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stitch

an architecture of connection

Submitted in fulfillment of part of the Requirements for the degree of Master of Architecture (Professional) in the faculty of Engineering, Built Environment and Information Technology

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Studio Master_ Jacques Laubscher
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_for my parents

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list of figures_

abstract_

The chosen project originated as a response to humanity's need to eat, and the agricultural processes necessary to feed the global population. The proposed solution will investigate the connection of physically and meta-physically dissociated elements, in order to create responsive architecture. The aim is to steer away from a mono-functional building and design typologies and to strive towards creating architecture that will address the needs of the public.

The chosen project investigates future and current solutions for the production of food in urban environments. The scales of investigation range from microscopic research to the implementation and monitoring of skills transferred into the community. The proposed facility is thus composed out of various different programs, each with its own specific requirements. The composition can broadly be divided into scientific research facilities, a greenhouse complex and a public exhibition centre.

It is unnecessary for the pragmatic and complex nature of the building to undermine the spatial expression. In the proposed facility, pragmatic limitations informed the design process, but did not govern the outcome. Instead, the limitations fuelled alternative problem solving, which in turn produced creative solutions. Thus, the building accepts that it is pragmatic in program, and compensates accordingly in order to create inviting spaces for people using the facility on an everyday basis.

fig. 01_ woman

“ Architecture is produced by ordinary people, for ordinary people; therefore it should be easily comprehensible to all. ”

-Rasmussen

(1959, p.14)

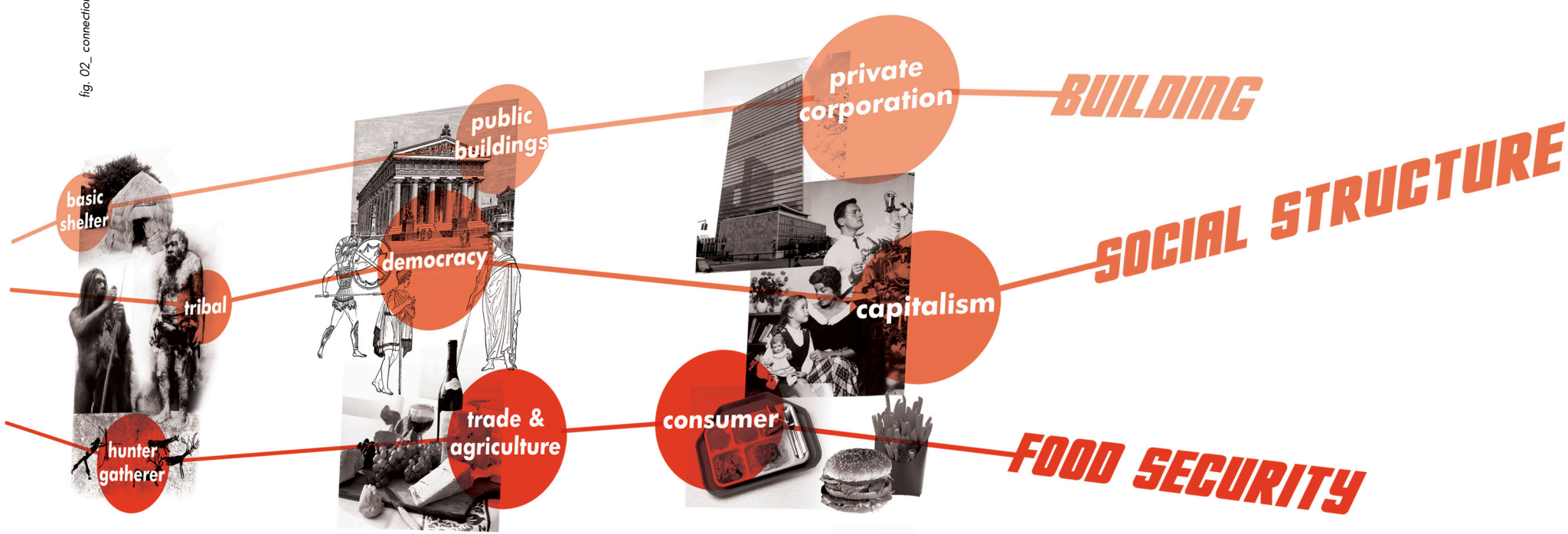
theoretical approach to architecture_00

According to Norberg-Schulz(1980, p.5) the aim of architecture is to give man an "existential foothold". Thus, the role of the architect in society is to plan and structure a suitable habitat for humanity. Humanity's ability to create habitats has evolved over centuries from basic shelter to technologically advanced architecture, as it is known today.

Although the built structure and process has changed dramatically, in essence, our built habitat still addresses our basic human needs. Our buildings protect us from the elements and are planned according to the social structure associated with the program of the building. When contemporary and historical buildings are compared, it becomes evident that the architect creates habitats that best respond to the needs of the time. The built environment therefore stands as a testimony of our time and as response to our social needs. Architecture can thus be seen as a barometer of social sophistication and development.

To create suitable environments for humanity in the 21st century is no easy task. As our social structure and daily habits become refined, they become more complex. Sequentially, so does the requirements for our habitats to sustain these activities and way of life.

fig. 02_ connection between humanity's social structure, food and building



There exists no absolute definition or rule to create suitable environments. It is however the opinion of the author that the most important aspect to address, is the well-being of people in buildings. Architecture is about creating spaces for people. When architecture exists without people, it ceases to be architecture and becomes something else; a lifeless monument, a sculpture. It is therefore important that the spaces are designed to be enjoyed and appreciated by everyone. The uniformed public should be able to enjoy the building without an explanation or justification for the building's existence. Architecture is for people, it belongs to everyone, and therefore it should reveal itself to all people.

> *" Architecture does not necessarily achieve art, but it can combine an understanding of human scale, the body, light and how it can penetrate form. Really great architecture is about creating wellbeing, the best decoration a building can have "*
>
> *- Antony Gromley*
>
> *(Cited in Melvin, Barlow & Ritchie, 2002, p. 87)*

The essence in creating architecture of well-being, to a large extent, lies in the successful manipulation of space and the manner in which it is presented. It is the way we experience architecture every day, our 'genus loci' (Norberg-Schulz, 1980, p.5). Architecture reveals these spaces, through different light intensities and allows comprehension of the spatial composition through movement. The architect's ability to create alluring spaces within and around the building, to create spaces for work and spaces to relax, should be given great consideration in the design process.

However, the approach does not imply that all buildings should be spatially expressive and overly indulgent. Norberg-Schulz (1980, p.5) argues that there does not exist different

types of architecture, but rather different situations that require different solutions in order to satisfy humanity's physical need. Architecture should thus be a reply to a social and physical demand. Good architecture could also be very rudimentary; it depends on how the architecture chose to reply. A bike shed could be architecture, and a church could merely be a building. Thus, in order to create good architecture, the architect should establish a search to identify these social and physical demands. The question of what the building needs to respond to, should inform the design.

conclusion_

The aim of this dissertation is to create inviting and interesting spaces for people, without limiting the pragmatic program nature of the building. And vice versa: the pragmatic program of the building should not force the design to become dull and seem planned as opposed to being designed. The focus will thus be to consider both the pragmatic program and creative design as informants for the design process and aid the design in creating spaces for people.

fig. 03_ boy

Pov·er·ty (pŏv'er-tē)
The state of one who lacks a usual or socially acceptable amount of money or material possessions. Poverty is said to exist when people lack the means to satisfy their basic needs.

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client + brief_01

client_

Client_ United Nations Food and Agriculture Organisation (UN FAO)
Funding: The World Bank and Member states of the G8

problem statement_

The major concern of the client, as outlined by the 2009 G8 Summit and the World Summit on Food Security, is the uncertainty of food availability in 2050. The UN FAO (2009) estimates that global food production needs to increase by 70% to meet the demands of the growing population by 2050. Apart from an estimated 2.3 billion extra mouths to feed globally, current agricultural practices are not sustainable (Pfeiffer p39). Modern agriculture is dependent on fossil fuels (appendix 1) and inefficient in terms of produce per hectare, especially in Africa (UN FAO, 2009)

According to Shantayanan Devarajan, Chief Economist of the Africa Region at the World Bank, in 2008 food prices around the globe increased by 50%. This rise, coupled with the negative economy of 2009, resulted in a global food crisis and pushed millions of people into poverty. In 2009 an estimated high of 1.02 billion people are reported to be living in poverty globally. Because Africa has the highest poverty rate in the world, it also suffers the most under the food crisis.

In light of these factors it has become evident that drastic short- and long-term plans needs to be formulated to support low-income nations in providing for themselves.

2b

ESTIMATED POPULATION SIZE IN BILLIONS FOR SUB-SAHARAN AFRICA BY 2050. 2005 POPULATION SIZE WAS ESTIMATED AT 770 MILLION PEOPLE.

33m

ESTIMATED AMOUNT IN MILLIONS OF LESS THAN 2 HECTARE SMALL-HOLDER FARMS IN SUB-SAHARAN AFRICA, REPRESENTING 80% OF ALL FARMS.

13kg

ESTIMATED AMOUNT OF kg FERTILIZER PER HECTARE OF FARMLAND, COMPARED TO 73kg IN THE MIDDLE EAST AND 190kg IN EAST ASIA AND THE PACIFIC.

30%

PERCENTAGE OF AFRICA'S POPULATION (218 MILLION PEOPLE) THAT ARE ESTIMATED TO BE SUFFERING FROM CHRONIC HUNGER AND MALNUTRITION.

1.2t

ESTIMATED CEREAL YIELDS IN TONNE PER HECTARE FOR SUB-SAHARAN AFRICA, COMPARED TO 3 TONNES PER HECTARE GLOBALLY.

3%

ESTIMATED PERCENTAGE OF AGRICULTURAL LAND WITH IRRIGATION IN SUB-SAHARAN AFRICA, COMPARED TO 20% GLOBALLY.

Statistics adopted from UN FAO (2009)

% of population that suffers from malnutrition

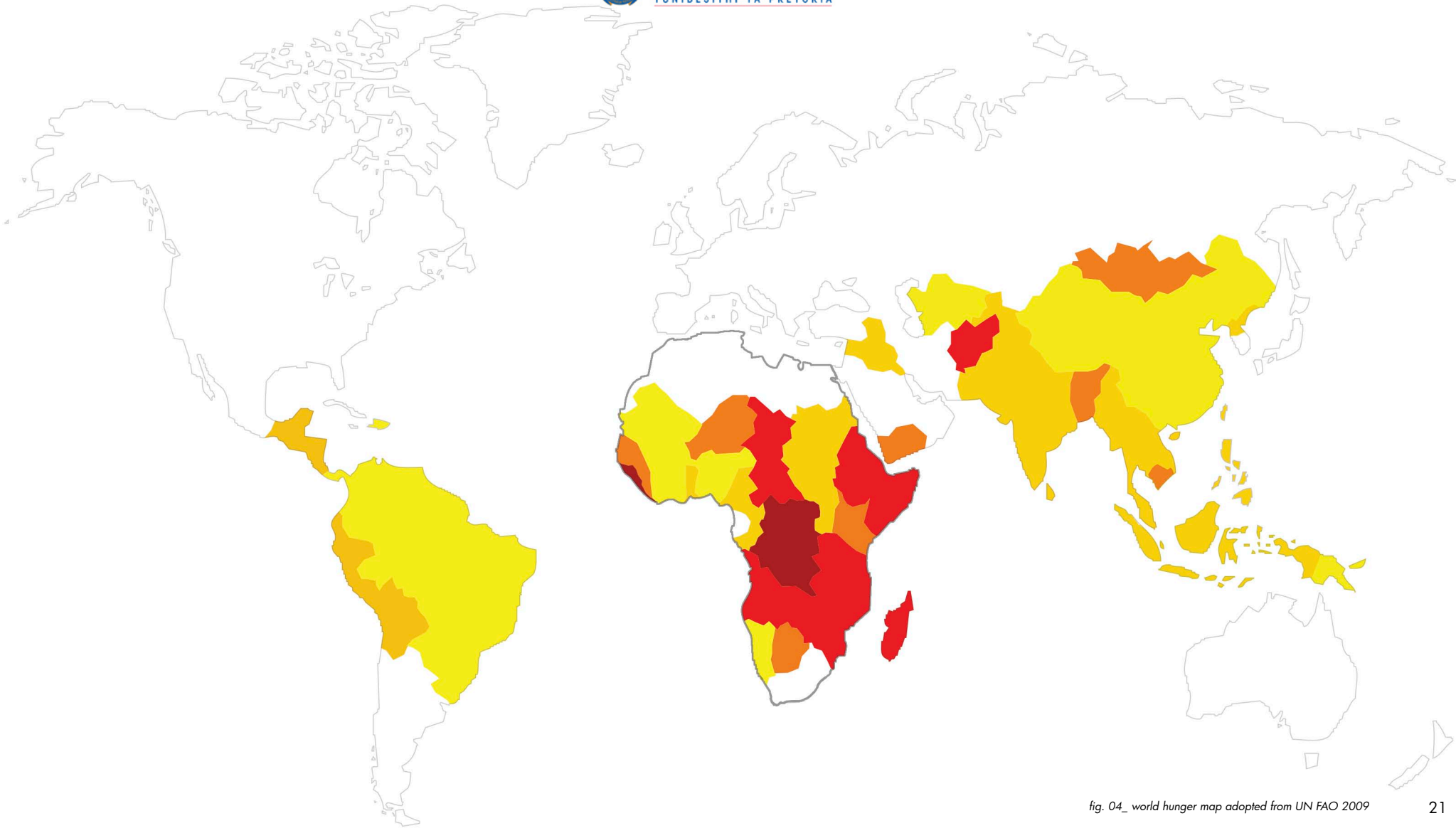
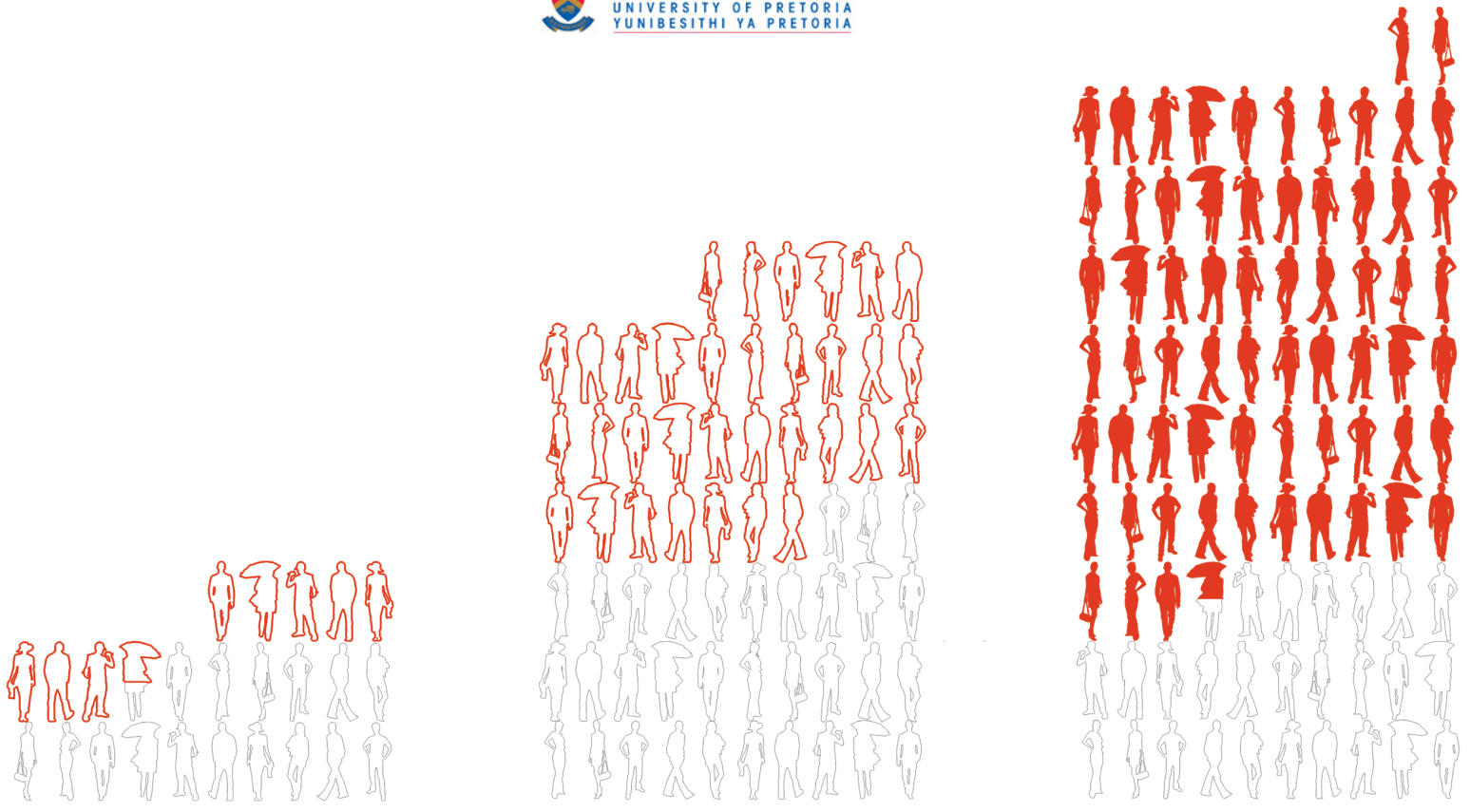


fig. 04_ world hunger map adopted from UN FAO 2009



1950
global population size: 2.5 billion
population urbanized: 29%

2008
global population size: 6.6 billion
population urbanized: 50%

2050
global population size: 9.2 billion
population urbanized: 71%

fig. 05_ population size and urbanization

> *“ The solution is to relocalize agriculture. We need to rebuild our local food production infrastructure. ”*
>
> -Pfeiffer (2006, p 02)

response_

When mass urbanization statistics are considered, it becomes evident that the focus for future agricultural produce needs to be widened to include urban areas, since the predominant global population will reside in urban areas in the near future.

One of the proposed solutions, according to the World Bank (2009), would be to double the amount of spending on agricultural research and development to $800 million over the next five years. According to UN FAO (2009) one of the focus areas of future agricultural research should be plant breeding and biotechnology, as it has already proven to be very successful.

Another possible solution would be for urban areas to re-localize agriculture within the city boundaries. This will allow impoverished households and consumers to start providing nutritious food for themselves. According to the World Bank (2009), when disadvantaged people cannot afford food they either eat less, opt for cheaper food or stop spending on education and health care. By securing a sustainable food supply, developing nations can focus their attention on other social and economic problems. Food security is the first step in eradicating poverty.

project aim_

_to invest in agricultural science, research, technology, education and innovation to ensure sustainable agricultural produce.

brief_

The role of the architect is to assist the client in choosing an appropriate site and designing an agricultural research facility that will focus on researching urban food production methods and solutions.

programmes_

_research and development
_support for urban farmers
_public education

research and development_

The research fields focuses on improving sustainable urban agriculture, which includes bio-technology, educating farmers, growth medium and planting-method research and greenhouse technology.

The aim is to develop bio-technological advancements for urban agriculture that can easily be understood. According to the UN FAO (2009) farmers in Africa produce inefficiently because of a lack of technological farming methods and education.

support for urban famers_

The aim is to strengthen the role of the agricultural household and small-holder farms by providing legal aid to assist with leasing or the purchase of land, to provide policies to manage resources and local communities, and to provide adequate support for farmers in terms of training and risk management.

Two types of agriculture (household vegetable and community gardening) will need to co-exist to ensure sustainable food production within the city boundaries and that skill is transferred from one individual to the other.

household vegetable gardening_

The primary focus will be to inform and educate impoverished households on micro-agricultural techniques and benefits, so that each household can produce enough vegetables to sustain themselves. With correct information and technological advancements, micro-gardens can be successfully managed on rooftops, balconies, inside a window sill or on communal ground available (e.g. The communal garden of an apartment block). Skills can effectively be transferred between household members.

community gardening_

Unskilled or unemployed individuals can receive training on small to medium scale agricultural techniques, and co-manage larger community gardens or small-holder farms on vacant lots within the city. Vacant lots and servitudes can be used free of charge through a municipal agreement or a municipal incentive with the landowner. Produce can be shared between individuals involved, or can be sold at a nearby market.

public education_

It is imperative that the general public has access to scientific knowledge since the success outcome of applied bio-technologies depends on society. The manner in which skills are transferred from institutions to individuals are important, as agricultural concepts should be easily understood. The objective would be to introduce easy to follow, step-by-step guide and hands-on experiments to educate the public on urban agricultural methods.

The concept of small-holder farms is not new to Africa, as it makes up 80% of the farms in sub-Saharan Africa (UN FAO, 2009). The focus, thus, becomes to support individuals in their transition from rural to urban farming. Urban farmers will therefore receive support regarding the relevant technology and education to ensure that productive agriculture can take place.

case study_

Havana, Cuba

After the fall of the Soviet Bloc in 1989, Cuba's economy was crippled and the country lost 85% of its trade. Its industrial agriculture was to a large extent dependant on fertilizer imports and Cuba imported half of the country's food. Subsequently, the decrease of these imports led to mass food shortages. The country was challenged to produce more food with fewer resources.

Cuba responded by restructuring their agriculture into localized 'city farms' or 'city gardens'. This typology of farming relocated production closer to consumers and provided a wider variety of fruits and vegetables to its people. People were encouraged to grow fruit and vegetables in their back yards, and were allowed to sell the goods on the property or nearby market. The initiative aimed at utilizing all available arable land for food production to ensure maximum return. The success of these gardens, to a large extent, relieved Cuba's food crisis.

Pfeiffer (2006, pgs. 53-65)

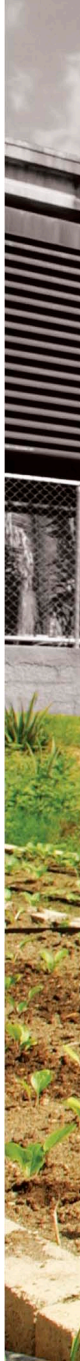


fig. 06_ an urban farmer in south america. © fao: guiseppe bizzarri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general public ····▷···· proposed facility

social aim_

_visitors are introduced to urban agricultural technologies
_visitors are informed on further training courses and community gardening schemes offered by the facility
_visitors can apply technology at home

educated public

_visitors can sign up for further training workshops
_participants receive formal training in the facility greenhouse and on the facility roof garden (training for both micro-gardens and community gardening)
_participants can sign up to obtain experience in a functional community gardening scheme
_participants can apply new skills at home to start their own gardening scheme (typically starting a garden on an apartment rooftop)
_participants can apply for assistance with initial set up of garden, social challenges and logistics
_progress can be monitored by field workers

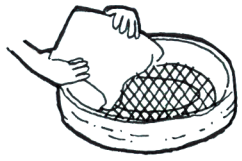
private farmer

_visitors can sign up for involvement or to become a stakeholder in a community gardening scheme
_participants receive formal training in the facility greenhouse and on the facility roof garden
_participants are required to obtain experience in a functional community gardening scheme
_participants' progress is monitored and the individual can either be placed in an already functioning community garden or start their own community garden
_participants can apply for assistance with initial set up of garden, social challenges and logistics
_progress can be monitored by field workers
_new biotechnologies can be supplied to the farmers as part of ongoing education and development

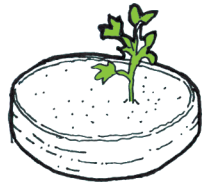
community gardenening farmer

typical application_ tire garden

cut tire

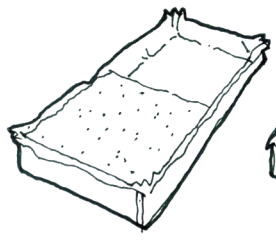


wire and plastic

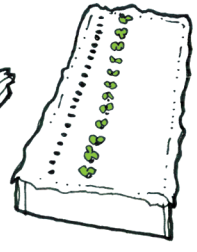


fill with soil

typical application_ micro garden



line box with plastic
fill with dried grass or leaves



punch holes for plants
cover with plastic

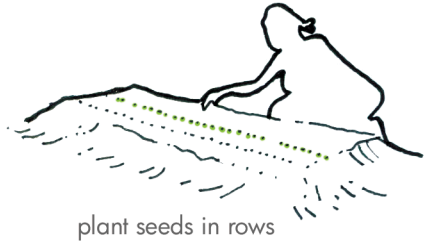
typical application_ feed sack garden

feed sack gardens

typical application_ door frame bed

dig 1m x 2m
knee deep

fill with organic waste



plant seeds in rows

fig. 07_ images adopted from TILZ (2009)

future projection_

A concept that has emerged in recent years, especially in developed countries, is that of the 'Vertical Farm' or 'Sky Farm'. The concept is formulated around the idea of exclusively building tower buildings for agricultural produce. The concept focuses on producing food under artificially monitored conditions, thereby maximizing productivity. Countries such Japan, with densely populated cities, has already started exploring this idea.

Pasona O2 is an underground farm in Tokyo. The facility explores high-tech food production methods by means of artificial light and hydroponics. LED's, metal halides and high-pressure sodium lamps are used to cultivate herbs, rice and lettuce underground. Accordinng to Dr. Dickson Despommier of Columbia University, it is merely a matter of time before such proposals will be realized in densely populated cities around the world.

Alter (2007)

> *"...the vertical farm should be a thing of architectural beauty as well as be highly functional, bringing a sense of pride to the neighborhoods in which they are built. In fact, the goal of vertical farm construction is to make them so desirable in all aspects that every neighborhood will want one for their very own."*
>
> Despommier (2008)

The proposed research facility can provide invaluable information and research about urban agricultural techniques, which could be used by a Vertical Farm in the future.

fig. 08_ a subterranean rice fields at pasona O2

fig. 09_ transgenic tomatoes at pasona O2

fig. 10_ lettuces are grown under artificial light at pasona O2

fig. 11_ sketch prspective of 'la tour vivante'

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la Tour Vivante

'The Living Tower'
Atelier SOA Architects
Rennes, France
Un built

The building is 30 storeys high and conceptually based around a core system. The core is made up of residential units in the bottom half and office space in the top half. Space for producing crops is wrapped around the core in a continuous ramp that spirals from the bottom to the top. The tower is anchored to the landscape by a plinth that is partially sunk into the ground. This 'plinth' connects the building with the street and also houses a variety of retail stores, a media centre and a nursery.

"...the Living Tower is designed as an autonomous ecological machine which associates places of production, places of consumption with spaces of life."

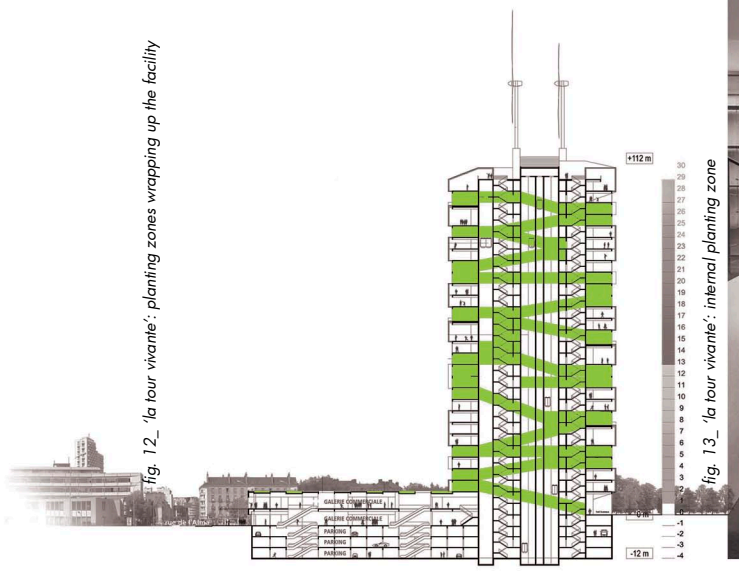

fig. 12_ 'la tour vivante': planting zones wrapping up the facility

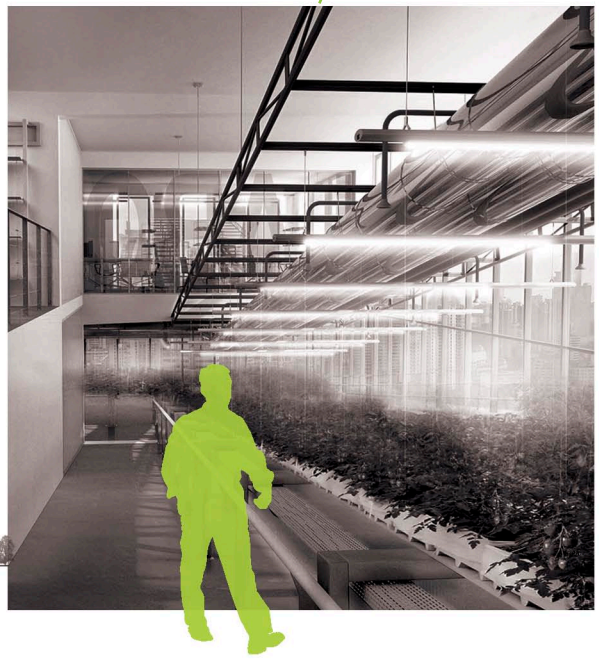

fig. 13_ 'la tour vivante': internal planting zone

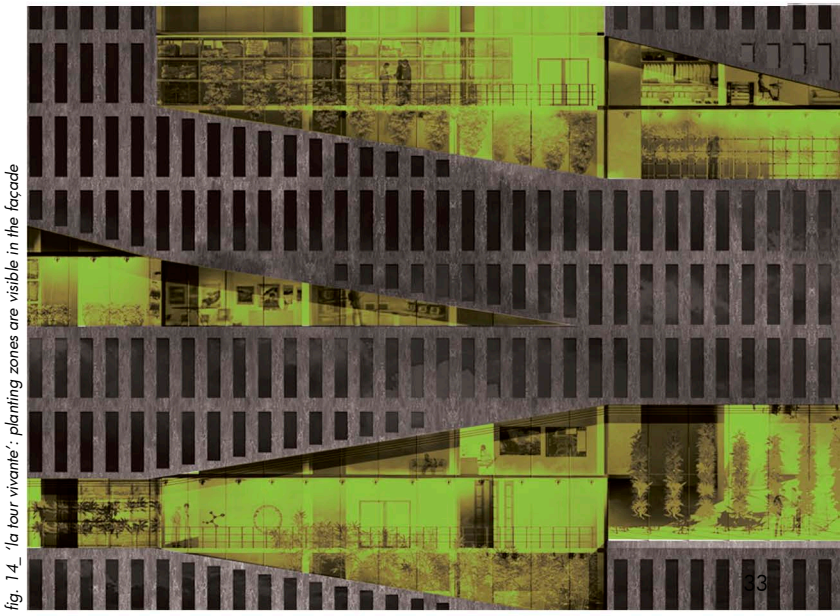

fig. 14_ 'la tour vivante': planting zones are visible in the façade

fig. 15_ man with carrots

site location + context_02

fig. 16_ location map

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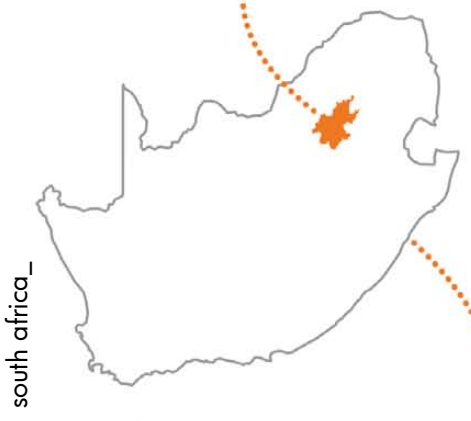
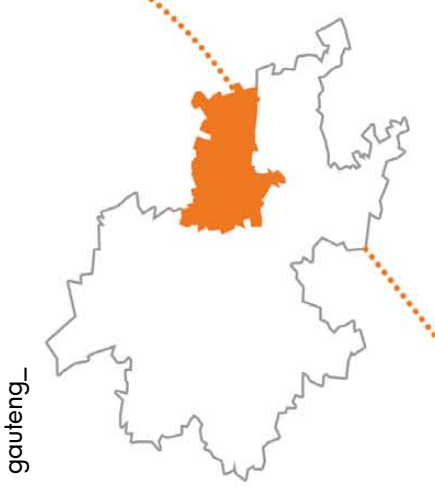
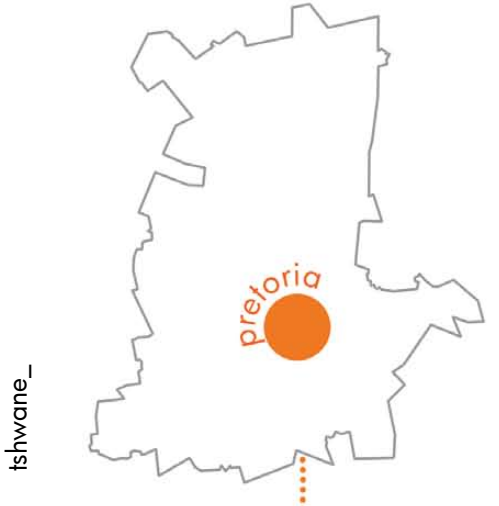






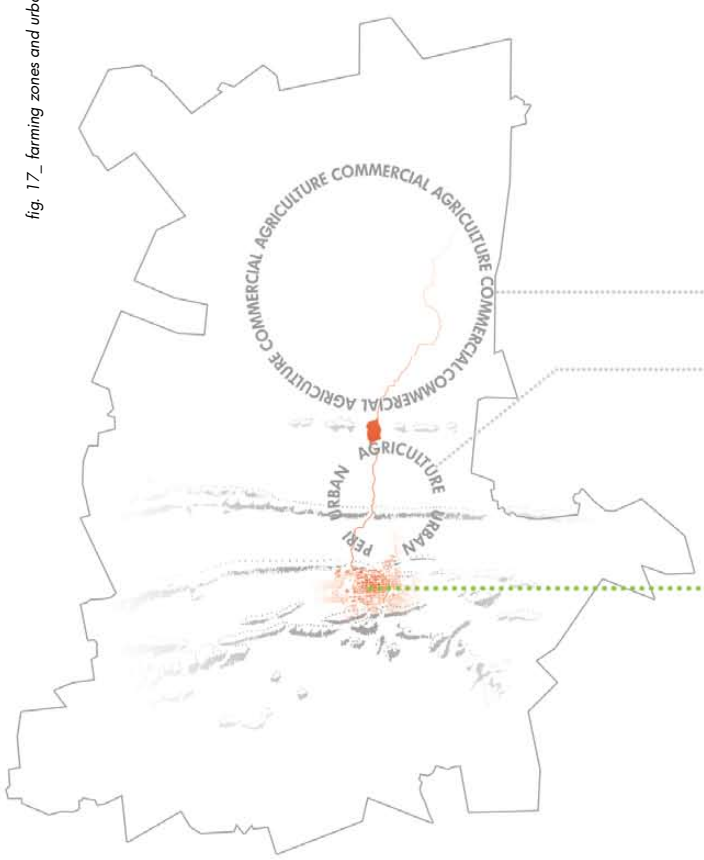
location_

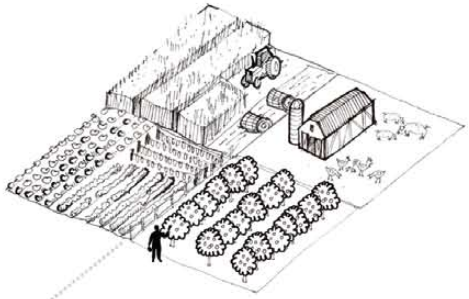
Geographically, South Africa is located close to some of the most impoverished nations in the world (World Hunger Map), making it possible to exchange agricultural solutions to those in need. South Africa also has the adequate infrastructure (World Bank, 2009), in terms of airports and highways, making it possible for foreign nationals to visit and observe the programs and progress of the facility.

