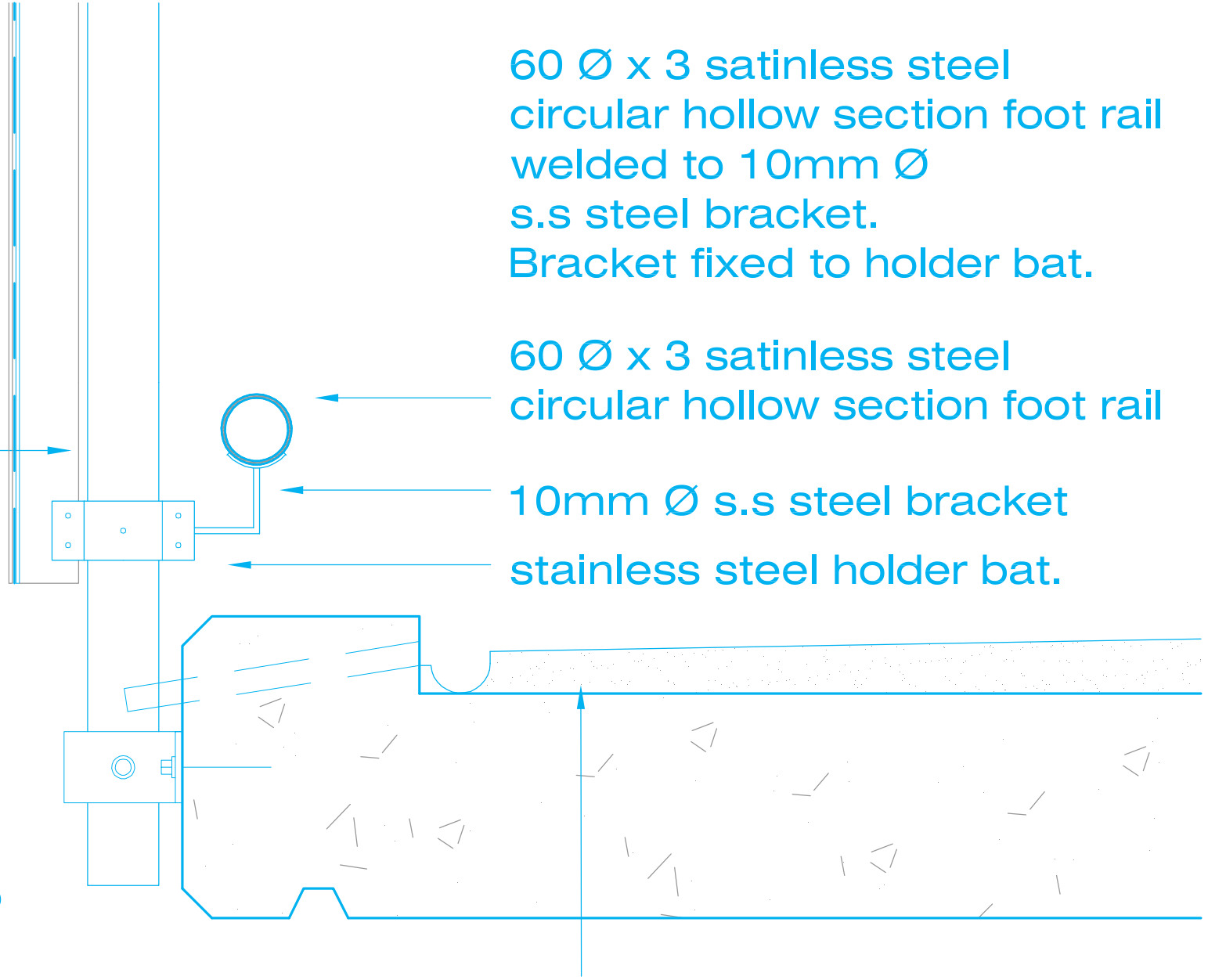
800 x 800 pre-cast concrete and galv. steel frame window.

