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'the halfway house'

Temporary housing and production facility for parolees in Pretoria West

Gerhard Janse van Rensburg

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The halfway house: Temporary housing and production facility for parolees in Pretoria West

by

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SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
MASTER OF ARCHITECTURE (PROFESSIONAL)
DEPARTMENT OF ARCHITECTURE
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY
UNIVERSITY OF PRETORIA

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Mentor:	Jacques Laubscher

PRETORIA
2011

With thanks to:

My loving and supportive parents,

The Alcade crowd,

The studio crowd,

Jacques Laubscher for his commitment and effort,

Marga Viljoen for all her support

In accordance with Regulation 4(e) of the General Regulations (G.57) for dissertations and theses, I declare that this thesis, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

I further state that no part of my thesis has already been, or is currently being, submitted for any such degree, diploma or other qualification.

I further declare that this thesis is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

Gerhard Janse van Rensburg

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Contents

Abstract

keywords: flexibility, recycling, adaptive re-use

Considering the permanent nature of the built environment, this dissertation investigates an alternative approach towards static architecture. Allowing the building's users the ability to alter and determine their own environments due to ever evolving social needs. This architectural approach is thereafter metaphorically condensed to formulate a programme between isolation (prison) and freedom (society), where parolees are temporarily housed and given the opportunity to implement the production skills that were developed in prison. Allowing these parolees a second chance for redemption and the opportunity to 'give back to society' through the production process of recyclable waste into new sustainable products. The architectural concept should be understood in various different time scales over which the building changes, thus designing for disassembly by utilising a modular and kit-of-parts approach.

Chapter _01
Introduction

"There was a time, not too long ago in evolutionary terms, when our existence was based on our capacity for movement and adaptability; indeed it is to this that we owe our survival of species" (Kronenburg, 2007: 10)

This chapter will briefly discuss the author's theoretical stance, followed by the real world problem that led to the proposed programme. These elements are thereafter combined to formulate a problem statement, hypothesis and sub-questions. Finally, the reader is exposed to the physical context, methodology and strategies the author intends to utilise for achieving the stated objectives.

Aiming for change_ *a 'normative stance'*

In the publication *'How Buildings learn: What happens after they're built'* , Stewart Brand (1994: 10) mentions that there is an interesting twist between how the individual perceive the world and the reality of the 'real'. He argues that architecture is imagined as permanent, thus our surrounding environment and architectural elements thwart us.

Building environments that ignore time, waste time **"...all buildings except monuments should adapt"** (*Ibid:* 12). Groák (1992: 15) invokes for a flexible design solution that not only **"withstand the changes brought about by time"** (Dewar & Uytenbogaardt, 1991: 22), but to accommodate these changes through physical adaptation. It is evident that available literature implies for a more adaptable built environment, where architecture reacts to ever evolving sociological, economical and environmental pressures (Zuk, 1970: 5). Adaptable architecture is not a new occurrence, but represents a form of building that has revolutionised along with human beings' developing social skills (Kronenburg, 2007: 11).

Brian MacKay-Lyons rhetorically questions the ideals of current architectural trends stating that **"Why should we imitate the past, is the future not good enough?"** (Tayona, 2007: 35). However Hampton Adams (2001: 11) signifies that **"only by looking at the past we can plan the future"**. Both authors raise interesting concerns, but considering the unpredictably of the built environment and human behaviour, architects surely cannot 'plan the future' but rather 'plan for the future'. This calls for the impermanent aspect of architecture that allows for future adaptation, but should also accommodate and justify any design move.

Re-entry vs. Re-integration _ *a 'real world problem'*

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*South Africa. Department of Correctional Services: Annual Report. 2010: 27-30

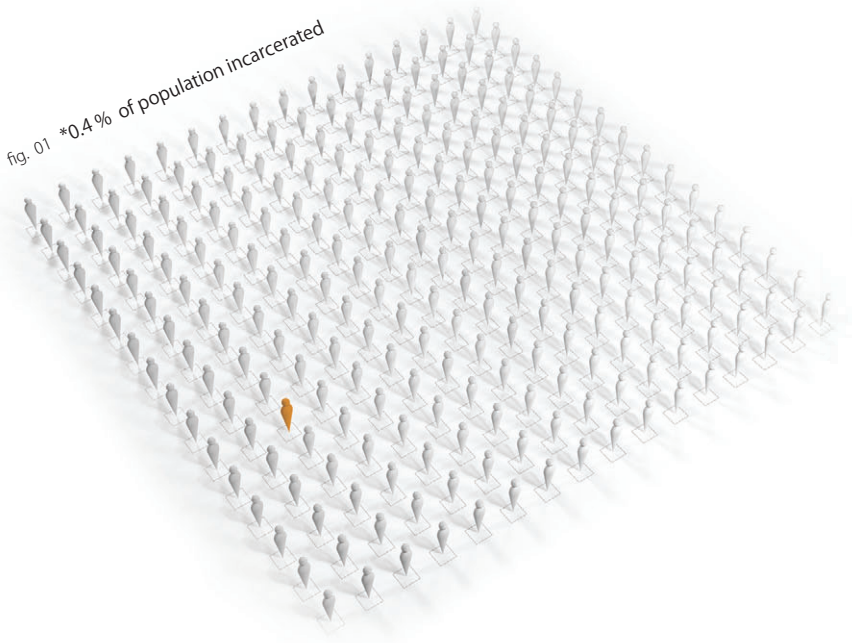


fig. 01 *0.4 % of population incarcerated

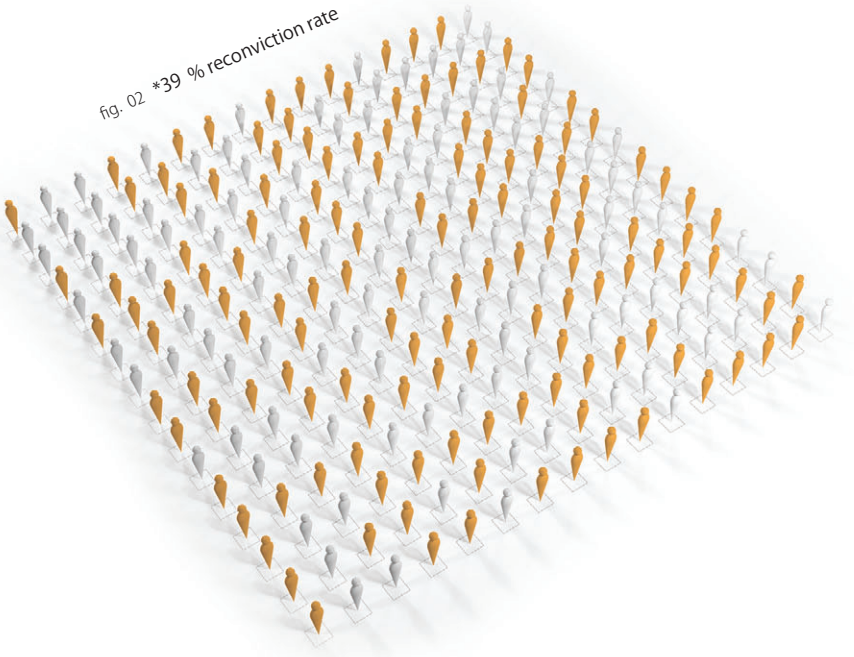


fig. 02 *39 % reconviction rate

According to Travis et al. (2001: 2), 'Re-entry' is a quantitative term used meaning **"the process of leaving prison and returning to society"**. All released offenders experience re-entry; however, these prisoners are not successfully 're-integrated'. 're-integration' is defined as **"a process of increased participation in social institutions such as the labour force, families, communities, schools and religious institutions"** (*Ibid:* 3).

"Contemporary prisons are designed by specialists to hold convicted men and women as punishment" (Johnson, 2000: 1). Defined by confinement and isolation, these structures offer little, if any freedom. According to Fairweather and McConville (2003: 49), the primary design intention of any prison facility is to protect the staff, the public and offenders. Only after these requirements are met, other issues can be considered such as rehabilitation, education and skills development.

Even though these secondary priorities are considered within the **'social re-integration programme'** (fig. 04) of existing prison facilities, little opportunity is offered to released prisoners (parolees) to implement the skills and education obtained within prisons. This deplorably leads to the high recidivism rates (fig. 02) we experience in South Africa, and, in turn, leads to the overcrowded prison facilities (fig. 03).

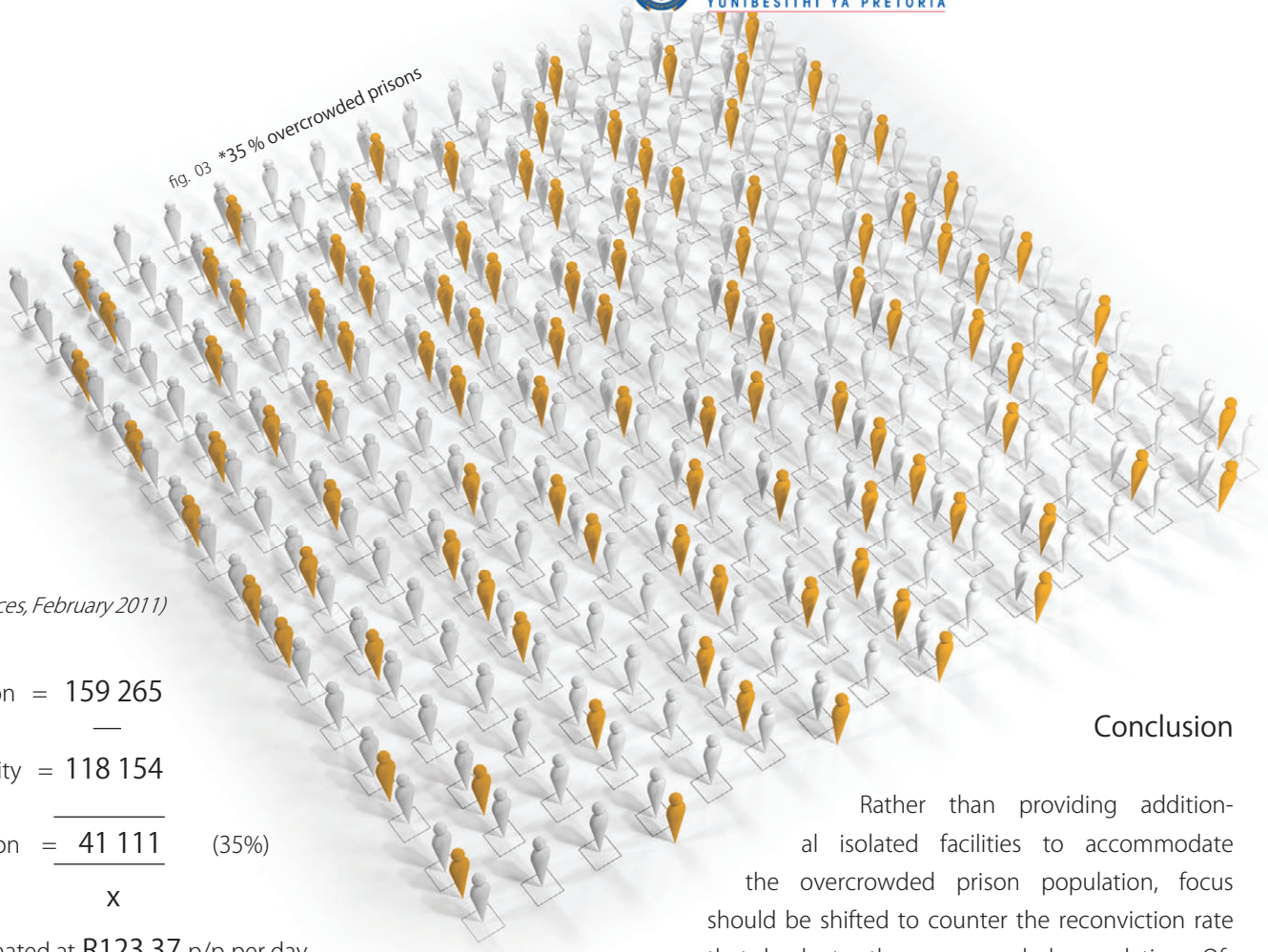


fig. 03 *35 % overcrowded prisons

Arousing prison statistics:

(South Africa. Department of Correctional Services, February 2011)

Total inmate population = 159 265

Prison accommodation capacity = 118 154

Overcrowded population = 41 111 (35%)

x

Average cost for incarceration estimated at R123.37 p/p per day

Government pays an additional R 5 071 864 per day to house the overcrowded population of prison facilities.

Conclusion

Rather than providing additional isolated facilities to accommodate the overcrowded prison population, focus should be shifted to counter the reconviction rate that leads to the overcrowded population. Offering parolees temporary accommodation and the opportunity to successfully reintegrate themselves within society on a gradual manner.

Social Re-integration_

Programme according to the South African Department of Correctional Services: Annual Report. 2010: 81-84

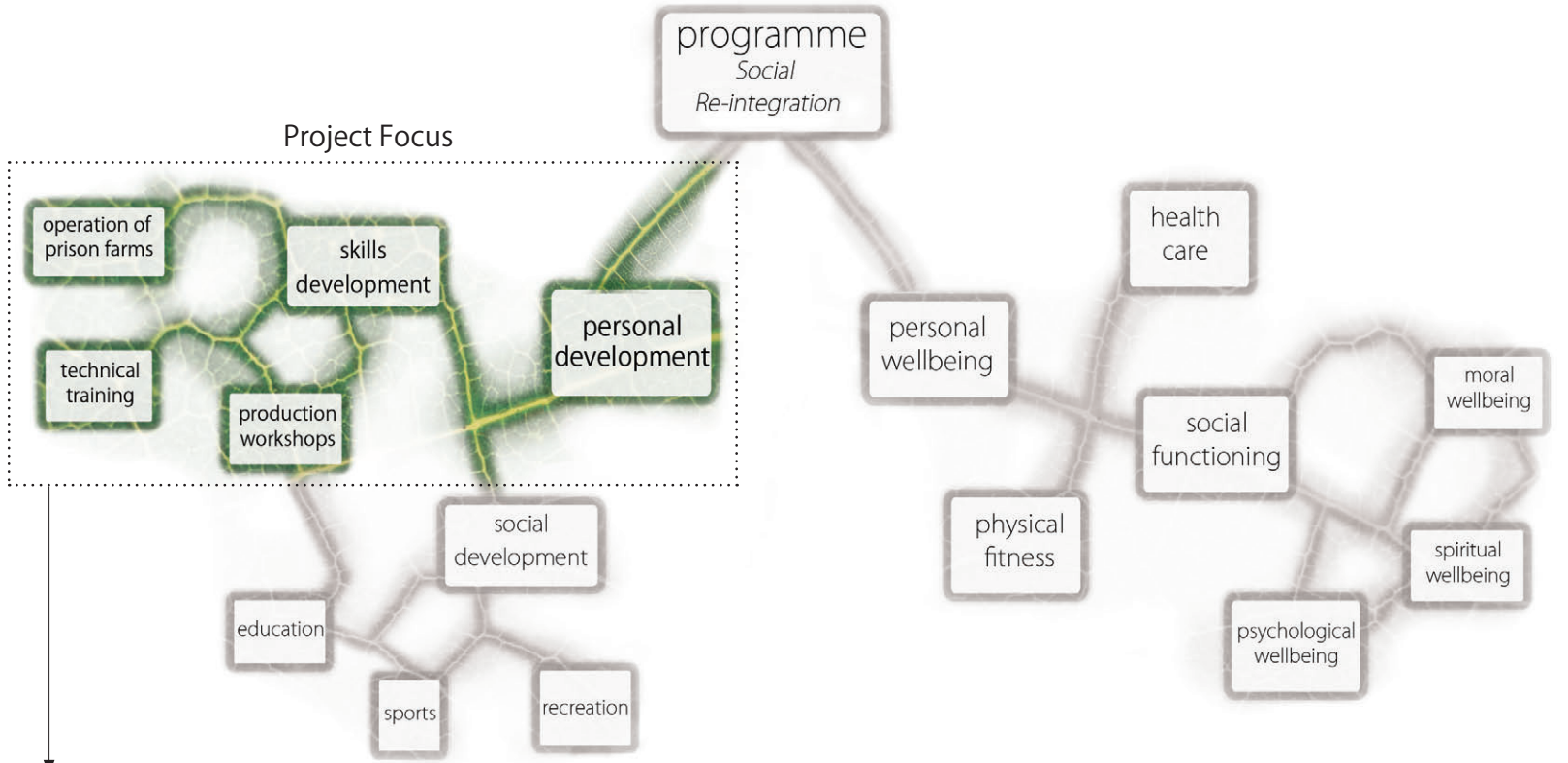


fig. 04 social re-integration programme

Illustrated in fig. 04, current prison facilities focus on personal development prior to final release. However, according to statistics (South Africa. Department of Correctional services, 2010: 83), the skills that are developed in prison are not put into effective use after prisoners are released back into society (See fig. 05).

An additional programme is required to implement the skills that were developed in prison such as:

- Production facilities / workshops
- Farming / agricultural facilities

Programming the 'in-between'

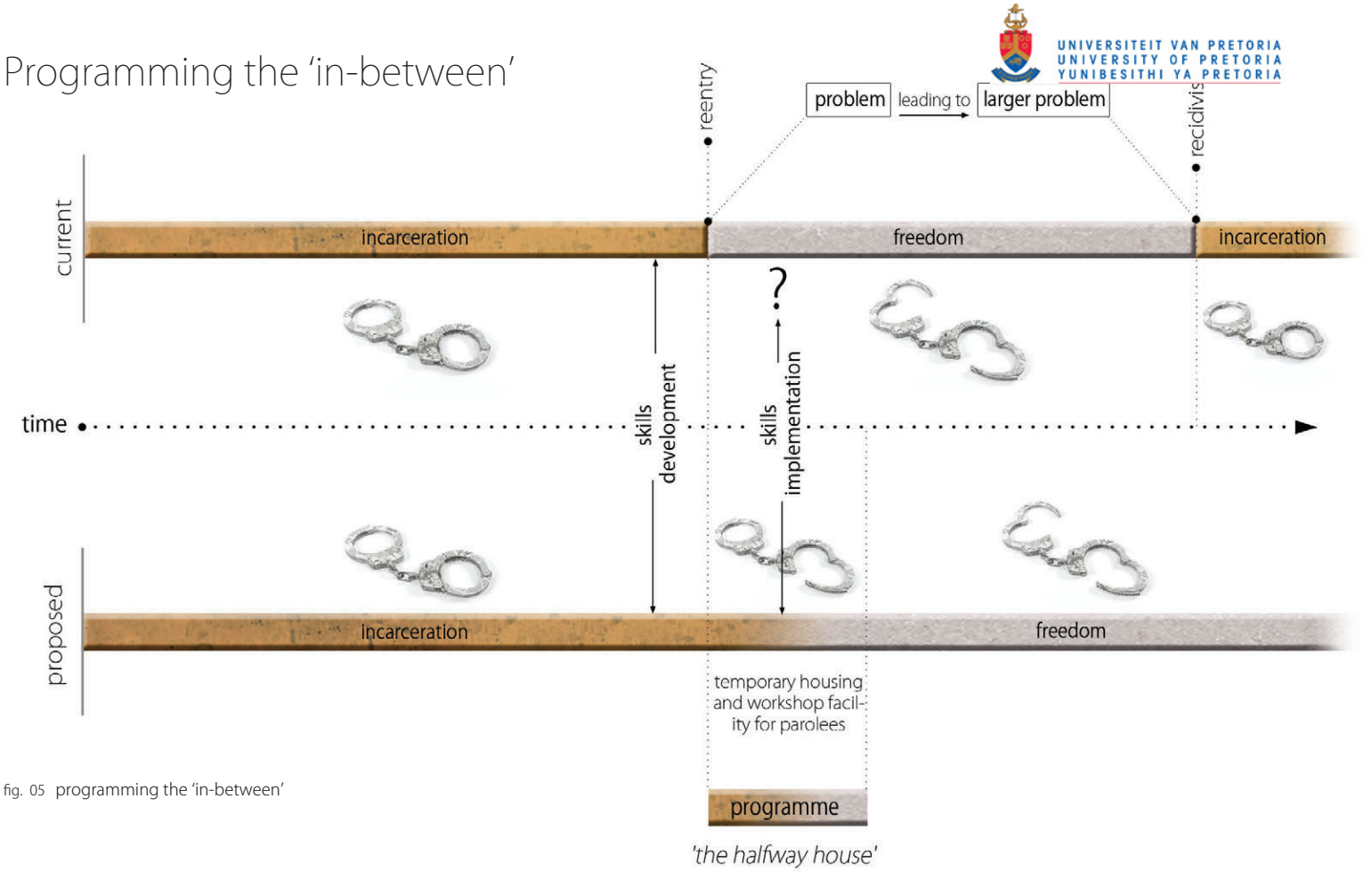


fig. 05 programming the 'in-between'

The aim of the research does not intend to contradict the existing structure of prison facilities, but rather to establish an additional architectural typology hosting a programme 'between' isolation (prison) and freedom (society). A facility that is not compulsory, allowing the parolee freedom of choice.

A facility that aims to:

- Temporarily house prisoners after release
- Improve the offender's human relationship abilities and employability for achieving successful social re-integration.
- Allow the parolee an opportunity for social acceptance by 'giving back to society' through:
  - The production process of sustainable useful products using recyclable waste.

Client

correctional services
Department:
Correctional Services
REPUBLIC OF SOUTH AFRICA

fig. 06 Department of Correctional Services logo

Objectives

Provide needs-based programmes and services to offenders to facilitate social acceptance and effective re-integration into their communities. http://www.dcs.gov.za/AboutUs/Programmes.aspx (access 16-04-2011)

Funding

NATIONAL TREASURY
PPP unit

fig. 07 National Treasury logo

- Public-Private Partnership (PPP) prisons fund the departments financial commitment to the suppliers of correctional services.
- 'Facilities Planning' funds the provision of infrastructure for correctional and other facilities.
- Department of Public Works (manage funding).

public works
Department:
Public Works
REPUBLIC OF SOUTH AFRICA

fig. 08 Department of Public Works logo

Site

fig. 09 site location

The site under investigation is currently owned by the Department of Water Affairs. All occupied buildings will be left unaltered. Dilapidated warehouses and under utilised spaces will be revitalised and the site will be strategically rezoned to accommodate the proposed intervention.

Architects should shift their design approach from creating geometries to creating environments. Environments that "...allow others to determine the geometry." (Jones, 1992: 36)

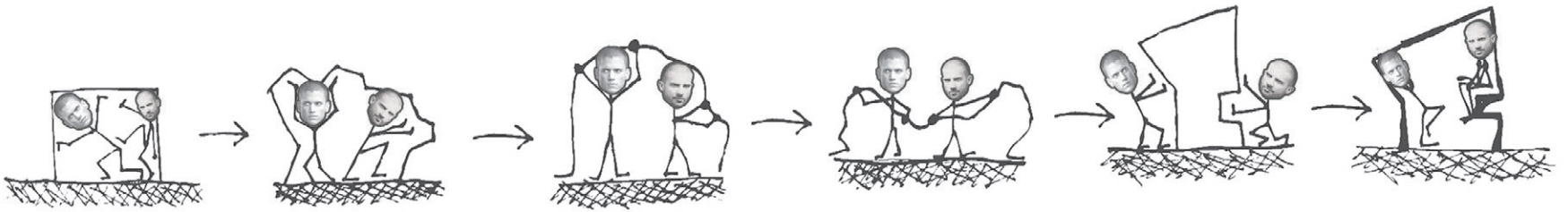


fig. 10 users altering spaces according to ever-changing social needs

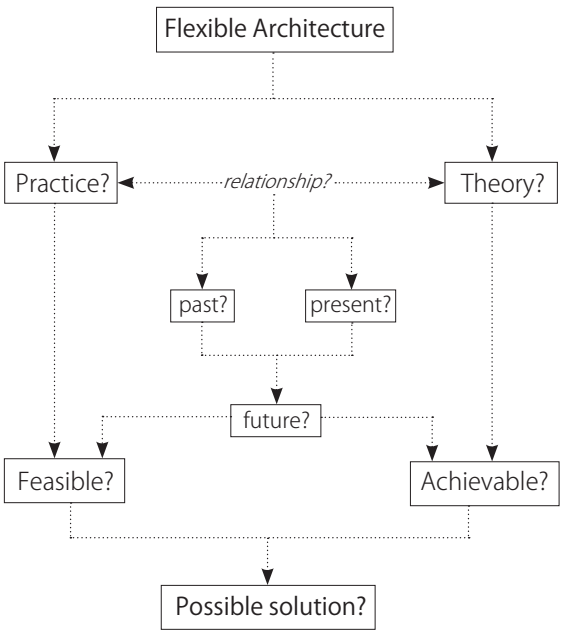
Problem Statement

The permanent nature of the built environment causes the inefficient utilisation of valuable resources; as buildings are constantly rejuvenated, revitalised and demolished in reply to various social needs.

Hypothesis

Architecture has to be flexible to accommodate a variety of use patterns by current and future user(s) without having to demolish the building (in part or completely)

Sub-Questions



Pretoria West _ Industrial

Background

Established in 1892, the Pretoria West region was allocated for industrial development along with a residential suburb serving the industrial area *(Du Plessis & White, 2008: 1).

After the power station was relocated (from the inner city) to Pretoria West in 1922 (Stark, 1952: 61), industrial expansion was inevitable. Residential densities could not satisfy these demands. Thus, additional labour from various locations was necessary to fulfil these economic needs.

Currently, the neighbourhood has changed from a residential to a mixed-use suburb consisting of restricted industry, commercial industry, retail, flats and single volume residential areas (Du Plessis & White, 2008: 1). Although these zones coincide, there is a lack of integration, thus leading to a monotonous indefensible urban environment that lacks identity.

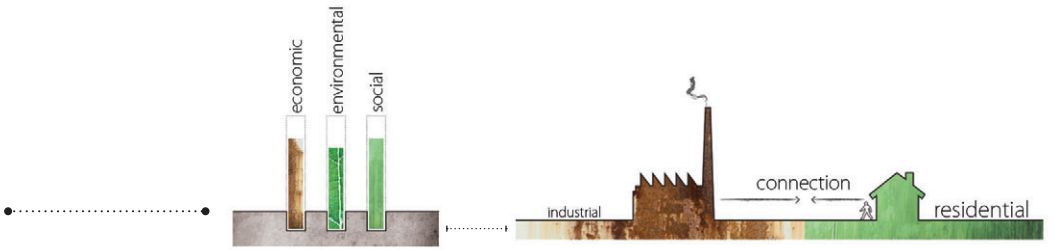


fig. 11 1882 - 1922

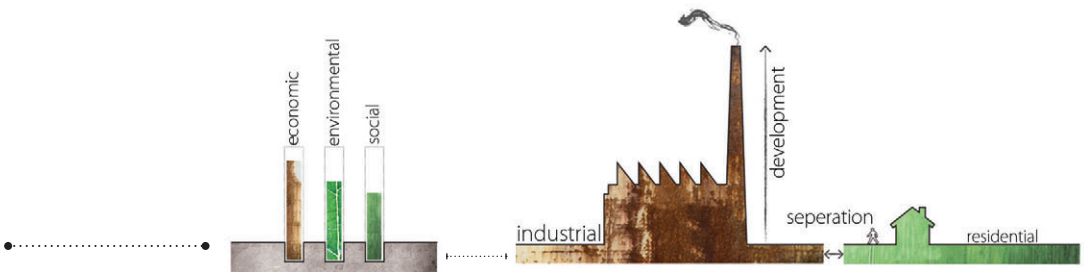


fig. 12 1922 - 2011

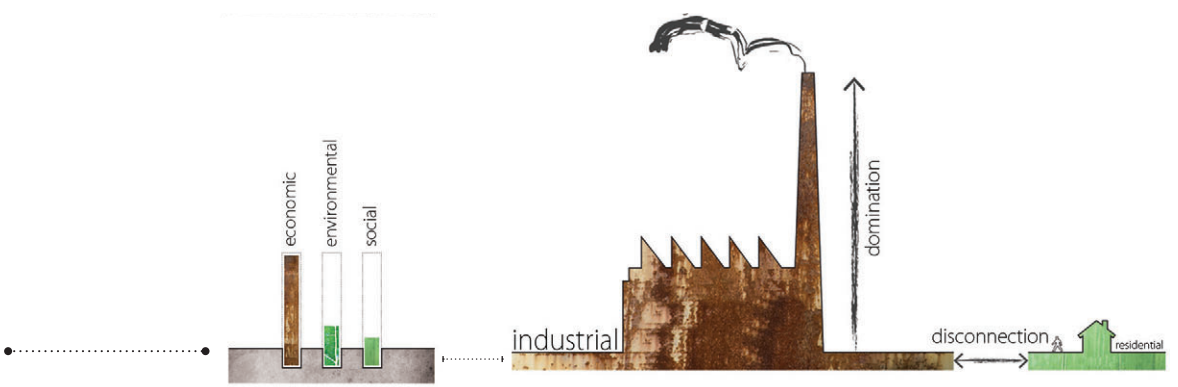


fig. 13 2011

'Riana du Plessis Urban Planners' & 'Gary White Architects and Urban Planners'. 2008. Integrated Compaction and Densification strategy for Pretoria West Residential Precinct. City of Tshwane Metropolitan Municipality.