South Africa will act as a good host for a research facility given the country's stable economic growth in recent years (World Bank, 2009) and the country's growth in research and development (Department of Science and Technology, RSA, 2009). The country has the potential resources to make a significant contribution and successfully act as host to such a facility.

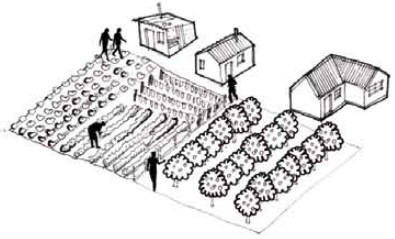
The city of Pretoria, Tshwane is ideal for the location of the proposed facility. Research institutions such as the Council of Scientific and Industrial Research (CSIR) and the Agricultural Research Council (ARC) are located in Tshwane, and could support the facility in expanding its research and development programs. The greater Tshwane municipal area will also allow for the implementation and monitoring of research on various scales of agriculture.

fig. 17_ farming zones and urban scales in tshwane

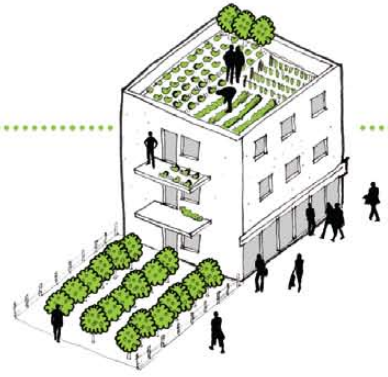




_scale: rural
_population density : sparse
_commercial agriculture



_scale: peri-urban / suburban
_population density : low to medium
_community gardening
_small-holder farms



primary focus of research_

_scale : urban
_population density : medium to dense
_ urban community gardening
_micro gardening

fig. 18_ potential for agriculture on rooftops in pretoria

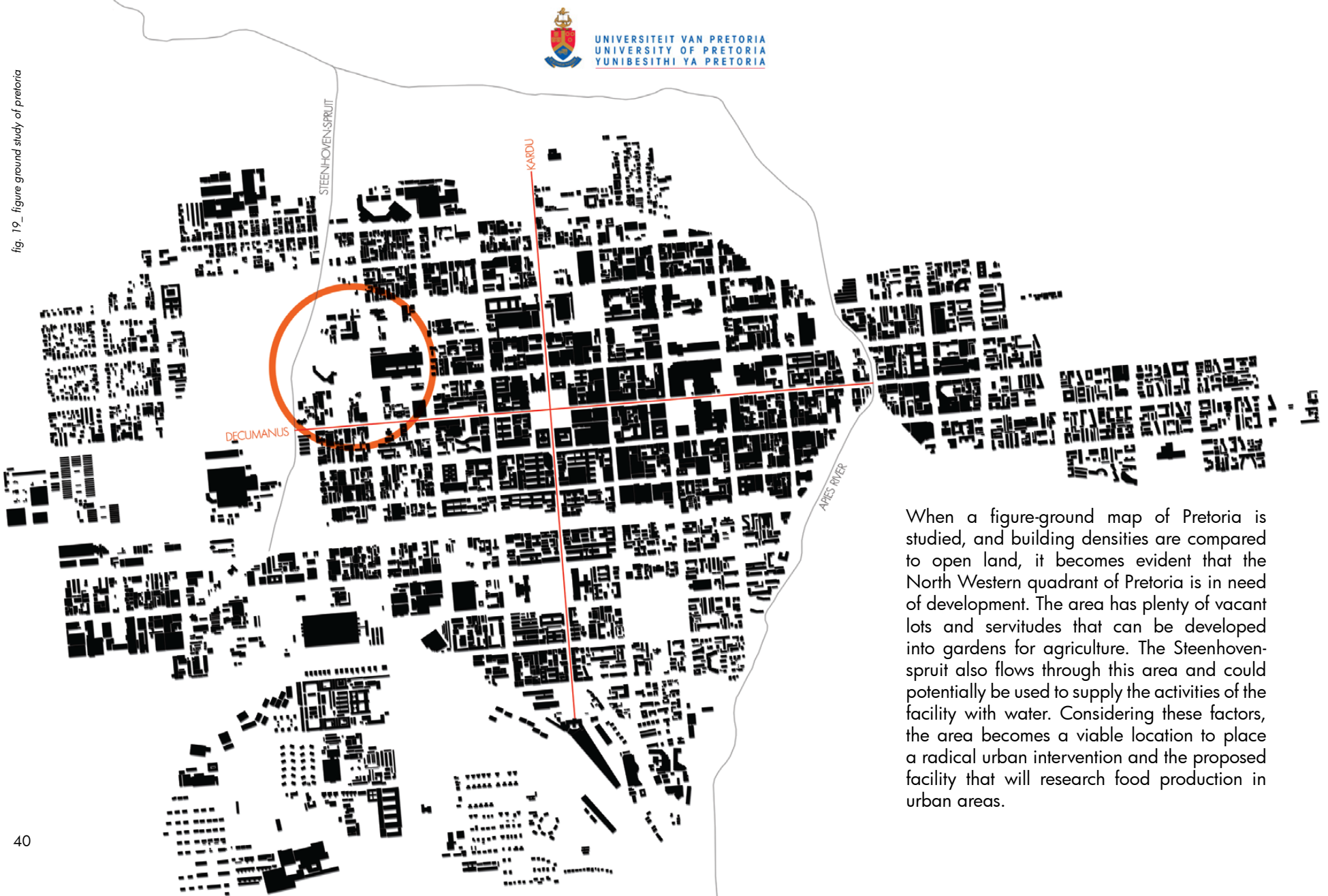


fig. 19_ figure ground study of pretoria

When a figure-ground map of Pretoria is studied, and building densities are compared to open land, it becomes evident that the North Western quadrant of Pretoria is in need of development. The area has plenty of vacant lots and servitudes that can be developed into gardens for agriculture. The Steenhoven-spruit also flows through this area and could potentially be used to supply the activities of the facility with water. Considering these factors, the area becomes a viable location to place a radical urban intervention and the proposed facility that will research food production in urban areas.

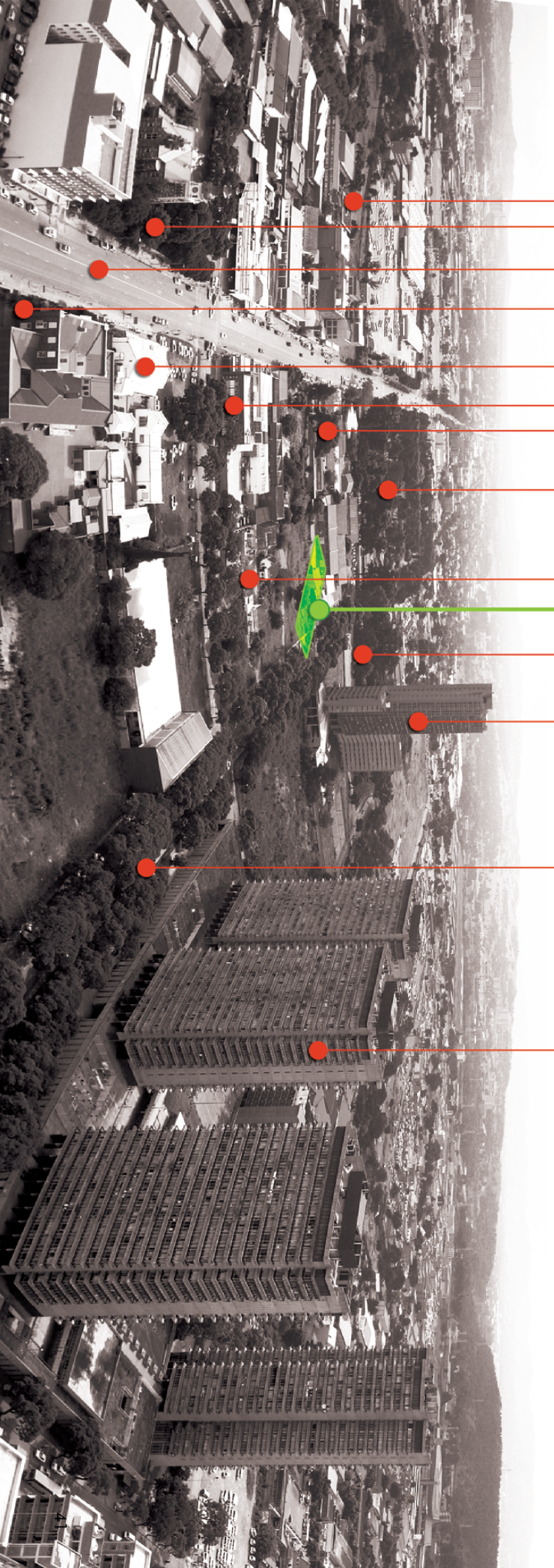


fig. 20_ existing context

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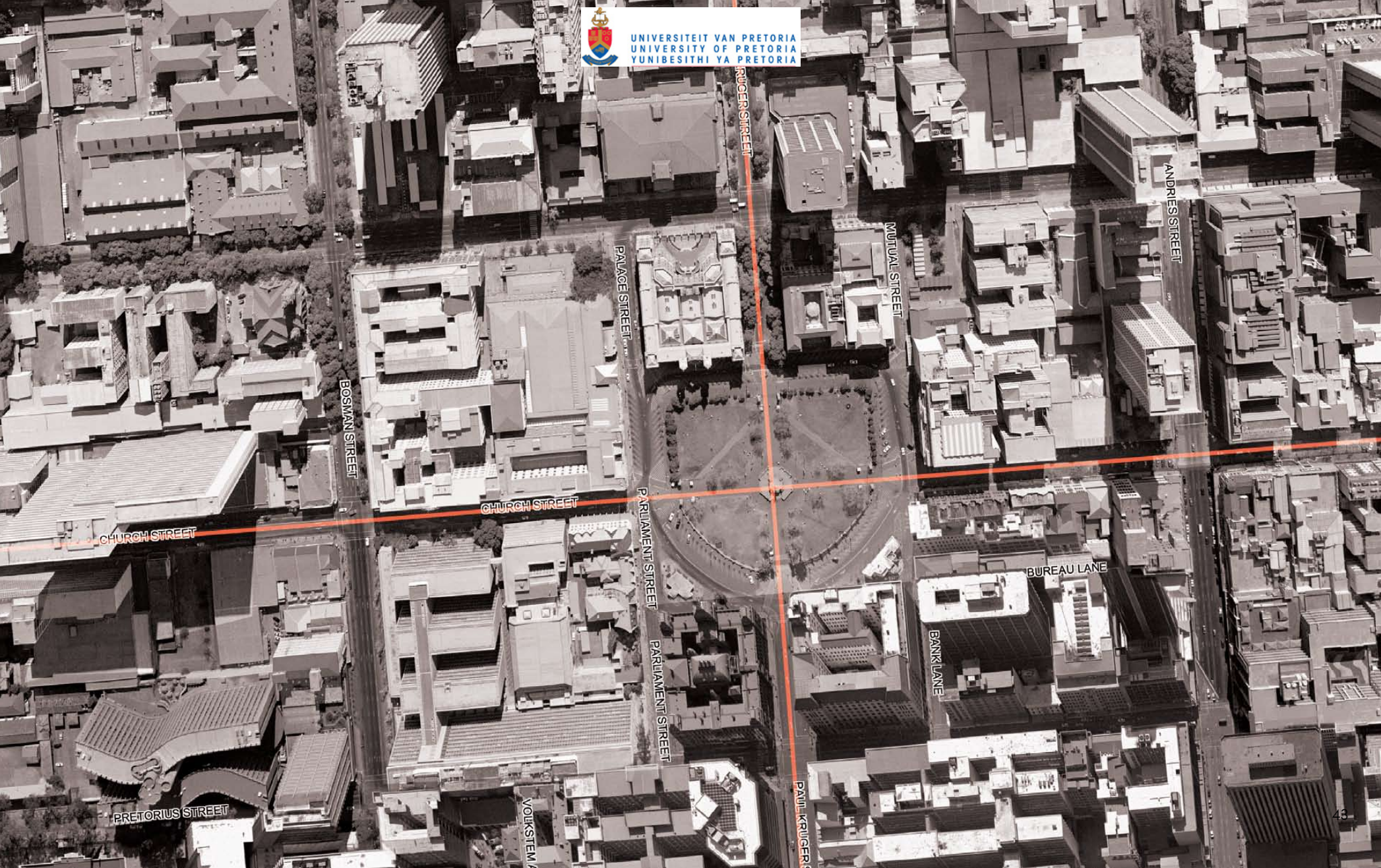
fig. 21_ study area aerial photograph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BANK LANE
PRETORIUS STREET
VOLKSTEM
PAUL KRUGER

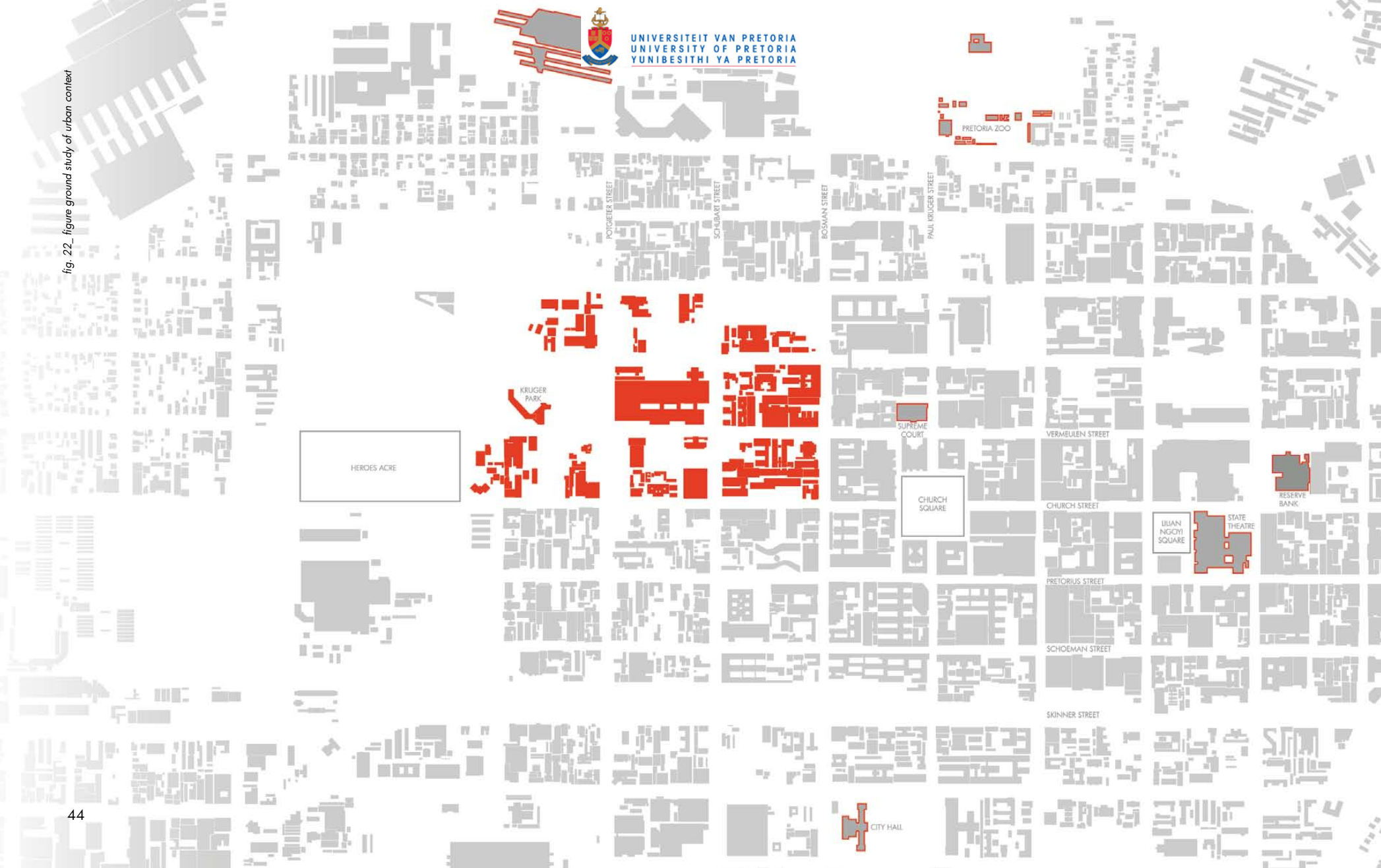
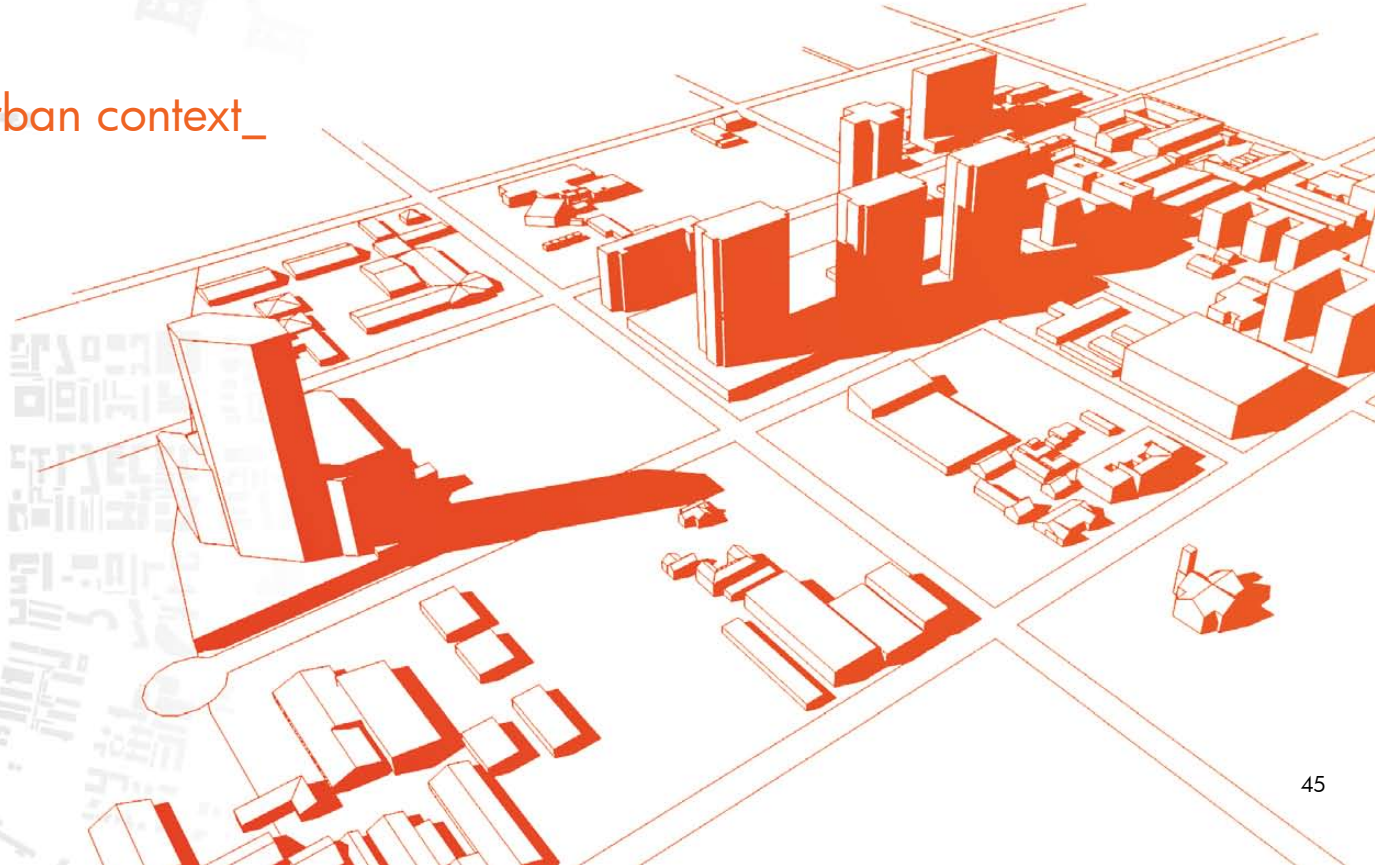


fig. 22_ figure ground study of urban context

When the figure ground is studied, it is clear that the dissipating urban fabric towards the West is insensitive to nearby Church Square, still generally characterized as the city center. The Reserve Bank and the infamous Kruger Park flats are both equal distances away from Church Square, although they seem to be in different cities in reality. The study area is characterized by low-rise, low-density and low-income urban fabric, normally associated with light industrial urban zones. Apart from these, five tall and neglected residential towers stand isolated from the city fabric. They are remnants of past failed attempts to successfully densify the North Western quadrant of the city.

urban context_



historical context_

> *“ Contextually the city form is a result of the interpretation of a classical landscape, its mountains, valleys, fountains, rivers and ‘poorte’. ”*
>
> *-Jordaan (1989)*

According to Jordaan (1989), the city blocks of Pretoria were laid out in a rigid Cartesian grid from the center point of Church Square, outwards on a North-South, and an East-West axis. The axes were ordered to correspond to the sun’s cosmic path and the location of the openings in the mountains.

The North-South axis or *cardu* (Paul Kruger Street) terminated in the Daspoort mountain range to the North and Schurweberge mountains to the South. The East-West axis or *decumanus* terminated at the crossing of the Apies River at the Eastern side and the Steenhoven-Spruit at the Western side.

Water from the Apies River and Steenhoven-Spruit were reticulated into open ducts (leivore), and subsequently served the grid with water for private agriculture. Regulations at the time stated that owners of erven had to wall-in and cultivate their property. According to Jordaan (1989), this was a tradition of combining the useful with the beautiful.

When considering the above, the proposed intervention should be sensitive to the historical significance of Steenhoven-Spruit as an urban element and as a feeder to the city

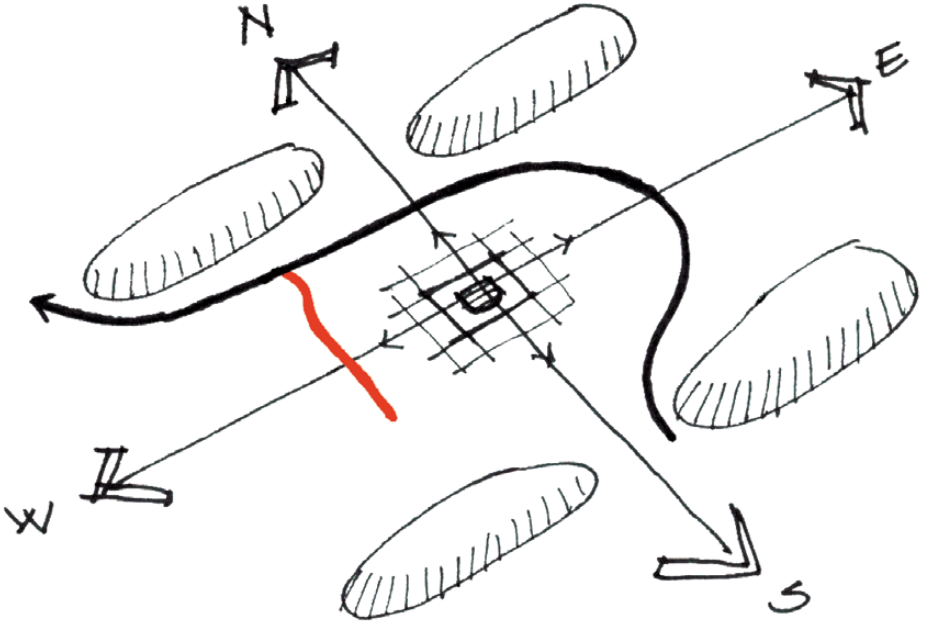


fig. 23_ steenhoven-spruit as an urban boundary for historical pretoria

The intervention must celebrate the historical significance of Steenhoven-spruit as
_a traditional provider to the city and it's people's everyday needs
_a natural boundary or edge for the city

social context_

An open veld next to the channel functions as a public green space, although it has no formal public facilities. The veld and spruit play host to a number of activities such as playing soccer, gathering under large trees throughout the day or around small food stalls and fires in the early morning. A substantial number of individuals also wash and bathe in the river. Permanent footpaths along the channel testify that the spruit also acts as a connecting pedestrian route to and from Marabastad.

A number of controversial issues surround the Kruger - and Schubart - Park apartment buildings. According to the Anti Privatisation Forum (2008), Schubart Park has been mismanaged and neglected by the Tshwane Municipality and the Tshwane Housing Company. The buildings have been neglected to such an extent that it has created unfavorable and dangerous living conditions for the occupants.

The Kruger Park complex received international media coverage when the building was forcefully evacuated on the 22nd of July 2008. According to News 24 (2009), the evacuation was assisted by a private company, known as 'The Red Ants', notorious for their violent evacuation tactics. Residents resisted the evacuation, as they were given no alternative means of accommodation. The building was partially set alight, five people died and some residents were evacuated from the top of the building by rescue helicopters.
Kruger Park is currently being renovated, although it is uncertain if the building is completely vacant or how the municipality will manage the re-occupation thereof.