profiled steel or signage fixed to expanded metal screen with M6 gutter bolt

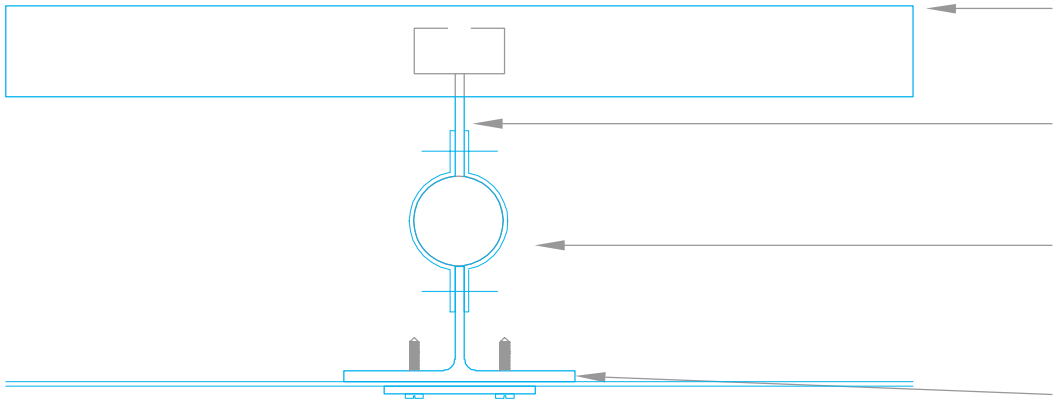


(inside)

window detail scale 1:10



footrail detail 1:5



60 Ø x 3 satinless steel
circular hollow section hand
rail

10mm Ø
s.s steel bracket.

stainless steel holder bat.

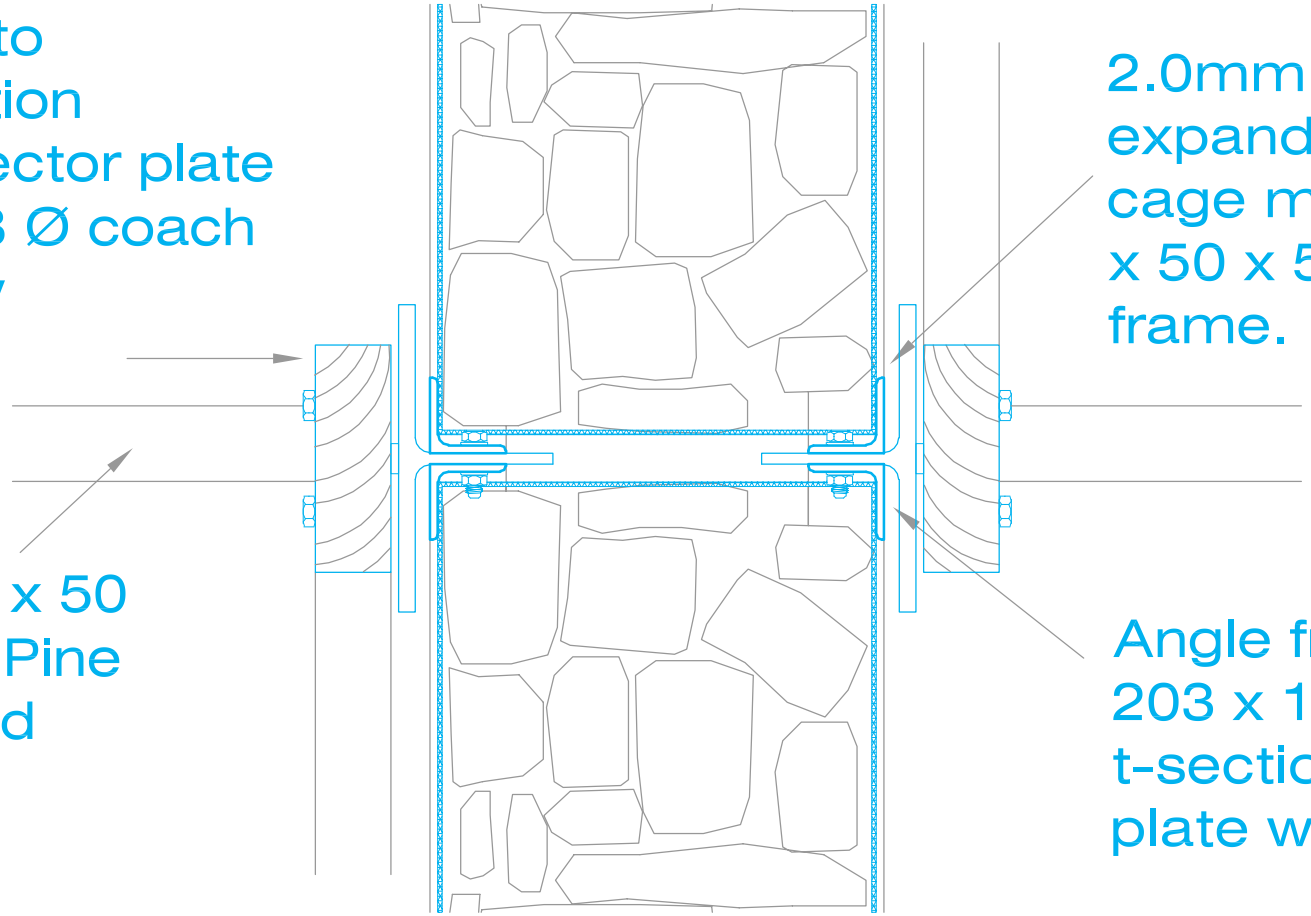
76 x 153 galv. T-section
fixed to holder bat