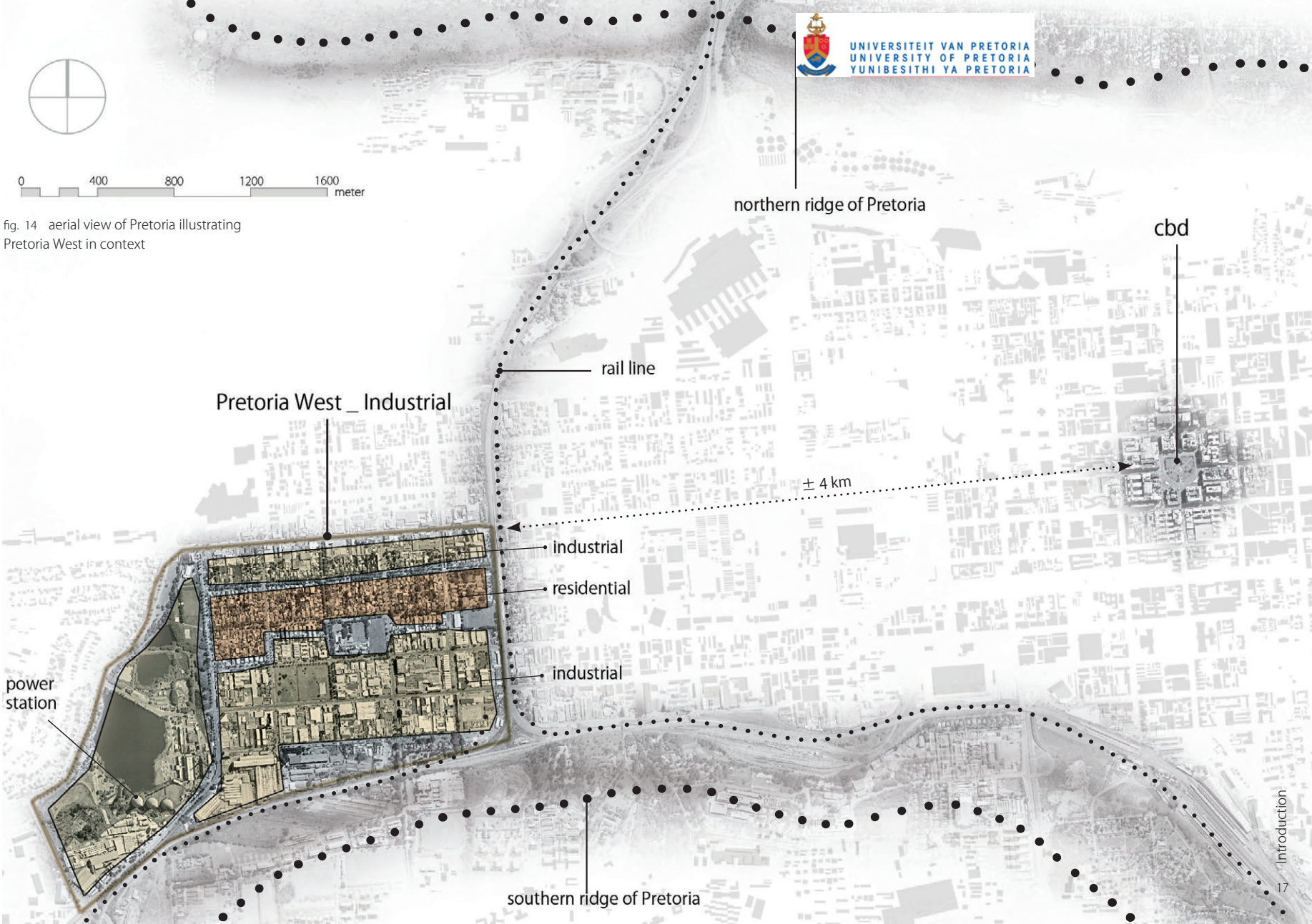


fig. 14 aerial view of Pretoria illustrating Pretoria West in context

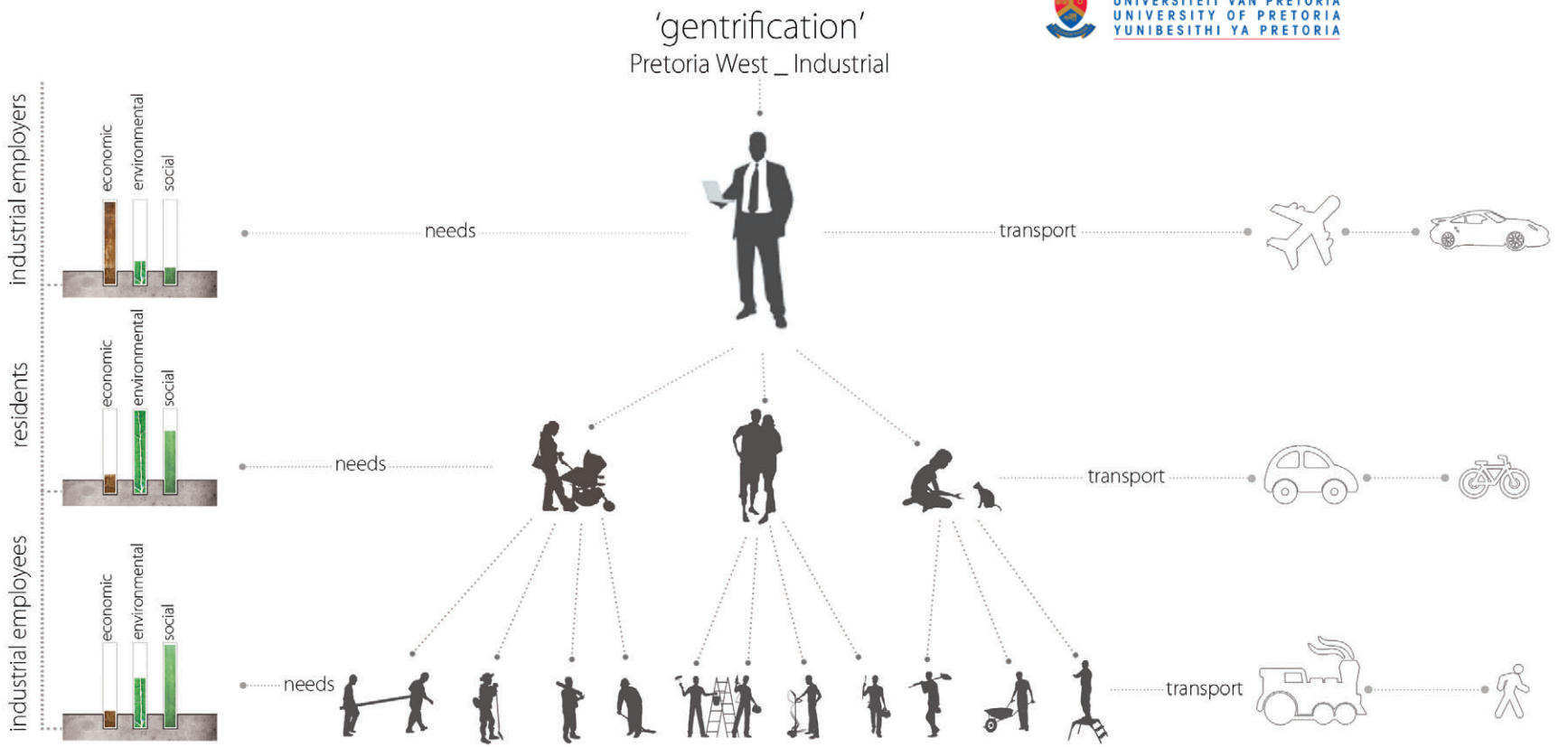


fig. 15 urban gentrification of Pretoria West in hierarchal diagram

Gentrification

Summarised from *'(Redfern, 2003: 2351-2366) What Makes Gentrification 'Gentrification'? '* considering the relevance to Pretoria West Industrial:

Characterised when a culturally heterogeneous character of a community is altered into a more economically homogeneous community.

Class substitution of those who live in the city by a higher class who create an identity in the city

- Upper class fails to interact with those around them (lower class residents).

Current residents are substituted due to escalating property, tax and the termination of an existing social community, forcing them to leave their historically established neighbourhood (Keating, 2000: 384).

fig. 16 Pretoria West _ Industrial (developed block North of site)

Aim

The main aim of the study is to present a flexible design strategy that would illustrate a different, yet substantiated architectural approach in dealing with prisoners after being released back into society.

Secondary objectives:

- Propose a validated solution to revitalise the Pretoria West region into a sustainable industrial environment:
    - Balancing economic; social; and environmental needs through architecture (fig 17).
    - Present a product where the living (residential) and working (industrial) environment can coincide.

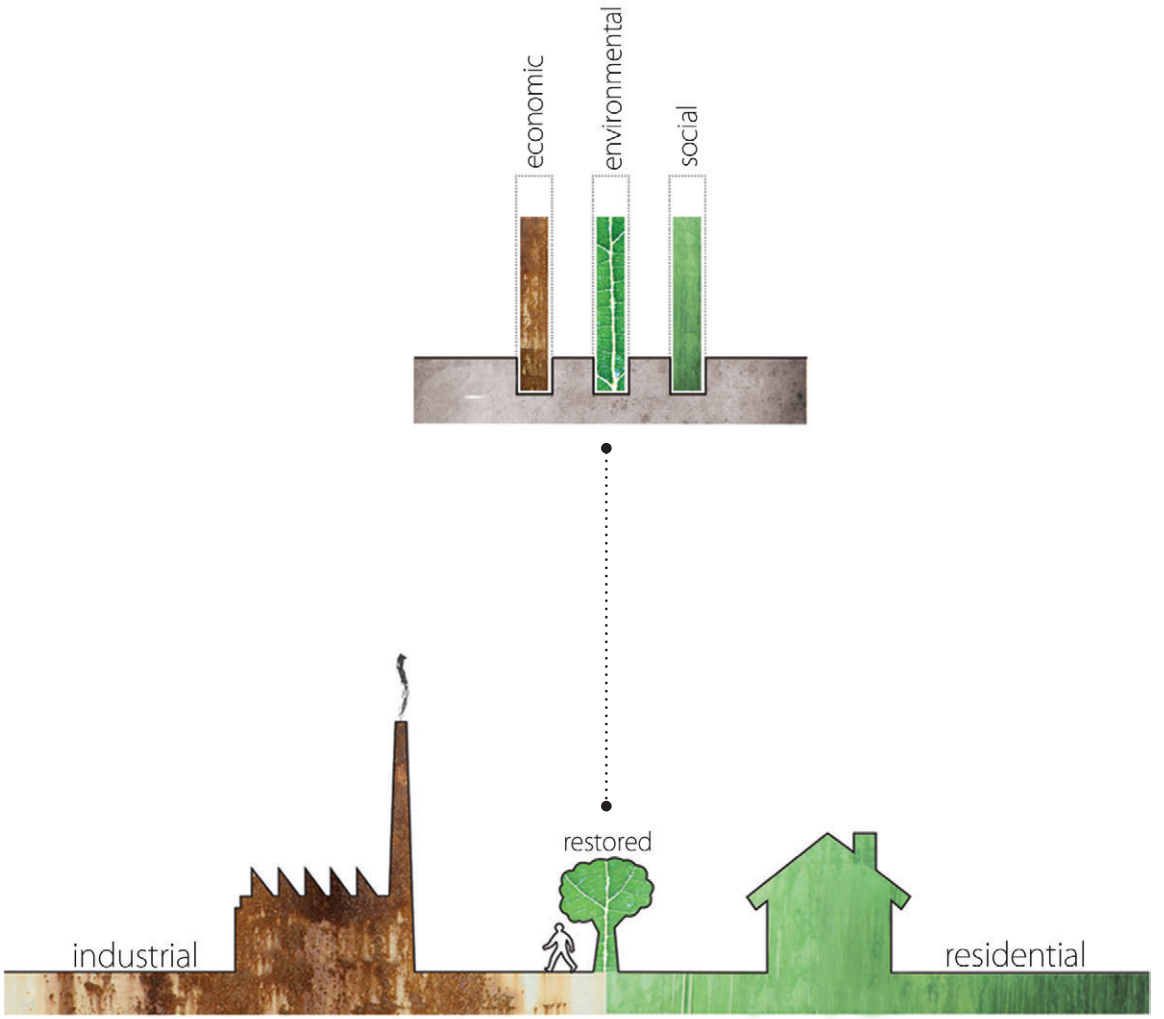


fig. 17 sustainable industrial environment by strategically balancing economic, social, and environmental needs (see fig. 11 - 13)

Methodology

The dissertation hypothesises the advantages of architecture as being 'flexible' in an action-reaction manner.

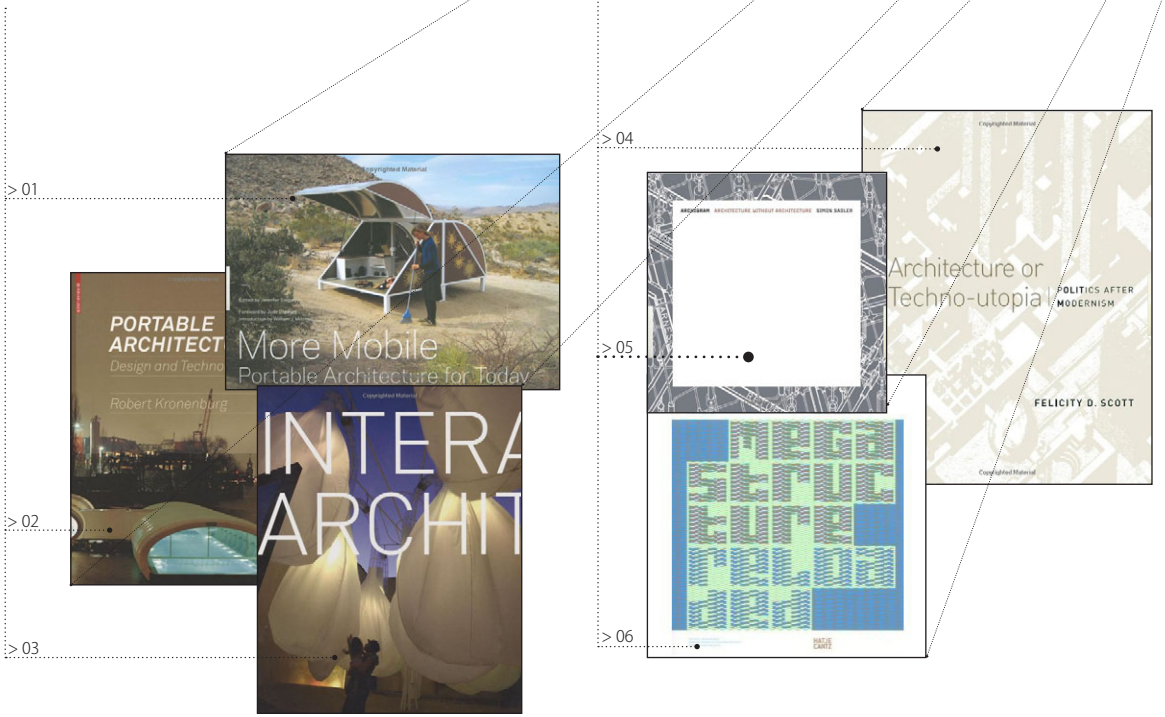
Recent research has addressed this in several different aspects:

Flexible Building

Physical mobility of the built form

Built Flexibility

Flux of modern society and their constantly changing needs



> 01. Siegal, Jennifer. More Mobile. 2008. More Mobile: Portable Architecture for Today.

> 02. Kronenburg, Robert. 2008. Portable architecture. Design and Technology.

> 03. Fox, Micheal and Kemp, Miles. 2009. Interactive Architecture.

> 04. Scott, D. F. 2007. Architecture or Techno-utopia. Politics after Modernism.

> 05. Sadler, Simon. 2005. Arhigram: Architecture without Architecture.

> 06. Ley, Sabrina and Richter, Markus. 2008. Megastructure Reloaded.

Although the author's study developed from the idea of a building being adaptable to any given environment, the idea of flexible architecture responding to a specific environment informed the design process. To certain extends this expand previous research on the topic: where technology, science and society is considered as the primary design generator (Sadler, 2005: 14).

Chapter _02
Literature Review

In this chapter, research will establish a possible answer for the sub-questions posed in chapter one. Areas for improvement are specified and countered with a potential solution. Finally, a conclusion is drawn to propose a theoretical solution for dealing with the problem statement.

The following strategies were obtained from various sources and illustrate a variety of theoretical and practical positions; however, each proposes an interesting method to deal with the static nature of architecture.

Nature and Architecture

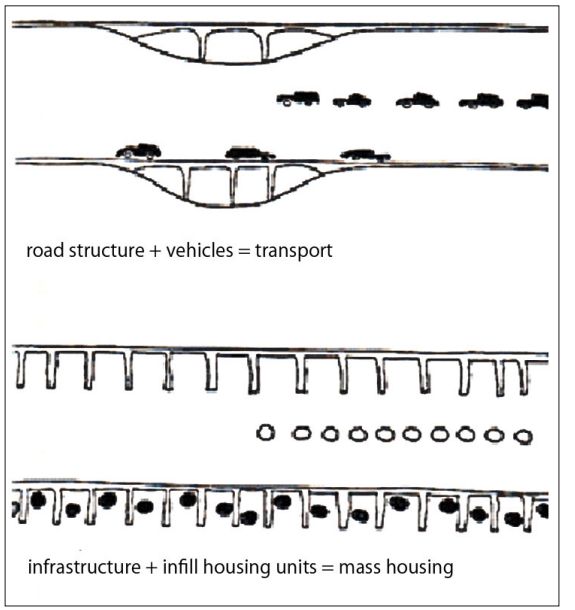
Darwin's evolutionary theory postulates that the survival of any organism depends on a self-organizing system that can only survive through continual interaction and adaptation to the given environment. Homeostasis should be established to balance external and internal conditions; this process of achieving equilibrium will constantly change due to external fluctuations (Abel, 1998: 563-4). This concept of evolution within architecture is not a new occurrence and provides a fundamental foundation for understanding the dynamics of urban and architectural discourse.

Support Structures

Various architectural concepts support this theory, where a support act as a structure capable of elevating dwellings from ground level, thus allowing the independent units to be altered and disassembled apart from other dwellings (Habraken, 1999: 78). Considering the verticality this method solves urban problems such as urban sprawling, however the large scale threaten the delicacy of urban organisation and living conditions such as accessibility.

According to Habraken (1999: 122) these structures distinguish between the ordinary and extraordinary, thus "allowing industrial development to take place; but at the same time they bring both together under the umbrella of an industrial apparatus. They also distinguish between industrial production and site labour." *(Ibid:* 122*)*

fig. 18 N.J. Habraken, the comparison between an infill package in a support structure and a car on the highway, 1965



Modularity

Usually based on the properties of dimensions, modularity is the break-down and standardisation of a structure into various elements. Jones (1992: 35) state that any successful design rely on the modules of which it consist of, he suggest that any design intention rely on some sort of modular organisation from musical notations to words of a language. Modularity is often disregarded for the thought of it being simplistic and fixed, but it is important to note that the combination of a variety of well combined modules establish a successful whole allowing for "either behavioral or morphological plasticity" (Mendell, 2005: 49).

fig. 19 Shugakuin Imperial Villa: modular dwelling for the Japanese Emperor (17th Century)

Piecemeal Growth

All urban communities, public spaces and buildings have evolved around the concept of piecemeal growth. Christopher Alexander explains this phenomenon as the development that proceeds in small steps, where spaces are recreated due to the adaptation towards function and site (Alexander, 1975: 67). This adaptation leads to a related whole due to internal and external factors that have been resolved, even though the individual parts are quite unique as independent elements.

This solution is relevant in any development strategy because the focus is on the concept of repair rather than replacement. As Christopher Alexander explained how the growth is considered in smaller contexts, the various elements need to respond with its own environment to establish a balanced whole.

fig. 20 Siena, Italy. Developed according to Piecemal growth

fig. 21 Panopticon, 1790. Jeremy Bentham

Polyvalence

Relating to the behaviour of flexibility, polyvalence is the way in which a given space can accommodate different programs with little or no physical re-arrangement. Some authors suggest that this can be achieved by only adding additional space to the proposed (Mendell, 2005: 52). Rem Koolhaas argues that "Perhaps the most important and least recognised difference between traditional and contemporary architecture is revealed in the way that a hyper monumental, space-wasting building like the Arnhem Panopticon proves flexible, while modern architecture is based on a deterministic coincidence between form and program." (Hill, 2001: 351-365)

It is important to realise that architecture and the flexibility thereof cannot accommodate any transformation, but only the allowance for different even opposite spaces can be considered as triumphant.

Open Building

Open Building separates the functional layers of an entwined project. Kendal (2001: 145) explains that 'Open Building' principles consider flexibility to a large extend. The aim of open building is creating environments that have additional value than their intended use. The building's life cycle is strongly considered throughout the design process, allowing for future alterations. The concept of open building consists of two independent parts, a permanent part known as the shell or base, and a more flexible 'Infill' part. This notion is reasoned by means of the standardisation approach that allows for flexibility (Mutchler, 2006: 31). Architecture consists of different dependent layers, and the accessibility between these layers evaluates the quality of flexibility.

fig. 22 Museum of the Moving Image Hospitality Pavilion

Mobility

Architectural mobility consists of various forms that prove a method of flexibility at different scales. Kronenburg (2000: 1) is bewildered by the resistance to impermanence of previous generations. From transportable environments to kinetic furniture Kronenburg mentions although the notion of mobility have been in use since the existence of humankind first began to built, it is only starting to show its appearance in the modern architectural trends.

Achieved by, manipulating the relationship of different components (fixtures), between functional spaces (rooms), or between context and building (whole building). Mobility in architecture can be related to the organisation of an organism's anatomy: from the movement of blood cells to organs to the entire body. However the important aspect is the classification of what is fixed and what elements allow for movement.

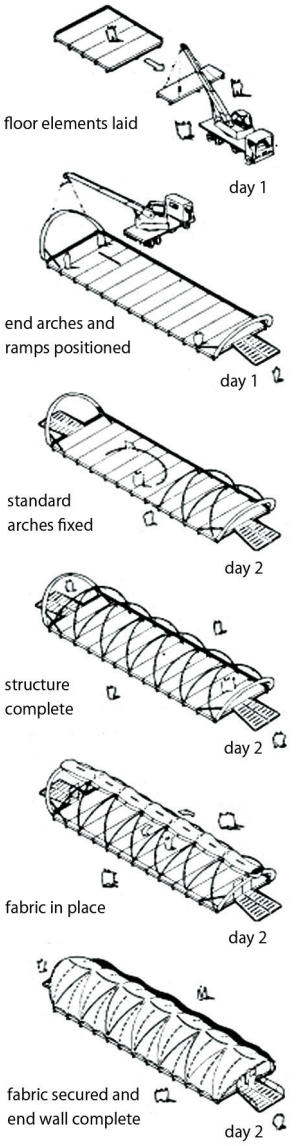


fig. 23 assembly procedure

Areas for Improvement

From the gathered theoretical ideologies concerning flexibility, there are limited areas for improvement concerning the conceptual basis for an adaptable built form. However architecture should be simplified; dismantled to the basic necessity and the various elements should be examined as a design within itself (Mutchler, 2006: 4).
The proposed theoretical solutions provide a fundamental basis for the conceptualisation of architectural flexibility. Nevertheless the implementation of theory in the 'real' world has to prove viable to various external factors including cost, time and quality. Still the quest for any architectural practice is to provide buildings that; are more cost effective; are faster to erect; and have a pleasing aesthetic quality. But in addition satisfy the need of the current client as well as the 'unknown' future client by utilising as few resources as possible. This ideology contradicts the thought of what is usual and expected, embarking for innovative design solutions.

Solution

The complexity of architectural problems should have a basic resolution that should be accepted by a large variety of society. Understanding and reasoning should inform this approach. Buildings and urban areas are essentially for the living experience. However, the economy, time and money speculate architectural trends rather than the architect or urban specialist.

Gregotti (1996: 64) state that "big picture" design notion is overwhelming the current society, thus raising a concern to any design profession and questions the role of the architect in essence. Importantly it should be realised that for the 'big picture' to succeed, the design in a whole is dependent on smaller parts that varies from connections to the exploration of space.
These spatial explorations should coincide with the specific given environment and ultimately inform the design form.

Mutchler (2006: 15) suggests that a 'lean' architecture can have an effective impact because it deals with monetary aspects as well as proving time efficient throughout the building process. 'Lean architecture' as suggested by Mutchler is the dismantling process of complex design forms, and dealing with the complexity of the dismantled elements prior to the whole. This approach can be observed as architecture on a smaller yet more detailed level.

Visually observing the built environment through time, it is evident that architecture grows as technology grows. Contemporary architecture relies on technology to aid the complexity it provokes. The practical implementation of concepts have become endless. However Kieran and Timberlake (2004: 8) implies that these contemporary forms can come at a price.
Modern architecture does not rely on form or style; it is more about innovative design strategies to fabricate environments that can have the same impact as technology can produce.

"The computer is a tool, not a partner. An instrument for catching the curve, not for inventing it"
-*Frank Gehry*- (Friedman, 2002: 4)

Conclusion

From the research gathered, it could be concluded that flexible design strategies provide an opportunity to resolve a variety of evolving societal needs rather than narrowing the possibilities down to a perfect solution to an immediate problem.
Flexibility can be catered for by observing the built environment as living organisms that are interlinked with its surrounding environment, and not as objects that are defined by rigid spatial organisation. If this approach is established, the evolution of buildings should adapt to the ever changing social and cultural needs of modern society.

Adaptation and flexibility should be defined as a relative term. Where these concepts depend on various resources such as materials, assembly and construction methods, and programme necessities. Flexible design strategies responding to a specific environment underpins the way a building proves flexible.

Architecture has developed to be an ideal of excessive customisation dealing with individual clients' needs. However this uniqueness is still achieved by the utilisation of standard, off the shelf components.

Due to escalating building cost, design often results in standardisation and less choice. Thus the role of the architect is constantly challenged to attain uniqueness. Mass customisation proves to be the best possible solution to deal with this problem. Not to be confused with mass production, this method provides a unique solution for each client due to the subjective organisation of components.

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Chapter _03

Mapping & Contextual Analysis

fig. 24 geographical location

Firstly, this chapter will illustrate the mapping and understanding of the railway infrastructure throughout Pretoria at different scales. Furthermore, an extensive analysis is done around the specific station under investigation (Rebecca station). Existing development proposals are critically reviewed and elaborated on. Quantitative data is assessed and exemplified in a qualitative manner to orientate the reader throughout the chapter. Finally, a conclusion is drawn to guide the proposed framework and site development plan (Chapter 4).

fig. 25 image from rebecca bridge (looking West)

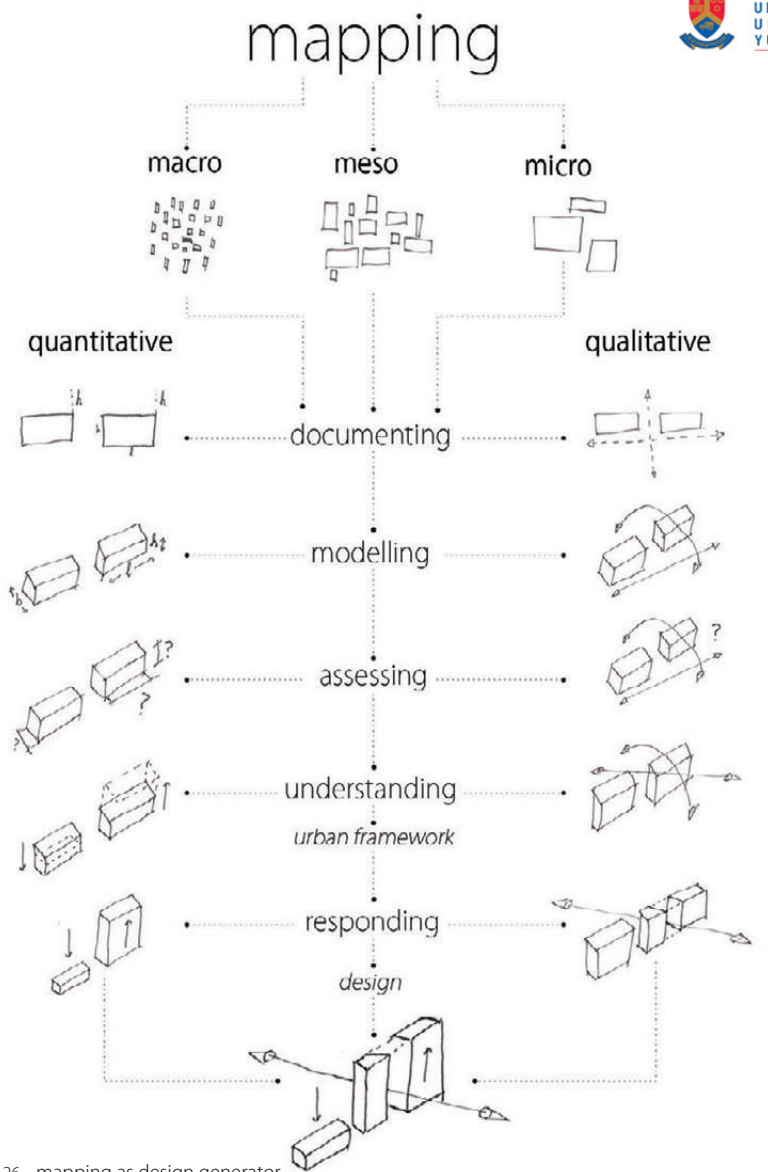


fig. 26 mapping as design generator

Macro scale

According to the City of Tshwane Spatial Development Framework (TSDF):

-City of Tshwane (2007, p. 18-19)

- New large development initiatives should be planned around public transportation facilities such as train stations, with a strong pedestrian focus. The dependency on private vehicles should be minimised through the development of an adequate public transport system.

