

[re]find

Pretoria West Power Station: reproducing the furniture industry through adaptive reuse



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UNIVERSITEIT VAN PRETORIA  
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\_ To my mom for all her continuous love and support and in memory of my dad, who would have loved this part of life.



## **abstract\_**

The aim of the design is to adapt a historic industrial structure and create a building that houses a production process, that is socially and historically responsive. A new structure will subtly connect with the old and accentuate the architectural heritage. By converting an old Boiler House into a furniture factory, the architecture strives to enable a physical and visual link between production and daily life. The urban fabric and showroom visually connects with the furniture makers, in order to inform the public on the production process. This will create an integrated socially responsive environment, where people can live, work and play.

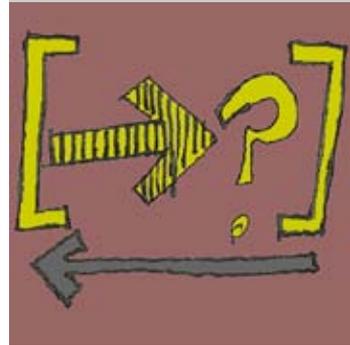
*Die doel van die ontwerp, is om 'n industriële erfenis gebou te hergebruik en aan te pas om so doende 'n nuwe gebou te skep wat 'n produksie proses huisves. 'n Nuwe struktuur sal sosiaal en histories reageer en subtiel met die ou struktuur gebind word. Die nuwe verbinding sal so geskiet dat die klem ter alle tye gelê word op die historiese kwaliteit van die omgewing. Die argitektuur strew om 'n fisiese konneksie tussen produksie en alledaagse lewe te vorm, gevolglik sal die argitektuur 'n omgewing skep waar mense kan woon, werk en ontspan. Die studie poog om 'n argitektuur te skep wat sosiaal reageer tot die omgewing.*



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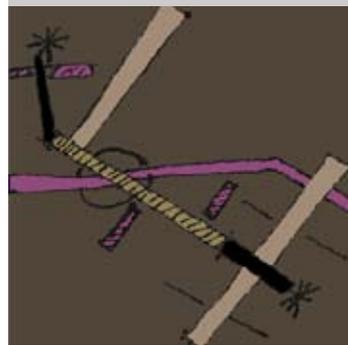
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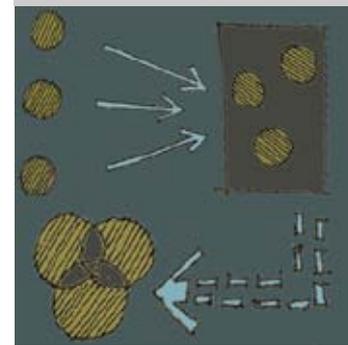
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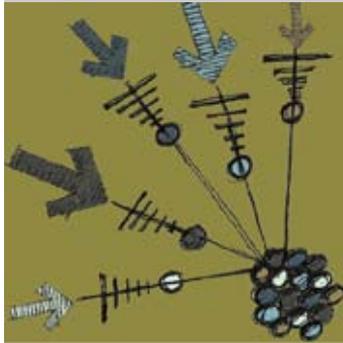
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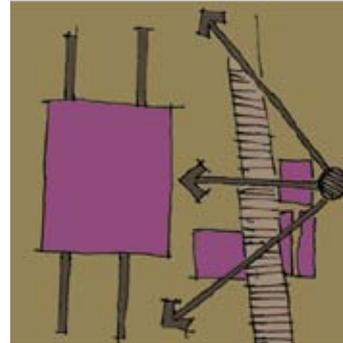


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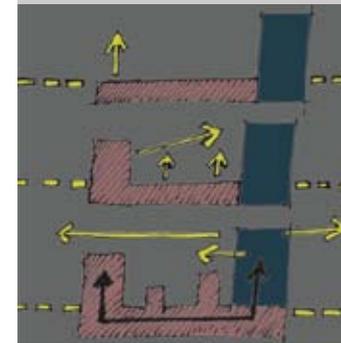


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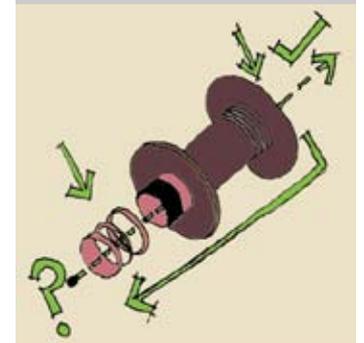


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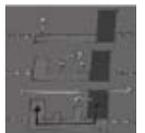
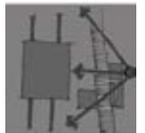
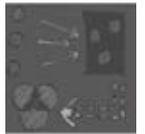
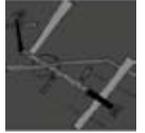


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# introduction

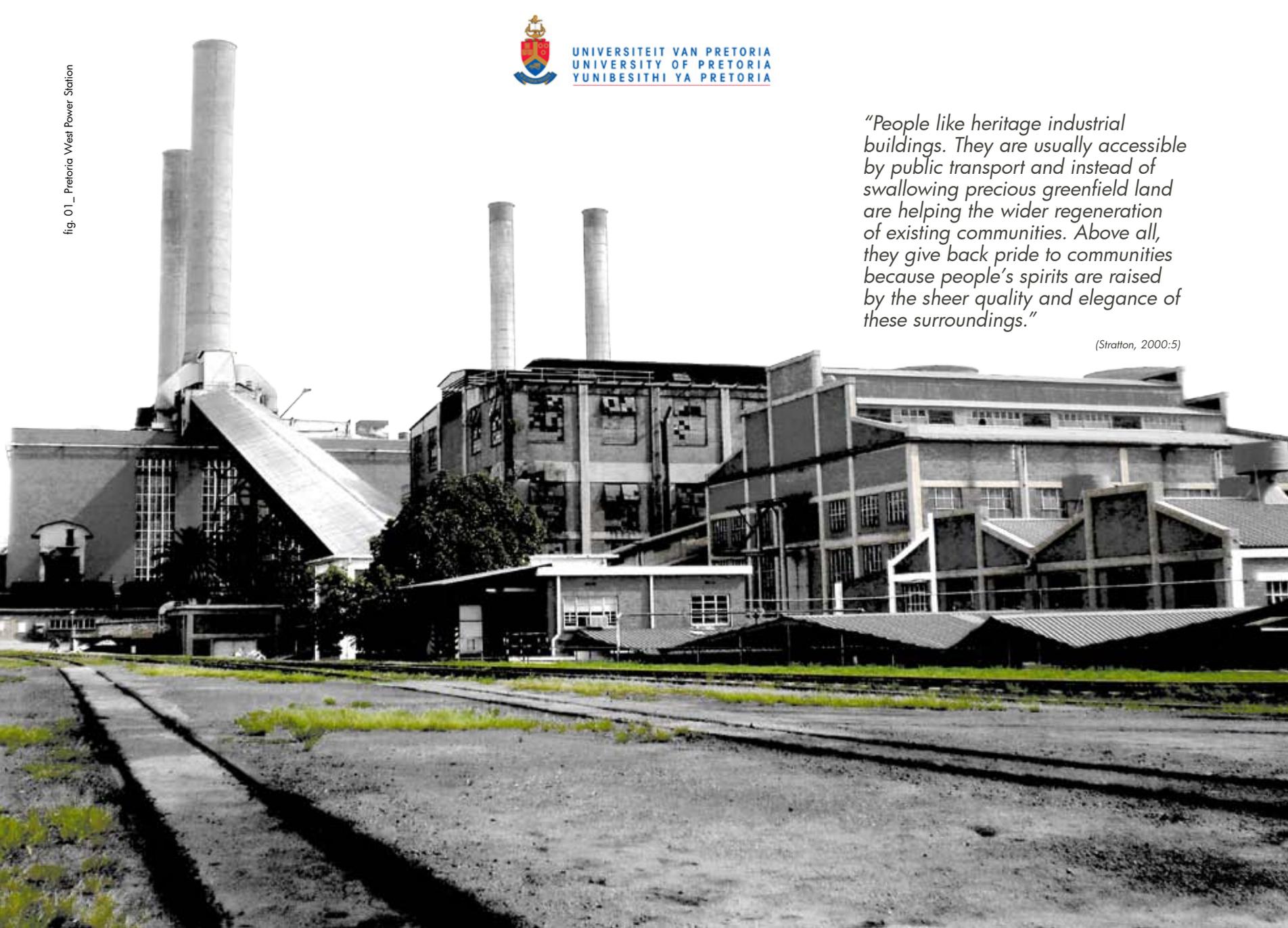
This chapter will give a succinct background discussion to formulate a problem statement, there after the author will state her hypothesis and bring sub questions to the table. The chapter will introduce the client to the reader and also explain the methodology and methods used in the dissertation.





*“People like heritage industrial buildings. They are usually accessible by public transport and instead of swallowing precious greenfield land are helping the wider regeneration of existing communities. Above all, they give back pride to communities because people’s spirits are raised by the sheer quality and elegance of these surroundings.”*

*(Stratton, 2000:5)*



## 1.1. Background\_



### 1.1.1. Deindustrialization\_

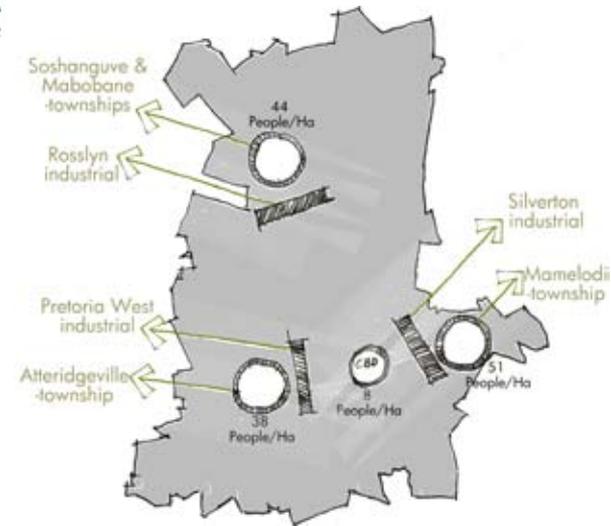
The world is teeming with abandoned industrial buildings and objects; lost, but waiting to be rediscovered. These buildings are frozen in time, they inspire the imagination and tell us things about the past in a intuitive way. They are abandoned relics - creepers run up and down empty staircases, birds and other small animals mark it as their home, broken windows give nature free access. It is here where past, present and future forcibly intersect in the form of memory. They stand as icons at the core of communities and are thus as much part of our history as cathedrals, monuments and artefacts.

**Globally\_** In many cities around the world, industrial areas were located on the fringes of cities or close to harbours because of their proximity to unskilled labour and railways. Today due to urban expansion these industrial

areas lie close to or in the heart of urban centres (Schiffer, 2005).

**EUROPE\_** *In the 20th century, and especially after World War II, European cities began to grow very rapidly. Historic inner-city areas currently occupy less than 5% of the total urban area of the old cities. This implies that the industrial sites, dating from the beginning of the 20th century, are no longer situated on urban peripheries, but are to be found in the central areas of cities (Vrijthoff, 2006:3).*

**BRITAIN\_** Britain was the world's first industrial nation, they were therefor also the first country to experience the full effects of the industrial decline. The effects of de-industrialisation left many industrial buildings unutilised. This issue has been discussed broadly over decades in many countries. According to Van Der Toorn



fig\_02\_ Tshwane - diagram illustrating industrial areas surrounding Pretoria CBD, these areas still segregate (apartheid city intention) informal settlements from the rest of the city

Vrijthoff (2006:4), the mono-functionality, in combination with uniformity of industrial areas, is recognised as one of the main reasons why these areas are sometimes unattractive.

### **SOUTH AFRICA\_**

Industrial areas were used to segregate the apartheid city from informal settlements. The Group areas Act (1950), stated that people from different cultures should share the same areas and that "black and white spaces" should be segregated by buffer zones (Shepherd & Murry, 2007:6). Pretoria CBD (see fig\_02) is surrounded by thee industrial zones that kept the city isolated. Silverton industrial divides the city from Mamelodi in the East, Rosslyn industrial divides Soshanguve and Mabopane in the North and lastly the study area, Pretoria West Industrial, segregates Atteridgeville from the city in the West.



Proclamation hill   Pretoria West Power Station Site   Bellehombre   Church square   Apies river



fig. 03\_ Aerial photograph of Pretoria CBD and the West



*“Since industry is a human creation and humans are social animal, we need an approach which brings industry and environment together with a social or community perspective.”*

*(Raymond & Cohen-Rosenthal, 1998:181)*

### 1.1.2. Pretoria West Industrial Area and The Power Station\_\_

On 1 December 1888 an agreement was entered between the Government of the South African Republic and S Neumann for the production and reticulation of gas for lighting, heating and other proposes in Pretoria. When the gas lamps in the streets failed, a request came through, asking the president permission to amalgamate with a new company that would generate electricity. It is under this concession that the Pretoria Lighting Company began its operation in 1892. The first power station was built on the corner of Schoeman and Van der Walt Street, it is today known as the Tram Shed (Stark, 1952:127).

It soon became evident that the Schoeman Street station was too restricted in area and facilities. The site also had no railway access,

therefore a new site was selected in 1919: Mitchell Street. This site had adequate access by rail and road and there was a small dam which could be expanded to provide circulating water for the condensers (Stark, 1952:60).

In 1922 the power station moved to the west of Pretoria and became known as the Pretoria West Power Station. The station moved to the west where there was ample space for growth, the station formed the base for industrial expansion. This was a very important milestone for the industrial development of South Africa. City Engineering Works Limited, as well as ISCOR (South African Iron and Steel Corporation Limited) located their companies in Mitchell Street and by 1923 this industrial area flourished (Stark, 1952:61).

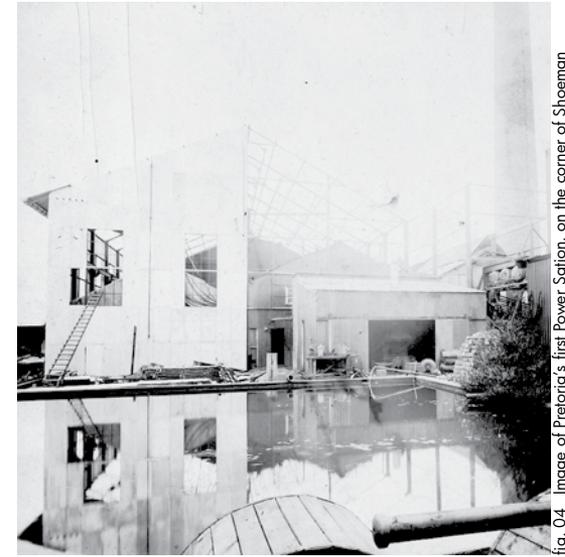


fig. 04\_ Image of Pretoria's first Power Station, on the corner of Schoeman and Van der Walt Street, 1900

The Power Station grew over the years as well as ArcelorMittal (formerly known as ISCOR), today both of these industries are partially underutilized. It is only a matter of time before they become obsolete.

South African cities are likely to have vacant industrial floor space (factories, power stations etc.), which becomes problematic when it is ultimately abandoned. These buildings rapidly become derelict and potential problems include dead city space, safety issues and ultimately sprawling. The Turbine Hall in Newtown, Johannesburg went through these motions in the year 2000, when it became an informal settlement for 300 people (see precedent study page 68).



well-being



health



shelter



nutrition



education



cultural expression

Social sustainability

fig. 05\_ Social sustainability - diagram illustrating the basic human needs



### 1.1.3. Heritage and Industrial sites in South Africa\_

Abandoned heritage industrial buildings are found right across South Africa. Those buildings that are still structurally sound can contribute immensely to the adaptation process as well as the industrial culture.

Since 2000 a sustainable industrial culture started to immerge in the form of Sustainable Industrial Production. Products are designed, produced, distributed, used and disposed of with minimal environmental impact, occupational health damages and use of new resources (material and energy) (Alting & Jorgensen, 1993:163). Researchers argue that industrial sustainability should focus, not only on economical and environmental factors, but also on industrial social sustainability. We have to build up what scientists call human capital,

this include people, skills, well-being, health, motivation, as well as rules, standards and culture (De Paula & Cavalcanti, 2000:110). Together with the natural capital (clean rainfall, fertile ground etc.), our generation can provide a human capital that will enable future generations to prosper in a sustainable world.

Social sustainability requires that the cohesion of society and its ability to work towards common goals are maintained. Individual needs, such as those for health, well-being, nutrition, shelter, education and cultural expression, should also be met (Van Wyk, 2009: 23).

John Tomlinson (2003) articulates in his article 'Globalization and cultural identity', that once before the era of globalisation (which to force in the 1980's) there existed local, autonomous, distinct and well-defined and culturally sustaining connections between people and their industrial surroundings. Therefore between place and experience. Identity was something that a culture 'just had', passed down from generation to generation. With the outset of globalisation, mass production evolved and this 'identity' proved to be a very fragile phenomenon. With mass production large quantities of products are produced in a short period of time. This allows for larger output per work-hour, fewer labourers are needed and products can be sold at lower costs.



fig. 06\_ Workers at Shernck brothers sawmill, Hogsback, Eastern Cape



fig. 07\_ Many production processes close when products are cheaper to produce in foreign countries.



fig. 08\_ Closed industry





#### 1.1.4. Industry in South Africa\_

Before the development of mass production, techniques were adopted, craftsmen were involved with the whole production process. Carpenters for example had to mould and shape individual components, fix them together and add decorative finishes. Today all of the above can be done by machines (Harmon, 2010).

*South Africa's economy is already under severe pressure to compete in a largely knowledge-driven global economy, and there is increasing pressure from developing economies i.e. Brazil, Russia, India, and China. If we don't pull together and aim at increasing manufacturing competitiveness immediately, there won't be a sustainable industry to support (Peinke, 2010).*

South African industries are closed down and left unoccupied, because products are mass produced in countries like China and Japan. Local industries in South Africa are oppressed because production becomes too uneconomical to sustain. It is less expensive to manufacture products elsewhere (China) and import it to South Africa, than it is to manufacture it locally (Thompson, 2006).

Developing countries are losing unique skills, partly due to of mass production, but also due to the ignorance of the general public. Several products we use everyday are imported from other countries: South Africans blindly buy these products and they don't realize what effects it has on our local economy.

Adapting an industrial building by reusing part of it, makes it economically viable, using it as a 'brownfield site', makes it environmentally sound, but what makes it socially viable? The vacant building is not necessarily the problem, but rather the monofunctional (repetitive) environment thereof. The ultimate question will then be: how can heritage industrial buildings be adapted to be more socially responsive, to the actor (worker) and the viewer (public)? Hence creating a building and environment that encourage proudly South African produce and skills.



## 1.2. Problem statement

Can heritage industrial buildings be adapted to create a connection between production and daily life and hence lead to a sustainable industrial culture?

## 1.3. Hypothesis

Through the adaptation and reuse of an old industrial building, architecture can enable a physical connection between production and daily life.

Architecture can generate a sustainable industrial culture that promotes a integrated city where people can live, work and play. Architecture can also connect the man on the street (viewer) with the industrial process by its connection to public space (the street). This connection between industry and daily life can create a new industrial culture and ultimately strengthen the local economy.

## 1.4. Sub questions

1. What is a sustainable industrial culture?
  - i) Social
  - ii) Environmental
  - iii) Economical
2. How can heritage industrial buildings be adapted for reuse, so that it can support a sustainable industrial culture?
3. How can heritage industrial buildings become more socially responsive?
4. How can social responsive environments have a positive effect on our local economy and skills development?
5. How can connections be established between production and daily life and how can architecture facilitate these connections?

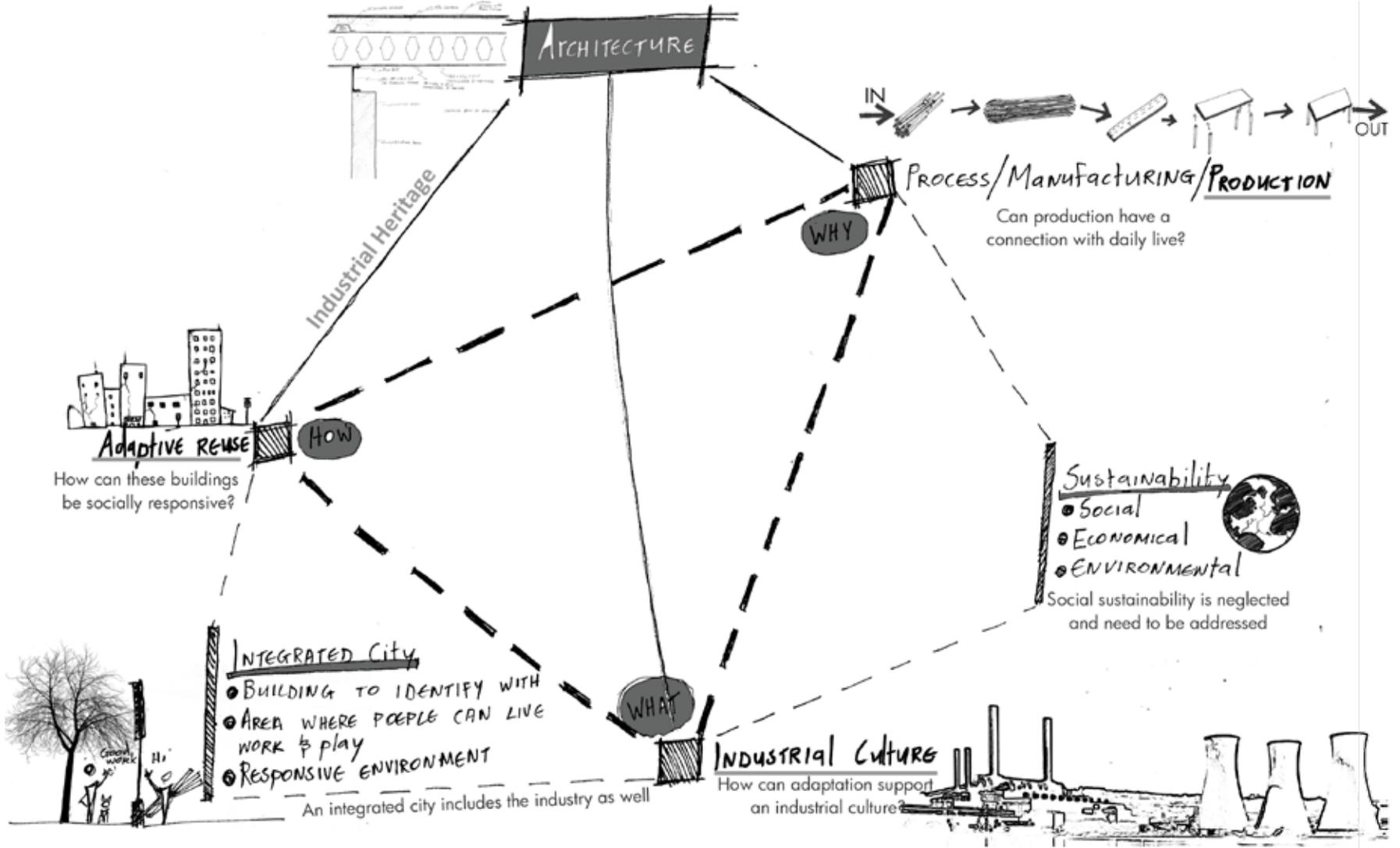


fig. 09\_ Diagram illustrating the interconnectivity between sub problems



1.5. Aim of study | The main objective of the study is to create a socially viable/responsive industry. An industrial structure, that people can relate to, a structure that embraces heritage and interacts with the public.

1.6. Methodology | The design methodology will look at experience as applied by Alfaro Siza (see fig \_10)

**PHENOMENOLOGICAL EXPERIENCE\_**  
*The term “phenomenology” is often restricted to the characterization of sensory qualities of experience (seeing, hearing, etc.) sensations of various kinds. However, our experience is normally much richer in content than mere sensation. Accordingly, in the phenomenological tradition, phenomenology is given a much wider range, addressing the meaning things have in our experience, notably, the significance of objects, events, tools, the flow of time, the self, and others, as these things arise and are experienced in our “life-world” (Stanford Encyclopedia, 2008).*

This notion of experience, as a phenomenological experience, will be adopted for this study. Experience and observation will mould the design and its intentions to the final product. Social responsiveness rely on experience and experience rely on interaction between buildings, the user, the observer and the environment.

The Pretoria West Power Station site has a distinct, majestic character: the quality of the atmosphere is already rich and meaningful. Adaptation of the buildings on site should therefore intervene in such a way that the majestic character is retained, so that future visitors will also be hallowed the experience.

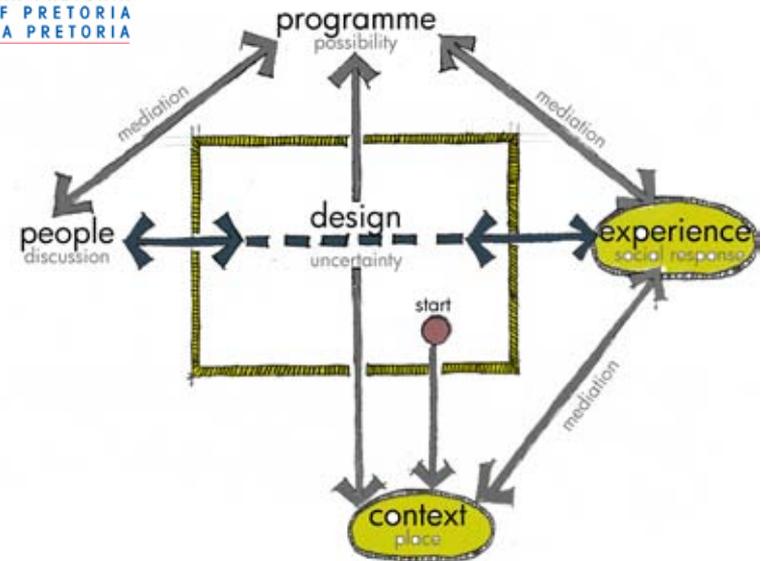


fig. 10\_ Diagram illustrating design methodology

Phenomenological experience also played a role when the program for the dissertation was chosen. The author is of opinion that an architect cannot design something for someone else without experiencing that space with the people that will use it. One needs to understand how the space and the environment around it, will be used.

Alvaro Siza designs by acknowledging reality. He is always attentive to landscape, materials, building systems, uses and to the people who inhabits his buildings. He states that architecture does not have a pre-established language, it's merely a response to a concrete problem: a situation in transformation in which one participates (Moneo, 2004: 202).

It is only by recognising the uncertainties, that

one can address specific problems. Logically, the site is the most important point of reference. By drawing the existing architecture as well as the urban and landscape settings, the first unique moment of intervention comes to life. Architecture then becomes the consequence of the relationship between life and work: the program needs reinterpretation through observation and sensational experience.

Siza always keeps the user of the spaces in mind, because evidently it is they that will determine the success of the building. His architecture recognises the value of the momentary and relishes the being of things that might have turned out differently (Siza, 2010).

A Simplified version of Siza's observations are:

- PLACE:** origin of all architecture.
- DISCUSSION:** understand who will use the building and how it will be used.
- POSSIBILITY:** the conflicts we find in a specific programme may have multiple solutions: it's about finding the most adequate one.
- UNCERTAINTY:** the vagueness of the goal ends as a source of satisfaction - only if a job is done thoroughly.
- MEDIATION:** two heads are better than one. Sometimes one becomes so involved in a project that obvious things become obscure.
- EVIDENCE:** every project is an opportunity to test the uniqueness of things as well as one's reaction to experiences (Moneo, 2004:207).

**Three data collection methods will be adopted to analyse and comprehend the problems that have been identified:**

**1.7.1. MAPPING:**

Mapping is the recording and translating of quantitative data in to a qualitative two-dimensional system. This method is used to explain and orientate the observer.

Mapping is a technique used in many professions: art, psychology, politics, science, literature, etc. "The hard world of numbers and scientific fact collide with the soft world of sensation, memory, illusion and aspiration" (Porter, 2004:114).

Mapping can reflect reading, experience, buildings, roads, movement or people. It is used to render new ideas and to develop or predict how we might intervene in order to solve problems.

This technique was used for:

- The calculation of the heritage significance of buildings.
- New movement patterns of transport and pedestrians in and around the site.
- The placement of new structures in relation to heritage buildings.
- Production process: material and waste, influx and distribution.

**1.7.2. PARTICIPANT OBSERVATION:**

This method involves the observation of a subject in a certain situation, one hopes to gain a better understanding of the behavior, motivation and attitudes of the people under study. The author will specifically conduct an overt participant observation, where the people under study will know who she is and what she is doing (Dawson, 2002:32).

- The programme for the dissertation was observed by visiting a sawmill in the Easter Cape as well as a furniture maker in KwaZulu Natal. The author could form a better understanding of the people, machines and systems that occupy the space.

**1.7.3. DESCRIPTIVE RESEARCH:**

With descriptive research methods, data is collected through observation. The information must be organized and presented systemically, so that valid and accurate conclusions can be made. Case studies, archival and survey research are all forms of descriptive research methods (Leedy, 1992:185).

- Interviews were conducted, with people at the Power Station, to gather information on the history of the site.
- Historic photographs were studied to get accurate information about the development of the area.
- Precedents on materiality, program, heritage and design were studied.

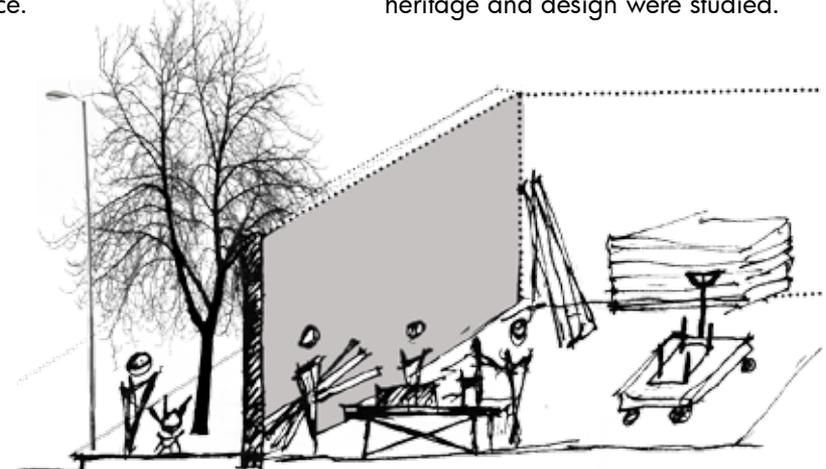


fig. 11\_ *Most industries are closed off to the street and the public, if these buildings could be transparent the energies (people, products, materials, machines etc.) that exists inside the building can spill over into the street*



fig. 12\_ Typical street facade in Mitchell Street, Pretoria West. This is the main route passing through the area and every second building house's a panel beater or a second hand car merchant

1.8. Site introduction  
The study area is located in the West of Pretoria, at a partially mothballed Power Station. The Pretoria West Power Station is located between Church, Buitekant, Rogger Dyson and Quagga Street. The Station is a remnant of South Africa's industrial revolution and of important historical value, not only for Pretoria but for the whole of South Africa. ArcelorMittal located just south of the Power Station site, is in the process of being mothballed (ISCOR, 2010) and the future of the Power Station foresees its decommissioning in the year 2020. When both these sites eventually become obsolete, these massive pieces of land holds the potential for a diverse urban renewal project. A

project that will protect and reuse the industrial heritage in the area.

Through analysis and observation it became evident that the industrial area around the station is already experiencing some form of urban decay. Archival articles proved that Pretoria West once was a significant place of industrial production. Products were produced locally for export. Today the Pretoria West area is filled with informal dwellings, scrap yards, second hand car wholesalers and panel beaters. Some manufacturers are still trying to survive; but they are enclosed by high walls or fences - there is subsequently very little interaction with the streetscape.



fig. 13\_ Scrap yards spill into the streetscape, causing unfriendly sidewalks



fig. 14\_ Client: Logo of Corrie lynn & co. furniture makers

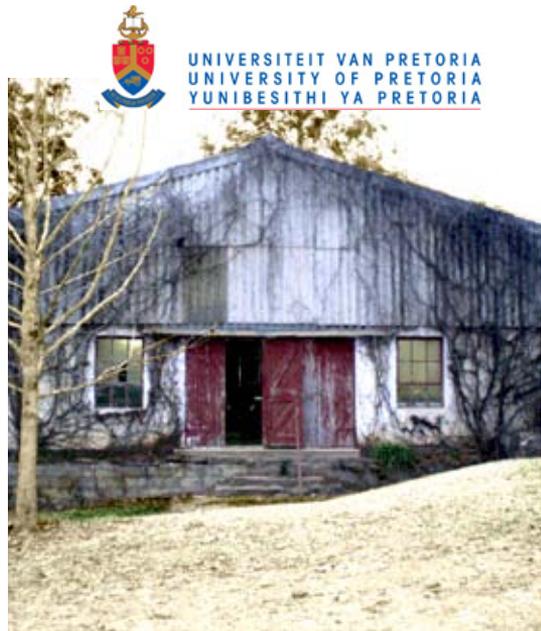


fig. 15\_ Corrie lynn & co's workshop in a restored farm shed



fig. 16\_ Robin Fowler only uses timber from demolished building or from trees that the municipality cut down

11.9.1. CLIENT\_

Corrie Lynn & Co timber furniture makers in collaboration with the United Nations Human Development Program (UNHDP).

1.9.2. PROBLEM STATEMENT\_

In 2006 the UNHDP observed that even though there was a decline in income in almost all income groups, the most drastic decline occurred in least wealthy households (Shivambu, 2006). According to Shivambu, it is almost clinically proven that there is a direct link between quality skills and poverty reduction.

The Accelerated and Shared Growth Initiative for South Africa (Asgi-SA) identified that the quantity of unskilled

people in South Africa could directly be linked to the decline in economical growth. In 2006 the Deputy President Mlambo-Ngouka also launched the Joint Initiative on Priority Skills Acquisition (Jipsa), this is a team that identify skills that are urgently needed and advise on how targets can be met.

For higher levels of growth and development South Africa needs high levels of both quantity and quality in skills, education and training (Shivambu, 2006). This will provide more job opportunities and more families will be able to sustain themselves.

Growth and development can only occur when there is a expansion in the manufacturing sector. The UNHDP recommends that the

focus be on two very broad sectors of the South African economy: activities that will receive large scale financial support and those that will fund themselves. The activities that require financial support will consist of small scale agriculture, small and medium projects and larger businesses that must either operate at high levels of labour intensity or generate substantial employment multipliers (Shivambu, 2006). Skills development will therefore be supported if local production is endorsed.

Corrie Lynn & Co is a thriving wood furniture workshop housed in restored farm buildings in Dargle Valley, KwaZulu Natal. The owner Robin Fowler designer and furniture maker, called for the expansion of the company and wants to relocate to Pretoria. Furniture



fig. 17\_ Corrie Lynn & Co's furniture showroom, made from found timber

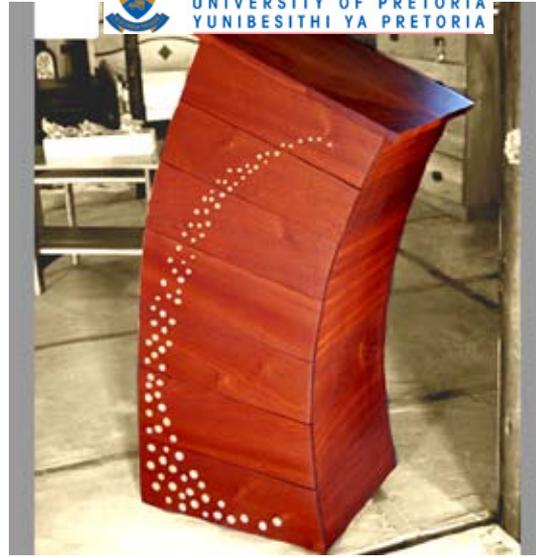


fig. 18\_ Robin Fowler's favorite work - he pushes the boundary and takes shaping of timber to the next level



fig. 19\_ Retable workshop space will also be provided for timber craft

making is a very labour intensive industry, they therefore qualify for financial assistance by the UNHDP. Designer furniture will not only be produced for local retail, but will also be exported as proudly South African products. Corrie Lynn & Co follows an environmental and social sustainable policy. They only use trees that are taken out by the municipality or timber from demolished buildings. Robin trains all personnel and prefers that they are unskilled in wood making when they arrive, this way he can train people to the level of skill needed. He also believes that each furniture maker should have a level of emotional investment in the work they do, he thus teaches to make furniture from start to finish. The development of skills and the implementation of emotional

investment not only provide the individual with the knowledge of producing a sophisticated product, but also nurse self-confidence and self-respect (Fowler, 2010).

Prior to the decision to expand Corrie Lynn & Co could financially manage to provide transitional accommodation to employees, while training. They had to seek financial assistance in this regard.

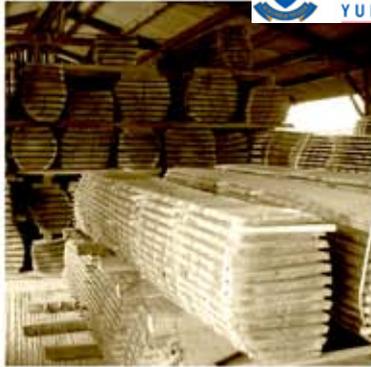
### 1.9.3. RESPONSE\_

The UNHDP agreed to subsidise transitional housing for 10 employees of Corrie Lynn & Co. The company's social policies will not only add value to the industry but it will also

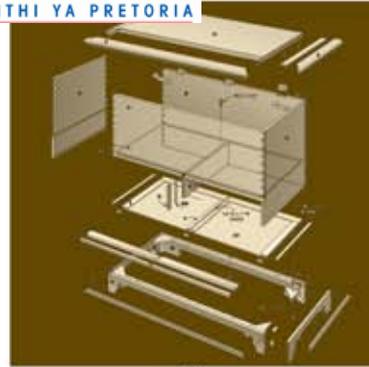
help individuals to sustain themselves in the greater spectrum of life. This skill exchange give individuals the opportunity to practise the skill after hours or even implement further skill exchange in their communities.



Lumber is collected and dried off site.



Tree trunks go through a ripping and cross-cutting process - timber is cut into more manageable sizes and put into storage.

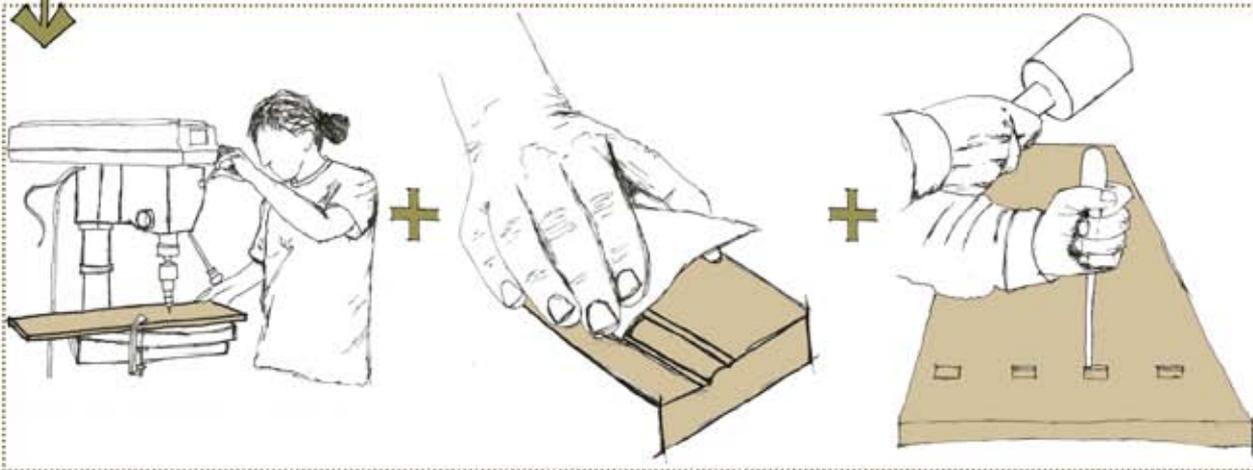


Furniture maker receives a design and cutting list. Cutting lists are drawn up to determine how trunks should be cut to maximise timber usage.

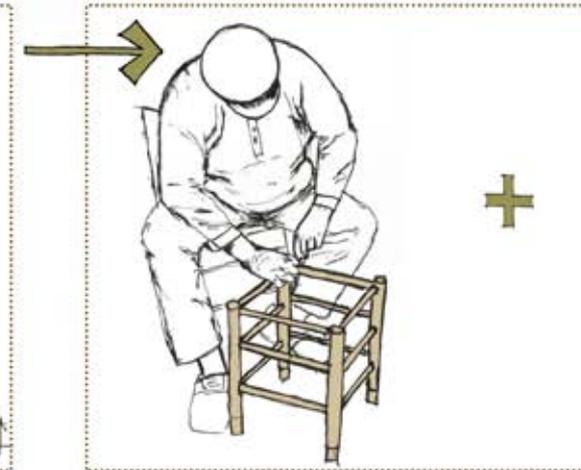


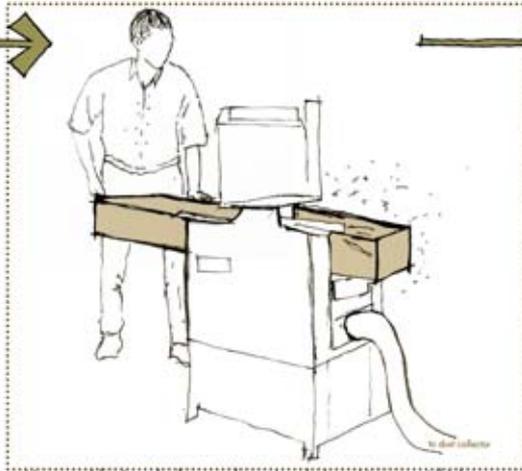
Furniture makers move between work benches and power tools to create the parts that will later be assembled.

18



The parts are then shaped, drilled, mortised, sanded, chiselled etc. to perfection.

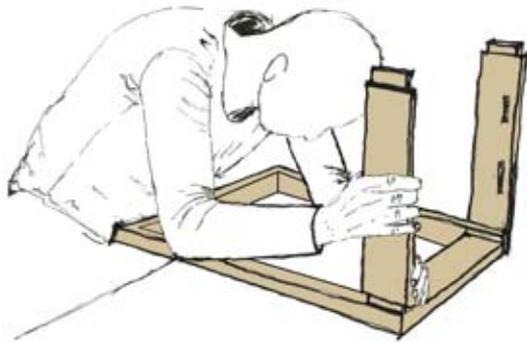




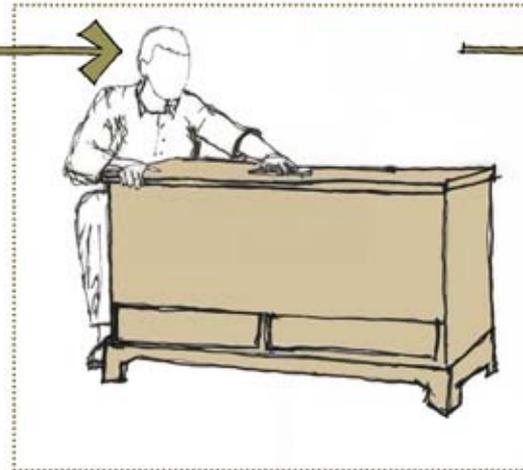
Manageable size planks are shaped and planed to correct thicknesses with a thickness planer, only a small amount of material is removed.