Schubart Park residents, estimated at well above 10 000, refuse to evacuate the

fig. 24_ kruger park apartments

premises for renovation, since they argue that the Municipality is not supplying them with adequate alternative accommodations (News24 , 2009) The living conditions of this residential complex is similar, if not worse, than that of Kruger Park. Residents claim that there is no sanitation or electricity in parts of the complex. Resident representatives and the Mayor have tried, but failed to reach a compromise. The initial evacuation was for early 2009, but has been postponed. The residents are prepared to fight for their homes. (Eye Witness News, 2009)

site views_

fig. 25_ view of kruger park from steenhoven-spruit

fig. 26_ schubart park plinth

fig. 27_ shabeen behind kruger park

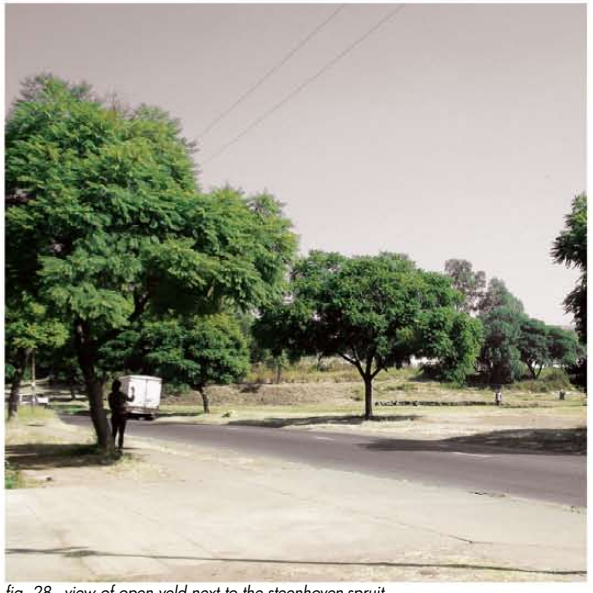


fig. 28_ view of open veld next to the steenhoven-spruit

fig. 29_ view of kruger park from antique store

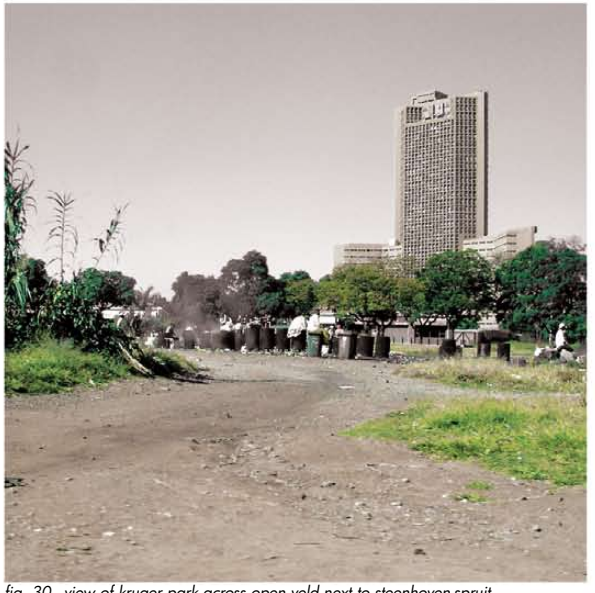


fig. 30_ view of kruger park across open veld next to steenhoven-spruit

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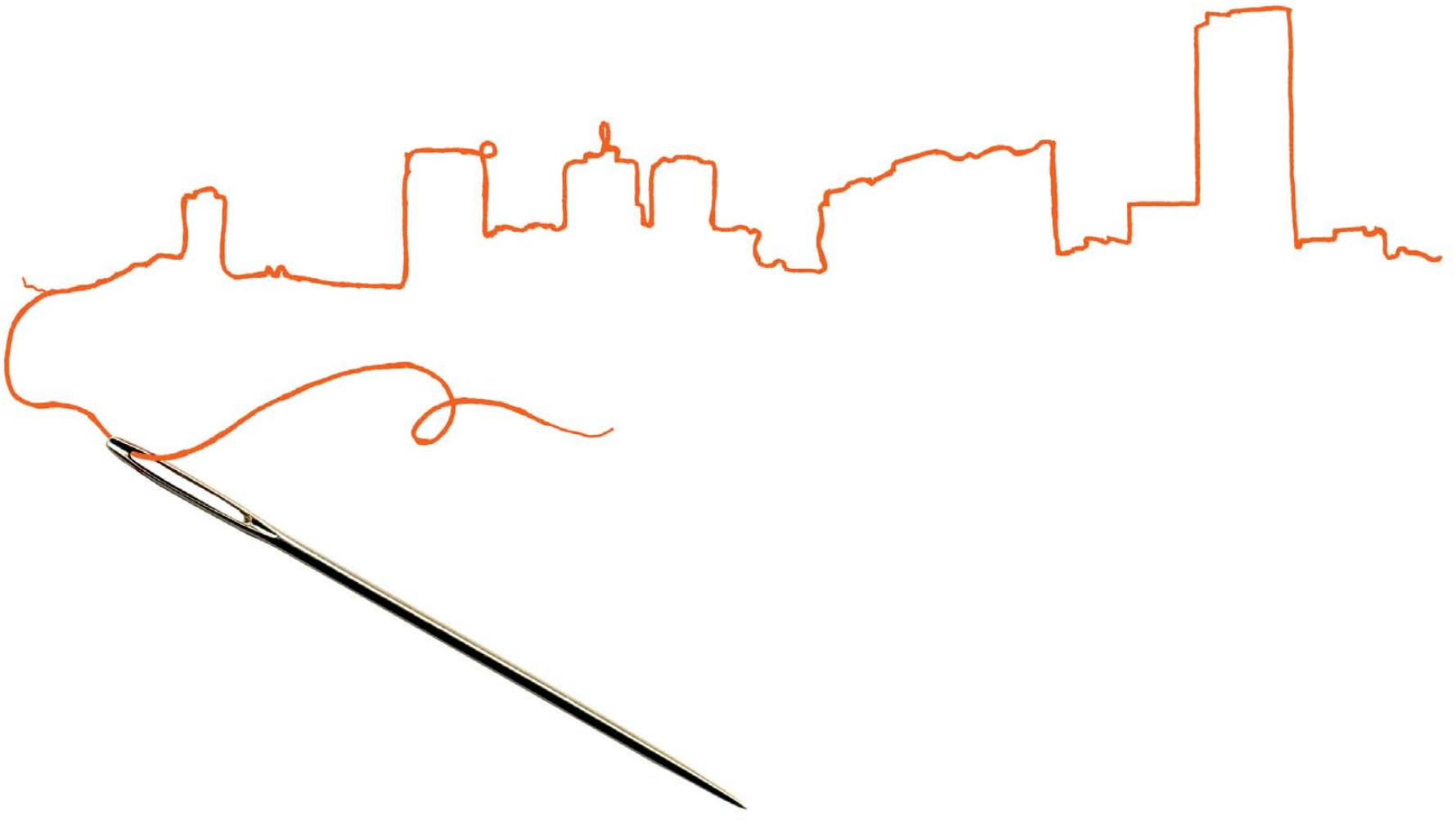

urban design + mass development_03

urban design_

To try and solve the many problems facing humanity by one intervention will be idealistic. The emerging environmental and food crisis needs to be solved piece by piece. Architecture and urban planning have significant contributions to make, but can merely create the opportunity and set the stage for change. Real change can only becv brought about through collective efforts. Additional factors such as management and implementation will determine the success of any intervention.

> *“ …the world’s growing population cannot attain a western standard of living by following conventional paths to development. The resources required are too vast, too expensive and too damaging to local and global ecosystems. The western model of development is a once off. We need a new model. ”*
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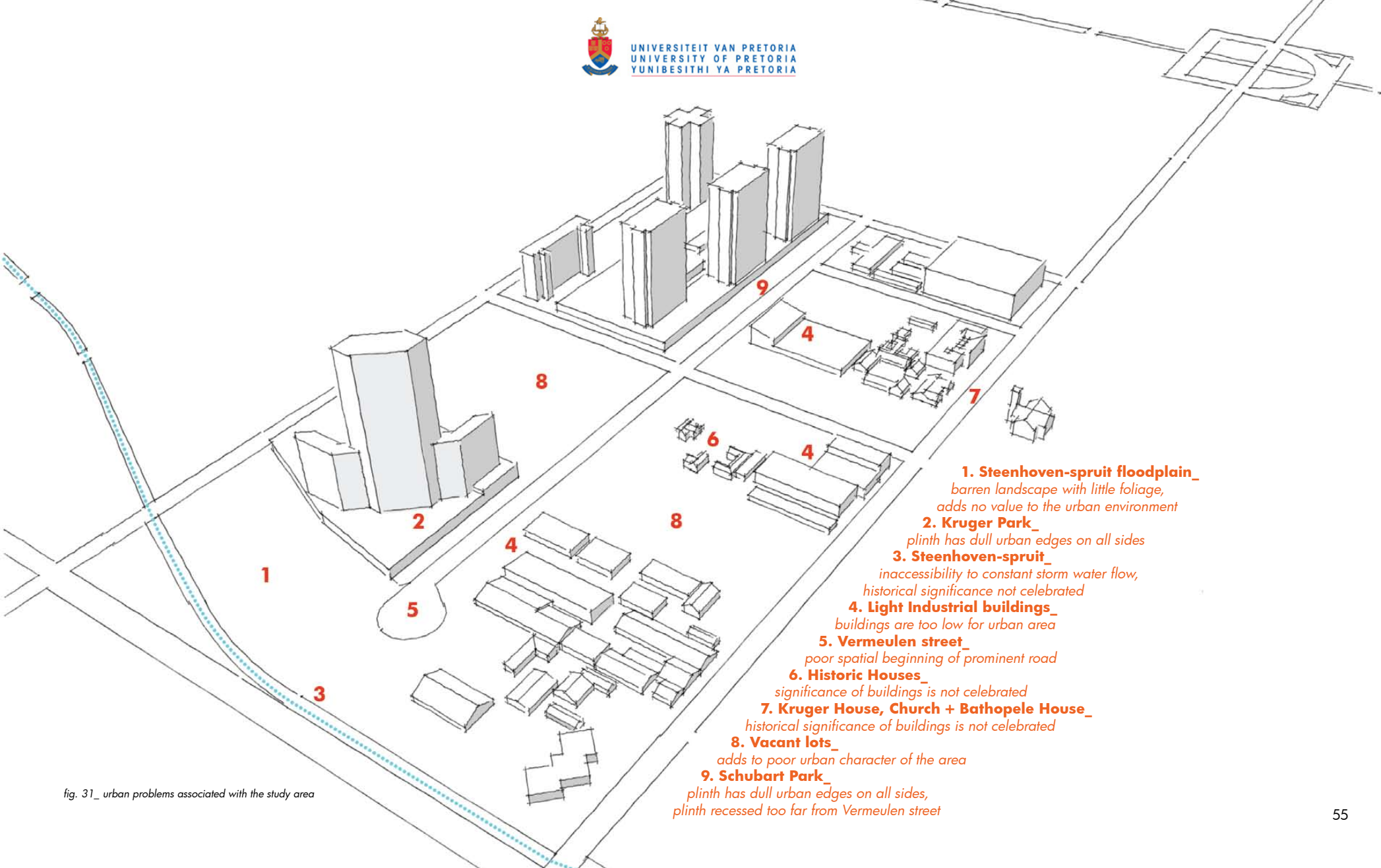
african city_

The conventional approach to creating new urban environments, especially in developing countries, is largely based on the western approach to develop society and cities. This is problematic for developing African cities, as the social fundamentals on which the city is planned, is completely different. The South African model of the new city should allow for choice, rather than an absolute solution. Choices within the city are created by allowing for the model to adapt over time by layering the social interpretation over the urban master plan. The model should therefore be flexible to the social needs of the people. Urban planning for a South African city should be a system of in-fill, rather than a set of definite rules.

pretoria_

The city of Pretoria is an energy consumer. Similar to most western approaches, Pretoria functions on a linear influx and output of energy and wastes. The city is fed by the surrounding rural environment, but also expects this environment to absorb its wastes.



1. Steenhoven-spruit floodplain_
barren landscape with little foliage, adds no value to the urban environment

2. Kruger Park_
plinth has dull urban edges on all sides

3. Steenhoven-spruit_
inaccessibility to constant storm water flow, historical significance not celebrated

4. Light Industrial buildings_
buildings are too low for urban area

5. Vermeulen street_
poor spatial beginning of prominent road

6. Historic Houses_
significance of buildings is not celebrated

7. Kruger House, Church + Bathopele House_
historical significance of buildings is not celebrated

8. Vacant lots_
adds to poor urban character of the area

9. Schubart Park_
plinth has dull urban edges on all sides, plinth recessed too far from Vermeulen street

fig. 31_ urban problems associated with the study area

In order for the city to protect its dwellers in the future, it needs to become a provider, and stop being a consumer. The city must become a self-sustaining ecosystem.

response_

The solution does not lie in demolishing existing infrastructure and planning. It rather suggests that unused and under utilized space in the city should be used more efficiently. A possible solution would be to convert some of these spaces into productive landscapes. A productive landscape can be characterized as an urban area that has more than one function, acknowledging the value of horizontal land within the city.

These productive landscapes should connect to existing parks and open spaces, thereby creating a new green spine to the city. This new backbone will start to grow over the grid that was designed to accommodate the automobile and private transport, and rather start to serve the needs of pedestrian and cyclist.

The problem of the unsustainable city will not be solved by merely adjusting a few negative elements and adding a few positive ones to the current approach. Consideration as to how people live their everyday lives in cities needs to be investigated.

"A productive landscape will be a park, a place for agriculture, a green lung, a place for recreation and social interaction."

Viljoen (2005, p.11)

objectives_

The aim of the urban framework is to create a sustainable borough within the city limits that will act as a catalyst for future developments of a similar nature. The development must be seen as an admirable example of a sustainable approach for the future of the city.

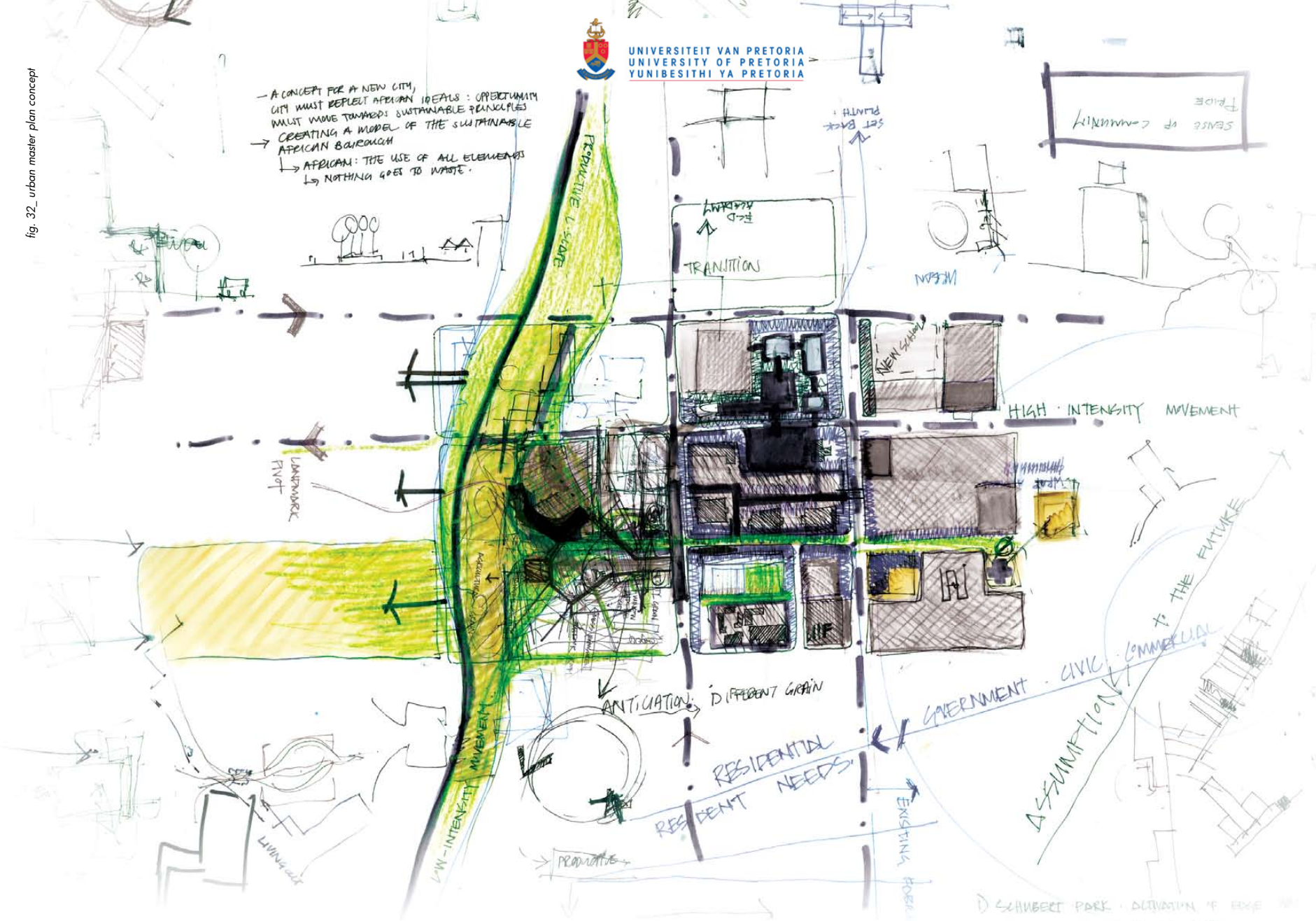


fig. 32_ urban master plan concept

The concept is about connecting dissociated elements that need to collaborate in order to contest the challenges our habitats face. Thus, it is about connection. The aim of the design is to stitch these elements firmly together.

The response will be
to **stitch_** people with agriculture,
to **stitch_** agriculture with the city and
to **stitch_** the city with its people.

aims_

_The framework should add sufficient density to the area

_The everyday needs of the inhabitants should be addressed

_The framework should allow for choice and opportunity for the inhabitants

_Existing natural and man-made urban elements must be incorporated

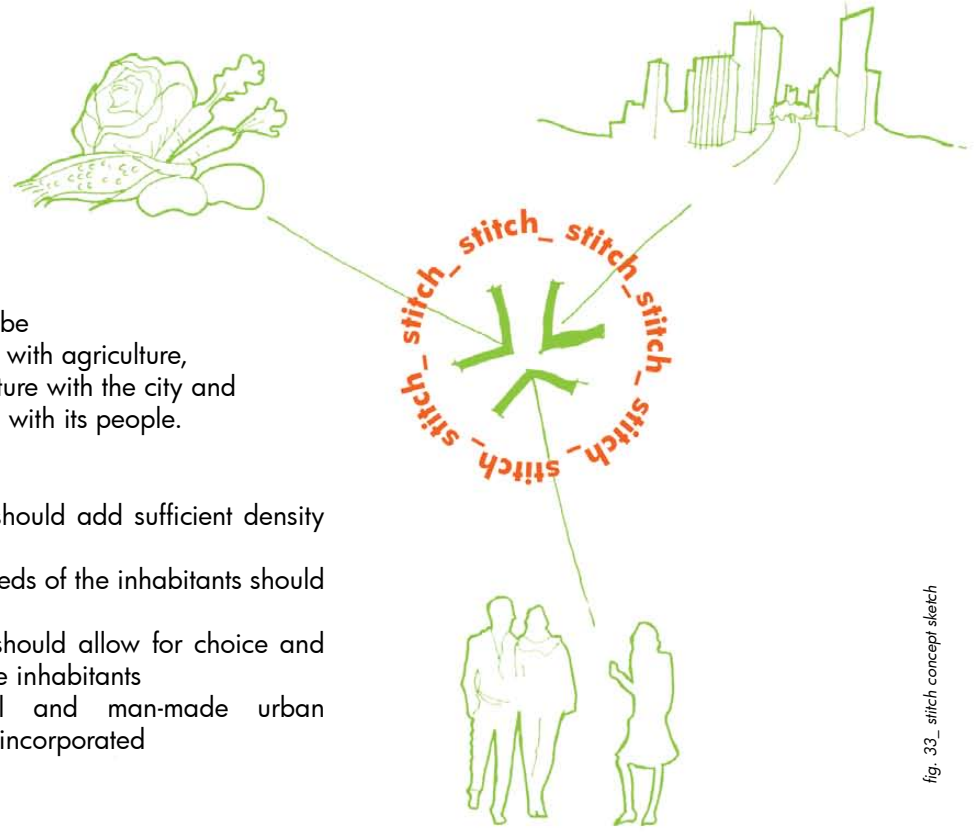


fig. 33_ stitch concept sketch

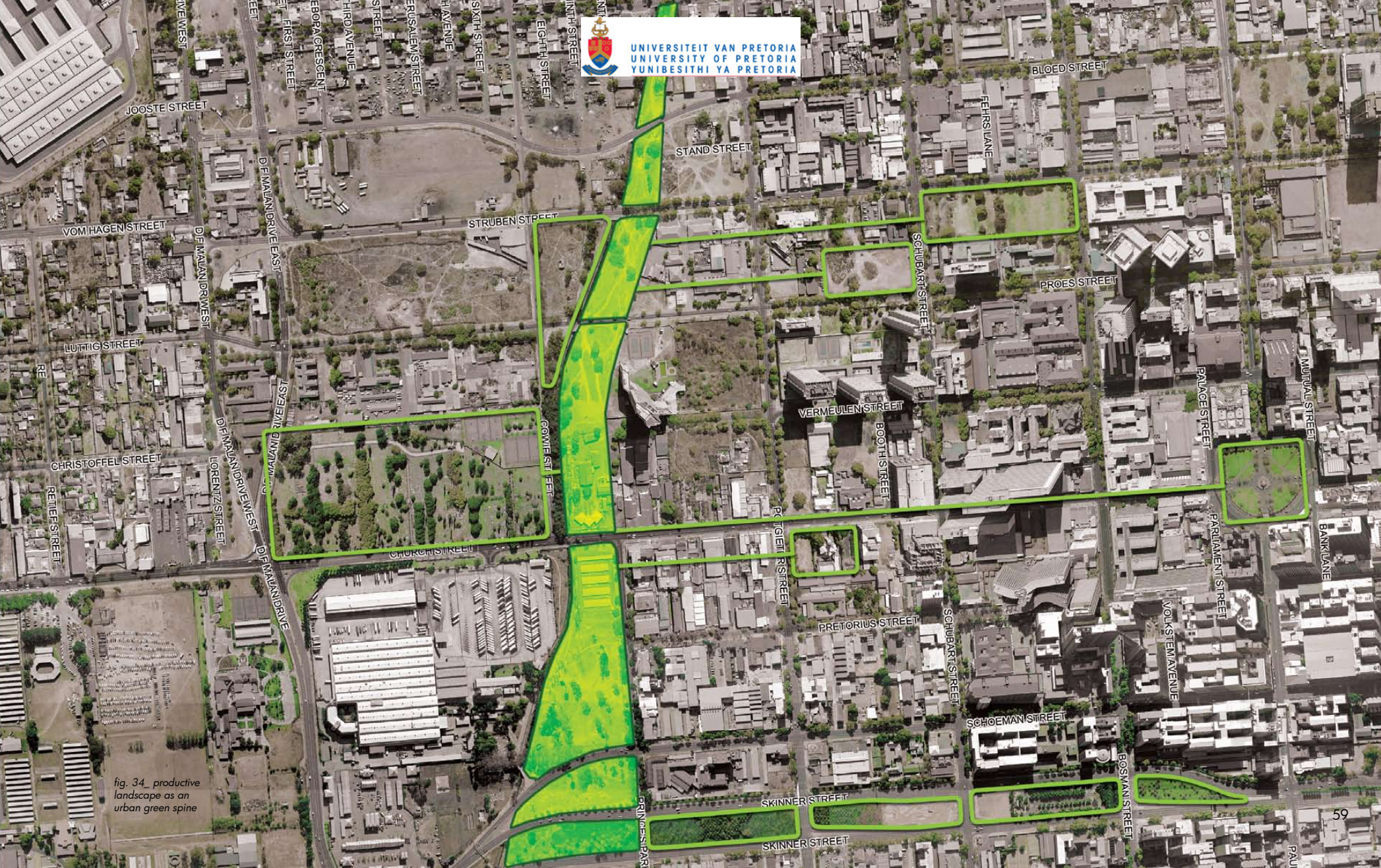


fig. 34_ productive landscape as an urban green spine

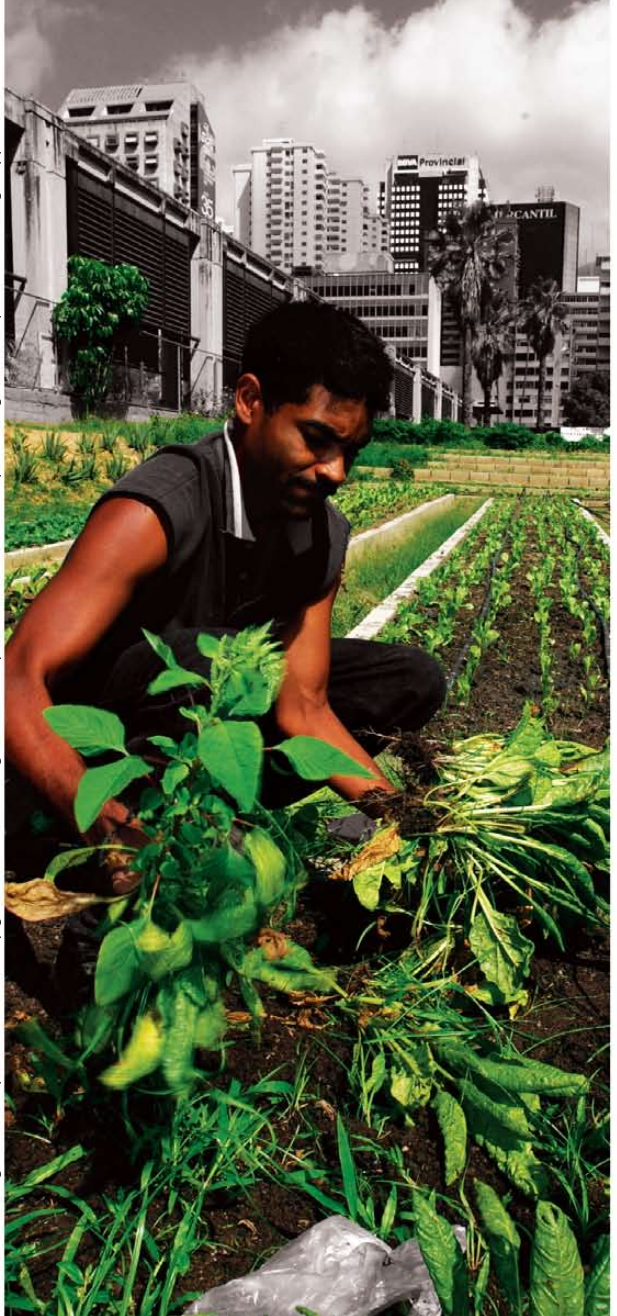


fig. 35_ a compost-based community garden in caracas. the garden is run by seven members, with no previous agricultural experience. © fao: guiseppe bizzarri

precedent study_
caracas, venezuela

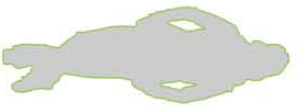
According to the UN FAO (2009), the government of Venezuela supported by the UN FAO started urban agriculture in poor parts of Caracas in 2003. 4000 micro-gardens and 20 community gardens were launched in and around the city.

The UN FAO (2009) state that the green gardens, in contrast to the harsh city environments, have become an advertisement for the program by itself. Micro-gardeners are also passing on their skills to other members of the community. According to UN FAO (2009) the President of Venezuela wants to increase the amount of micro-gardens to 100 000, due to the success of the project since it was introduced.

micro-gardens_

A 1sqm shallow wooden tray is filled with a planting medium, typically composed of rice-hulls and peanut shells. Micro-gardens are fed a nutrient-rich solution on a daily basis, to ensure adequate plant growth. A well maintained micro-garden can produce up to 18kg of tomatoes or 16kg of cabbage in multiple harvests, every year.

fig. 36_ gardeners tell their stories

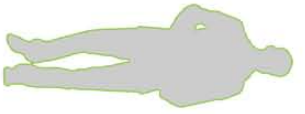


Ms Hernandez

"We have to go a long way down the hill to get fresh vegetables at the market. And they are expensive. With the micro-garden we have access to fresh vegetables for free every day."

Jessica Suárez, 11 years

"I have learnt how to manage the table and the vegetables, what vegetables can be grown, when to water and when to add the nutrient solution, when I have learnt enough I will do a micro-garden at home with my parents."



Mr Michelena, agronomist

"Sometimes people try gardening once and don't continue. We try to take the table back and give it to someone who is doing well, as a reward."

Ms Verenzuela

"I didn't know anything about vegetables and how important they are for your health, now I eat vegetables every day."

fig. 37_ supervisors make weekly rounds to micro-gardeners to monitor progress. © fao: guiseppe bizzarri

fig. 38_ produce from a community garden is sold at an outlet next to the garden. © fao: guiseppe bizzarri

interventions and opportunities_

1_ Development of Steenhoven-spruit floodplain into a productive landscape, forming a part of the Urban Green Spine.
2_ Development of a landscape intervention that will tie the plinth of Kruger Park with the productive landscape.
3_ Development of an esplanade next to Steenhoven-spruit to form a North-South path.
4_ Densification of the area by replacing existing low-rise buildings with mixed use buildings of an appropriate urban scale.
5_ Development of a new civic square that will play host to the origin of Vermeulen Street.
6_ Development of Vermeulen Street into a promenade.
7_ The connection between the city and the productive landscape should be carefully considered.
8_ Addition of active urban edges to the plinth of Schubart Park.
9_ Unused parking lots can be shared by new buildings in the vicinity.
10_ Location of public orientated buildings that surround the proposed civic square.
11_ Establish prominent connection with Heroes Acre.
12_ Establish connection with 'decumanus' axis and Steenhoven-spruit crossing.

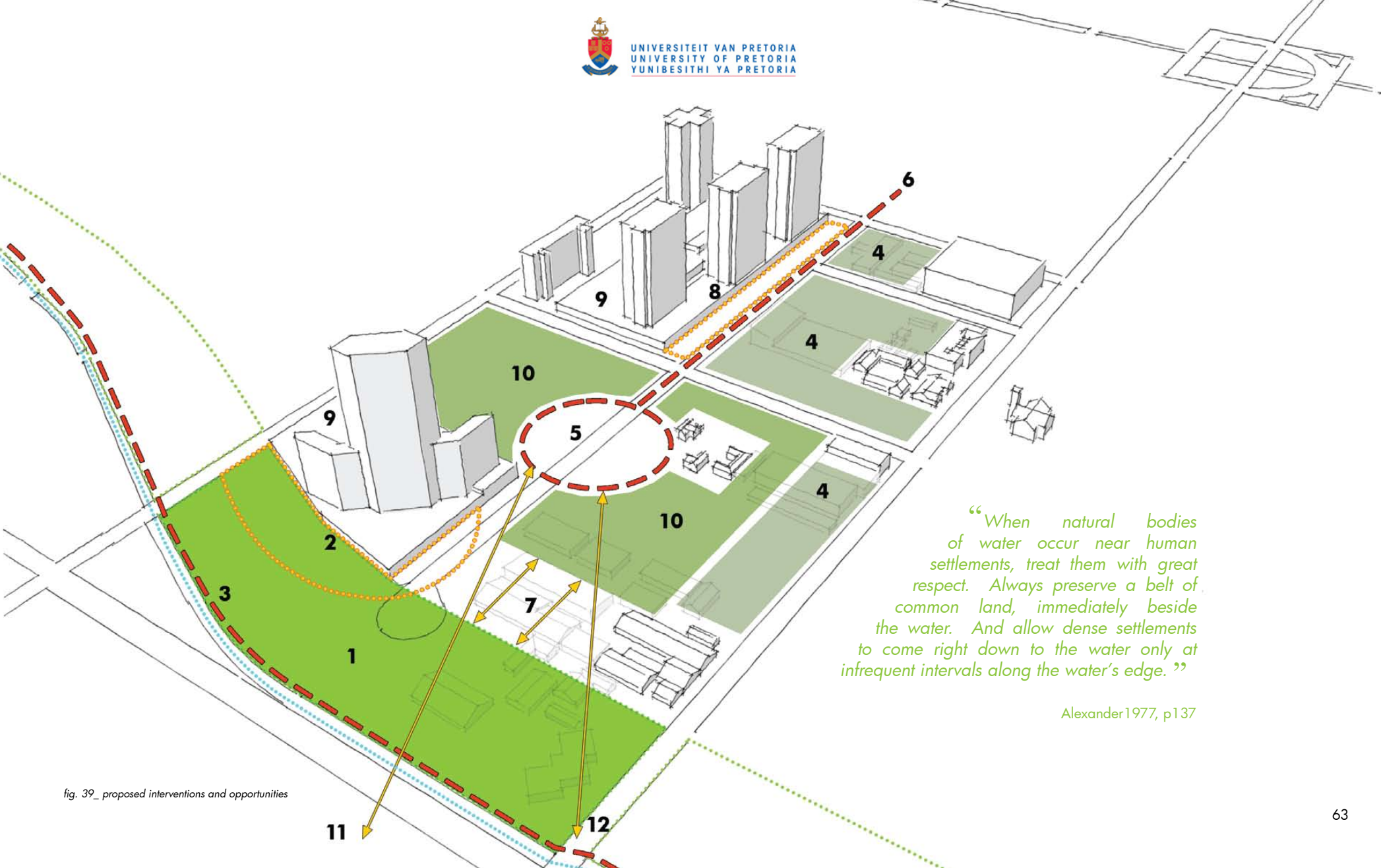


fig. 39_ proposed interventions and opportunities

"When natural bodies of water occur near human settlements, treat them with great respect. Always preserve a belt of common land, immediately beside the water. And allow dense settlements to come right down to the water only at infrequent intervals along the water's edge."