- The metropolitan area is well served by rail infrastructure and although the integration of the different rail systems will be a major challenge, it could in future form the backbone of a public transportation system for the entire region.

- The rail together with the first order road system should inform the city's new structure to promote transformation of the urban area.

Considering the mentioned objectives of the TSDF, the main purpose of the macro mapping exercise was to:

Fig. 28

- Identify and analyse the specific location of rail stations throughout the Pretoria region, considering pedestrian movement around these stations (adequate walking distances).
- Map the route genesis of railway users (commuters) working in and around the CBD.

Fig. 29

- Illustrate a comparison between the utilisation of train stations throughout the metropolitan area. Attempting to identify the least used station.
- Identifying specific places, buildings, and environments train users relate to when questioned on the location of a specific station.

Data was obtained through:

- Interviews:
  - Pretoria West users (employees, residents, and employers)
  - Train users (commuters, social users, and train operators)

- Personal observations

- Existing statistics and urban frameworks

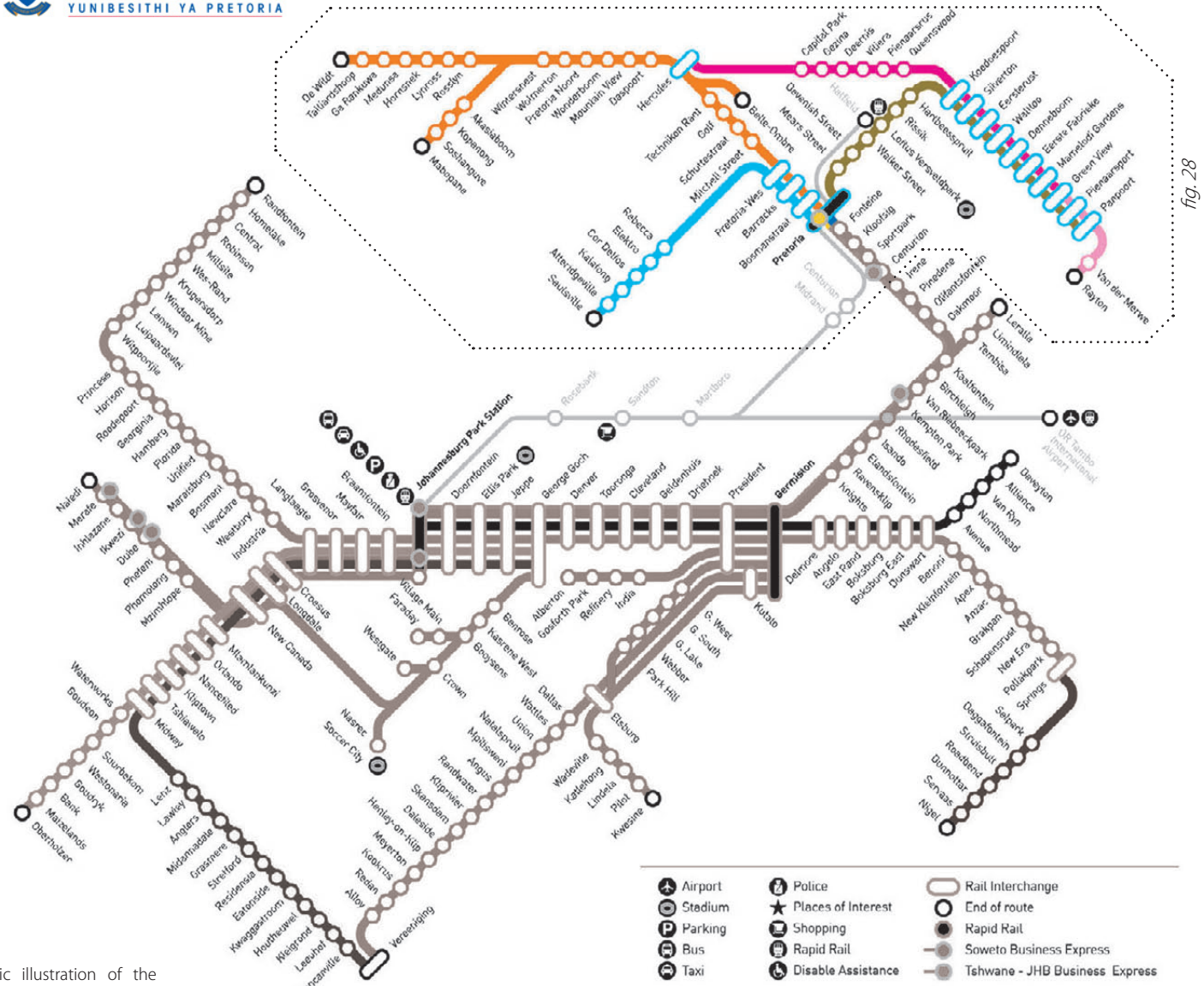


fig. 28

fig. 27 diagrammatic illustration of the Gauteng Metro rail infrastructure

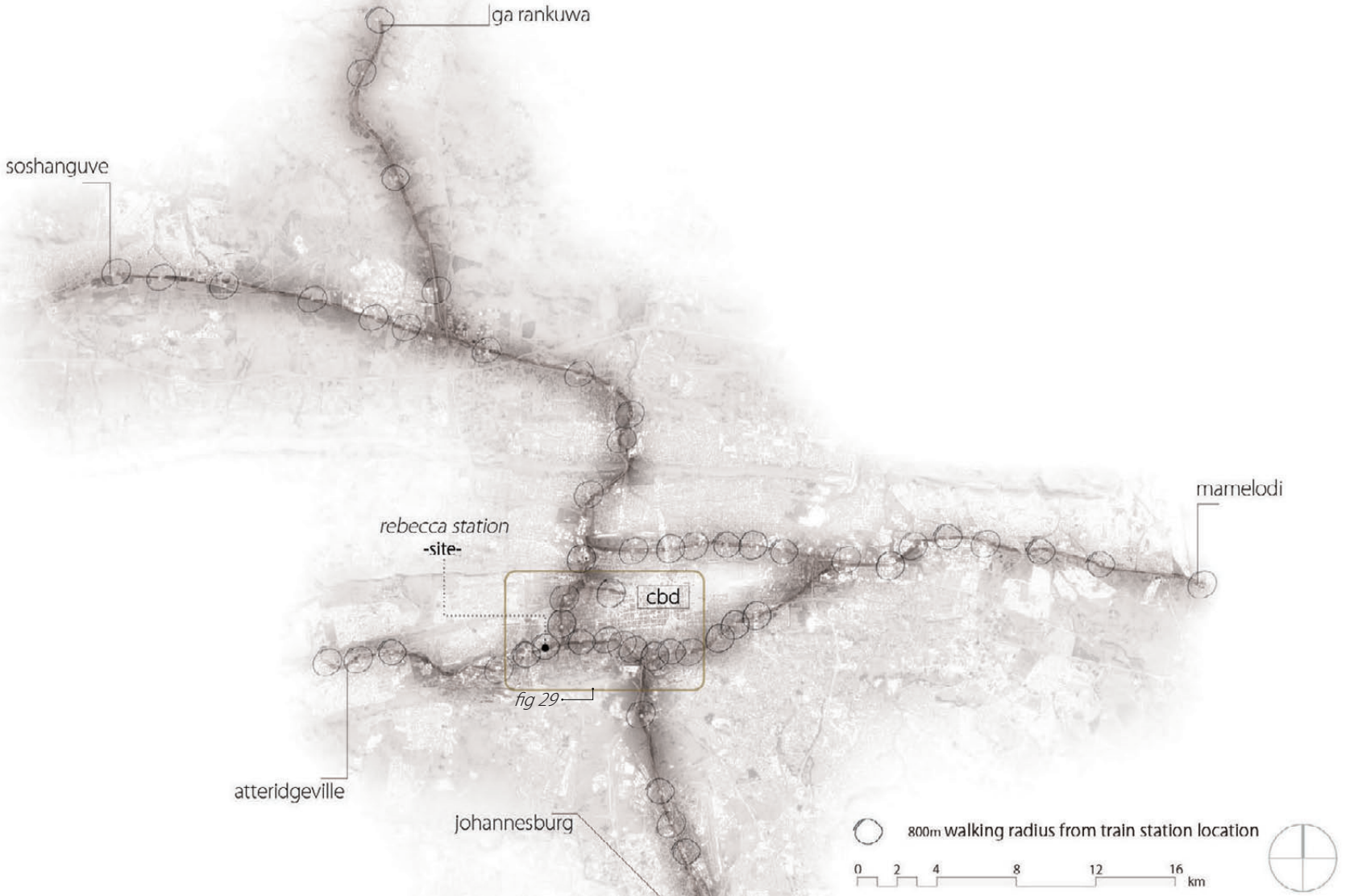


fig. 28 illustrating the origin of rail commuters and densification of train stations throughout Pretoria

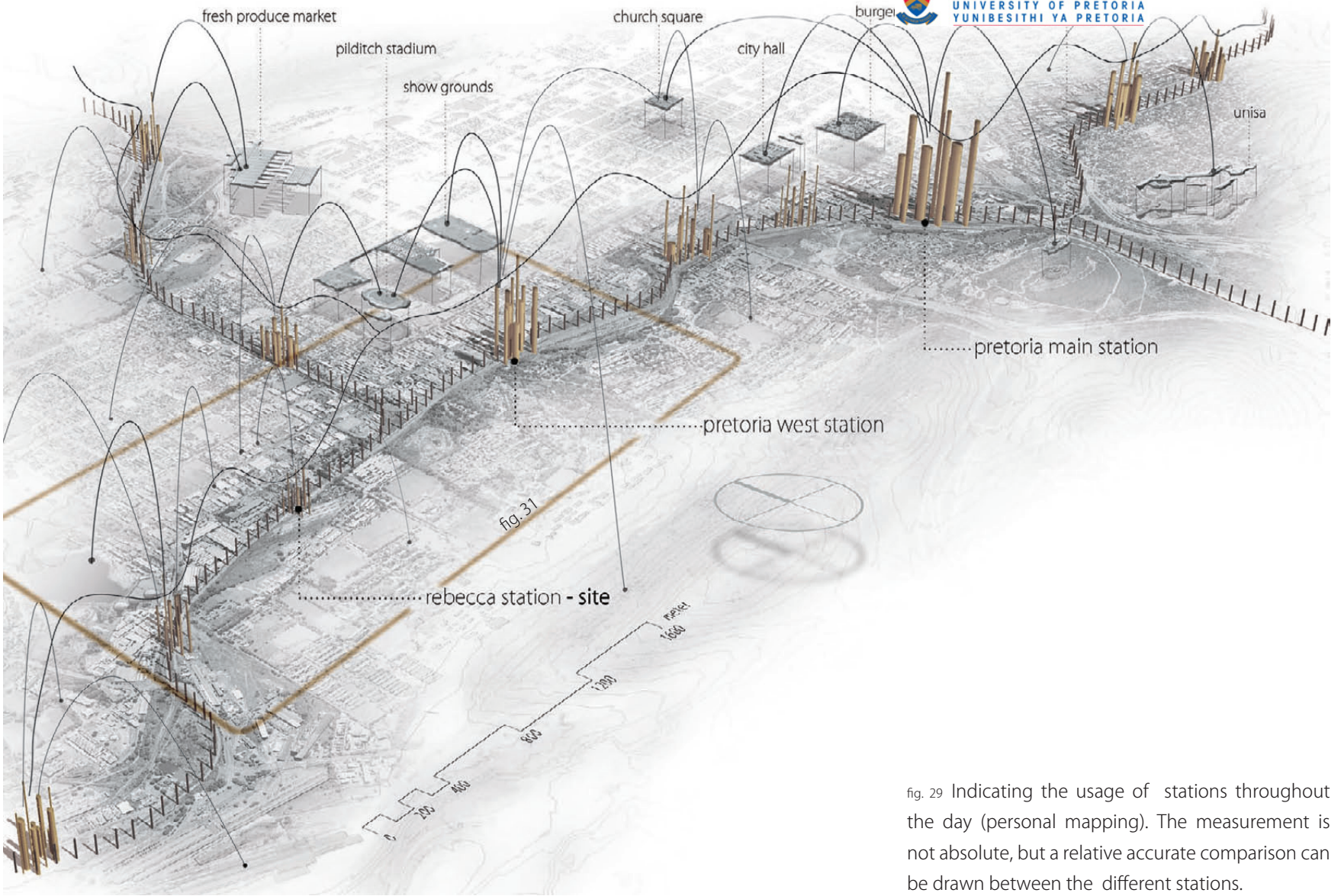


fig. 29 Indicating the usage of stations throughout the day (personal mapping). The measurement is not absolute, but a relative accurate comparison can be drawn between the different stations.

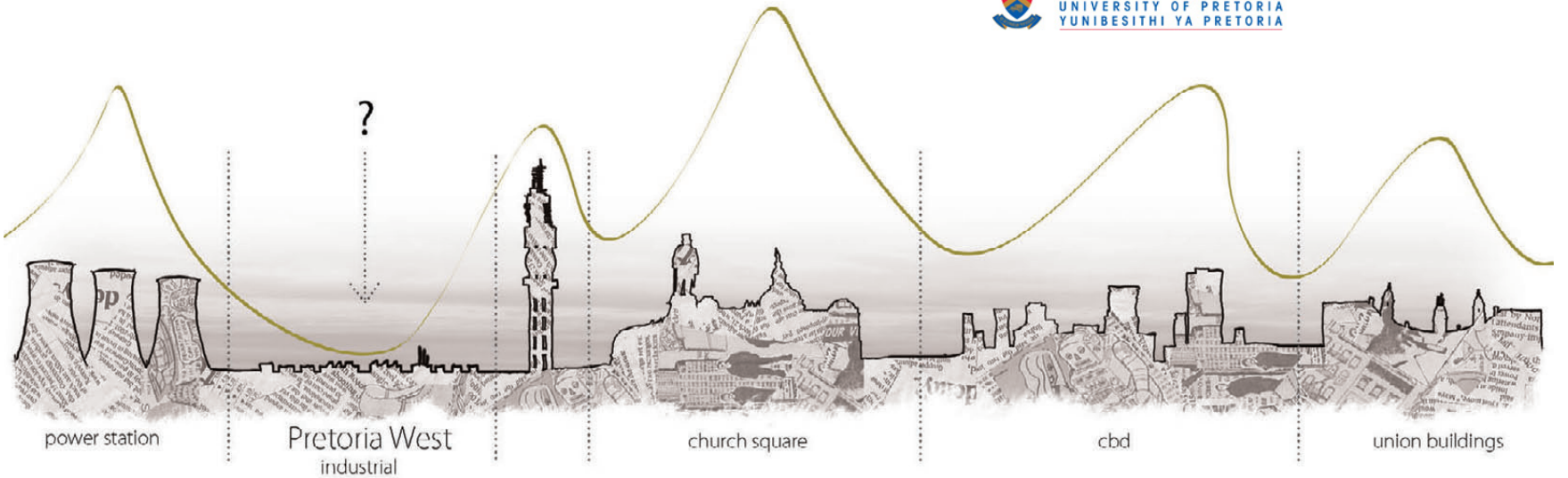


fig. 30 Indicating certain places and buildings citizens relate to within Pretoria

Findings
'macro' mapping

- As mentioned in the TSDF, the metropolitan area around the CBD, especially to the south and west are well equipped with stations serving the adjacent area.

- Train users relate to certain iconic structures and built environments (fig. 29) when queried on the location of stations due to personal use and the ability to access these environments on foot (adequate walking distances).

- A large portion of employees in and around the Pretoria CBD are commuters living in Ga-Rankuwa, Soshanguve, Atteridgeville and Mamelodi.

- Rebecca station is strategically located to serve the industrial area. However it can be considered as the most underutilised station surrounding the CBD due to the dilapidated and dangerous state.

- Industrial employees travel further distances on foot to stations where they feel safe and allows for social interaction prior to travelling home (avoiding Rebecca station).

Note: From the findings, further investigation is required to:

- *Identify the specific problem/s responsible for the current state and avoidance of Rebecca station.*

- *Propose a strategy to revitalise the station to be a catalyst for sustainable growth as depicted in the TSDF.*

Meso & Micro scale

Integrated Compaction and Densification Strategy (ICDS) for Pretoria West

Objective _ ICDS

Ensuring harmonious, co-ordinated and integrated residential development in and around Pretoria West. (Du Plessis & White, 2008: 1)

According to the ICDS proposal for Pretoria West, the following reasons are identified why it is an ideal location for new development:

- Proximity to a major employment and activity centre, namely the Tshwane Inner City
- Proximity to major public transport opportunities
- The decaying character of the area which makes it ripe for urban renewal and development intervention.

(Du Plessis & White, 2008: 5)

The ICDS regards the neighbourhood and improving the neighbourhood to the extent that it begins to have a positive impact on the lives of the community and the long-term social and/or economic change is ensured in the area (*Ibid:* 7).

- Creating socially cohesive and diverse communities through a mix of housing types and employment opportunities;
- Promoting alternative transportation and energy;
- Promoting efficient use of resources; and
- Locating residential areas close to recreational and commercial services with pedestrian and cycling connections.

Pretoria West as a sustainable neighbourhood

The future development proposals and strategies for the Pretoria West region goes beyond the merely issue of densification, it should ultimately benefit the community and its users. Consequently, the successful densification of any environment should co-exist with the concept of creating sustainable neighbourhoods. Ignoring the creation of a sustainable environment, densification will result in an unlikable, weak and ultimately unsustainable neighbourhood. The concept of a sustainable neighbourhood is a holistic one, aiming to classify the living conditions within which all people can pursue dynamic and meaningful lives that simultaneously optimise the use of natural resources.

Sustainable neighbourhood planning seeks to achieve lasting environmentally, socially and economically viable communities through design.

The benefits of a Sustainable Neighbourhood:

- Healthier living environments;
- Local employment opportunities;
- Safe and livable environments; and
- Access to public transport

Landmarks & context

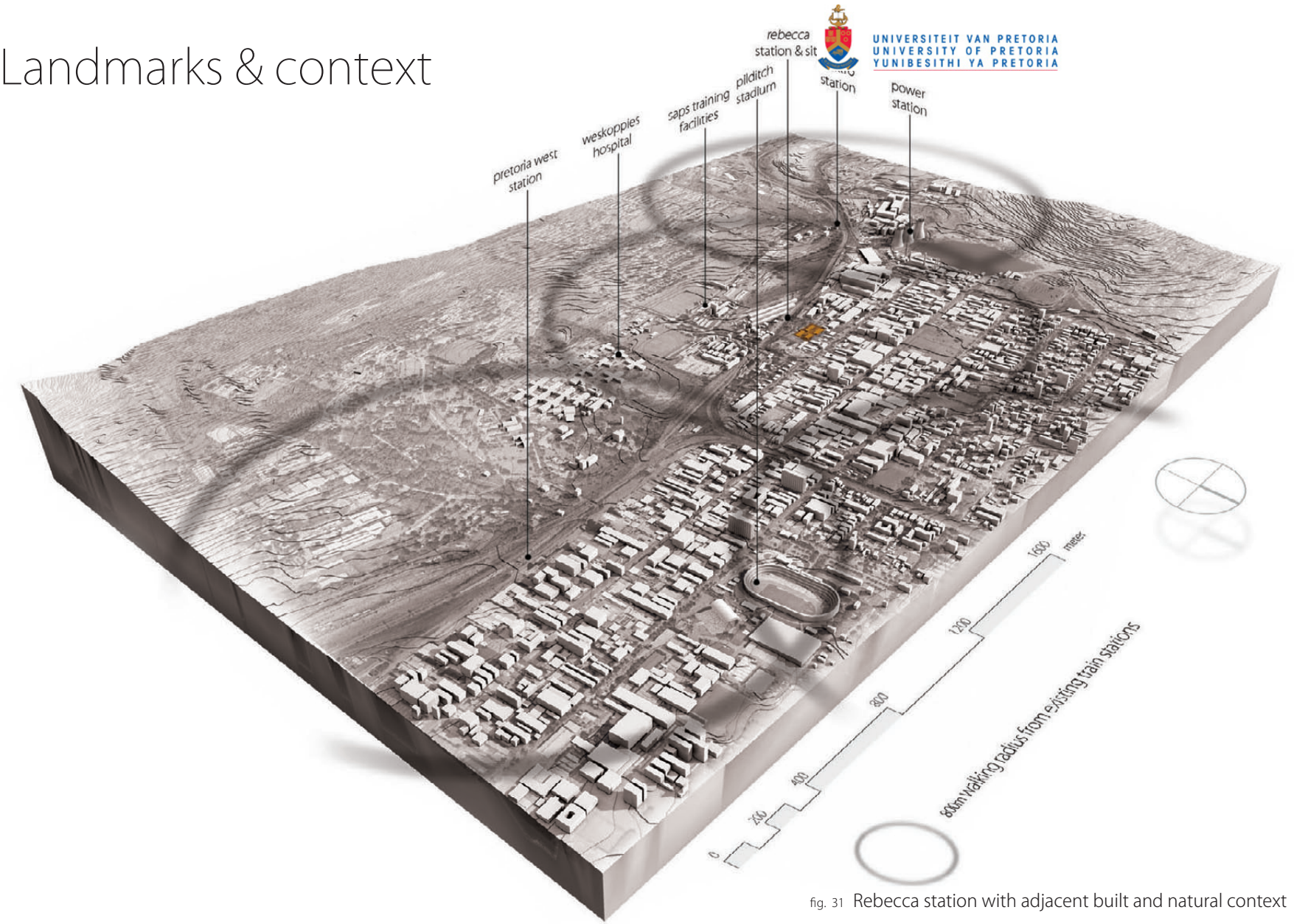


fig. 31 Rebecca station with adjacent built and natural context

Context Layering

water used by power stations' cooling towers

-fast east-west vehicular movement (from CBD)
-slow north-south vehicular movement (residents)

sporadic soft surfaces 'green landscaping' between industrial environment

trees according to vehicular flow patterns
(provide shading for commercial customers)

figure ground map indicating built surfaces

hard surfaces causing excessive stormwater run-off

fig. 32 elementary layered components forming existing industrial environment

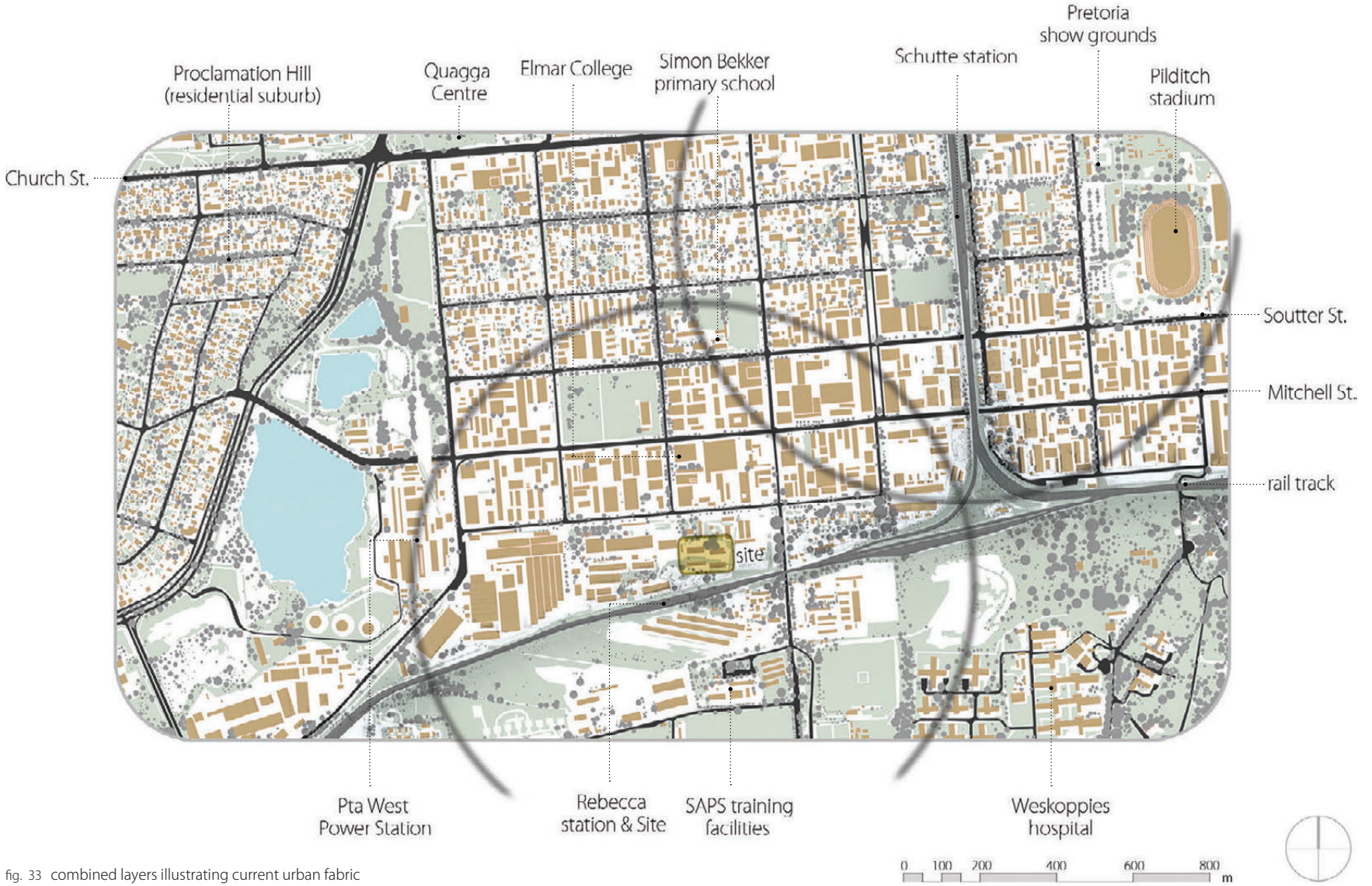


fig. 33 combined layers illustrating current urban fabric

As illustrated, Rebecca station is well situated to serve as a transportation node for the majority of the industrial area. Further urban development to the South is inevitable. Thus, Rebecca station should be revitalised according to a pedestrian flow pattern prior to this expansion. The current railway line and station acts as a psychological boundary. This boundary should be altered into a threshold space between the existing and expected development to the South.

The land use adjacent to the major east-west streets (Church & Mitchell) have all been developed for commercial purposes. Because of the location adjacent to the Inner City, the general character of these commercial streets tends to lean more towards an urban rather than a suburban character. This growing commercial activity has led to the current monotonous environment. Expanding commercial development on the North (Church Street) and the South (Soutter Street) constantly threaten the existing residential sector located between these busy vehicular routes.