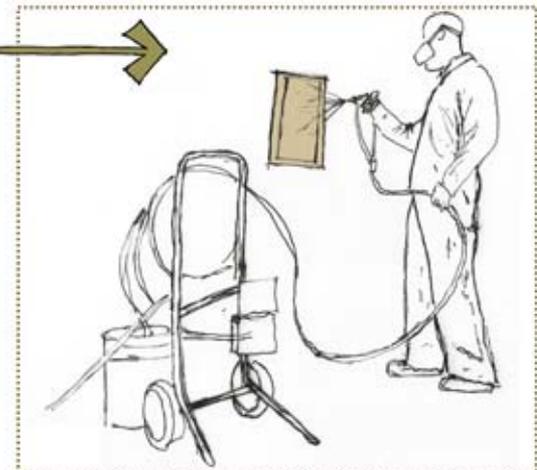
A table saw and ban saw is used to roughly create the shapes needed.



Assemble- the parts are assembled with jig frames and glue, furniture pieces are then left to dry.



Quality check, final touches and sanding.



Painting and drying.



fig. 20\_ Workers taking a break at Schenk brothers sawmill, Hogsback, Eastern Cape. The aim of the study is to create a connection between the blue collar worker and the public, the design should be socially responsive.



#### 1.9.4. BRIEF\_

As the client follows a very distinct and sustainable policy, the architect was asked to assist in the location of an appropriate site. The client insisted on finding a vacant industrial building that calls for conservation, this ties in with their sustainable approach.

#### 1.9.5. PROGRAMMES\_

**Design and manufacturing\_** This is the main programme for the development. The design studios for designers and workshop spaces for furniture makers need to be located close to each other. This will insure social interaction between the spaces and the people that use them.

**Show room and retail\_** These functions must be physically separated from the manufacturing process, but must have a visual link to connect production with product and educate the public in this regard. The social aim is not only to train unskilled people, but also to show the general public how the production process works. This will emphasize the connection between production and daily life, without disturbing the production process.

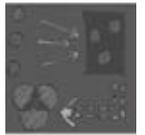
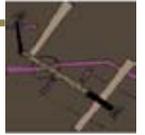
**Rentable workshop space\_** The client wants to create a wood craft hub, where not only furniture designers, but also smaller craftsmen can be part of the process of exchanging skill and energies.

**Event Space\_** Furniture and craft designers often design new collections to celebrate the level of skill and the unique products produced. The client insisted on having an event space to launch new designs. The space should have a double function: if it is not used by Corrie Lynn & Co, it should function as a furniture gallery and coffee/cocktail bar.



# context

The location and character of the Pretoria West Power Station is presented.





2.1. Location\_





fig. 21\_ location Mapping of Pretoria West Power Station

**WHY INVEST IN INDUSTRIAL AREAS IN SOUTH AFRICA?**

According to some global companies (Acer Africa, Agrid South Africa, Britannia Biscuits, etc.) with a presence in South Africa, there are many advantages for setting up shop in our country. Our low labour costs and infrastructure form an adequate base for export of products to international destinations (SouthAfrica.info, 2010). On a continental level South Africa’s trade with countries increased since 1994. Today South Africa is the fourth-largest export destination in Africa. (Economy, 2010).

The Study Area

*“The sophisticated business environment of South Africa provides a powerful strategic export and manufacturing platform for achieving global competitive advantage, cost reductions and new market access”*  
\_Jim Meyer (president of the American Chamber of commerce in South Africa)

## 2.2. Pretoria West

According to the Integrated Compaction and Densification strategy for Pretoria West Residential Precincts (2008), the Pretoria West area was established in 1892 and is one of the oldest townships in Pretoria, along with Arcadia, Sunnyside and Muckleneuk. At first this was only a residential area but over the years it grew and the character of the area changed to mixed-use, industrial developments, businesses, flats and single residential areas (Planners & Designers, 2008).

Pretoria West is exceptionally well located in relation to Pretoria Central and for employment opportunities in the surrounding areas. The precinct is in a fairly structurally sound physical condition,

with a unique urban character (Municipality, 2004).

The area to the North is bounded by the Witwaters Berg. The area to the south consists of well maintained areas, which include military facilities, correctional services facilities, South African Police, and the Weskoppies Hospital on the Schurweberg. In the East, the area consists of the well developed areas of the inner City, consisting out of retail, office developments, and buildings of value for conservation (especially on Church Square). To the West, the area is bounded by residential areas (Municipality, 2004).

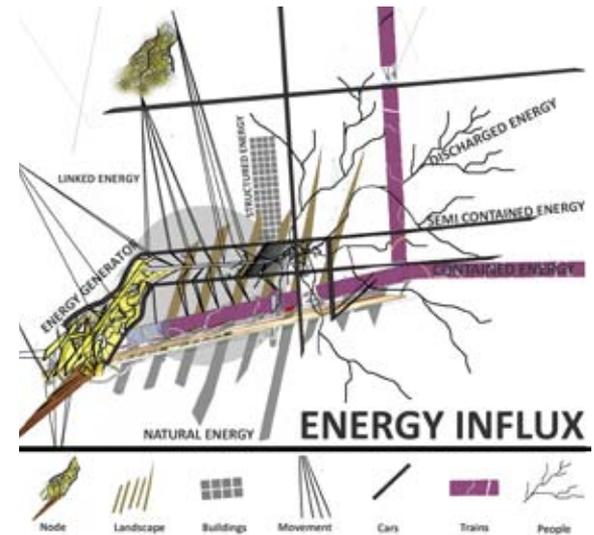


fig. 22\_ Diagram illustrating the different forms of energy influx Pretoria West experiences



Atteridgeville & Laudium

Danville

Proclamation Hill

Pretoria West

CBD

Sunnyside

Study Area

Witwaters Berg

Military

Weskoppies

SchurwebergBerg

Pretoria West Industrial

fig. 23\_ Location map illustrating the area around Pretoria West. Note how the area is bounded by the mountain ranges in the North and South

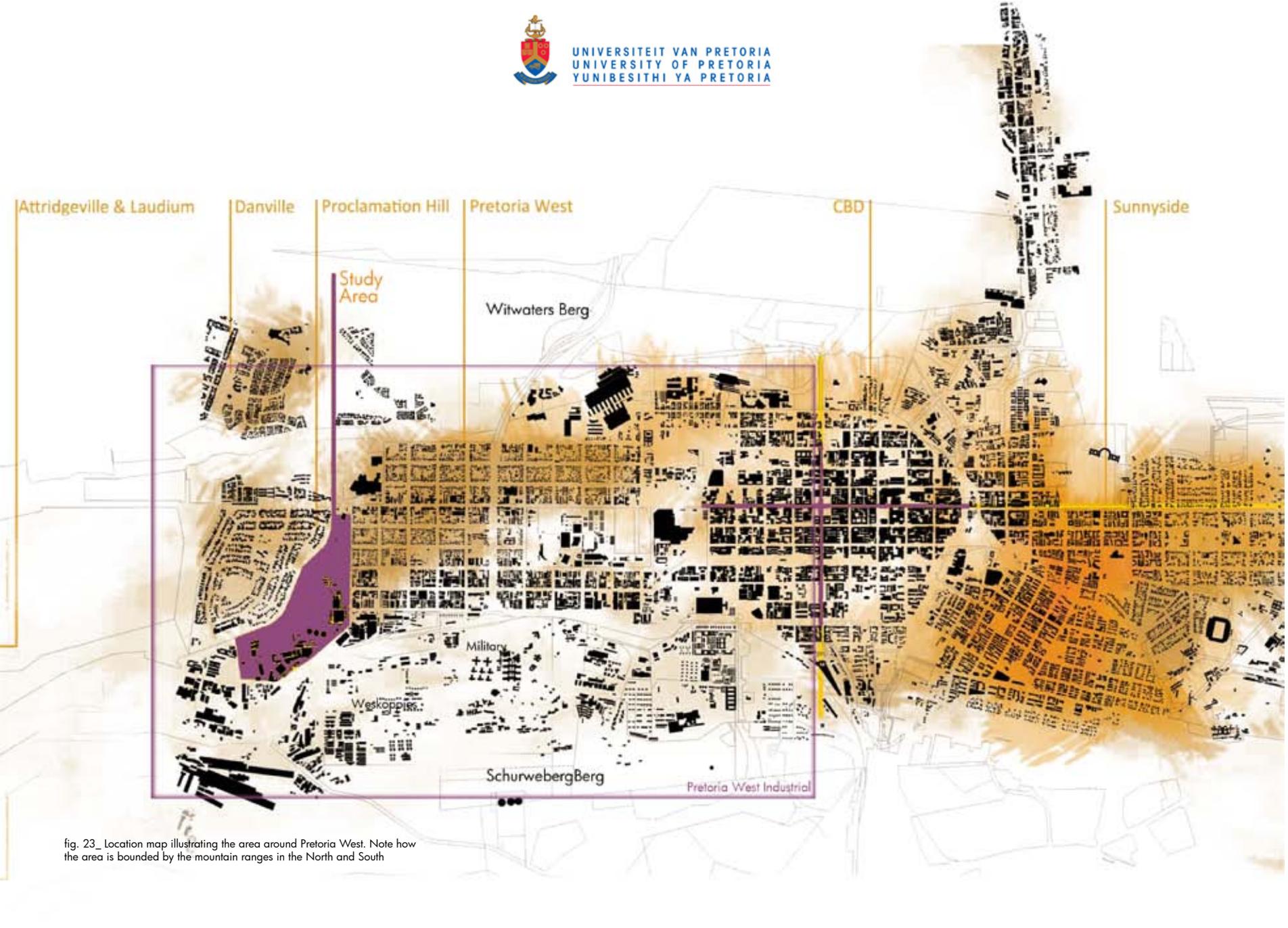




fig. 24\_ Image illustrating a city without people

### BUSSES AND TAXIS

Bus stops occur on most blocks: residents and labourers in the area have a potential high degree of accessibility by bus.

Mini Busses are also very active as in the rest of Tshwane \_ Four important East-West routes pass through this area: Mitchell and Soutter Street (one-ways); Von Hagen Street (on the North edge) and Church Street.

### RAILWAY

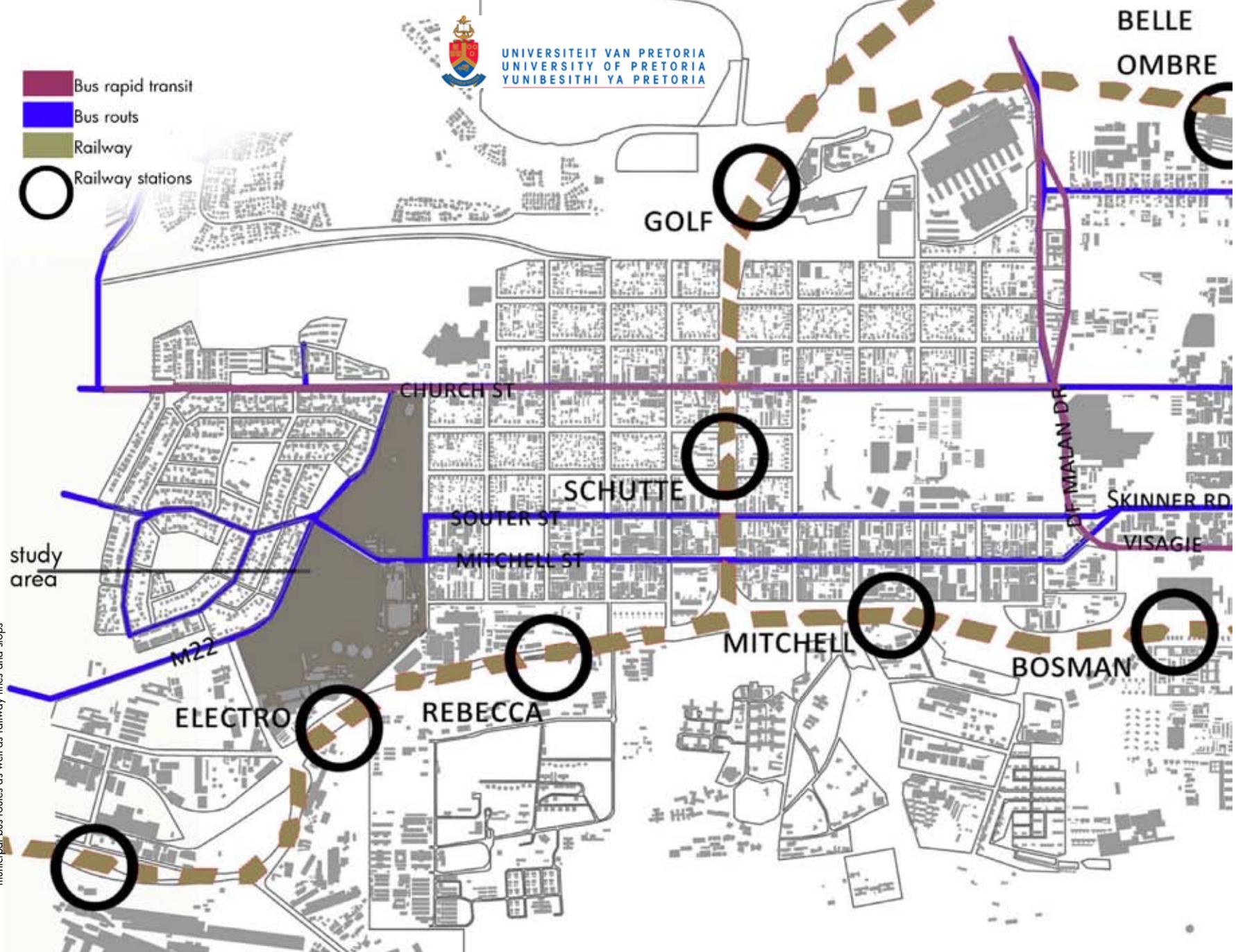
A number of stations are located at close intervals and serves the industrial area adequately. The railway also serves the more regional significant facilities like Pilditch and the Pretoria Show Grounds - these facilities are on average 10 minutes walk from a station. Important linkages will also be established with the rest of the city when the proposed new Ring Rail project comes into play.

For the Pretoria Power Station development or any of their labour intensive industries to be successful, one needs people. People, not only from the Pretoria West area but also from in and around Tshwane. The analyses of the transport systems in the area proved adequate

placement and routes. The proximity of the railway line to the Power Station site, can only add to the success of the site as an industrial precinct.

-  Bus rapid transit
-  Bus routes
-  Railway
-  Railway stations

fig. 25\_ Nolly Map of Pretoria West precinct, illustrating bus rapid transit and municipal bus routes as well as railway lines and stops



## 2.2.2. Pretoria West Industrial

In 1928 the Parliament established the South African Iron and Steel Corporation Limited (IsCOR) on the site just south of the power station. During the worst years of the great depression this big construction programme did much to relieve unemployment and bring some measure of prosperity to the city. IsCOR rapidly began to expand and the steel industry sprawled into the rest of Mitchell street and for that matter South Africa. They not only produced steel products like rails, structural steel sections, bars and rods, but also a wide range of by-products. These by-products like road tar, ammonia liquor for the explosives industry and creosotes formed new industries that also located in the west (Engelbrecht et al., 1952:103).

At present the closure of IsCOR is unfortunately seen as a blessing in disguise: they were the biggest polluter in the West and to a certain extent sterilising the area for various other types of new development.

Though industrial areas are generally associated with a neglected urban environment, the potential for a quality industrial area can be seen in many newly established industrial townships. The Pretoria West industrial precinct suffered neglect largely through the primary industrial nature of the ISCOR site and the power station. The polluting character of these primary industries caused considerable degradation of the area. The industrial precinct is a well established industrial node consisting of the Pretoria Industrial Township and ISCOR and is

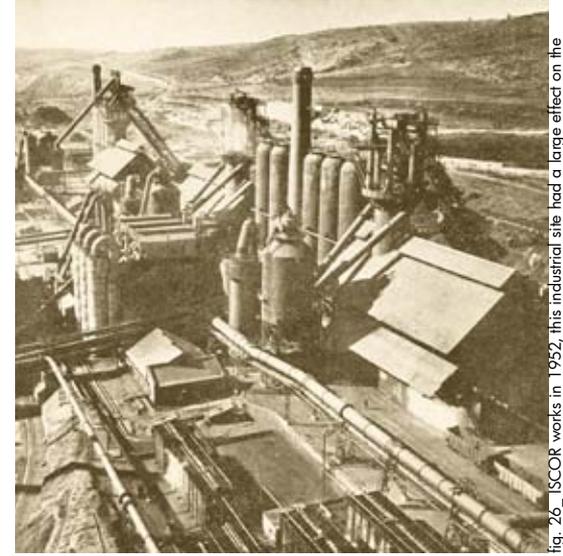


fig. 26. ISCOR works in 1952, this industrial site had a large effect on the industrial growth in the West and the whole of South Africa

located closely to well established residential suburbs. The ISCOR land is considered central to the unlocking of this precinct, creating new large manufacturers and other commercial enterprises (Municipality, 2004).

*“So it is that from the efforts of a few enthusiasts, Pretoria has become, in a remarkable short space of time, the nerve centre of a great industrial complex on which much of the prosperity and growth of South African Industry, in fact of the whole South African economy, depends.”*

(Stark, 1952:105)

### 2.3. Pretoria West Power Station\_

The first building on the Power station site was called the A-station. It expanded from one building, which housed three 3MW turbo-alternators and six boilers. The plant grew in phases as the demand for power continued to increase. In 1940 the capacity of the station was 54 MW, and the station was starting to reach its limits. In 1952 the Pretoria West Power station sold more than 400 000 000 units per year and more than 10 000 street lamps were kept burning every night. It was also the year that the new B-station was commissioned. In 1954 Station A was decommissioned.

The years to come Station-A was mostly used for storage space of machinery.

In the 1990's health and safety acts, demanded that all asbestos needed to be removed from site- most of the old buildings on site contained this material to some degree. As the Pretoria West Power Station is owned by the municipality as a private organisation and, not by ESCOM, funds were scarce. The municipality decided to strip Station-A of all metal components: this included all floors and machinery. The metal was sold as scrap to smelters and the revenue paid for the removal of the asbestos. Today, this building stands only as a shell to an enormous void ( for an explanation of the heritage of the site see page 30).



fig. 27\_ Pretoria West Power Station and the area where the framework intervention will commence

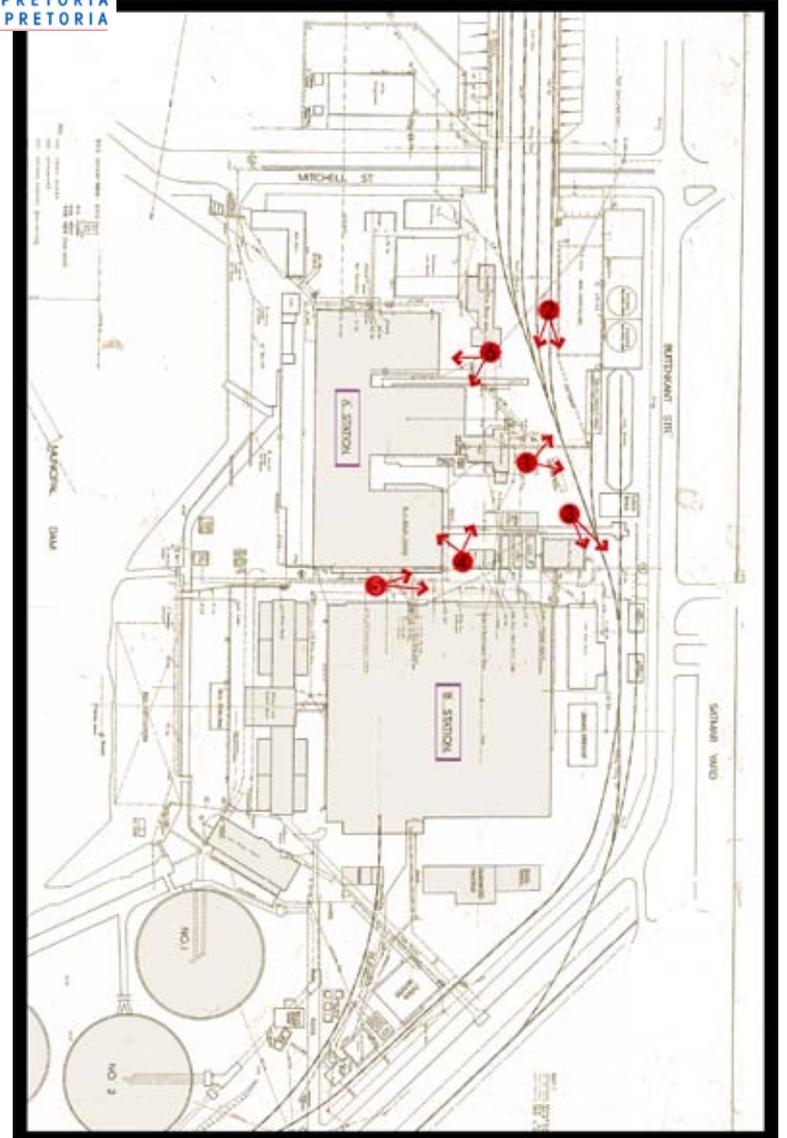


fig. 28\_ Site Plan of existing structures on site, note Station A and B as well as views 1 to 6 (page 31)



fig. 29\_ View 1: The Coal bunkers\_trains enter the site and dump the coal in the bunkers, from here it is taken to the fireboxes by conveyor

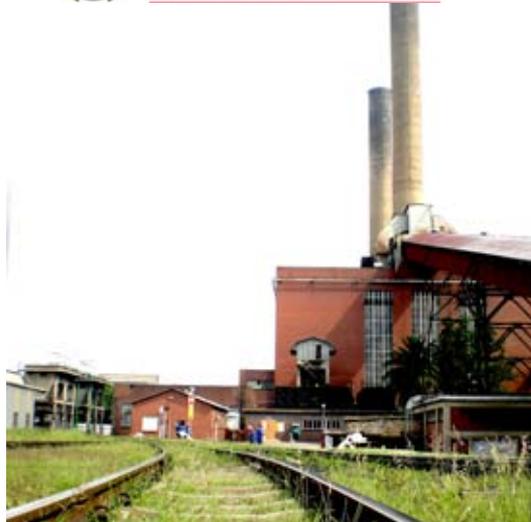


fig. 30\_ View 2: Station B and the conveyor belt that takes coal from the coal bunkers to the fireboxes



fig. 31\_ View 3: Ash hoppers\_after coal is burned it is taken here where contractors pick it up for use in for example concrete

2.4. Site views



fig. 32\_ View 4: Both these buildings form part of Station A and their interiors have been cleaned out of all metal components



fig. 33\_ View 5: Station A on the left and Station B on the right, with moth-balled ash hoppers in-between

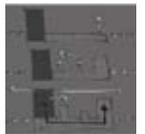
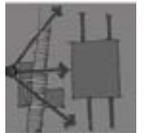
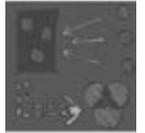
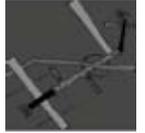


fig. 34\_ View 6: Station A, some of the buildings on site has been decommissioned for over 60 years



# vision

This chapter will discuss the vision for Pretoria West Power Station, compiled by the Pretoria West Framework Group 2010





*“The city is not merely a grey speechless mass, ponderous beyond description. It is a built thing that is continuously refined through our physical interactions. The way we physically rub flecks of paint off walls, the way wood warps with use, the way our feet inscribe a rubbed-in history on a set of granite stairs. And gradually, as our accidental or intentional inscriptions are pushed into walls—the dent of a shoulder—or written on brick—a graffitied image or comment—these marks and rubs are read as a narrative.”*

*(Macfie, 2008)*

Why Pretoria West?  
3.1.

Urban sprawl is a general problem in most cities in South Africa. It is problematic, because it weakens the fabric of a city. By studying a Nolly map of Pretoria and the surrounding area it is apparent that sprawling expanded to a greater degree towards the East than to the West. As a result Pretoria CBD is experiencing urban problems (safety, vacant buildings, no cross programming etc.).

Cities require urban support cells to lighten the weight of a full scale urban renewal. Therefore having support cells on the periphery of Pretoria CBD, might solve the problems in the inner city.

Negative perception dilutes development

potential. However after analysis, valuable aspects of the study area are revealed and this leads to new development potential specific to the study area.

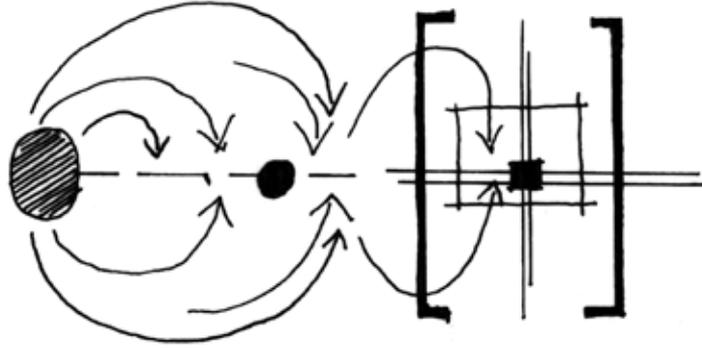
The ultimate vision for Pretoria West is that it should become a support system for the city of Pretoria. This might counteract sprawling further West and people will move into this denser area.

This land is filled with potential for hybrid programming. The infrastructure is already in place and when the time of ‘end of suburbia’ comes, this will become the perfect location to live and work – a walkable city with sufficient public transport. The area can support a wide range of programmes, because it has direct

connections to provincial and national systems of production, trade and transport.

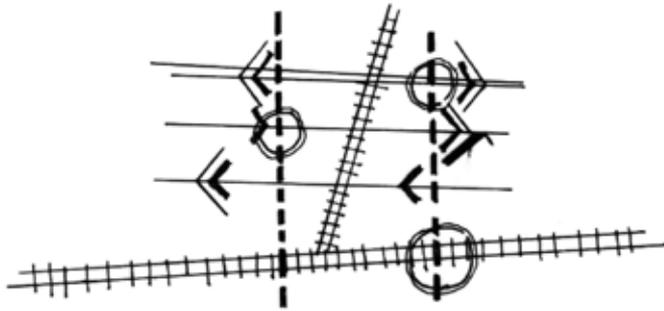
This area is rich in historical value and the century old grid lends itself to a more dense urban fabric. The grid block sizes are the same as Pretoria CBDs’, which means the area can far exceed its current densities.

### subsupport system for the city of pretoria



- counteract sprawling
- form a urban support cell
- densification of area
- support other framework (CBD, Marabastad)

### in-place urban infrastructure



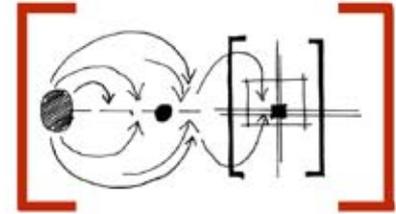
- existing urban grid mimics the city core
- area has the potential for higher densities
- it is a direct and manageable cell for support and densification for the CBDv

### urban fabric of multiplicity



- potential for hybridity in program
- urban space and infrastructure
- vast potential for economic, social, sustainable urban growth

fig. 35\_ Diagrams representing the vision and development of Pretoria West



38



current densities

growth

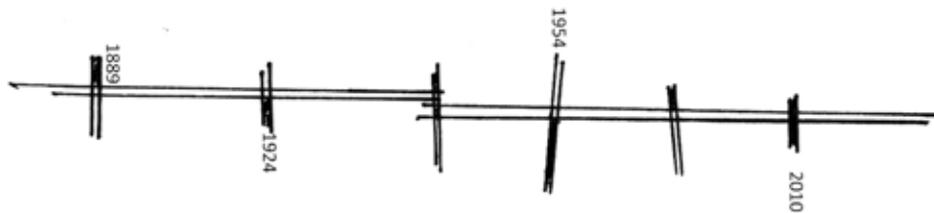
fig. 36\_ Densities diagram: projected residential density growth in Pretoria West



fig. 37\_ Graphic representation of the vision created for the area: the image illustrates a integrated city where industry can occur parallel to everyday life

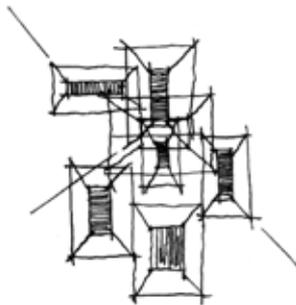


## subsupport system for the city of pretoria



- dates indicate important moment in Pretoria West area
- valuable existing industrial building stock should be integrated into urban fabric

## perception dilute development potential



- opportunities for smart industry/housing, landscape urbanism and various other hybrid design theories can be applied

## regional connectivity



- this cell has direct connection to provincial and national systems of production, trade and transport
- the unique character should be cultivated to reach the potential of a productive quarter

fig. 38\_ Diagrams representing the vision and development of Pretoria West



UNIVERSITEIT VAN PRETORIA  
 UNIVERSITY OF PRETORIA  
 YUNIBESITHI YA PRETORIA

Proclamation hill



remaining historic fabric

lost areas / memory of urban fabric

current urban fabric

fig. 39\_ Mapping indicates the heritage and memory in the area



fig. 40\_ Graphic representation of the vision created for Pretoria West area: the image illustrates the integration of industrial heritage into the city fabric

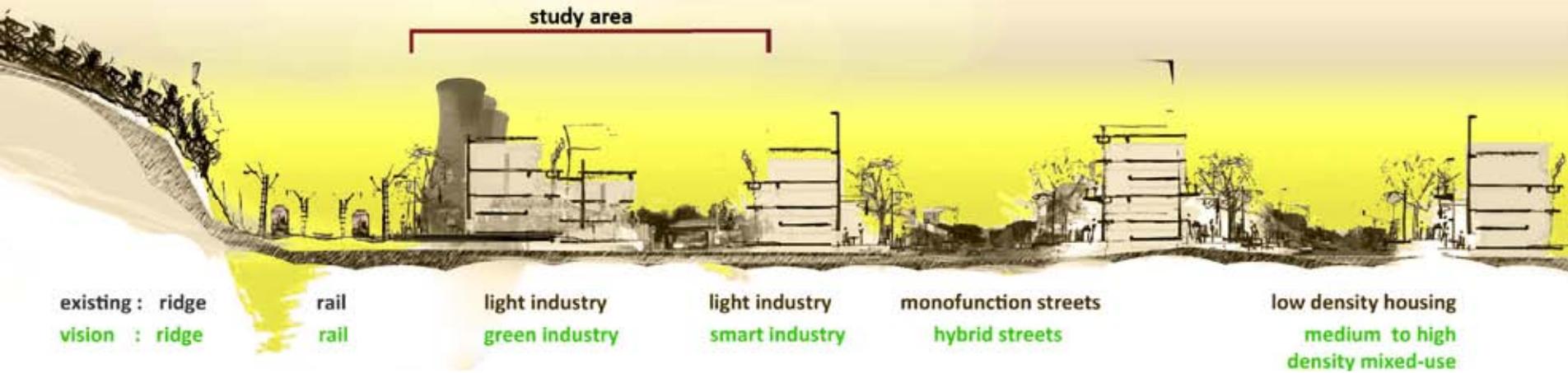


fig. 41\_ Sectional diagram illustrating the new proposed scale for Pretoria West: note the threshold between building and street



### 3.2. Why The Pretoria West Power Station? \_

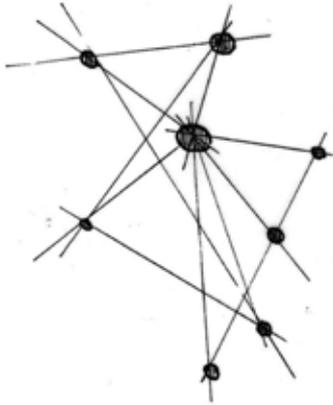
The vision for the Power Station site is the creation of a light industrial productive precinct with hybrid programs (agriculture, housing, production and transport). The future for Pretoria West envisions a place where products are produced: anything from food to furniture. The reason: this area is already labeled as industrial and is situated flanking a railway which enforces the ease of transporting to and from the site.

The programs that are proposed in this precinct must focus on energy distribution and influx. This means that the programs should not only focus on the production of a physical material, but also on the development of skills.

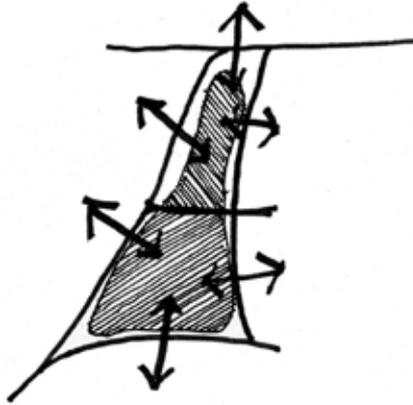
The Power station site has the potential of becoming a small town in itself. The existing fabric has awesome potential: beautiful spaces are already created between buildings. Robust industrial heritage stock is at a good urban scale and decommissioning of the site will give the opportunity for public infiltration. The existing character must at all times be protected as the station is already a landmark in the area. The development may have the potential of recreating the Power Station as a gateway and important node for Pretoria (see fig. 40 - 41)



### current rail connection



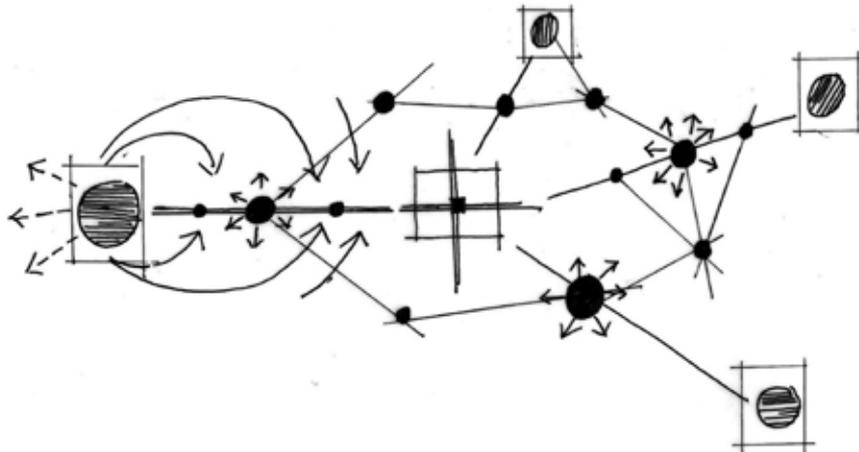
### publicise private space



### opportunity for diversity



### major node on activity spine



### industrial heritage

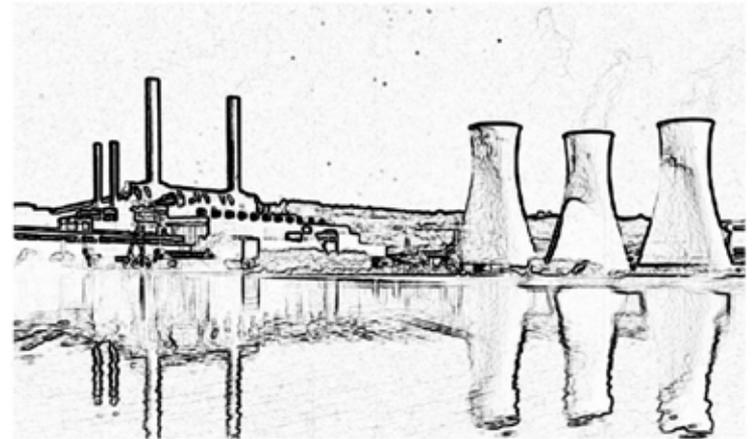
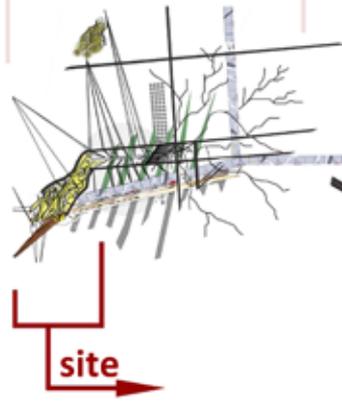


fig. 42\_ Diagrams representing the development of Pretoria West Power Station as well as the opportunities of the site and its location



pta west



SEMI CONTAINED ENERGY

ENERGY EXCHANGE

FLUCTUATING ENERGY

DISCHARGED ENERGY

STATIC ENERGY

NATURAL ENERGY

POTENTIAL ENERGY

CONTAINED ENERGY



fig. 43\_ Diagram illustrating current site energies

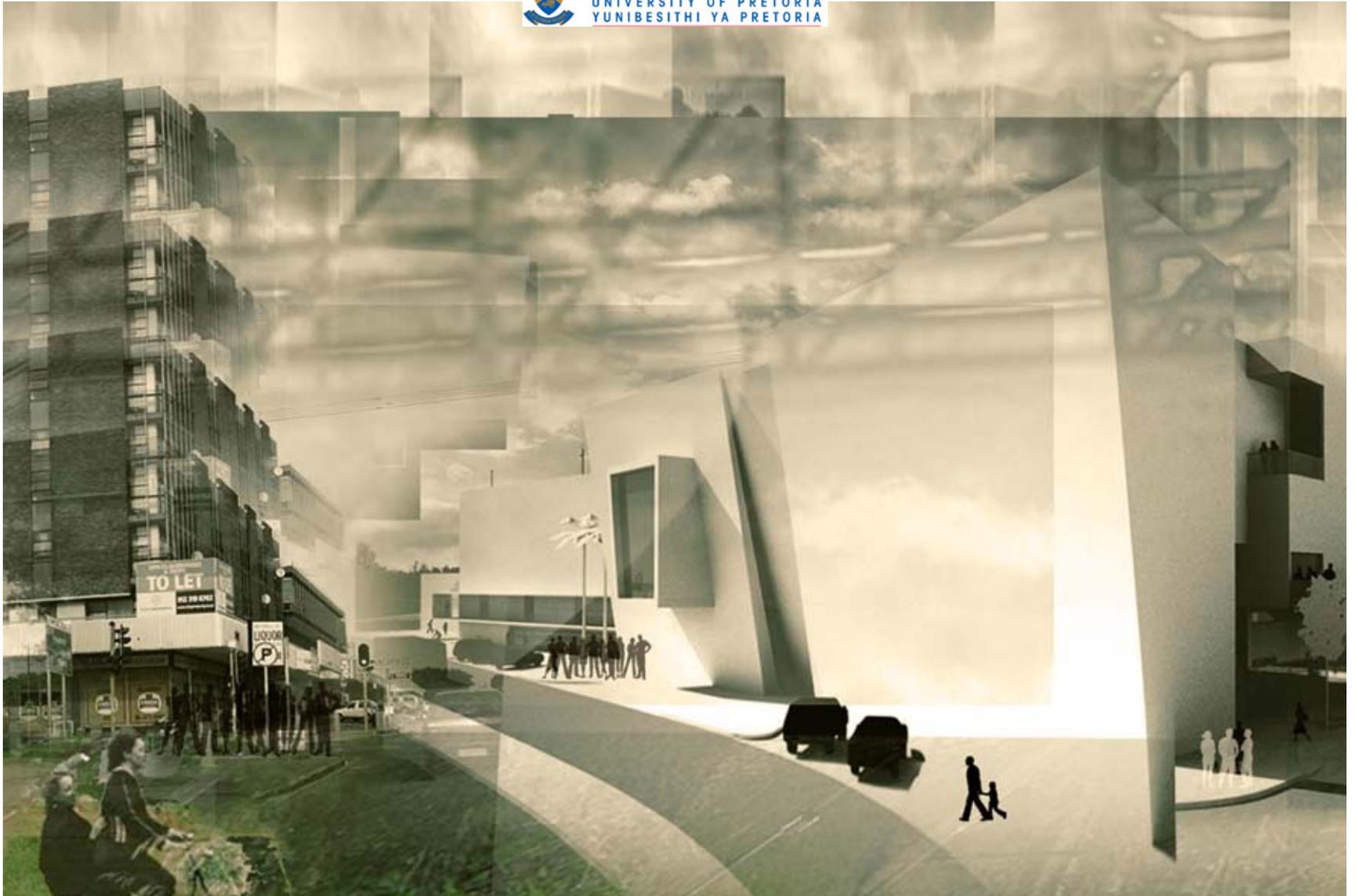
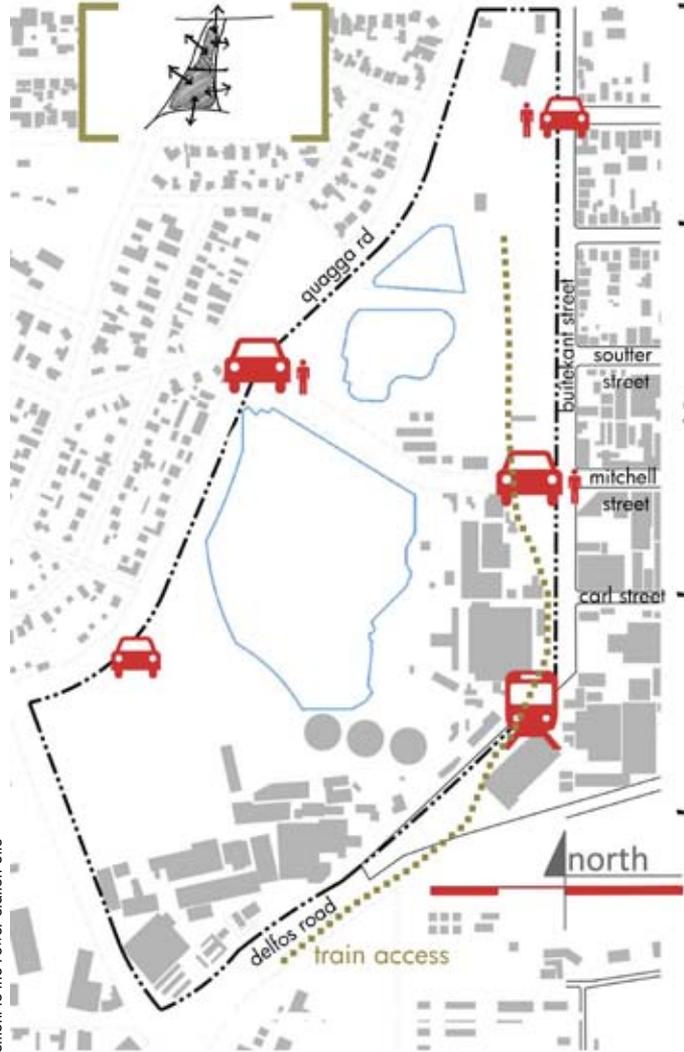
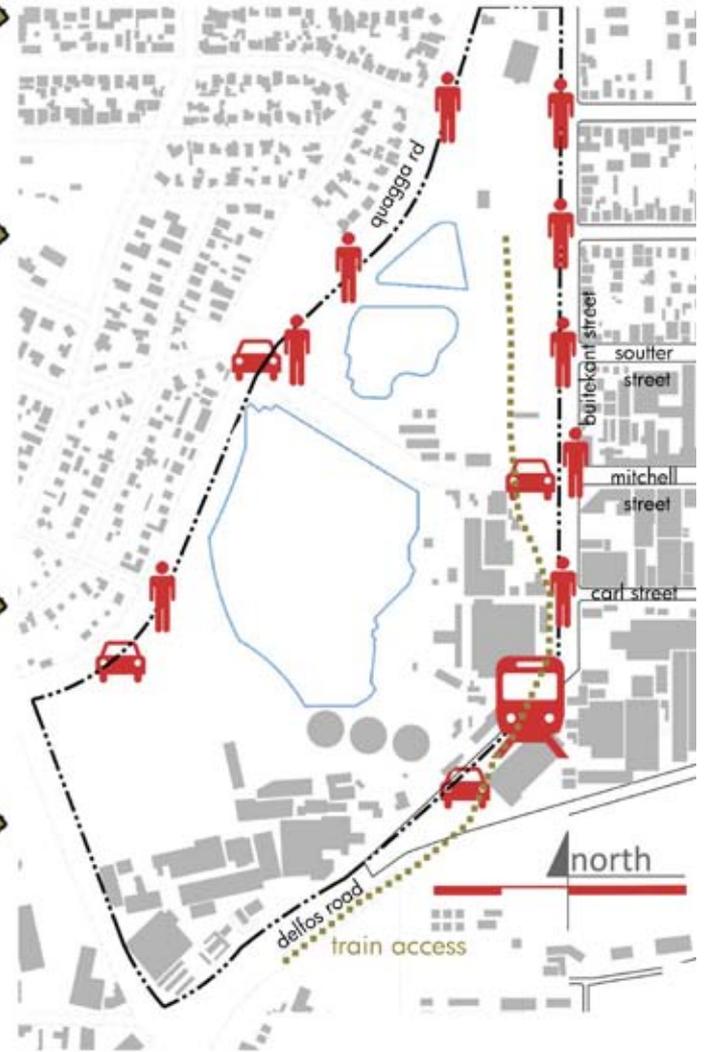


fig. 44\_ Graphic illustration of the hybrid industry for the Power Station, the group envisions a site where housing, industry and recreational activities can occur side by side