3mm galv. steel welded grating
clamped by t-section and strap with
M6 self tapping screws at 400 ¢

5 x 100 stainless
steel strap

handrail detail 1:5

150 x 50 S.A pine beam fixed to t-section connector plate with 8 Ø coach screw

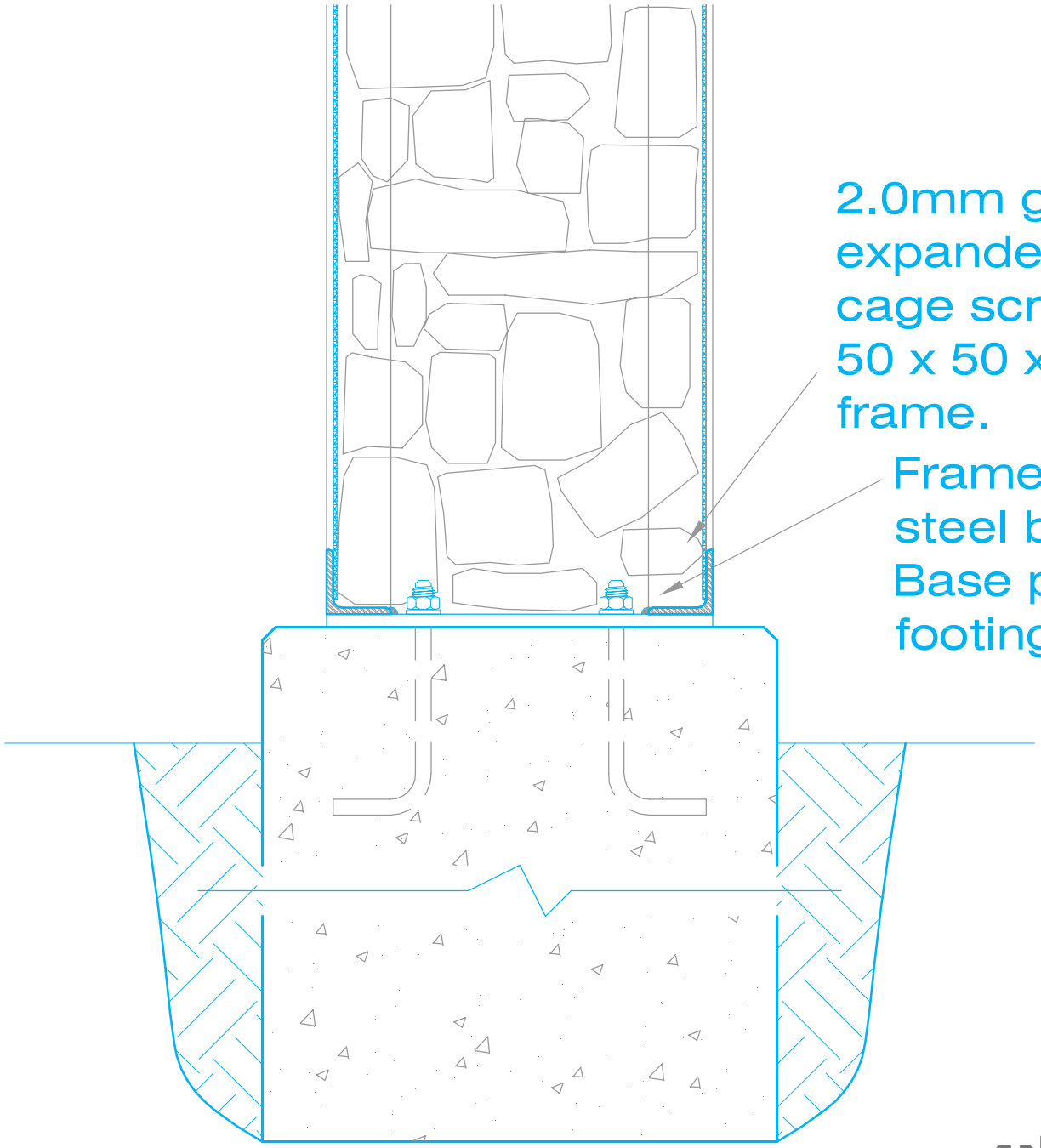


2.0mm galv. steel expanded metal gabion cage mesh, welded to 50 x 50 x 5 galv. steel angle frame.

300 x 50 S.A Pine tread