Alexander1977, p137

urban design development_

1_ Development of the Urban Green Spine.
2_ Landscape intervention: Addition of berm to Kruger Park plinth.
3_ Proposed new mixed-use building footprints.
4_ Multi-purpose civic square.
5_ Site for proposed new Agricultural Research Facility.
6_ Site for proposed new Market.
7_ Site for proposed new Taxi Stop.
8_ Market square as umbilical cord between Agricultural Research Facility and Market.
9_ Proposed Community Gardening Lots.
10_ Proposed Active edge: Strip of retail and commercial 'box structures' that will allow informal traders to establish stalls in between.
11_ Proposed Active edge: Retail strip to wrap around plinth of Kruger Park.
12_ Connection between Agricultural Research Facility and Urban Green Spine.

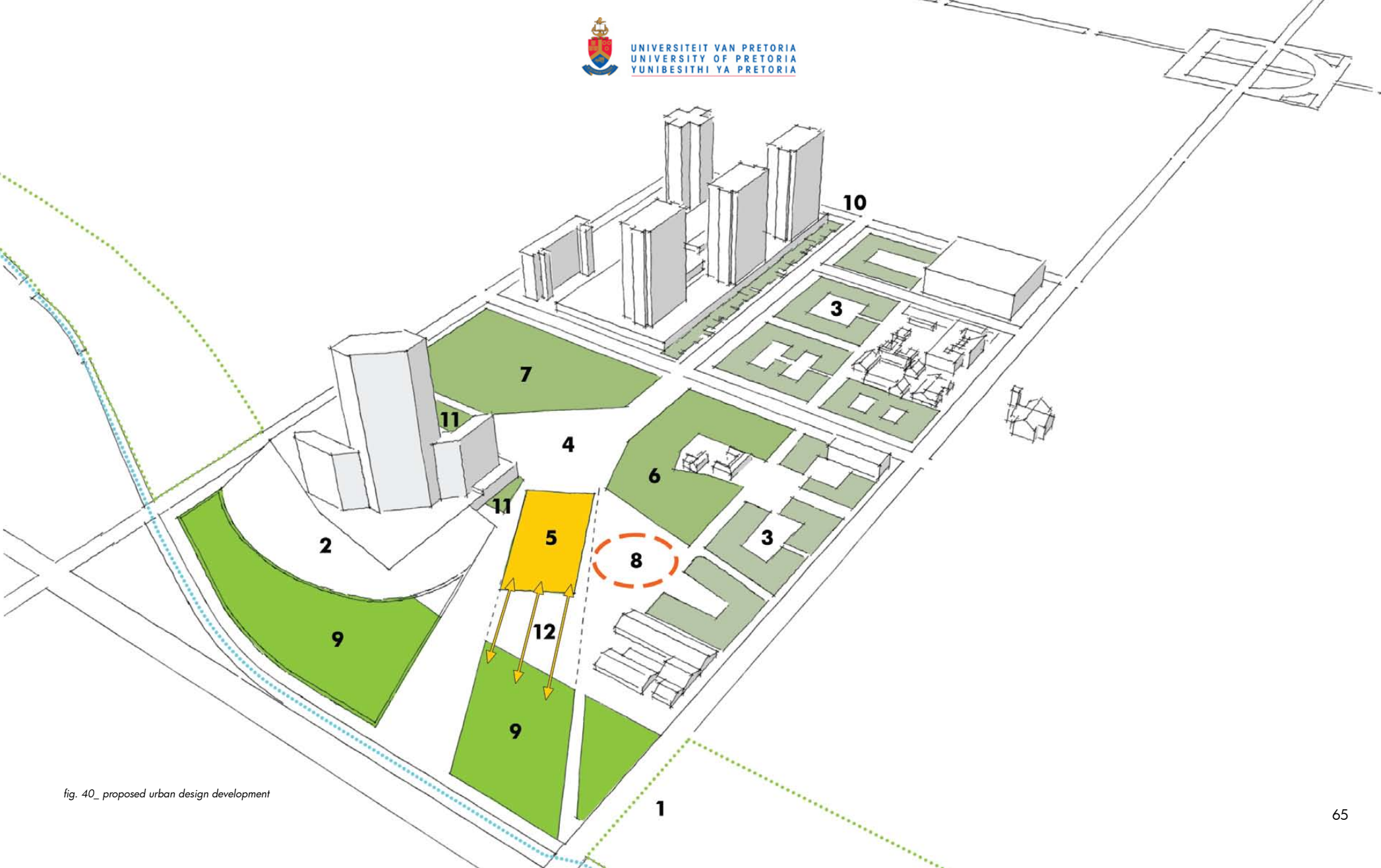


fig. 40_ proposed urban design development

"Landmarks: the observer does not enter within them, they are external. They are usually a rather simply defined physical object: building, sign, store, or mountain."

Lynch
(1975:48)

scale_

Proposed building heights are planned to be of a good urban scale, but not to contest or match that of Kruger Park or Schubart Park.

1_ Urban Green Spine.
2_ Mixed-use buildings at various heights between 5 to 10 storeys.
3_ Storm water catchment channels become a legible paving pattern over all the connecting public spaces.
4_ Community Gardening Lots.
5_ Agricultural Research Facility vegetable garden.
6_ Development of a pedestrian boulevard with Play Park.
7_ Civic buildings all developed with same plinth height and active edges.

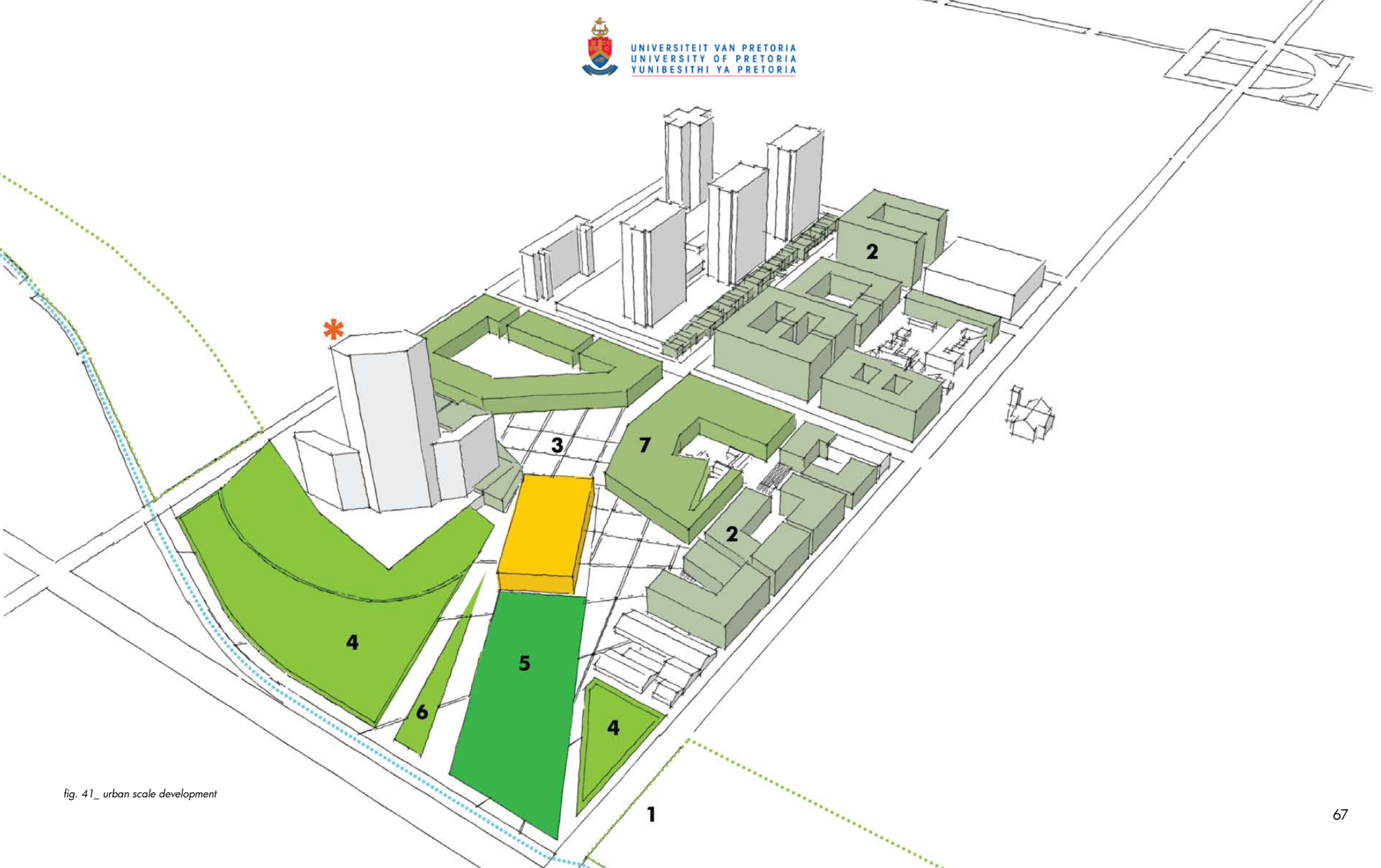
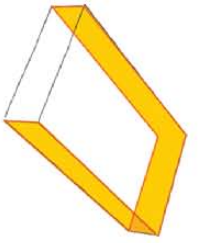


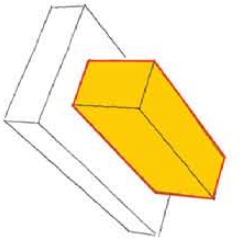
fig. 41_ urban scale development

mass development_



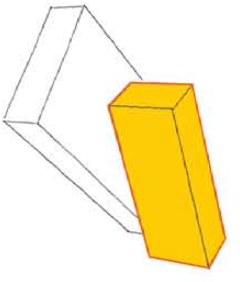
edges_

PLINTH WITH ACTIVE URBAN EDGES
PLINTH DEFINES AND FRAMES URBAN SPACES



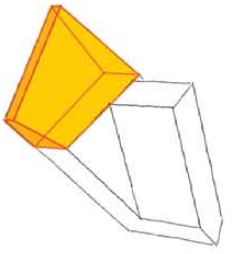
tower_

ADDITIONAL FLOOR AREA DEVELOPED
AS A SLENDER TOWER



turn_

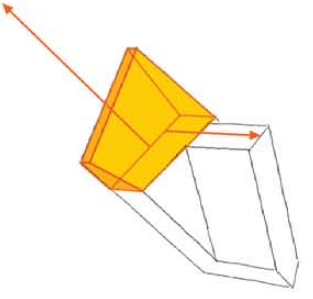
TOWER TURNED FOR NORTH-SOUTH
ORIENTATION
TOWER MOVED TOWARDS CIVIC SQUARE



slope_

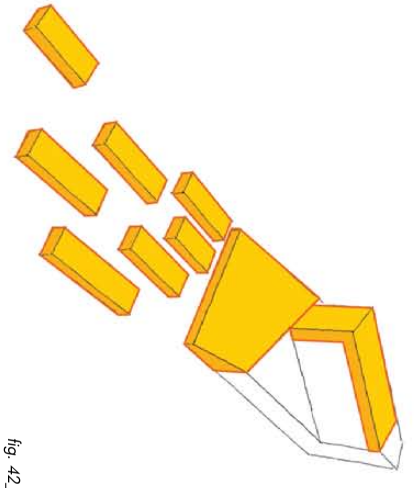
WESTERN PART OF PLINTH DEVELOPED INTO GREENHOUSE

_ TO CONNECT WITH GREEN SPINE
_ TRANSITION BETWEEN URBAN AND LANDSCAPE
_ LEAST AFFECTED BY SHADOWS OF KRUGER PARK



extend_

ADITIONAL GREEN HOUSE AND PLANTING SPACE NEEDED



stitch_

GREENHOUSE DISINTEGRATES INTO SMALLER, TEMPORARY GREENHOUSES, STITCHING THE BUILDING INTO THE LANDSCAPE. GREENHOUSE EXTENDS TO A ROOF GREENHOUSE

fig. 42_ building mass development

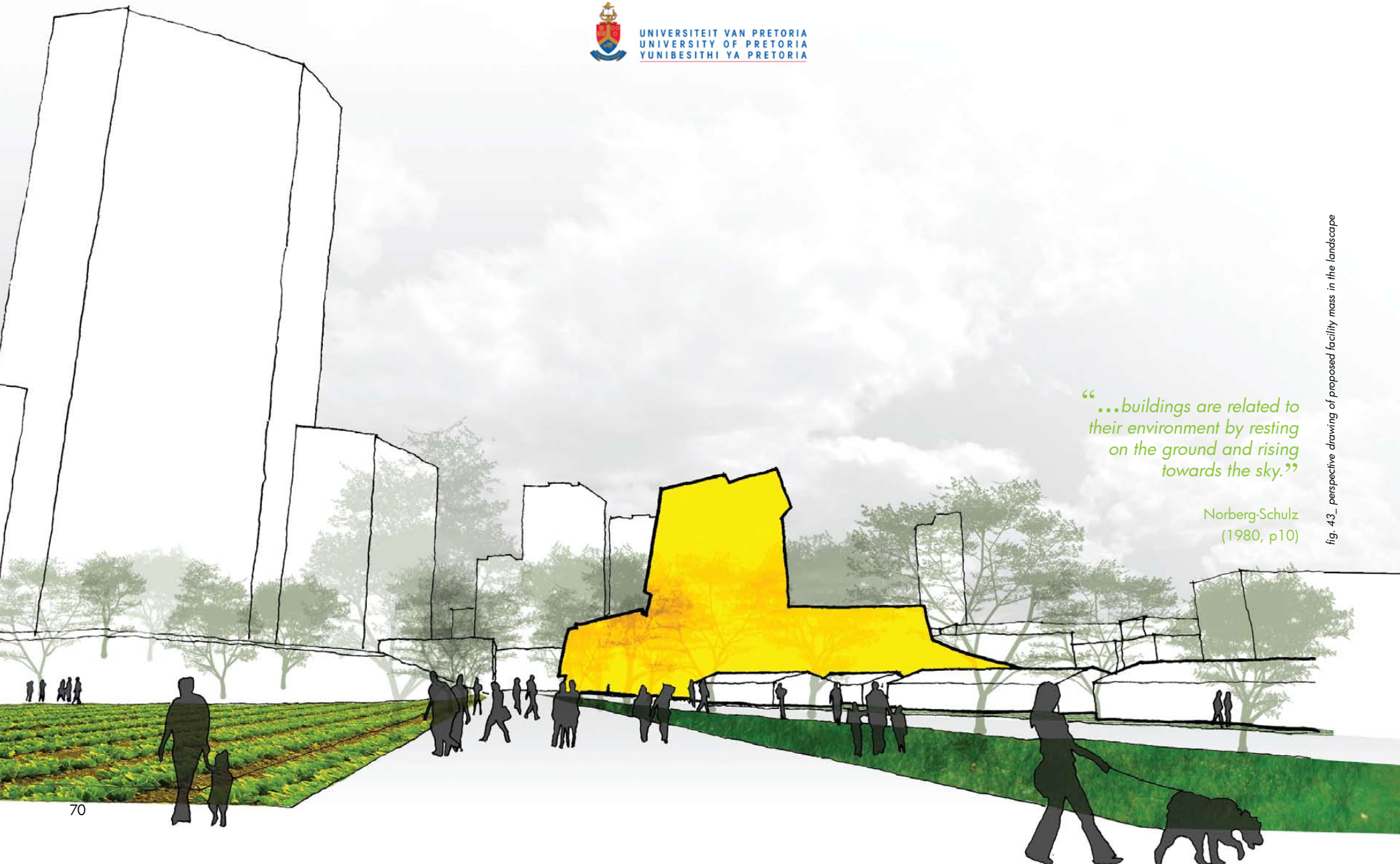


fig. 43_ perspective drawing of proposed facility mass in the landscape

"...buildings are related to their environment by resting on the ground and rising towards the sky."

Norberg-Schulz
(1980, p10)

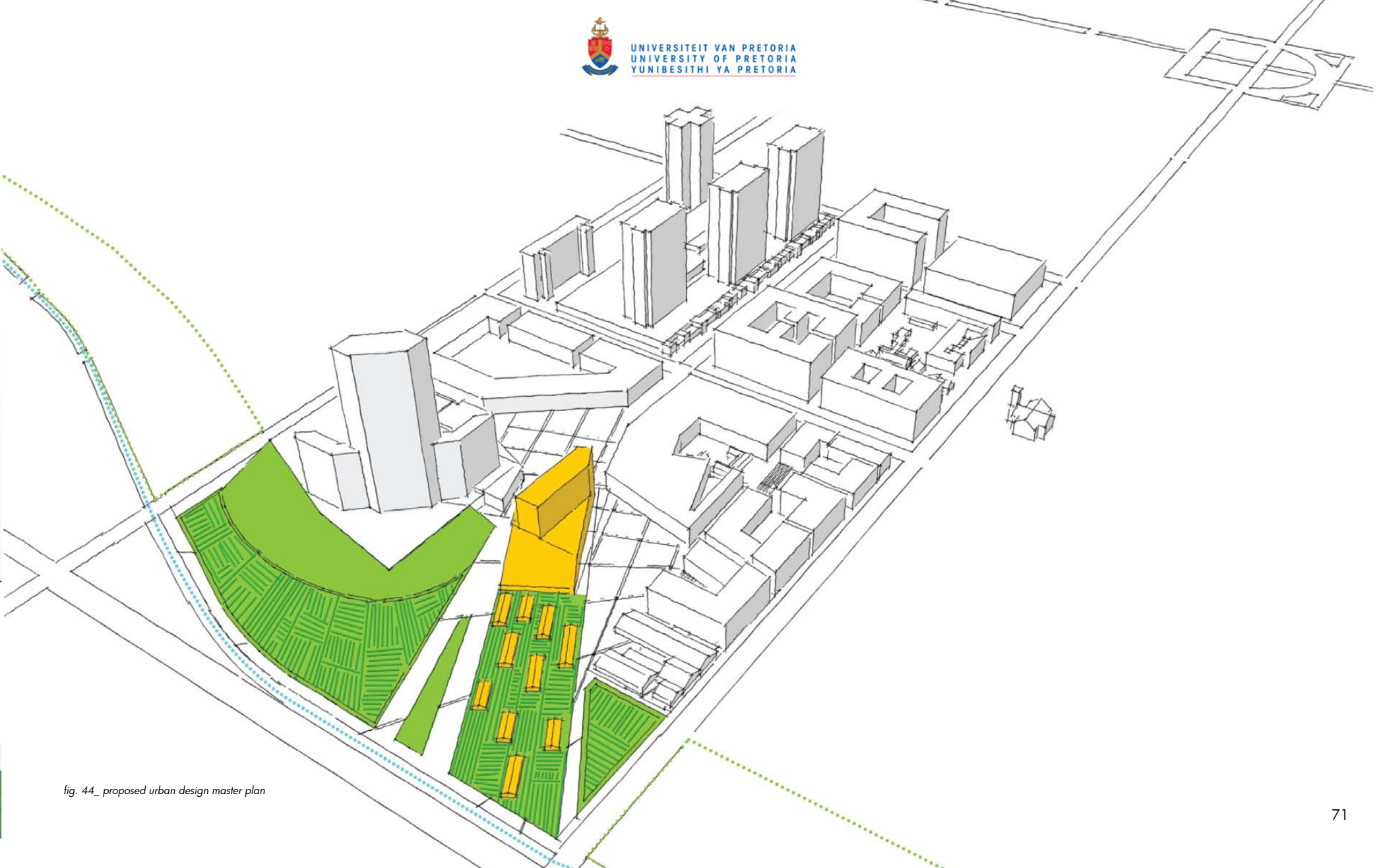


fig. 44_ proposed urban design master plan

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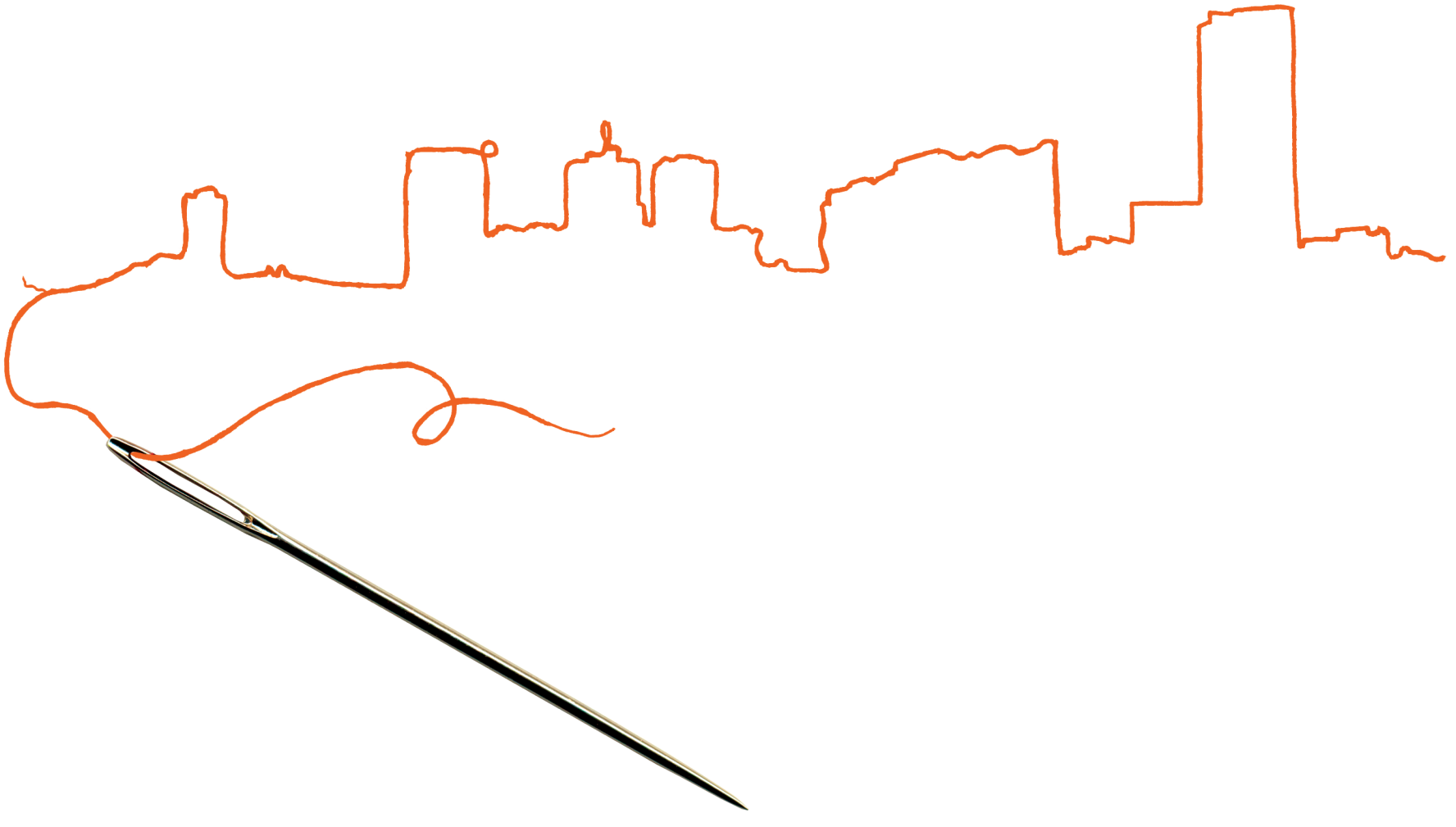

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urban design + mass development_03

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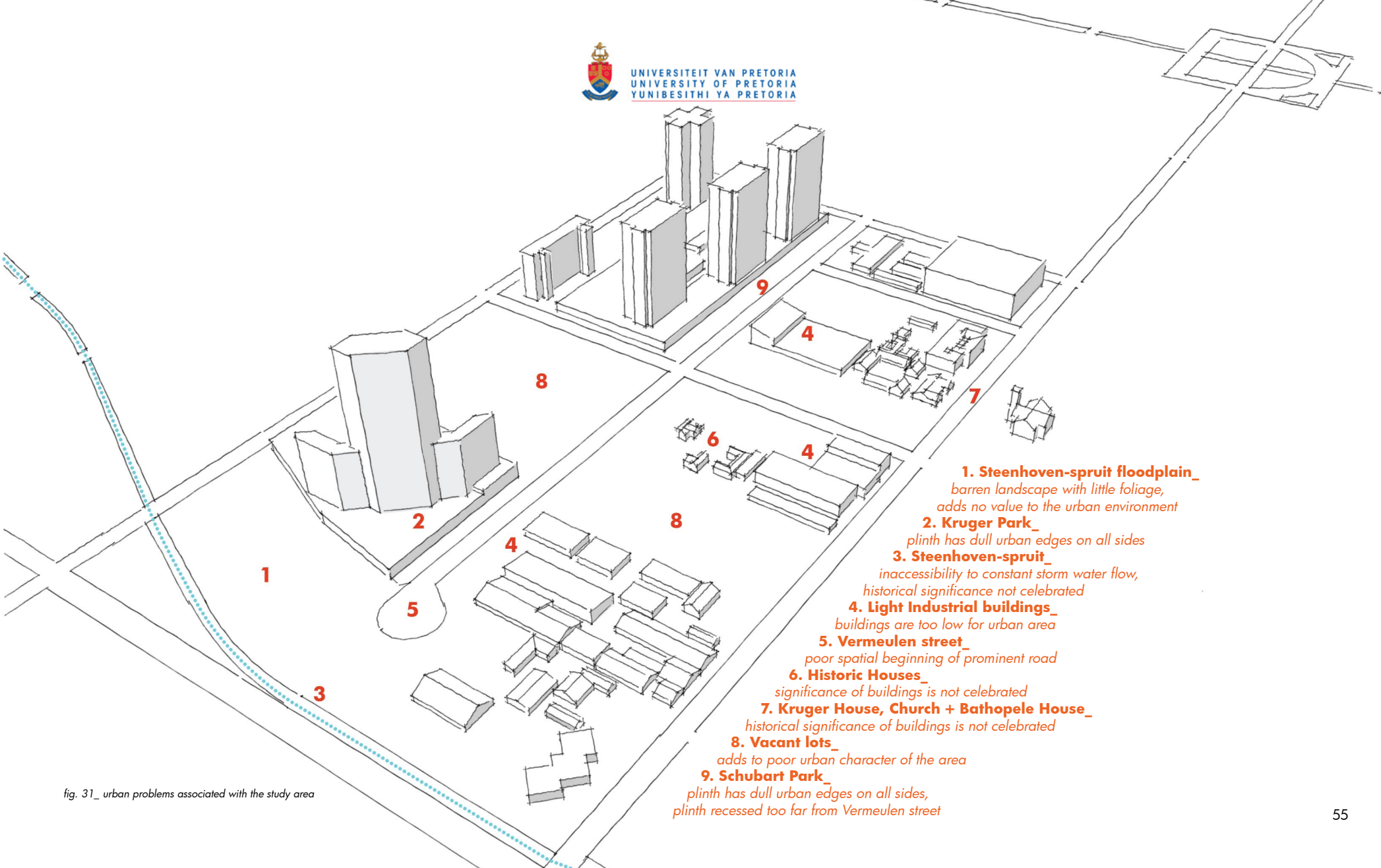

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These productive landscapes should connect to existing parks and open spaces, thereby creating a new green spine to the city. This new backbone will start to grow over the grid that was designed to accommodate the automobile and private transport, and rather start to serve the needs of pedestrian and cyclist.

The problem of the unsustainable city will not be solved by merely adjusting a few negative elements and adding a few positive ones to the current approach. Consideration as to how people live their everyday lives in cities needs to be investigated.

"A productive landscape will be a park, a place for agriculture, a green lung, a place for recreation and social interaction."

Viljoen (2005, p.11)

objectives_

The aim of the urban framework is to create a sustainable borough within the city limits that will act as a catalyst for future developments of a similar nature. The development must be seen as an admirable example of a sustainable approach for the future of the city.

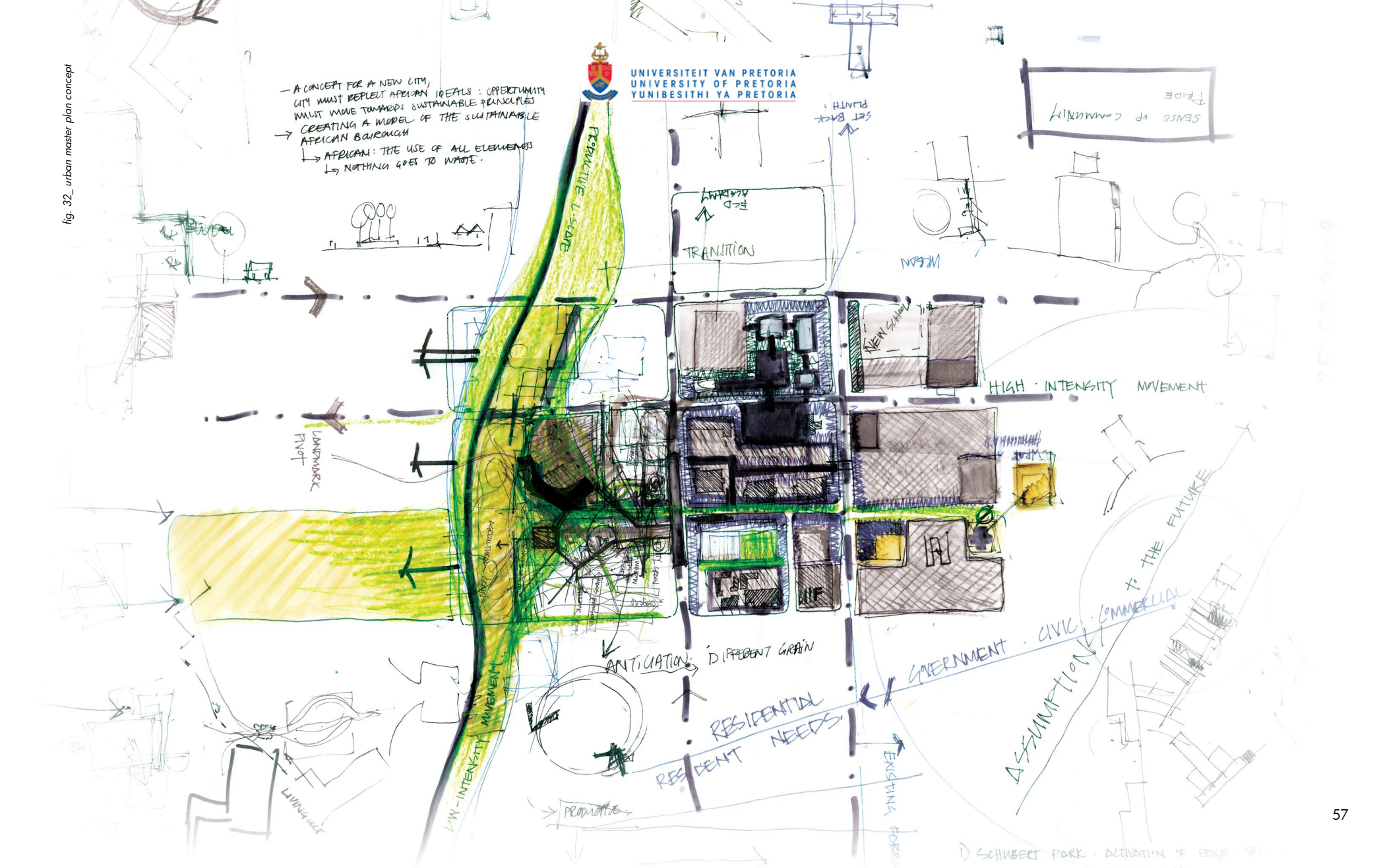


fig. 32_ urban master plan concept

The concept is about connecting dissociated elements that need to collaborate in order to contest the challenges our habitats face. Thus, it is about connection. The aim of the design is to stitch these elements firmly together.