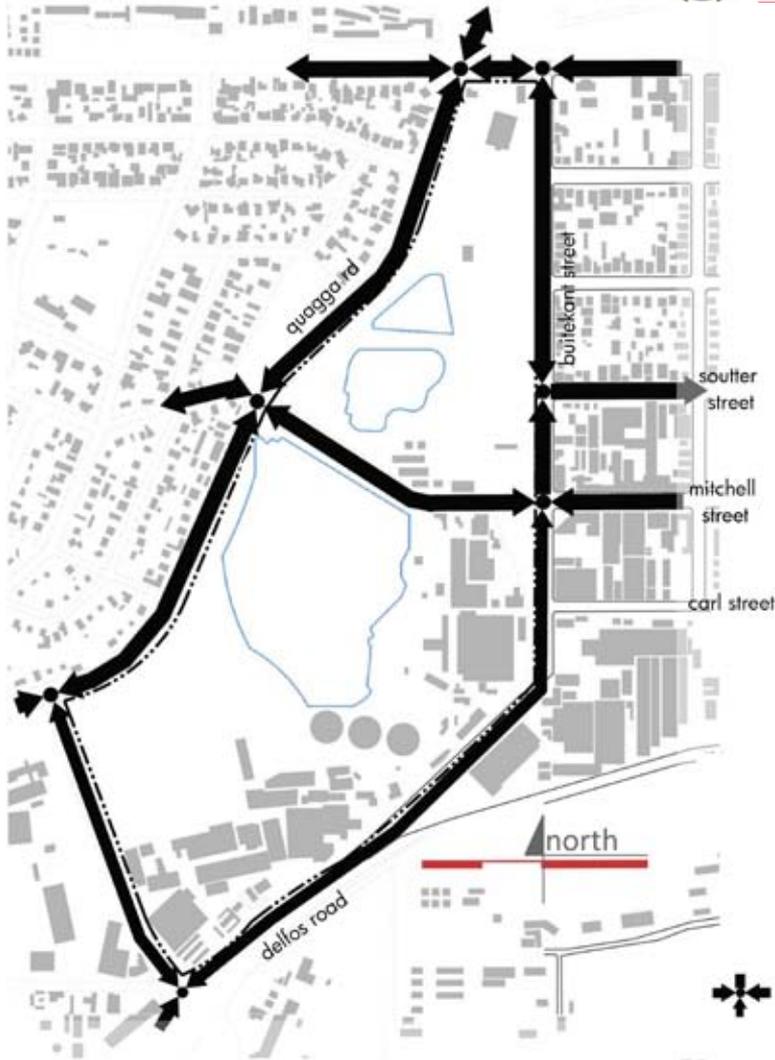


existing access

- 24hour amenities
- increase pedestrian and rail activity
- slow down motorist manouvers
- breach park and campus access
- develop produce and trade access



new access



existing movement



new movement

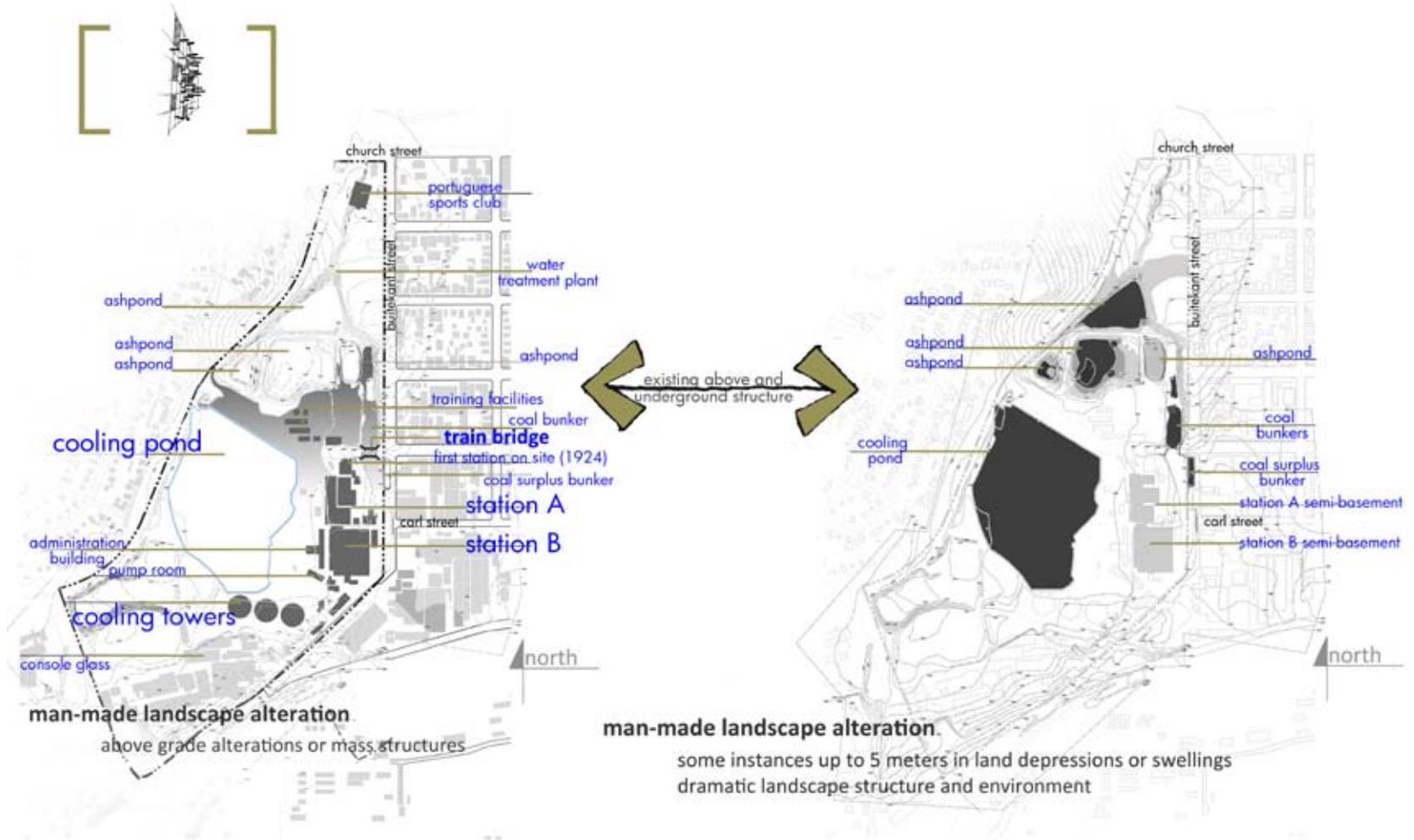
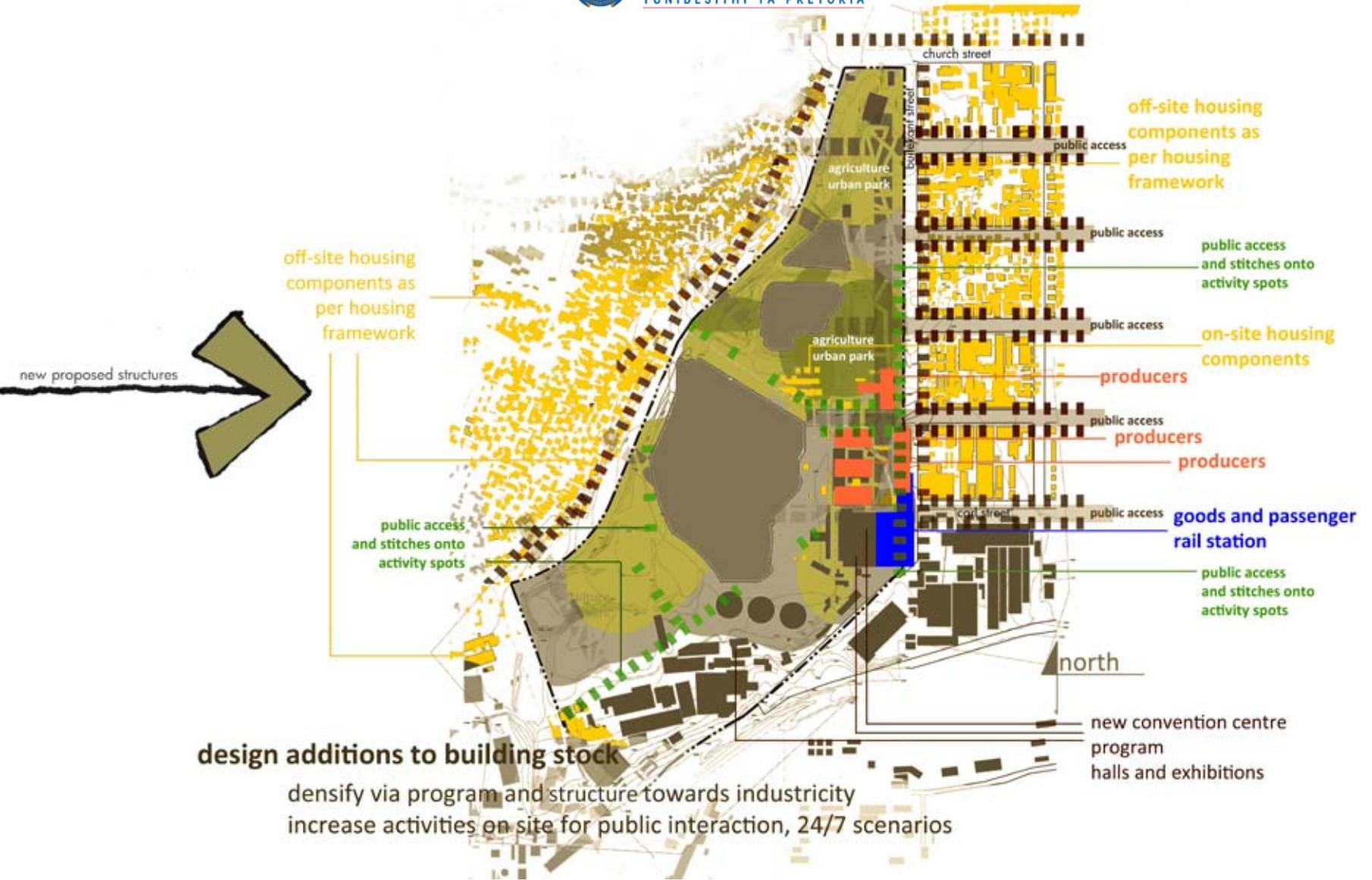


fig. 46\_ Graphic illustration indicating existing above and underground structures, as well as the proposed new intervention for the site



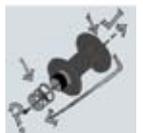
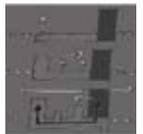
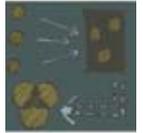
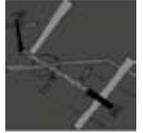
**design additions to building stock**

densify via program and structure towards industry  
increase activities on site for public interaction, 24/7 scenarios



# research

In this chapter the connectivity between the sub questions (p.10) will be established and a conclusion will be drawn to determine a possible answer for the problem statement.





### 4.1.1. WHAT IS SUSTAINABILITY?

According to the author, sustainability means to constantly be aware of the environment around and always striving for better living conditions. Sustainability has three interdependent factors—the one cannot function without the other. The Green Handbook of South Africa gives a clear definition of environmental, social and economical sustainability.

#### **Environmental sustainability\_**

*This requires that natural capital remains intact. This means that the source and sink function of the environment should not be degraded. Therefore, the extraction of renewable resources should not exceed the rate at which they renew, and the absorption capacity to the environment to assimilate wastes should not be exceeded (Van Wyk, 2009: 23).*

#### **Social sustainability\_**

*This requires that the cohesion of society and its ability to work towards common goals be maintained. Individual needs, such as those for health and well-being, nutrition, shelter, education and cultural expression should be met (Van Wyk, 2009: 23).*

#### **Economic sustainability\_**

*This occurs when developments, which moves toward social and environmental sustainability, is financially feasible (Van Wyk, 2009: 23).*

In the last decade or two, environmental awareness has grown exponentially around the world. Global warming is a reality and has been proven by scientists. The question is no longer: if global warming will happen its

is rather: when will we start experiencing its full effects and their consequences. The earth's surface temperature has already increased by about 1.8°C, total snow cover has decreased and sea levels are still rising (Scientists, 2009).

*"The evidence is now clear: industrial civilization has caused irreparable damage. Our political and corporate leaders have persistently ignored the overwhelming scientific evidence. It's not just the 11th hour its 11:59. By the end of the century there might be 150 million environmental refugees. There are too many of us, using too many resources too fast. Every living system on earth is in decline and the rate of decline is accelerating. The tragedy is the extinction of human kind. Our prevailing generation has to create a sustainable world*

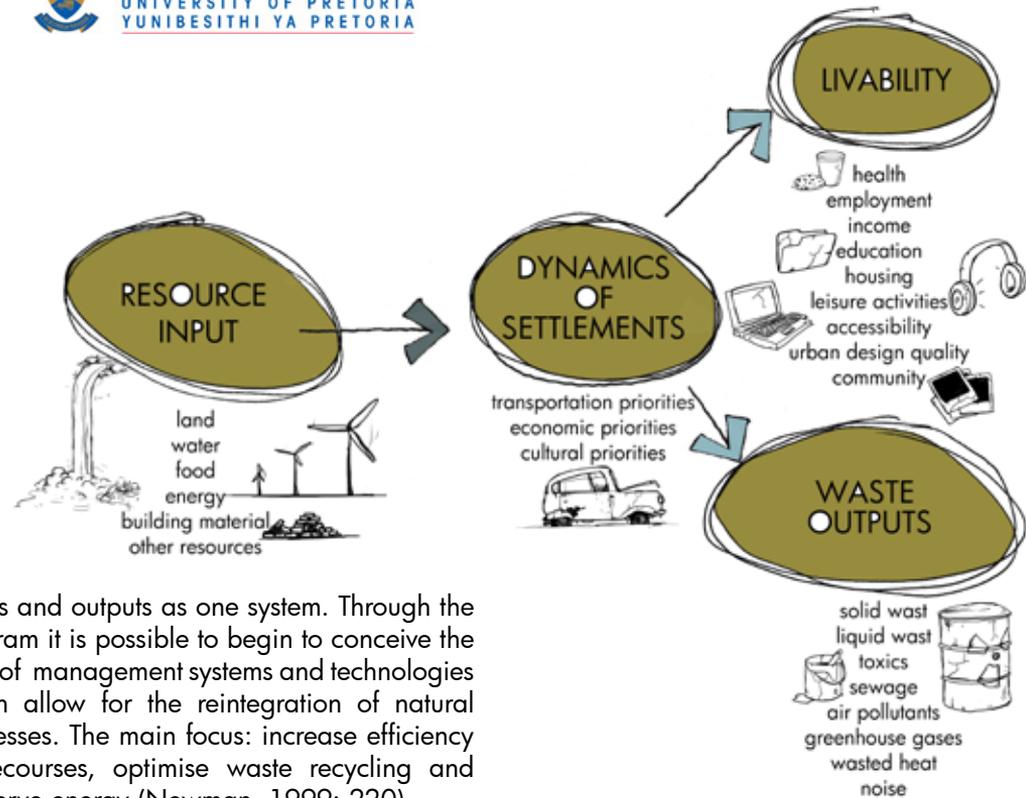


fig. 47\_ Peter Newman's diagram illustrating pathways of input and output systems (Newman, 1999: 220)

*the question is, will we be able to do this in time. People need to realize that there are things they can change in their everyday lives. With existing technologies we can reduce the human footprint on earth by 90%. Redesign design itself. It needs to be our priority. Today's generation gets to change the world!"*

*(The 11th Hour: Turn Mankind's darkest hour into it's finest, 2008)*

To understand the sustainable concept more clearly, the city needs to be viewed as a ecosystem. With inputs of energy and material, environmental problems are related to the growth of these inputs and managing the increased outputs. Peter Newman, professor of city policy in Australia, draws a diagram (fig.45) to understand the pathways of these

inputs and outputs as one system. Through the diagram it is possible to begin to conceive the idea of management systems and technologies which allow for the reintegration of natural processes. The main focus: increase efficiency of recourses, optimise waste recycling and conserve energy (Newman, 1999: 220).



#### 4.1.2. WHAT IS A SUSTAINABLE INDUSTRIAL CULTURE?

Approximately 230 years ago industrial urbanisation began on a global scale (Byrne, 2002: 261) and industrial systems were more than just economic production. Distinctive cultural forms, shaped around this through social production and reproduction. Today, because of deindustrialisation, industrial cultures are seen in a negative light, as working against innovation and modernization. This is problematic, because industrial cultures are so much more than just production: it is a component of identity. When production in a area fades away, large communities with multi-generational experience of industrial life, stay behind. *“The history of industrial society is a history in which masses, as well as elites, believed that they could change things to be as they would wish.”* (Byrne, 2002: 280).

Sustainable industrial culture acknowledges that projects are process-orientated, but it must also aim at facilitating cultural sustainability. One must first understand what cultural sustainability means, for the people involved, before change can take place. The overall aim is to create a new sense of place, with a heightened awareness between humans and nature. Sustainability is not a fixed state of affairs, it is a continues process which involves positive and healthy self-development.

*“Cultural vitality and viability is as necessary for sustainable development as social equity, economic viability and environmental responsibility”* (Birkeland, 2008: 283).

The new sustainable industrial culture also calls for the assessment of products that will be manufactured in the future. The life cycle of a product needs to be determined before the it manufactured: all input and output levels must be calculated beforehand. This method assesses and evaluates the environmental, occupational health and resource impact of a product (Alting & Jorgensen, 1993: 167). Products can thus only be economically sustainable if it meets the needs of the social and environmental factors.

Social sustainability is as important as environmental and economical sustainability. The industrial culture in Pretoria West is already more than 100 years old, people live in and around the area even though the conditions



are not ideal. There is very little green or public space and the buildings do not really interact with the street. South Africa needs industry to survive and the industry is as much a part of an integrated city as housing and retail. The focus should therefore be turned toward social sustainability. It is only then that perceptions might change and Pretoria West can develop a sustainable industrial culture.



fig. 48\_ Mitchell Street, very few people are seen in the public areas, there are few public open space amenities and streets do not interact with private land but are rather fenced off



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### 4.2.1. ADAPTATION AND REUSE OF HERITAGE INDUSTRIAL BUILDINGS

As one of the world's first industrial nations, Britain presently has several initiatives promoting an integrated form of theory and practice on urban planning, architecture and the development of heritage industrial buildings and areas.

The late Michael Stratton (2000) was part of a team at the Institute of Advanced Architectural Studies at the University of York. He visited numerous redundant industrial buildings of architectural and historical value all over Britain and abroad. He focused most of his energy on the adaptation of old industrial buildings for contemporary, economic, residential and cultural uses. He did not suggest building a better yesterday, but to encourage and

and welcome appropriate new additions and adaptation to the heritage of industrial buildings.

Stratton, together with HRH Prince of Wales, established The Prince's Regeneration Trust (Trust, 2010) in 1997, a charity organisation that supports the regeneration of economically or socially disadvantaged areas, through the conservation and reuse of redundant historic buildings. The Trust is committed to sustainable development, implementing practices which promote vibrant and inclusive communities, a productive and innovative economy and a, healthy, flourishing natural environment. They first focus on areas of economic and social need. Then they encourage the preservation

and development of valuable skills in traditional building craft and strive to honour the individuality and historic character of the their countryside, towns and cities.



# Coal Fired Power Stations in South Africa

- ⊗ Demolished
- ⊗ Decommissioned
- ⊗ Operational
- ⊗ Adapted

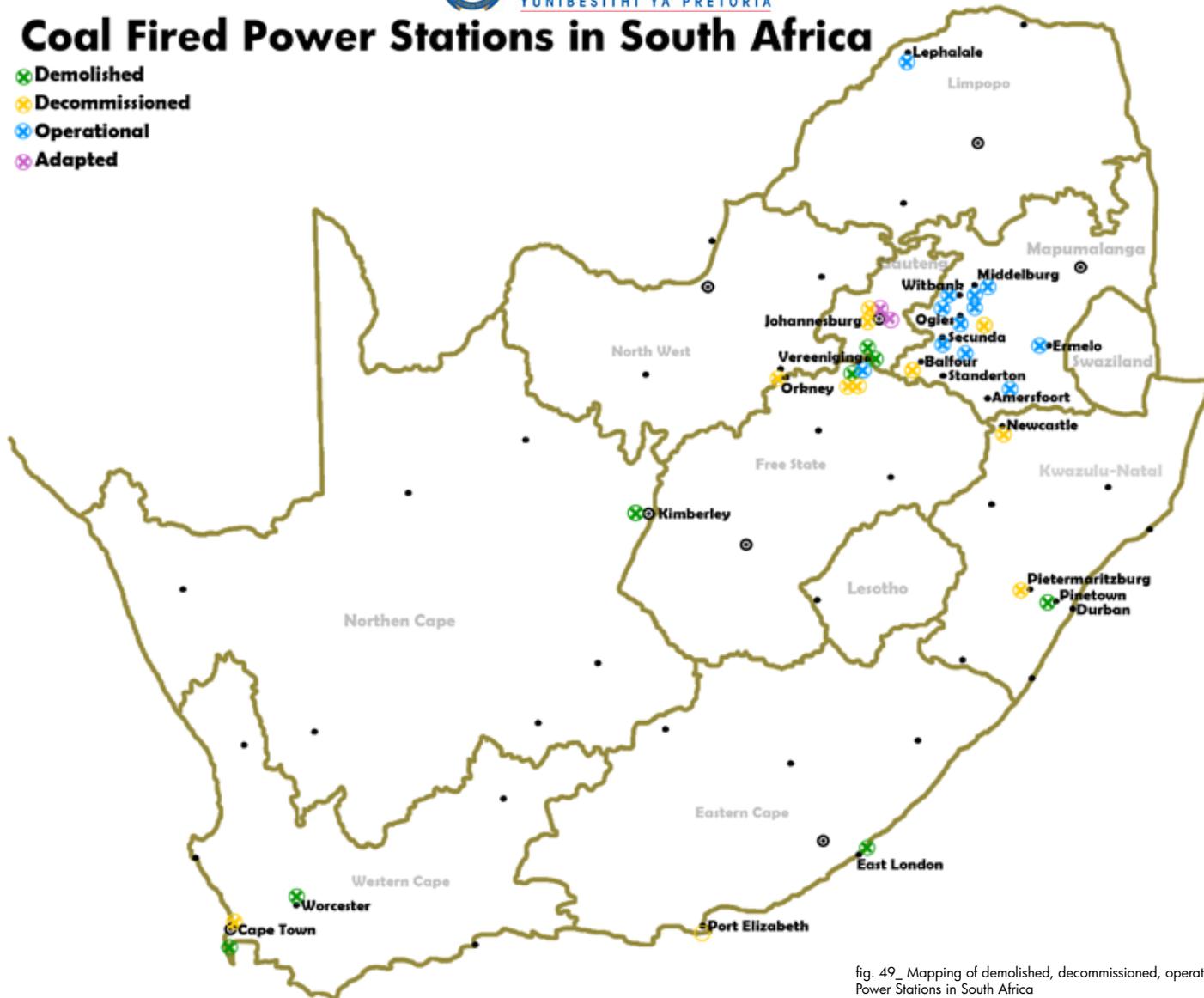
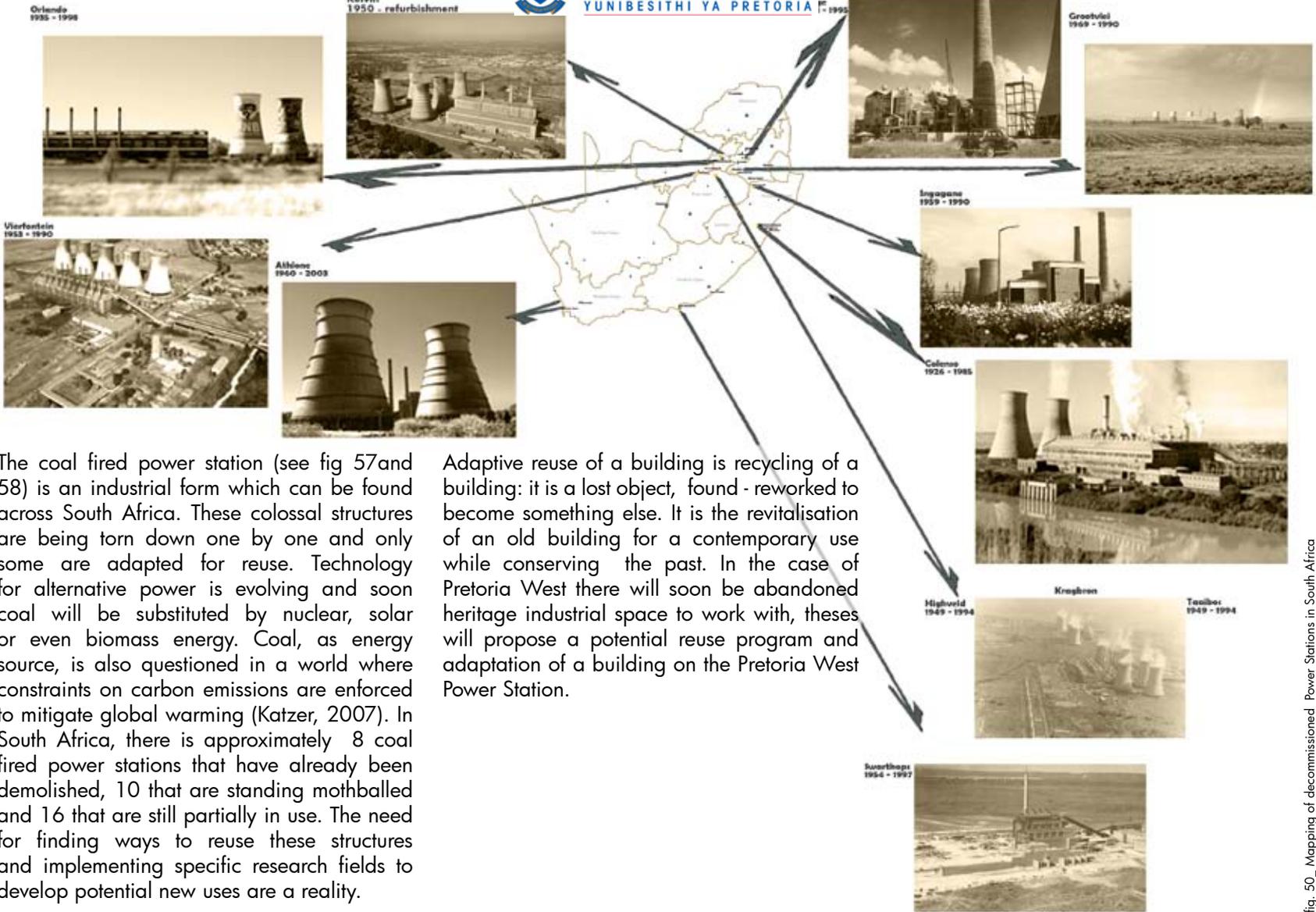


fig. 49\_ Mapping of demolished, decommissioned, operational and adapted Power Stations in South Africa



60 The coal fired power station (see fig 57 and 58) is an industrial form which can be found across South Africa. These colossal structures are being torn down one by one and only some are adapted for reuse. Technology for alternative power is evolving and soon coal will be substituted by nuclear, solar or even biomass energy. Coal, as energy source, is also questioned in a world where constraints on carbon emissions are enforced to mitigate global warming (Katzner, 2007). In South Africa, there is approximately 8 coal fired power stations that have already been demolished, 10 that are standing mothballed and 16 that are still partially in use. The need for finding ways to reuse these structures and implementing specific research fields to develop potential new uses are a reality.

Adaptive reuse of a building is recycling of a building: it is a lost object, found - reworked to become something else. It is the revitalisation of an old building for a contemporary use while conserving the past. In the case of Pretoria West there will soon be abandoned heritage industrial space to work with, these will propose a potential reuse program and adaptation of a building on the Pretoria West Power Station.

fig. 50\_ Mapping of decommissioned Power Stations in South Africa

#### 4.2.2. INDUSTRIAL ADAPTATION AND A SUSTAINABLE INDUSTRIAL CULTURE

The adaptive reuse of existing buildings supports sustainability, as well as the smart growth initiative. Smart growth is an anti-sprawl proposal that invests time in restoring communities and vitality in abandoned or redundant parts of cities. It also promotes public transport and pedestrian orientated cities (Technology, 2010). Industrial buildings are known for their large open spaces, they are thus well suited for adaptive reuse. Industrial buildings can be adapted for reuse, to support a sustainable industrial culture. This culture depends on the preplanning of products and the effect it would have on the people using the facilities and its environment.

Through analysis it is evident that the industrial realm need to focus more on social

sustainability. This factor of sustainability is severely neglected. When a heritage building is adapted or reused, one's main goal should be to produce a building that supports a sustainable industrial culture. A structure that nurtures people's health and well-being, not only managing waste and toxins to create a hazard free environment, but also a healthy environment with social stability, natural light and fresh air.

The design focuses on the environment inside the building to produce workshops with ample natural light. The spaces will be connected to nature with green courtyards that open-up into the space. This will also give workers the opportunity to sit outside while working. The production process will be revealed to form

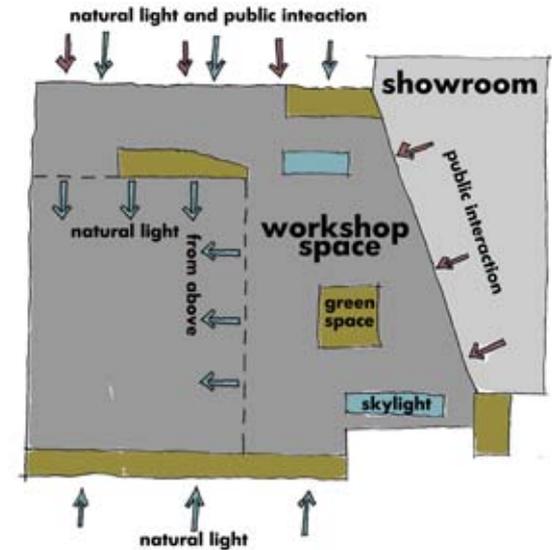


fig. 51\_ Diagram illustrating the proximity between workshop space, green space, natural light and public interaction: author, 2010

a connection between industry and passer by. Showroom space will be connected to workshop space, with glazing, to educate buyers about the production process. The social connectivity between the public and the worker will occur through views.



### 4.3. Social responsiveness: people, activities and the environment\_

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According to Jan Gehl, architect and professor of Urban Design at the Royal Danish Academy of Fine Arts in Copenhagen. All outdoor activities can be divided into three categories: necessary, optional and social activities (Gehl, 2006: 9). Necessary activities are obviously compulsory activities: going to work, school, the super market, etc. Optional activities are the activities people would like to do: go for a walk or a breath of fresh air. Optional activities usually only take place when the weather is favorable. These two activities are directly linked: when outdoor quality is bad, people tend to only do necessary activities. When the area is of high quality, optional activities start to emerge in-between necessary activities. Thirdly, social activities depend on necessary and optional activities, these

activities depend on the presence of people in public spaces: children playing, communal gatherings, greetings and conversation. It is primarily dependent on passive contacts such as hearing and seeing other people. Social activity is a spontaneous activity. It is a direct consequence of people moving in the same space, it can also be understood as something that takes place every time two people use the same space (Gehl, 2006:16).

These three activities are not necessarily dependent on physical architecture, but rather on the spaces designed in-between buildings: spaces where people meet and see each other. Social responsiveness, in this document, refers to the ability of people to see and hear others and to experience other people functioning in

various situations. It is a source of inspiration, stimulating the senses through experience.

Team Zoo argues in their design principles that responsive environments are places which interact with people by stimulating the senses. It is creating a space where people can move through and around to communicate and exchange ideas. Their common concern is the relation between nature, humans and the cultural features of a place and the human response to them (Jencks & Kropf, 1997). They design to inspire emotional response. It is thus clear that social responsive environments rely on specific activities, that bring people to interact with each other through seeing and hearing. It does not necessarily rely on architecture, but rather on the spaces between

and next to buildings. If public spaces around industrial buildings (squares, streets, etc) are designed to heighten the social interaction between people, a more social responsive environment can be established.

The Pretoria West Power Station is a grand opportunity for industrial redevelopment. The Pretoria West framework group proposes a development with mixed use functions. The group envisions a light, industrial precinct where different people can interact on a daily bases. Necessary and optional activities will commence in this area because it is the placement these functions that will ultimately determine if social activities will occur.

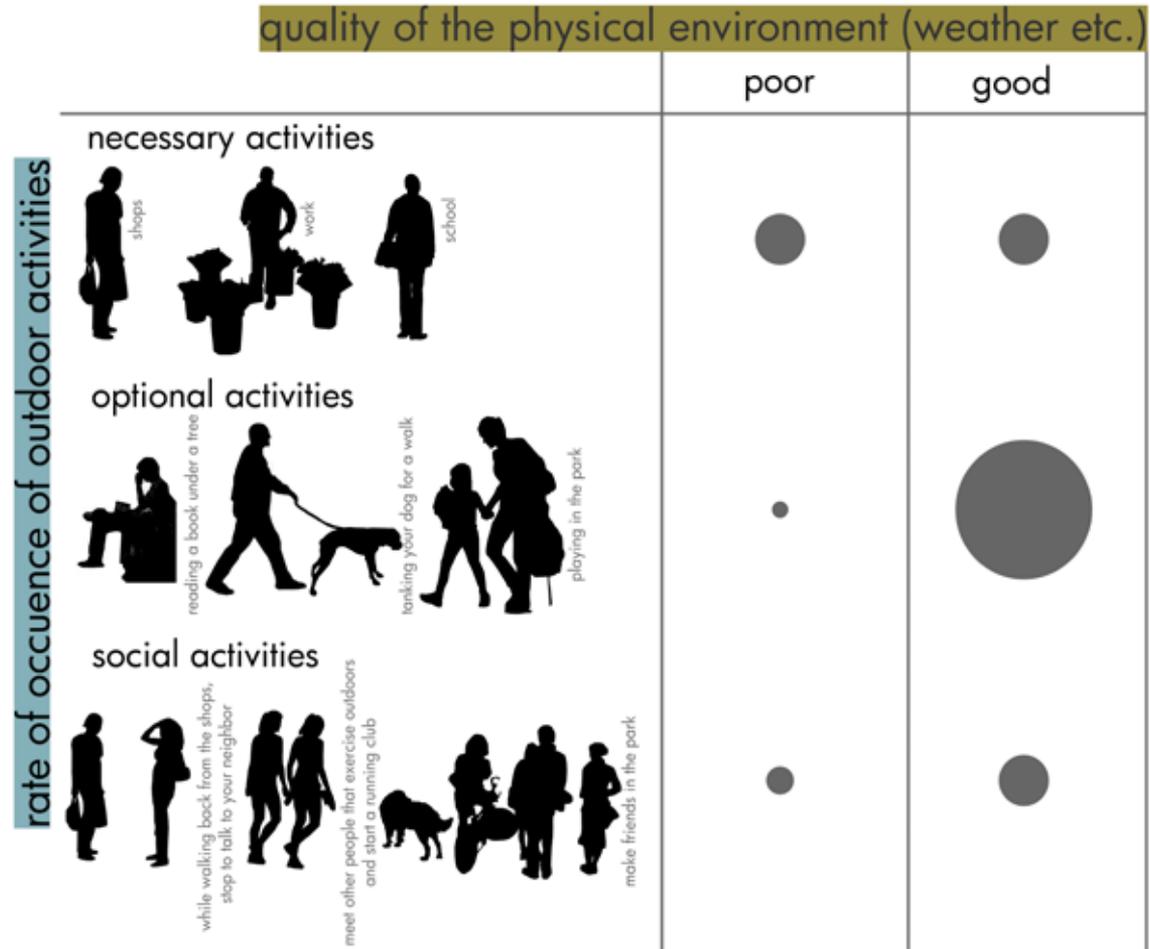


fig. 52\_ Graphic representation of the relationship between the quality of outdoor space and the rate of occurrence of outdoor activities: author, 2010



## 4.5. Production and daily life\_



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Social activities will only occur after necessary and optional activities are in place. According to the Compaction and Densification Strategy of Tshwane (2005), Pretoria is a functionalist city. This results in an evident segregation of functions and groups that differ from each other i.e. industrial, residential, governmental. Working, playing and living components are scattered over the whole of Tshwane and a large number of people are trapped in their circumstances, because employment is too far from where they can afford to live.

Gehl's theory on integration articulates the importance of various activities and functions in and around public spaces. These allow people in the area to function together, to stimulate and encourage one another.

Industrial buildings are closed off to the public because, like in Pretoria West, there are few public spaces and the street is designed for cars. These buildings have so many functions and activities within them and the interaction between man and machine. Responsive environments not only facilitate social activity, but also support experience through stimulation of the senses. By revealing manufacturing processes to the public, they will see and learn how things are made. Most importantly public spaces should be used to join the production process with other programmes like housing, night life and retail.

*"Only a very small group of the most annoying industrial activities is unsuitable for integration with residences" (Gehl, 2006:102).*

*"It is not the formal integration of buildings and primary city functions but the actual integration of various events and people on a very small scale that determines whether the contact surface is monotonous or interesting. What is important is not whether factories, residences, service functions, and so on are placed close together on the architect's drawing, but whether the people that work and live in the different buildings use the same public space and meet in connection with daily activities."*

(Gehl, 2006:101)

If social activities are activated and the integration of functions in areas is supported. Architecture can establish a visual and sometimes physical connection between production and daily life



Findings and intentions that will be taken forward in the design:

**Social sustainability:**

Internal workshop environments will be designed to nurture the workers health and well-being, ample natural light and fresh air will infiltrate spaces. Green spaces will be designed parallel to the production cycle and furniture makers will have the option of working outside when the weather is favourable.

**Environmental sustainability:**

Brownfield site, using existing infrastructure, natural ventilation, sustainable heating and cooling systems, water harvesting, natural light and solar water heating.

**Social activities:**

There will be a direct connection between furniture maker and the general public. The vision for the Pretoria West Power Station is a mixed use light industrial precinct. Housing, retail and educational facilities will be in close proximity to one another. More than half of the power station site will be preserved as a public nature reserve to provide the city with recreational green space. The study area will therefore provide facilities that accommodate necessary and optional activities, spaces between buildings will be designed to strengthen social activity.

**Industrial culture and social responsiveness:**

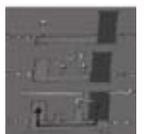
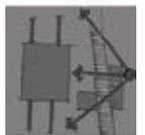
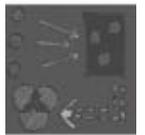
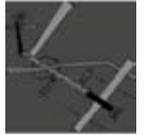
The study showed the value of industrial exposure and that industrial buildings should reveal their processes, evidently creating a building that people can identify with. There will be a direct connection between furniture maker and the general public. Urban fabric with high intensity pedestrian movement will move past the building, the proposed intervention will interact accordingly. Large glass walls will leave spaces transparent and a visual connection can accumulate.