Angle frames fixed to 203 x 102 x 7 galv. steel t-section cage connector plate with M8 bolts

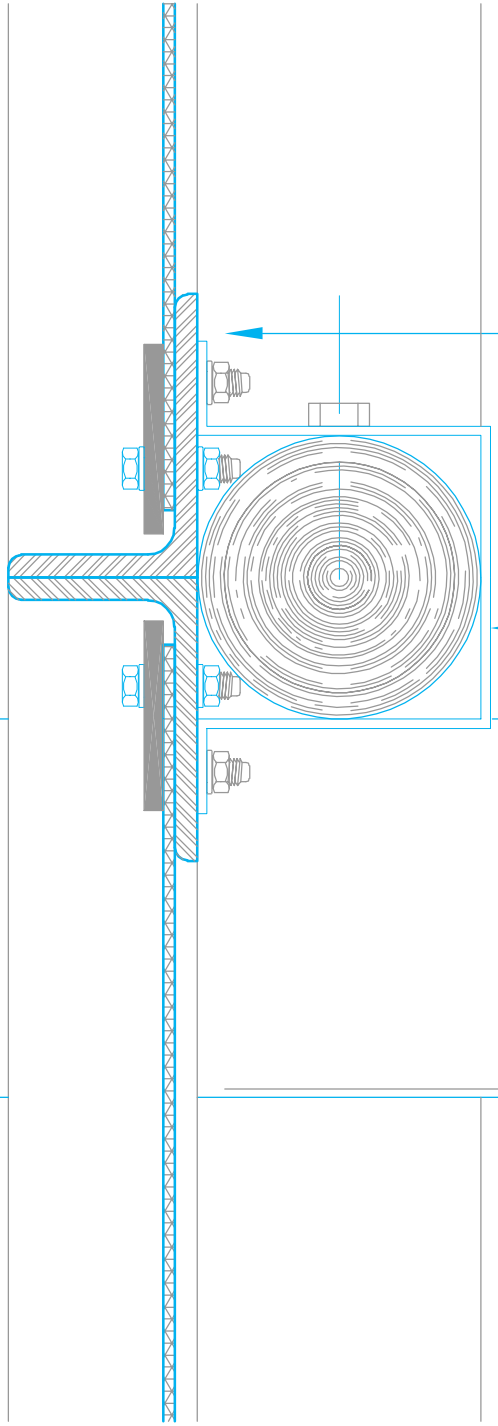
gabion wall connector detail scale 1:5



2.0mm galv. steel expanded metal gabion cage screen, welded to 50 x 50 x 5 galv. angle frame.

Frame welded to 10mm galv. steel base plate.
Base plate fixed to concrete footing with M12 anchor bolts