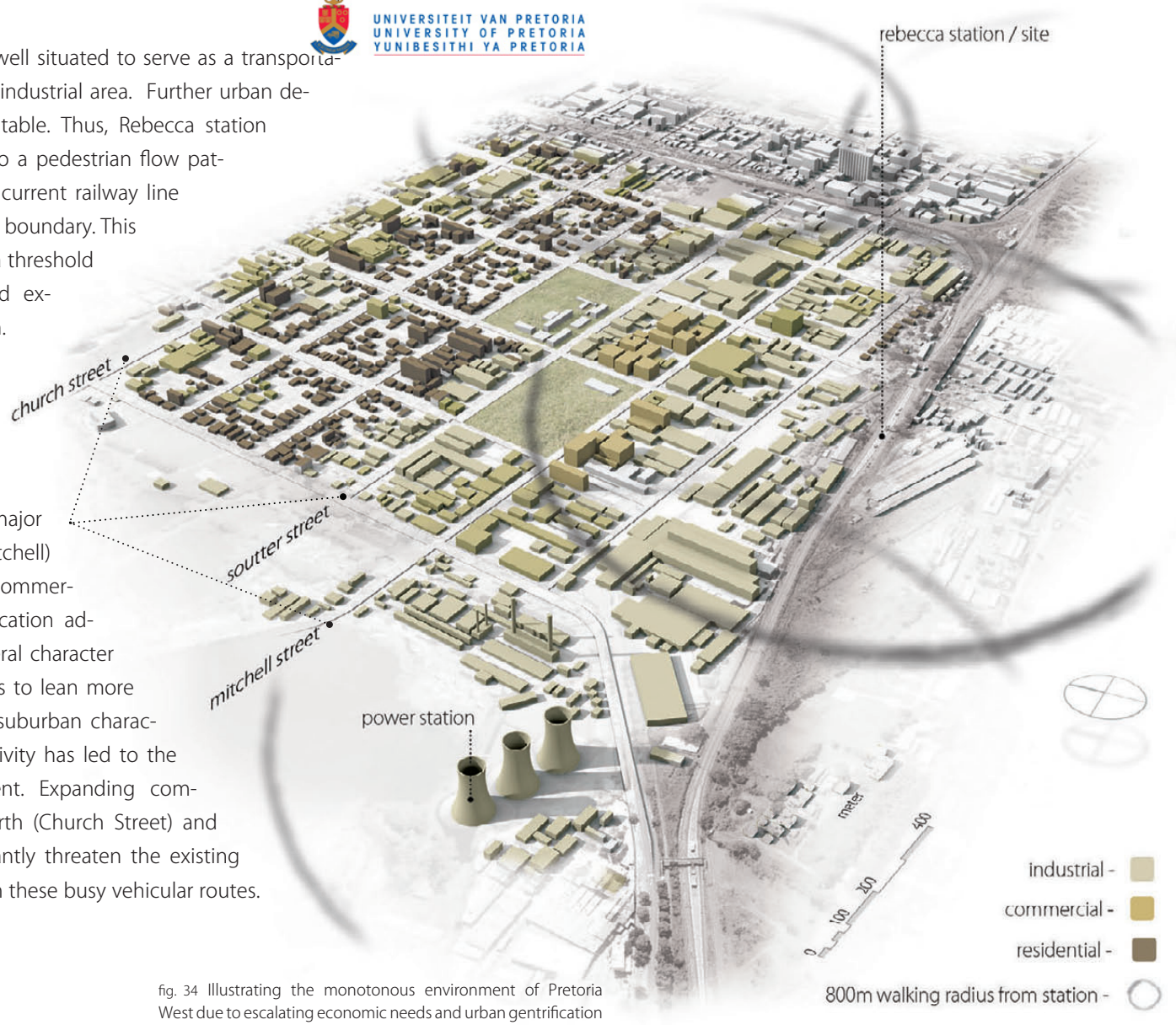


fig. 34 Illustrating the monotonous environment of Pretoria West due to escalating economic needs and urban gentrification

Movement & Transportation

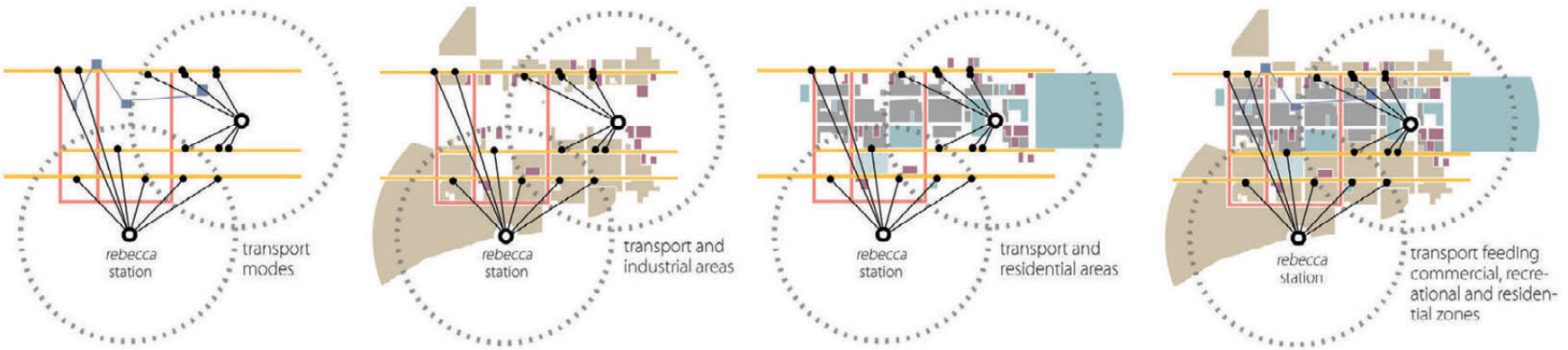


fig. 35 Transportation connections around Rebecca station

Public Transport Facilities and Densification

Transit Orientated Development (TOD) focuses on the integration of major public transport facilities with the urban development. The aim is to create compact, vibrant pedestrian communities around high quality transport systems **"...such as train stations"** (Tshwane City Planning and Development, 2010: 6). A TOD neighbourhood has a centre with a rail station, surrounded by relative high-density development and progressively lower-density spreading outwards (*Ibid:* 6)

Findings

'meso' mapping

From the data obtained via the 'meso' mapping analysis, it can be summarised that the cause/reasons for Rebecca station's current under-utilised and dangerous state is it being:

- Inaccessible to users (dept. of public works)
- Visually secluded from the adjacent environment
- Equipped with poor ablution facilities

Birds eye view of Pretoria West

fig. 36 birds eye view of Pretoria West (southwest - northwest)

fig. 37 birds eye view of Pretoria West (northwest - northeast)

fig. 38 birds eye view of Pretoria West (northeast - eastwest)

steel sheeting

corrugated sheeting

timber

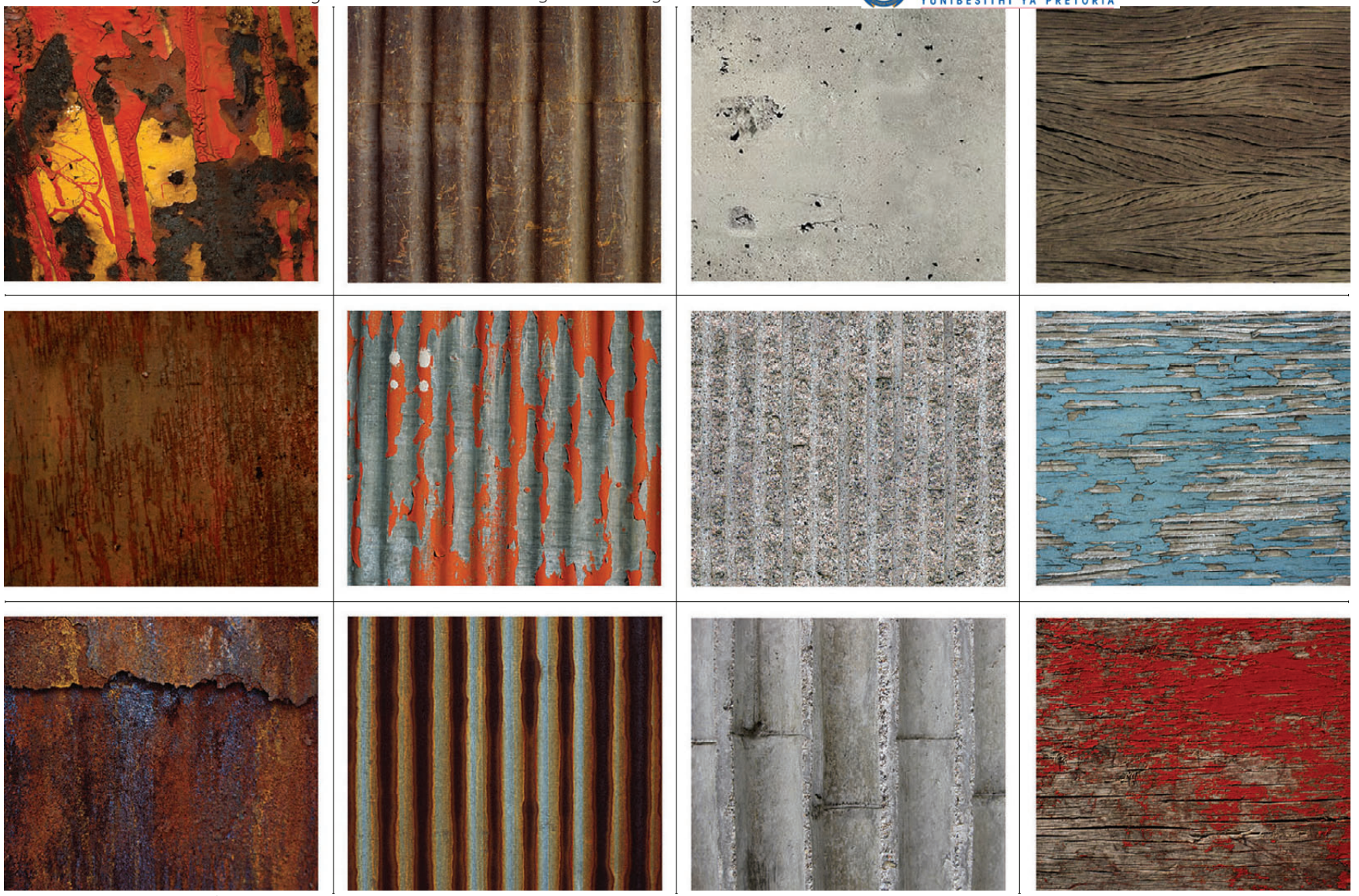


fig. 39 typical industrial textures found in Pretoria West (images by author)

East - West streetscape

fig. 40 typical east-west streetscape (Mitchell street)

Characteristics

- Vehicular orientated
- Marketing intensive (vehicle services)
- Fast singular directional vehicular movement
- Restricted cross-transitional pedestrian movement
- Acts as access route from and to CBD

North - South streetscape

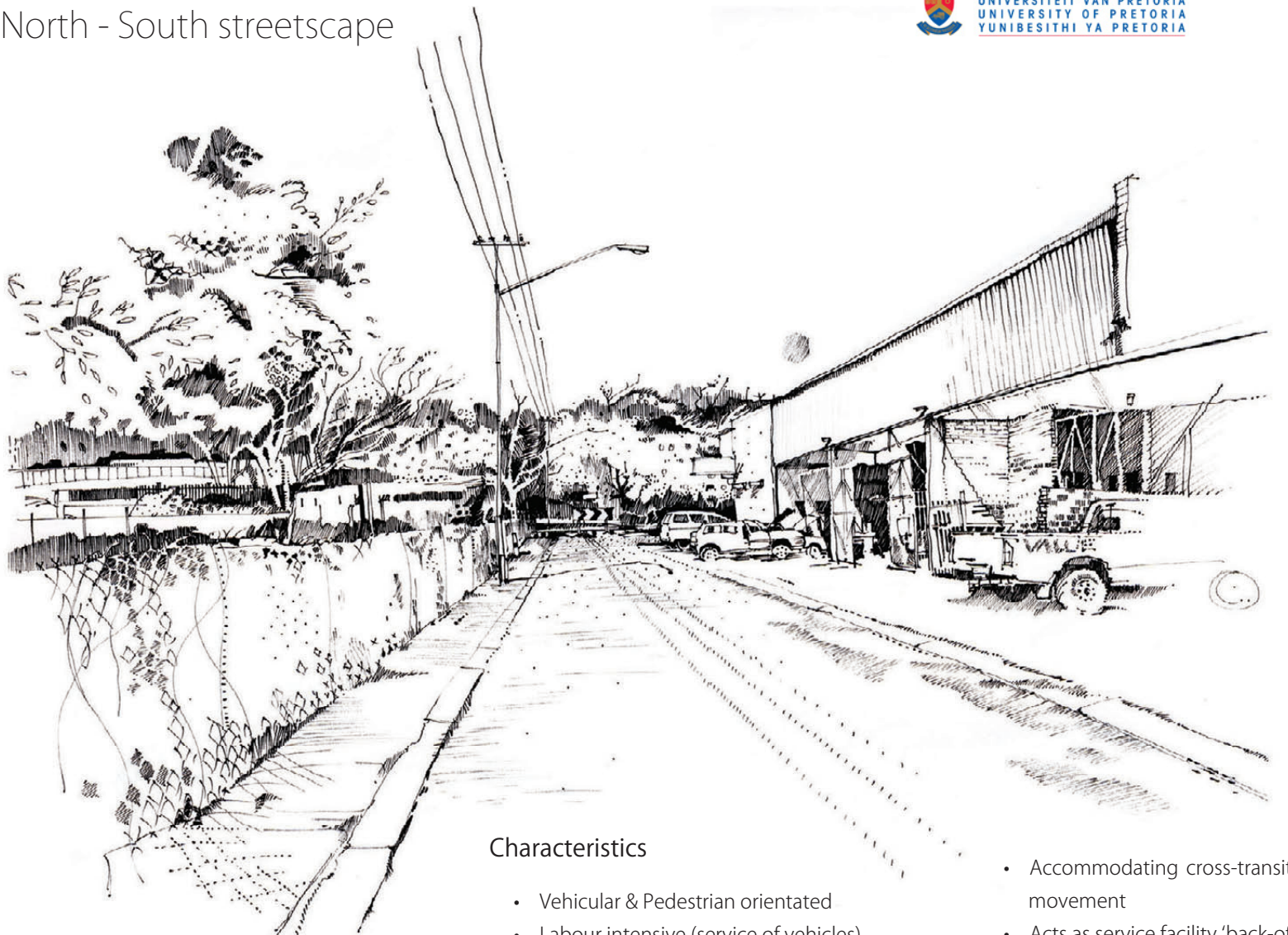


fig. 41 typical north-south streetscape (Rosetta street)

Characteristics

- Vehicular & Pedestrian orientated
- Labour intensive (service of vehicles)
- Slow multi- directional vehicular movement
- Accommodating cross-transitional pedestrian movement
- Acts as service facility 'back-of-house' for East - West streetscape

fig. 42 view from rebecca bridge (looking East)

Conclusion

In response to the findings mentioned throughout the chapter and the qualitative understanding of the specific area under investigation, one can conclude that:

- There is a definite need for Rebecca station as a commuter facility.
- Rebecca station should be redefined as a mediator between the living and working environment with a strong pedestrian focus.
- The successful integration of high-rise residential developments between the existing commercial fabric is necessary to accomplish a sustainable industrial environment as depicted in the ICDS.
- In addition to the residential proposal, an adequate revitalising strategy is required to satisfy the environmental, social, and economical needs responsible for achieving a sustainable industrial environment.

Chapter _04
Context Development & Programme

From the contextual analysis posed in the previous chapter, this chapter will indicate the motive for selecting the specific site under investigation. Furthermore, a strategic revitalising strategy is proposed in a response to the shortcomings concluded in Chapter 3. A conceptual context development plan is exemplified in relation to the production programme. Finally, the programme for the proposed intervention is specified.

fig. 43 aerial view of site and adjacent context

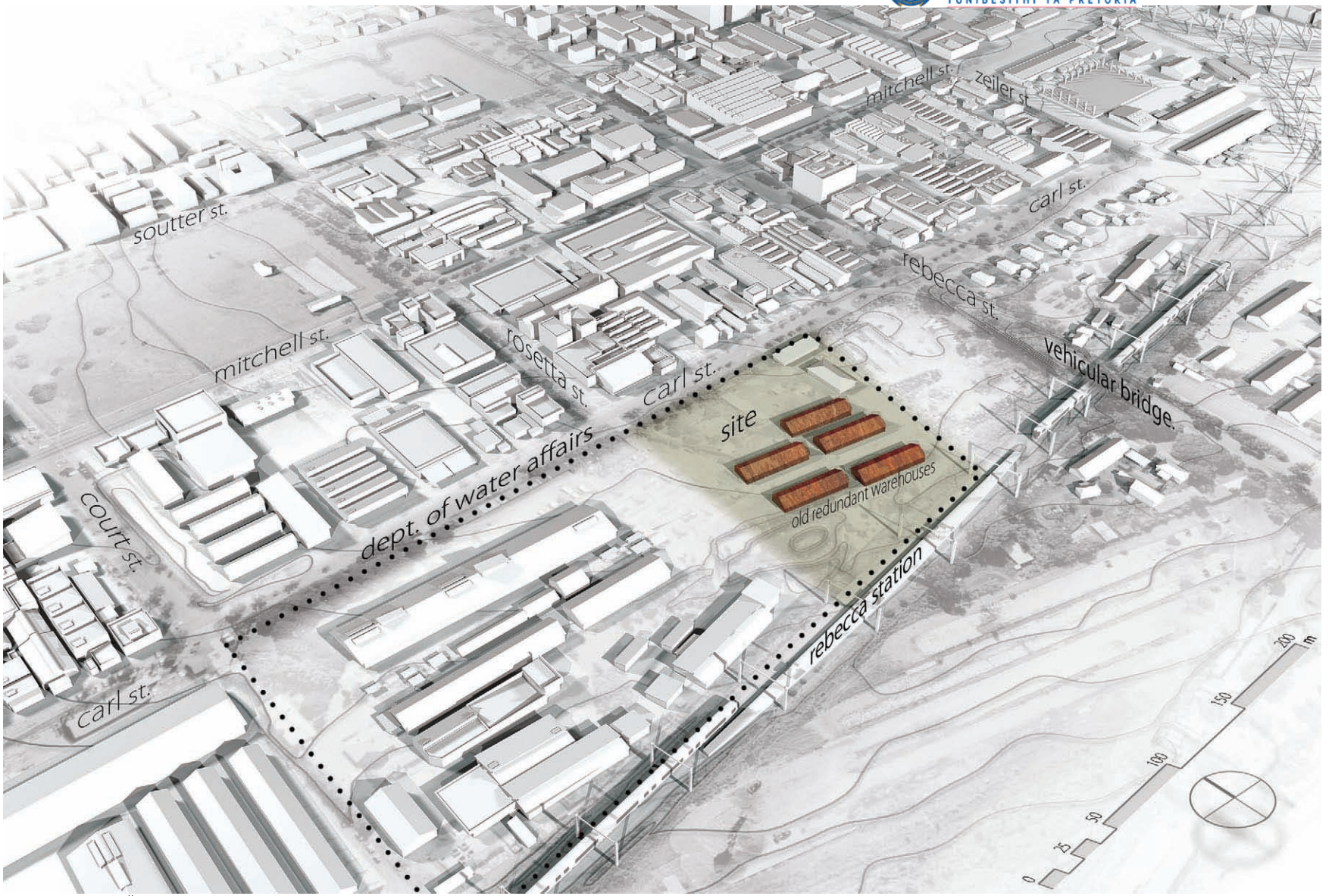


fig. 44 perspective illustrating site context

fig. 45 dilapidated warehouses currently on site (view of power station to the West)

In a response to the contextual analysis presented in Chapter 3, and the building's programme *(temporary housing and production facility)* posed in Chapter 1, the specific site was chosen due to the following factors:

Pretoria West _ Industrial?

- Acts as a threshold environment between social seclusion (prison facilities) and social integration (urban living). Thus, Pretoria West represents a sub-urban character, allowing for gradual social interaction.

- The production process of *'the halfway house'* relates directly with the industrial character.

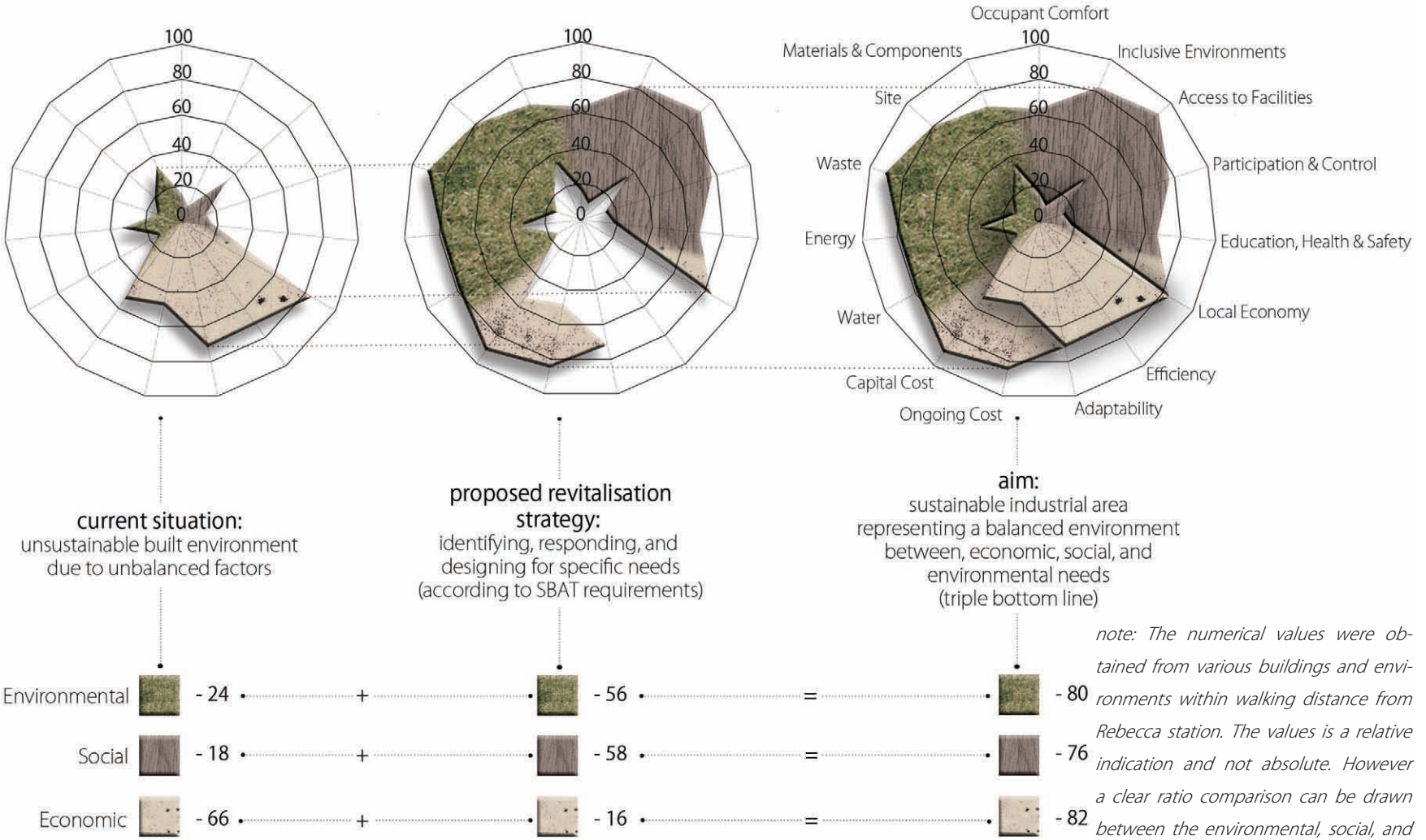
Selection of Specific site?

- Under the watchful eye of the police (Police Training Facility located on the southern side of the proposed site).

- Geographically located between the redundant recyclable materials that would be used as primary structural components for the proposed intervention (see Chapter 6).

Assessing the built environment of Pretoria West (SBAT)

SBAT - *Sustainable Building Assessment Tool*



note: The numerical values were obtained from various buildings and environments within walking distance from Rebecca station. The values is a relative indication and not absolute. However a clear ratio comparison can be drawn between the environmental, social, and economical factors.

fig. 46 assessing the built environment of Pretoria West (SBAT)

*Pretoria West_* Conceptual revitalising proposal

Social needs

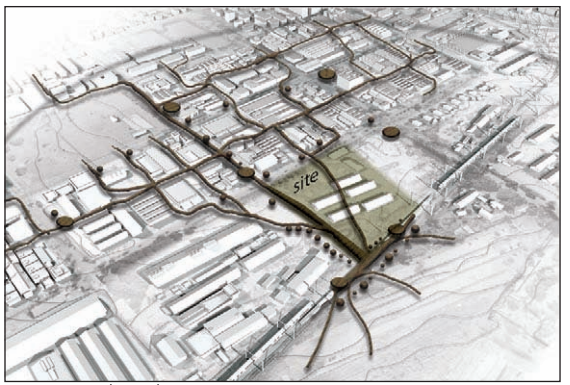


fig. 47 social needs

- *new pedestrian route / walkway*

- *new public facilities*
  -transport
  -ablution
  -communication

- *proposed retail*
  -informal markets
  -cafes
  -canteens

Environmental needs

fig. 48 environmental needs

- *new vegetation*
  -parks
  -'green streets'
  -food production

- *proposed planting & trees*

- *waste collection / recycling depot*

- *stormwater catchment*

Economic needs

fig. 49 economic needs

- *new high-rise residential development according to the densification framework proposal for Pretoria West*

The proposed residential development is integrated between the commercial and industrial fabric, redefining the current monotonous environment in an attempt to establish a sustainable industrial environment between industry and residency with a strong pedestrian focus.

Proposed residential development adjacent to site

According to Du Plessis and White (2008: 40), a very important aspect that needs to be taken into consideration when approving developments is not to consider only the site, but rather the site in the context of the street block. All developments should contribute to the development of a specific street block development model, which comprise of three essential elements:

- Perimeter buildings;
- Internal open spaces in the centre of the block; and
- Pedestrian movement and streetscape around the edge of the block.

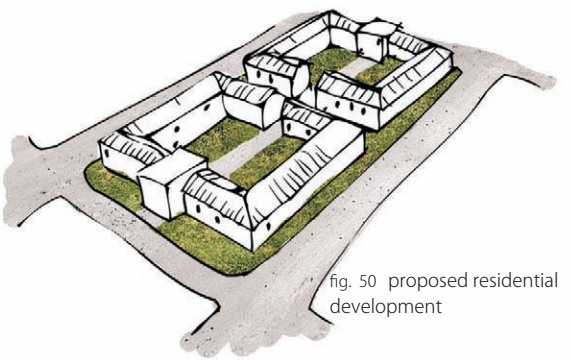


fig. 50 proposed residential development

The advantages of having multi- storey perimeter buildings arranged at the periphery of the block are:

- Create continuity in the street facade
- Distinguish between public and private realm
- Allow for green open spaces at core of block
- Encourages richness and continuity

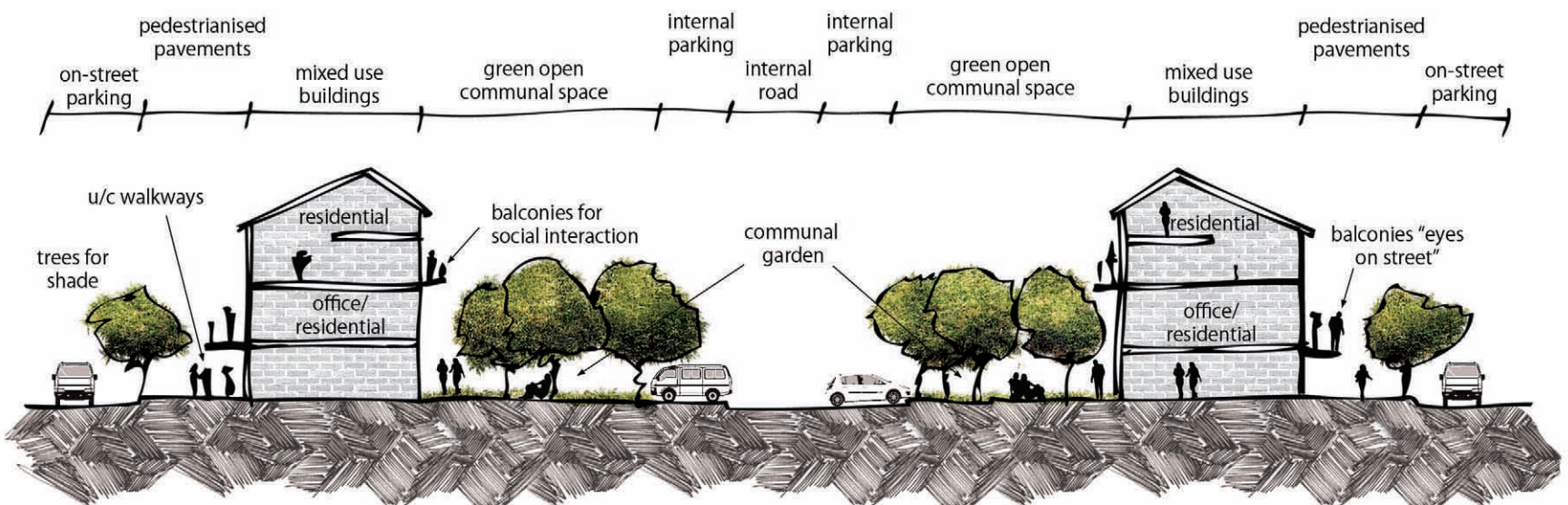


fig. 51 diagrammatic section illustrating proposed residential development in Pretoria West

Revitalising strategy

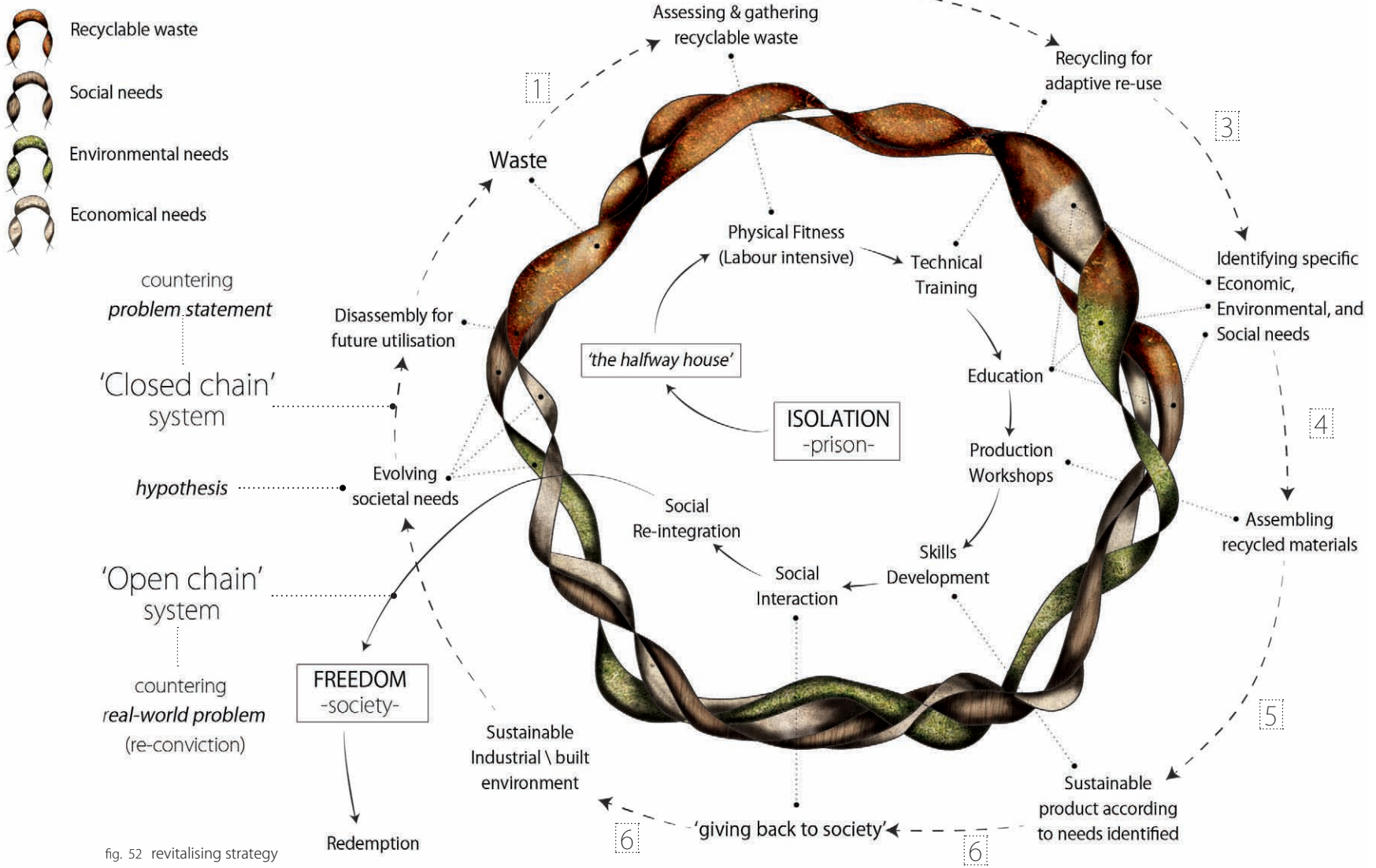


fig. 52 revitalising strategy

*'the halfway house'*_ a Revitalising process

1 — 6 see *fig. 52*

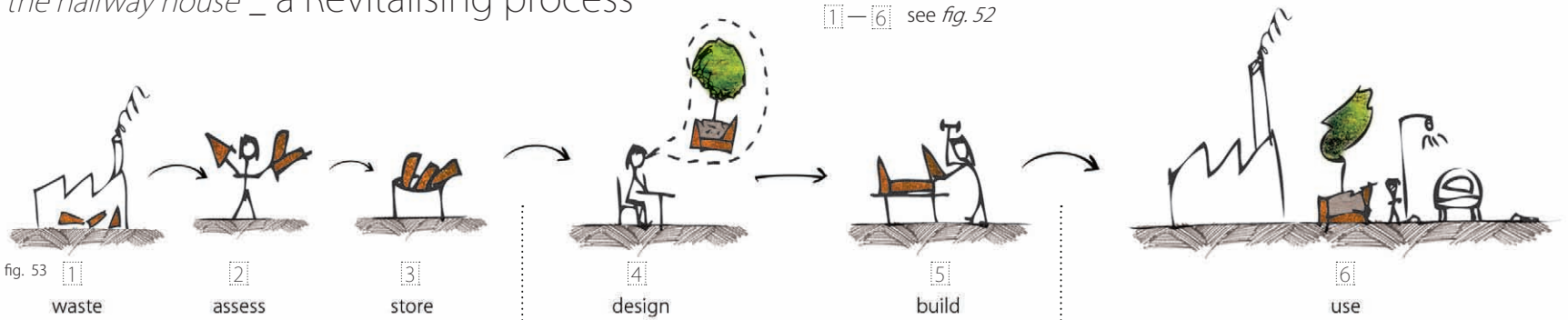


fig. 53

Recyclable waste is accumulated throughout the industrial area of Pretoria West.