**Adaptation and conservation:**

A contrasting structure will connect with the 1940 Boiler House to accentuate the historical quality of the site. The form and proportions of the proposed furniture showroom will be informed by the existing surrounding structures.



fig. 54\_ At the end of the day it's making space for the user of the building, evidently those are the people that would determine the success of the it: author, 2010



## precedent studies

Precedent studies that support the research done in the previous chapter will critically be investigated. Only key factors will be taken from each. These factors will then be reinterpreted and implemented in the authors design development.



fig. 55\_ Herzog & de Meuron (author unknown, 2010)

## 5.1. VitraHaus

Herzog & de Meuron  
Vitra Campus, Weil am Rhein, Germany  
2010  
1,324 sqm

### IMPORTANCE FOR PROJECT:

- Displaying furniture to the outside
- Projecting views into the landscape
- Creating interesting open air spaces
- Vertical circulation as a focal point



fig. 56\_ Courtyard , take note how the facade becomes a seating area (archspace, 2010)

vertical circulation points 

ground floor views 

level 1 to 4 views 

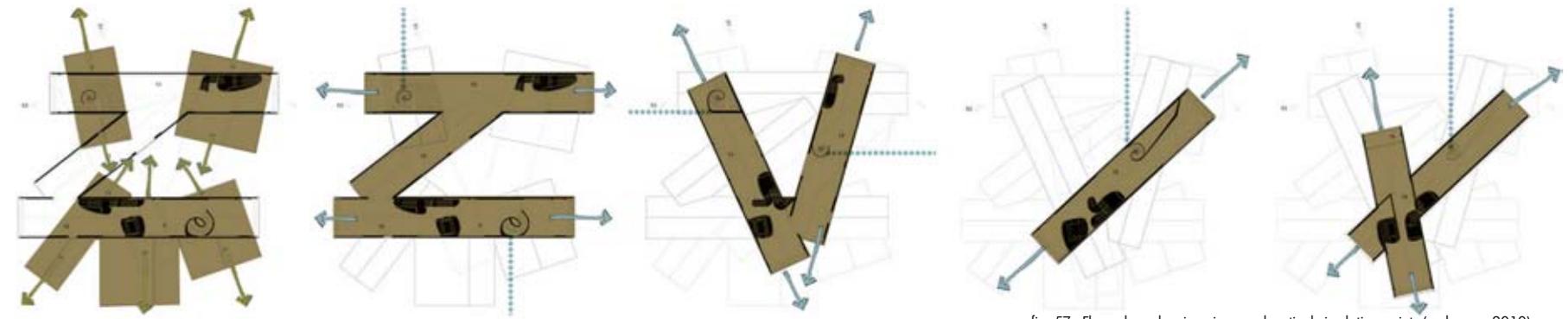


fig. 57\_ Floor plans showing views and vertical circulation points (archspace, 2010)

## BRIEF\_

To create a structure that exhibits designer furniture and interacts with the public.

## CONCEPT\_

Herzog and de Meuron connects two themes: the archetypal house and stacked volumes. These architects returned to the idea of the ur-house. The primary purpose of the five story building is to present furnishings and objects for the home. The building consists out of 12 houses stacked on top of each other and it represents the characteristics of a general house as a display space.

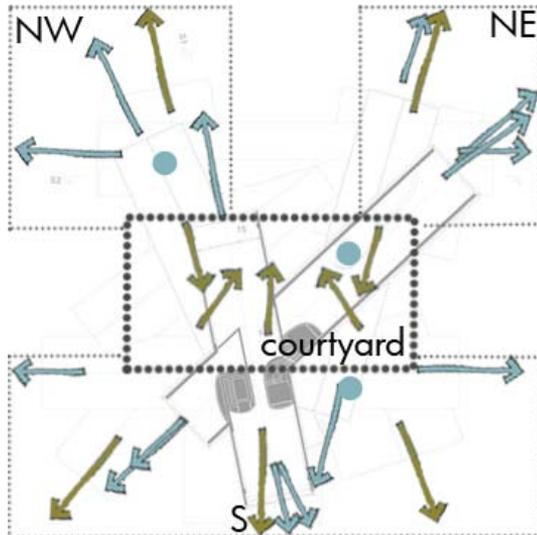


fig. 58\_ View analyses: by layering the direction of the views from each floor, it is evident that the focus of the views are directed in four specific directions (by author, 2010)

## MOVEMENT\_

The building opens into different levels and the connectivity of the "houses" on the outside, form courtyards and breathing spaces, where people can sit and observe the surrounding showrooms. When one enters the building it suddenly takes on a different character: Where "houses" intersect, structural volumes are created and it is here where the geometry changes. Staircases are integrated into organic volumes revealing visual relationships between the houses or sometimes blocking the view of the observer.



fig. 59\_ Image illustrating vertical circulation. Interior space is kept simple to direct focus on the products (archspace, 2010)

## VIEWS\_

The charcoal of the exterior not only unifies the building with the earth, but also focuses the viewer on the glazed gable ends, that display white finished showrooms. During the day the glazed gables focus views on the landscape and factory, but at night the illuminated interior glows from within and the physical structure seems to magically disappear. (arcSPACE, 2010)



fig. 60\_ During day time views are focused to the outside (archspace, 2010)



fig. 61\_ During night time views are focused to the furniture displays (archspace, 2010)

## 5.2. Turbine Hall

TPSP Architects

Newtown, Johannesburg, South Africa

2009

7,000 sqm

### IMPORTANCE FOR PROJECT:

- Interaction with heritage
- Reusing existing element
- Juxtaposing elements and materials

### HISTORY\_

The Jeppe Street Power Station was constructed during the 1930's. The original site consisted of a shorter Turbine Hall and single North Boiler House. The Power Station could not keep up with Johannesburg's electricity demand and in 1934 it was extended (Krige & Beswick, 2008: 3).

Jeppe Street Power Station was mothballed in October 1961, but in 1967, after the installation of two Rolls Royce jet engines in the Turbine Hall, was recommissioned (Krige & Beswick, 2008: 29).



fig. 62\_ The Turbine Hall before construction (Schoemaker, 2008)



fig. 63\_ The adapted Turbine Hall on the left with the new office structure on the right, the scale and material choice compliments the old structure (Tibler Group, 2008)



fig. 64\_ The Turbine hall was cleaned out in 2000 and once again fenced of (Gaule, 2008)

After 1967 the remaining steam turbines, associated plants and the South Boiler House were demolished. The boiler house and turbines were cleared out for much needed workshop space and the North Boiler House was converted into offices and stores (Krige & Beswick, 2008: 31).

In 1970, after being decommissioned and bricked up, this majestic site became secluded from the public. It was only in 1990 when it was once again publicized after squatters invaded the premises. By 2000 over 300 people lived on the site and consequently the

buildings were cleaned out and closed off. (Krige & Beswick, 2008:53).

In 2004 the Turbine Hall was again experienced in all its glory, when it was used as a event space. AngloGold's CEO and Corporate Affairs Executive where charged with the task of finding new premises for the company. Through thorough investigation, they decided on the Turbine Hall site they commissioned TPSP Architects to design a new office park by reusing the old buildings on site. (Krige & Beswick, 2008: 99).

## HERITAGE INTENTIONS\_

The architect's intention was to create a new structure that would honour the industrial heritage buildings in material selection, scale and spatial experience (Krige & Beswick, 2008:97). In essence, they wanted to create a new structure with a humble exterior expression. Adapting old structures on site, the designers focused on all existing elements and reworked them as little as possible. In the end recreating the program of the building but embracing the existing character of it, thus exploiting the potential of the structure to the maximum.



fig. 65\_ The X-brace structure of the building was reinterpreted as structure and aesthetic device (TPSP Architects, 2008)



fig. 66\_ Skylights were kept in place as memory of the old structure (TPSP Architects, 2008)



fig. 67\_ The original concrete hoppers in the demolished North boiler house are commemorated as skylights in their original location (TPSP Architects, 2008)



fig. 68\_ Prof. Gunter Henn (author unknown, 2010)



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### 5.3. Transparent Factory

Prof. Gunter Henn

Dresden, Saxony, Germany

2001

81,600 sqm

#### IMPORTANCE FOR PROJECT:

- Responsive environments
- Exposing the production process
- Link between production and daily life
- Transparency

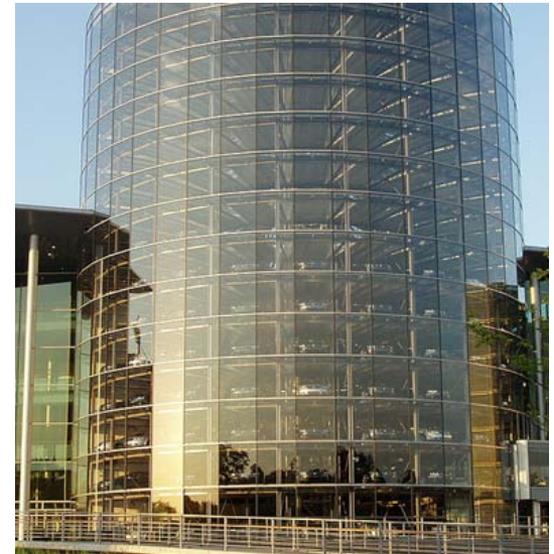


fig. 69\_ Displaying automobiles (author unknown, 2010)



*The glass facade of the factory is a symbol of transparency and authenticity, of reflection and integration, absorbing and reflecting the historical and spatial resonances of Dresden.*

*(Loschmann, 2001)*

fig. 70\_ The clinical character of the building, focus attention to the interior of the building (author unknown, 2010)

#### LOCATION:

A building designed for Volkswagen is allocated in an area where high-precision craftsmanship of the industries are celebrated, the building and spaces also speak the language of an integrated city where living and manufacturing are seen as functions that can work together. Volkswagen stages what usually takes place behind closed doors - as a place of communication, exchange and experience, by visually displaying the process (Loschmann, 2001).

#### TRANSPARENCY:

Prof. Gunter Henn designed a building flawless

in form and function. The building celebrates the automobile industry by displaying the manufacturing and assembly of the product to the outside world - the experience and elegance of the car is put before the architecture. He describes the building as a unique exchange between man, technology and the environment. This is here where real live production is turned into livable experience, where the interesting world of transparency communicates to the public (Loschmann, 2001).

Latest technologies are displayed where people can experience the creative intensity of production. As said before the function of

the building is expressed by the form of it. L-shaped production areas are in contrast to the round organic shapes of the customer centre, it symbolically directs people from nature to structure.

*As an alternative to anonymous mass production that indiscriminately churns out a product, we present an individual produced masterpiece, a unique specimen with its own character. Our manufacturing processes are a combination of high-precision handiwork and a love of detail. Machines are only used to assist the craftsman.*

*(Loschmann, 2001)*



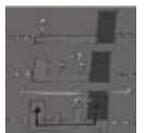
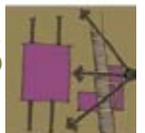
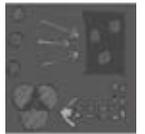
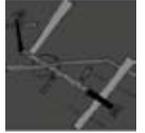
fig. 71\_ The public can visit the factory and experience the production process (author unknown, 2010)



fig. 72\_ Public interaction with the building (author unknown, 2010)



fig. 73\_ Transparency of the building (author unknown, 2010)



## site analysis

This chapter will illustrate the analysis of the Power Station site and more specifically the area around the 1940 Boiler House. Existing fabric, pedestrian movement and significant views determines the placement of a new intervention.

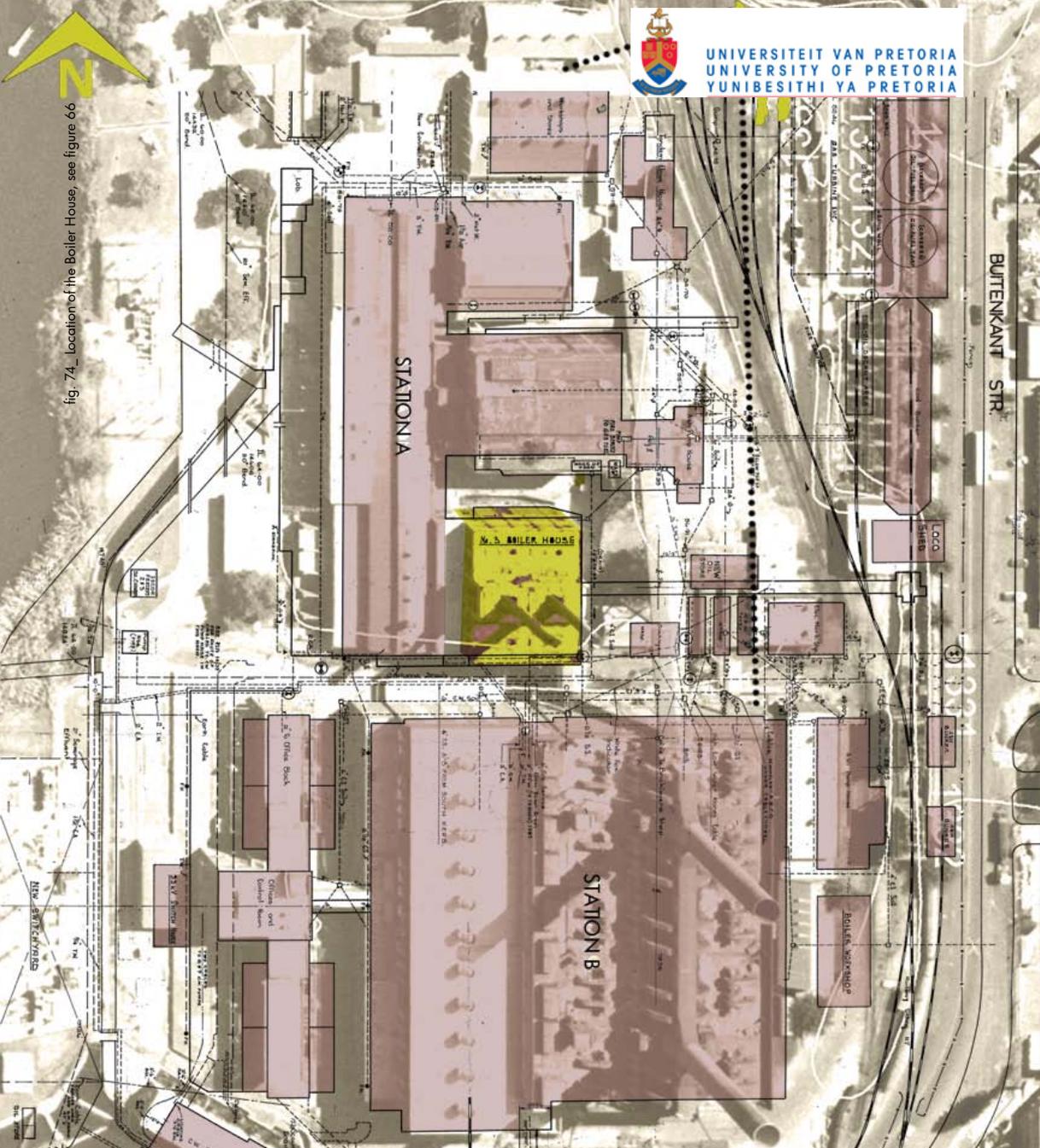
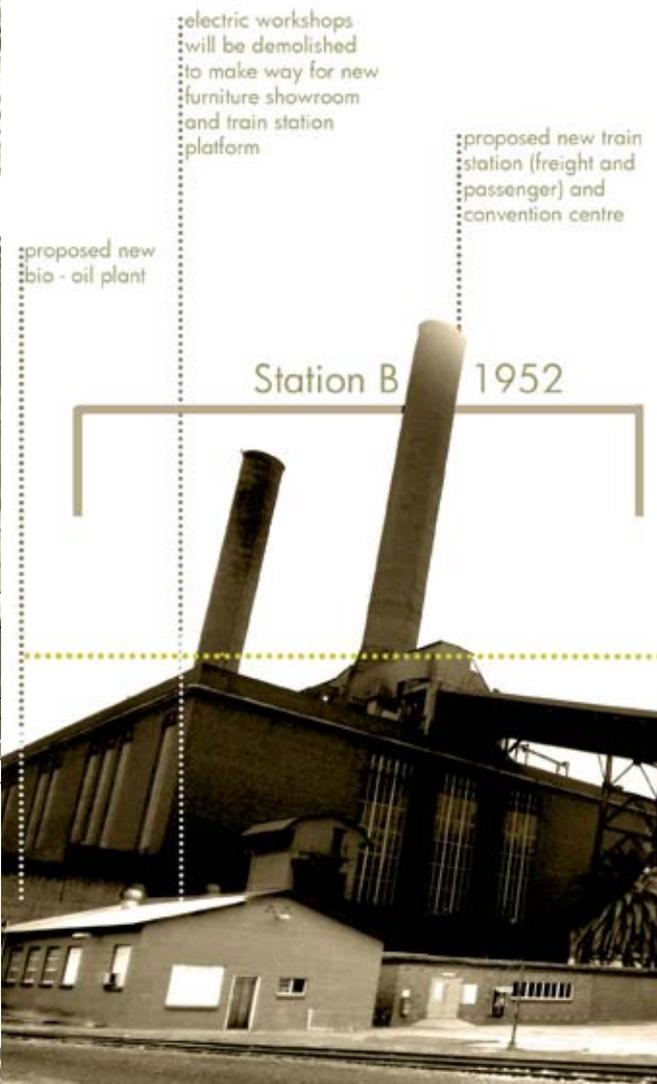


fig. 74. Location of the Boiler House, see figure 66



proposed new bio - oil plant

electric workshops will be demolished to make way for new furniture showroom and train station platform

proposed new train station (freight and passenger) and convention centre

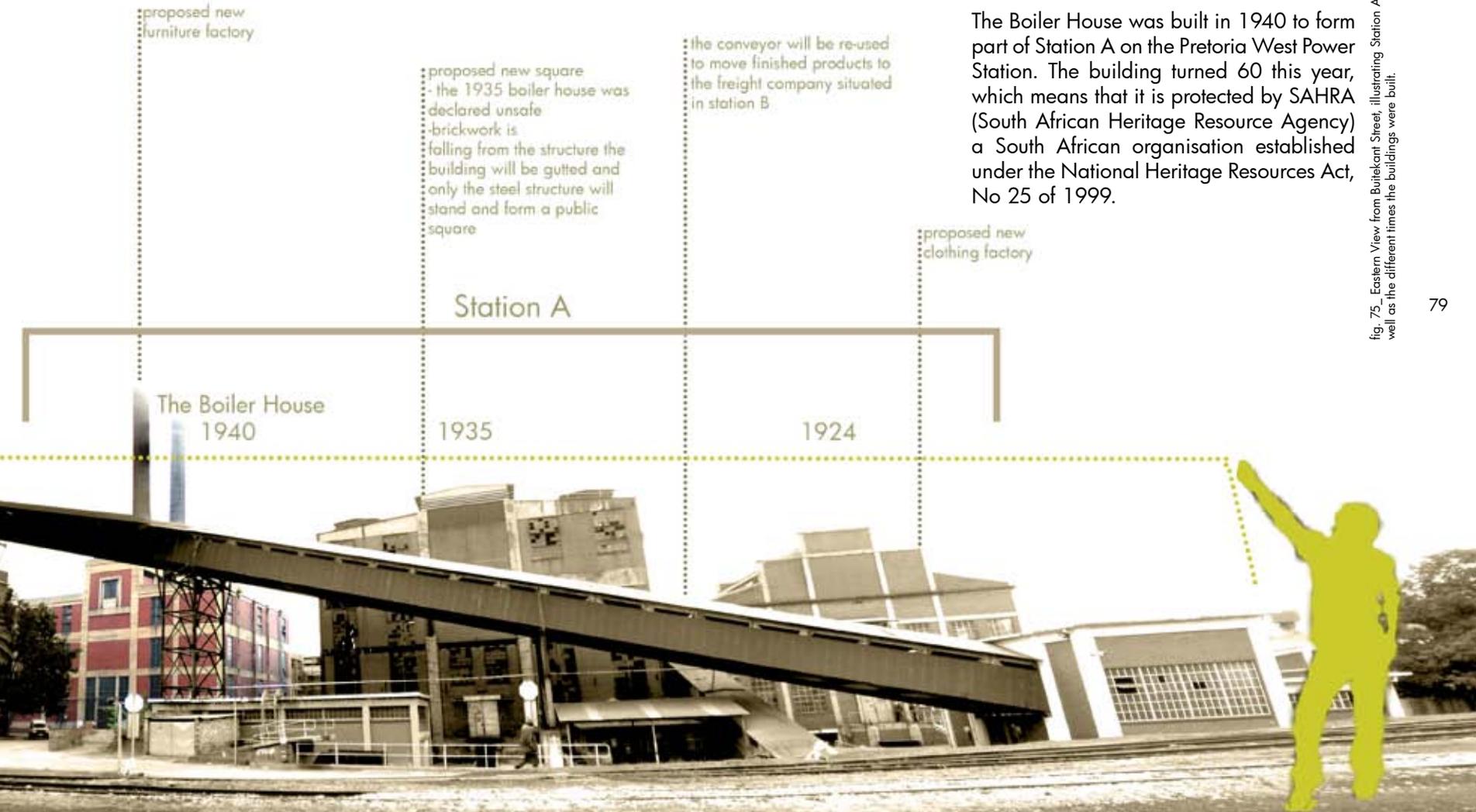
Station B 1952



## 6.1. Introducing the existing structure

The Boiler House was built in 1940 to form part of Station A on the Pretoria West Power Station. The building turned 60 this year, which means that it is protected by SAHRA (South African Heritage Resource Agency) a South African organisation established under the National Heritage Resources Act, No 25 of 1999.

fig. 75\_Eastern View from Buitsekant Street, illustrating Station A and B as well as the different times the buildings were built.





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As mentioned in chapter 4, the 1940 Boiler House was stripped from all metal components- this included all floors and machinery. Today this building stands as an envelope to a massive void. The structure represents honest, industrial architecture: form follows function. The elevated window strips to the north, east and west allows adequate light into the spacious interior.

*“South Africa and many other developing countries have fallen behind the rest of the world in recognizing, declaring and protecting their industrial heritage. It is this understanding that made us realize that the lack of attention and awareness of old industrial structures would in the future lead to their extinction.*

*(Läuferts & Mavunganidze, 2006)*

The Boiler House stands as a fort in the landscape overlooking the city. The southern and northern facades are extended into the ground and the basement level is opened up by 2 meter wide trenches. The entrance to the building is located on the eastern facade. It is this facade that represents the form of the structure, it is therefore evident that the Eastern facade should be acknowledged, at all times, during the design.



The void will be retained in the adaptation process

The east elevation will be retained and the new showroom will become a display window.

The trenches around the building will become green spaces for the furniture workshop.



fig. 76\_ Interior view of The Boiler House, photograph taken from the entrance of the building



fig. 77\_ East Elevation showing entrance and the buildings form



fig. 78\_ The Northern facade of the Boiler House extends into the ground, and stand as a fort in the landscape

## 6.2. Statement of significance\_

### 6.2.1. THE BOILER HOUSE AS A LANDMARK\_

The Boiler House stands as an icon of industrial architecture. It represents mans' ability to create and destroy. The chimneys that historically represented pollution, now add to the abandoned atmosphere of the site.

The chimneys will be used to ventilate the Boiler House through the stack effect.

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fig. 79\_ View of Pretoria West Power Station from Proclamation hill

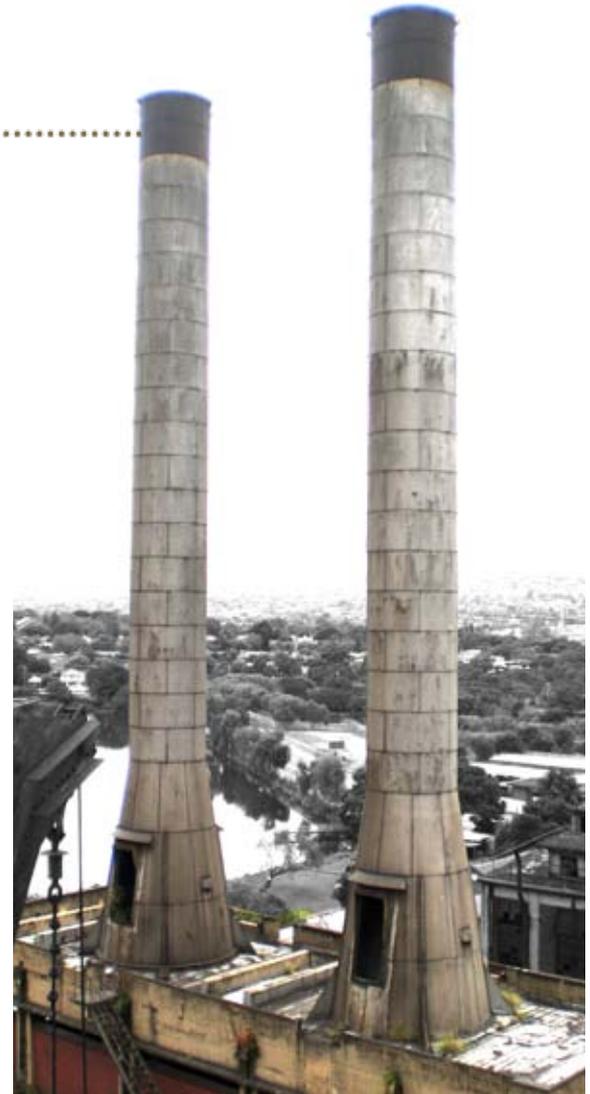


fig. 80\_ The chimneys of The Boiler House



### 6.2.2. PROCESS\_

The previous program of the building was industrial in nature. In essence this means that an element or material enters the building, goes through a process and exits in a different form. Because the building has been stripped it creates endless possibilities for future industrial programs.

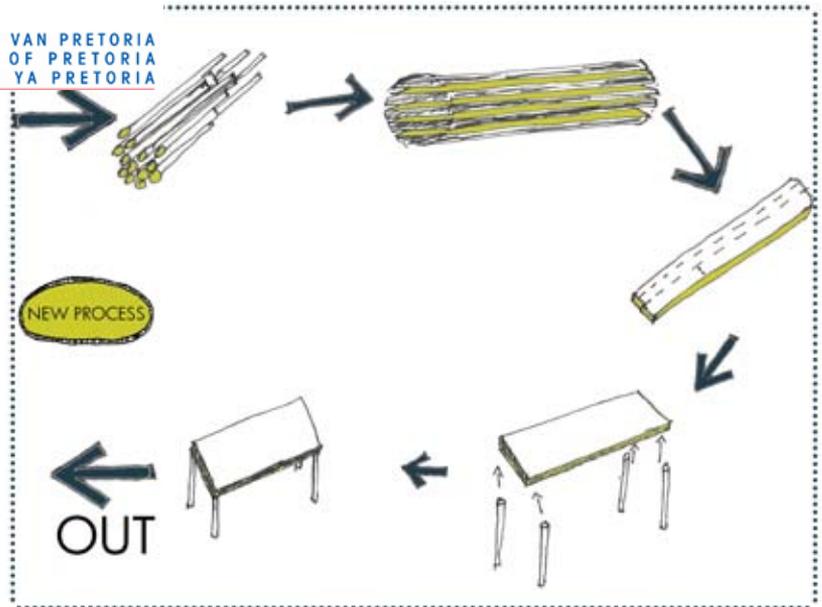


fig. 81\_ Production process diagram, raw material enters, it goes through a process and exits in another form.

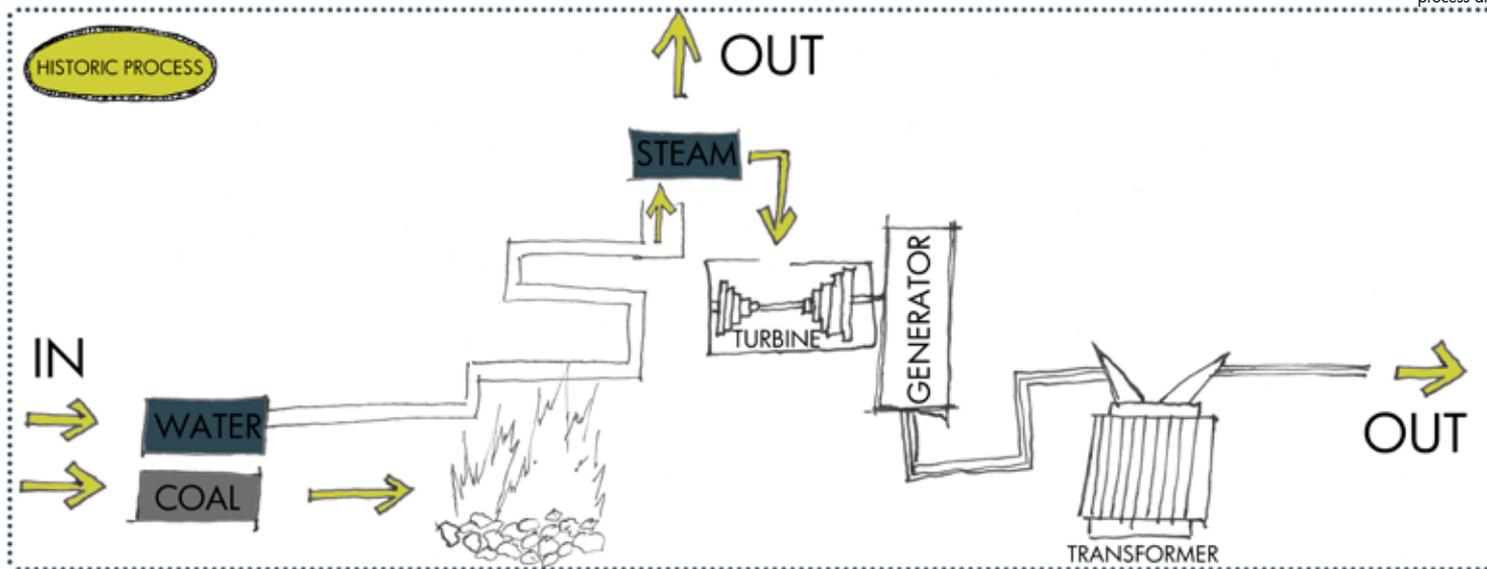
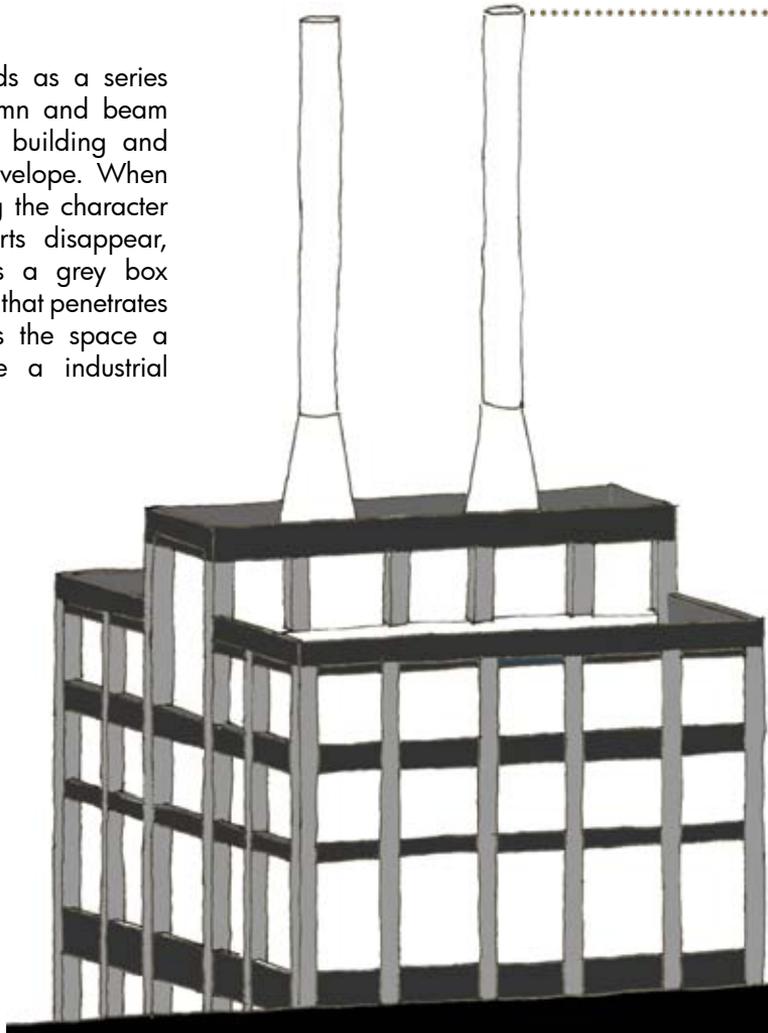


fig. 82\_ Boiler House process: diagram showing how water and coal through a process creates steam and electricity

### 6.2.3. STRUCTURE\_

The building's exterior reads as a series of parts: the concrete column and beam structure gives form to the building and the brick infill forms the envelope. When one moves into the building the character suddenly changes, the parts disappear, and the building becomes a grey box illuminated by light. The light that penetrates through the openings gives the space a sacred quality, almost like a industrial cathedral.

84



The structure needs to be retained to keep the building form in place, the new structure can subtly punch through the existing.



fig. 83\_ The buildings column and beam structure represents honest 20th century industrial architecture.

fig. 84\_ The grey " box" illuminated by light



fig. 85\_ Perspective view of the Southern facade of the Boiler House.  
Note the column and beam structure, as well as the brick infill



fig. 86\_ Industrial cathedral



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The existing concrete roof has extraordinary views, to the east (Pretoria CBD) and the west (Proclamation Hill, nature and the Power Station dam). The majestic nature of the building lies in the internal void. It is here where one experiences the scale of the building.



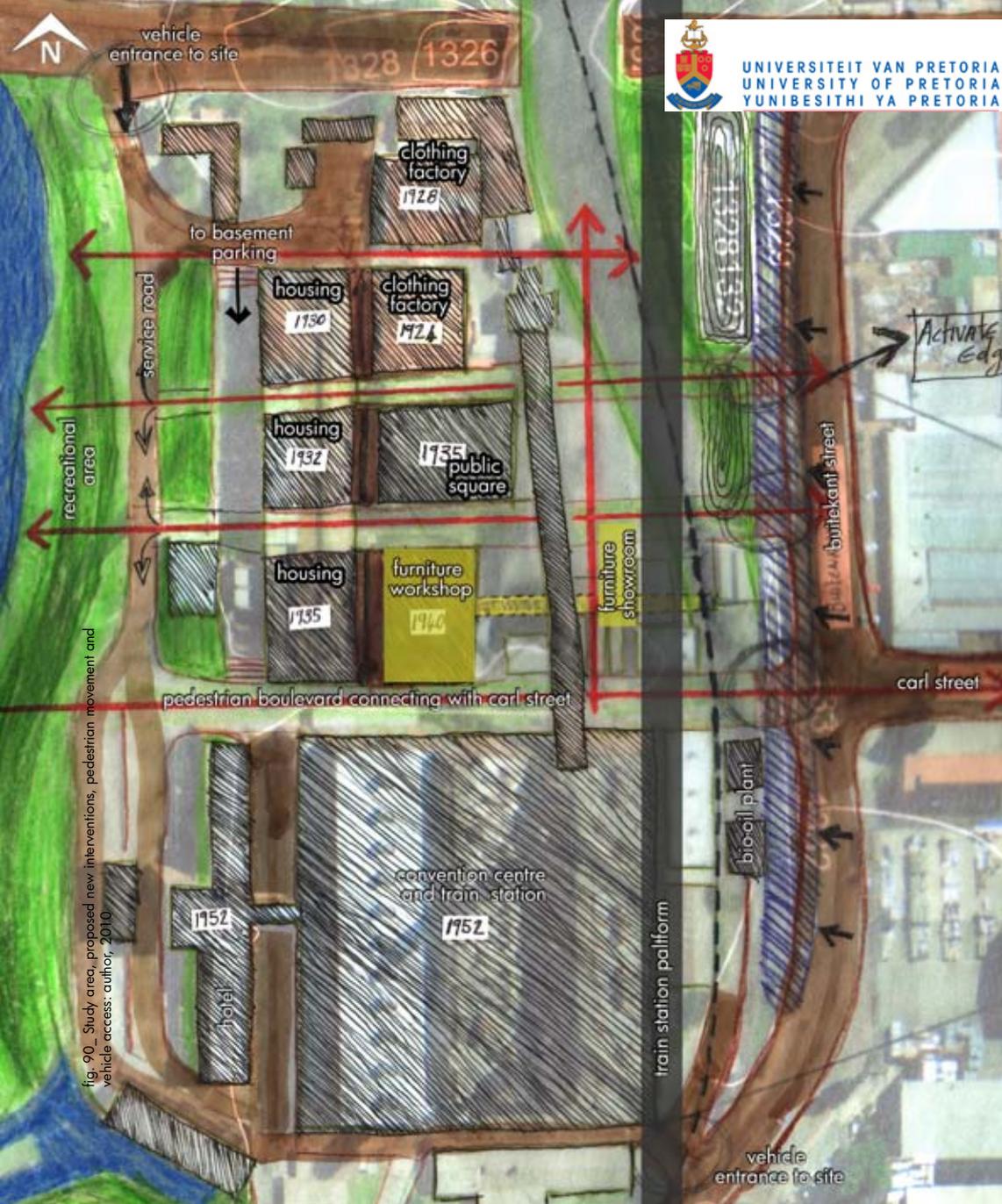
fig. 87\_ The view to the West, with Proclamation Hill in the background



fig. 88\_ The Boiler House's roof, lends itself to beautiful views to the East and the West, the flat roof has the potential of becoming a roof garden or event space for the new furniture production workshop.



fig. 89\_ The view to the East: Pretoria West Industrial in the foreground and the city's high rise buildings to the back.



### 6.3. Site analysis\_

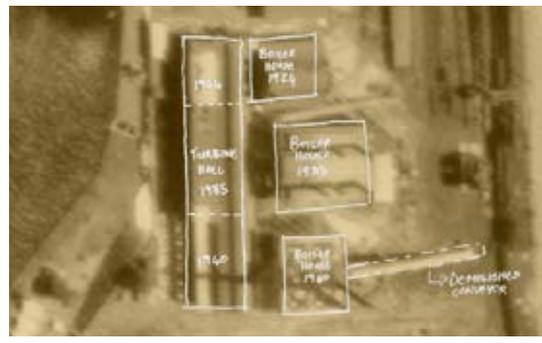


fig. 91\_ A aerial photo dated 1940; illustrates the building stock of the time

fig. 90\_ Study area, proposed new interventions, pedestrian movement and vehicle access; author, 2010

The introduction of the 1940 Boiler House concluded the importance of the building's Eastern facade. Studying the site and aerial photographs, the placement of an intervention can be determined. Note the 1940 aerial photograph in comparison to the 2010 aerial, the buildings in front of the Eastern facade of the boiler house is not yet constructed, these buildings are thus not older than 60 years and not protected by the Heritage act.

The space in front of the Eastern facade is consequently the most important and the author will interact accordingly. The ash hoppers, bricklayers workshop, oil tanks and oil storage facility is situated in the intervention area. The ash hopper will be re-used, a bridge that moves products between the furniture workshop and the freight company in Station B, will protrude through the hopper. The bricklayers workshop, oil storage facility and part of the oil tanks will be demolished, their existents will be remembered by keeping their foot prints in place. Part of the oil tanks will be converted in to water storage tanks.