The response will be
to **stitch_** people with agriculture,
to **stitch_** agriculture with the city and
to **stitch_** the city with its people.

aims_

_The framework should add sufficient density to the area

_The everyday needs of the inhabitants should be addressed

_The framework should allow for choice and opportunity for the inhabitants

_Existing natural and man-made urban elements must be incorporated

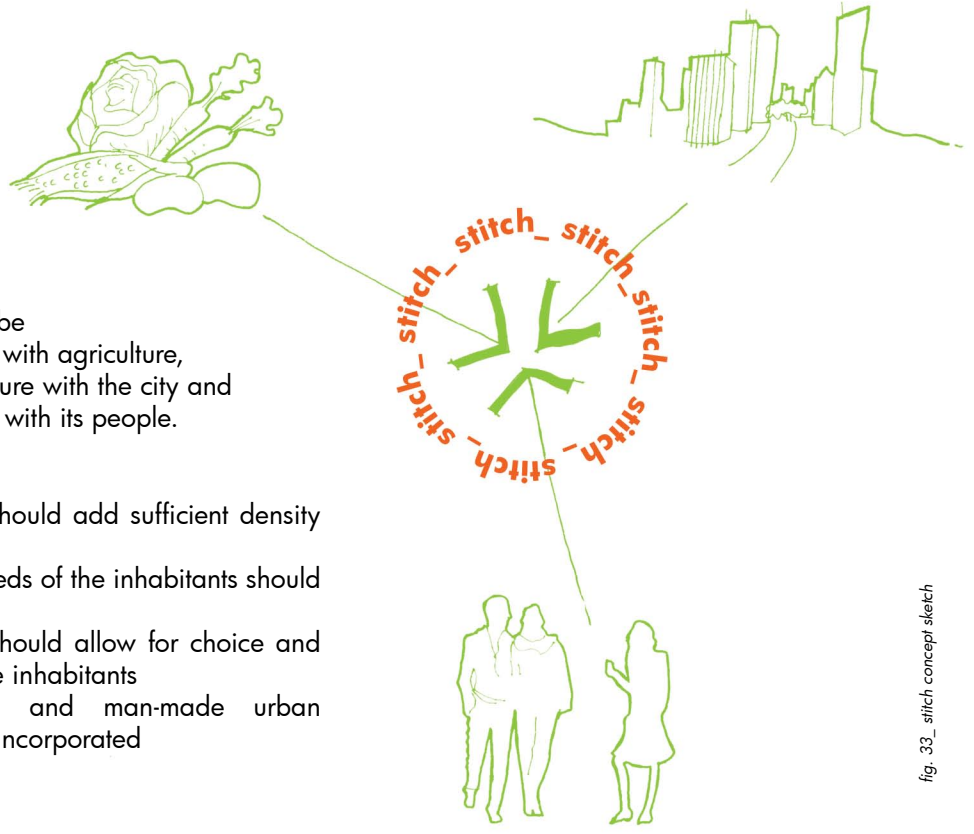


fig. 33_ stitch concept sketch

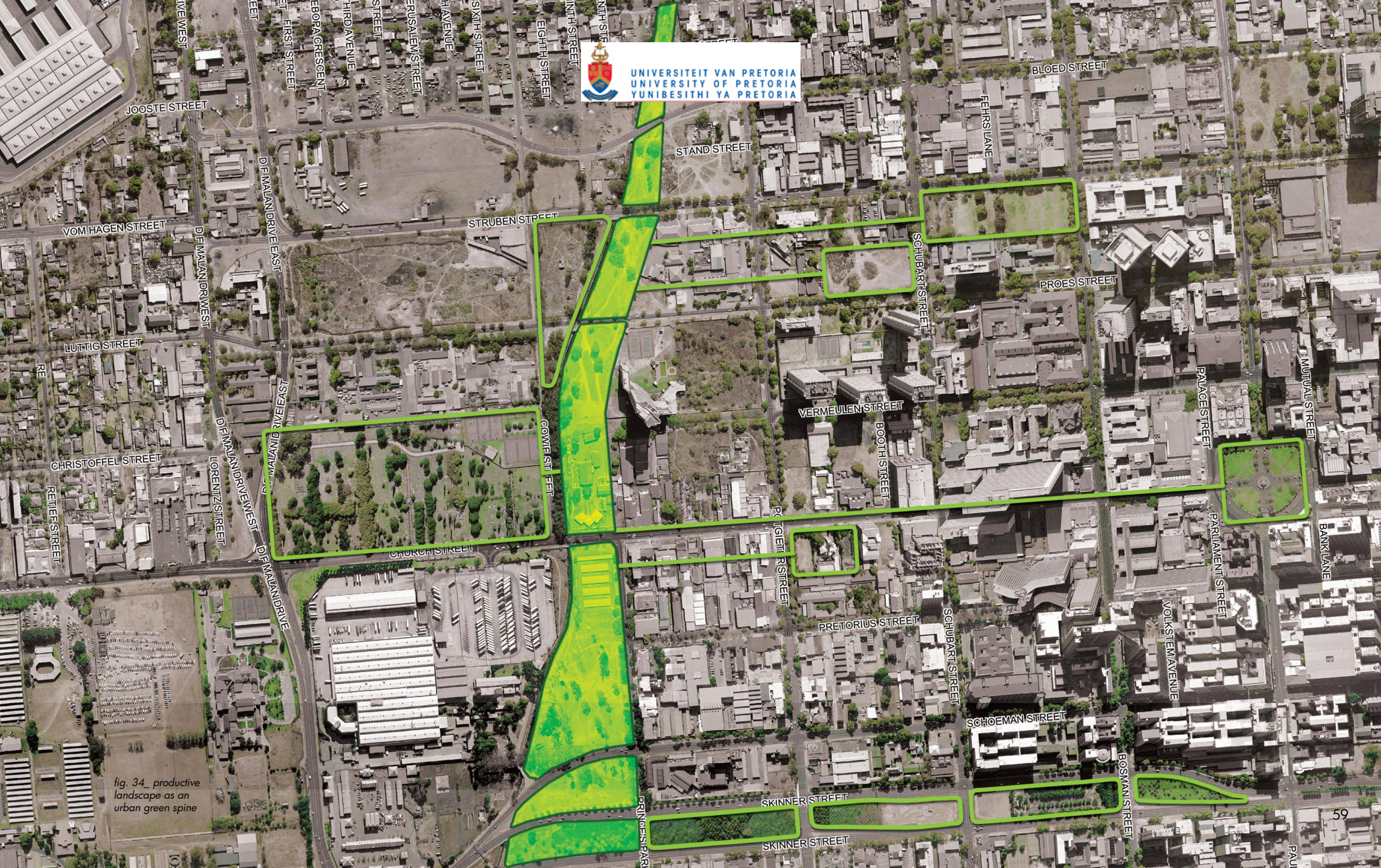


fig. 34_ productive landscape as an urban green spine

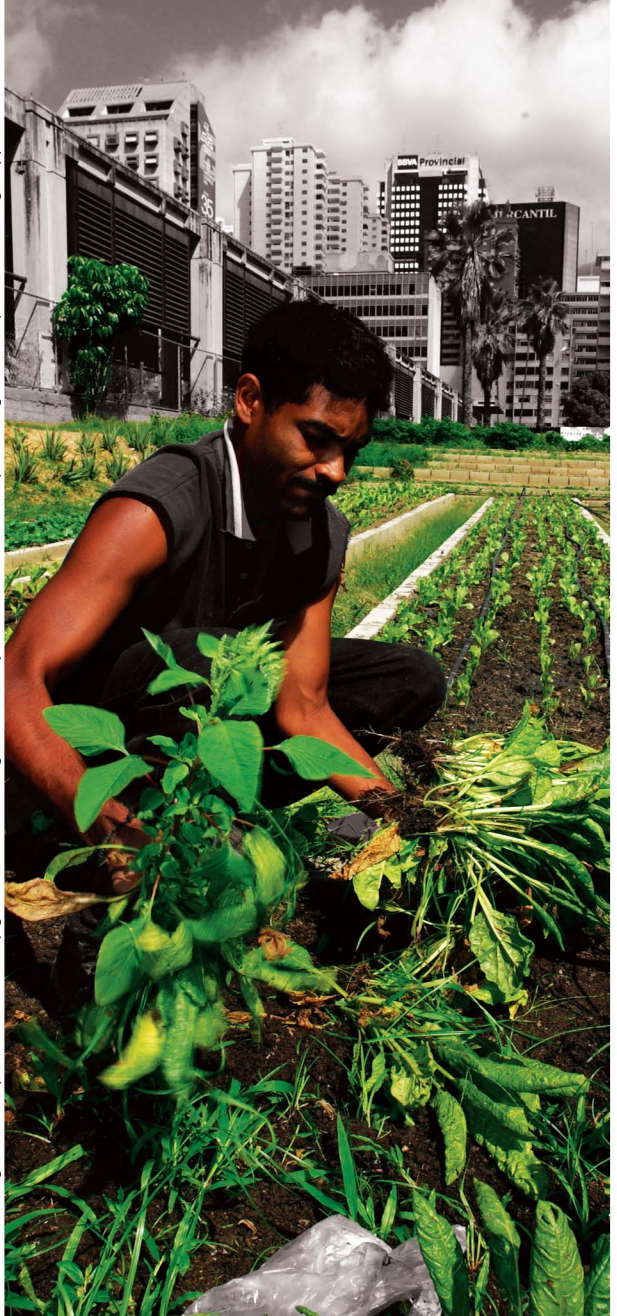


fig. 35_ a compost-based community garden in caracas. the garden is run by seven members, with no previous agricultural experience. © fao: guiseppe bizzarri

precedent study_
caracas, venezuela

According to the UN FAO (2009), the government of Venezuela supported by the UN FAO started urban agriculture in poor parts of Caracas in 2003. 4000 micro-gardens and 20 community gardens were launched in and around the city.

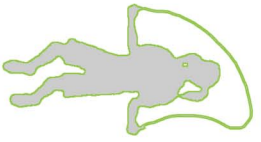
The UN FAO (2009) state that the green gardens, in contrast to the harsh city environments, have become an advertisement for the program by itself. Micro-gardeners are also passing on their skills to other members of the community. According to UN FAO (2009) the President of Venezuela wants to increase the amount of micro-gardens to 100 000, due to the success of the project since it was introduced.

micro-gardens_

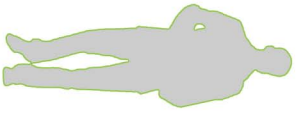
A 1sqm shallow wooden tray is filled with a planting medium, typically composed of rice-hulls and peanut shells. Micro-gardens are fed a nutrient-rich solution on a daily basis, to ensure adequate plant growth. A well maintained micro-garden can produce up to 18kg of tomatoes or 16kg of cabbage in multiple harvests, every year.

fig. 36_ gardeners tell their stories

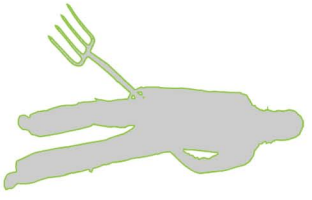
Ms Hernandez
"We have to go a long way down the hill to get fresh vegetables at the market. And they are expensive. With the micro-garden we have access to fresh vegetables for free every day."



Jessica Suárez, 11 years
"I have learnt how to manage the table and the vegetables, what vegetables can be grown, when to water and when to add the nutrient solution, when I have learnt enough I will do a micro-garden at home with my parents."



Mr Michelena, agronomist
"Sometimes people try gardening once and don't continue. We try to take the table back and give it to someone who is doing well, as a reward."



Ms Verenzuela
"I didn't know anything about vegetables and how important they are for your health, now I eat vegetables every day."

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

fig. 37_ supervisors make weekly rounds to micro-gardeners to monitor progress. © fao: guiseppe bizzarri

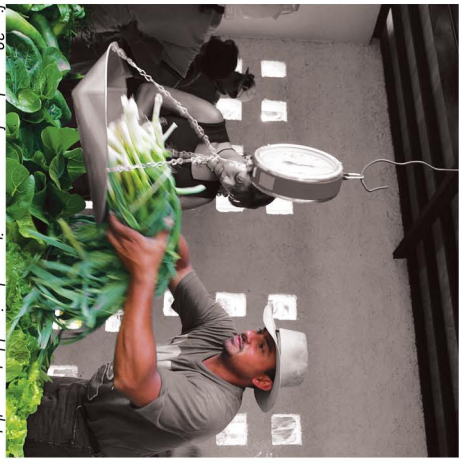


fig. 38_ produce from a community garden is sold at an outlet next to the garden. © fao: guiseppe bizzarri

interventions and opportunities_

1_ Development of Steenhoven-spruit floodplain into a productive landscape, forming a part of the Urban Green Spine.
2_ Development of a landscape intervention that will tie the plinth of Kruger Park with the productive landscape.
3_ Development of an esplanade next to Steenhoven-spruit to form a North-South path.
4_ Densification of the area by replacing existing low-rise buildings with mixed use buildings of an appropriate urban scale.
5_ Development of a new civic square that will play host to the origin of Vermeulen Street.
6_ Development of Vermeulen Street into a promenade.
7_ The connection between the city and the productive landscape should be carefully considered.
8_ Addition of active urban edges to the plinth of Schubart Park.
9_ Unused parking lots can be shared by new buildings in the vicinity.
10_ Location of public orientated buildings that surround the proposed civic square.
11_ Establish prominent connection with Heroes Acre.
12_ Establish connection with 'decumanus' axis and Steenhoven-spruit crossing.

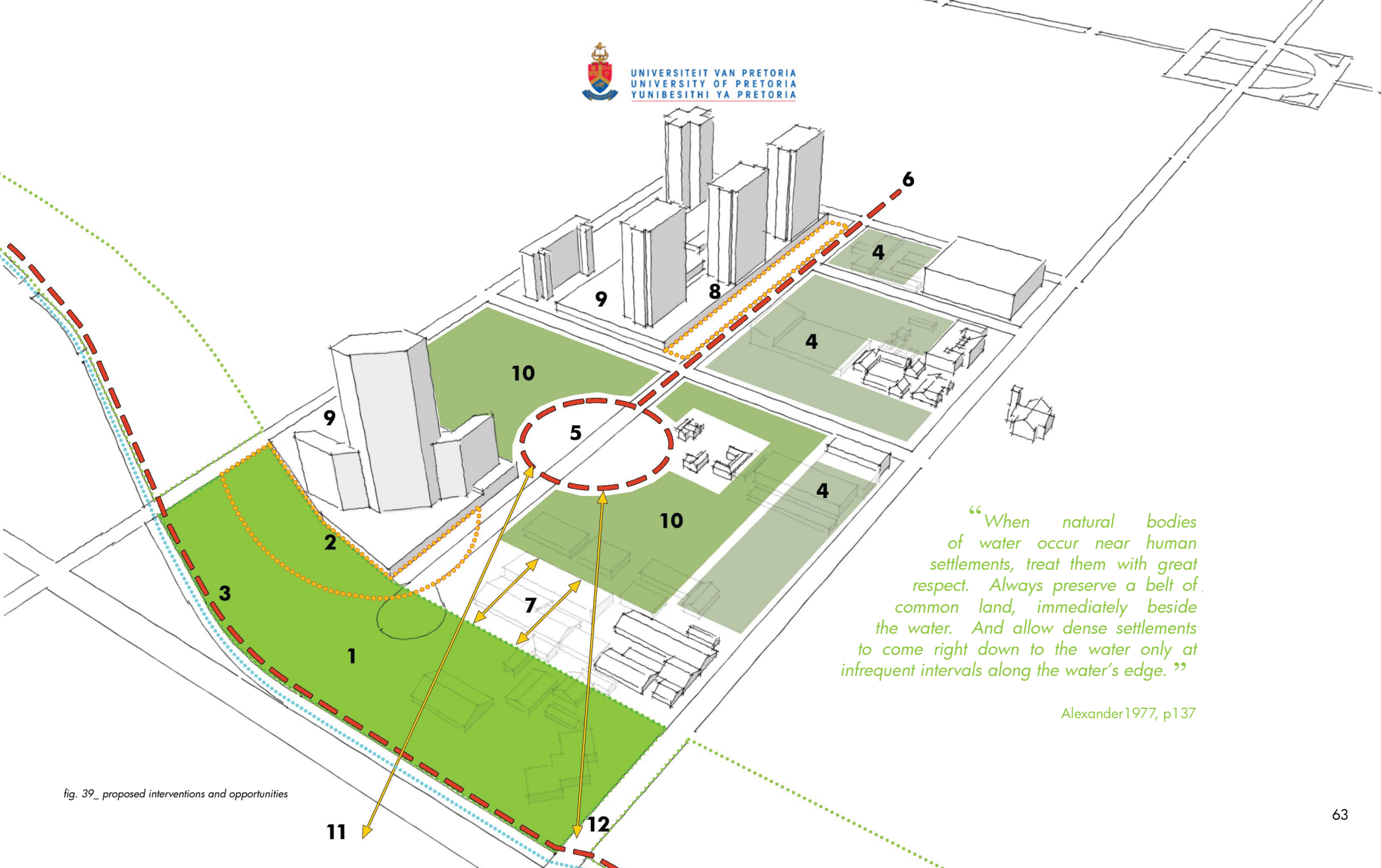


fig. 39_ proposed interventions and opportunities

"When natural bodies of water occur near human settlements, treat them with great respect. Always preserve a belt of common land, immediately beside the water. And allow dense settlements to come right down to the water only at infrequent intervals along the water's edge."

Alexander1977, p137

urban design development_

1_ Development of the Urban Green Spine.
2_ Landscape intervention: Addition of berm to Kruger Park plinth.
3_ Proposed new mixed-use building footprints.
4_ Multi-purpose civic square.
5_ Site for proposed new Agricultural Research Facility.
6_ Site for proposed new Market.
7_ Site for proposed new Taxi Stop.
8_ Market square as umbilical cord between Agricultural Research Facility and Market.
9_ Proposed Community Gardening Lots.
10_ Proposed Active edge: Strip of retail and commercial 'box structures' that will allow informal traders to establish stalls in between.
11_ Proposed Active edge: Retail strip to wrap around plinth of Kruger Park.
12_ Connection between Agricultural Research Facility and Urban Green Spine.

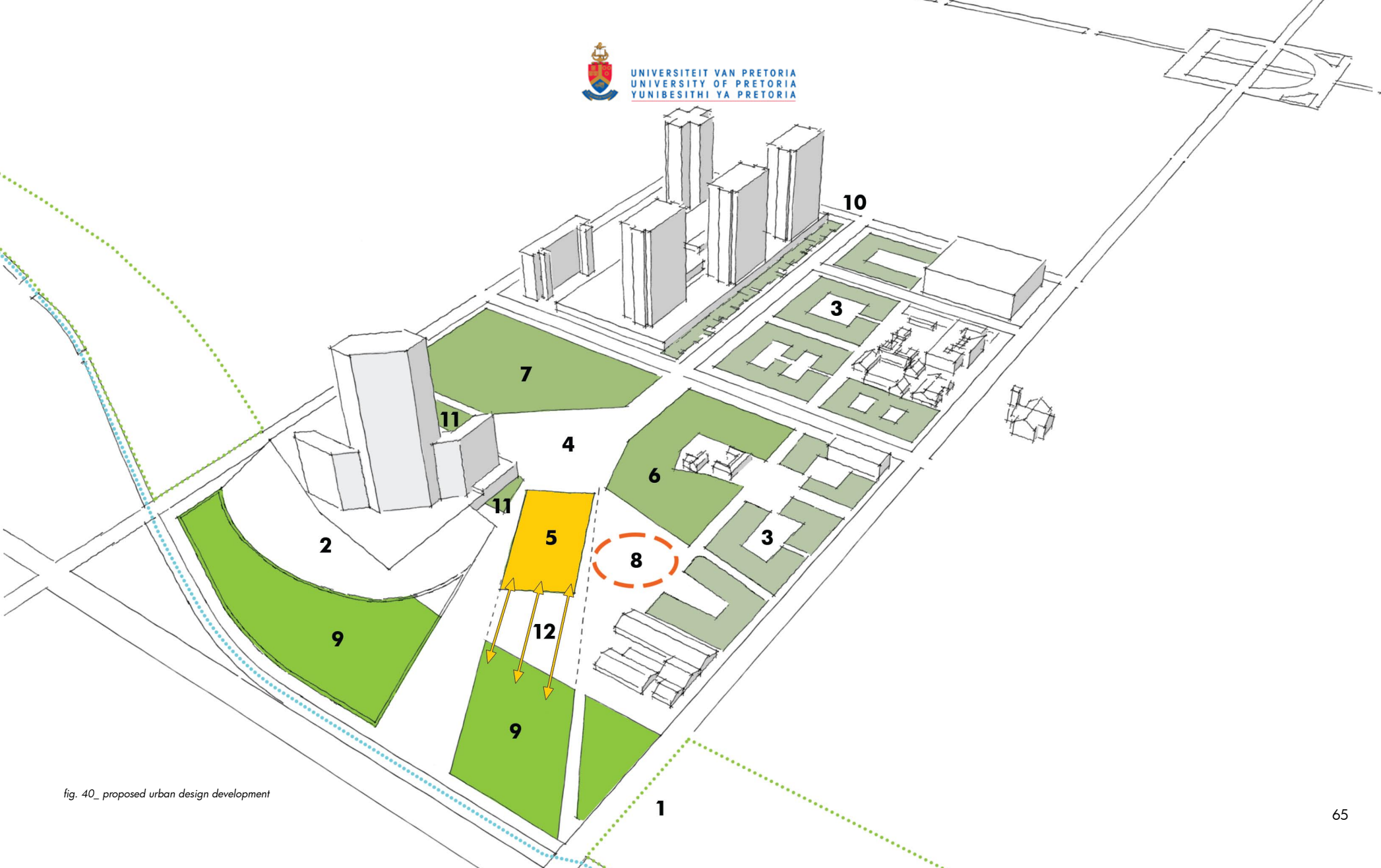


fig. 40_ proposed urban design development

"Landmarks: the observer does not enter within them, they are external. They are usually a rather simply defined physical object: building, sign, store, or mountain."

Lynch
(1975:48)

scale_

Proposed building heights are planned to be of a good urban scale, but not to contest or match that of Kruger Park or Schubart Park.

1_ Urban Green Spine.
2_ Mixed-use buildings at various heights between 5 to 10 storeys.
3_ Storm water catchment channels become a legible paving pattern over all the connecting public spaces.
4_ Community Gardening Lots.
5_ Agricultural Research Facility vegetable garden.
6_ Development of a pedestrian boulevard with Play Park.
7_ Civic buildings all developed with same plinth height and active edges.

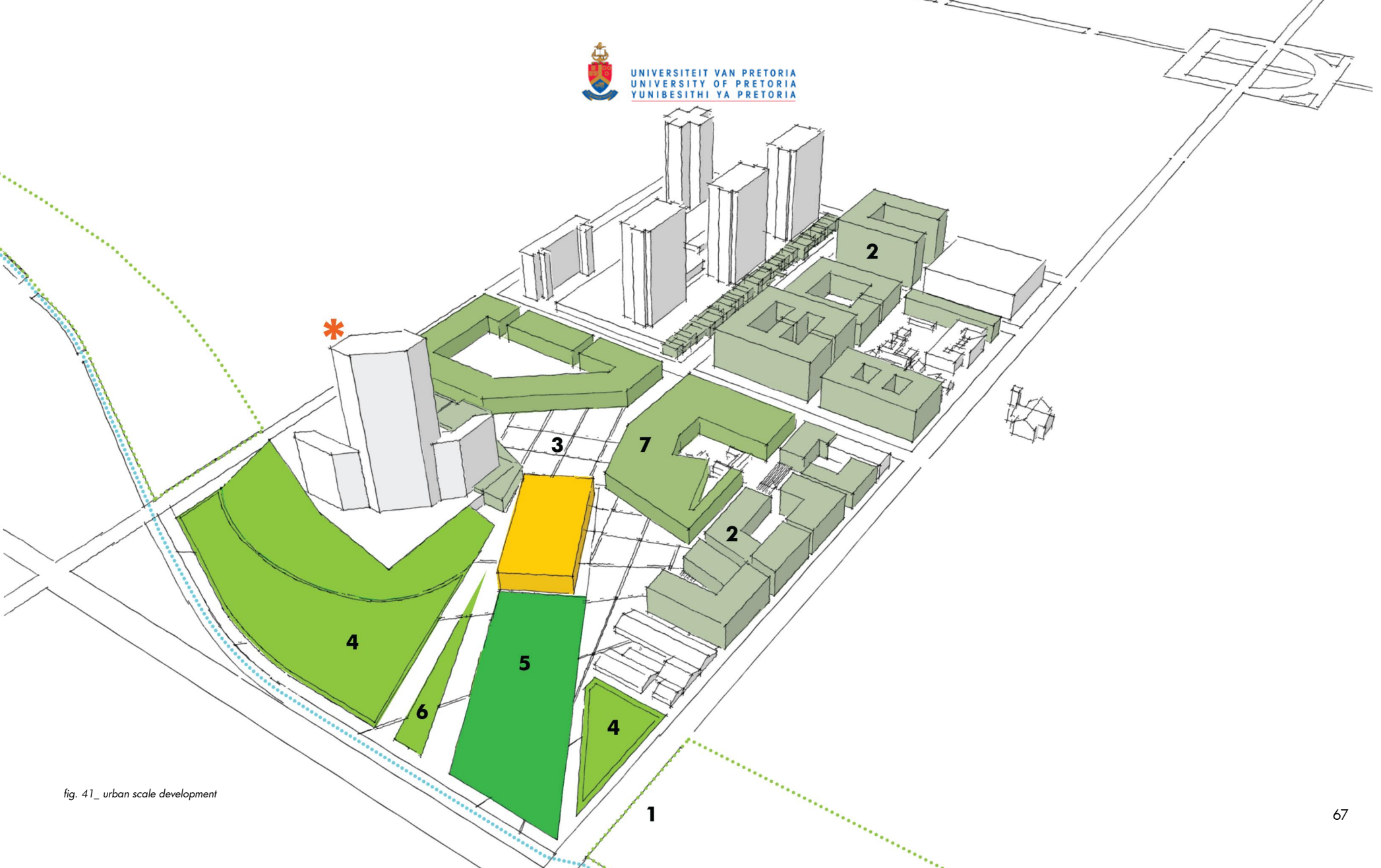
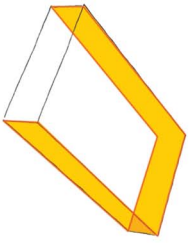


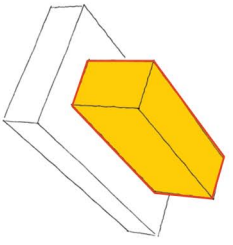
fig. 41_ urban scale development

mass development_



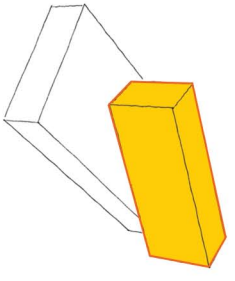
edges_

PLINTH WITH ACTIVE URBAN EDGES
PLINTH DEFINES AND FRAMES URBAN SPACES



tower_

ADDITIONAL FLOOR AREA DEVELOPED
AS A SLENDER TOWER



turn_

TOWER TURNED FOR NORTH-SOUTH
ORIENTATION
TOWER MOVED TOWARDS CIVIC SQUARE

slope_
WESTERN PART OF PLINTH DEVELOPED INTO GREENHOUSE
_ TO CONNECT WITH GREEN SPINE
_ TRANSITION BETWEEN URBAN
_ AND LANDSCAPE
_ LEAST AFFECTED BY SHADOWS OF
_ KRUGER PARK

extend_
ADITIONAL GREEN HOUSE AND PLANTING SPACE NEEDED

stitch_
GREENHOUSE DISINTEGRATES INTO SMALLER, TEMPORARY GREENHOUSES, STITCHING THE BUILDING INTO THE LANDSCAPE.
GREENHOUSE EXTENDS TO A ROOF GREENHOUSE

fig. 42_ building mass development

fig. 43_ perspective drawing of proposed facility mass in the landscape

"...buildings are related to their environment by resting on the ground and rising towards the sky."