The *'halfway house'* acts as a transitional facility where waste is recycled and transformed into useful sustainable products. Allowing parolees the opportunity to implement the production skills that were developed in prison.

Parolees *'give back to society'* by revitalising the current unsustainable industrial environment.

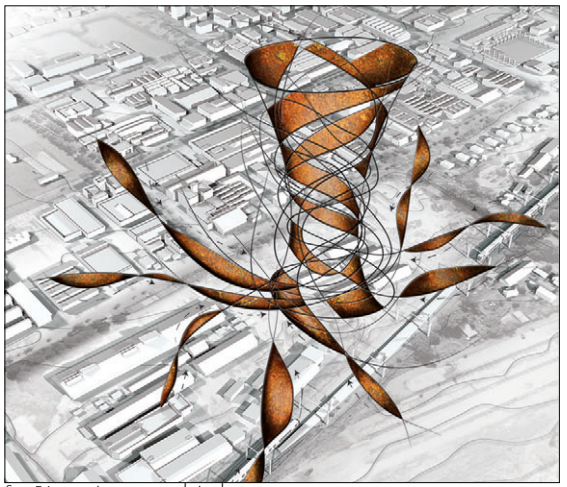


fig. 54 waste accumulated

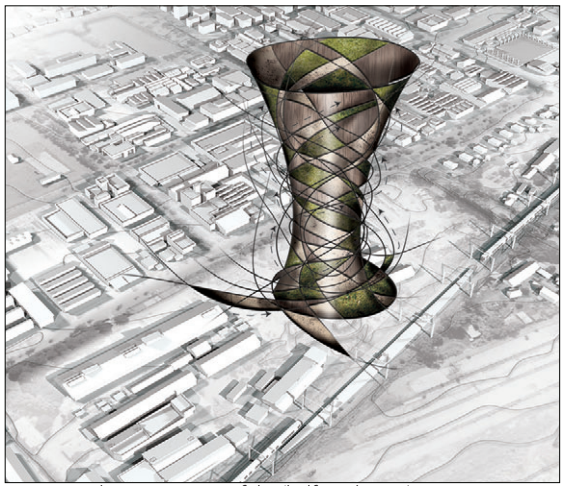


fig. 55 production process of the 'halfway house'

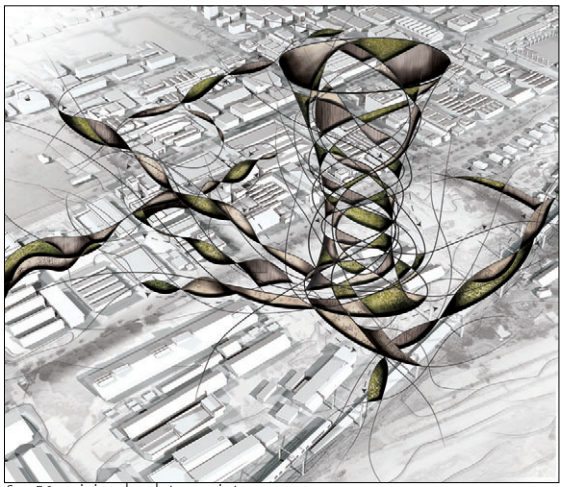


fig. 56 giving back to society

Site development concept

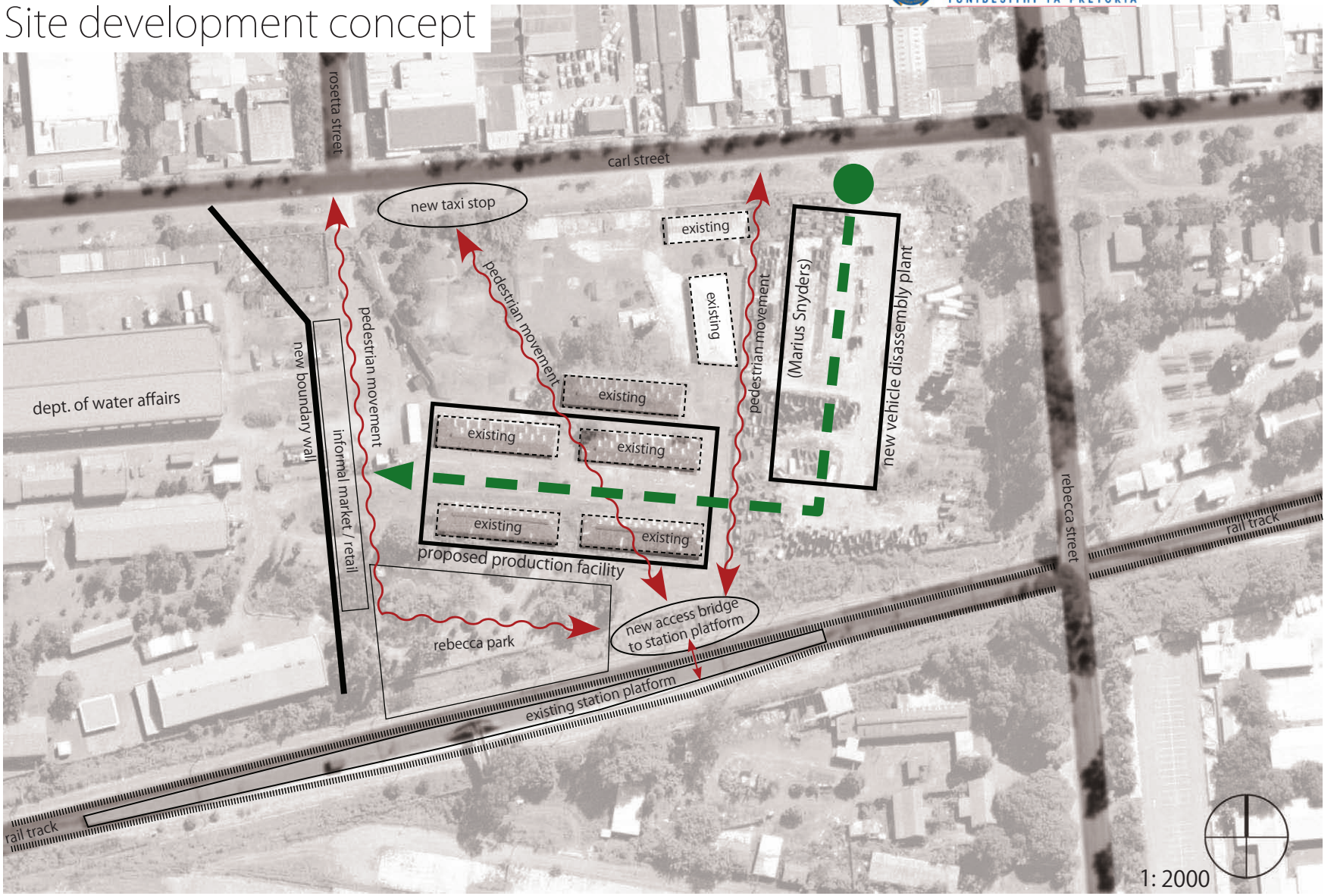


fig. 57 site development concept and production process

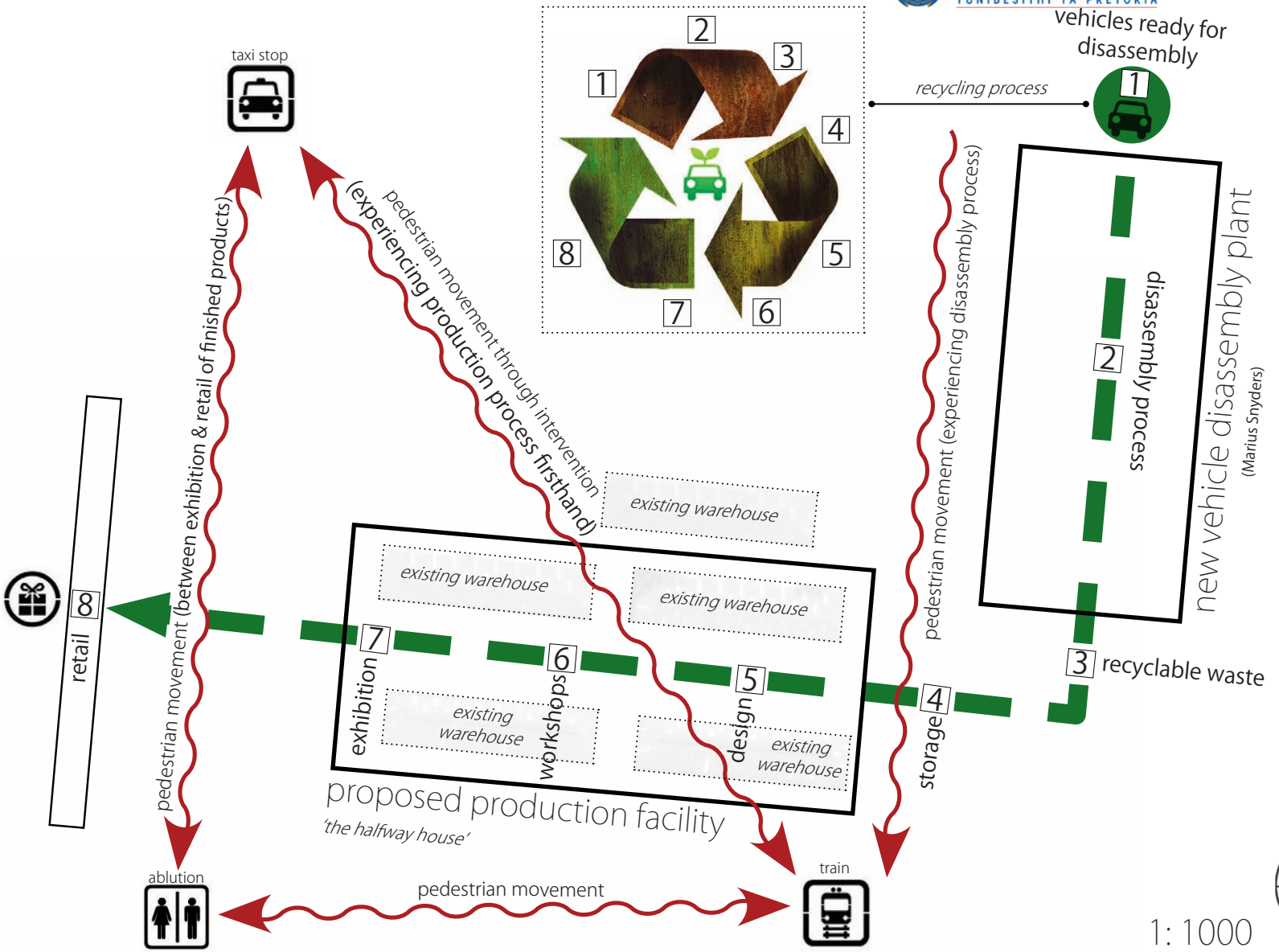


fig. 58 production concept as recycling process

Site development proposal

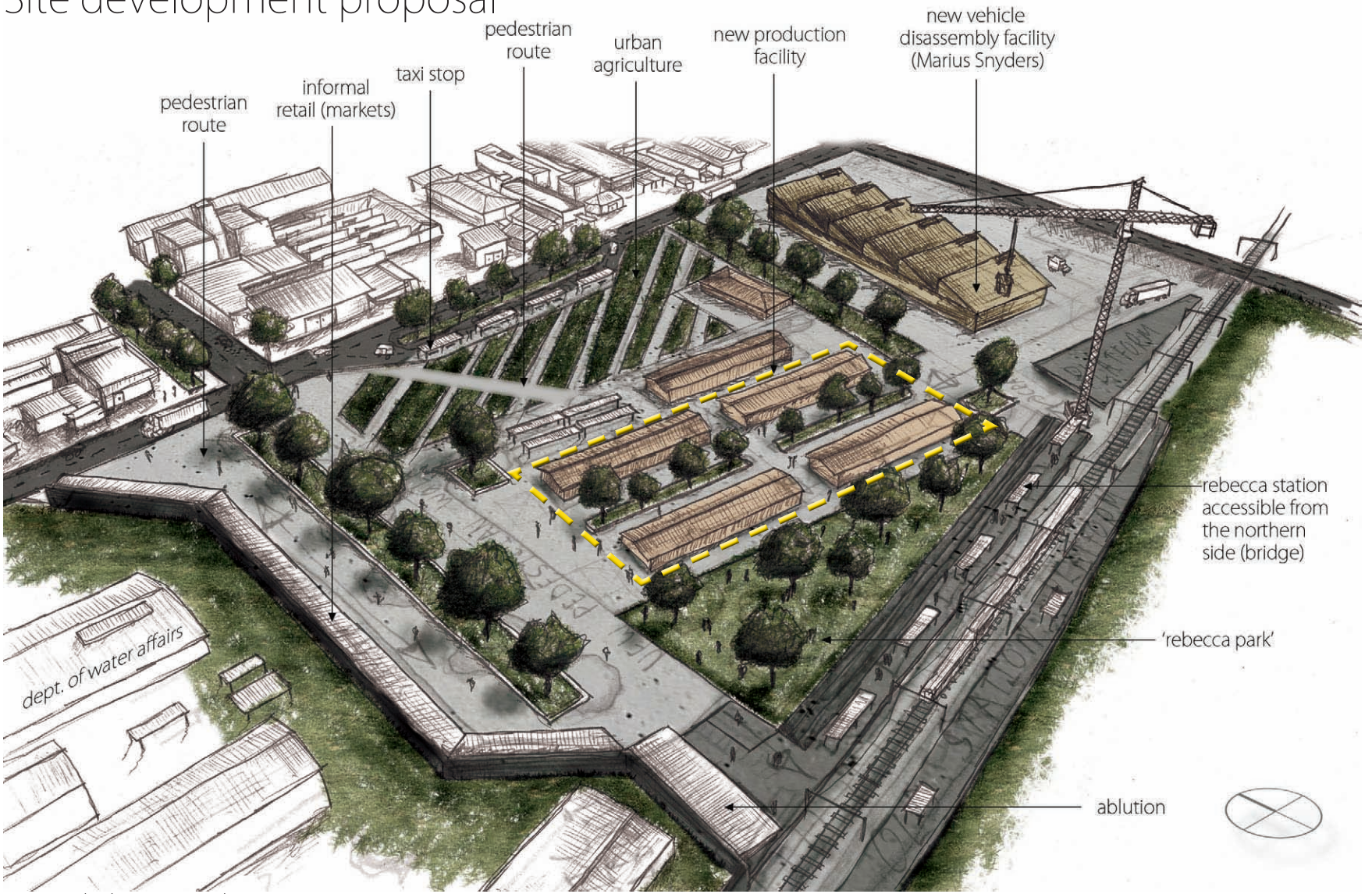
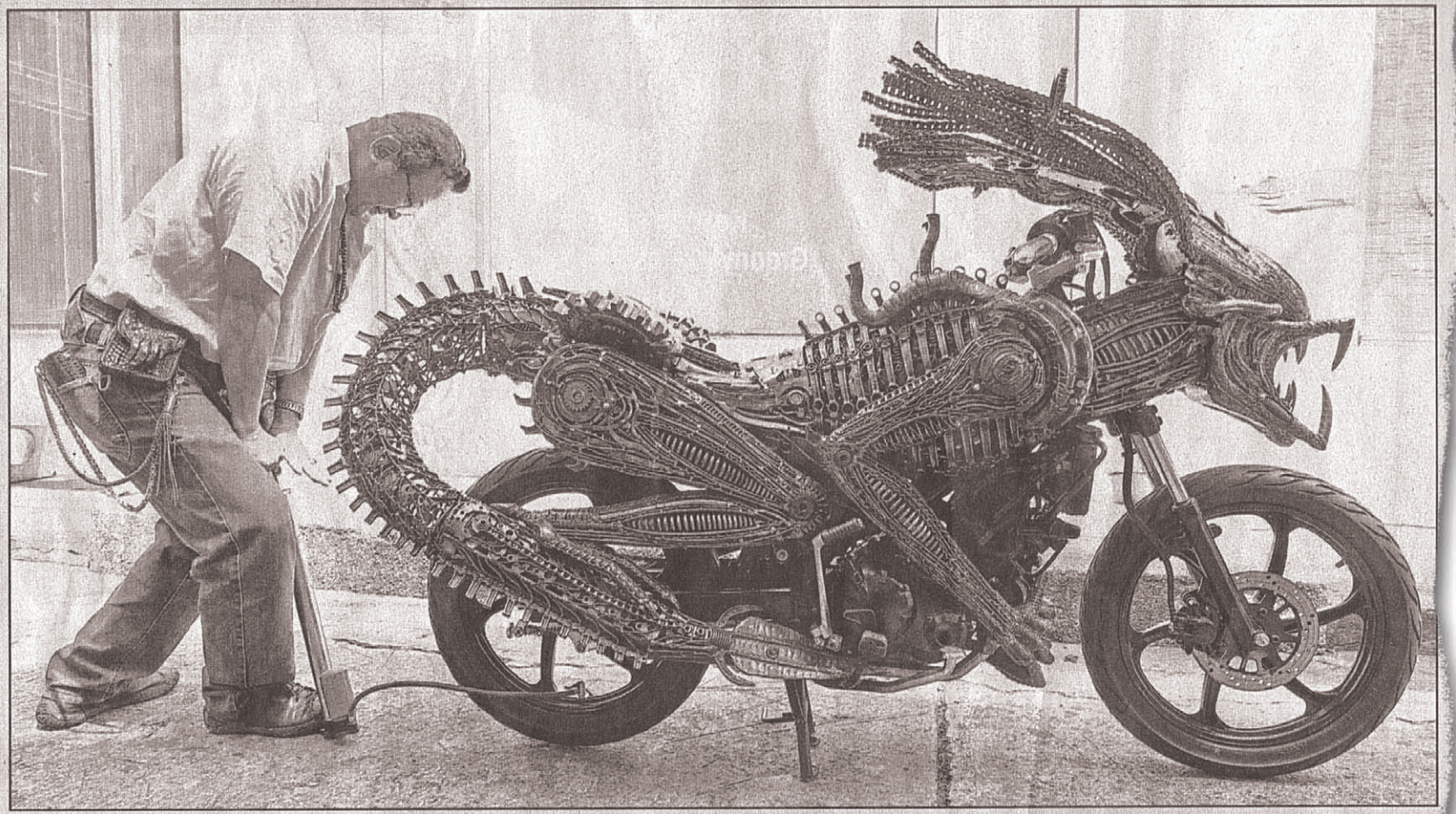


fig. 59 site development proposal

Beeld, Donderdag 28 Julie 2011



Waar 'n wiel is, is 'n weg

Roongrojna Sangwongprisarn (54), 'n kunstenaar, pomp in 'n werkwinkel in Bangkok die agterwiel op van die motorfiets wat hy uit herwonne motor- en fietsonderdele gemaak het. Roongrojna voer die kunswerke wêreldwyd uit van die vier takke van sy Ko Art Shop-kettinggroep. Foto: Sukree Sukplang, REUTERS

fig. 60 newspaper extract supporting production programme

Programme

The programme for the proposed intervention can be divided into three self-governing, yet related parts. However, as mentioned in Chapter 1 (see *'normative stance'*), the intervention should be understood over various different timescales where the buildings form can physically extend or detract according to ongoing user needs. Thus, the proposed programme should only be considered as a response to the immediate social, environmental, and economical needs.

fig. 61 model by author illustrating the reassembly of recyclable waste into a new useful product

01 Production Facility

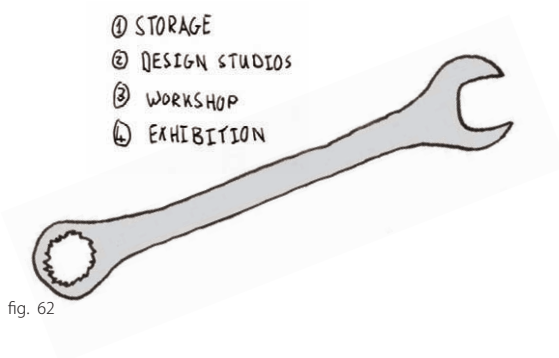


fig. 62

Responding to the *'real world problem'* posed in Chapter 1

↓

Re-entry vs. Re-integration
(see fig. 05)

↓

The primary aim of the production facility is to provide parolees with social interaction, and an adequate working environment in an attempt to successfully re-integrate themselves back into society. Offering parolees the opportunity to implement the production skills that were developed in prison.
The production facility should be considered as a skills implementation centre rather than a skills development centre.

02 Temporary Housing


fig. 63

Responding to the contextual analysis and urban framework proposal posed in Chapter 4

↓

Residential development + Commercial development
= Sustainable Industrial Environment

↓

The building's users (parolees) will constantly change as parolees leave 'the halfway house' after successful social re-integration. Thus, it should be considered that the social structure and programme necessities of *'the halfway house'* would be in constant flux. Temporary *'plug-in'* housing modules allow the building's users to re-arrange the living environment according to social preferences. The housing module should function as a portable independent unit capable of transportation throughout the urban fabric, allowing for erection at a new location. (see Chapter 5 - *'micro compact village'*)

03 Flexible Space

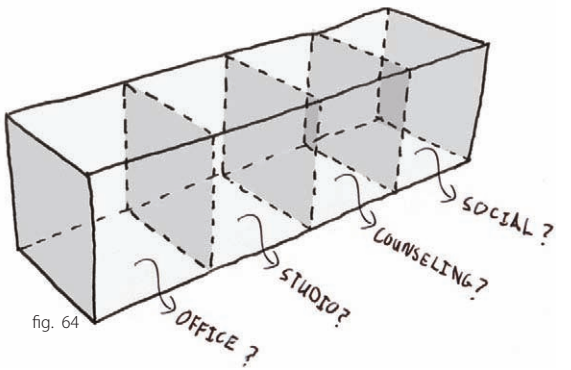


fig. 64

Responding to *'problem statement'* posed in Chapter 1

↓

"The permanent nature of the built environment causes the inefficient utilisation of valuable resources; as buildings are constantly rejuvenated, revitalised and demolished in reply to various social needs."

↓

hypothesis

↓

"Architecture has to be flexible to accommodate a variety of use patterns by current and future user(s) without having to demolish the building (in part or completely)"

Chapter _05
Precedents

This chapter will illustrate the precedents that guided the concept and design development phase for the proposed intervention. The precedents can be divided into three main categories:

- Theory - *Flexibility*
- Language - *Adaptive re-use / Industrial architecture*
- Programme - *Temporary housing*

fig. 65 rail track leading to rebecca station

La Ville Spatiale

Paris, 1958 - 62: Yona Friedman

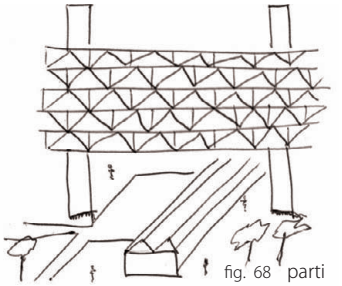


fig. 68 parti

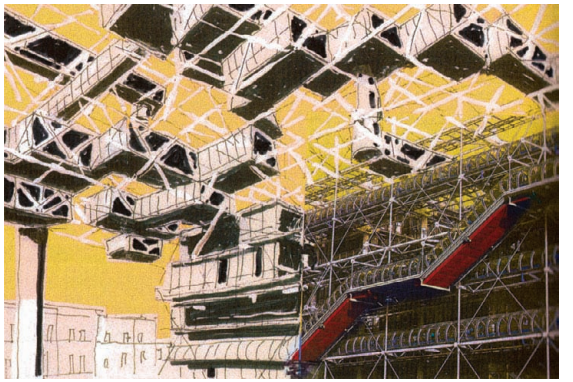


fig. 66 "Extention to the Centre Georges Pompidou" , Paris (1959), by Yona Friedman

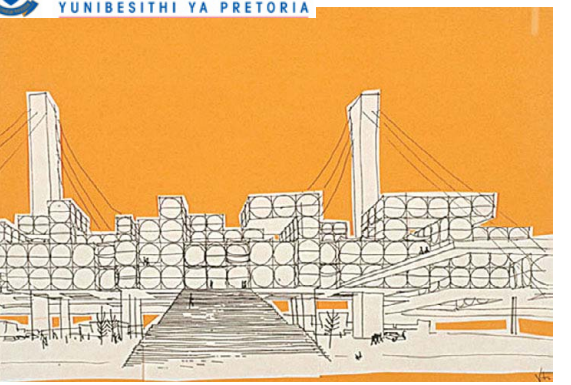


fig. 67 "Ville Spatiale" , Paris (1959), by Yona Friedman

Description

Between 1950 and 1973, Friedman visualised a city of flexible, mobile dwellings and housing units, allowing the inhabitants to freely manipulate their environment according to their wishes and habits in urban everyday life based on his project *La Ville Spatiale* (The Spatial City) (Ley & Richter, 2008: 124).

The theoretical backbone for *La Ville Spatiale* was based on a "multi-story space frame grid", supported by widely spaced pillars to minimise the connection between the city and the natural environment. In addition, Friedman introduced flexible modular structures on the higher levels that would be determined by the users, or inhabitants, and not on a fixed infrastructure. Advocating that infrastructure should not be determined or determining *(ibid:* 124*)*. La Ville Spatiale is elevated above the surface of the existing city fabric, not only allowing for 'mobile architecture', but also a flexible network of social relationships that could expand organically within the current urban space (Friedman, 2006: 16).