1940  
boiler house  
**site**

ash  
hopper

bricklayers  
workshop

oil tanks

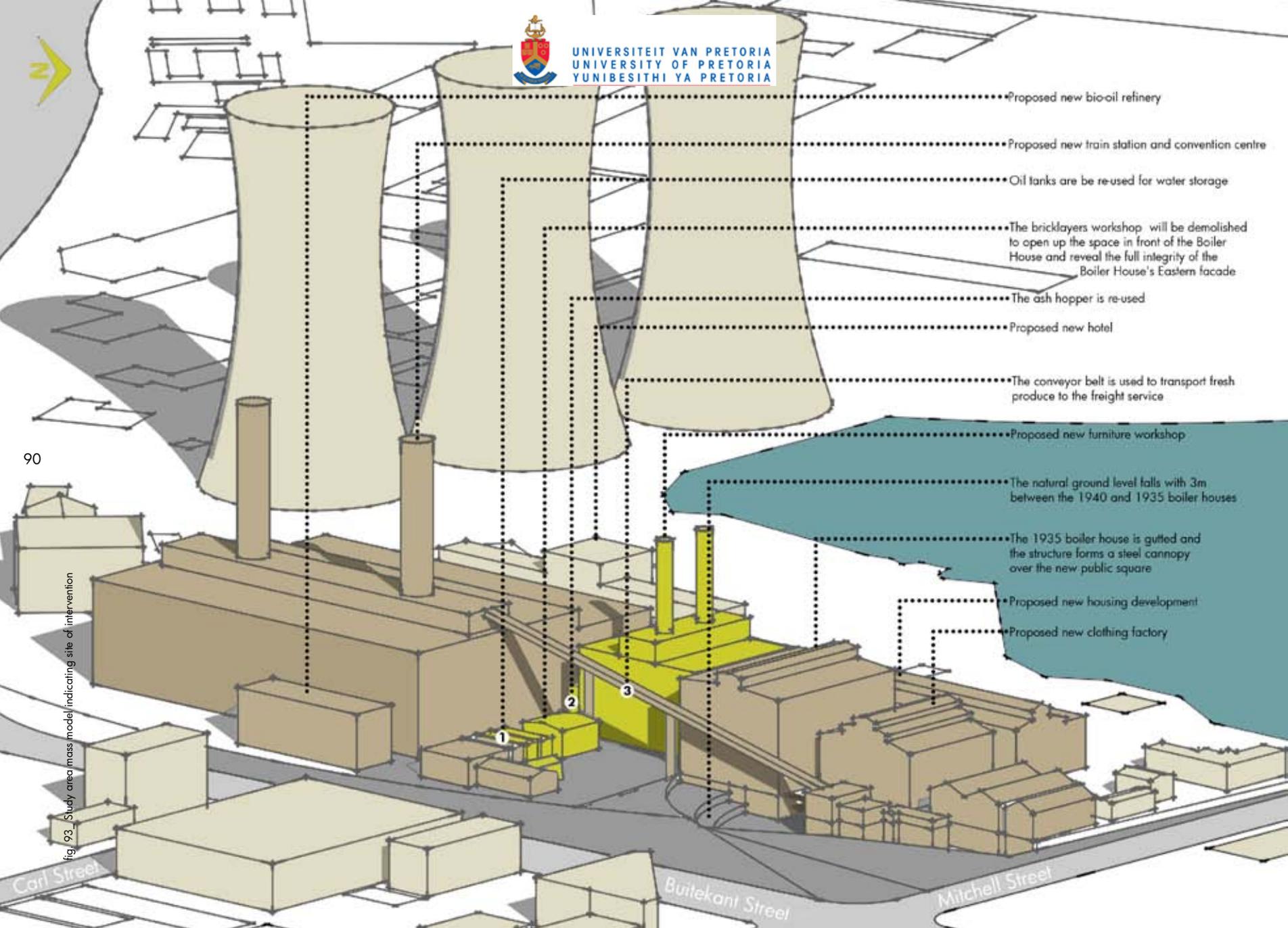
oil  
storage

Butekant Street

fig. 92\_A 2010 aerial photo of Pretoria West Power Station:  
Note the buildings that were added between 1940 and 2010



fig. 93. Study area mass model indicating site of intervention



Proposed new bio-oil refinery

Proposed new train station and convention centre

Oil tanks are re-used for water storage

The bricklayers workshop will be demolished to open up the space in front of the Boiler House and reveal the full integrity of the Boiler House's Eastern facade

The ash hopper is re-used

Proposed new hotel

The conveyor belt is used to transport fresh produce to the freight service

Proposed new furniture workshop

The natural ground level falls with 3m between the 1940 and 1935 boiler houses

The 1935 boiler house is gutted and the structure forms a steel canopy over the new public square

Proposed new housing development

Proposed new clothing factory

1

2

3

Carl Street

Buitekant Street

Mitchell Street



fig. 94\_ Part of the steel oil tanks will be converted into water storage tanks



fig. 95\_ A bridge will protrude through the ash hopper between Station A and Station B



fig. 96\_ The conveyor belt will play a crucial role in determining the shape of the furniture showroom

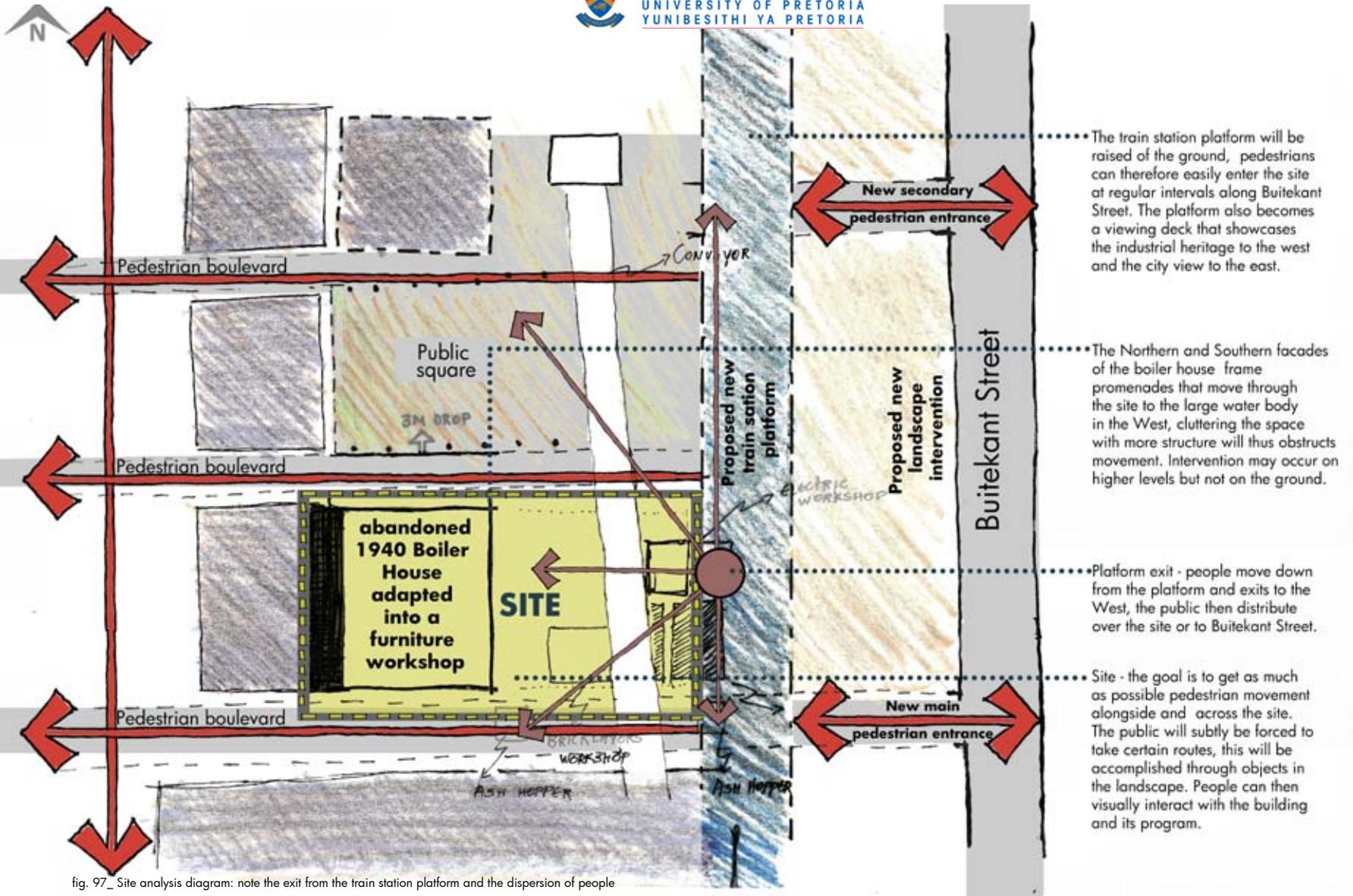


fig. 97\_ Site analysis diagram: note the exit from the train station platform and the dispersion of people

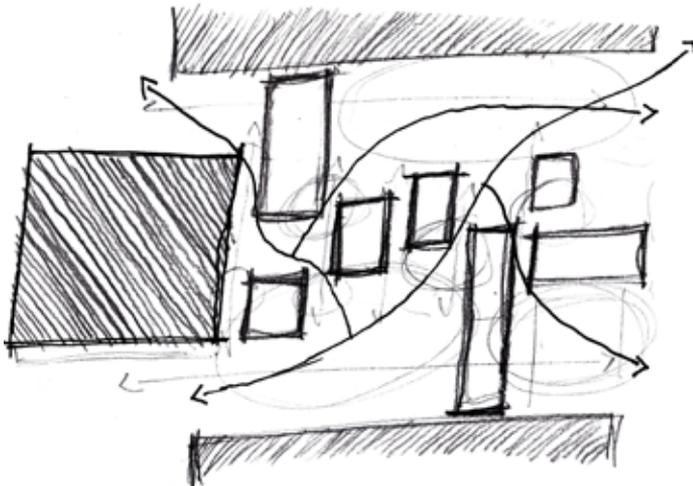


fig. 98\_ Diagram illustrating specific pedestrian movement patterns because of objects in the landscape

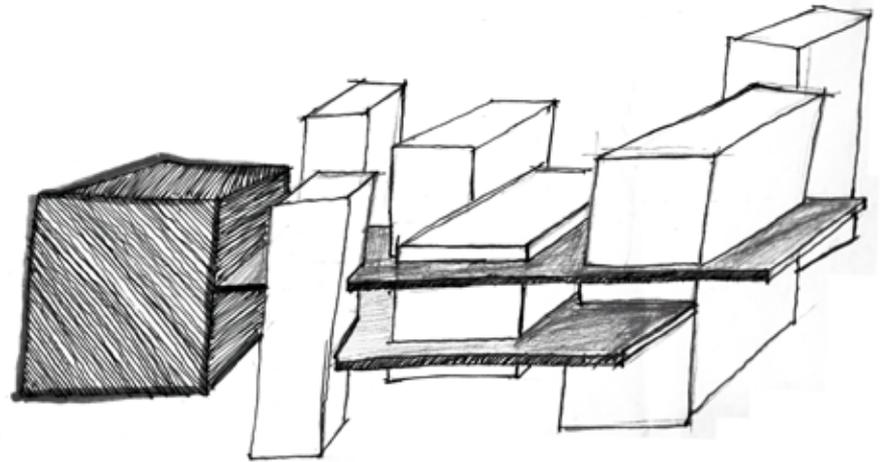
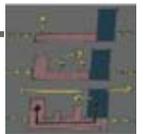
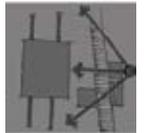
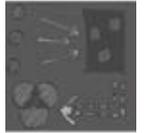
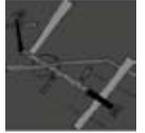


fig. 99\_ Tree dimensional diagram illustrating objects in the landscape in front of the heritage building



design development



96

According to the Burra Charter places of cultural significance enrich people's lives, often providing a deep and inspirational sense of connection to community and landscape, to the past and to lived experiences. They are historical records that are important as tangible expressions of our identity and experience. Places of cultural significance reflect the diversity of our communities, telling us about who we are and the past that has formed us and our landscape. They are irreplaceable and precious (ICOMOS, 1988).

Memories of urban spaces are marked by historical buildings and by celebrating their permanence we allow the past and present to coexist (Porter, 2004:117). Gathering of information about the past and the future of a site, can lead to the subtle amalgamation of

old and new architecture. The aim is to add value to an existing building or space while preserving and accentuating an old building and the memory of it (fig.131). Demolished structures are remembered by preserving their footprints in different form (fig.118). Juxtaposing buildings or materials might lead to evocation of emotion and memory. The proposed intervention is in contrast with the existing fabric (fig.134)

John Ruskin (1865) states that architecture can never be renovated, as this is to try to bring a corpse back to life. A piece of art or architecture is created in the spirit of a workman and can never be recalled. Another spirit may be added of another time, by another workman, but as for direct copying: this is plagiarism and obviously impossible. By "fixing" the old, one

destroys old life, the mystery of what it had been and of what it had lost – the "sweetness in the gentle lines which rain and sun had wrought" (Ruskin, 1865:162).

Conservation or preservation is a better word to use in this regard, to add value and simultaneously keeping the story of the building intact. We have no right to destroy as we please: these buildings of the past are for the generations who are to follow us (Sawyer, 2000). Heritage is a very precious thing that adds to human's life form (ICOMOS, 1988). By conserving heritage architecture, architects might be able to create habitable, qualitative spaces for people: spaces where mankind can feel alive.

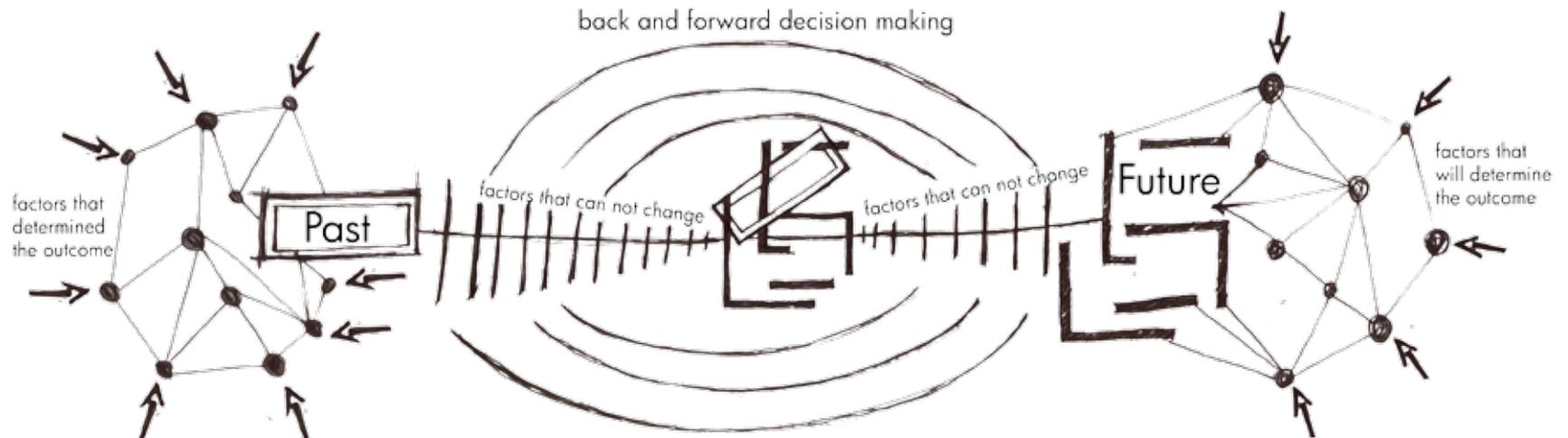


fig. 100\_ Diagram illustrating the amalgamation of old and new architecture and as well as the back and forward process ultimately create a new architecture that emphasizes the old.

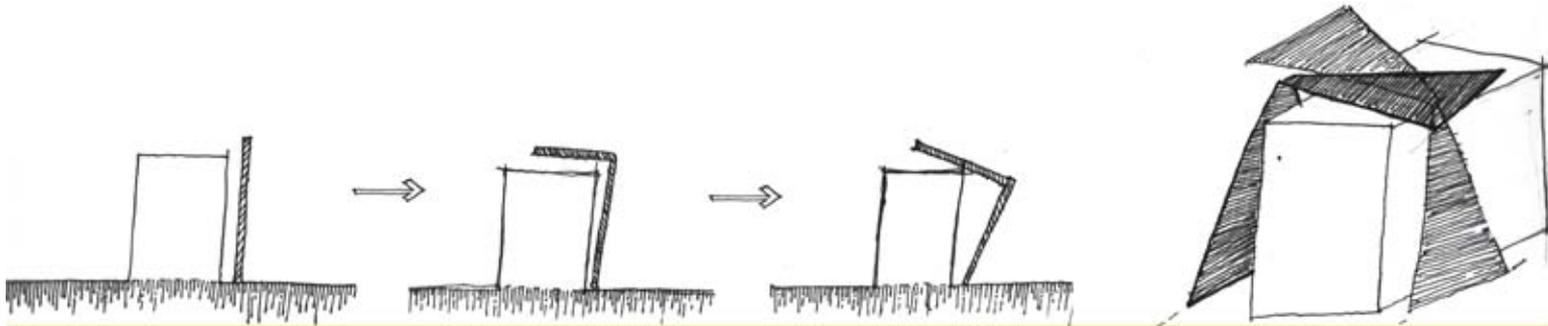


fig. 101\_ The diagrams demonstrate tension between elements when they are juxtaposed

Juxtaposing according to Porter (2004:105) is the placing of elements, side by side, in order to invite interaction and the activation of a comparison of relationships (fig.134). It is the positioning of two or more contrasting shapes, surfaces, forms, or spaces, it heightens interest especially when the character of each element is maintained (fig.139). It induces emotional suspense through shock and surprise. Where the old and the new meet, it should be as if this alone was a sacred thought, they should merely kiss.

Kiss in architectural term is when one element comes deliberately close to another –without ever quite touching – so that the poignancy of the moment is not lost on the observer or user. It refers to a peck, a precisely placed air-kiss,

which shows mutual respect through restraint immediately before the point of contact. It holds both parties in perfect tension and ties into the juxtaposition of architecture, this happens in a moment in time in space (fig.132) (Porter, 2004:108).

The tension created between two elements materials, spaces or even old and new by juxtaposing, can be done through detailing. Detail is the art of architecture, it is what makes a building unique in form. It is as Marco Frascari states: “Details are the generator of the construction process - and therefore of meaning, the tectonic detail is thus the site of innovation and invention” (Frascari, 1996). When the ‘contact’, which is mentioned above, becomes the poignancy of the moment it tells

a tale of what once was and that what will be. Physically this poignancy forms a joint. These joints or details, form the network that holds the collective memory together in perfect harmony. By exposing detail, one reveals the soul of a building and people can see and experience the architecture for what it truly is.

The human memory is both heightened and endangered in the ever changing urban landscape. Etched into their hardened fabrics of brick and stone, records of human interaction mark cities as sites of endurance, as well as change. Porter (2004) describes a ‘place of memory’ as a image and spatial relationship that act quickly on the mind.

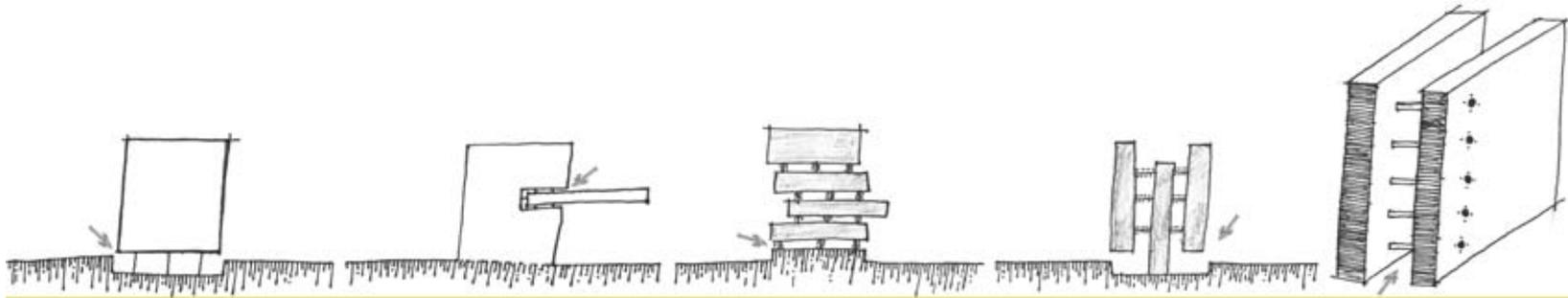


fig. 102\_ Kiss Diagrams\_ the diagrams demonstrate possible tensions that can be created between two elements and how this idea can be expressed in a detail as well.

*“All awareness of the past is founded in memory, remembering the past being crucial for our sense of identity. As the manifestation of architecture can itself provide a kind of knowledge through which the past remains accessible, this accounts for the significant of memory in design. For example, memories of times past can be woven into the fabric of buildings through materials and architectural and historical references.”*

(Porter, 2004:117)

Todd Macfie (Macfie, 2008) writes on a architectural blog site (Megaphone magazine) how he found himself at a construction site in Vancouver. On this particular day he was confronted by a hole in the ground and he describes how his memory fails. “I find it impossible to remember what building stood here before a developer had it removed. No shape, no texture or tone comes to mind. Only this: there was a building here, a building that I was quite familiar with. And now it is gone and my memory of it has also vanished.” He compares this event to war: In war, architecture is targeted to disrupt life and to remove structure that have, over time, gained meaning in a community. The war begins on a cultural front, displacing people’s history, their memory.

Intervention with other buildings can occur in a respectful harmonious manner by using the history, the fabric, the ground and the environment to generate clues and leave something behind for the generations to come (fig.141 and 142).



100

The aim of the design is to adapt a heritage industrial structure and create a building that houses a production process. This “industrial” building should be able to make a connection with residential and commercial buildings.

Movement paths through and around the old and new building must guide people past the manufacturing process. Public spaces will be situated in such a way that all people on site will use it for necessary and optional activity. Social activity might then spontaneously derive from the necessary (people going to work) and the optional activity (shopping for furniture) (Gehl, 2006, p.10).

The design should steer away from mono-functional industrial building design and make

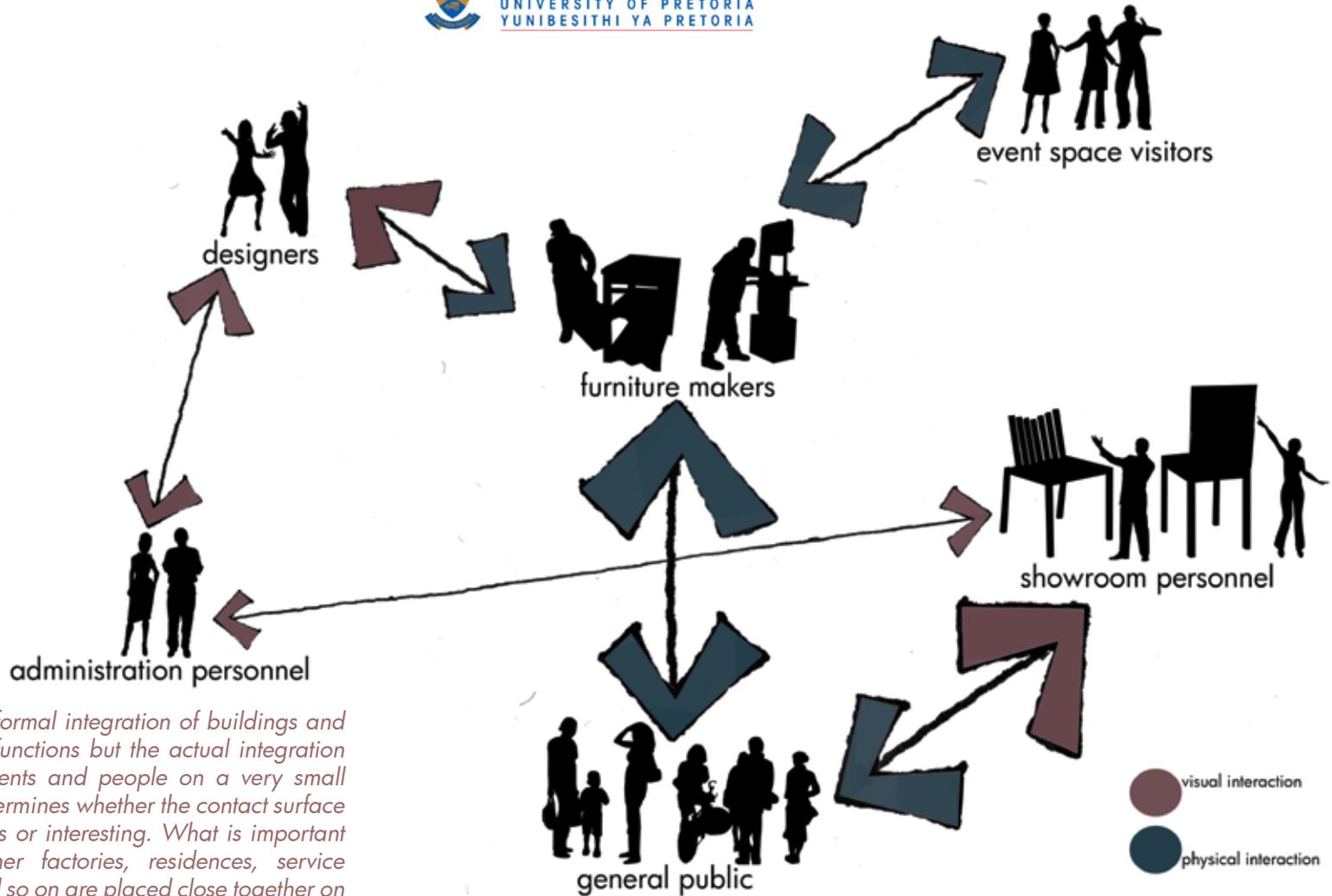
use of other activities like showrooms, training spaces or dining activities to incorporate the production process into daily live. The most important objective of the program is to connect with the public while the normal production process persists.

The private-public spaces in the building will be designed in a non hierarchal manner. Obviously there is certain hierarchy in the production process, but private-public spaces like rest rooms, tea rooms or canteens will facilitate all personal in the building. This way people can form a community in the building. There is interaction between designers, blue collar workers, administration personnel and, in some cases, the public as well. This can help with 24 hour surveillance in and around the

building, because interaction in private-public spaces force passive connections to form between people who do not necessarily know each other. Thus just by hearing and seeing the same people over and over again generates low intensity connections. When a stranger walks into the space, personnel will realise and raise questions.

The challenge is thus to re-create an innovative interactive design without disturbing the pragmatic functions of the program. Industrial buildings are like organisms, with different network systems, that are usually adaptable for future change. The design should be influenced by the specific programme it is designed for, but should also have the ability to change for future industries.

7.3. Social intend\_



*"It is not the formal integration of buildings and primary city functions but the actual integration of various events and people on a very small scale that determines whether the contact surface is monotonous or interesting. What is important is not whether factories, residences, service functions, and so on are placed close together on the architects drawing, but whether the people that work and live in the different buildings use the same public space and meet in connection with daily activities."*

(Gehl, 2006:101)

fig. 103\_ Diagram illustrating different levels of interaction between users



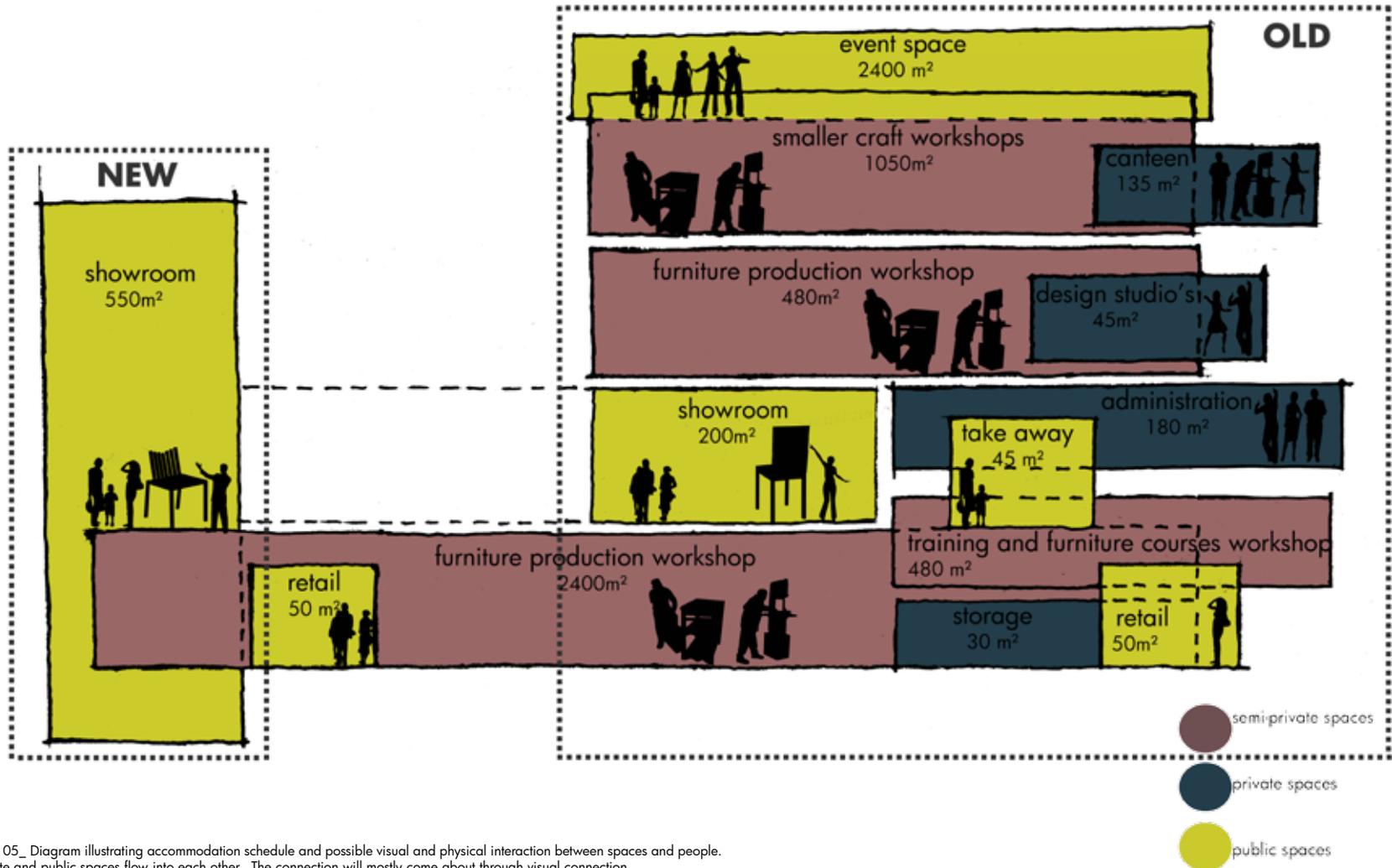


fig. 105\_ Diagram illustrating accommodation schedule and possible visual and physical interaction between spaces and people. Private and public spaces flow into each other. The connection will mostly come about through visual connection.



7.4. Mass development\_z

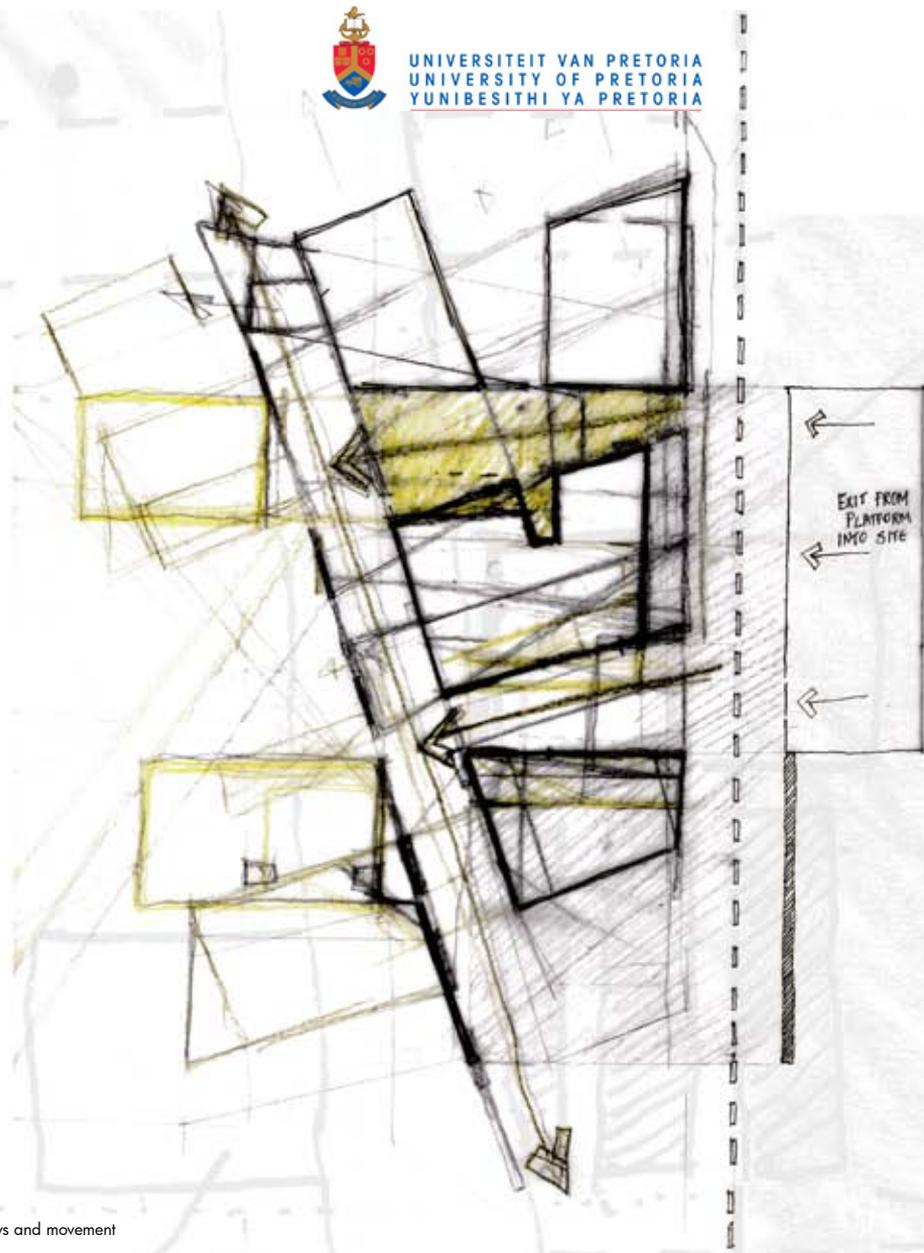


fig. 106\_ Mass development: determined by views and movement

The architectural form was determined by movement patterns, specific views that need to be focused on and most importantly the existing building. The area needed for the show room is 550m<sup>2</sup>, the current conceptual idea is more than 1500 m<sup>2</sup>, the form still needs to be refined to create a more compact viewing box. The building should also become more transparent to reveal the boiler house and the furniture to the people on the train station platform. The concept starts to hide and reveal, but an in debt study needs to be done to show how views should be projected from the platform.

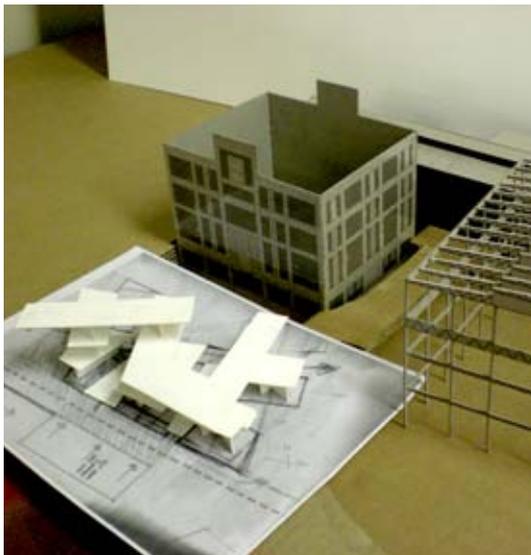


fig. 107\_ Conceptual mass model: possible intervention between old and new

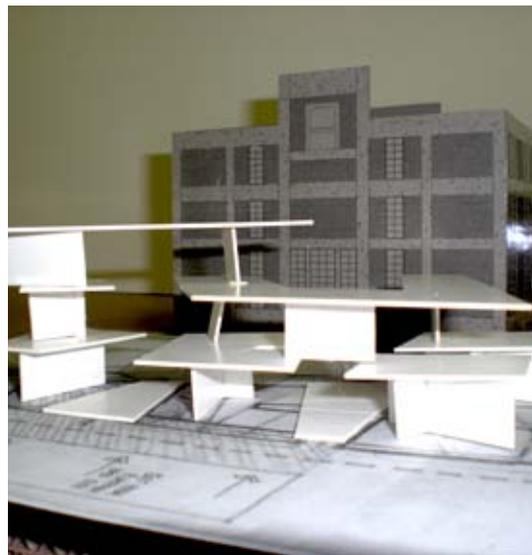


fig. 108\_ The scale of the new structure needs to respond to the existing

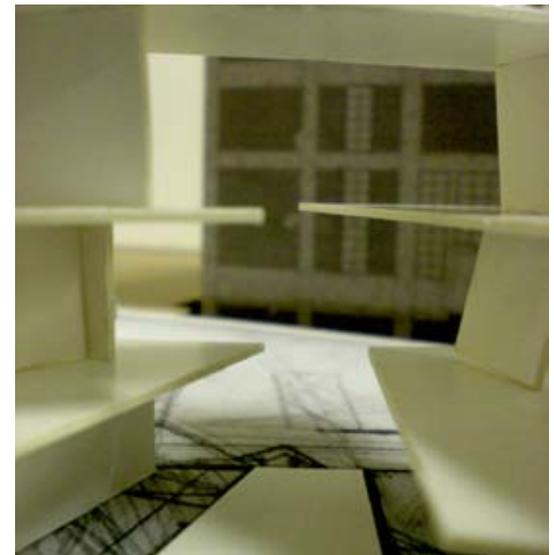


fig. 109\_ The architecture start to focus views to the existing building



fig. 110\_ Walkways connect to the existing structure, the void in the existing structure conveys the character of what it once was: industrial cathedral

The next study revealed a more solid building form, glass walls to the public square start to show how responsive industrial environments can be created. There is a visual link between worker and passerby. Elements that pop up on ground floor level guides people in certain directions, these elements are skylights and sunken courtyards that bring natural light to the workshop space below.

As there are already a bunch of existing elements in the landscape, the building form needs to be reworked and simplified. The area between the new and old should be less cluttered and the new structure should add to

the existing majestic atmosphere of the site. Keeping in mind the protrusion of views and movement patterns a new atmospherically tension needs to be created between old and new, evidently creating a showroom that emphasises the industrial heritage.



fig. 111\_ The space between the old and the new structure reveals possible objects in the landscape, these objects protrude light to the basement level, people can also view the production process through these openings



fig. 112\_ All Eastern levels need to visually interact to the public: on ground and platform level. Note how the architecture focuses views over the rest of the site

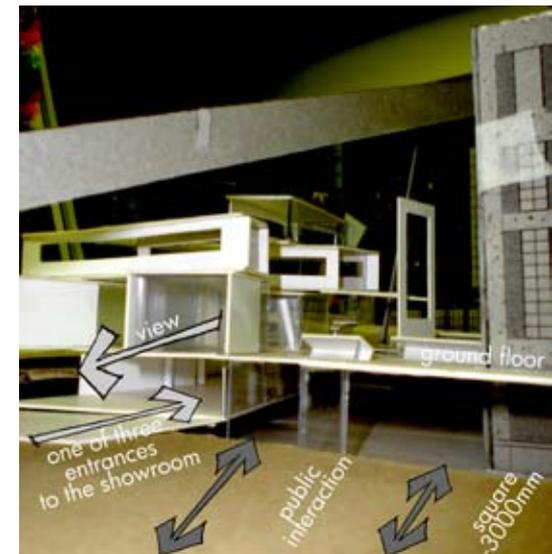


fig. 113\_ The production process on basement level visually interacts with the square to the North

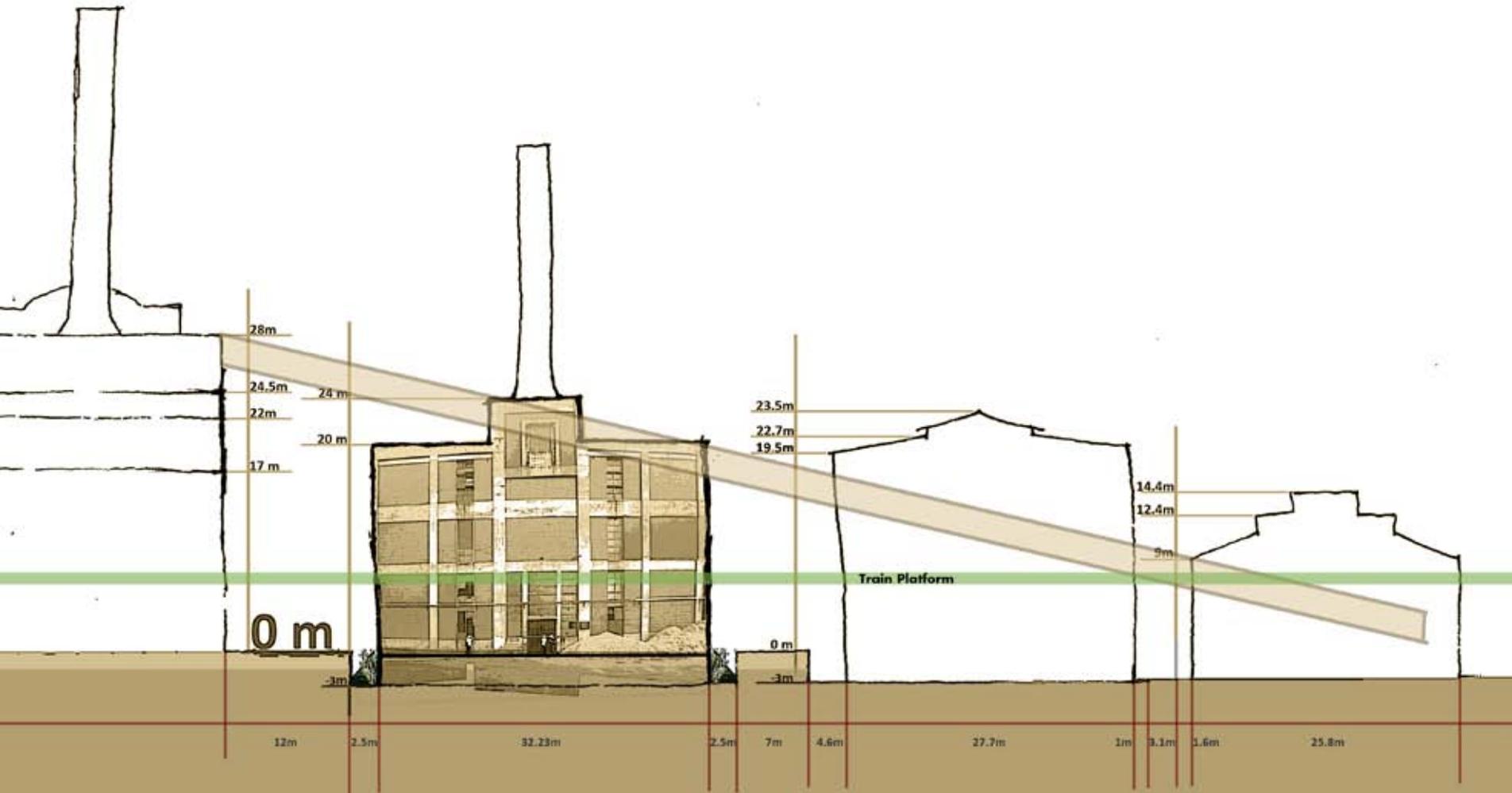


fig. 114\_ The 1940 Boiler house in proximity to surrounding buildings, the image also illustrates the placement of the train station platform

## 7.5. Revisiting the design\_



The projection model which indicates various views from the platform gives a better understanding of what the showroom building should be. The building must almost be 'invisible', a thinner, simpler building

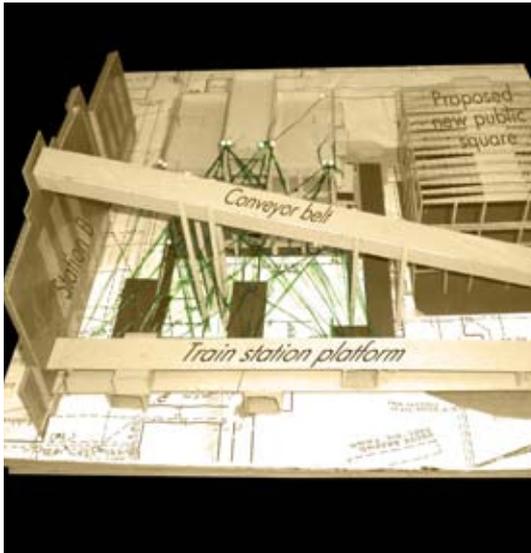


fig. 115\_ Views projected from the platform to the boiler house

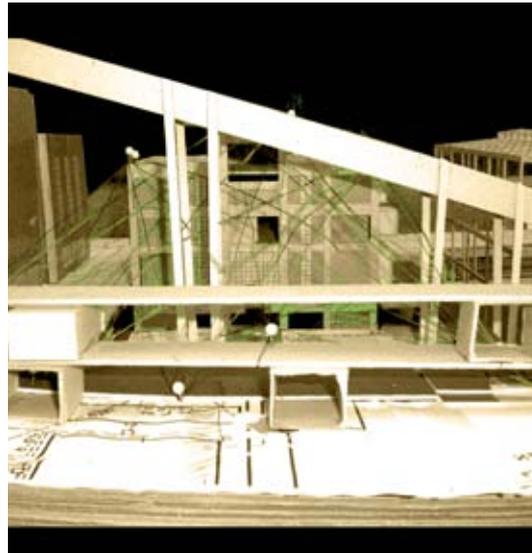


fig. 116\_ The proposed showroom, between the platform and the boiler house, calls for a transparent structure to create a definite visual connection between the two

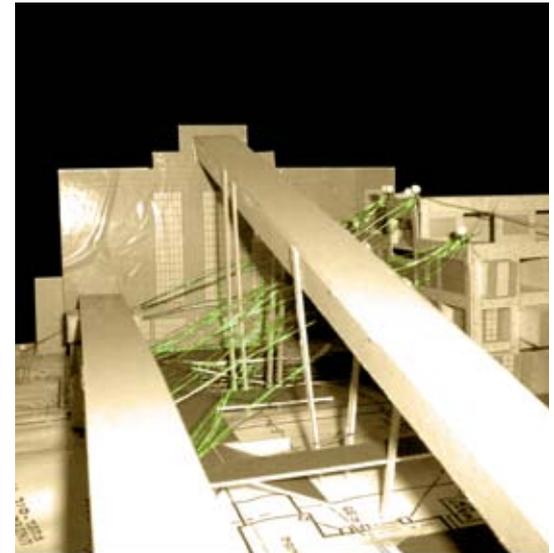


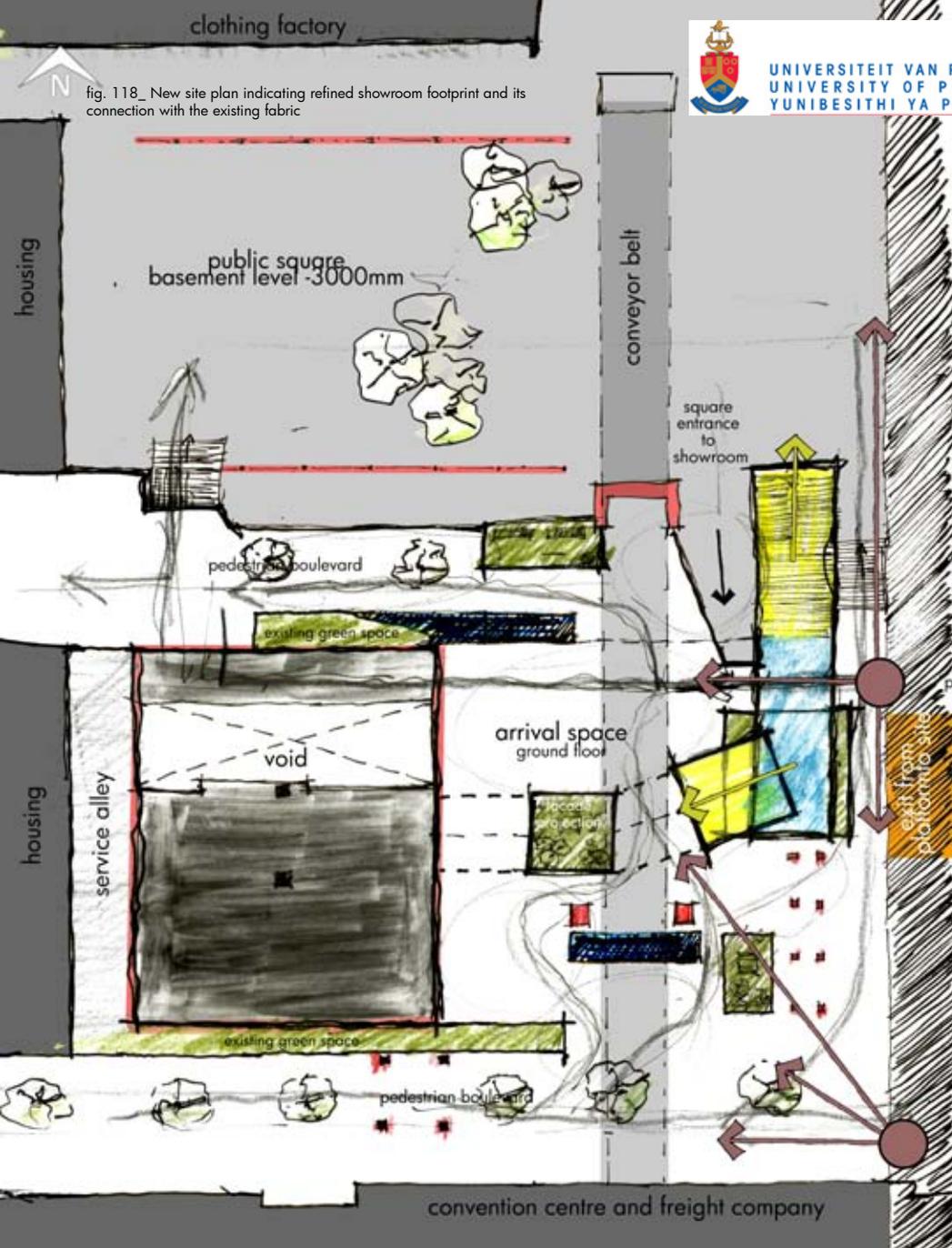
fig. 117\_ The conveyor belt does not obstruct views from the platform

clothing factory



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fig. 118\_ New site plan indicating refined showroom footprint and its connection with the existing fabric



This part of the new building is completely transparent, note that the box align with the edge of the existing building.