gabion footing detail 1:5

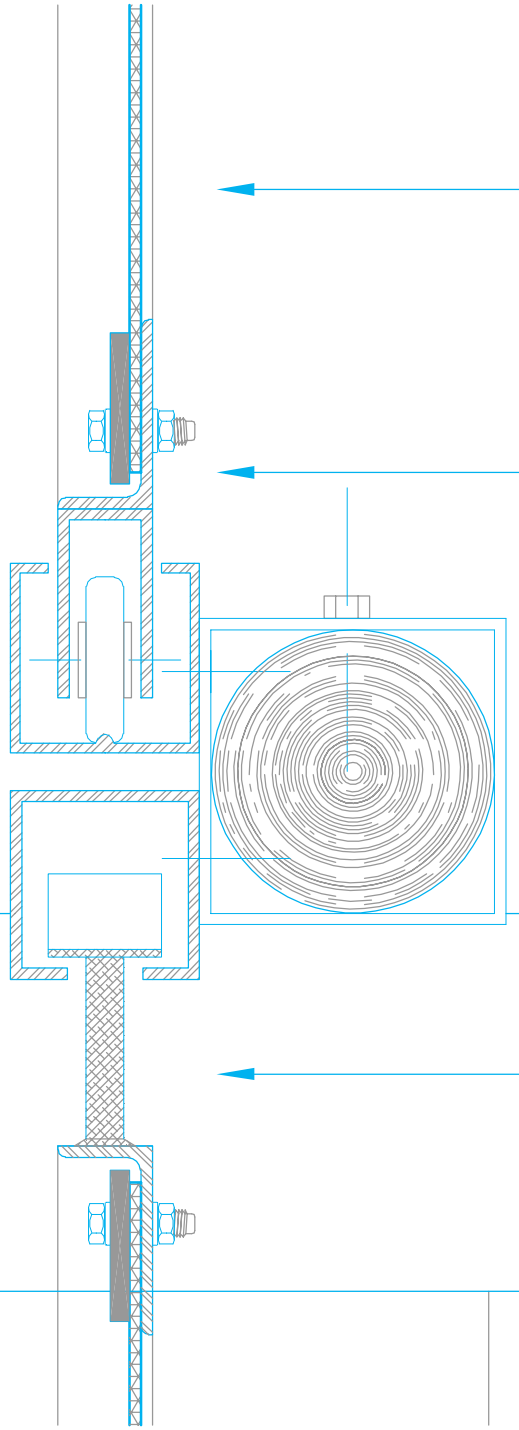


75 x 50 x 6 galvanised angle screen frame fixed to holding bracket with M6 bolt.

80 x 80 x 25 x 2.5 galv. top hat section holding bracket, fixed to 75 Ø bluegum beam with M10 coach screw.

2.0mm galv. steel expanded metal screen, fixed to angle screen frame with 50 x 5 galv. flat bar strap. Strap bolted to angle screen frame with M6 bolt

gumpole screen fixture detail scale 1:2



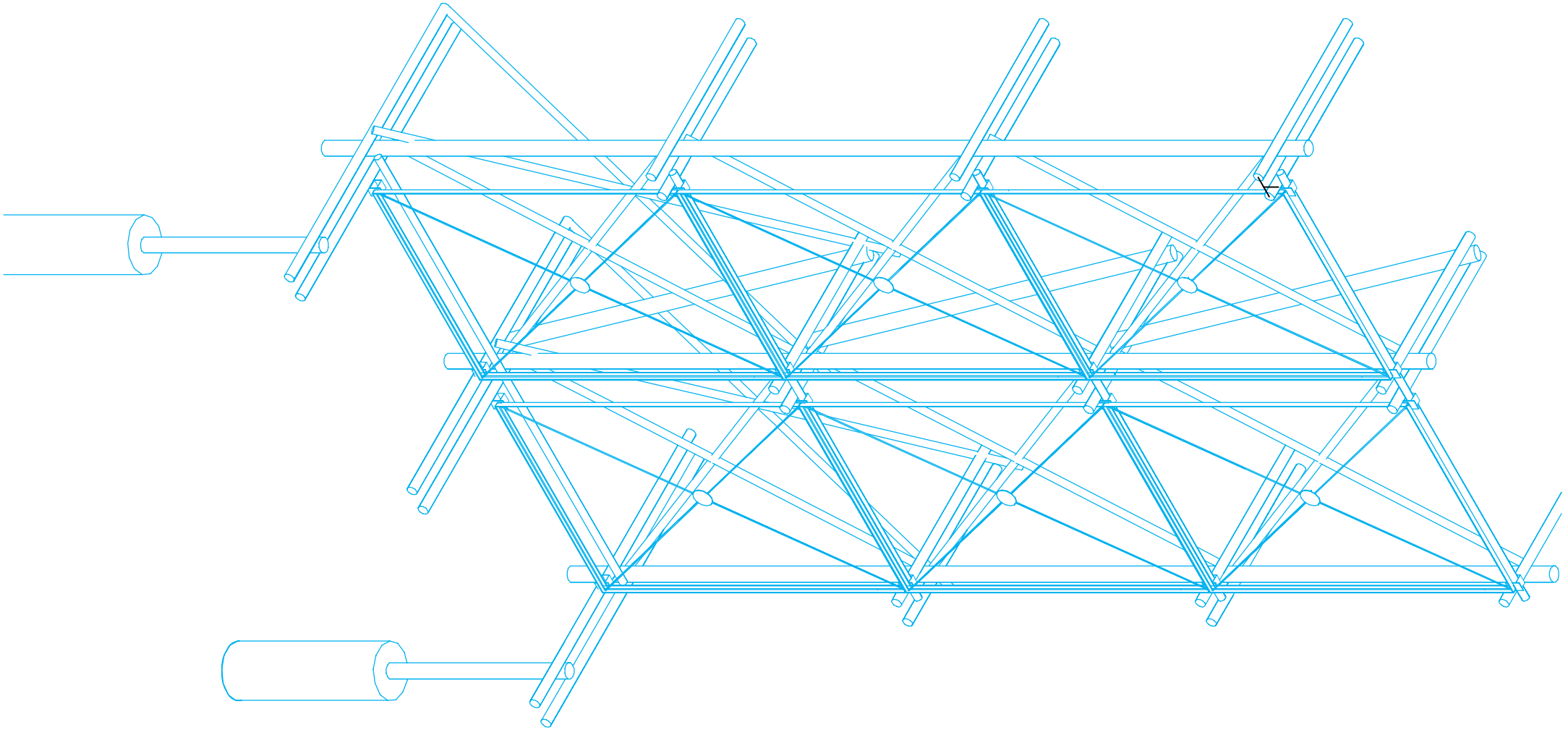
2.0mm galv. steel expanded metal screen, fixed to 50 x 25 x 3 galv. steel angle screen frame with 50 x 5 galv. flat bar strap. Strap bolted to angle screen frame with M6 bolt