Norberg-Schulz
(1980, p10)

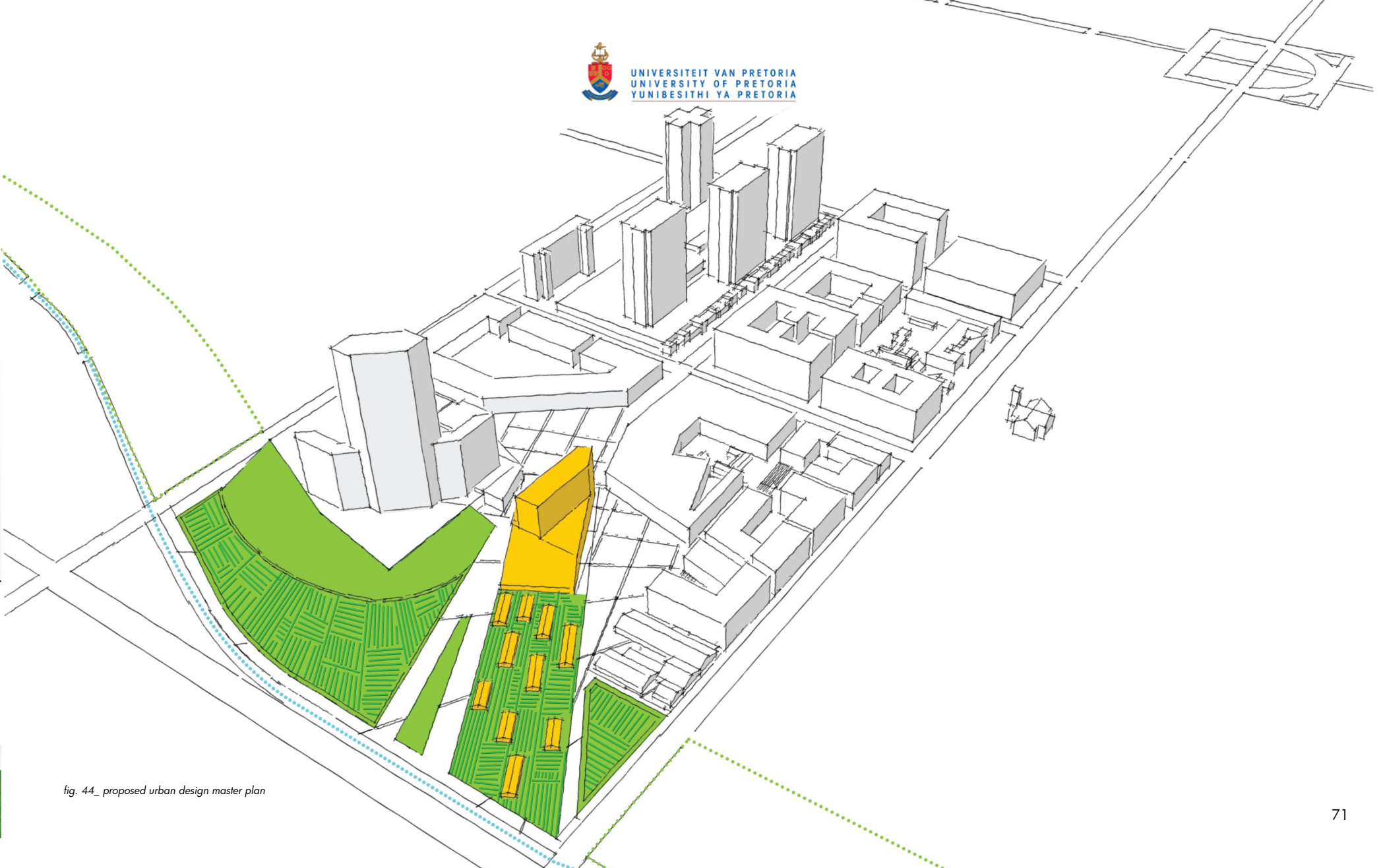


fig. 44_ proposed urban design master plan

fig. 77_ exterior photograph of a typical courthouse and corresponding section

material precedent_

Law Courts
Bordeaux, France
1998
Rogers Stirk Harbour + Partners
_red cedar timber was used to clad the soft shape of the courtrooms

materials + technical development_05

fig. 78_ bamboo strip floor in a public facility

fig. 79_ texture of a laminated bamboo panel

fig. 80_ texture of a bamboo strip floor

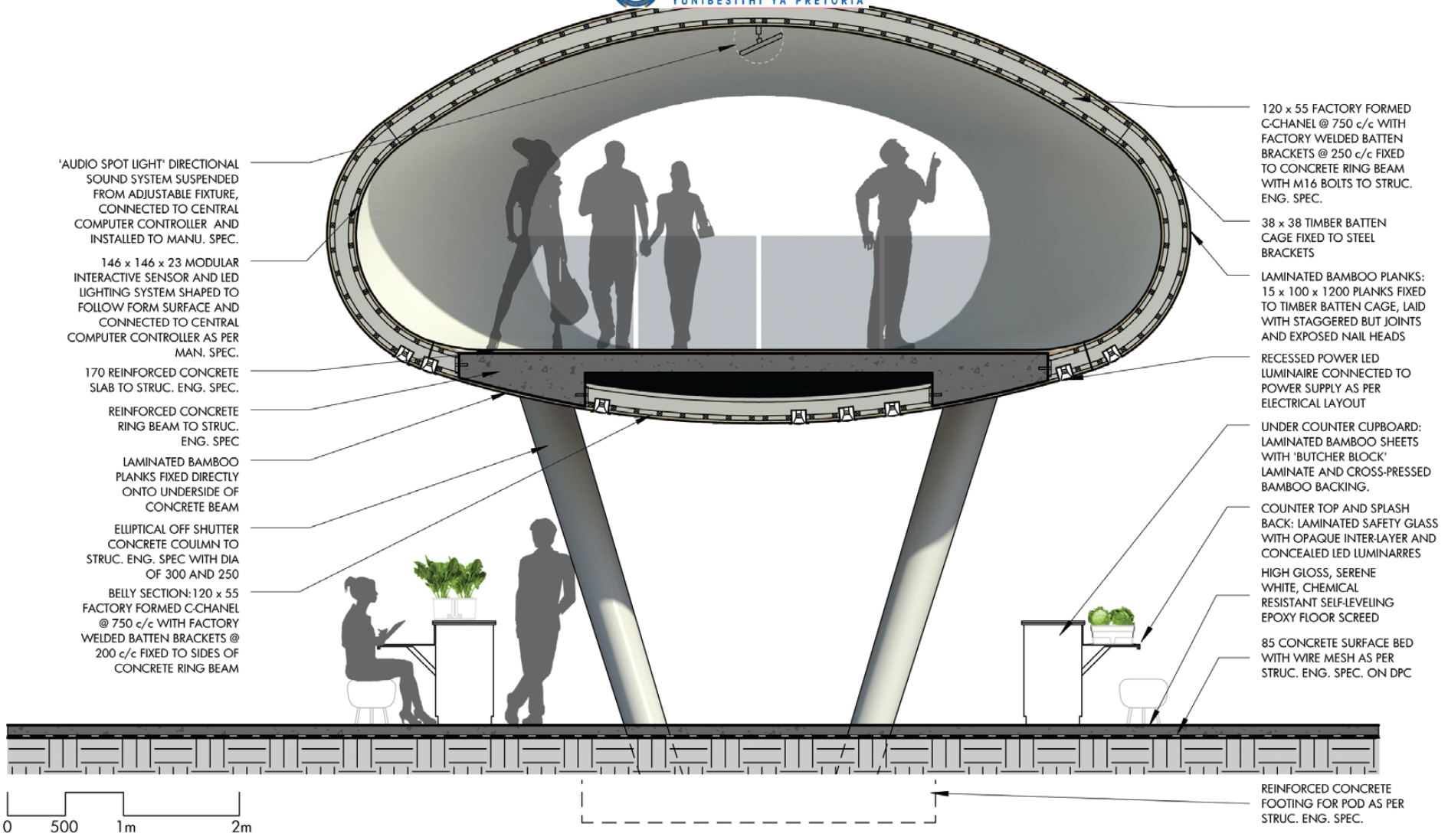
bamboo_

Bamboo is chosen for its versatility, strength, sustainable characteristics and fire retardation after treatment. Bamboo is used in the facility as flooring, ceiling panels and to clad the metaphorical seeds. For each application a different specification of bamboo is used.

floors_ Laminated bamboo strips measuring 197 x 25 x 30 are bundled and taped together to form various length strips. The bundles are glued directly onto the concrete screed using a low volatile organic compound (VOC) adhesive. After the glue has set, the tape is sanded off, creating a varied pattern.

ceilings_ Bamboo ceiling panels consist of 5 veneer layers pressed together. Ceiling panels are laid out in a staggered pattern with the grain. Panels are fixed to the manufacturer's clip-in aluminum track system and suspended from above.

seeds_ Un-carbonized solid laminated bamboo boards are fixed to a timber cage frame in a staggered pattern with exposed screws. The grain of the boards and staggered pattern are aligned over the length of the seed on the inner and outer skins.



section_ exhibition pod_

fig. 81_ uppsala konsert & kongress, uppsala, sweden

fig. 82_ lawyers office, stockholm, sweden

fig. 83_ planted wall from green fortune

bio-wall_

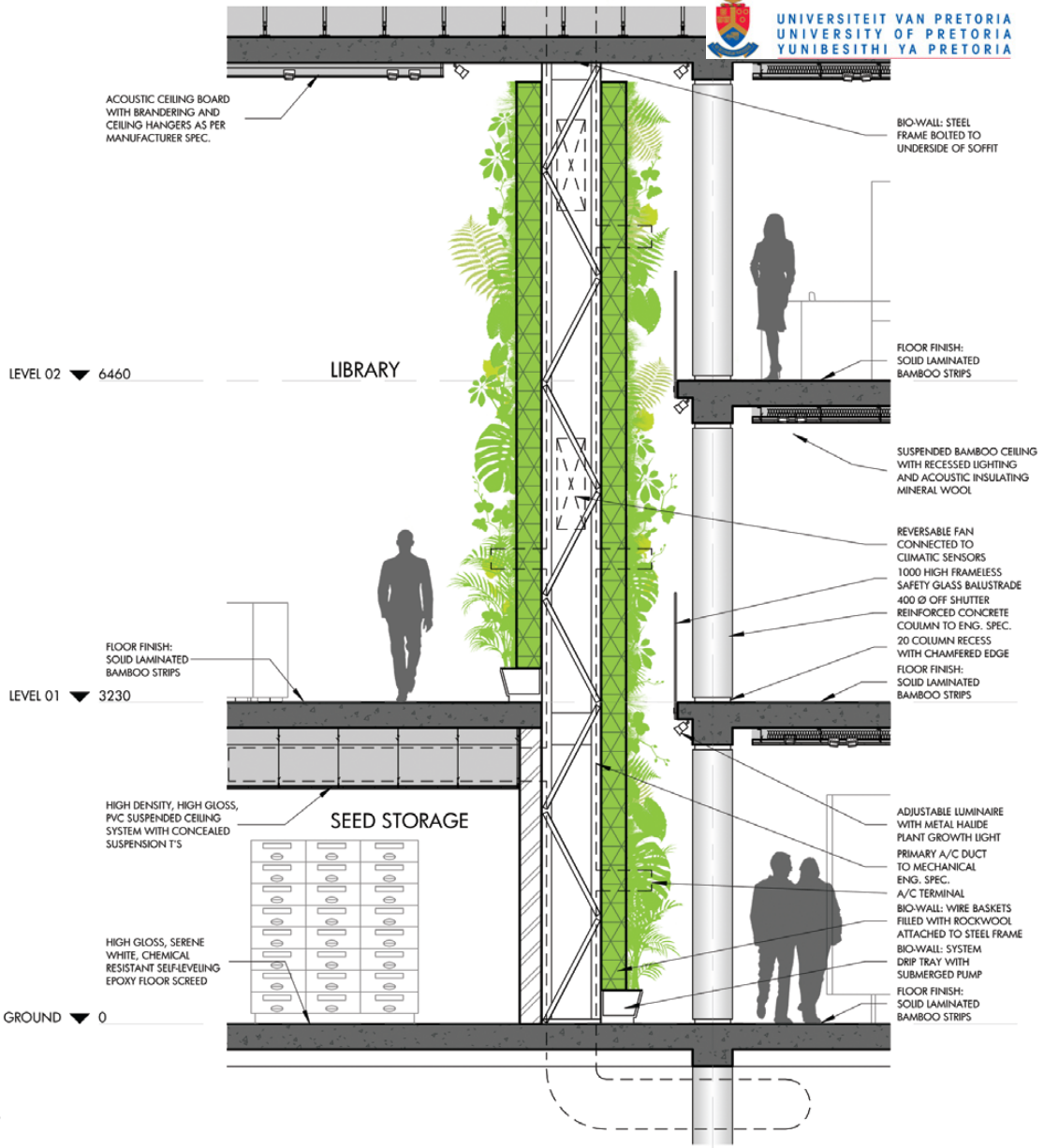
A planted wall or 'bio-wall' is chosen to separate the public zones (exhibition spaces and farmer support) and the semi-private zones (library and canteen) from one another in the building. The wall is chosen for its positive material properties and the symbolical link to plants and nature associated with the building program.

According to The Clean Air Partnership (CAP) (2009) a planted wall acts as a bio-filter, breaking down harmful chemicals found in the air. Microbes living on the plant roots can effectively break down indoor air pollutants such as formaldehyde, toluene, and benzine when air is circulated over the plant roots. CAP (2009) states that the system works most efficiently when integrated with the air conditioning system, which helps to circulate air over the plant roots. An integrated air conditioning and bio-wall system can significantly reduce energy usage of the air conditioning system, since fresh air is partially generated inside the building. Apart from the physical properties, a bio-wall will have positive psychological effects on the occupants, since indoor plants can significantly reduce absenteeism and increase productivity. (CAP, 2009)

Apart from the bio-wall's passive contributions, it will also actively contribute to energy savings for the air conditioning system. In summer, cool air from the Southern plinth (library and canteen areas) will be circulated through the bio-wall to the Northern plinth (exhibition spaces and farmer support). In winter the system will be reversed, pumping warmer air from the Northern plinth to the Southern plinth, to help maintain indoor temperature between 21-24 degrees centigrade.

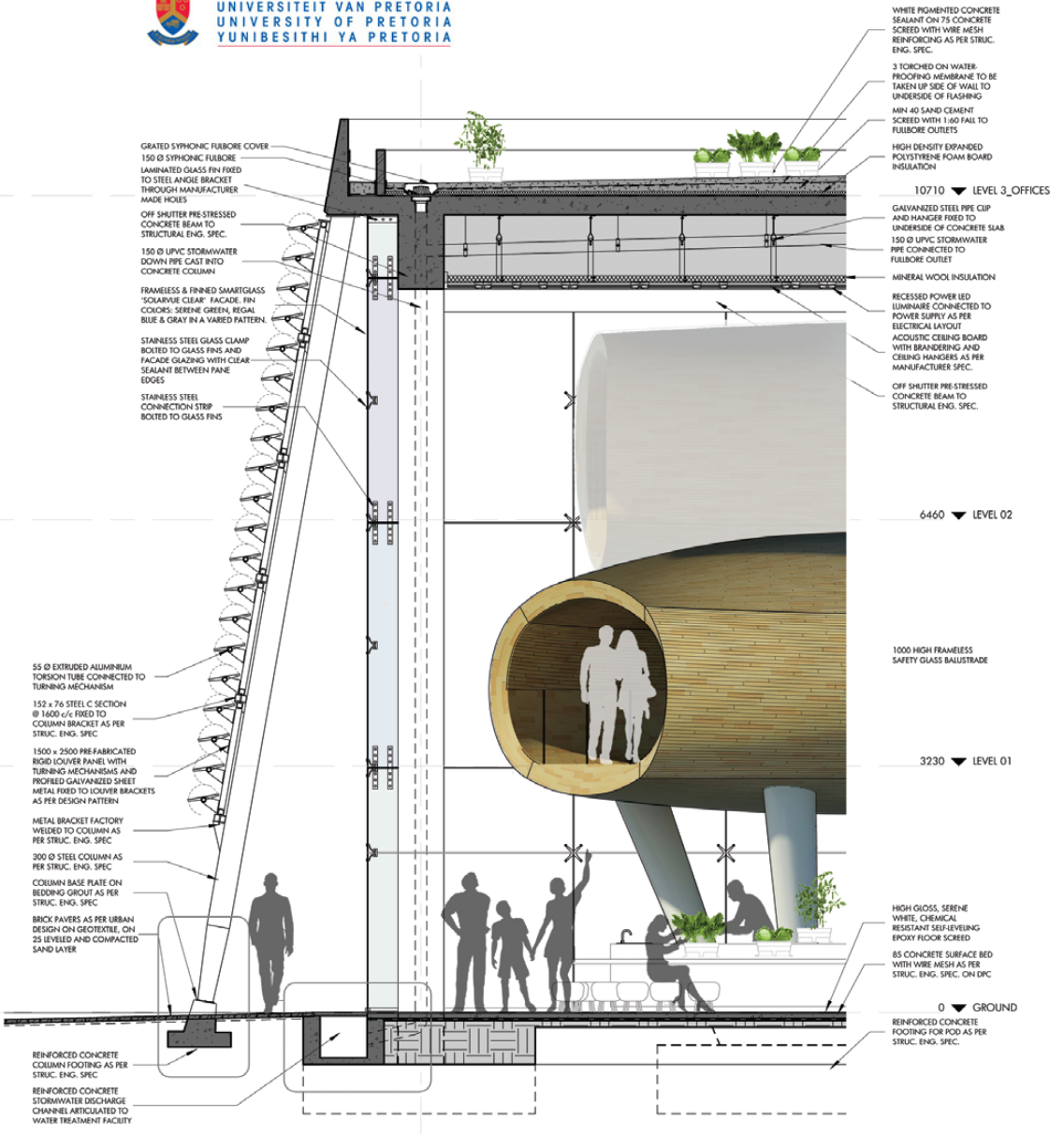
Typical plants include_ orchids, spider plants, cordyline, verigated ficus and schleferas.

fig. 84_ concept sketch of the bio-wall, as seen from the library



0 500 1m 2m

section_ bio-wall



0 500 1m 2m

section_ plinth façade

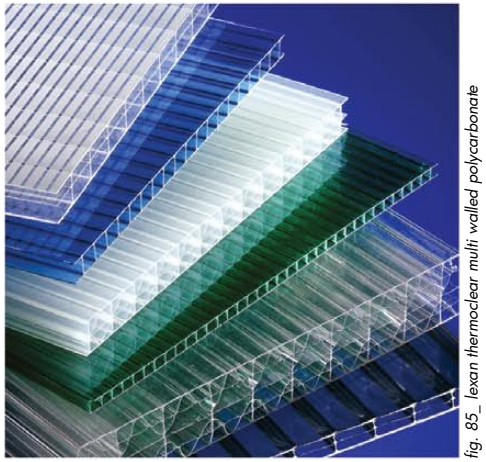


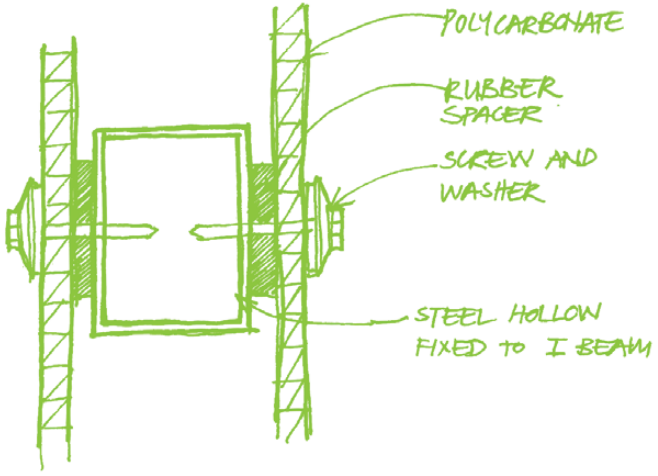
fig. 85_ lexan thermoclear multi walled polycarbonate

polycarbonate_

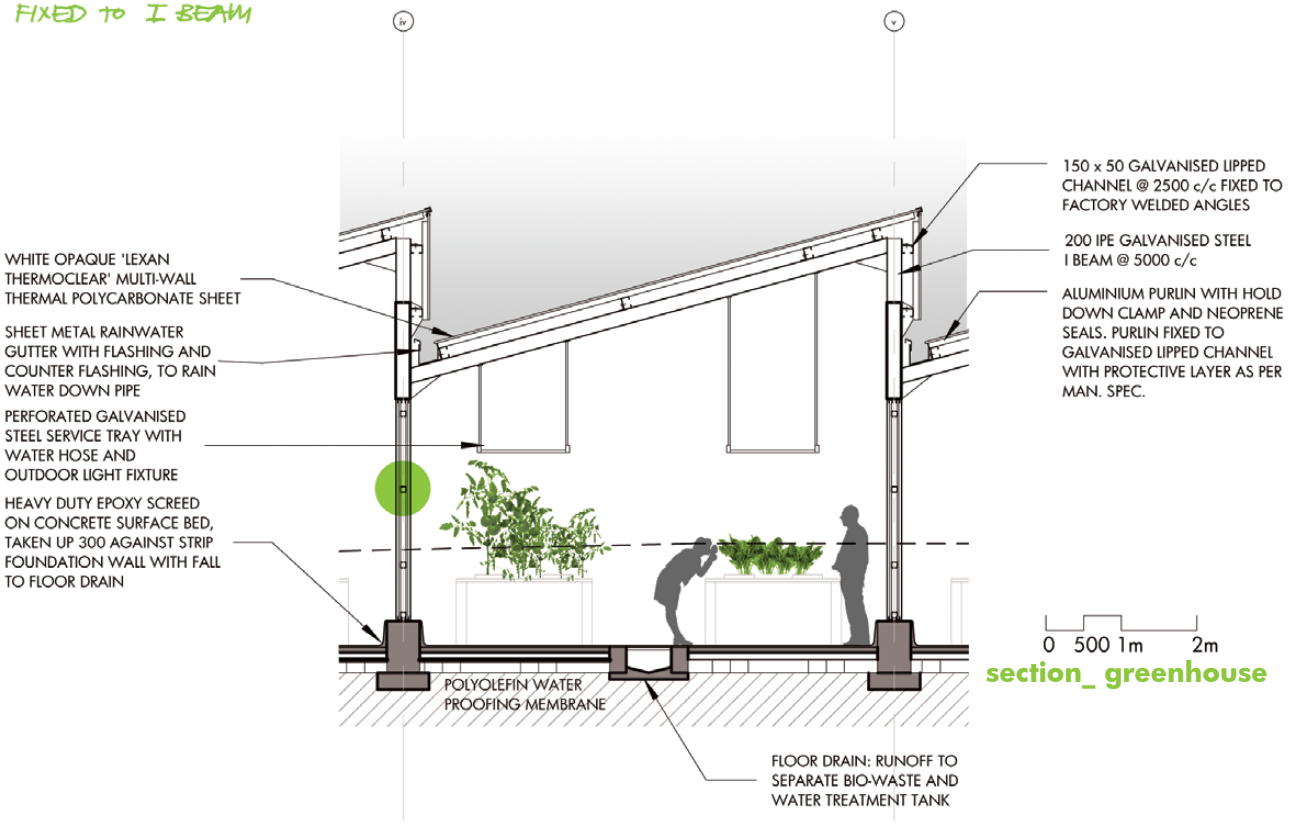
According to Greenhouse Product News (GPN) (2009), there are three types of covering materials for greenhouses. **1.** Thin films, typically polyethylene or EVA (ethylene vinyl acetate). Thin films are the least expensive to install, has good thermal and solar protection values for plants, but needs to be replaced after 4-6 years. **2.** Flexible plastics, typically polycarbonate or acrylic composites. Cellular polycarbonate panels are less expensive than glass, weigh less, and are virtually unbreakable. Modern polycarbonate has a UV-resistant film that prevents the panel from discoloration and becoming brittle, with most manufacturers extending a 10 to 20 year warranty. Most types of polycarbonate can be recycled. **3.** Rigid glazing materials such as glass. Glass has the highest light-transmission value of the materials and has the longest life-span, although laminated glass types resistant to hail and impact are expensive.

A five-walled, opaque polycarbonate is chosen as primary cladding material for the greenhouse, based on its superior strength, good light transmission, insulation properties and because it is lightweight. The polycarbonate panel also has an internal layer that prevents the formation of condensation droplets. Panels are 1200 x 5800 x 25 in size.

The greenhouse will be primarily constructed out of a galvanized steel frame, with aluminum fixings as part of the polycarbonate patented system. To prevent a reaction between the two metals (although chances are small, it will be hot and humid in the greenhouse) the aluminum fixings will be separated from direct contact with the steel by a 5mm rubber strip as part of the polycarbonate fixing system.



DOUBLE GLAZING PARTITION.



section_ greenhouse

glass_

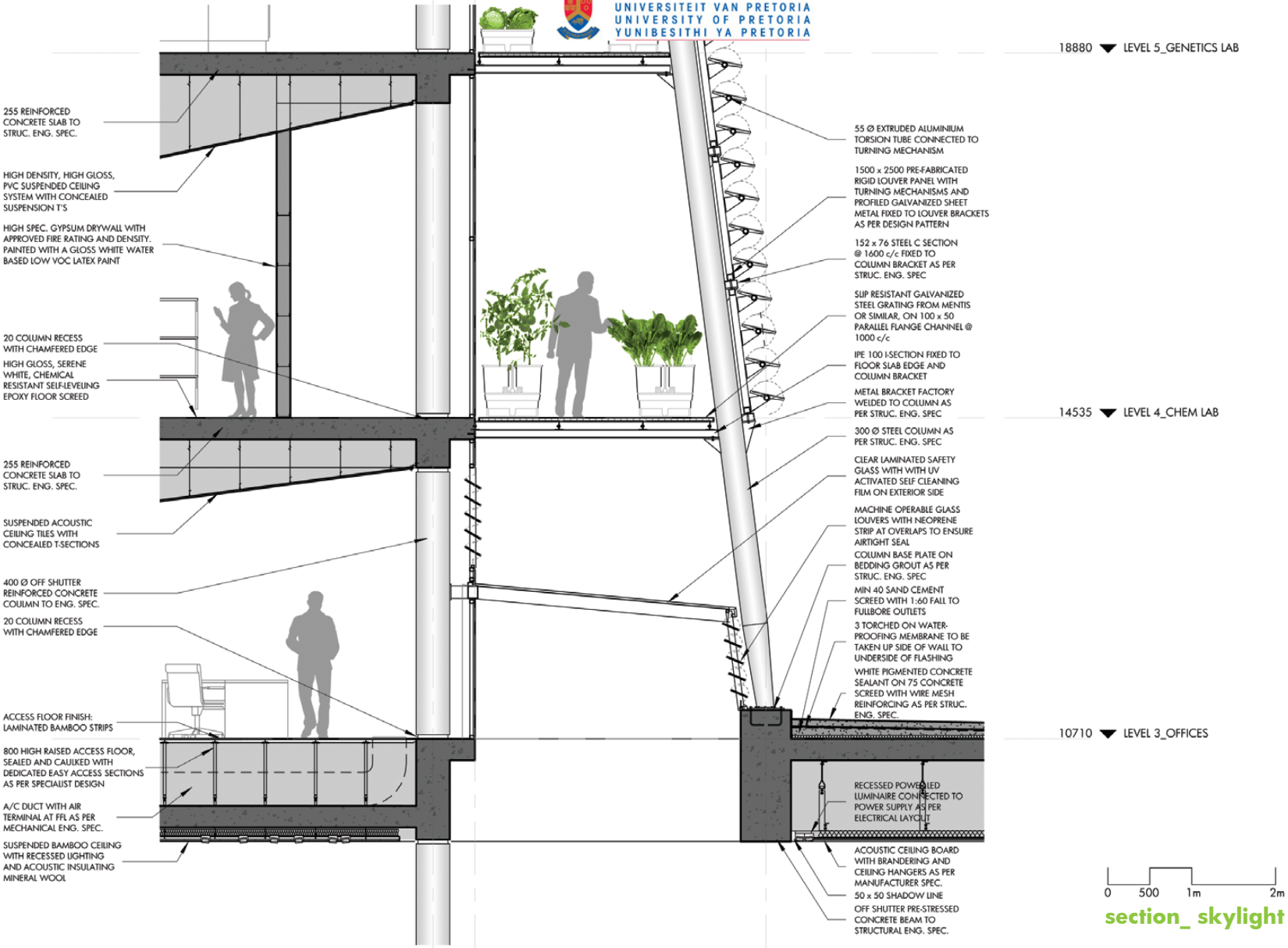
One of the primary objectives of the design is to allow as much possible natural light into the building, but without solar heat gain.

According to Patrick Köhler, from Spoormaker & Partners mechanical and electrical consulting engineers, the most effective design option is to use clear laminated glass in combination with external shading devices. Although high performance glazing types can effectively lessen solar heat gain, the glazing itself absorbs much of the heat and radiates this heat as infrared into the building. This will put negative strain on the facility's air handling system in summer, and will prevent controlled solar heat gain in winter.

Thus, an appropriate glazing type for the facility would be a clear laminate, as the facility has an adjustable external shading system. A suitable clear laminated glass is Coolvue from Smart Glass. According to the manufacturer Coolvue clear will transmit 70% of visible light into the building whilst only absorbing 37% of the solar energy.

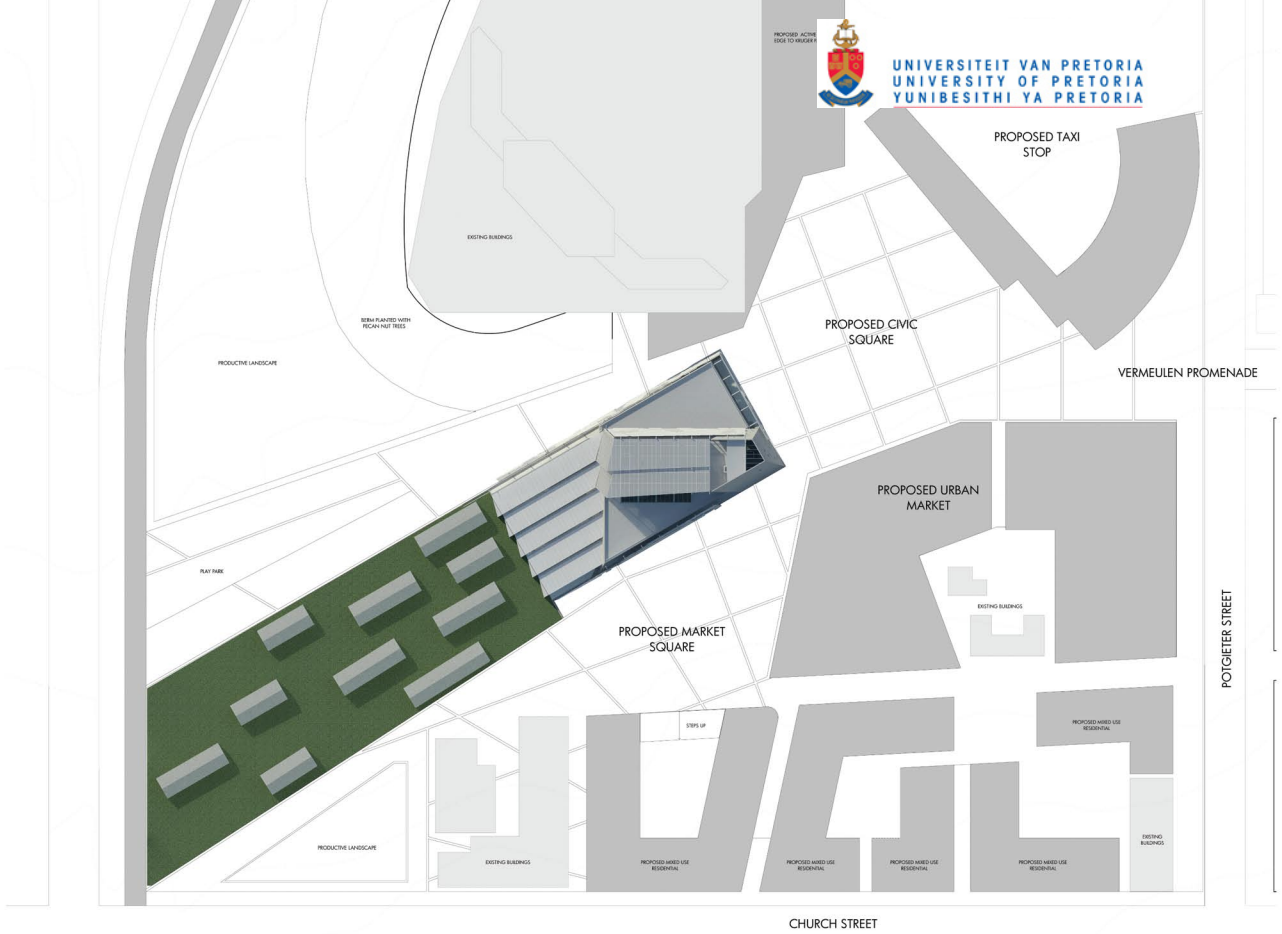
construction_

Glazing on the lower, public levels of the building will be of a frameless system. The aim is to limit the divide between the external urban spaces and the ground floor of the exhibition space. The public area inside the facility should appear to be an extension of the surrounding urban spaces. The frameless system will consist of stainless steel spider clamps and colored glass fins in a varying pattern.