Specific views are projected to the existing building and the site.

The new intervention in the existing building, only partially fill the space, the reason: to experience the cathedral quality/void.

Basement level -6000mm courtyards: existing openings. the placement. forms of the new courtyards were determined by demolished structure footprints - facade projection.

Skylights to basement level: they not only provide natural light, but pedestrians can also view part of the production process form above.

Existing structures on site.

pedestrian movement



main entrance to site

fig. 119\_ Energy diagram representing movement between old and new

## 7.6. Final proposal\_



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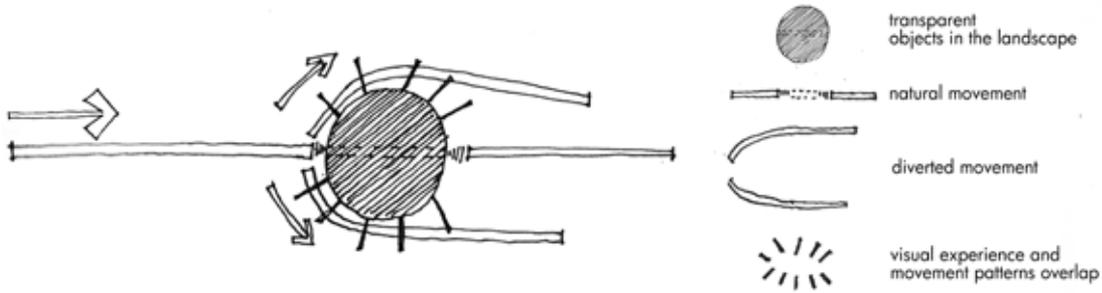


fig. 120\_ Diagram illustrating movement around objects in the landscape

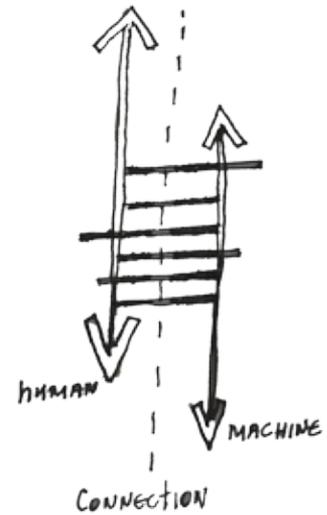


fig. 121\_ The design will focus on the connection between man and machine

# 7.7. The connection\_

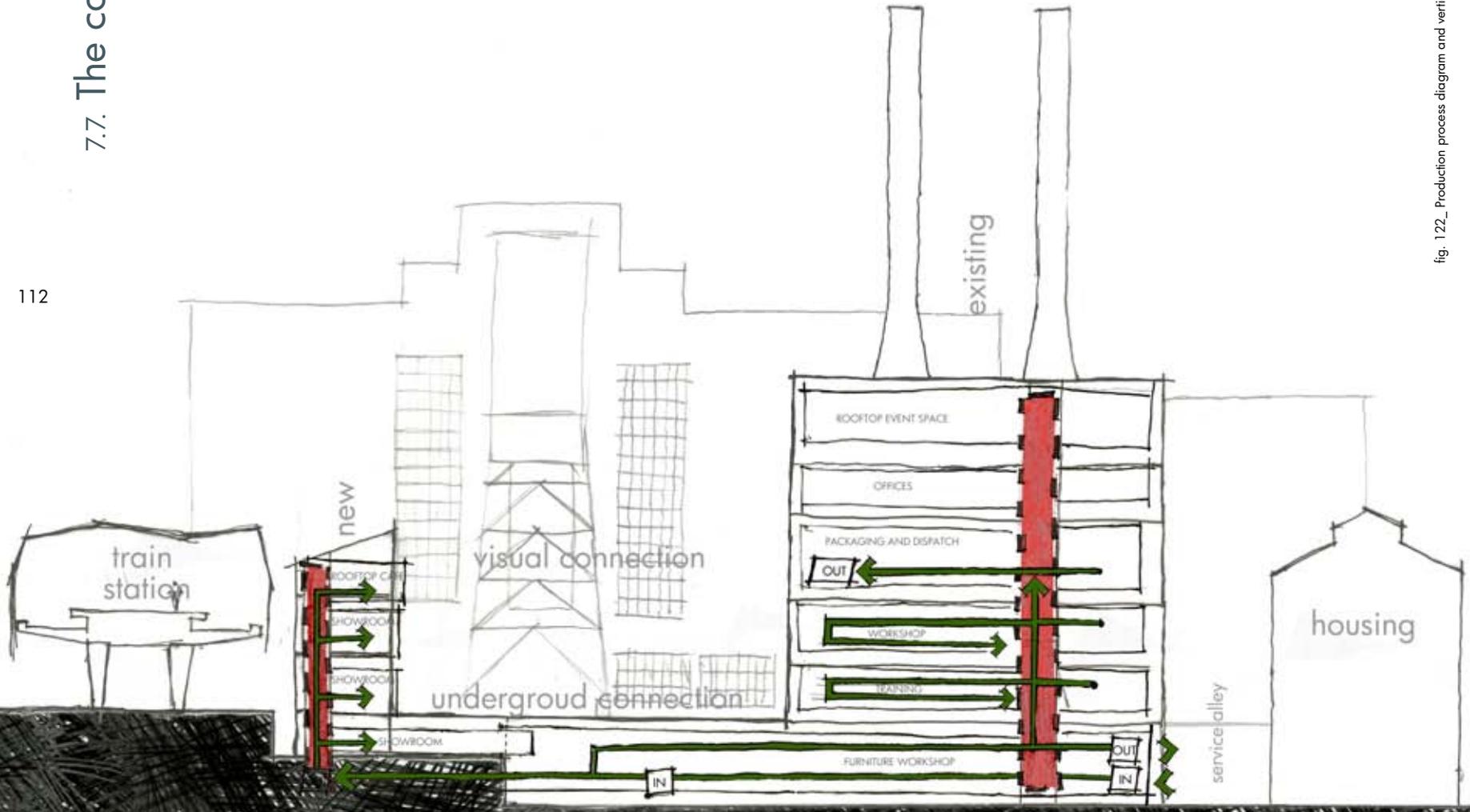


fig. 122\_ Production process diagram and vertical circulation of the products

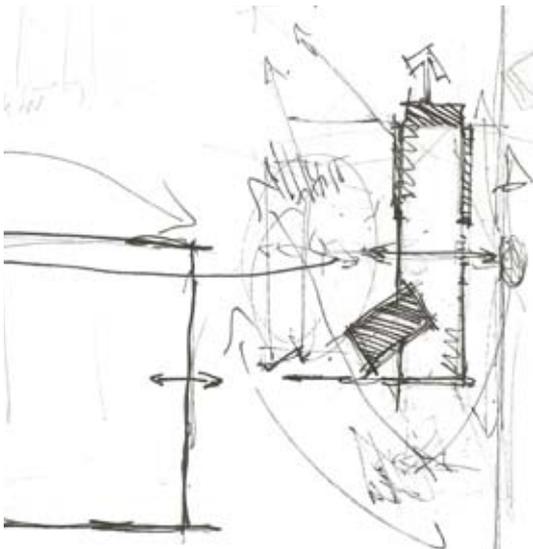


fig. 123\_ Sketch of the refined showroom form, highlights most prominent views

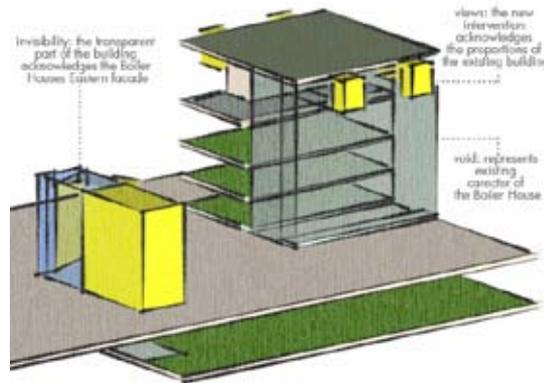


fig. 124\_ Green represents the new production levels and yellow masses represent new viewing boxes

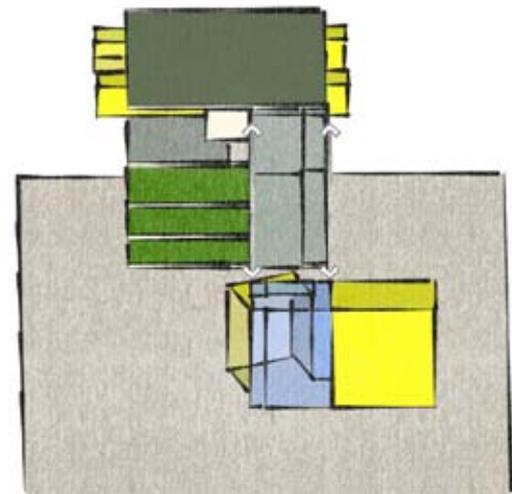


fig. 125\_ Note how the transparent element recognizes the Boiler House's Eastern facade

# 7.8. The Boiler House\_



114

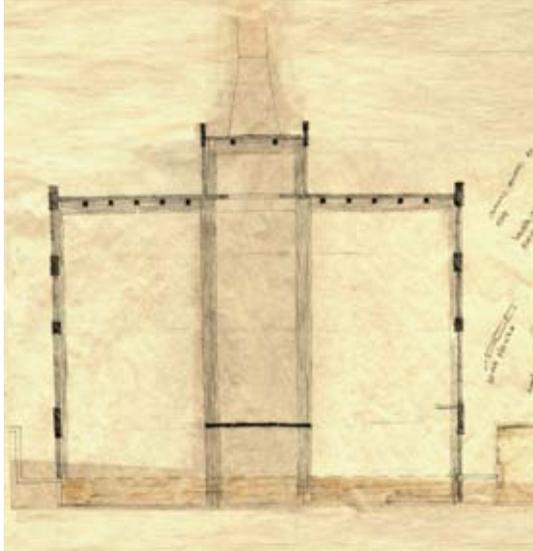


fig. 126\_ The buildings existing structure

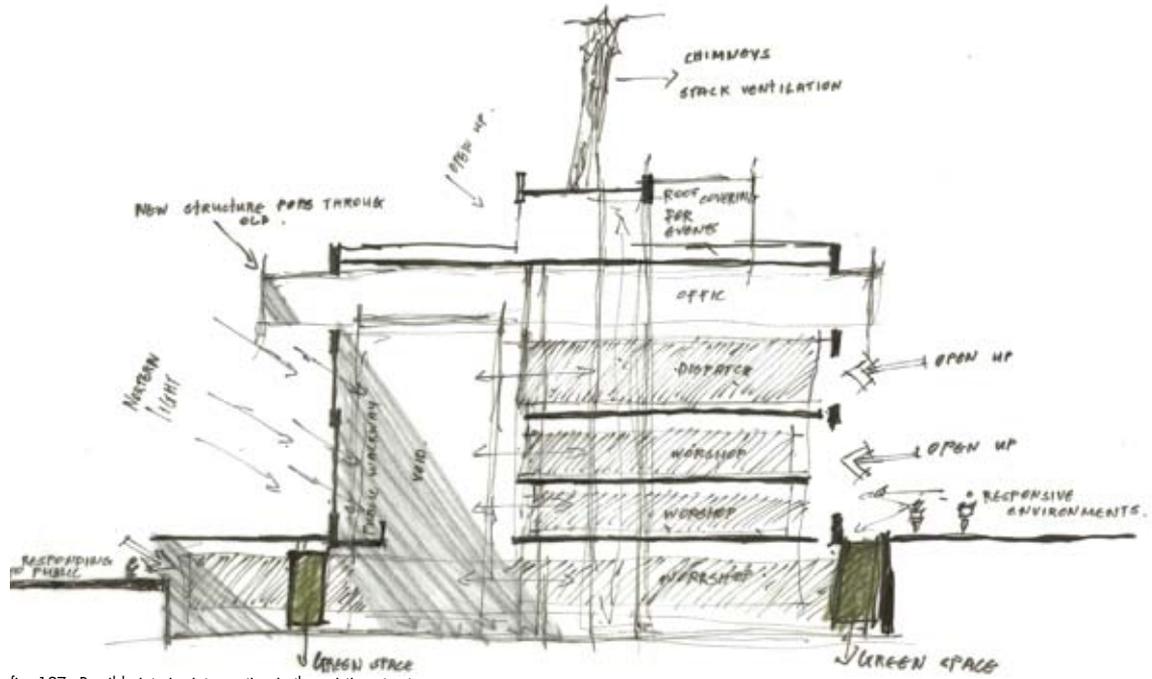


fig. 127\_ Possible interior intervention in the existing structure

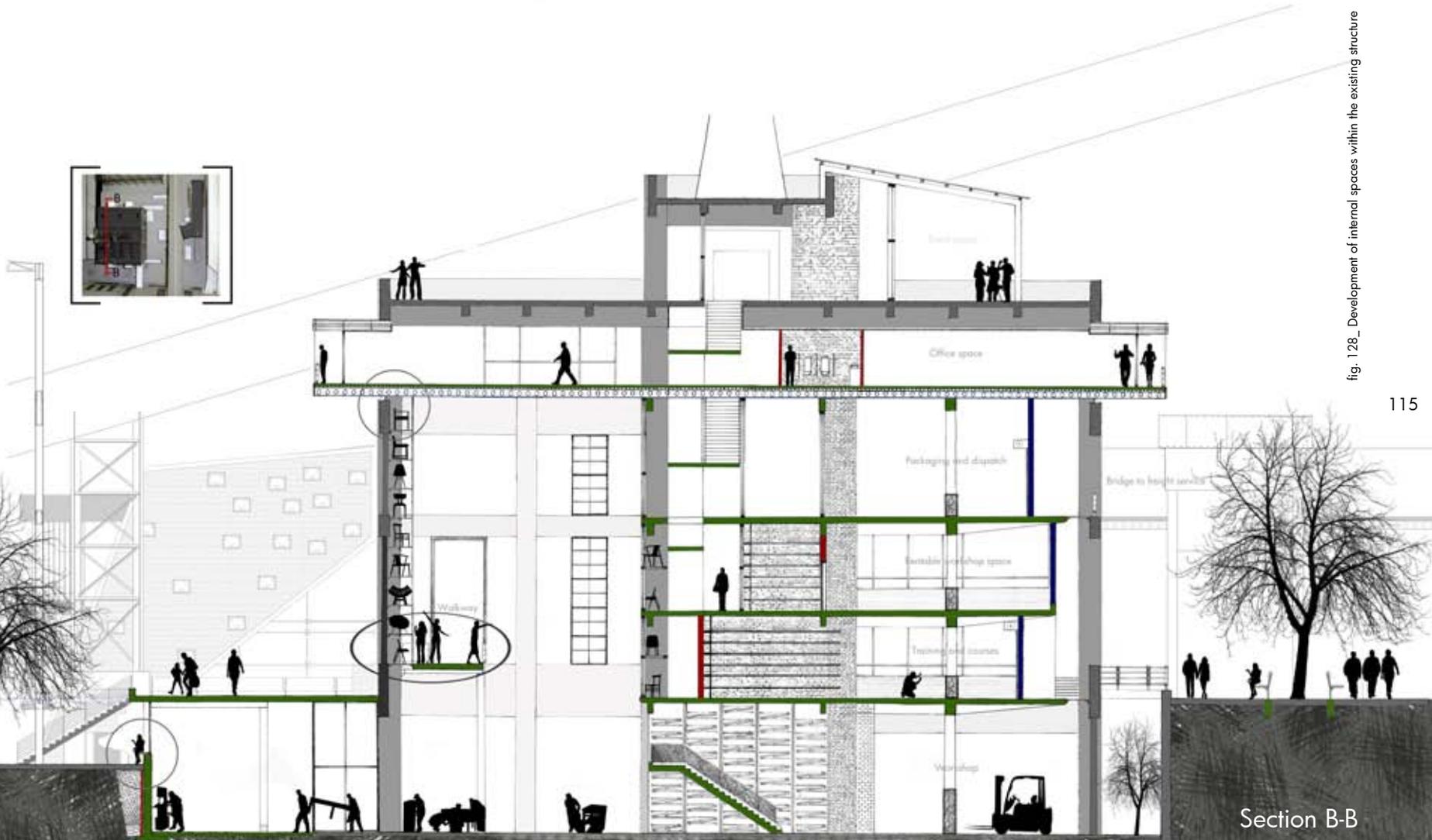


fig. 128\_ Development of internal spaces within the existing structure

Section B-B

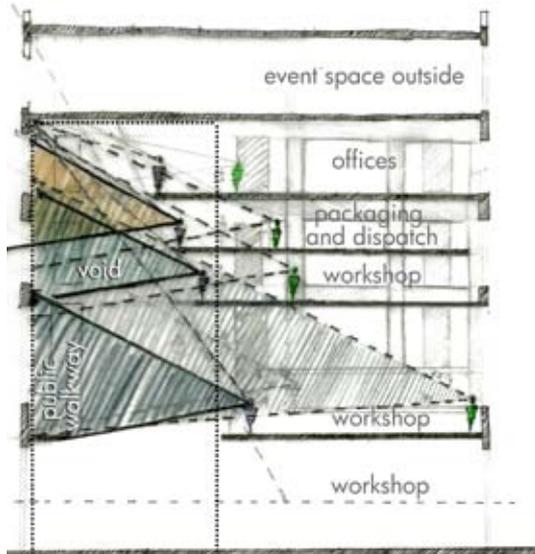


fig. 129\_ Concept sketch: development of internal spaces



fig. 130\_ Perspective view as seen from the public walkway inside the existing structure, the walkway also exhibits furniture to the people that walk past



fig. 131\_ The majestic character of the existing structure is preserved to a degree, the light still streams into the Northern facade as it did before

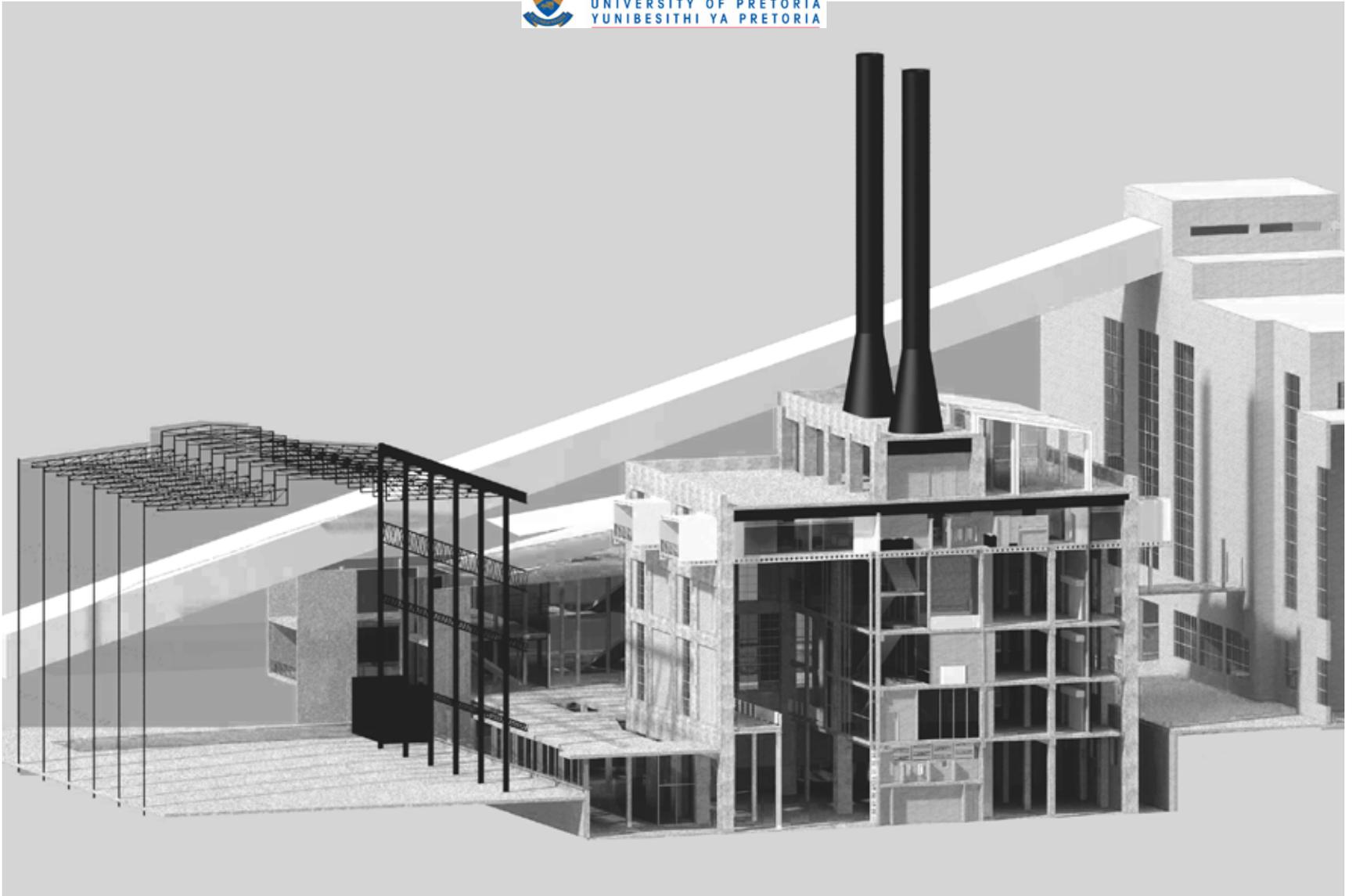


fig. 132\_ Perspective section illustrating the new intervention inside the building in proximity to other buildings

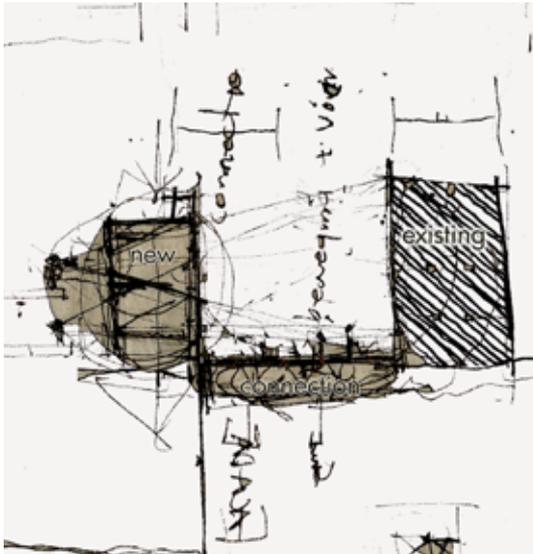


fig. 133\_ Conceptual diagram illustrating the underground connection between old and new architecture



fig. 134\_ Perspective view as form the square area

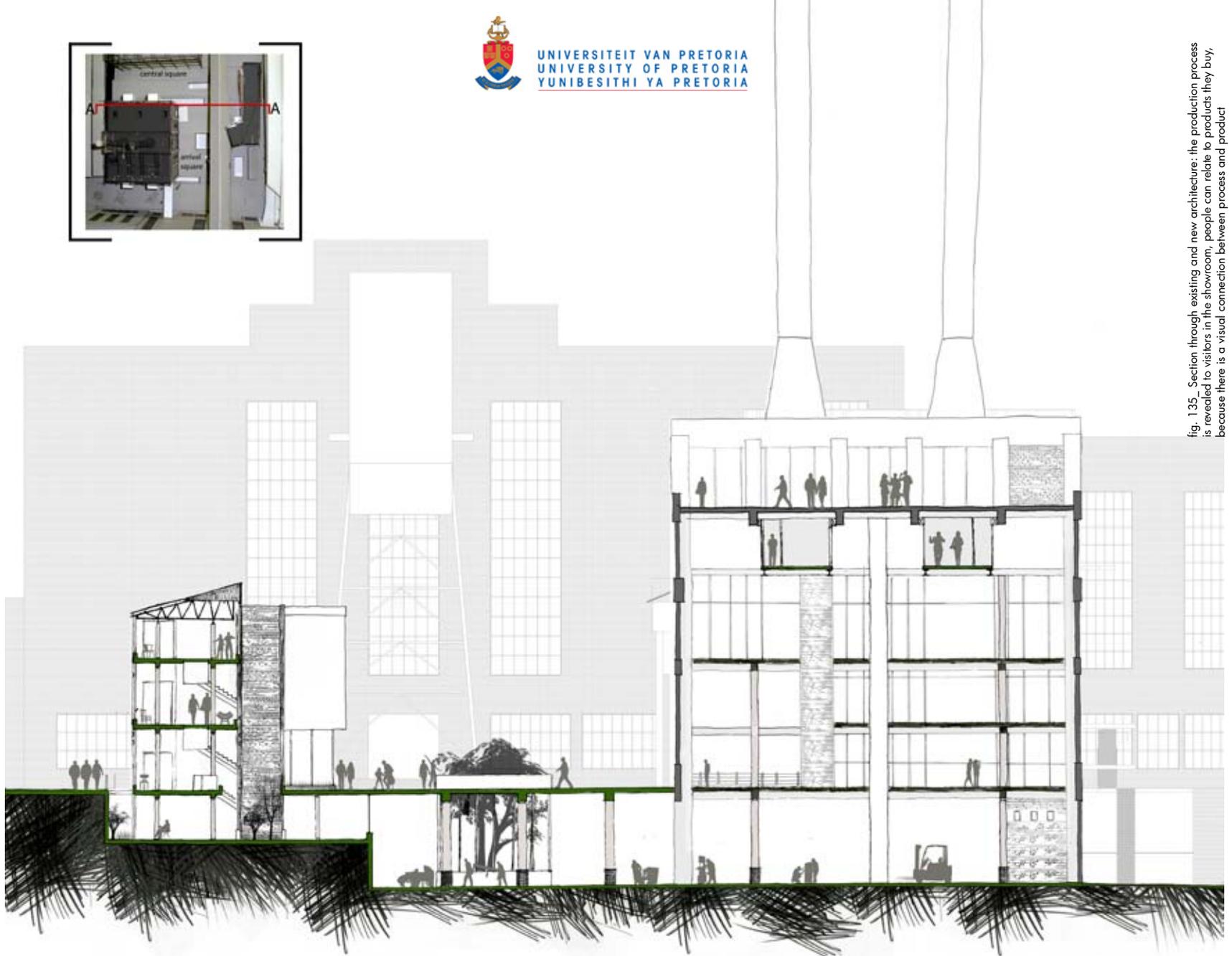


fig. 135\_ Section, through existing and new architecture: the production process is revealed to visitors in the showroom, people can relate to products they buy, because there is a visual connection between process and product

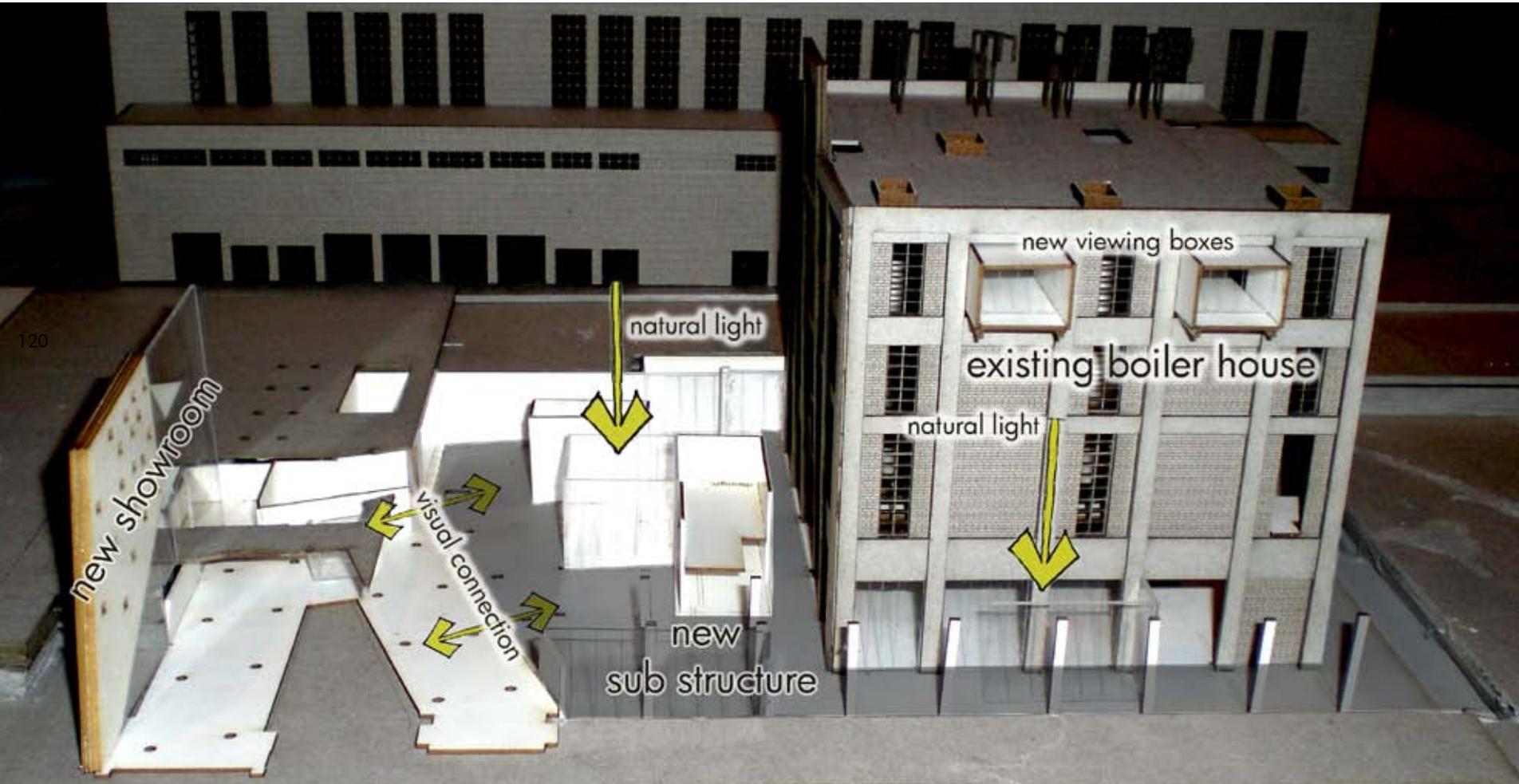


fig. 136\_ Image illustrating the underground connection between the old boiler house and the new showroom



fig. 137\_ The visual connection between the old and new architecture

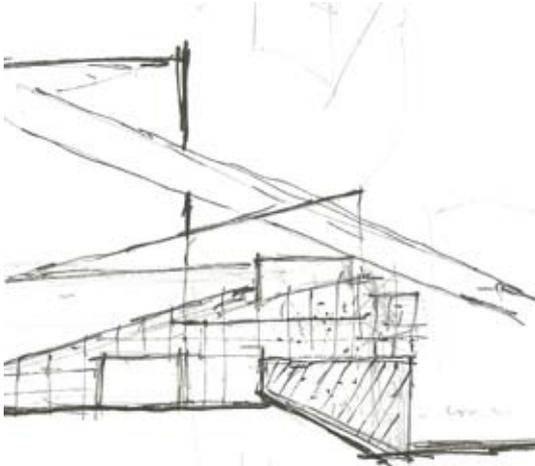


fig. 138\_ Conceptual exploration

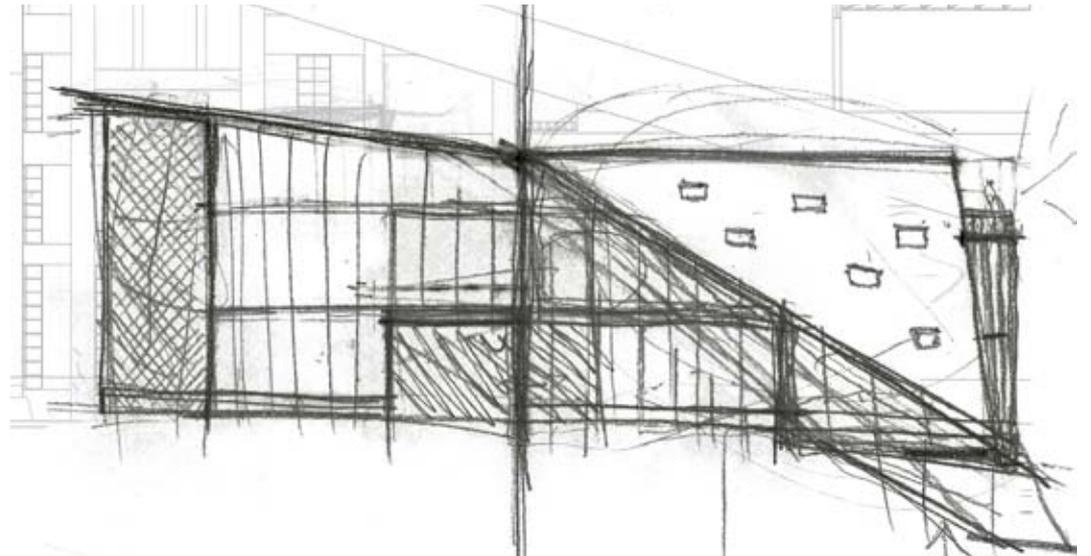


fig. 139\_ Exploration sketch illustrating the showrooms Eastern facade exploration

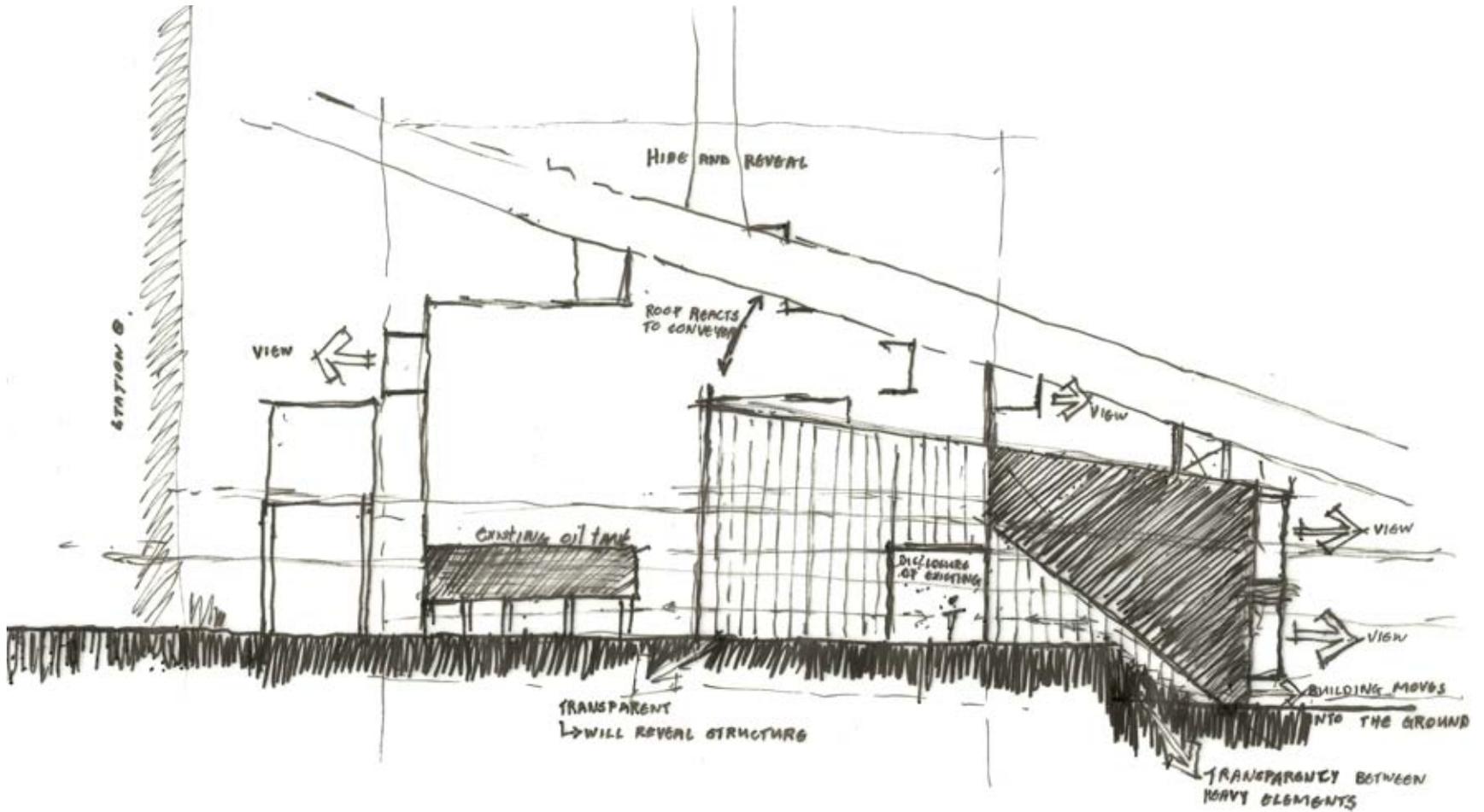
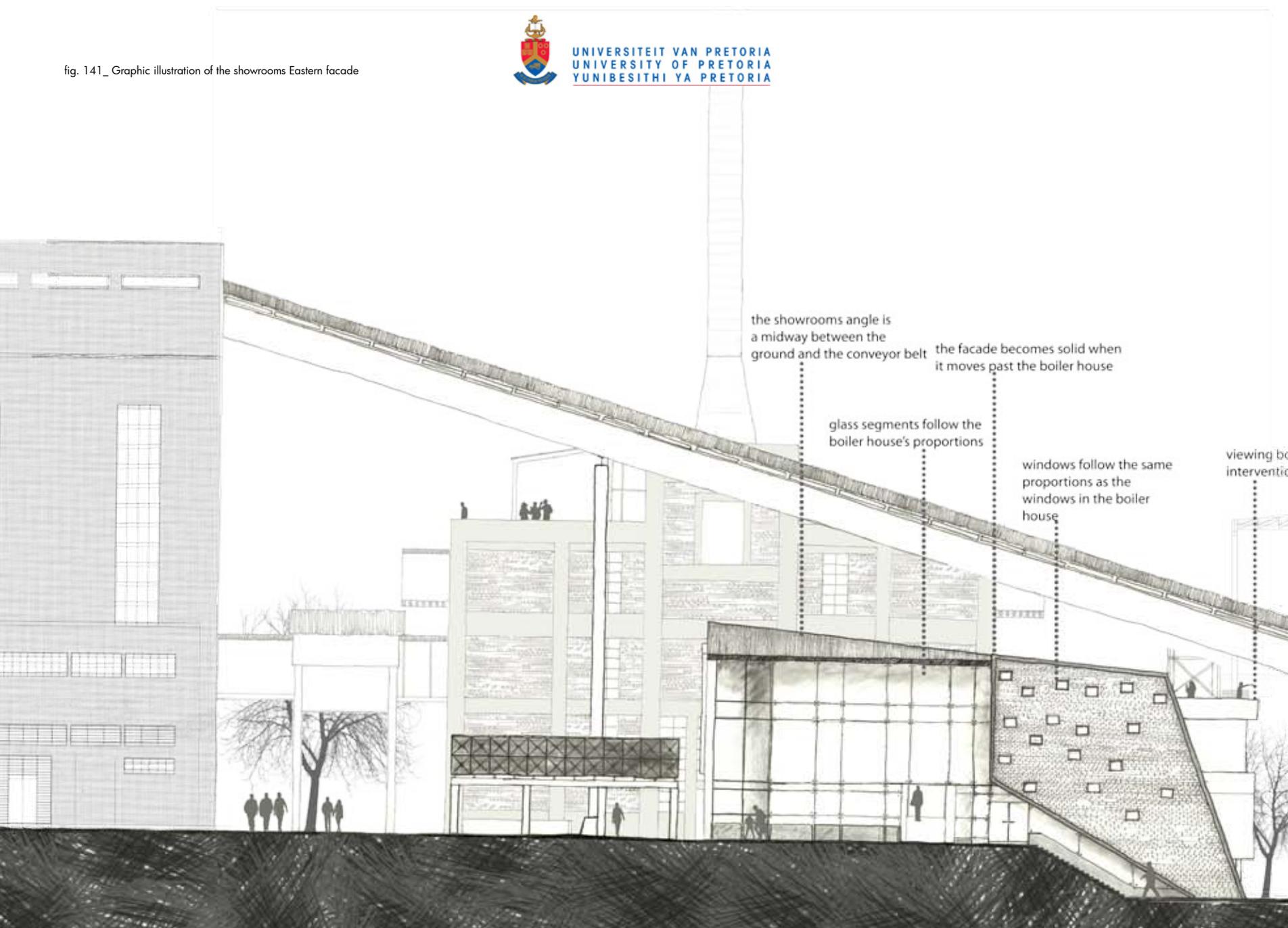


fig. 140\_ Stipulating reasons for the facade development

fig. 141\_ Graphic illustration of the showrooms Eastern facade



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the showrooms angle is  
a midway between the  
ground and the conveyor belt

the facade becomes solid when  
it moves past the boiler house

glass segments follow the  
boiler house's proportions

windows follow the same  
proportions as the  
windows in the boiler  
house

viewing bo  
interventio



boxes relate to the  
on inside the boiler house

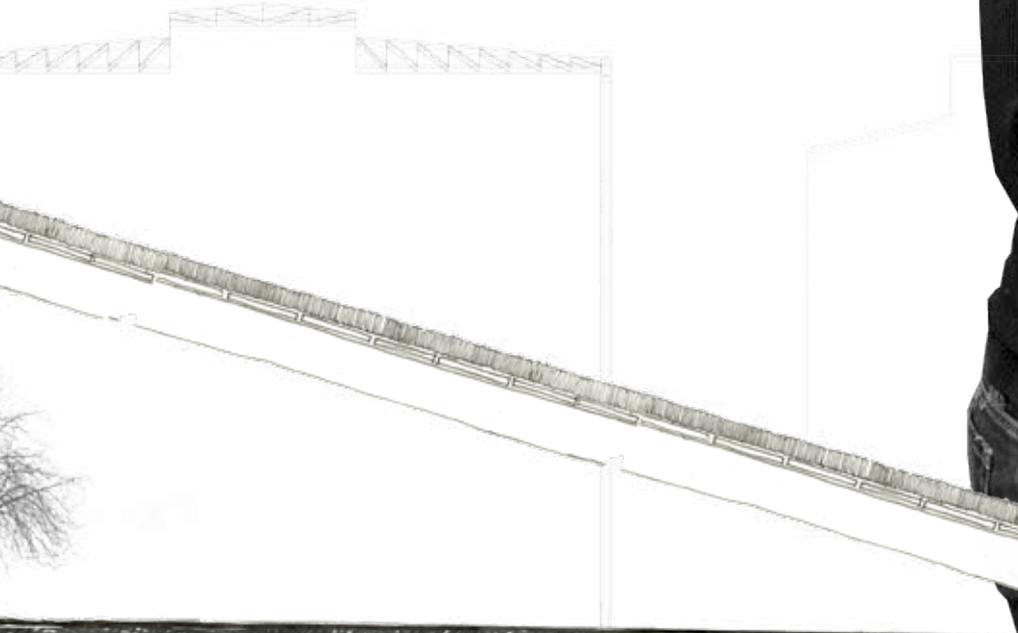


fig. 142\_ Furniture making is a skill that can be practised by both sexes



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fig. 143\_ The connection between the train platform and the showroom