Relevance

The main purpose of Friedman's participatory design was to decrease the decision-making role of the architects/planners to the least amount by only observing them as being "mediators" (Friedman, 1975: 54) who offered their technical practices to inhabitants willing to decide on the design of their dwellings by themselves. This is of specific importance not only for the democratisation of urban living and architecture - one of the most critical issues of current times - but also for social sciences and communication studies in the context of complex global cities (Ley & Richter, 2008: 127).

Conclusion

The Spatial City's intention was not to counteract or overhaul the existing city, but rather to coexist as an additional network disconnected from the existing urban fabric, in an effort to preserve the character of the city. Due to this, it would not be located over major city centers or historical sites, but rather over underutilised space in and around the city.

Friedman's manifesto principles are that buildings should:

- Touch the ground (natural environment) over a minimum area.
- Allow for disassembly and movement.
- Be capable of various forms determined by the inhabitant

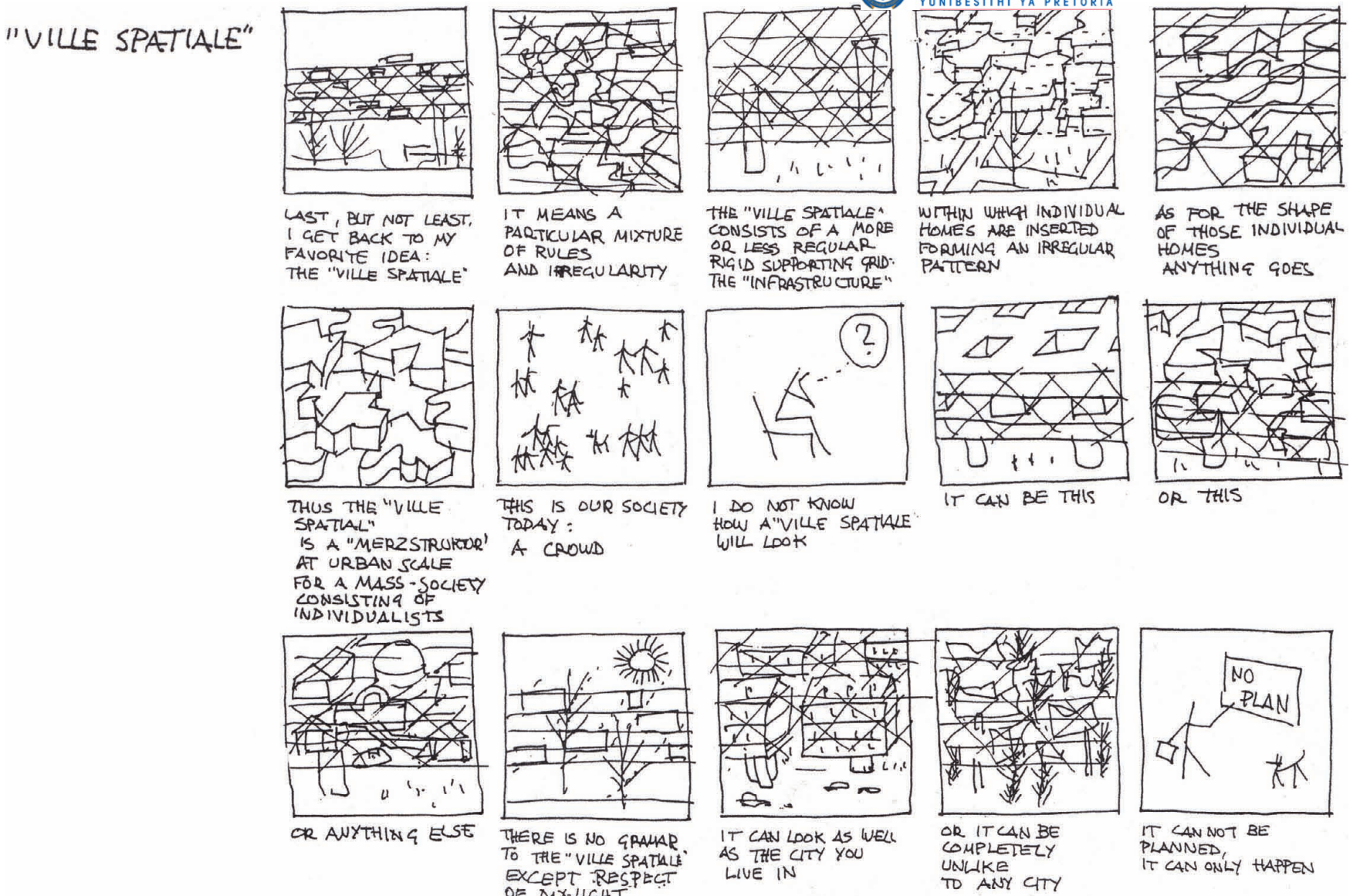


fig. 69 series of diagrams illustrating concept for 'La Ville Spatiale'

Potteries Thinkbelt Project

Staffordshire, UK. 1964: Cedric Price

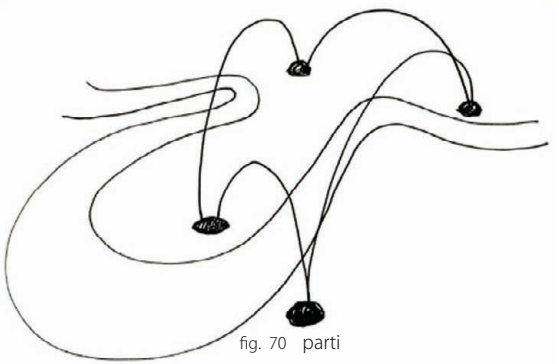


fig. 70 parti

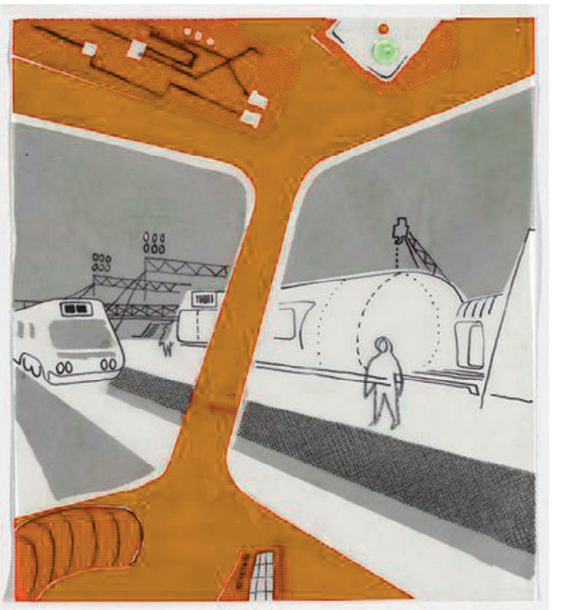
Description

In the Potteries Thinkbelt Project, Price presents the ideas for a time-based, self-regulating mobile architecture and applies them to a large-scale planning experiment for the economically depressed region of North Staffordshire (Kronenburg, 2007: 60). The project utilised miles of redundant railway tracks in the creation of a flexible educational institution for 20,000 students. Envisioned on an underused industrial site with prefabricated and mobile facilities, redefining not only the way this specific location was observed, but also the thought of what a university might be (Lobsinger, 2000: 24). Price referred to the project as a social-economic instrument, a controlled yet flexible experiment intended to catalyse and accommodate change at all levels of interaction.

Relevance

Price's project was intended to drive economic and social change. The transfer points would be under-utilised sites for the growth of new trade, manufacturing and residential settlement. Critical to Price's thinking was his believe that any structure would have a limited life of 20 years, although within that period it was purposefully designed to be in a state of constant change (*Ibid:* 27). Price's architecture administers with the visual and invites one to re-consider the experience of time and social interaction in the present. Time is not the buildup of historical process, but rather the fourth dimension and not reducible to a visual vocabulary. Price advocates that the social produces the architectural form in time and the new social forms of time and space are not comparable to what our perceptions have experienced to date (Casteus, 1996: 376).

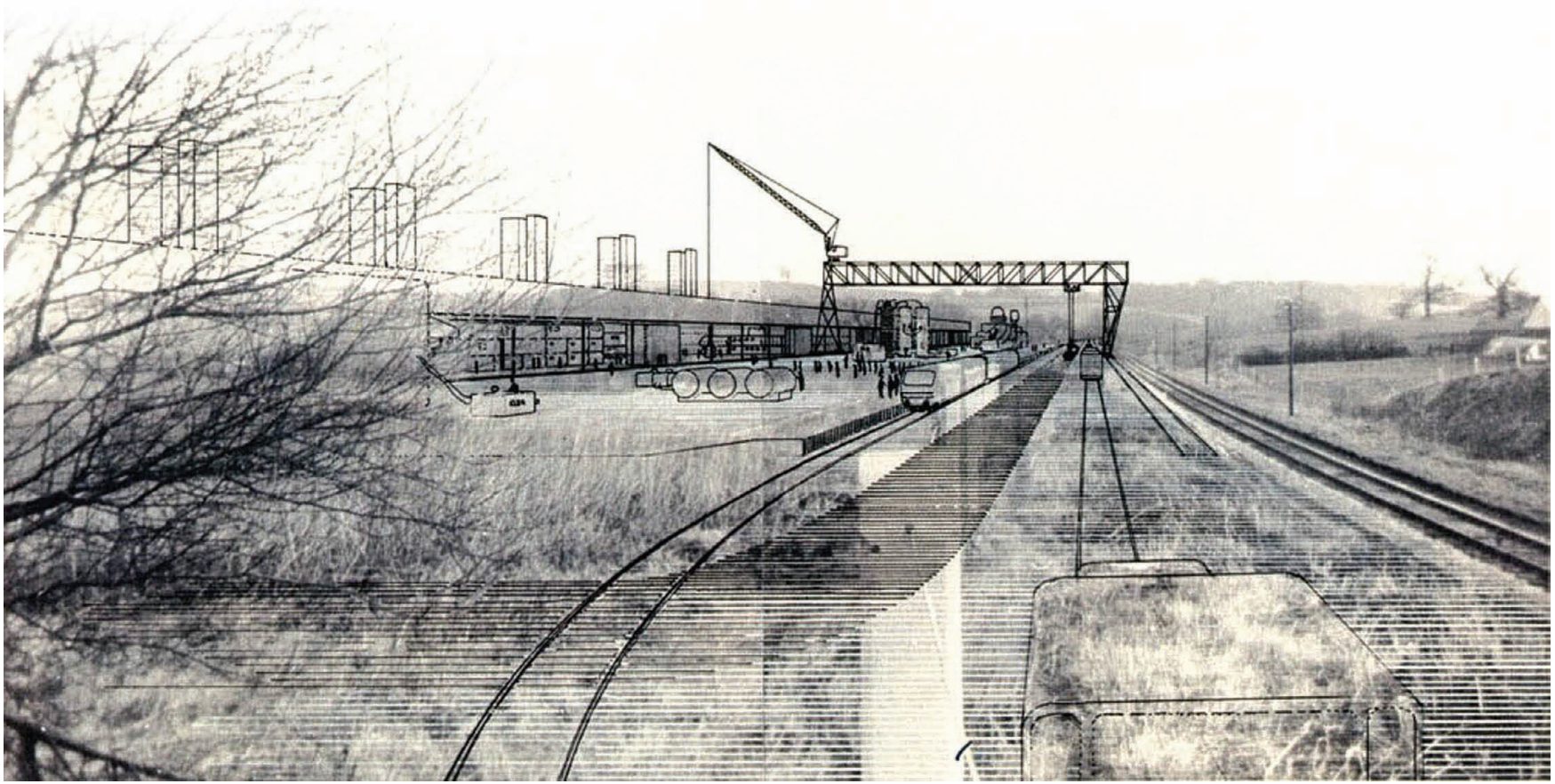
fig. 71 Perspective from railway module



Conclusion

Price consistently challenged the belief that buildings were a fixed response to a static problem. His vision of architecture, as a time-limited, flexible entity rather than a fixed, permanent form, led him to explore the concept of buildings as objects that defined public space rather than discrete environments that define boundaries into which you enter.

fig. 72 The Rail connections not only acted as a connection between various sites, but also acted as an educational facility and workshop. This was achieved by having container modules that could be lifted by cranes and transferred onto or off a train depending on specific needs.



NYC High Line Park

Manhattan, New York. 2009 -2011: James Corner Field Operations & Diller Scofidio + Renfro

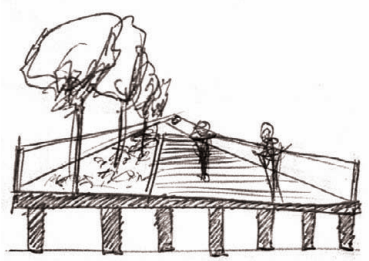


fig. 74 parti

Description

The High Line (HL) is a public park in New York City, constructed on an elevated 1930's freight rail infrastructure in Manhattan's West Side. The HL was designed by architects Diller Scofidio + Renfro in partnership with James Corner Field Operations (landscape), in response to the self-germinating, wild landscape that grew on the existing structure after the trains stopped running the past 25 years (City of New York Parks & Recreation, 2009: 2).

The HL's landscape consists of trees, grasses, perennials and bushes, alike the HL's original scenery. A large portion of the steel Art-deco railings was restored. Concrete pathways, lighting and seating were installed, and many of the redundant rail tracks were incorporated into the proposed design (*Ibid:* 3).

fig. 73 artist's illustration of the High Line public park

fig. 75 NYC High Line Park

Relevance

Dealing with the programme of 'infrastructure adaptive reuse', the designers faced a constant battle to create an additional identity for the dilapidated 2.5-kilometer-long infrastructure without stretching it too far from its rich industrial past. The designers approached this by withstanding the temptation to over-design and to **"do too much"** (Pearson, 2009: 86). The architects stated that **"We kept protecting the High Line from architecture... the idea was to retain the singularity of the place, to capture its postindustrial charm."** (*Ibid:* 87)

fig. 76 Perspective of pedestrian walk route

Conclusion

Conceptually inspired by the sombre, lost and **"found"** (City of New York Parks & Recreation, 2009: 11) beauty of the High Line, where natural vegetative progression has reclaimed a critical portion of existing urban infrastructure, the design aims to revitalise this industrial transport line into a post-industrial mechanism of leisure and architectural growth. Displaying an alternative approach between plant life and pedestrians, the design strategy of **"agri-tecture"** (*Ibid:* 12) combines building materials and organic growth into a mixture of various proportions. Accommodating urban, social and recreational needs to a large extent.

Micro Compact Village

Munich, Germany. 2005: Horden Cherry Lee Architects

"It's short stay, smart living... it shows the value of scale." Richard Horden

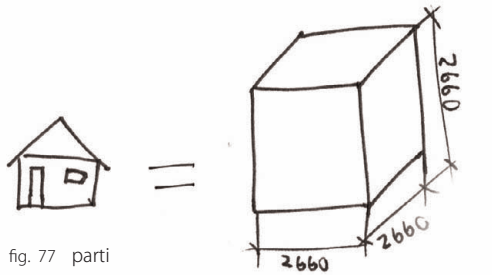


fig. 77 parti

Description

The Micro Compact Village features seven micro-compact homes (**m-ch**), each transportable and lightweight, combining high technology and low energy use. The m-ch was developed in response to an increasing demand for temporary housing for students, weekenders and business travellers (Siegal, 2008: 78). The design was inspired by the classical scale and order of a Japanese tea-house, where every space is versatile. All necessities required in a conventional house are provided within a 2.66-meter cube by resolving internal spaces through an "ingenious manner" (Kronenburg, 2008: 108).

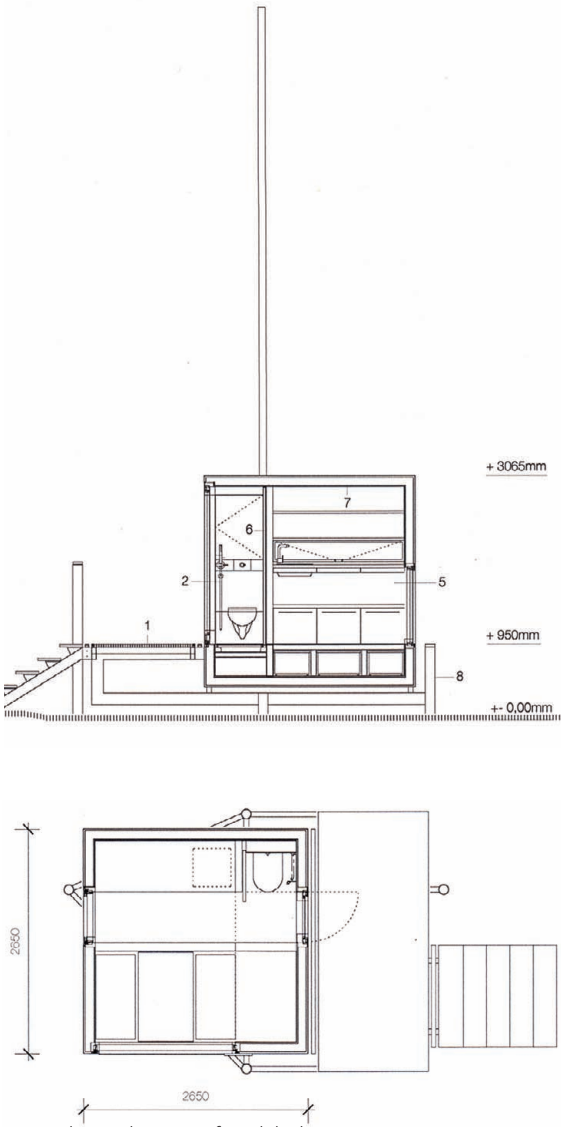


fig. 78 design drawings of modular housing unit

fig. 79 concept model

Relevance

Arranged on site by a crane, the dwellings connect to services in minutes (Dumaik, 2007:53). In addition to services, the site needs minimum preparation to accommodate these modules. Several **m-ch** modules can be mounted on an external frame in a horizontal or vertical fashion around an access core to form a "village" (Siegal, 2008: 78). Elevated from ground level, the 'village' has a minimum impact on its environment.

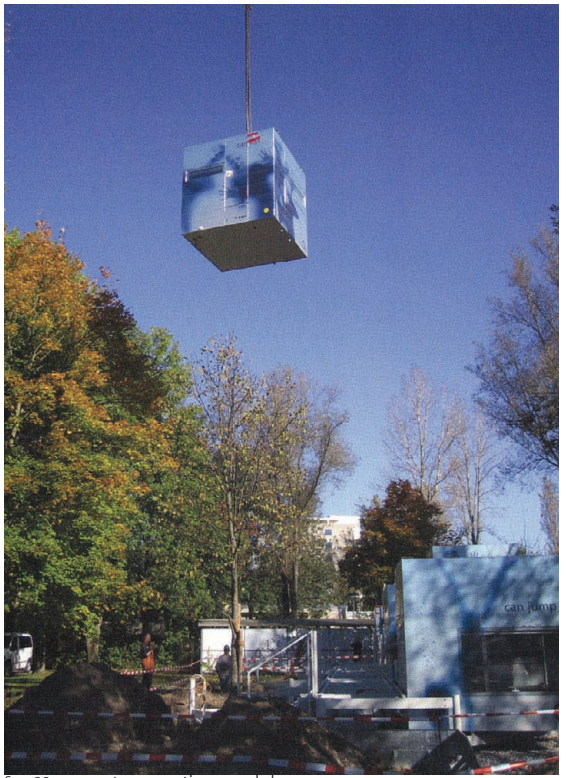


fig. 80 crane transporting module

fig. 81 clustered modules forming a 'village'

Conclusion

The living experience in a **m-ch** focuses on the essential - less is more. The compact design reflects intelligent use of spaces where lightweight kit-of-parts are strategically assembled to offer mass-customisation to the user. Adaptability and ease of transportation was considered from the initial design phase, resulting in a sleek modular, yet progressive and unique product.

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Chapter _06
Concept Development

In this chapter, the author will specify the theoretical concept for the proposed intervention. The concept will be illustrated as a sequence (from the initial stage) that influenced the final design product. The development process will be grouped into two chronological parts:

- *Residential / living environment concept*
- *Production Facility / working environment concept*

Finally, a summary and conclusion are drawn to illustrate the shortcomings and possible solutions for the final proposition.

fig. 82 dumping containers adjacent to site (east)

Concept

As mentioned in Chapter 4, the focal programme for the proposed intervention is the production facility: where recyclable waste are gathered and reassembled to produce new useful products.

The concept for the proposed design should noticeably reflect the programme (only on a much larger scale). Thus, identifying recyclable materials in the surrounding context that would be used as primary design elements / materials.

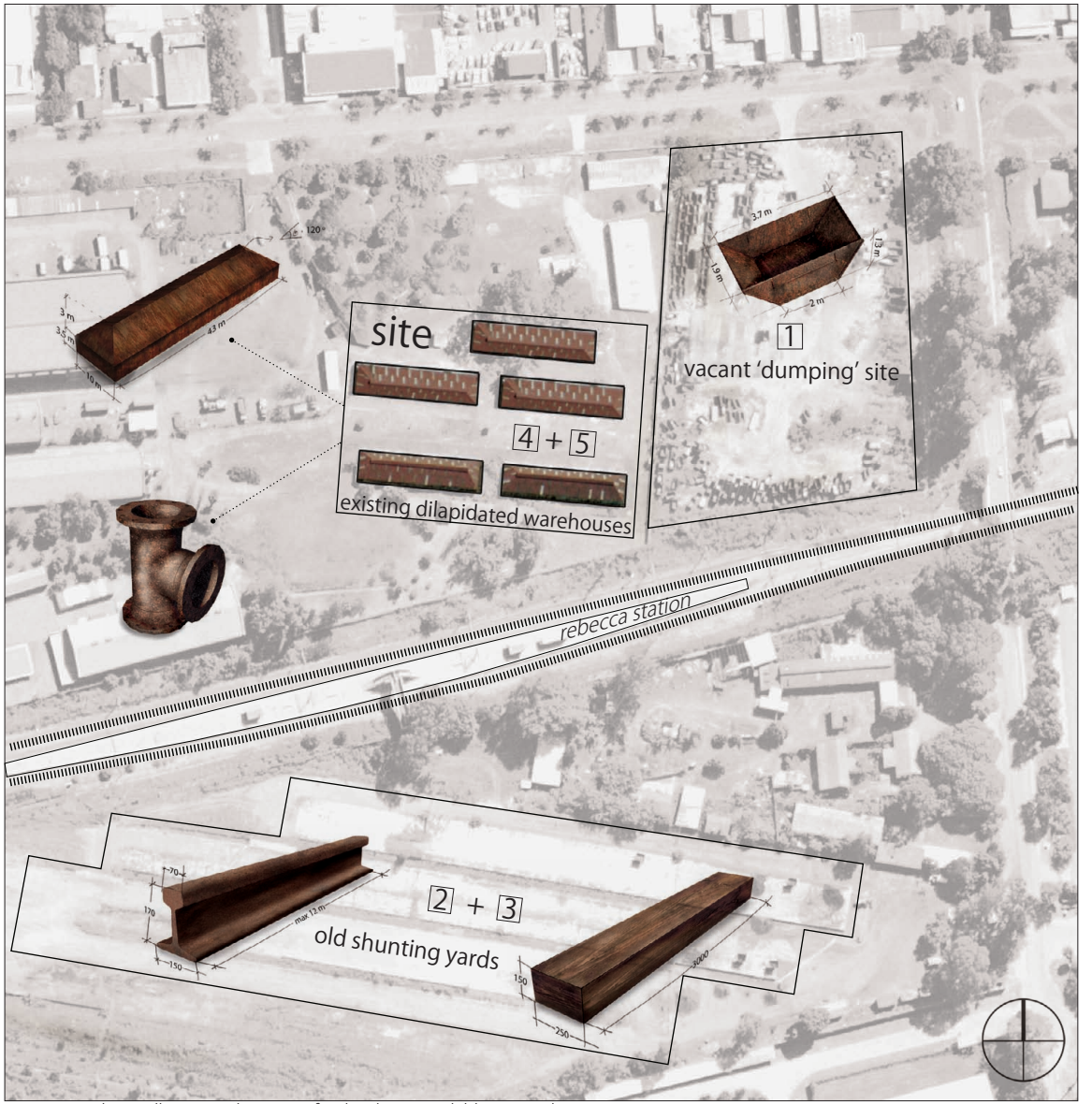


fig. 83 aerial view illustrating location of redundant recyclable materials

01 Dumping / Garbage Containers

Quantity: 328

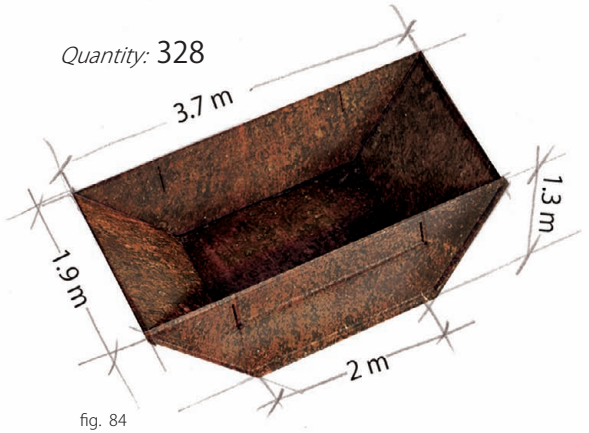


fig. 84

02 Rhodesian Teak Rail Sleepers

Quantity: > 1600

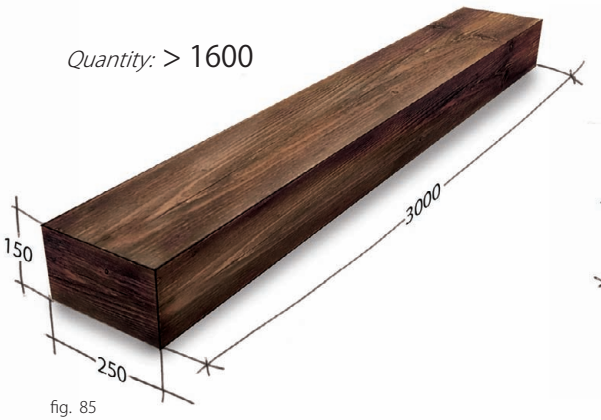


fig. 85

03 Rail Tracks

Quantity: > 4200 m

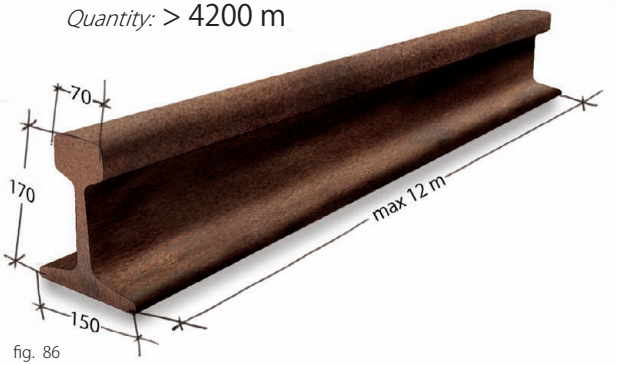


fig. 86

04 Corrugated Steel Sheeting

(existing warehouses)

Quantity: 5 x 903 m^2
= 4515 m^2

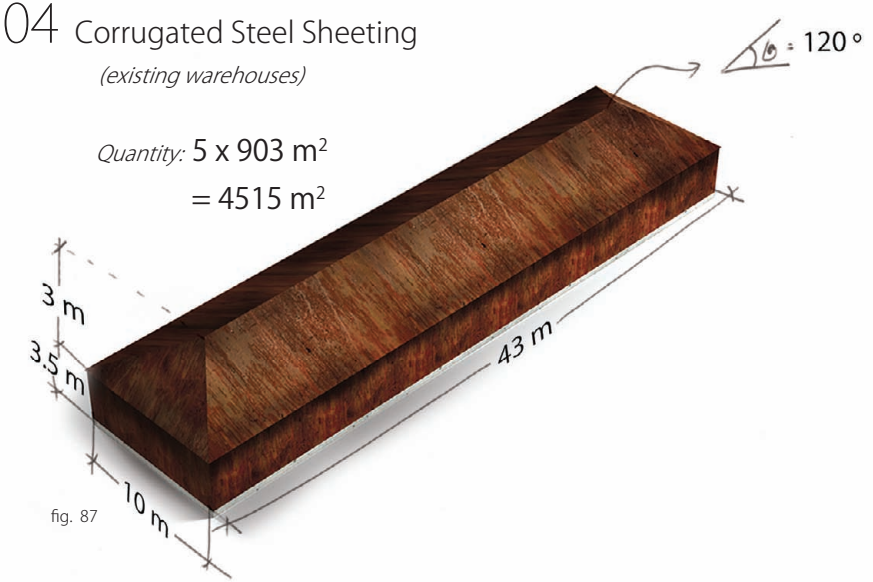


fig. 87

05 Ductile Iron Water Pipes

(currently stored in warehouses)

Quantity: > 1300 m

fig. 88

Residential / Living Environment

Concept _ 01

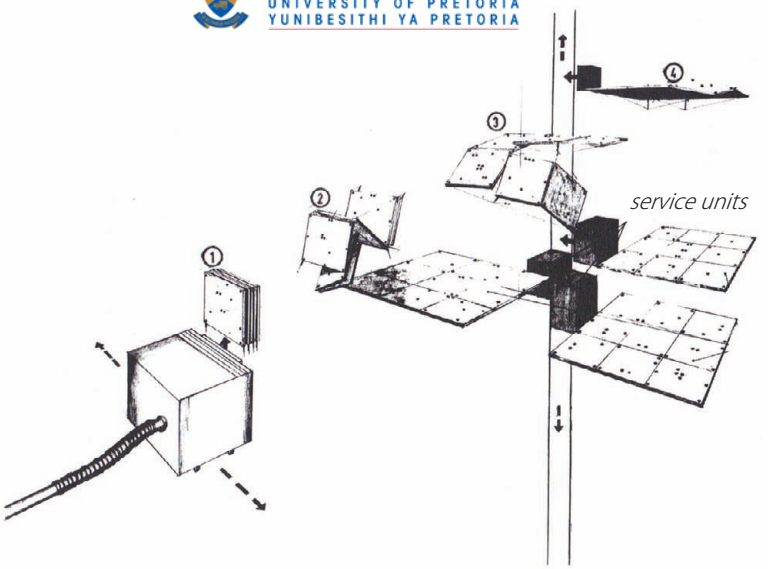


fig. 89 "The erection sequence of a 'Terrapin' structure" (Terrapin bungalo of 1948), Archigram no. 3, August 1963.