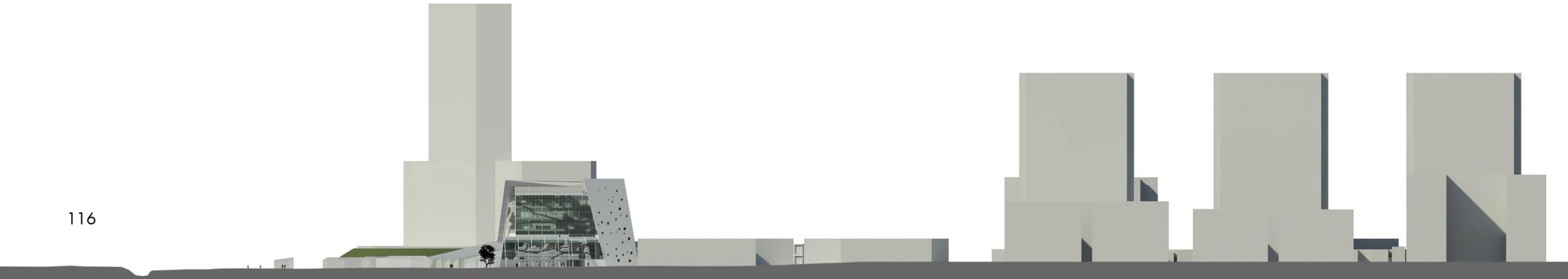


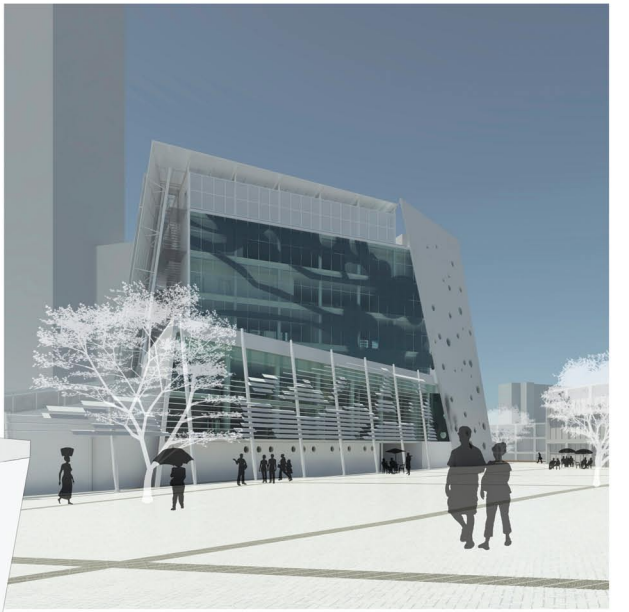
section_ skylight

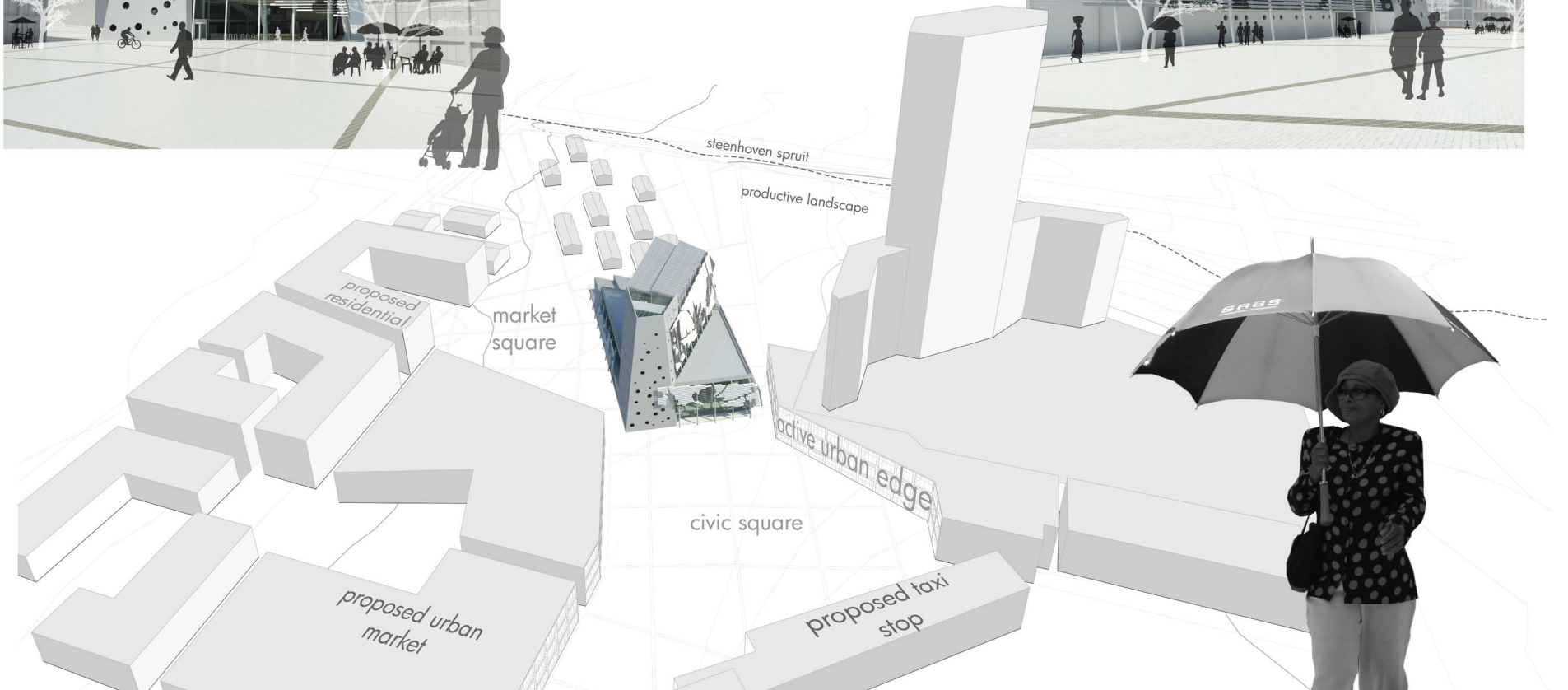
drawings_06

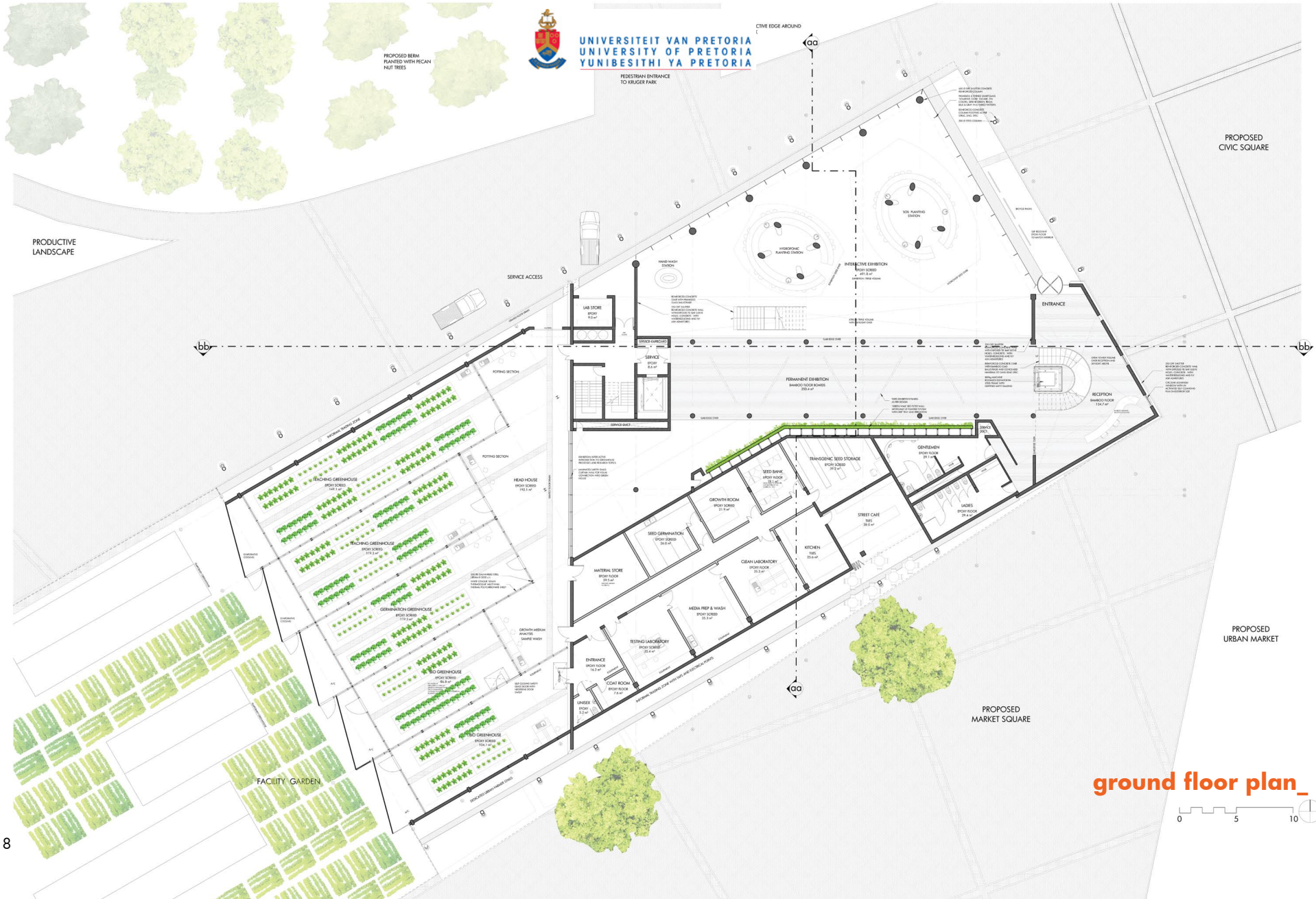


site location_



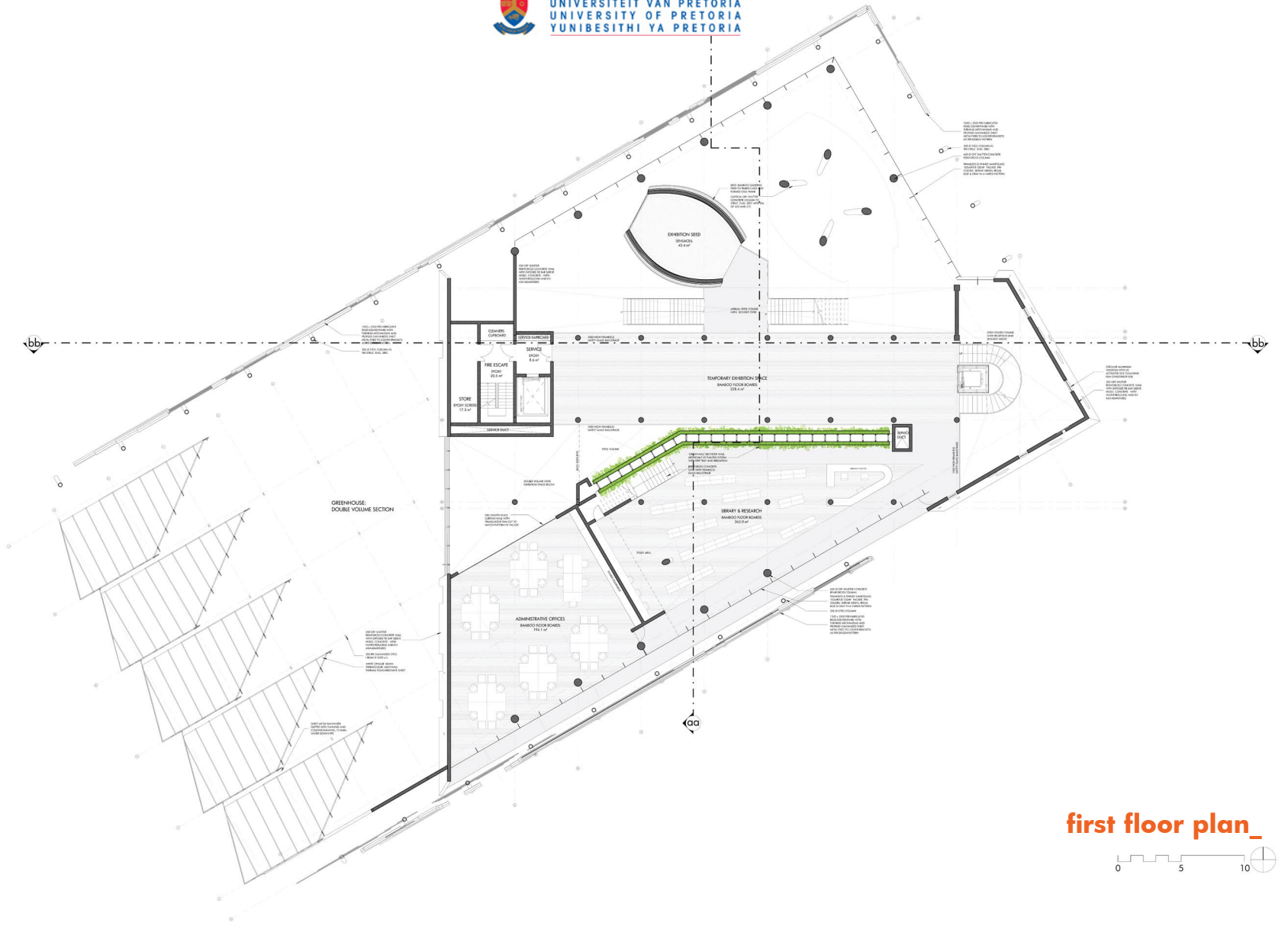



steenhoven spruit
productive landscape
proposed residential
market square
active urban edge
civic square
proposed urban market
proposed taxi stop



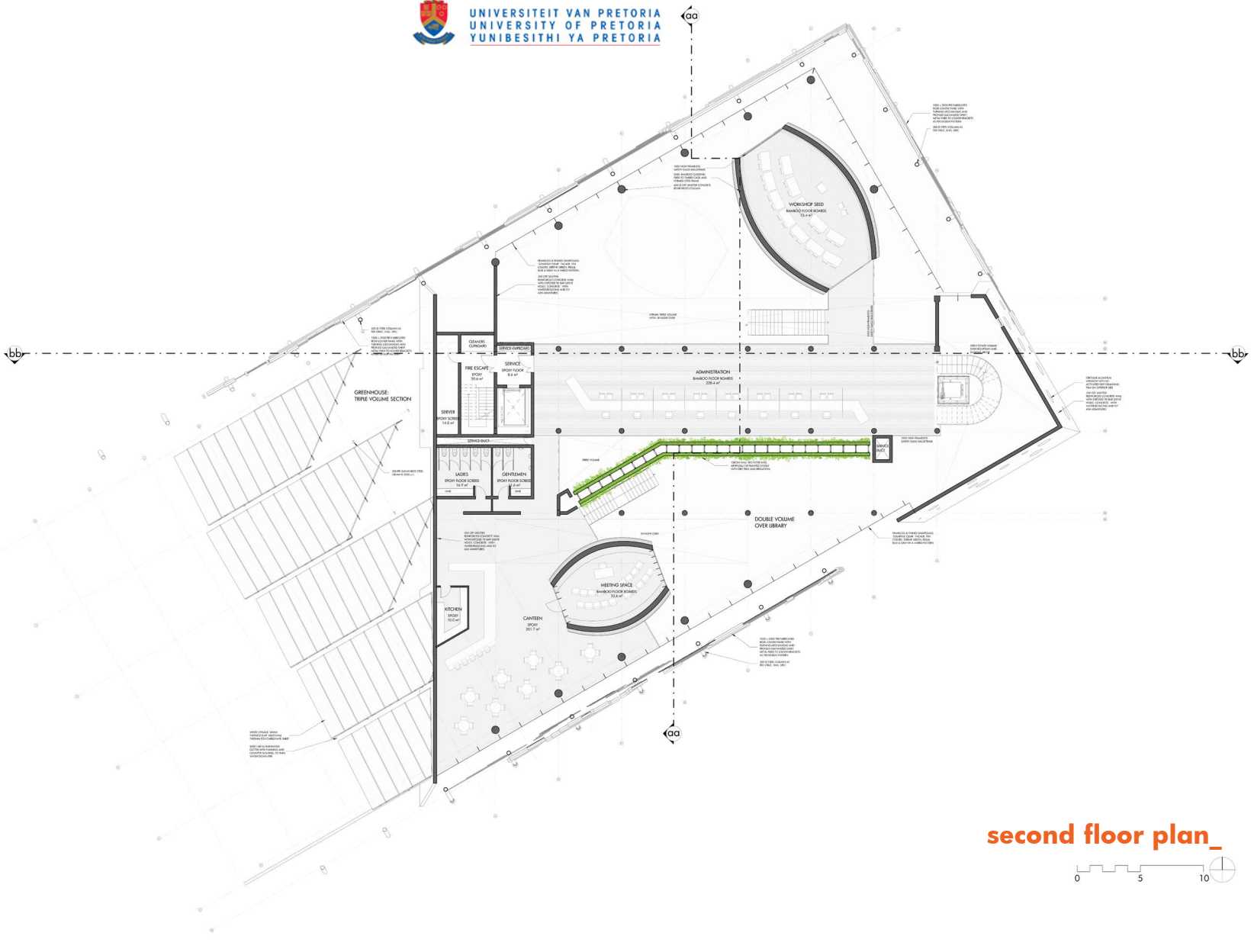
ground floor plan_

0 5 10



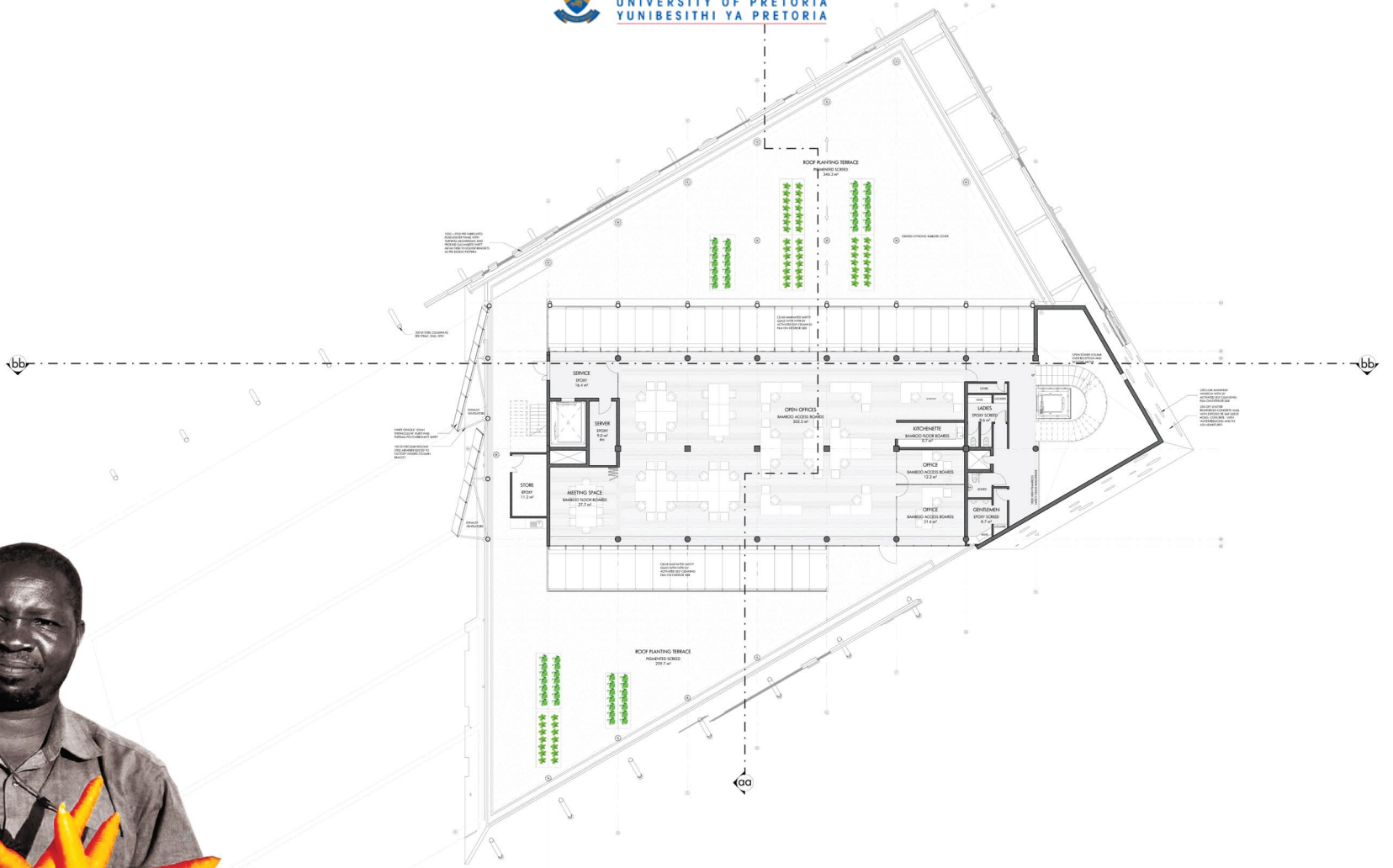
first floor plan_

0 5 10



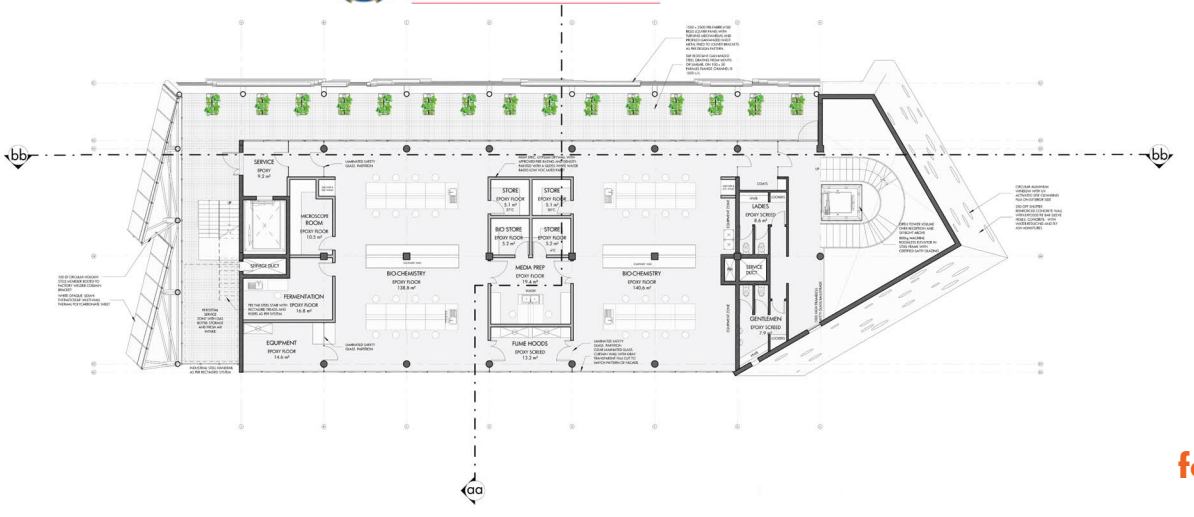
second floor plan_

0 5 10

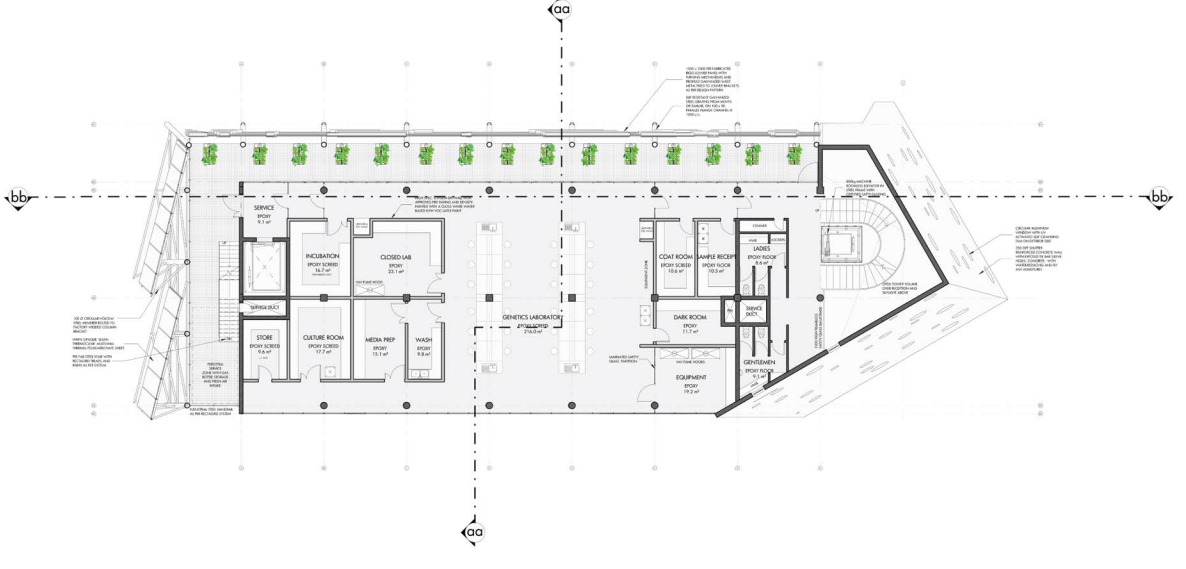


third floor plan_

0 5 10

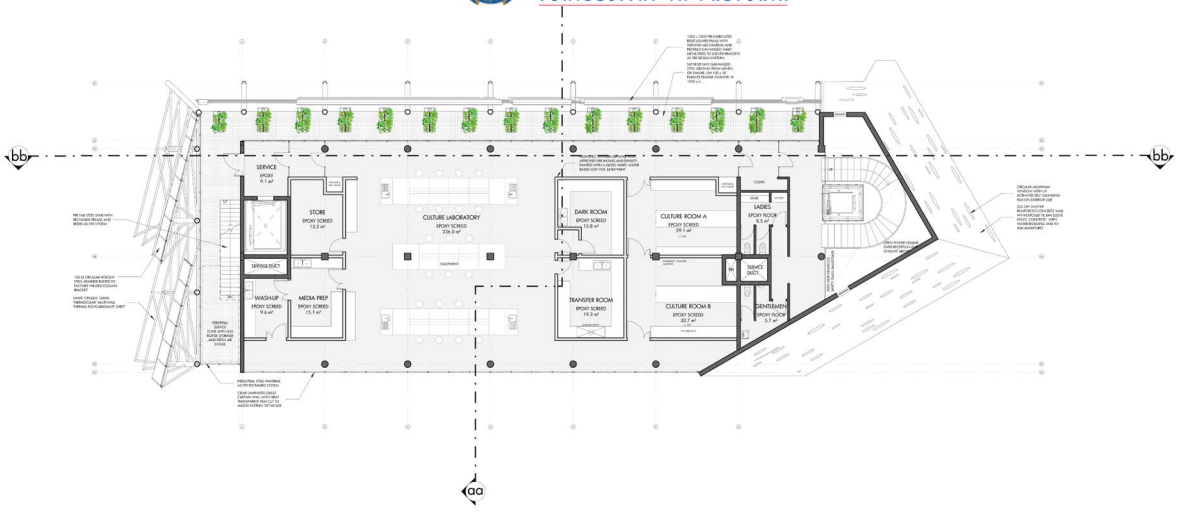


fourth floor plan_

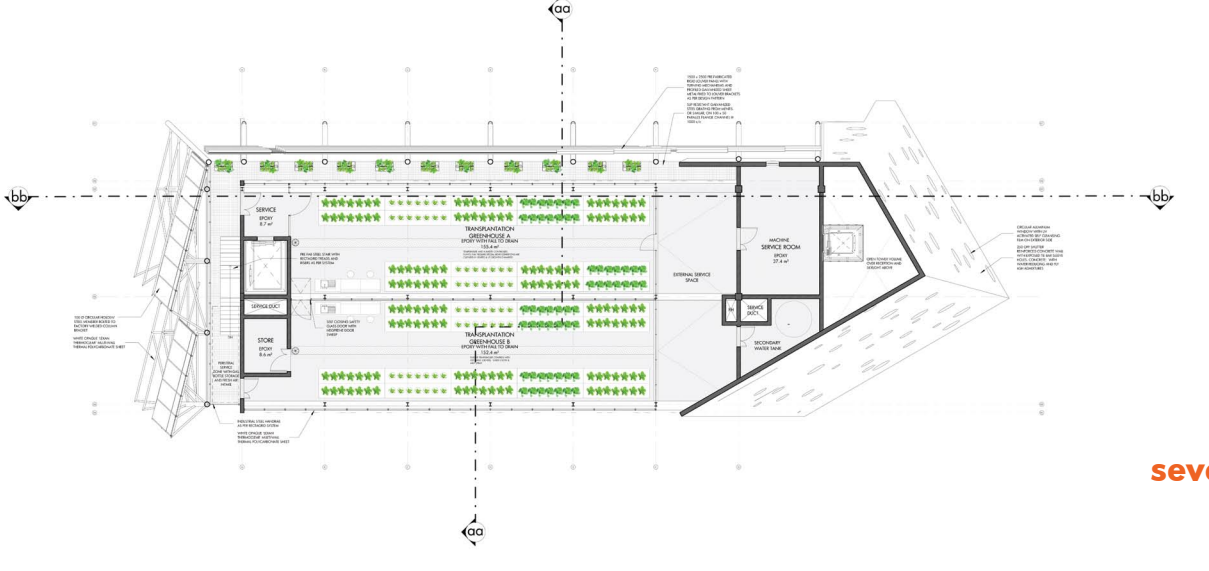


fifth floor plan_

0 5 10



sixth floor plan_



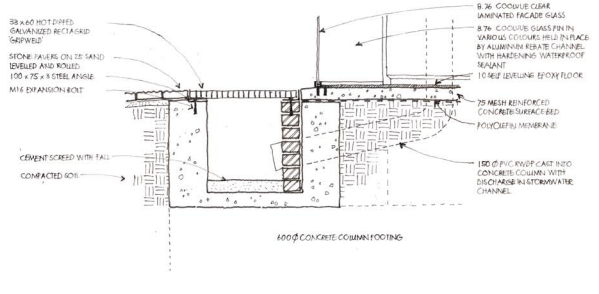
seventh floor plan_

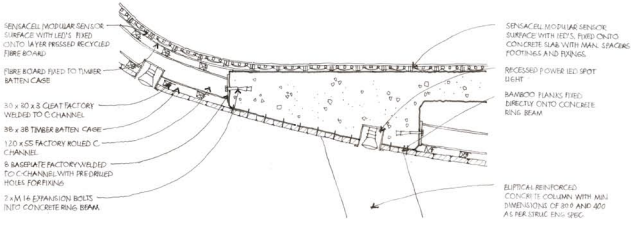
0 5 10

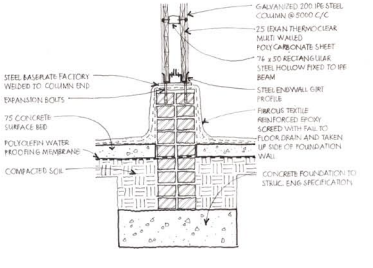
section a-a_

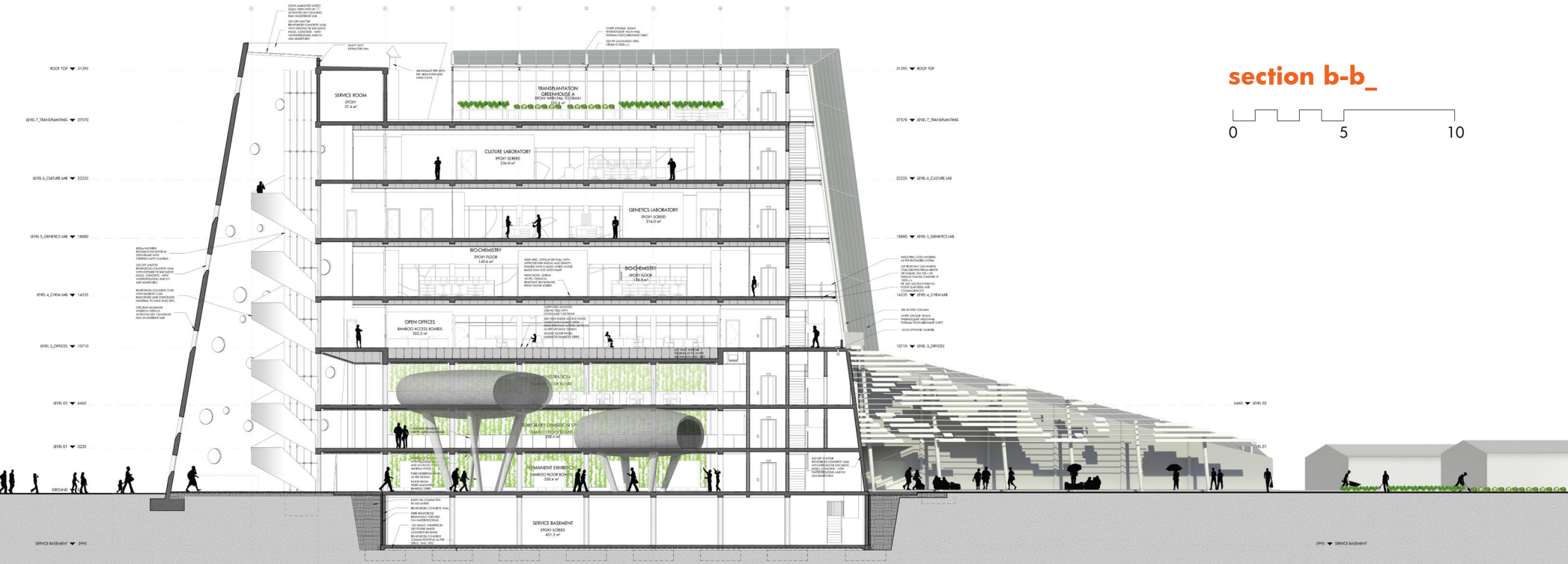
0 5 10

details_


8.76 COOLVUE CLEAR LAMINATED FACADE GLASS
8.76 COOLVUE GLASS PIN IN, VARIOUS COLOURS, HELD IN PLACE BY ALUMININ REBATE CHANNEL WITH HARDENING WATERPROOF SEALANT
10 SELF LEVELLING EPOXY FLOOR
75 MESH REINFORCED CONCRETE SURFACE BED
POLYOLEFIN MEMBRANE
150 Ø PVC RWDP CAST INTO CONCRETE COLUMN WITH DISCHARGE IN STORMWATER CHANNEL
38 x 60 HOT DIPPED GALVANIZED RECTASKID GRIPWELD
STONE PAVERS ON 25 SAND LEVELLED AND ROLLED
100 x 75 x 8 STEEL ANGLE
M16 EXPANSION BOLT
CEMENT SCREED WITH FALL
COMPACTED SOIL
600Ø CONCRETE COLUMN FOOTING