unequal leg galv, steel angle screen frame, welded to patent sliding gear in channel.

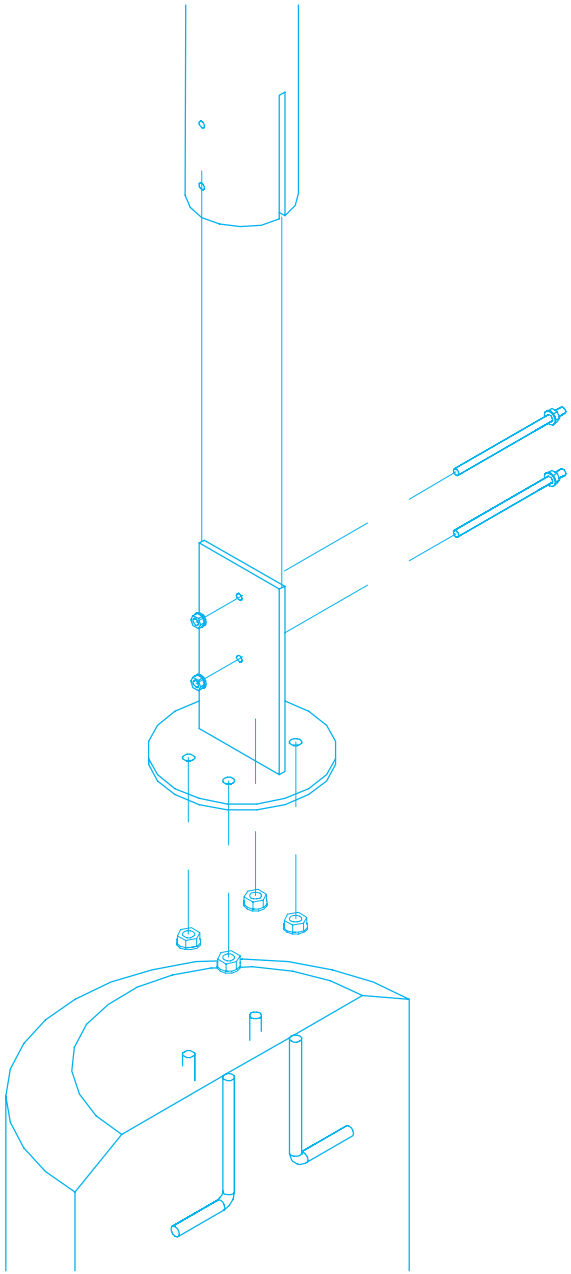
80 x 80 x 2.5 galv. steel section holding bracket, fixed to 75 Ø bluegum beam with M10 coach screw.