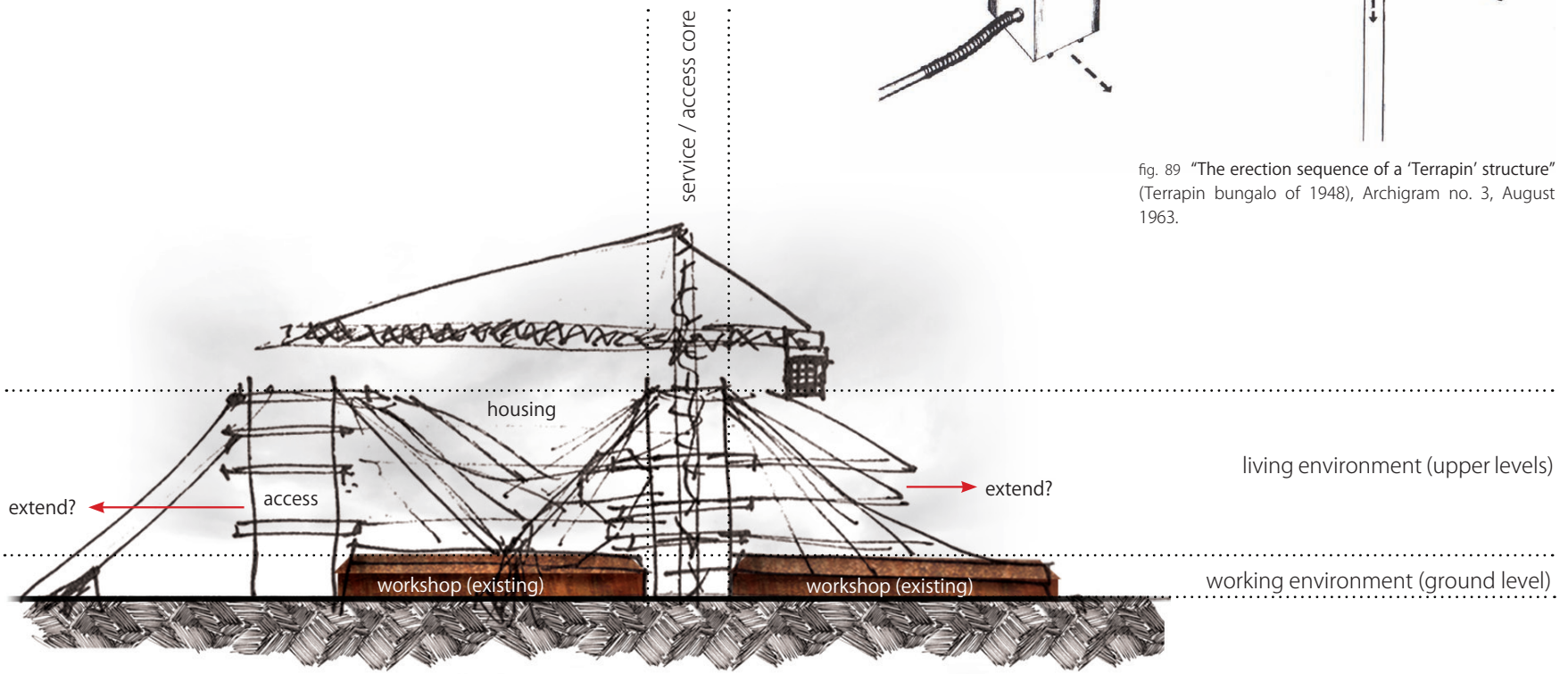


fig. 90 concept sketch based on theoretical principles (southern elevation)

The following design principles relate to the theoretical discourse that influenced the conceptual product. Thus, the proposal should be considered as a theoretical, rather than a formalistic solution. However, the final design proposition should be regarded as a sequential procedure, from an idealistic to a pragmatic approach.

Design Principles

- Minimum impact on natural environment (touch ground over minimum area)
- Capable of various forms/arrangements determined by the user
- Allow for disassembly and structural expansion
- Constructed from recycled materials
- Site independent (non-site specific)
- Considering the building's users being capable of constructing the building, structural complexity should be avoided to a large extend.

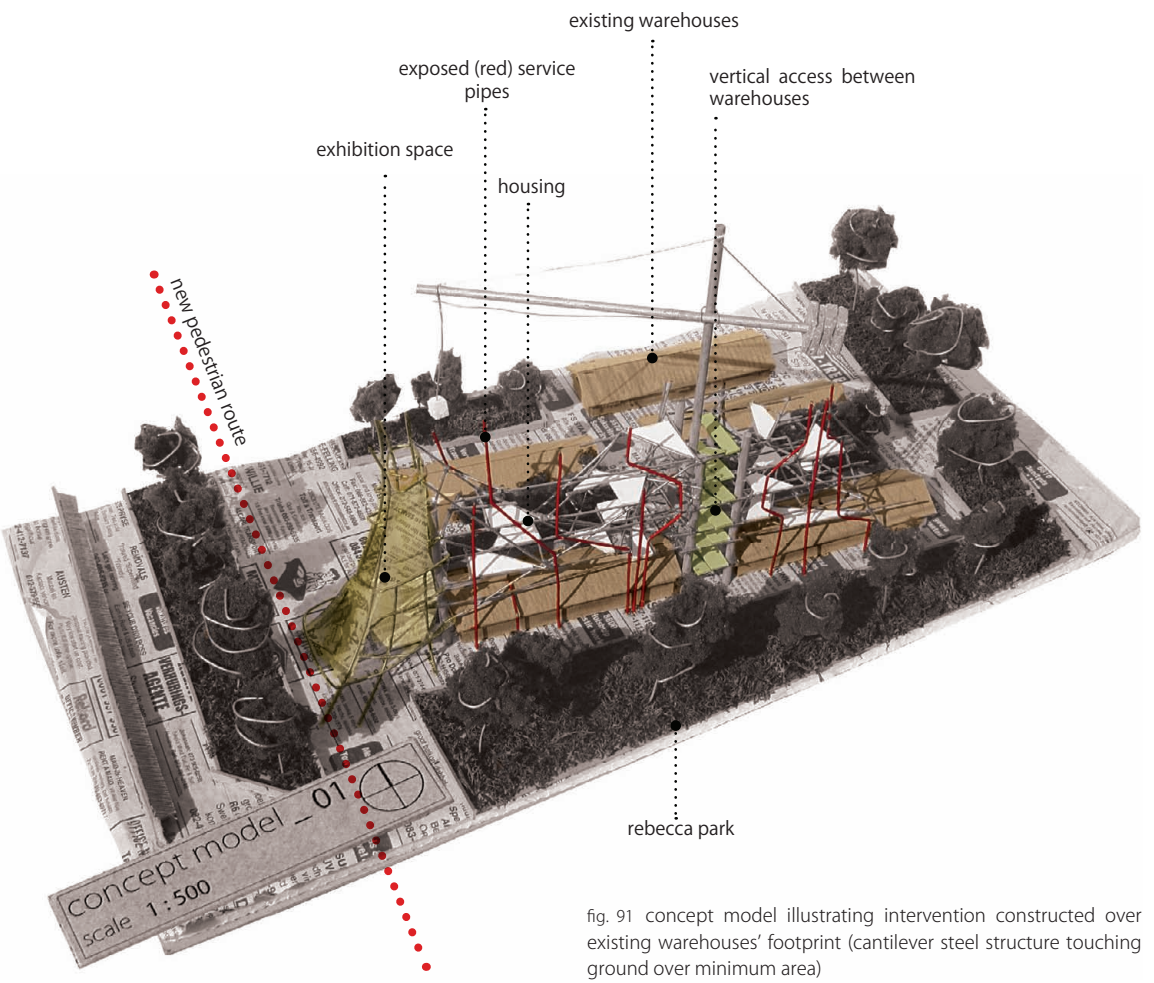


fig. 91 concept model illustrating intervention constructed over existing warehouses' footprint (cantilever steel structure touching ground over minimum area)

Housing Module

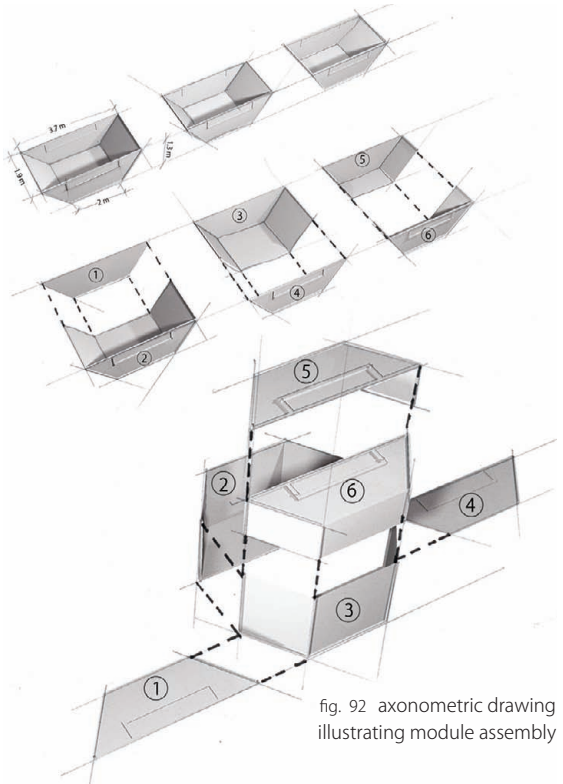


fig. 92 axonometric drawing illustrating module assembly

Attempting to display the concept of recyclability, three dumping containers are dismantled and strategically re-assembled to construct a hexagonal housing unit. Considering the principle of a *'bee-hive structure'*, the modules allow for multiple spatial arrangements and even spatial expansion of a unit when modules are grouped together (see fig 102).

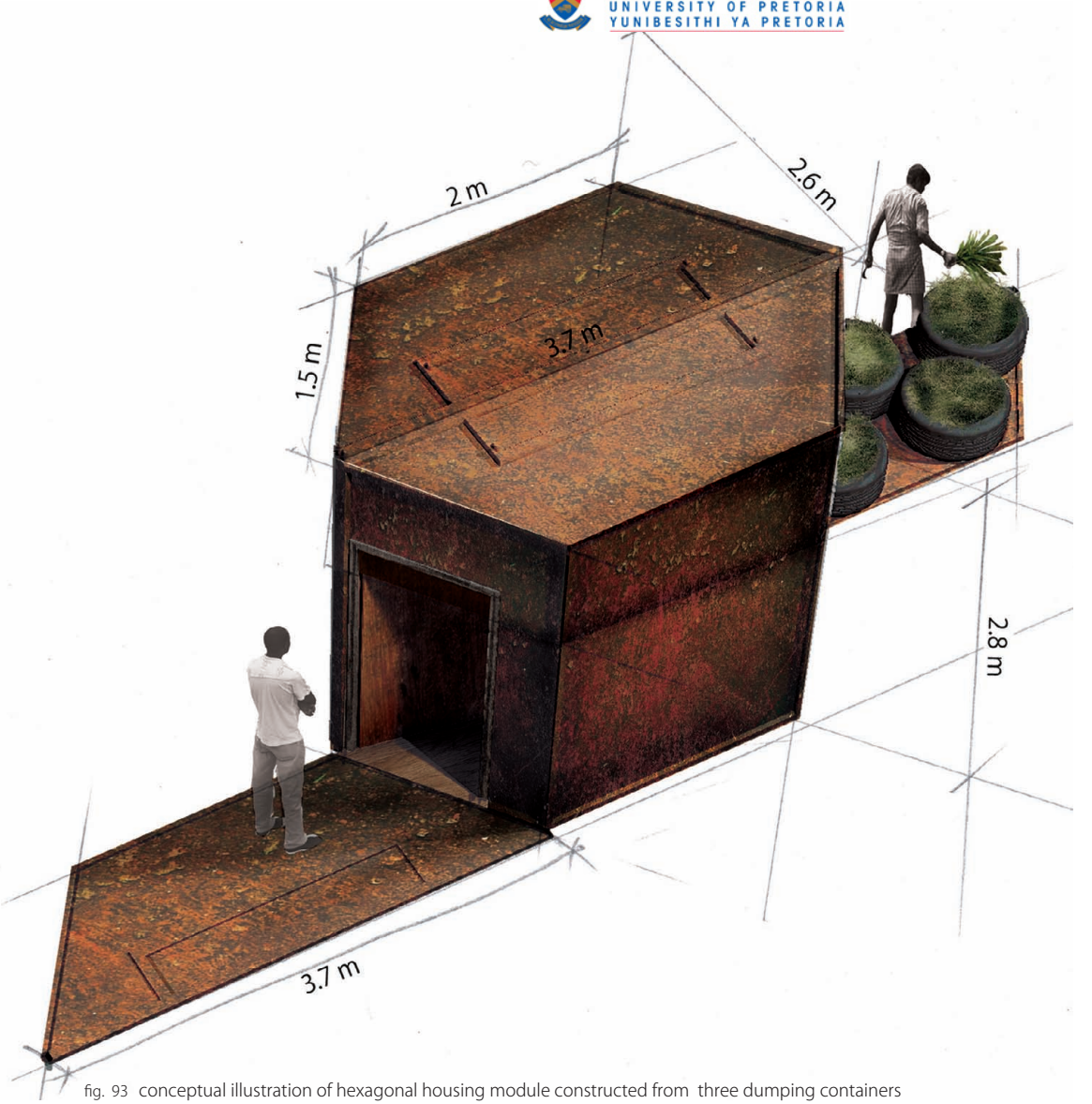


fig. 93 conceptual illustration of hexagonal housing module constructed from three dumping containers

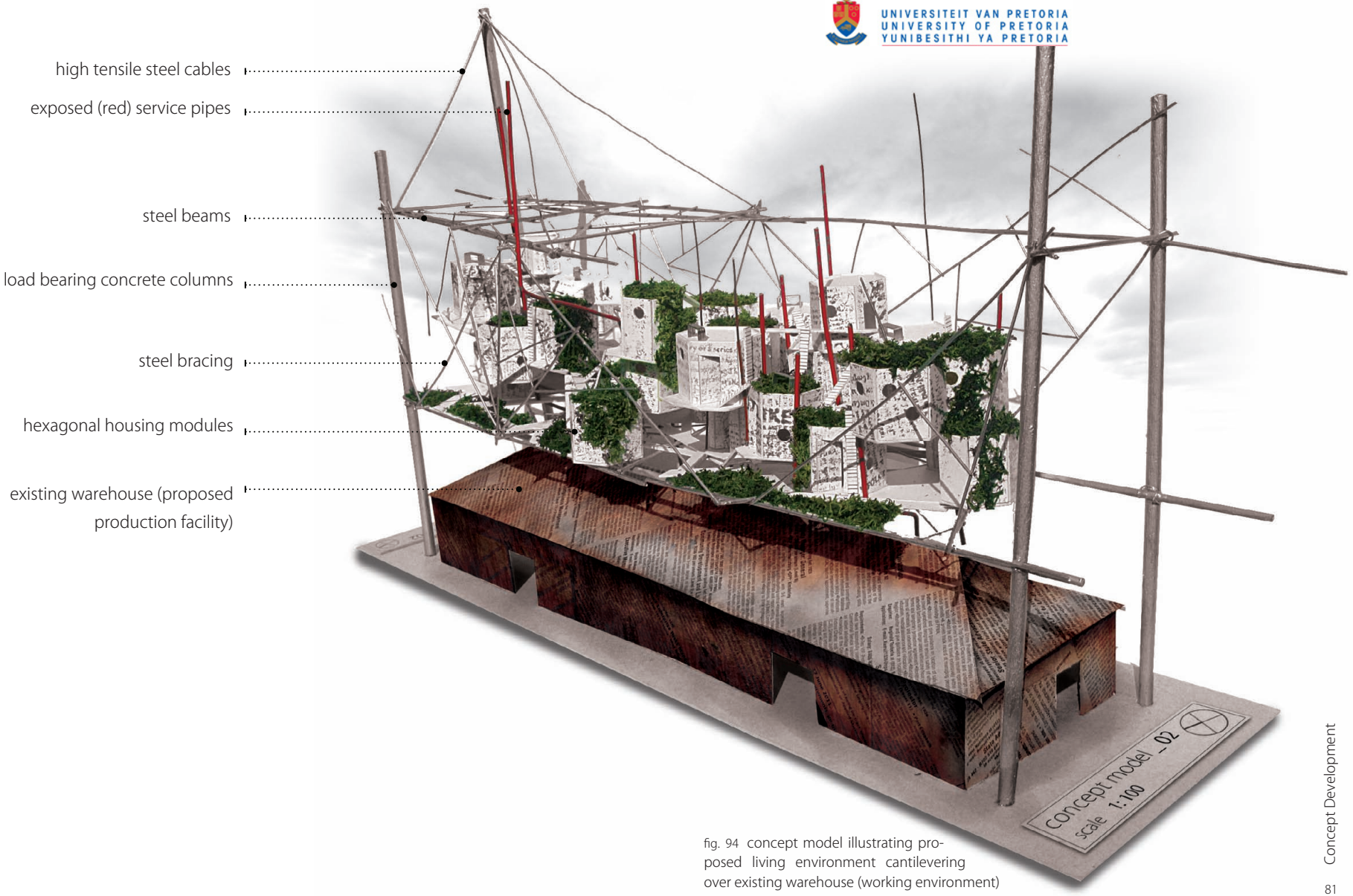


fig. 94 concept model illustrating proposed living environment cantilevering over existing warehouse (working environment)

Elevation - **North**

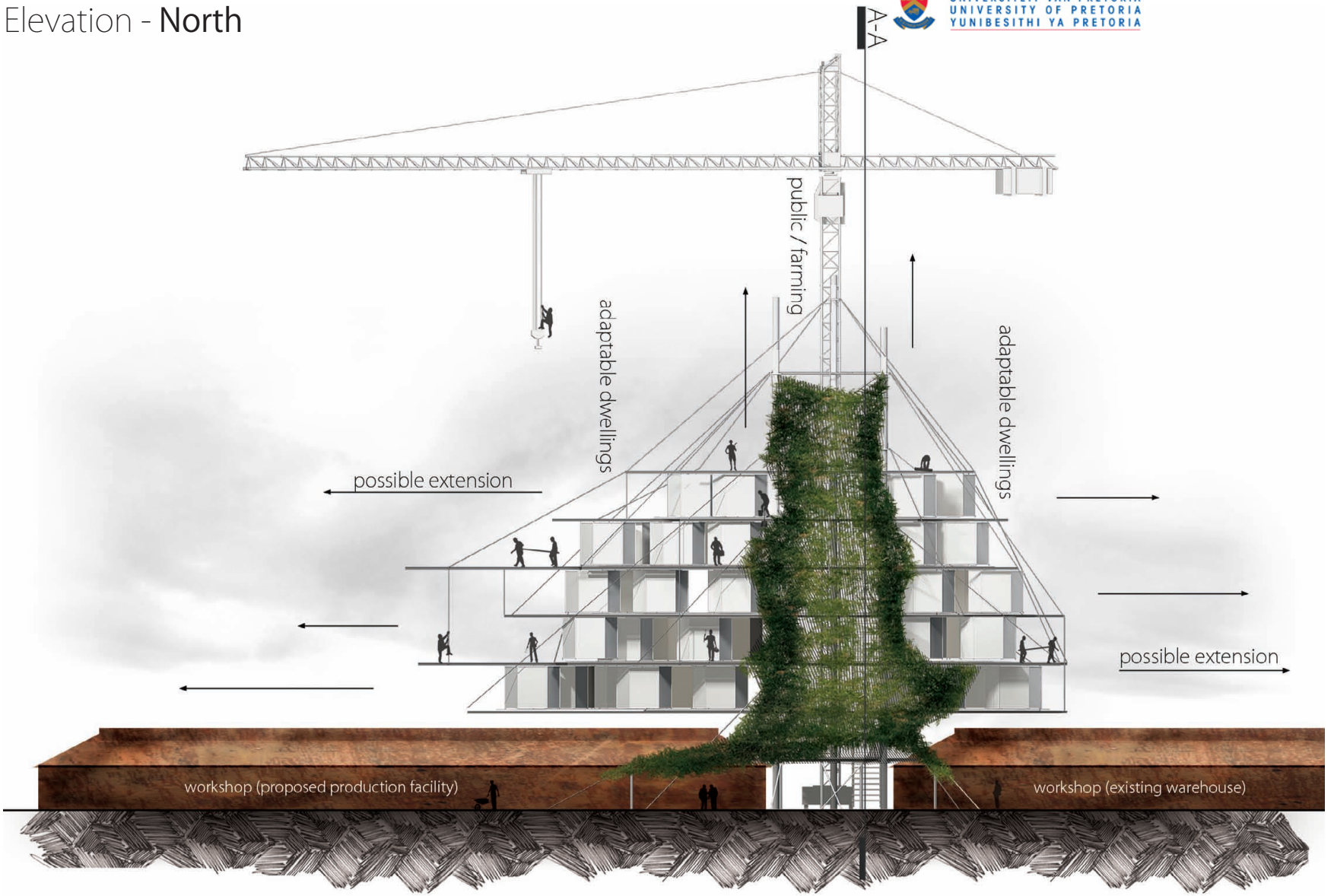


fig. 95 northern elevation illustrating working environment at ground level, and residential environment at upper levels

Section A-A

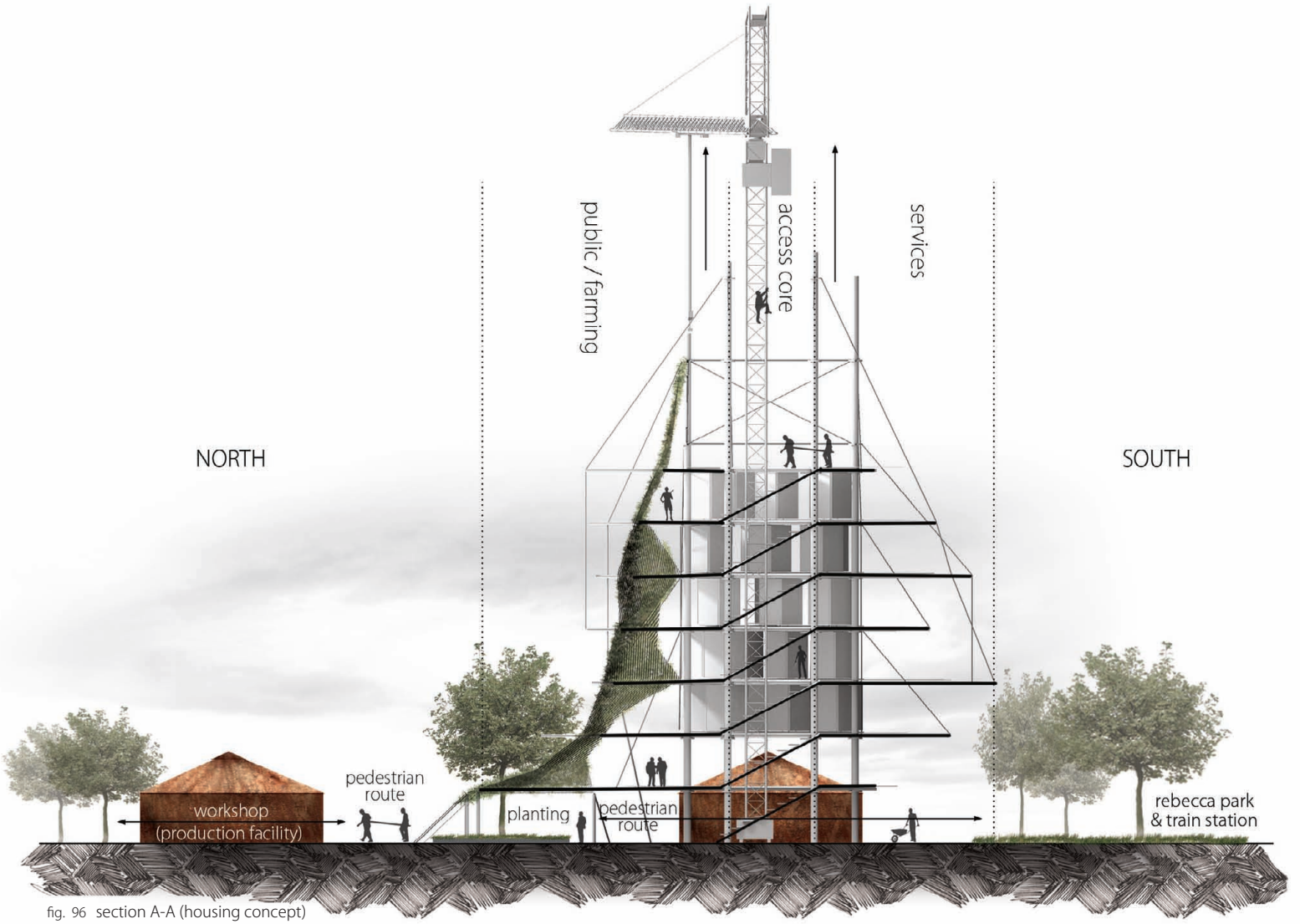
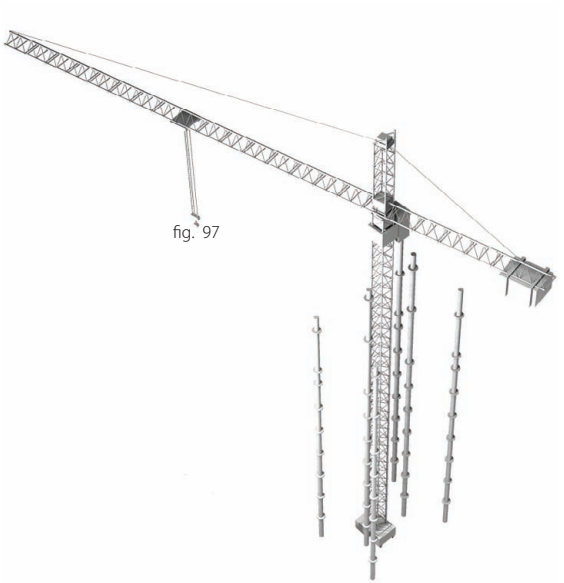


fig. 96 section A-A (housing concept)

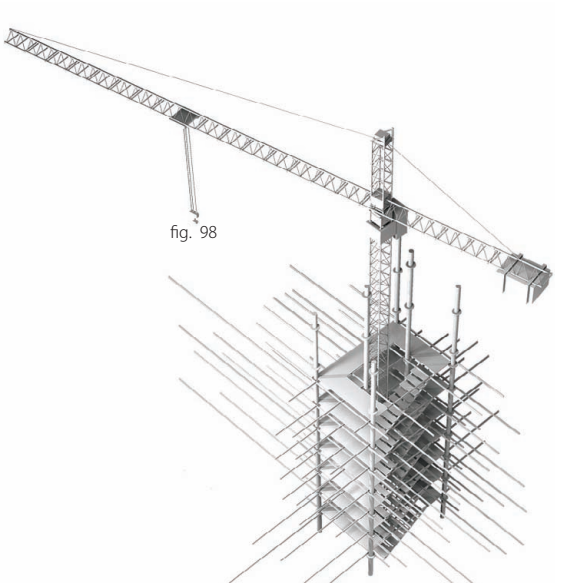
Structure Assembly Process

phase 1



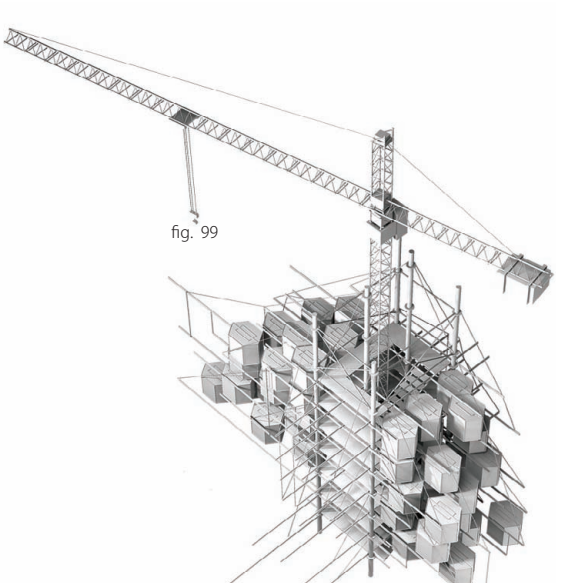
- structural columns & service core

phase 2



- vertical accessibility &
- structural beams (rail tracks)

phase 3



- high tensile steel cables &
- hexagonal housing modules (east & west)