SENSACELL MODULAR SENSOR SURFACE WITH LED'S FIXED ONTO 3 LAYER PRESSED RECYCLED FIBRE BOARD
FIBRE BOARD FIXED TO TIMBER BATTEN CASE
50 x 50 x 3 CLEAT FACTORY WELDED TO C-CHANNEL
38 x 38 TIMBER BATTEN CASE
120 x 55 FACTORY ROLLED C-CHANNEL
8 BASEPLATE FACTORY WELDED TO C-CHANNEL WITH PRE-DRILLED HOLES FOR M16
M16 EXPANSION BOLTS INTO CONCRETE RING BEAM
SENSACELL MODULAR SENSOR SURFACE WITH LED'S, FIXED ONTO CONCRETE SLAB WITH MAN. SPACERS FOOTINGS AND FIXINGS.
RECESSED POWER LED SPOT LIGHT
BAMBOO PLANKS FIXED DIRECTLY ONTO CONCRETE RING BEAM
ELIPTICAL REINFORCED CONCRETE COLUMN WITH MIN DIMENSIONS OF 300 AND 400 AS PER STRUC ENG SPEC


GALVANIZED 200 IPE STEEL COLUMN @ 5000 C/C
25 LEXAN THERMOCLEAR MULTI WALLED POLYCARBONATE SHEET
74 x 50 RECTANGULAR STEEL HOLLOW FIXED TO IPE BEAM
STEEL ENDWALL GIRT PROFILE
FIBROUS TEXTILE REINFORCED EPOXY SCREED WITH FALL TO FLOOR DRAIN AND TAKEN UP SIDE OF FOUNDATION WALL
CONCRETE FOUNDATION TO STRUC. ENG SPECIFICATION
STEEL BASEPLATE FACTORY WELDED TO COLUMN END
EXPANSION BOLTS
75 CONCRETE SURFACE BED
POLYOLEFIN WATER PROOFING MEMBRANE
COMPACTED SOIL



section b-b_

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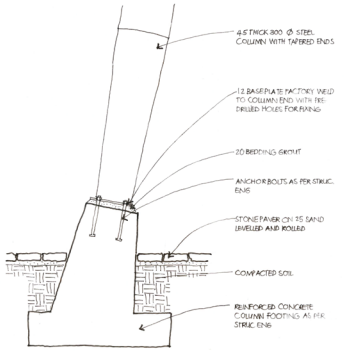
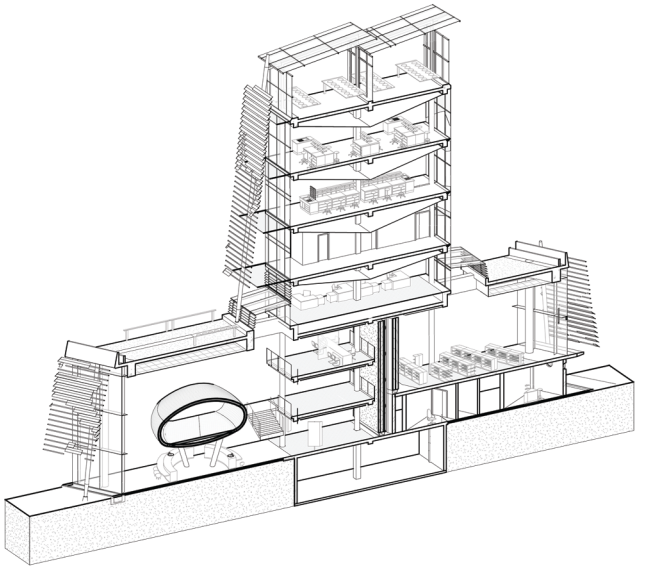
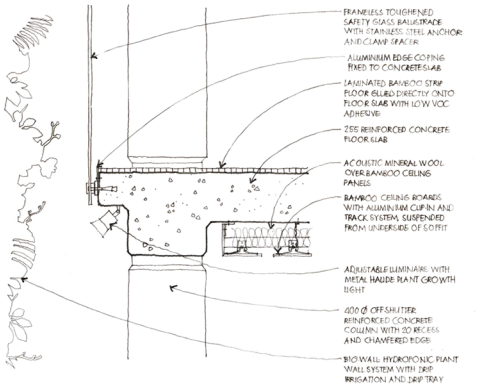
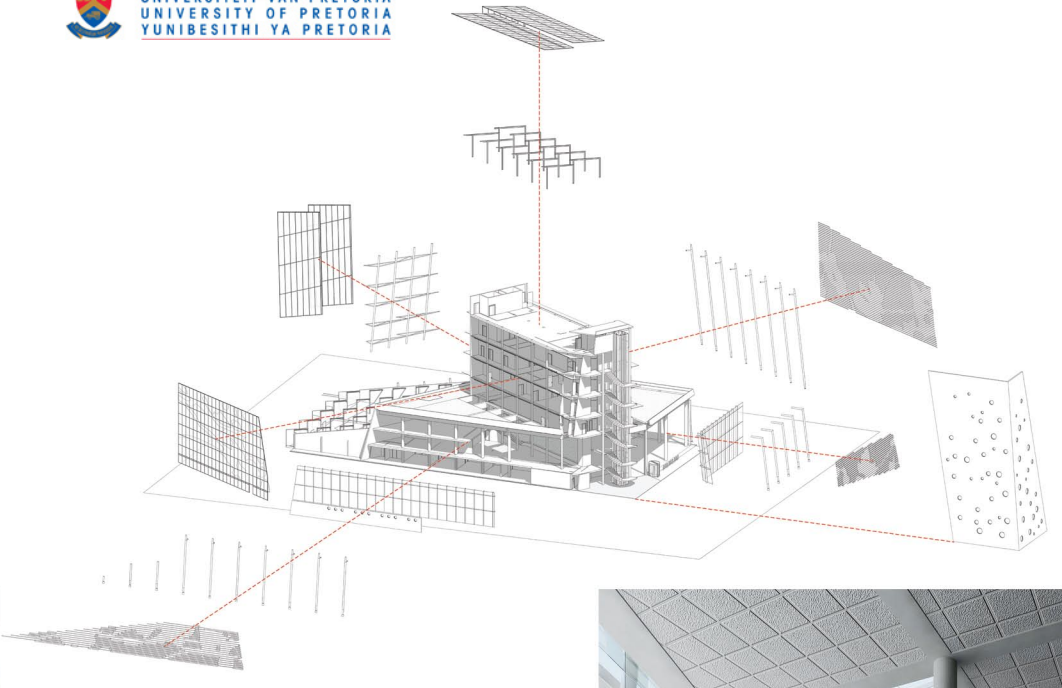
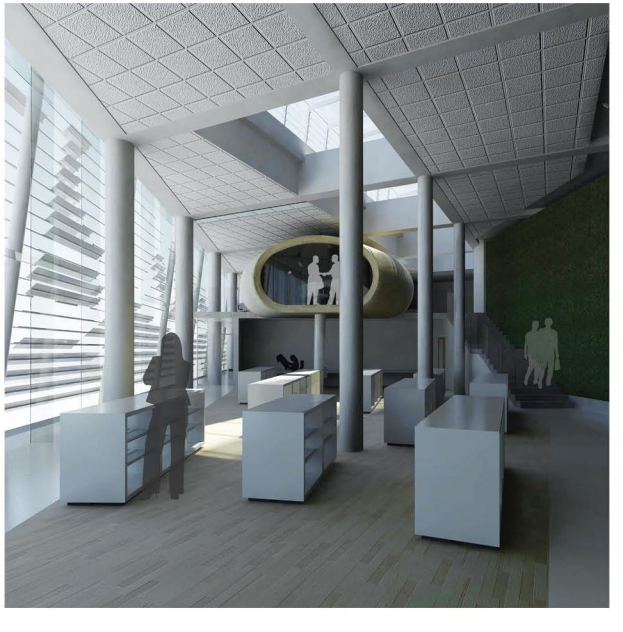
details_

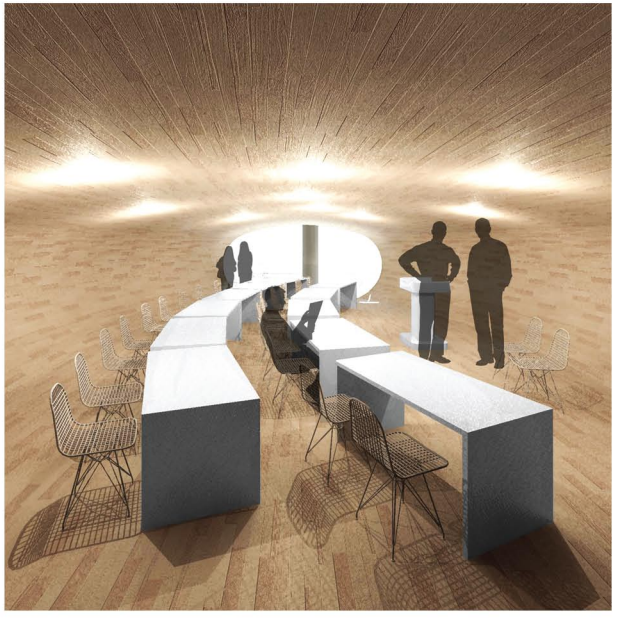

COMPACTED SOIL

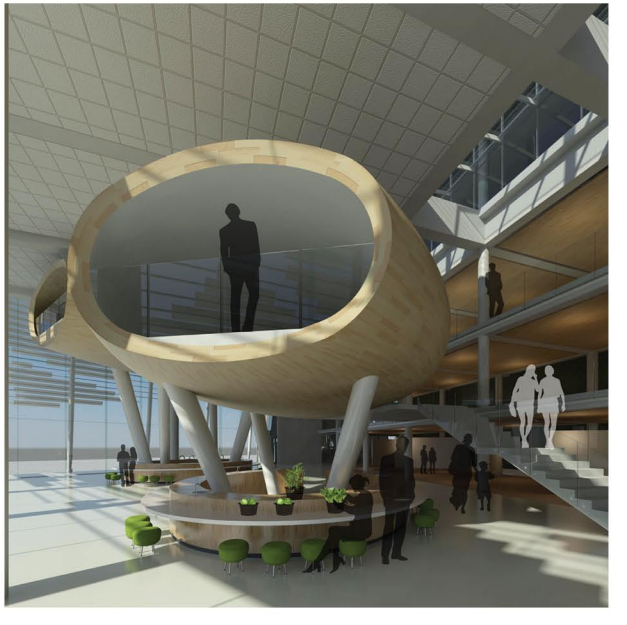



ALUMINIUM EDGE COPING FIXED TO CONCRETE SLAB
25S REINFORCED CONCRETE FLOOR SLAB
ACOUSTIC MINERAL WOOL OVER BAMBOO CEILING PANELS
ADJUSTABLE LUMINAIRE WITH METAL HALIDE PLANT GROWTH LIGHT







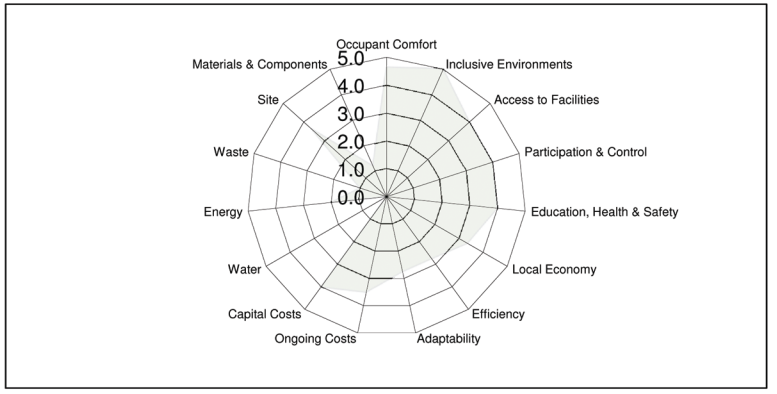


appendixes_07

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

SUSTAINABLE BUILDING ASSESSMENT TOOL (SBAT- P) V1

PROJECT		ASSESSMENT	
Project title:		Date:	
Location:		Undertaken by:	
Building type:		Company / organisation:	
Internal area (m2):		Telephone:	Fax:
Number of users:		Email:	



Social	4.3	Economic	3.3	Environmental	1.6
Overall	3.1	Classification			

Building Performance - Social

	Criteria	Indicative performance measure	Measured	Points
SO 1	**Occupant Comfort**			4.6
SO 1.1	Daylighting	% of occupied spaces that are within distance 2H from window, where H is the height of the window or where there is good daylight from skylights	78	0.8
SO 1.2	Ventilation	% of occupied spaces have equivalent of opening window area equivalent to 10% of floor area or adequate mechanical system, with unpolluted air source	100	1.0
SO 1.3	Noise	% of occupied spaces where external/internal/reverberation noise does not impinge on normal conversation (50dbA)	100	1.0
SO 1.5	Thermal comfort	Tempreture of occupied space does not exceed 28 or go below 19oC for less than 5 days per year (100%)	100	1.0
SO 1.5	Views	% of occupied space that is 6m from an external window (not a skylight) with a view	85	0.9
SO 2	**Inclusive Environments**			5.0
SO 2.1	Public Transport	% of building (s) within 400m of disabled accessible public transport	100	1.0
SO 2.2	Information	High contrast, clear print signage in appropriate locations (100%)	100	1.0
SO 2.3	Space	% of occupied spaces that are accessible to ambulant disabled / wheelchair users	100	1.0
SO 2.4	Toilets	% of space with fully accessible toilets within 50m	100	1.0
SO 2.5	Fittings & Furniture	% of commonly used furniture and fittings (reception desk, kitchenette, auditorium) fully accessible	100	1.0
SO 3	**Access to Facilities**			4.0
SO 3.1	Children	All users can walk (100%) / use public transport (50%) to get to their childrens' schools and creches	100	1.0
SO 3.2	Banking	All users can walk (100%) / use public transport (50%) to get to banking facilities	50	0.5
SO 3.3	Retail	All users can walk (100%) / use public transport (50%) to get to food retail	100	1.0
SO 3.4	Communication	All users can walk (100%) / use public transport (50%) to get to communication facilities (post, telephone and internet)	50	0.5
SO 3.5	Exercise	All users can walk (100%) / use public transport (50%) to get to recreation / excersise facilities	100	1.0
SO 4	**Participation & Control**			4.0
SO 4.1	Environmental control	% of occupied spaces able to control their thermal environment (adjacent to openable windows/thermal controls)	100	1.0
SO 4.2	Involvement	% of users actively involved in the design process (workshops / meetings with models / large format drawings)	100	1.0
SO 4.3	Social spaces	Social informal meeting spaces (parks / staff canteens / cafes) provided locally (within 400m) (100%)	100	1.0
SO 4.4	Sharing facilties	5% of facilities shared with other users / organisations on a weekly basis (100%)	0	0.0
SO 4.5	User group	Active representative user group involved in the management of the building / facilities / local environment (100%)	100	1.0
SO 5	**Education, Health & Safety**			4.0
SO 5.1	Education	Two percent or more space/facilities available for education (seminar rooms / reading / libraries) per occupied spaces (75%). Construction training provided on site (25%)	100	1.0
SO 5.2	Safety	All well used routes in and around building well lit (25%), all routes in and around buildings (25%) visually supervised, secure perimeter and access control (50%), No crime (100%)	100	1.0
SO 5.3	Awareness	% of users who can access information on health & safety issues (ie HIV/AIDS), training and employment opportunities easily (posters/personnel)	100	1.0
SO 5.4	Materials	All materials/components used have no negative effects on indoor air quality (100%)	0	0.0
SO 5.5	Accidents	Method in place for recording all occupational accidents and diseases and addressing these	100	1.0

Building Performance - Economic

	Criteria	Indicative performance measure	Measured	Points
EC 1	**Local economy**			3.4
EC 1.1	Local contractors	% value of the building constructed by local (within 50km) small (employees<20) contractors	15	0.2
EC 1.2	Local materials	% of materials (sand, bricks, blocks, roofing material) sourced from within 50km	20	0.2
EC 1.3	Local components	% of components (windows, doors etc) made locally (in the country)	100	1.0
EC 1.4	Local furniture/fittings	% of furniture and fittings made locally (in the country)	100	1.0
EC 1.5	Maintenance	% of maintenance and repairs by value that can, and are undertaken, by local contractors (within 50km)	100	1.0
EC 2	**Efficiency**			2.8
EC 2.1	Capacity	% capacity of building used on a daily basis (actual number of users / number of users at full capacity*100)	75	0.8
EC 2.2	Occupancy	% of time building is occupied and used (actual average number of hours used / all potential hours building could be used (24) *100)	50	0.5
EC 2.3	Space per occupant	Space provision per user not more than 10% above national average for building type (100%)	0	0.0
EC 2.4	Communication	Site/building has access to internet and telephone (100%), telephone only (50%)	100	1.0
EC 2.5	Material & Components	Building design coordinated with material / component sizes in order to minimise wastage. Walls (50%), Roof and floors (50%)	50	0.5
EC 3	**Adaptability**			3.9
EC 3.1	Vertical heights	% of spaces that have a floor to ceiling height of 3000mm or more	72	0.7
EC 3.2	External space	Design facilitates flexible external space use (100%)	100	1.0
EC 3.3	Internal partition	Non loadbearing internal partitions that can be easily adapted (loose partioning (100%), studwall (50%), masonary (25%)	50	0.5
EC 3.4	Modular planning	Building with modular stucture, envelope (fenestration) & services allowing easly internal adaptaptation (100%)	70	0.7
EC 3.5	Furniture	Modular, limited variety furniture - can be easily configured for different uses (100%)	100	1.0
EC 4	**Ongoing costs**			3.5
EC 4.1	Induction	All new users receive induction training on building systems (50%), Detailed building user manual (50%)	100	1.0
EC4.2	Consumption & waste	% of users exposed on a monthly basis to building performance figures (water (25%), electricity (25%), waste (25%), accidents (25%)	100	1.0
EC 4.2	Metering	Easily monitored localised metering system for water (25%) and energy (75%)	100	1.0
EC4.3	Maintenance & Cleaning	Building can be cleaned and maintained easily and safely using simple equipment and local non-hazardous materials (100%)	0	0.0
SO 4.5	Procurement	% of value of all materials/equipment used in the building on a daily basis supplied by local (within the country) manufacturers	50	0.5
EC 5	**Capital Costs**			4.0
EC 5.1	Local need	Five percent capital cost allocated to address urgent local issues (employment, training etc) during construction process (100%)	100	1.0
EC5.2	Procurement	Tender / construction packaged to ensure involvement of small local contractors/manufacturers (100%)	100	1.0
EC 5.3	Building costs	Capital cost not more than fifteen % above national average building costs for the building type (100%)	100	1.0
EC5.4	Sustainable technology	3% or more of capital costs allocated to new sustainable/indigenous technology (100%)	100	1.0
EC 5.5	Existing Buildings	Existing buildings reused (100%)	0	0.0

Building Performance - Environmental

	Criteria	Indicative performance measure	Measured	Points
EN 1	**Water**			0.0
EN 1.1	Rainwater	% of water consumed sourced from rainwater harvested on site	0	0.0
EN 1.2	Water use	% of equipment (taps, washing machines, urinals showerheads) that are water efficient	0	0.0
EN 1.3	Runoff	% of carparking, paths, roads and roofs that have absorbant/permeable surfaces (grassed/thatched/looselaid paving/ absorbant materials)	0	0.0
EN 1.4	Greywater	% of water from washing/relatively clean processes recycled and reused	0	0.0
EN 1.5	Planting	% of planting (other than food gardens) on site with low / appropriate water requirements	0	0.0
EN 2	**Energy**			2.0
EN 2.1	Location	% of users who walk / use public transport to commute to the building	50	0.5
EN 2.2	Ventilation	% of building ventilation requirements met through natural / passive ventilation	36	0.4
EN 2.3	Heating & Cooling	% of occupied space which has passive environmental control (no or minimal energy consumption)	15	0.2
EN 2.4	Appliances & fittings	% of appliances / lighting fixtures that are classed as highly energy efficient (ie energy star rating)	100	1.0
EN 2.5	Renewable energy	% of building energy requirements met from renewable sources	0	0.0
EN 3	**Waste**			1.0
EN 3.1	Toxic waste	% of toxic waste (batteries, ink cartridges, flourescent lamps) recycled	0	0.0
EN 3.2	Organic waste	% of organic waste recycled	100	1.0
EN 3.3	Inorganic waste	% of inorganic waste recycled.	0	0.0
EN 3.4	Sewerage	% of sewerage recycled on site	0	0.0
EN 3.5	Construction waste	% of damaged building materials / waste developed in construction recycled on site	0	0.0
EN 4	**Site**			3.7
EN 4.1	Brownfield site	% of proposed site already disturbed / brownfield (previously developed)	0	0.0
EN 4.2	Neighbouring buildings	No neighbouring buildings negatively affected (access to sunlight, daylight, ventilation) (100%)	100	1.0
EN 4.3	Vegetation	% of area of area covered in vegetation (include green roofs, internal planting) relative to whole site	65	0.7
EN 4.4	Food gardens	Food gardens on site (100%)	100	1.0
EN 4.5	Landscape inputs	% of landscape that does not require mechanical equipment (ie lawn cutting) and or artificial inputs such as weed killers and pesticides	100	1.0
EN 5	**Materials & Components**			1.2
EN 5.1	Embodied energy	Materials with high embodied energy (aluminium,plastics) make up less than 1% of weight of building (100%)	0	0.0
EN 5.2	Material sources	% of materials and components by volume from grown sources (animal/plant)	20	0.2
EN 5.3	Ozone depletion	No materials and components used requiring ozone depleting processes (100%)	0	0.0
EN 5.4	Recyled / reuse	% of materials and components (by weight) reused / from recycled sources	0	0.0
EN 5.5	Construction process	Volume / area of site disturbed during construction less than 2X volume/area of new building (100%)	100	1.0

Hulle gaan nêrens heen, sê inwoners oor uitsetting

Leon Botha

Die Tshwane-metroraad het die inwoners van Schubartpark tot gister tyd gegee om dié gebou vrywillig te ontruim.

Die raad beoog dringende herstelwerk aan die woonstelgebou.

Maar volgens mnr. Aubrey Ramotlhale, voorsitter van die Schubartpark-en-Krugerpark-inwonerskomitee, gaan geen inwoner trek nie.

"Ons het ons punt reeds duidelik aan die raad oorgedra," sê Ramotlhale. "As die raad nie 'n ander heenkome vir almal van Schubartpark kan voorsien nie, bly ons.

"Ons het reeds ons name opgegee by die raad vir alternatiewe akkommodasie, maar die raad het tot nou toe nog nie teruggekom na ons nie."

Ramotlhale sê daar is 900 woonsteleenhede in die kompleks en meer as 3 000 mense wat daar woon.

"Onthou, hier bly pensioentrekkers, gestremde mense en weduwees. Die raad moet nie probeer om ons met geweld te skuif nie, ons sal ons teësit.

"As die raad 'n hofbevel bring, sal ons eenvoudig 'n dringende aansoek by die hooggeregshof indien om die ontruiming te stuit.

"Die raad sê dis onveilig om hier te woon. Ons as inwoners het tot vandag toe nog geen sulke verslae gesien nie. Ons het water en elektrisiteit, net die hysers werk nie, maar ons is gewoond aan trappe klim."

Me. Susara Maritz bly saam met haar man, Lucas, haar gestremde dogter Mina (22) en haar kleindogter, die 18 maande oue Anita, in een woonstel.

"Dit *stress* my baie uit oor waar gaa't ons heen," sê Maritz.

"Wat van my twee katte en hond? Ek en my man is werkloos en leef van my dogter se geld wat sy by die staat kry. Sy kry 'n ongeskiktheidstoelae van R980 en R210 vir haar kleintjie."

Maritz sê hulle sal trek as die raad vir hulle ander blyplek kan voorsien.

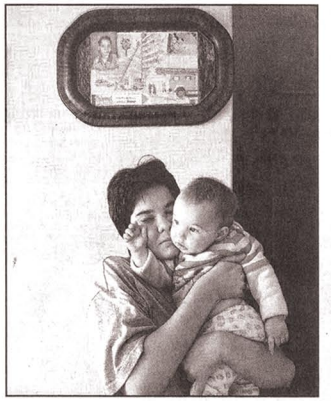
Nog 'n bekommernis van Ramotlhale is die hertoekenning van eenhede wanneer die herstelwerk klaar is by Schubartpark.

Die inwoners soek 'n waarborg dat hulle weer daar hervestig sal word.

"Ons vertrou die raad geensins nie; hulle is leuenaars. Ons is moeg vir politieke uitlatings, hulle moet dinge vir ons swart op wit gee," sê Ramotlhale.

Volgens mnr. Absalom Ditshoke, ANC-burgemeesterskomiteelid verantwoordelik vir behuising, was daar 'n teleurstellend klein groepie mense wat hulle name opgegee het vir alternatiewe akkommodasie.

Luidens 'n verklaring wat Vrydag uitgereik is deur die metroraad, gaan die raad van vandag begin met uitsettings.



Die gestremde me. Mina Maritz (22) en haar kind Anita (18 maande), wat op die 20ste vloer van Schubartpark woon. Foto: LEON BOTHA

Beeld 01 June 2009

Afrika moet leer boer, nie net kos kry – G8

André le Roux

L'Aquila (Italië). – 'n Nuwe noodplan van $12 miljard (sowat R96 miljard) om kossekerheid oor die volgende drie jaar te help verseker.

Dit is een van drie hoofdoelwitte van die G8-beraad wat hierdie week hier begin.

Die plan behels landbou-ontwikkeling pleks van kosskenkings, sal bekend staan as die L'Aquila-inisiatief vir kossekerheid, en na wat hier berig word, sal die VSA en Japan dit grootliks finansier.

Volgens die G8 sal die grootste deel van die plan toegespits wees op die bemagtiging van arm lande deur die verbetering van hul landbou-infrastruktuur eerder as deur regstreekse voedselhulp.

Italië sal vra dat die G8 die konsortium vir infrastruktuurontwikkeling vir Afrika verder steun. Die konsortium se doel is om voorsieners van infrastrukture in Afrika toegang te gee tot 'n geraamde $20 miljard (sowat R160 miljard) wat in die proses verdien kan word.

Al agt G8-lande is lede van die konsortium saam met die Wêreldbank, die Ontwikkelingsbank van Afrika en dié van Suider-Afrika, asook Nepad.

Mnr. Silvio Berlusconi

Mnr. Silvio Berlusconi, huidige G8-voorsitter, het in Rome die plan regstreeks gekoppel aan Afrika, wat die hooftema van die beraad is. "Ons wil met hierdie beraad verseker dat Afrika 'n volwaardige deelnemer aan die wêrelddebat word, nie net 'n ontvanger van internasionale geldhulp nie."

Die beraad sal ook 'n "beraad van reëls" wees. Berlusconi, Italiaanse premier, het gesê 'n reëlboek sal opgestel word om 'n herhaling van die huidige finansiële krisis in die wêreld te voorkom.

Die verwagting hier is dat dié debat moeilik sal wees weens veral Frankryk, Duitsland en Italië se uiteenlopende sienings oor die stappe om proteksionisme uit te skakel.

Die derde groot tema van die beraad is die formulering van 'n G8-standpunt oor aardverhitting wat in Desember by die wêreld-omgewingsdebat in Kopenhagen sal gebeur.

Benewens die G8-leiers sal nog 17 wêreldleiers die beraad bywoon, onder wie pres. Jacob Zuma van Suid-Afrika.

Zuma en pres. Barack Obama van die VSA sal tydens die beraad vergader.

Beeld 17 July 2009

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