patent sliding gear nylon guide in channel.

sliding screen frame detail scale 1:2



timber and steel skin tructure scale 1:50

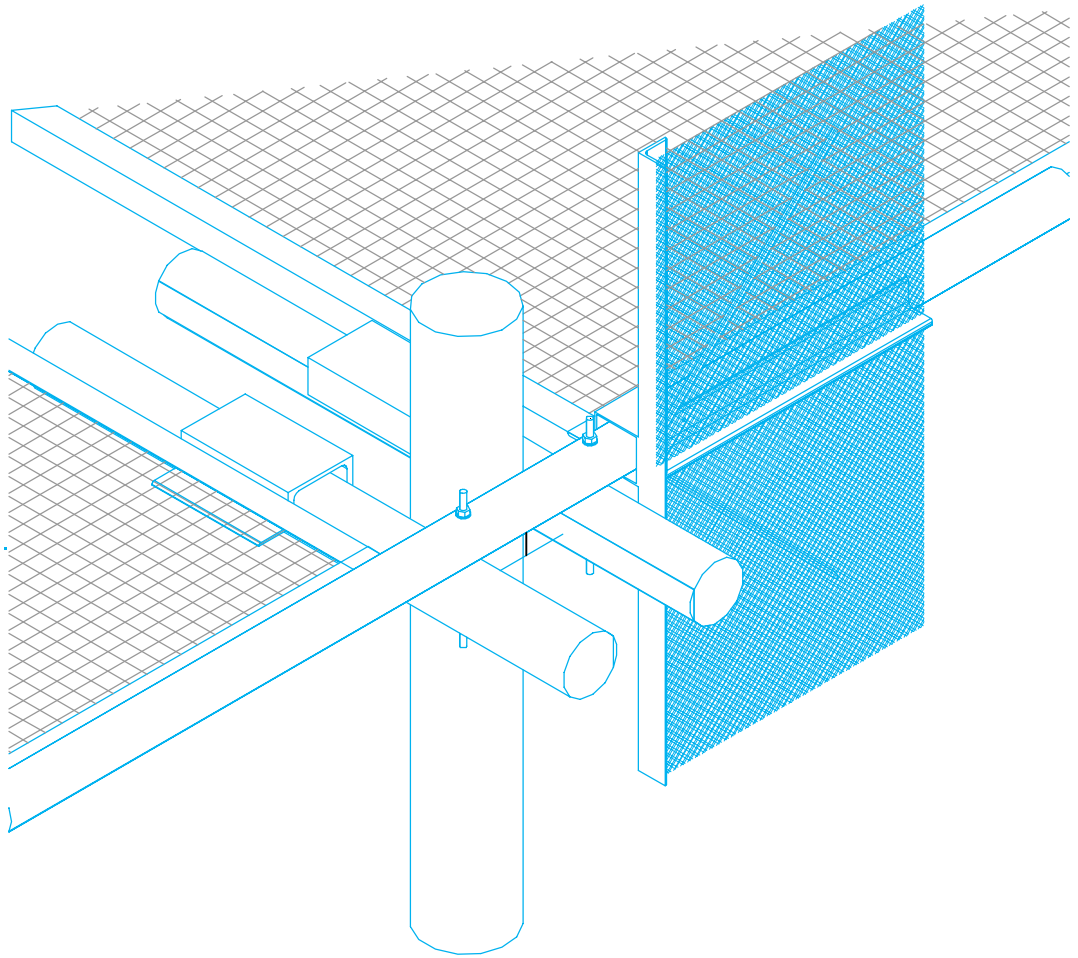


150 Ø treated bluegum pole, fixed to 300 x 150 x 10 galv. steel flange plate with M10 bolts

Flange plate welded to 200 Ø x 10 galv. steel base plate. Base plate fixed to concrete column with anchor bolts

timber pole to concrete column
scale 1:10

50 x 50 x 5 galv. steel framed walkway grid welded to galv. steel brackets.
Walking grid set into pole structure.



timber and steel screen structure
scale 1:10