7.12. Views\_



fig. 144\_ The viewing box line up with the existing entrance of the Boiler House, it also directs the viewer to specifically notes and experience the historical building

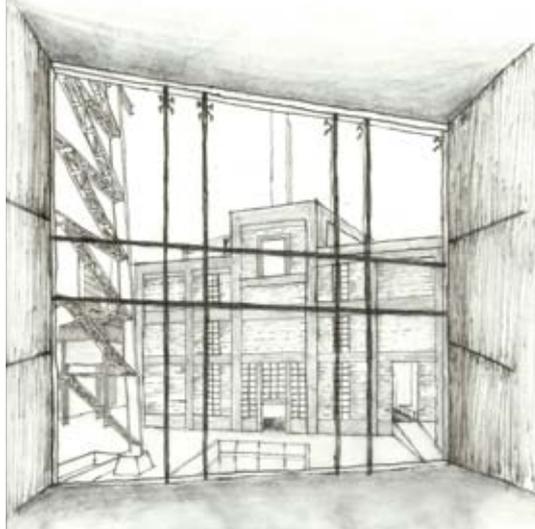
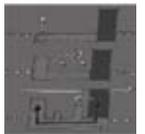
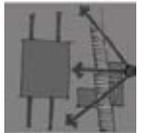
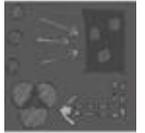
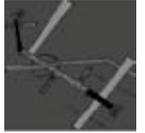


fig. 145\_ Views as seen from the furniture showroom





technical

8.1. Concept\_

The furniture showrooms design attempted to contrast with the heritage as much as possible. Juxtaposing as mentioned in chapter 6 is the positioning of two or more contrasting elements, forms, or spaces, it heightens interest and induces emotional suspense. The existing Boiler House speaks a language of honest 20th century industrial architecture. Its column and beam structure is exposed and presents the buildings' form, the brick infill is set back. The new intervention firstly acknowledge the heritage by also implementing a column and beam structure, but then counteract it. As the showroom needed

to be as transparent as possible, the column and beam structure was set back and the infill pushed forward. The materials that are found in the existing structures, brick, concrete and glass, are also used in the new structure, but it is reinterpreted to create a contrasting structure that emphasizes the robust industrial nature of the heritage. Where different materials touch, the plains shift, and shadow lines are created. It reads as a push-pull architecture, one element moves out of another and into the landscape.

The new intervention inside the existing structure partially mimics the materiality of the building, as the building once again houses

a industrial process, the building called for a robust material. A concrete column and beam structure is added to the inside, but where ever the new structure touches the old the poignancy of the moment is captured by a kiss. Elements come deliberately close to one another , but newer quite touches. Before the point of impact the material changes and subtly connects with the old.

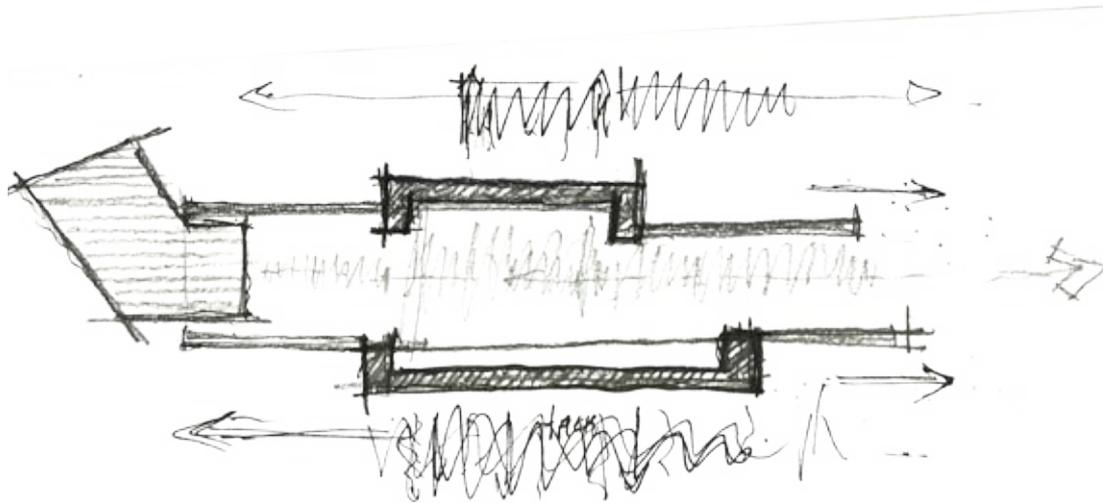


fig. 146\_ Diagram illustrating the idea of push-pull architecture

fig. 147\_ Contrasting materials can focus the attention on the connection between old and new

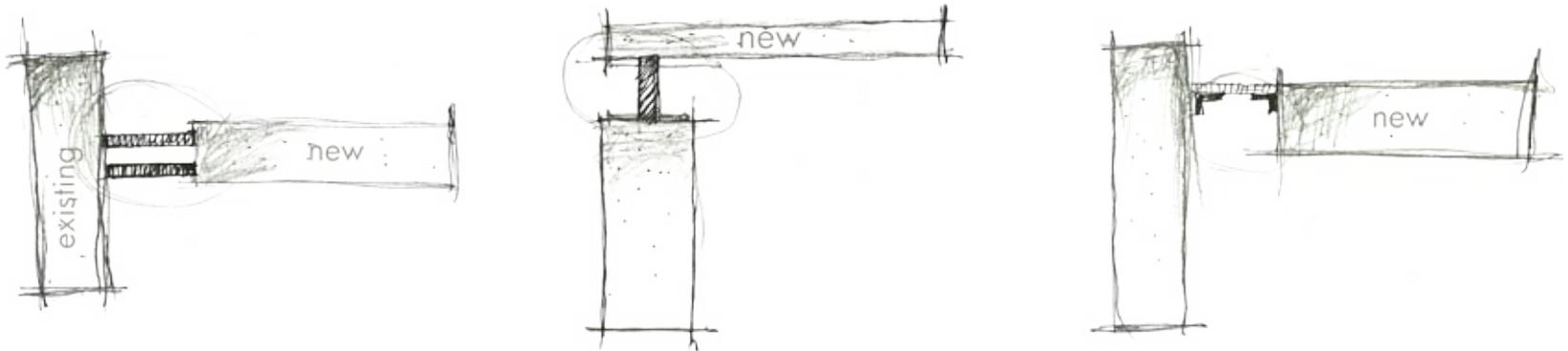


fig. 148\_ Sketches illustrating possible connections between old and new that can capture the poignancy of the moment

## 8.2. Material choice\_ Whitewashed brickwork\_

The 1935 Boiler House situated North of the 1940 Boiler House, was declared unsafe. Brick work is falling from the structure, the framework determined that the steel structure will be retained but the brick work removed. The open steel canopy, will define the new public square.

A study was conducted to determine a colour pallet for the showroom. The new material had to draw attention to the timber furniture as well as the boiler house. Creating a more clinical atmosphere or a blank canvas to the interior and the exterior, warmer elements like varnished timber or clay brickwork are

emphasized. Whitewashed common bond brickwork not only corresponds with the heritage but it also creates an atmospherically tension between old and new, therefore acknowledging the heritage but stressing its existence by contrasting colours and shapes.

**WALLS:** Brick work will be reused for paving as well as to construct part of the showroom. The brick work will be reused in the same common bond style, as it was before, and whitewashed to generate a architecture that is in contrast to the existing, robust, industrial heritage.

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fig. 149\_ The brick work of the dilapidated 1935 Boiler House will be reused to construct part of the showroom

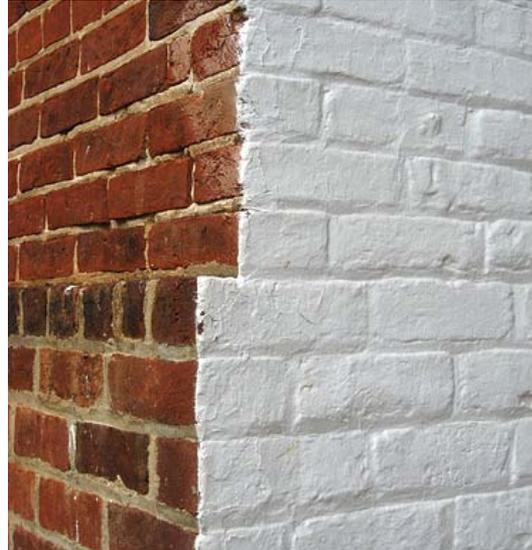


fig. 150\_ Contrast created between whitewashed brickwork and natural brickwork



fig. 151\_ Brickwork as a backdrop for exhibiting timber furniture: timber is not accentuated



fig. 152\_ Wood as a backdrop for exhibiting timber furniture: furniture blends in with the panels



fig. 153\_ Whitewashed brickwork as a backdrop: timber is accentuated the most when it is placed in front of a white service



fig. 154\_ Concrete brickwork as a backdrop: timber is accentuated in front of grey services as well

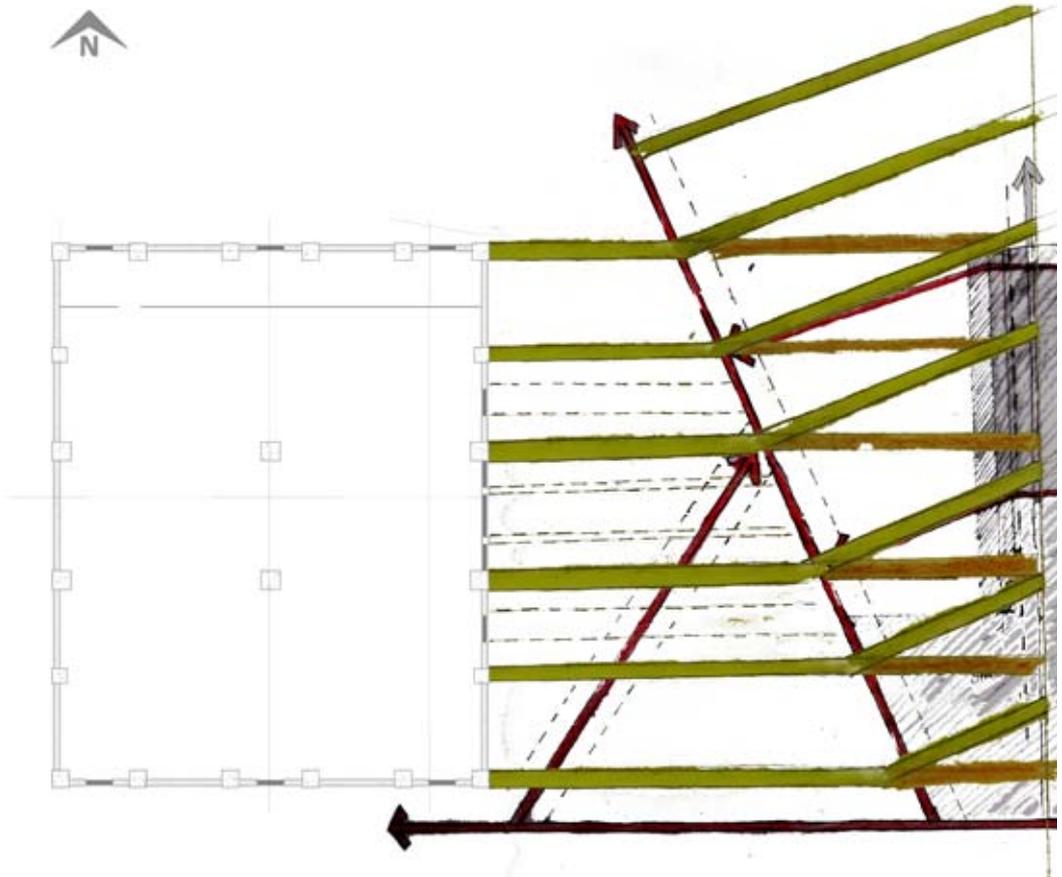
### 8.3. Structure\_



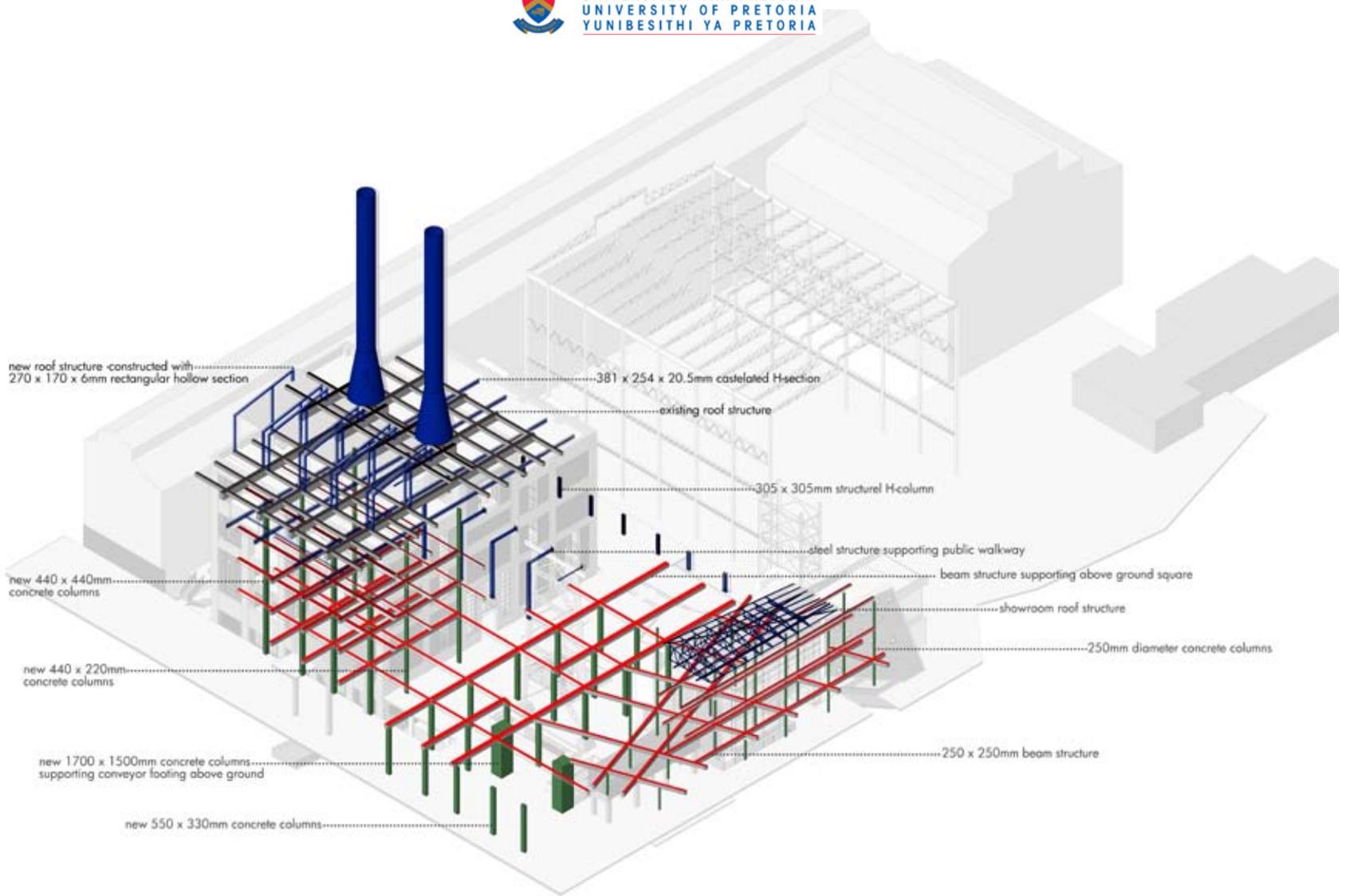
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The new furniture showroom's structure is set at the same grid as the Boiler House's, the change in direction is caused by a pedestrian walkway that crosses over the site. The columns in the showroom is set back, round columns are used to contrast the existing building's square columns. Round columns also indicate high intensity movement spaces.

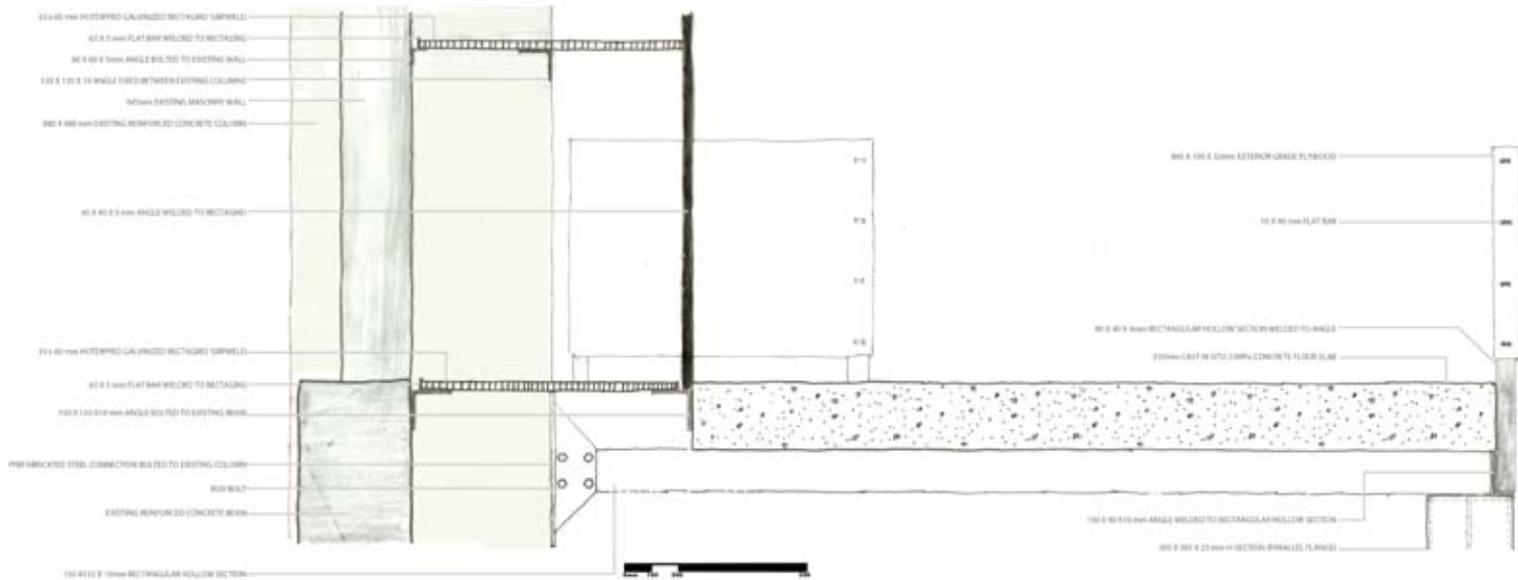
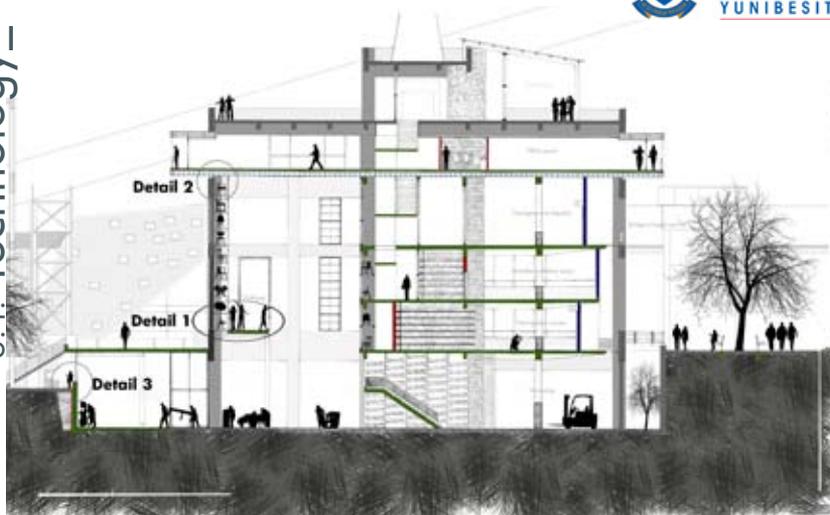
The shape of columns change as activity changes. The new addition to the existing structure has industrial spaces, that require thicker square columns. Vertical and horizontal movement is indicated by rectangular columns.





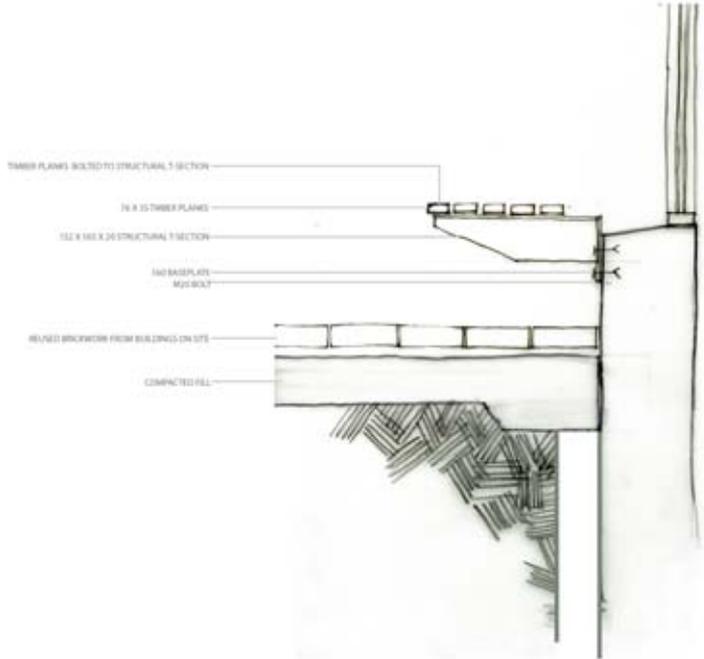
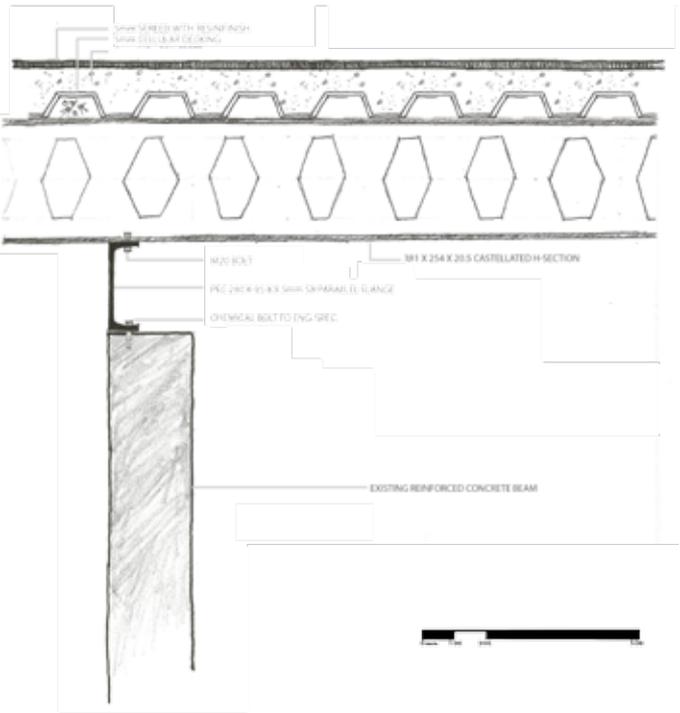


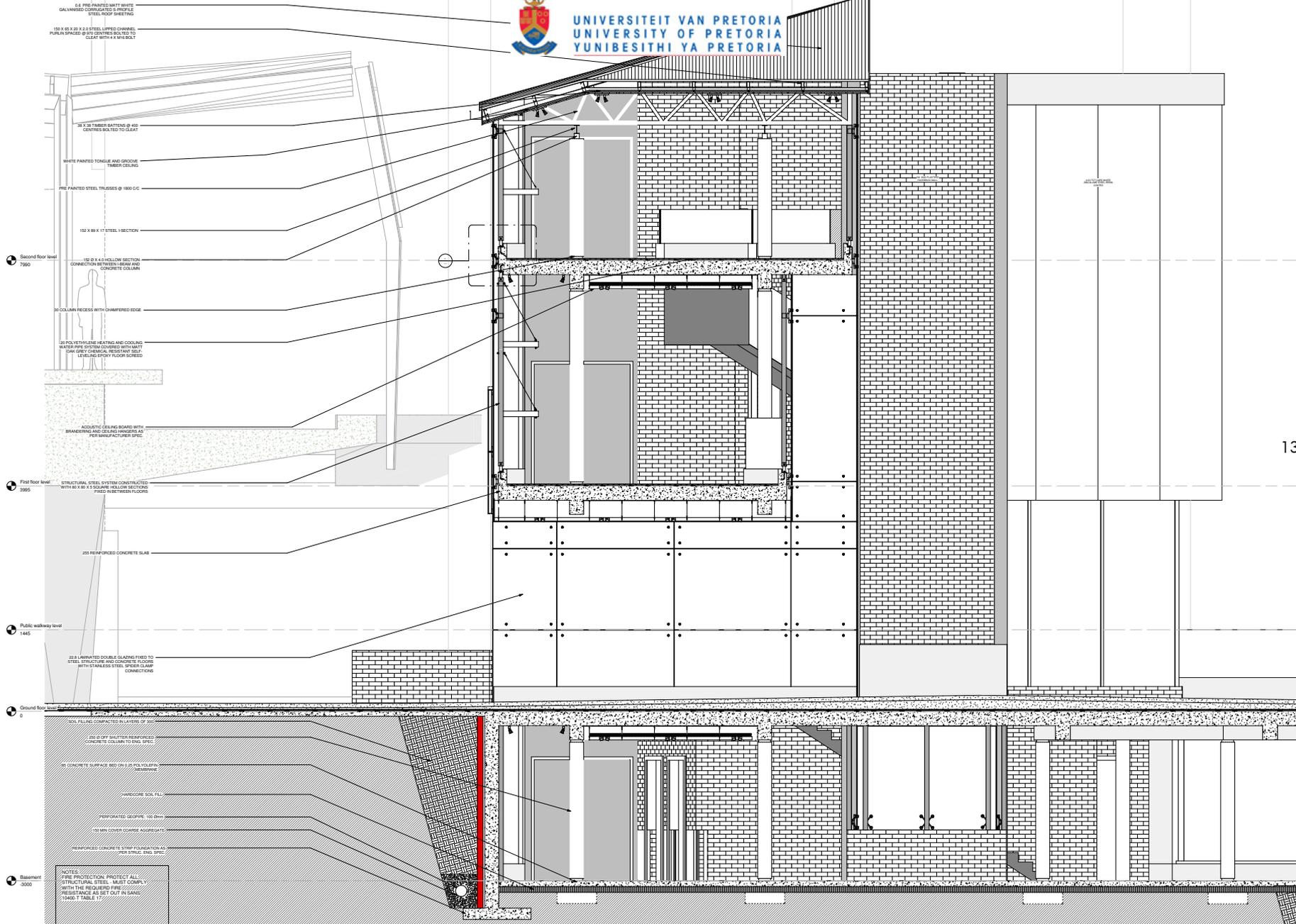
# 8.4. Technology –





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G.P. PRE-PANCHED MATT WHITE GALVANISED CORRUGATED Z-PROFILE STEEL ROOF SHEETING  
150 X 65 X 20 X 2.5 STEEL LIPPED CHANNEL PURLIN SPACED @ 915 CENTRES BOLTED TO CLEAT WITH 4 X 8 M BOLT

38 X 38 TIMBER BEATING @ 400 CENTRES BOLTED TO CLEAT  
WHITE PAINTED TONGUE AND GROOVE TIMBER CEILING

PRE-PANCHED STEEL TRUSSES @ 1800 O.C.  
152 X 89 X 17 STEEL I SECTION

Second floor level 790  
150 D X 4.4 HOLLOW SECTION CONNECTION BETWEEN BEAM AND CONCRETE COLUMN

30 COLUMN RECESS WITH CHAMFERED EDGE  
30 POLYETHYLENE HEATING AND COOLING WATER PIPE SYSTEM COVERED WITH DAMP PROOF MEMBRANE AND SELF-LEVELLING EPoxy FLOOR SCREED

ACoustic CEILING BOARD WITH BRANDING AND CEILING HANGERS PER MANUFACTURER SPEC

First floor level 995  
STRUCTURAL STEEL SYSTEM CONSTRUCTED WITH 60 X 80 X 5.5 SHAPES BOLTED AND WELDED IN BETWEEN FLOORS

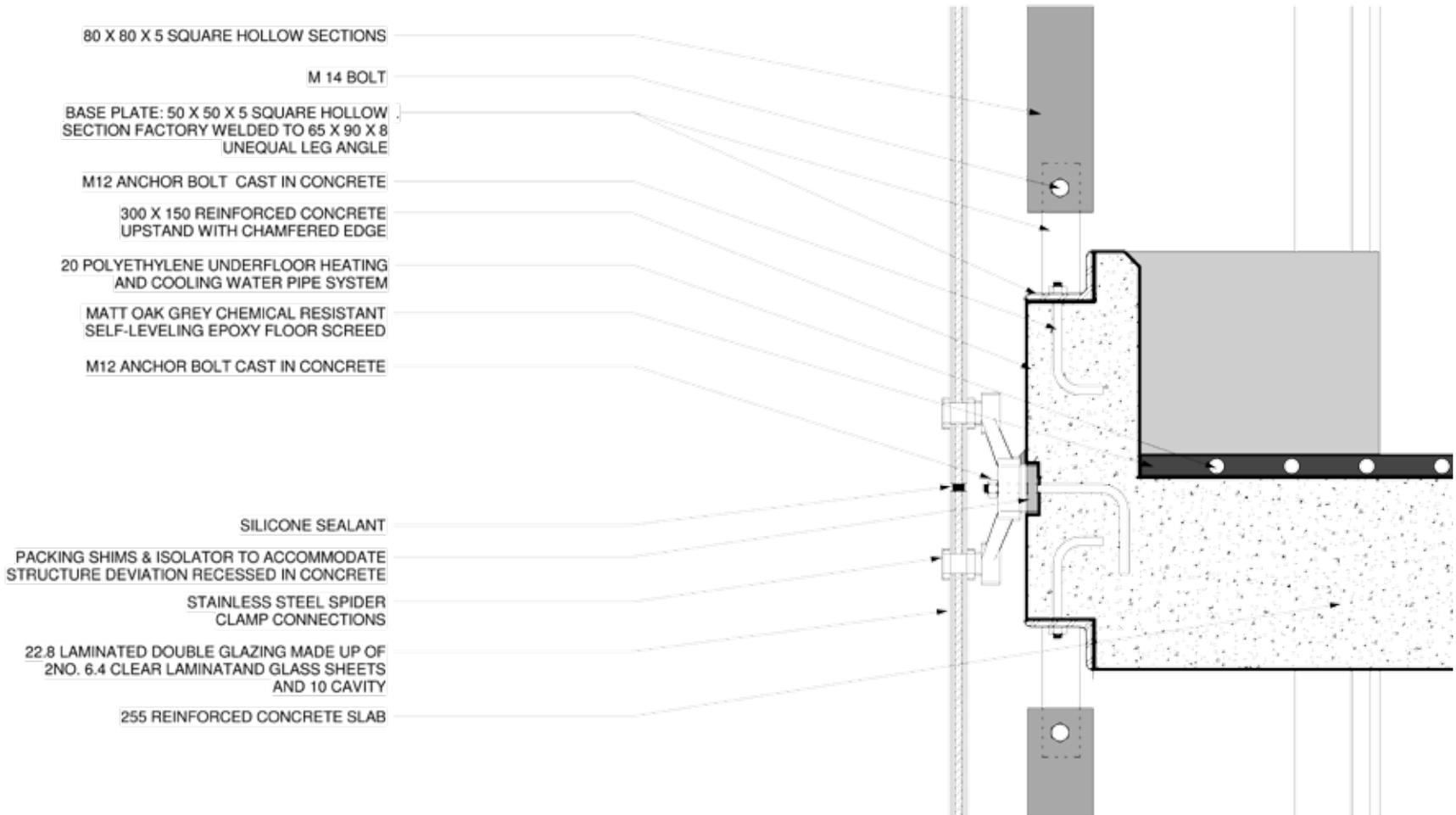
205 REINFORCED CONCRETE SLAB

Public walkway level 1445  
28.5 LAMINATED GLASS CLAMPS FIXED TO STEEL STRUCTURE AND CONCRETE FLOORING WITH STAINLESS STEEL GROUND GLASS CONNECTIONS

Ground floor 0

100mm FILLING  
100mm GROUT  
100mm CONCRETE SURFACE BED ON 20mm POLYETHYLENE DAMP PROOF MEMBRANE  
HARDWARE SOLE FILL  
PERFORATED GRAPPE 100mm  
100mm COVER COURSE ASSEMBLY  
200mm WELDED CONCRETE TO STEEL CONNECTION AS PER TABLE T17

Basement 3000  
NOTES  
FIRE PROTECTION PROTECT ALL STRUCTURAL STEEL AND CONCRETE WITH THE REQUIRED FIRE RESISTANCE AS SET OUT IN TABLE T17





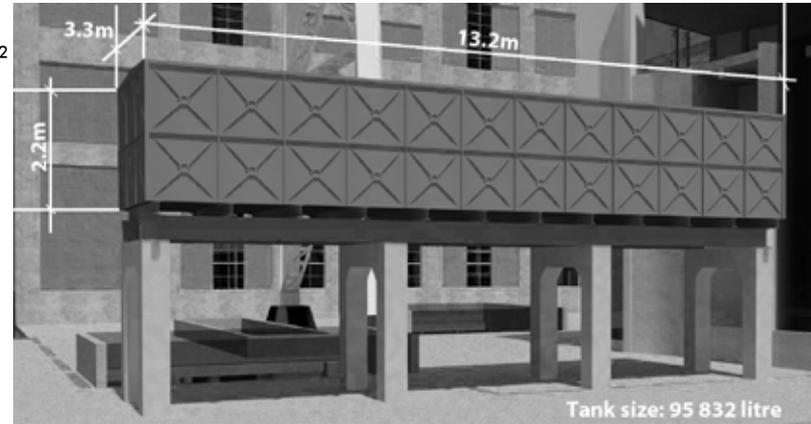
8.5. Sustainable systems\_ Water Harvesting\_

The showroom and Boiler House has separate water harvesting tanks. Water harvested will be used as non-potable water for flushing toilets.

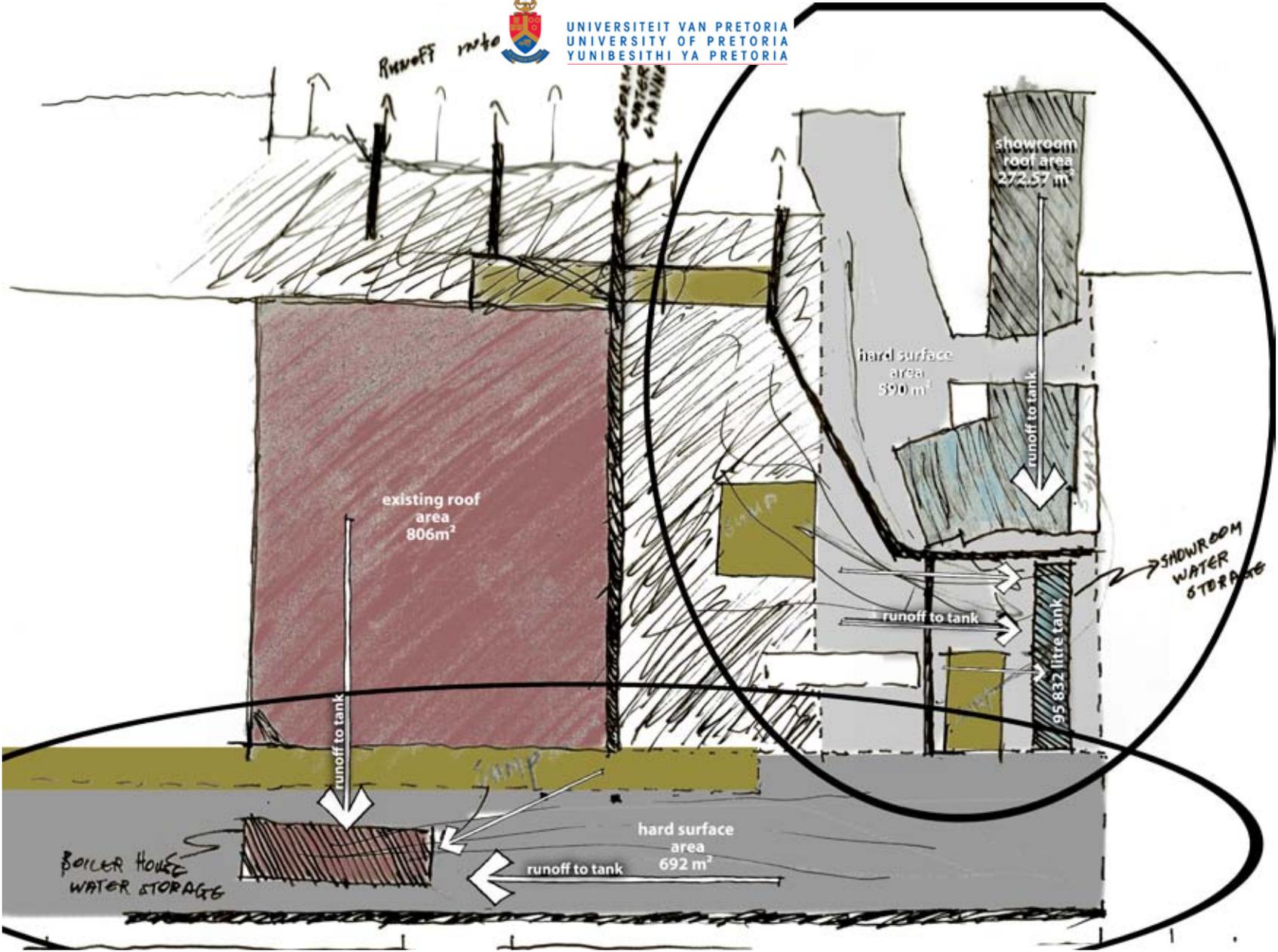
SHOWROOM:

The runoff from the roof area and hard surface areas, on the square between the Boiler House and showroom, will be collected and stored. Oil tanks on site will be retrofitted to store water, the tank that stores water for the showroom has a capacity of 95 832 liter.

- Showroom roof area 242.57 m<sup>2</sup> + hard surface area 590 m<sup>2</sup> = 832.57 m<sup>2</sup>
- Water consumption per month (only toilets) : 20 088 liter



Month	Rainfall in Pretoria (mm)	Actual Rainfall Harvesting Capacity (L)
January	82	61 443.67
February	60	44 958.78
March	52	38 964.28
April	33	24 727.33
May	11	8 242.44
June	5	3 746.56
July	3	2 247.93
August	6	4 495.87
September	17	12 738.32
October	43	32 220.46
November	85	63 691.61
December	81	60 694.35
<b>Totals</b>	<b>478</b>	<b>358 171.6</b>



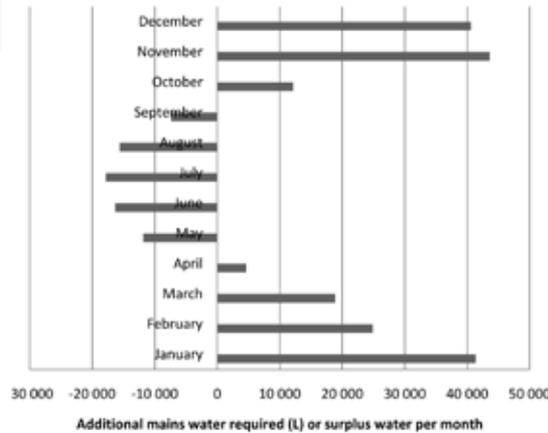


By only using a 20 088 liter tank the building is nearly self sufficient in water for 8 months of the year (Jan, Feb , Mar, Apr, Oct, Nov, Dec). The building can thus be completely self sufficient , when the monthly consumption and additional water required for low rainfall months are calculated.  
20088 + 68969 = 89 057 liter tank will be needed.

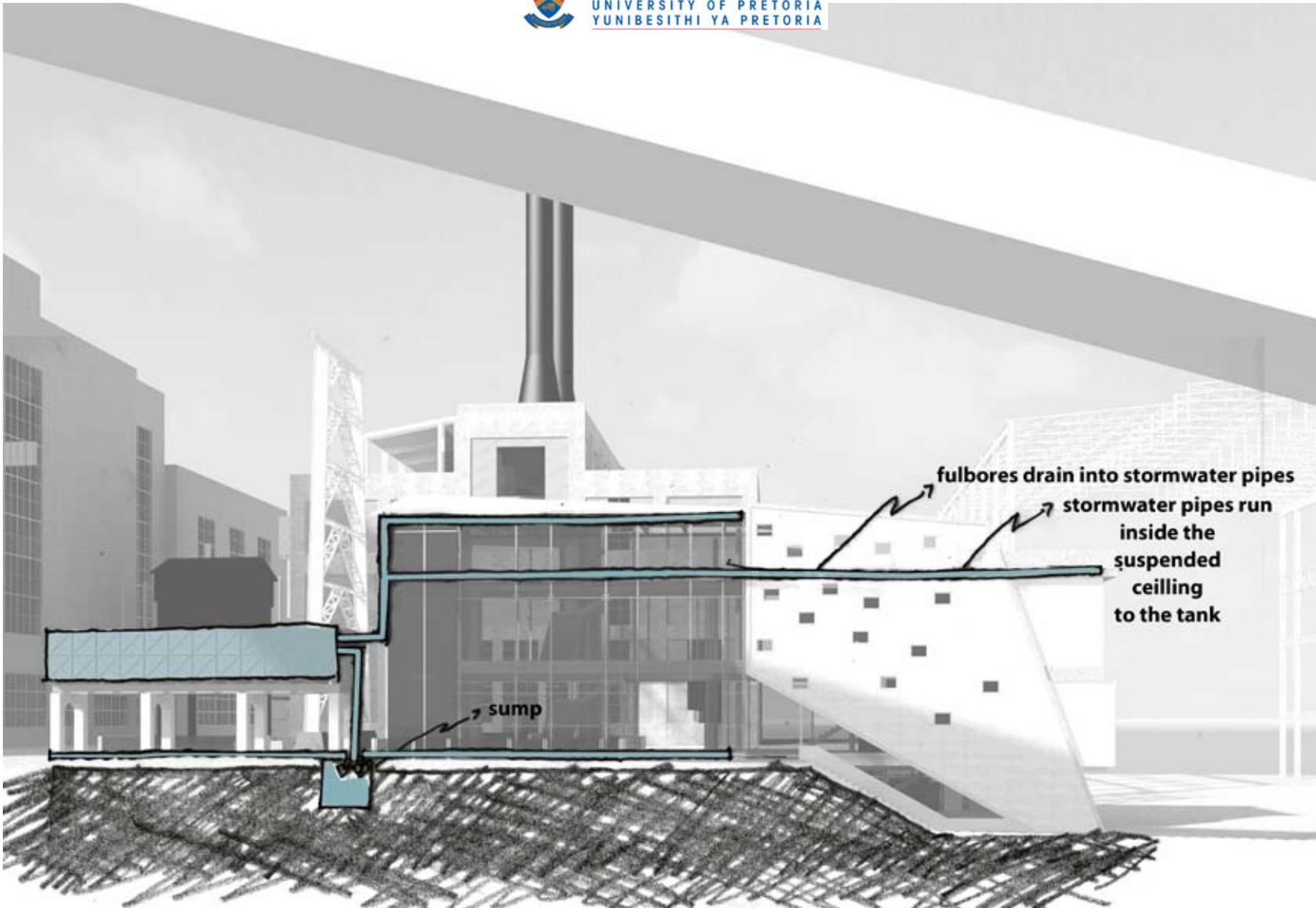
Rain water harvesting tanks

Number of months with low or no rainfall	Consumption (L)	Required capacity (L)
4	20 088	80 352

Month	Rainfall (mm)	Actual Rainfall Harvesting Capacity (L)	Monthly consumption (L)	Additional mains water required (L) or surplus water
January	82	61443.67	20 088	41 356
February	60	44958.78	20 088	24 871
March	52	38964.28	20 088	18 876
April	33	24727.33	20 088	4 639
May	11	8242.443	20 088	-11 846
June	5	3746.565	20 088	-16 341
July	3	2247.939	20 088	-17 840
August	6	4495.878	20 088	-15 592
September	17	12738.32	20 088	-7 350
October	43	32220.46	20 088	12 132
November	85	63691.61	20 088	43 604
December	81	60694.35	20 088	40 606
<b>Totals</b>	<b>478</b>	<b>358 171.6</b>	<b>241 056</b>	<b>117 116</b>

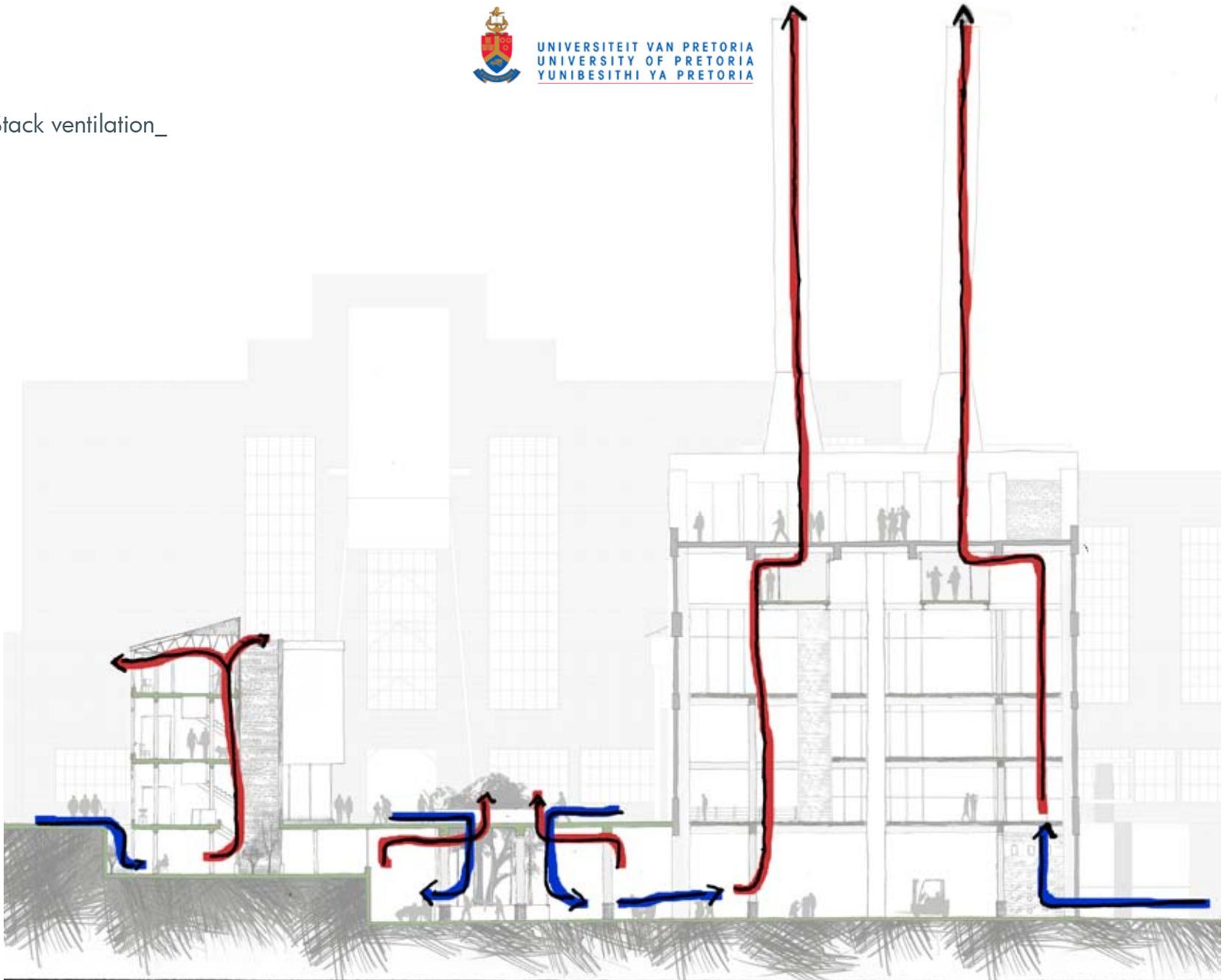


	Surplus water	Additional water required
January	41 356	
February	24 871	
March	18 876	
April	4 639	
May		-11 846
June		-16 341
July		-17 840
August		-15 592
September		-7 350
October	12 132	
November	43 604	
December	40 606	
<b>Total:</b>	<b>186 084</b>	<b>-68 969</b>

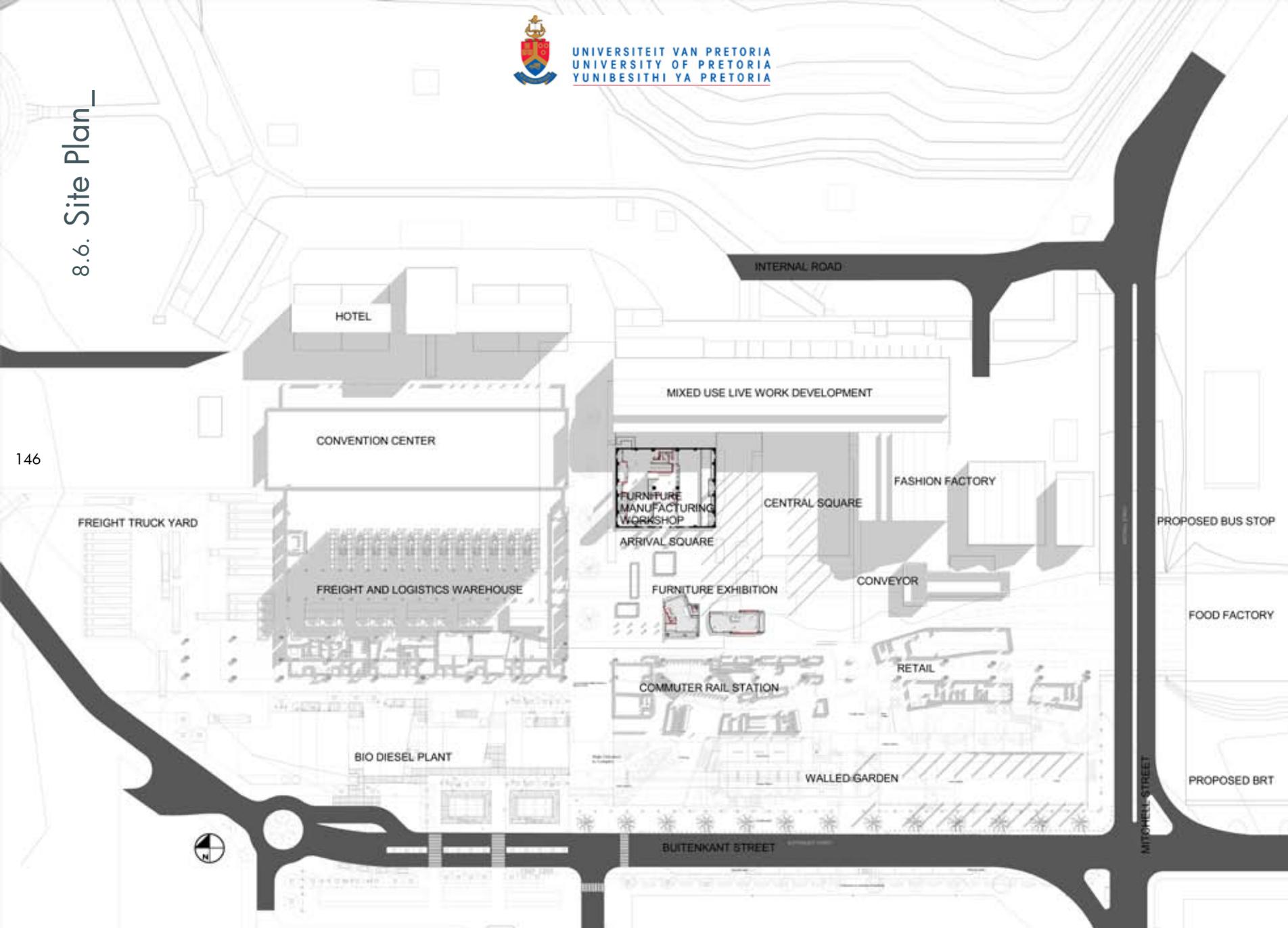




Stack ventilation\_



8.6. Site Plan



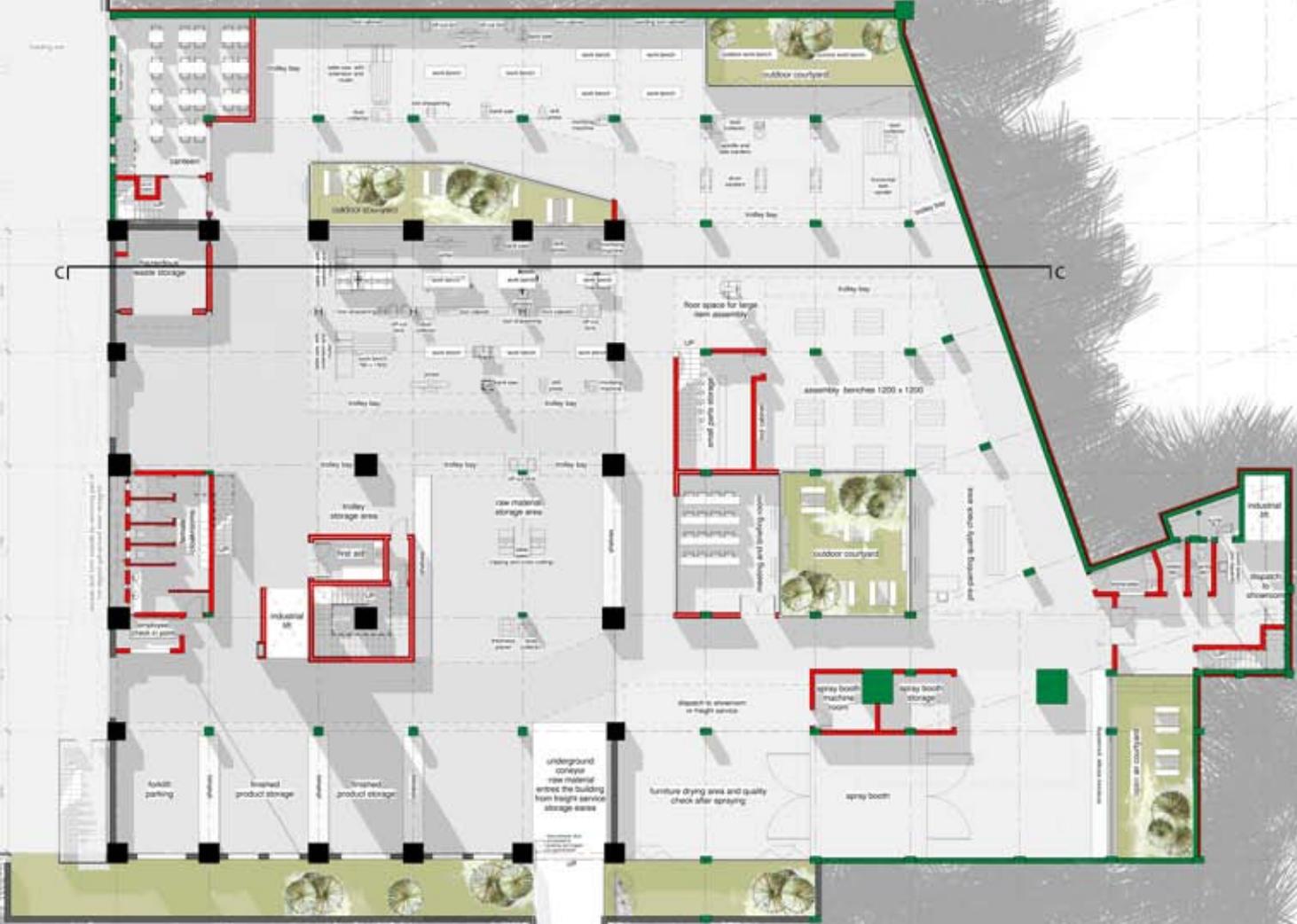
basement floor plan -6000 mm

8.7. Plans\_



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proposed  
basement parking



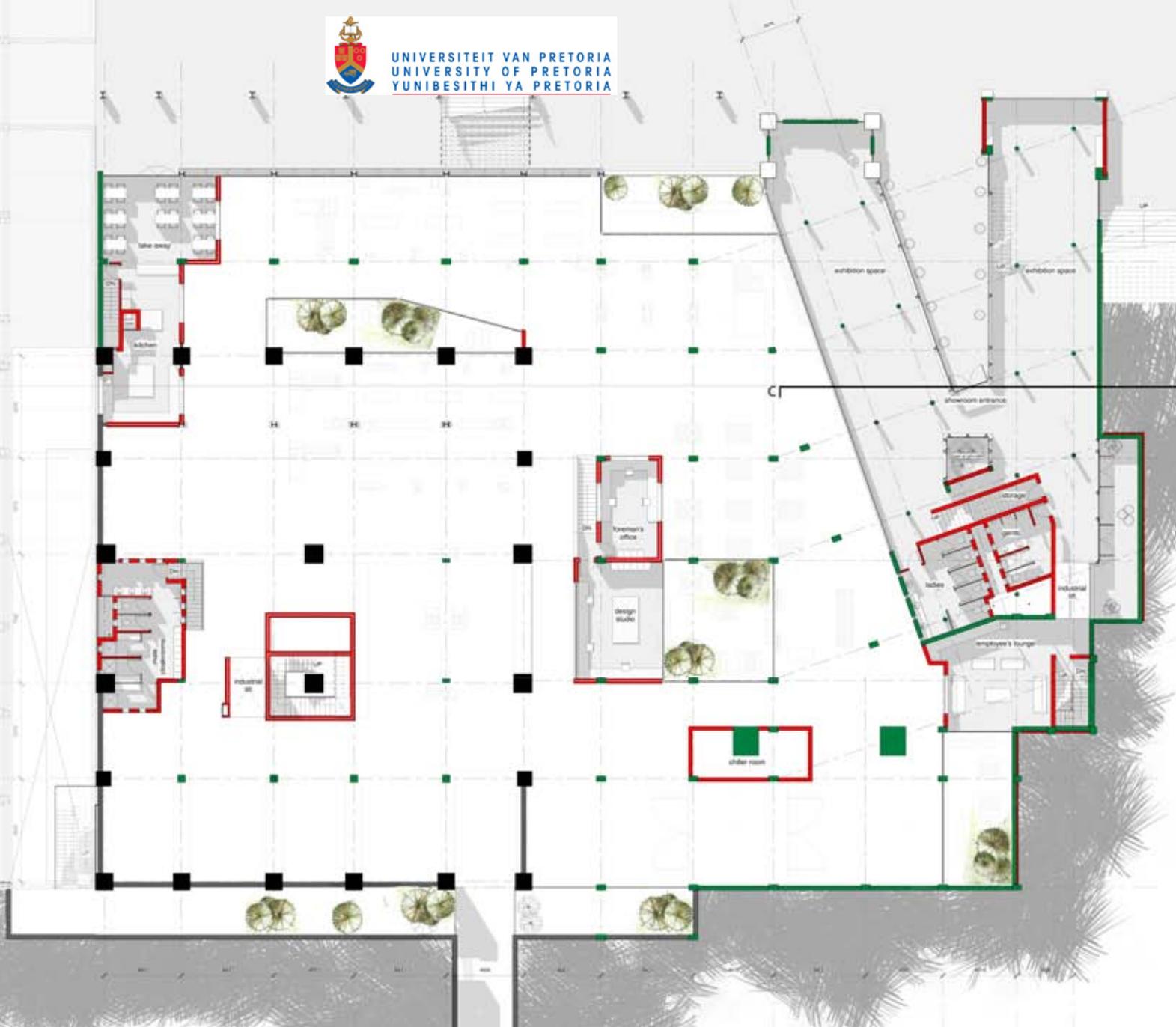
226 4





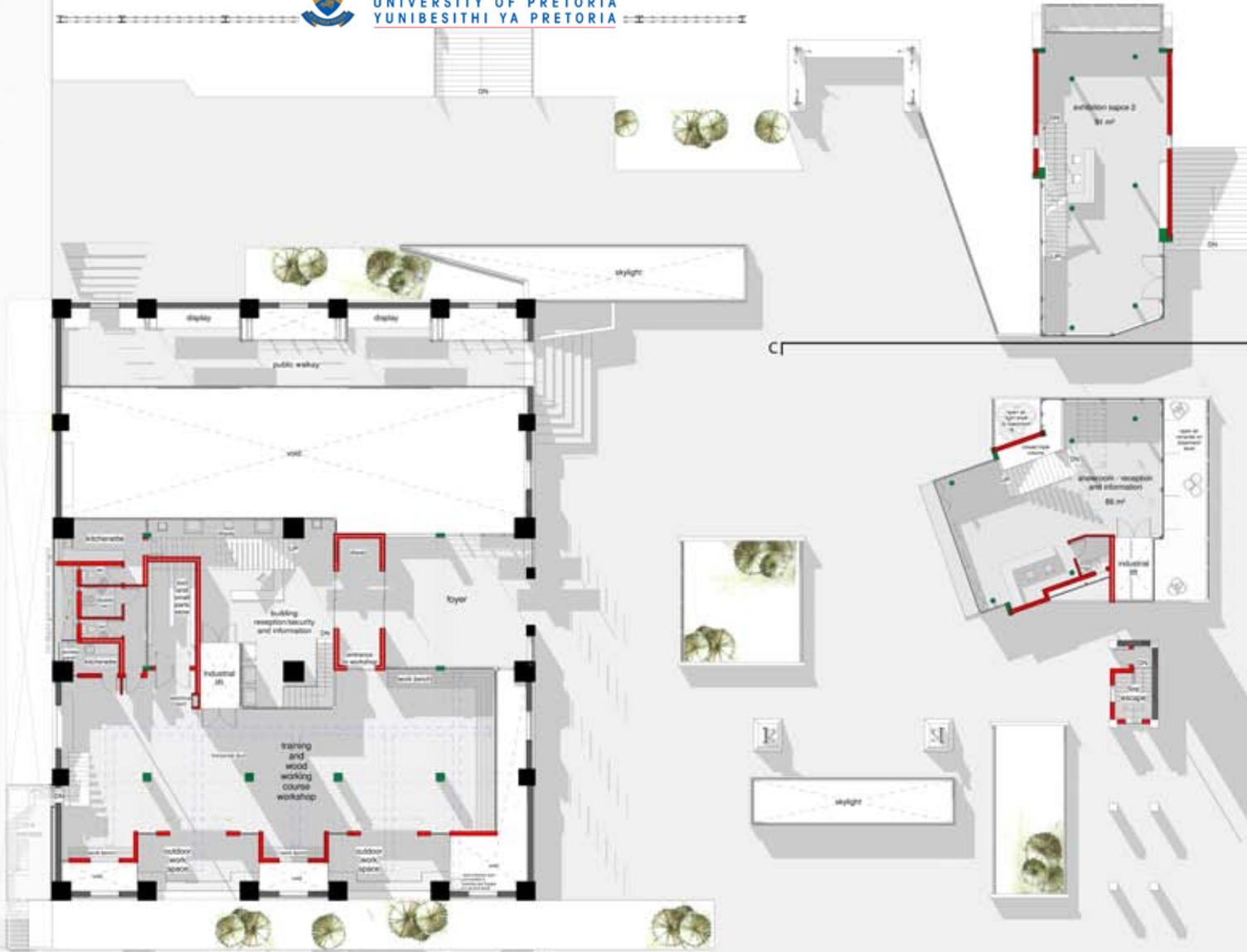
148

basement floor plan -3000 mm





ground floor plan

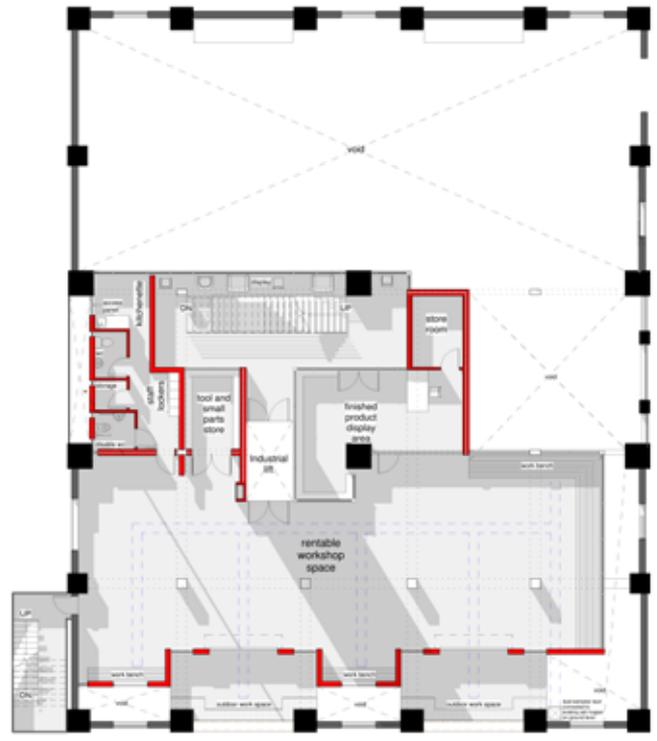




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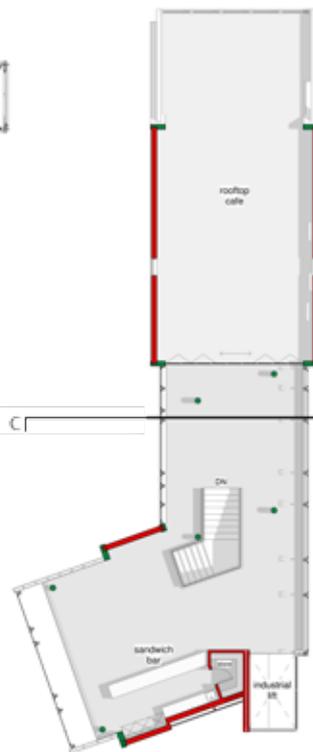
first floor plan



□ □



second floor plan





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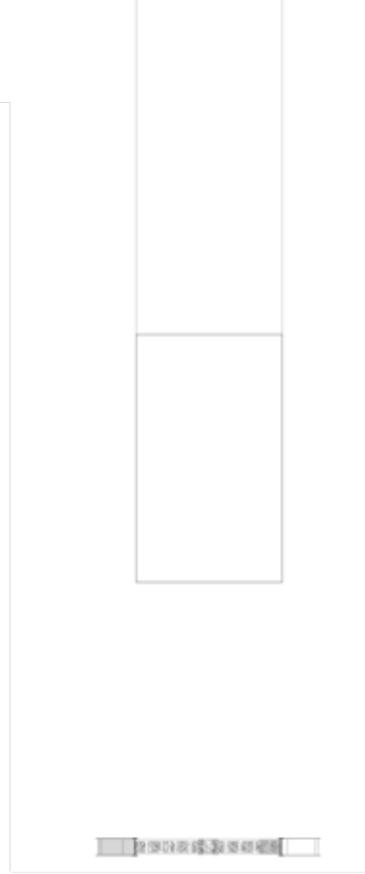
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third floor plan





8.8. Photographs of Model\_





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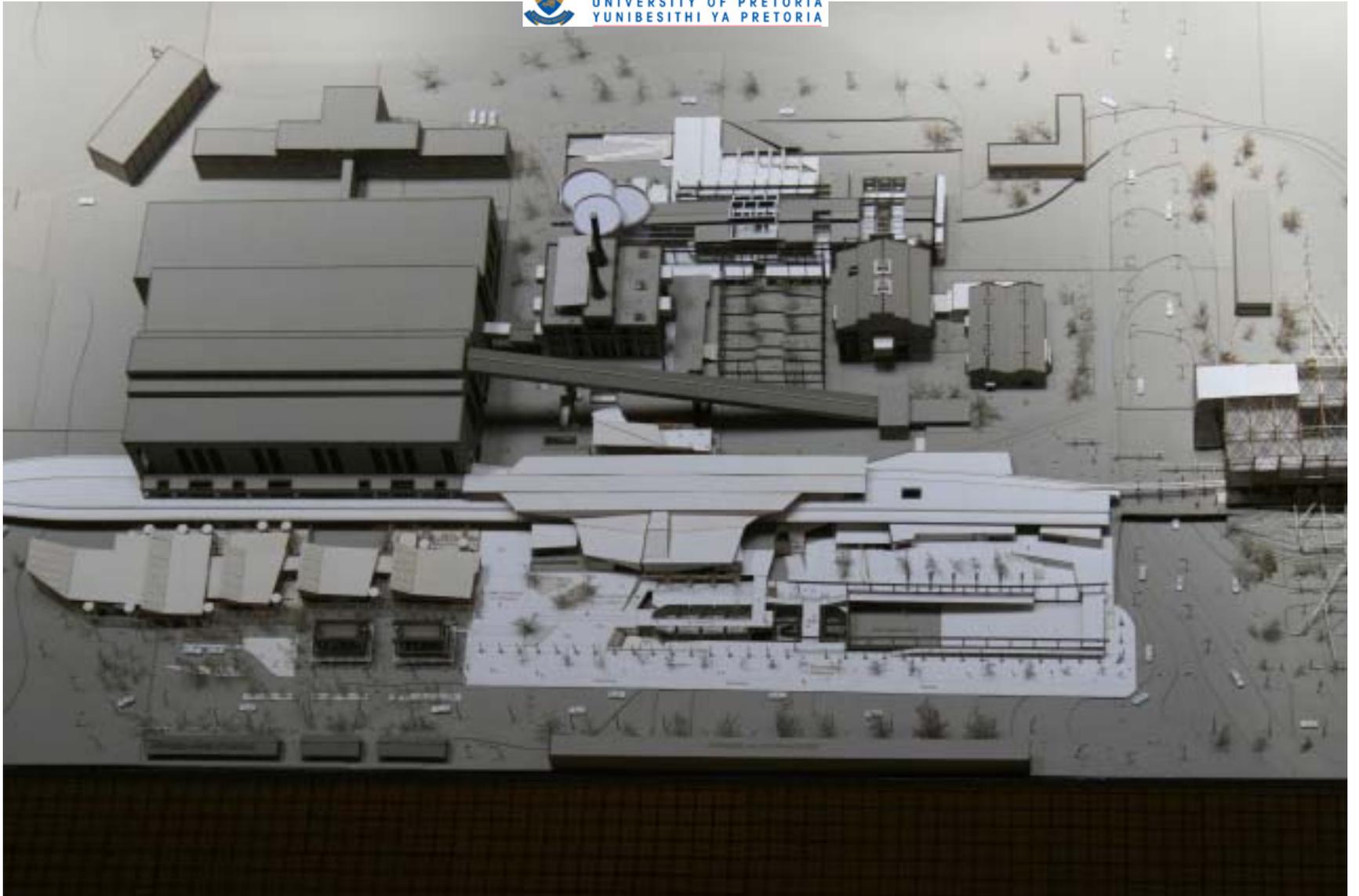














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The dissertation has investigated the principles of adapting and reusing industrial heritage buildings in order to find a solution to create socially responsive industries. The study focused on a 1940 Boiler House situated at the Pretoria West Power Station. Nationally and internationally the architectural approach to heritage buildings and how they should or should not be preserved are widely discussed and considered. The author used the Burra charter as guideline for the design, which states: as much as necessary and as little as possible. The majestic nature of the site rests in the structures and the spaces formed between them. Very early in the design process the author conducted a phenomenological assessment on the significance of the building structures on site their character, and how it should be conserved. These considerations

were prime within the design process and decisions.

The research further revealed that despite the fact that industrial society stresses the significance of sustainable industries, that social sustainability is neglected. Industrial buildings do not interact to the outside world and interior working conditions are not always favorable. Sustainability means to be aware of the environment and to strive for better working and living conditions. It is not only about, keeping the user of a space in mind, but also the passer by. This aspect was specifically addressed in the design resolution.

The result is a new contrasting architecture of a furniture showroom that accentuates the heritage of the boiler house, it stands back

from the old structure respecting its story and acknowledging its future. The connection with the old mostly occurs underground and internally, keeping the form and character of the existing structure in place. Creating an environment, that prickles the senses. The design has proved a possible solution to the improvement of industrial buildings, to be more socially responsive. The furniture production process is physically and visually revealed as an attempt to create an industrial building that interacts with the public. The public can buy furniture and is simultaneously made aware of the production process. People are therefore exposed to a production process and a direct connection can be made between furniture maker and buyer.

- fig. 1\_ Pretoria West Power Station:** photograph by author, 2010
- fig. 2\_ Tshwane:** image by author, 2010
- fig. 3\_ Aerial photograph of Pretoria CBD and the West:** photograph from tshwane.gov.za/streetsmaps.cfm, image edited by author
- fig. 4\_ Pretoria's first power station 1900:** photograph unknown
- fig. 5\_ The humans basic needs:** image by author, 2010
- fig. 6\_ Workers at Schenck brothers sawmill, Hogsback, Eastern Cape:** photograph by author, 2009
- fig. 7\_ Made in china:** photograph, author unknown, found online at [www.siue.edu/lovejoylibrary/archives/50/convocation\_speech.shtml]
- fig. 8\_ Closed Industry:** photograph, author unknown, found online at [www.flickr.com/photos/southernbreeze/4611472833/]
- fig. 9\_ Interconnectivity diagram:** image by author, 2010
- fig. 10\_ Methodology diagram:** Image by author, 2010
- fig. 11\_ Industry closed of tho the public:** image by author, 2010
- fig. 12\_ Pretoria West industrial:** photographs by author, 2010
- fig. 13\_ Unfriendly sidewalks, Pretoria West industrial:** photographs by author, 2010
- fig. 14\_ Corrie lynn & co logo:** photograph, author unknown, found online at [www.corrielynn.co.za/]
- fig. 15\_ Corrie lynn & co's workshop:** photograph by author, 2010
- fig. 16\_ Raw timber in storage:** photograph, author unknown, found online at [www.corrielynn.co.za/]
- fig. 17\_ Corrie lynn & co's showroom:** photograph, author unknown, found online at [www.corrielynn.co.za/]
- fig. 18\_ Corrie lynn & co's famous furniture piece:** photograph, author unknown, found online at [www.corrielynn.co.za/]
- fig. 19\_ Crafter at the timber craft market in Kenya:** photograph by author, 2008
- fig. 20\_ Workers taking a break at Schenck brothers sawmill, Hogsback, Eastern Cape:** photograph by author, 2010
- fig. 21\_ Location Mapping:** image by Dewald Struwig, 2009, edited by author
- fig. 22\_ Energy Diagram:** image by author, 2010
- fig. 23\_ Pretoria West Location map:** image by Pretoria West Framework Group, 2010
- fig. 24\_ A city without people:** image compiled by author, 2010, Photoshop brushes found online at [www.deviantart.com]
- fig. 25\_ Transport diagram:** image by Pretoria West Framework Group, 2010
- fig. 26\_ ISCOR 1952:** photograph, author unknown, available in: Engelbrecht, S.P., Agar-Hamilton, J.A.I. & Pelzer, A.N., 1952. Eeufees-Album. Pretoria: Die Stadsraad van Pretoria.
- fig. 27\_ Nolly map of Pretoria West Power Station:** image by author, 2010
- fig. 28\_ Framework site: site plan,** author unknown
- fig. 29\_ Ash hoppers:** photograph by author
- fig. 32\_ Power Station A:** photograph by author
- fig. 30\_ Power Station B:** photograph by author
- fig. 33\_ Mothballed ash hoppers:** photograph by author
- fig. 31\_ Ash hoppers:** photograph by author
- fig. 34\_ Power Sation A:** photograph by author
- fig. 35\_ Pretoria West vision diagrams:** image by Pretoria West framework group, 2010
- fig. 36\_ Densities diagram:** image by Pretoria West framework group 2010
- fig. 37\_ Vision for a integrated city:** image by Pretoria West framework group 2010
- fig. 38\_ Pretoria West vision diagrams:** image by Pretoria West framework group, 2010
- fig. 39\_ Heritage Mapping:** image by Pretoria West framework group 2010
- fig. 40\_ A vision for the integration of industrial heritage into the city fabric:** image by Pretoria West framework group 2010
- fig. 41\_ Sectional diagram:** image by Pretoria West framework group 2010
- fig. 43\_ Site energy diagram:** image by Pretoria West framework group 2010
- fig. 42\_ Pretoria West Power Station vision diagrams:** image by Pretoria West framework group 2010
- fig. 44\_ Hybrid industry:** image by Pretoria West framework group 2010
- fig. 45\_ Existing and new site access and movement:** image by Pretoria West framework group 2010
- fig. 46\_ Existing structures on site and proposed new intervention:** image by Pretoria West framework group 2010
- fig. 47\_ Input output diagram:** image by author, information available in: Newman, P.W.G., 1999. Sustainability and citie: extending the metabolism model. Elsevier: Landscape and urban planning, 44, pp.219-26.
- fig. 48\_ Mitchell Street:** photograph by Pretoria west framework group 2010
- fig. 49\_ Decommissioned coal fired Power Station Mapping:** image by author, information available from: <http://www.eskom.co.za>
- fig. 50\_ Power Station Mapping:** image by author, information available from: <http://www.eskom.co.za>
- fig. 51\_ Proximity diagram - workshop space, green space, natural light and public interaction:** image by author
- fig. 52\_ Relationship between quality of outdoor spaces and outdoor activities:** image by author, information available in: Gehl, J., 2006. Life between buildings: Using Public Space. 6th ed. Copenhagen: The Danish Architectural Press.
- fig. 53\_ The connection between production and daily life:** image by author
- fig. 54\_ Blue collar worker:** photograph by author
- fig. 55\_ Herzog & de Meuron:** photograph author unknown, available from: <http://www.vitra.com/en-pl/campus/vitrahhaus/architects-concept/> accessed on:08/08/2010
- fig. 57\_ Diagrams illustrating views and vertical circulation points:** image by author, adopted from arcspce, available at: [http://www.arcspce.com/architects/herzog\\_meuron/vitrahhaus/vitrahhaus.html](http://www.arcspce.com/architects/herzog_meuron/vitrahhaus/vitrahhaus.html), accessed on:08/08/2010
- fig. 56\_ A courtyard at the VitraHaus:** photograph by Iwan Baan, available at: [http://www.arcspce.com/architects/herzog\\_meuron/](http://www.arcspce.com/architects/herzog_meuron/)

- fig. 58\_VitraHaus view and vertical circulation digram:** image by author
- fig. 59\_VitraHaus vertical circulation:** photograph by Iwan Baan available at: [http://www.arcspace.com/architects/herzog\\_meuron/vitrahaus/vitrahaus.html](http://www.arcspace.com/architects/herzog_meuron/vitrahaus/vitrahaus.html)
- fig. 60\_Day view of VitraHaus:** photograph by Iwan Baan available at: [http://www.arcspace.com/architects/herzog\\_meuron/vitrahaus/vitrahaus.html](http://www.arcspace.com/architects/herzog_meuron/vitrahaus/vitrahaus.html)
- fig. 61\_Night view of VitraHaus:** photograph by Iwan Baan available at: [http://www.arcspace.com/architects/herzog\\_meuron/vitrahaus/vitrahaus.html](http://www.arcspace.com/architects/herzog_meuron/vitrahaus/vitrahaus.html)
- fig. 62\_The Turbine Hall before construction:** photograph by Karl Schoemaker, available at: <http://blogs.timeslive.co.za/somethingtodo/2008/08/27/the-city-of-joburg-gets-an-electric-makeover/>
- fig. 63\_The adapted Turbine Hall:** photograph by Tiber Group, available at: <http://blogs.timeslive.co.za/somethingtodo/2008/08/27/the-city-of-joburg-gets-an-electric-makeover/>
- fig. 64\_The clearing of the Turbine hall:** photograph by Sally Gaule, available in: Krige, S. & Beswick, S., 2008. Turbine square. Johannesburg
- fig. 65\_The Turbine Hall before and after:** photograph by TSPS Architects, available in: Krige, S. & Beswick, S., 2008. Turbine square. Johannesburg
- fig. 66\_The Turbine Hall before and after:** photograph by TSPS Architects, available in: Krige, S. & Beswick, S., 2008. Turbine square. Johannesburg
- fig. 67\_The Turbine Hall before and after:** photograph by TSPS Architects, available in: Krige, S. & Beswick, S., 2008. Turbine square. Johannesburg
- fig. 68\_Prof. Gunter Heen:** photograph author unknown, available from: <http://www.competitionline.de/HENNARCHITEKTEN> accessed on: 03/02/2010
- fig. 70\_View of the Transparent factory:** photograph author unknown, available from: <http://www.glaesernemanufaktur.de/gmd.html> [Accessed 29 April 2010].
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