In order to apprehend the building, it is necessary to understand the construction cycle capable of achieving various different forms and configurations. The construction process of *'the halfway house'* should follow a prototypical blueprint assembly procedure. This will allow users to extend or disassemble the building according to ever evolving social needs.

phase 4

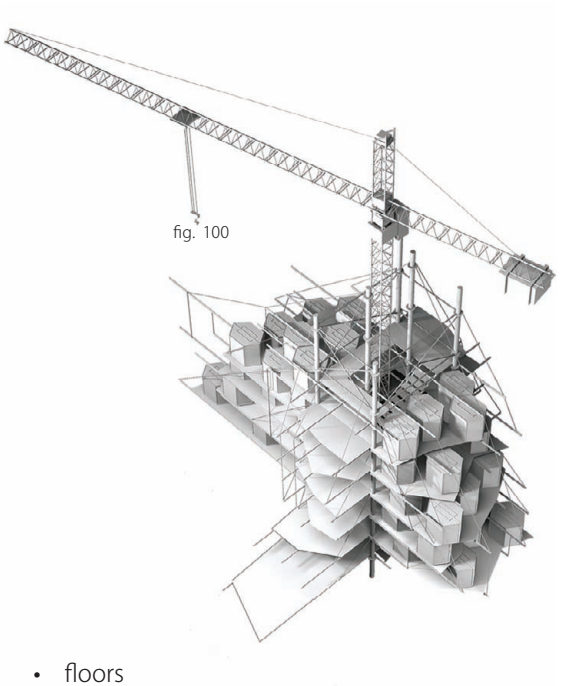


fig. 100

- floors
  - north - social & farming
  - south - service facilities

phase 5

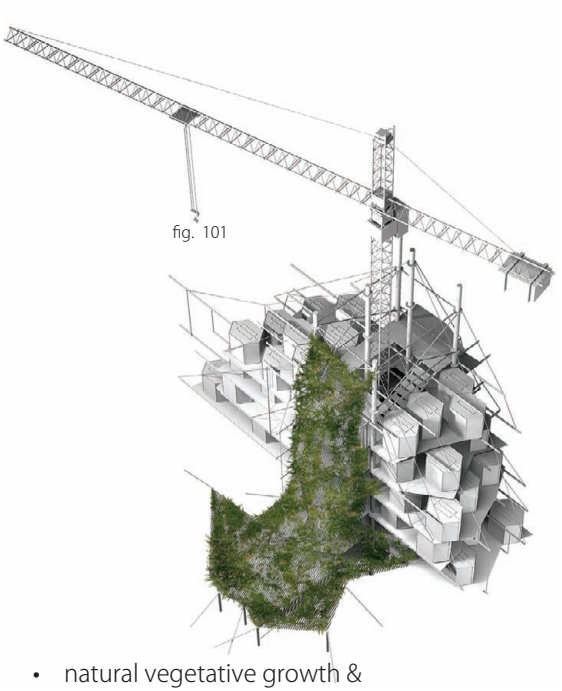


fig. 101

- natural vegetative growth &
- structure capable of various social arrangements

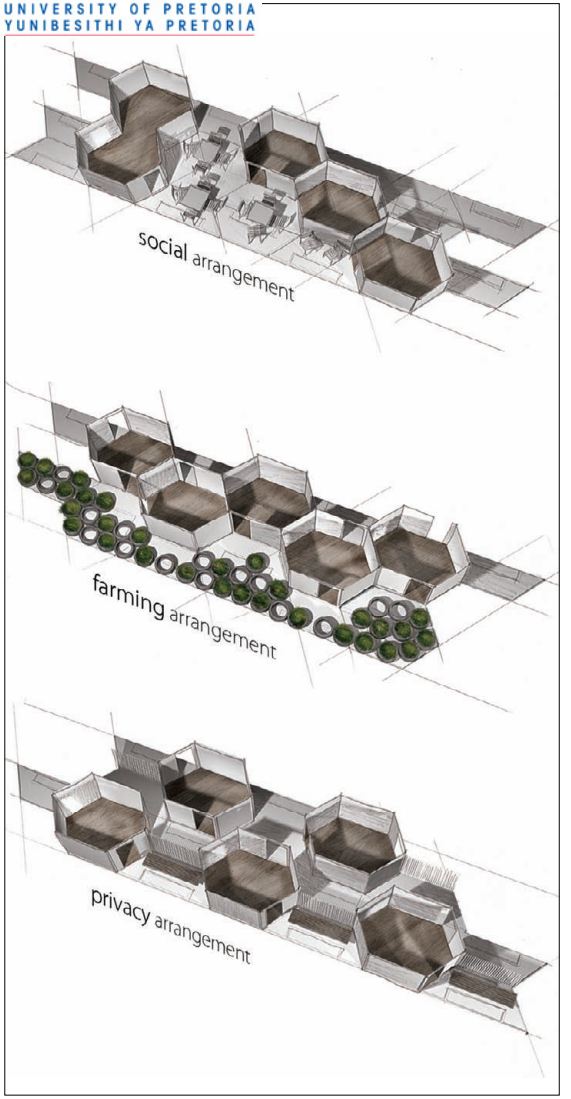


fig. 102 representing the ideology of a *'bee-hive-structure'*, multiple floor layouts are achievable by arranging modules according to social preferences.

Perspective

fig. 103 perspective view between existing warehouses (looking East)

Areas for Improvement

concept _ 01

As mentioned previously, the concept proposal should be considered as an idealistic approach, however practical implementation should guide the design process to a large extend.

After scrutiny, numerous shortcomings were identified:

- Feasibility
- Structural complexity
  - Cantilever distance
  - Hexagonal housing module

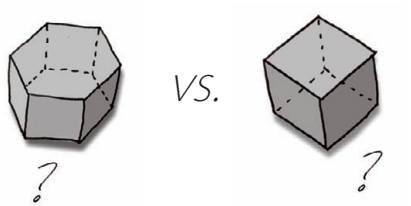


fig. 106

- Flexible internal spaces (between modules)
- Repetitiveness lacking uniqueness (considering the need for variety in residential living)
- Scale (need for *'Mega-structure'?)*
- Communication and access between the working & living environment?
- Practical execution
- Too theoretical driven? (disregarding context)

Conclusion

concept _ 01

Considering the mentioned shortcomings, it can be concluded that the proposed design should relate to the architectural language of the existing environment, and cannot be observed as a 'site-independent' structure.

Even though the hexagonal housing modules allow for various spatial arrangements, and represents the concept of recyclability to a large extend; construction feasibility and structural complexity required to support these modules (weight of module) prevent practical execution.

The 'flexible' appropriable spaces between the housing modules are too dependent on the configuration of the modules. Thus, tensions between private and social spaces are inevitable.
The structure supporting the housing modules should function as a separate entity from the 'flexible' space. In turn, these 'flexible' spaces will not be affected by any module configuration/displacement.

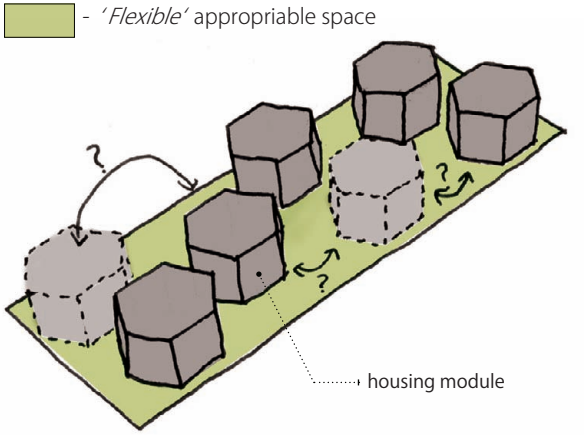


fig. 104 'flexible' social spaces determined by modular configuration (private housing units)

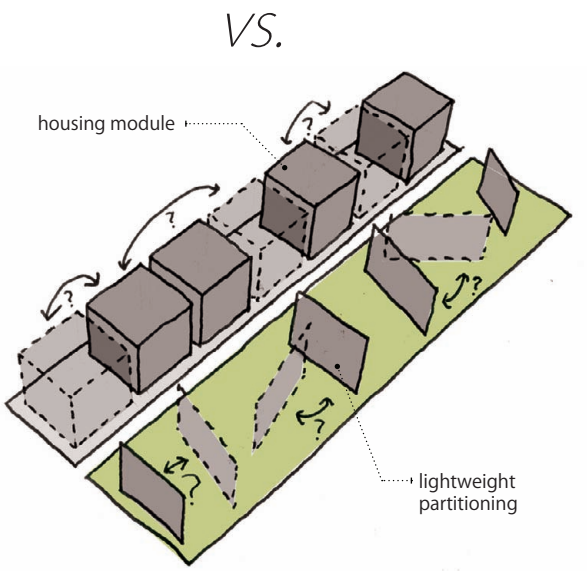


fig. 105 'flexible' spaces determined by lightweight partitioning (independent from module displacement/configuration)

Production Facility / Working Environment

Concept _ 02

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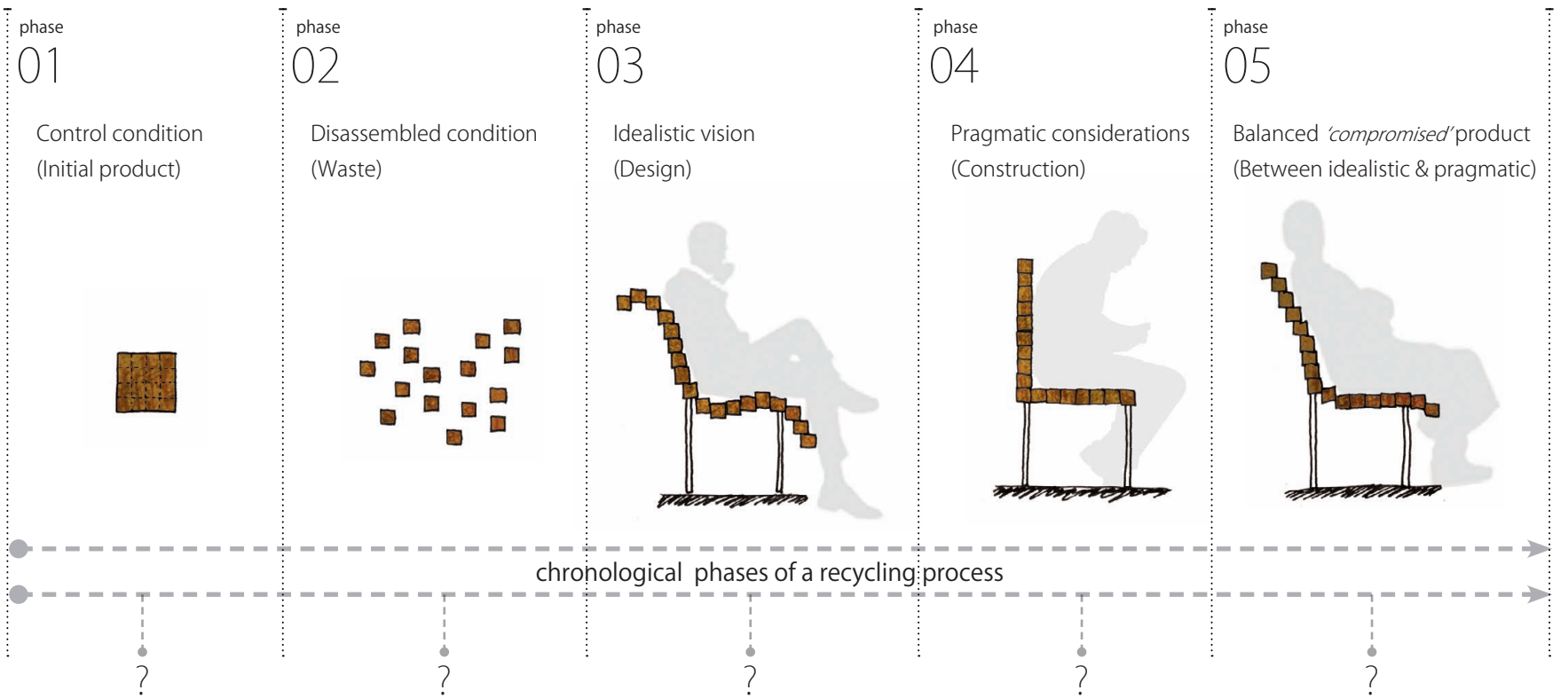
'the halfway house' = Production Facility = Recycling Process

fig. 108

fig. 107 chronological phases of a recycling process



Question: How can a structure represent a certain phase of a recycling process?

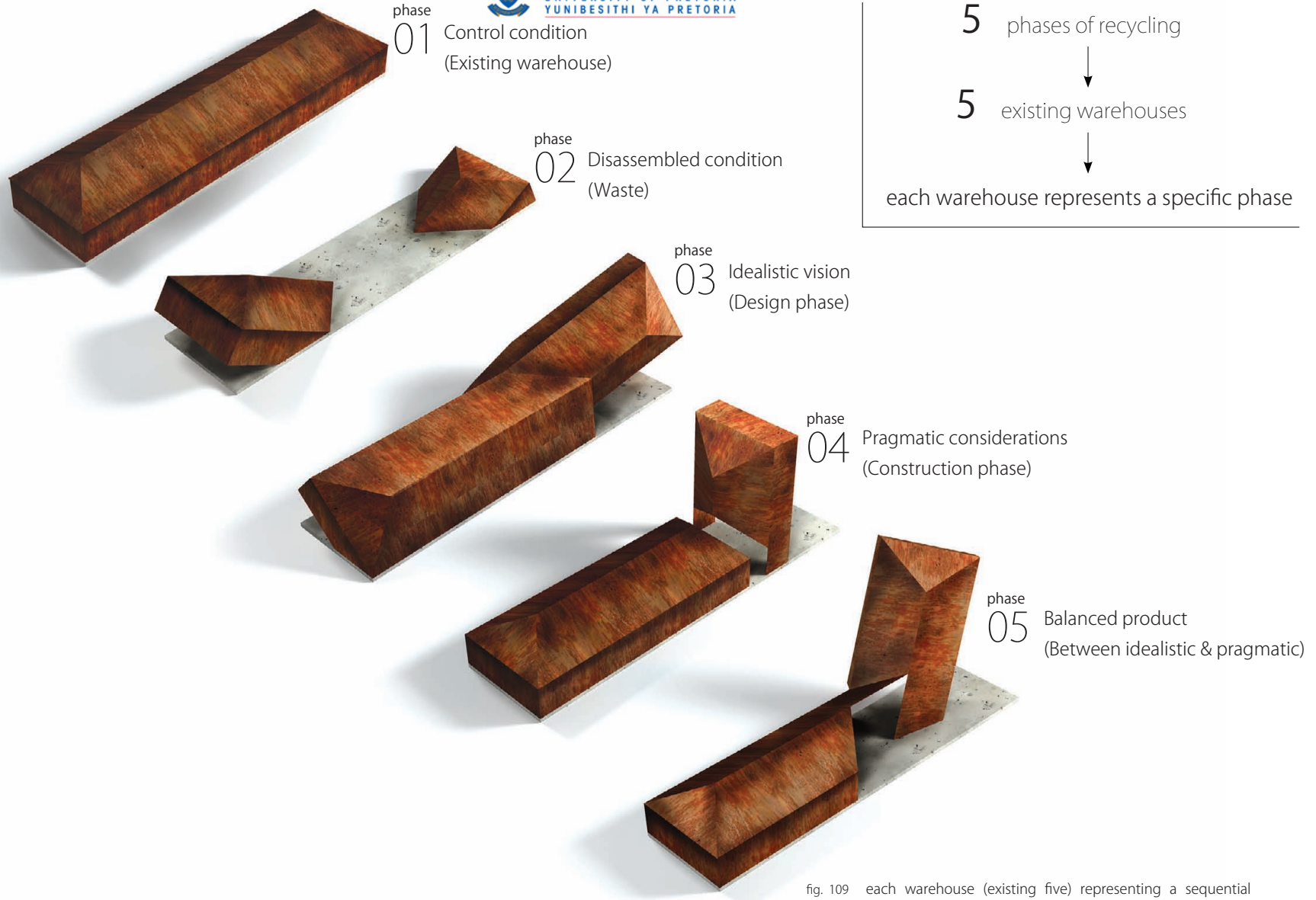


fig. 109 each warehouse (existing five) representing a sequential phase in the recycling process.

fig. 110 concept model illustrating perspective view from new pedestrian walk route (looking East)

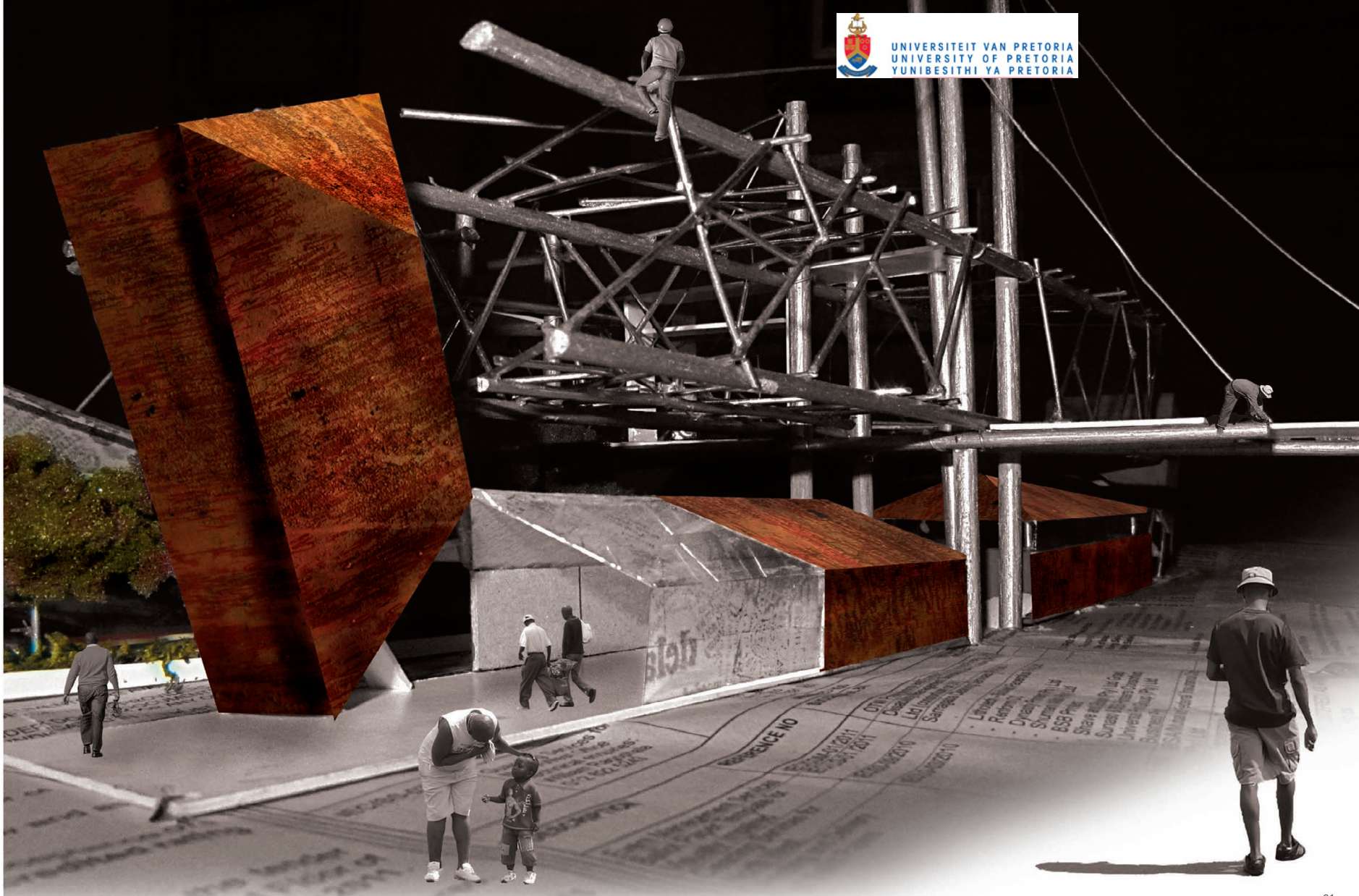


fig. 111 concept model illustrating perspective view of southern facade (principal facade)

Areas for Improvement

Warehouse representing a specific phase

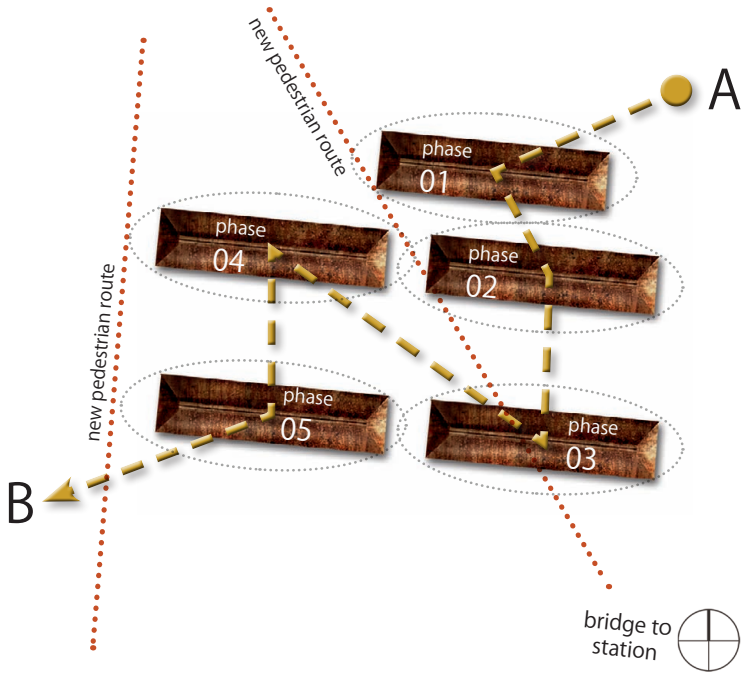


fig. 112 disorientated meandering process

- Disorientated process (A - B)
- Pedestrians / railway users wouldn't be able to grasp the architectural concept (doesn't read as a linear process)

VS.

Facade representing a sequential process

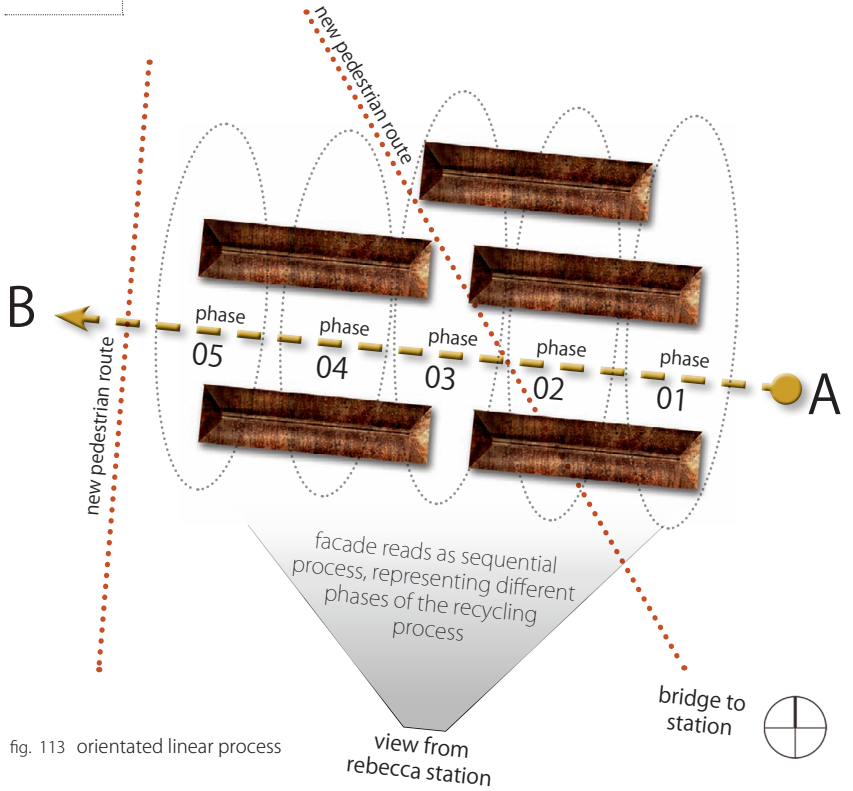


fig. 113 orientated linear process

- Linear chronological process (A - B)
- Concept of representing a phase in a recycling process will be evident from Rebecca station

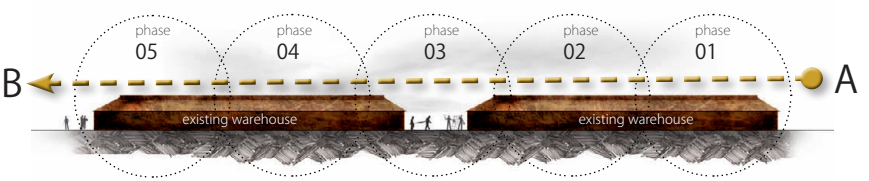


fig. 114 southern elevation (view from Rebecca station) reading as a linear process from East to West

Concept Development Process

Summary

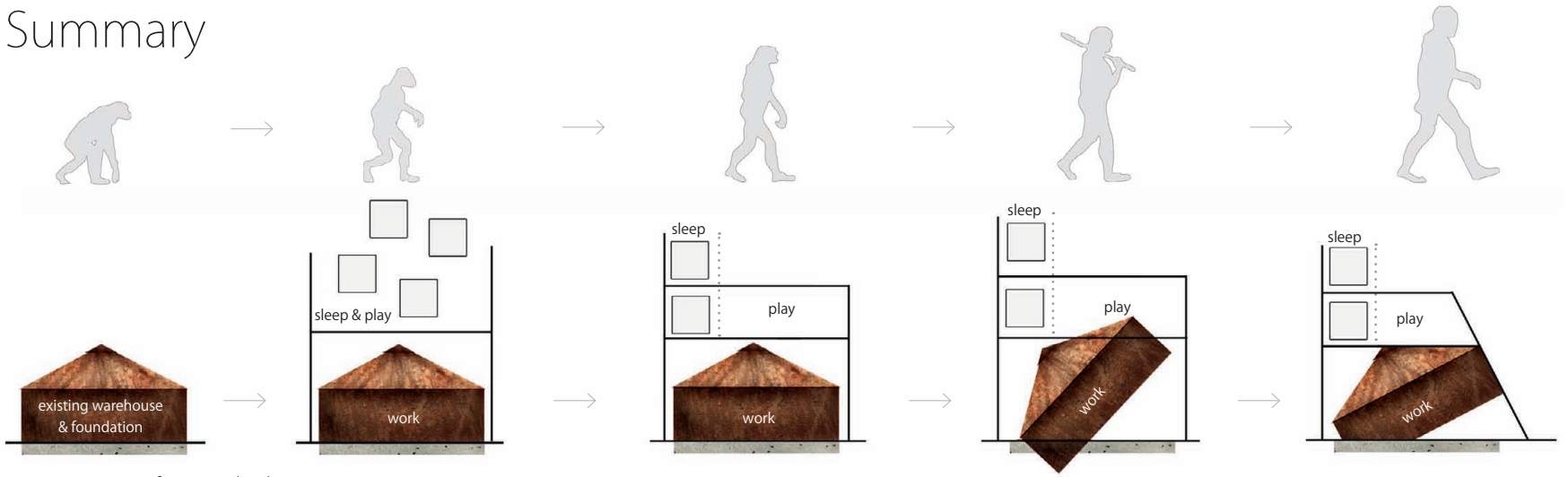


fig. 115 summary of concept development process

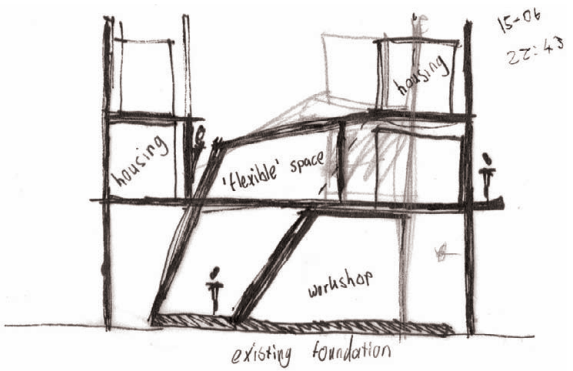


fig. 116 Most influential concept sketch illustrating the integration of the working and living environment. Angles and dimensions are subjected to measurements of the existing warehouses on site

Conclusion

As illustrated throughout the chapter, the concept development process were separated (working environment & residential environment) due to theoretical principles related to each. This disconnection led to a clearer understanding and concept development of each entity.

However, this separation invokes **tension between the architectural languages of these two environments.** Thus, as a final design proposition, these two environments should be integrated in an attempt to display a **single architectural language** that relate to the existing industrial context of Pretoria West.

Chapter _07
Design & Technical Development

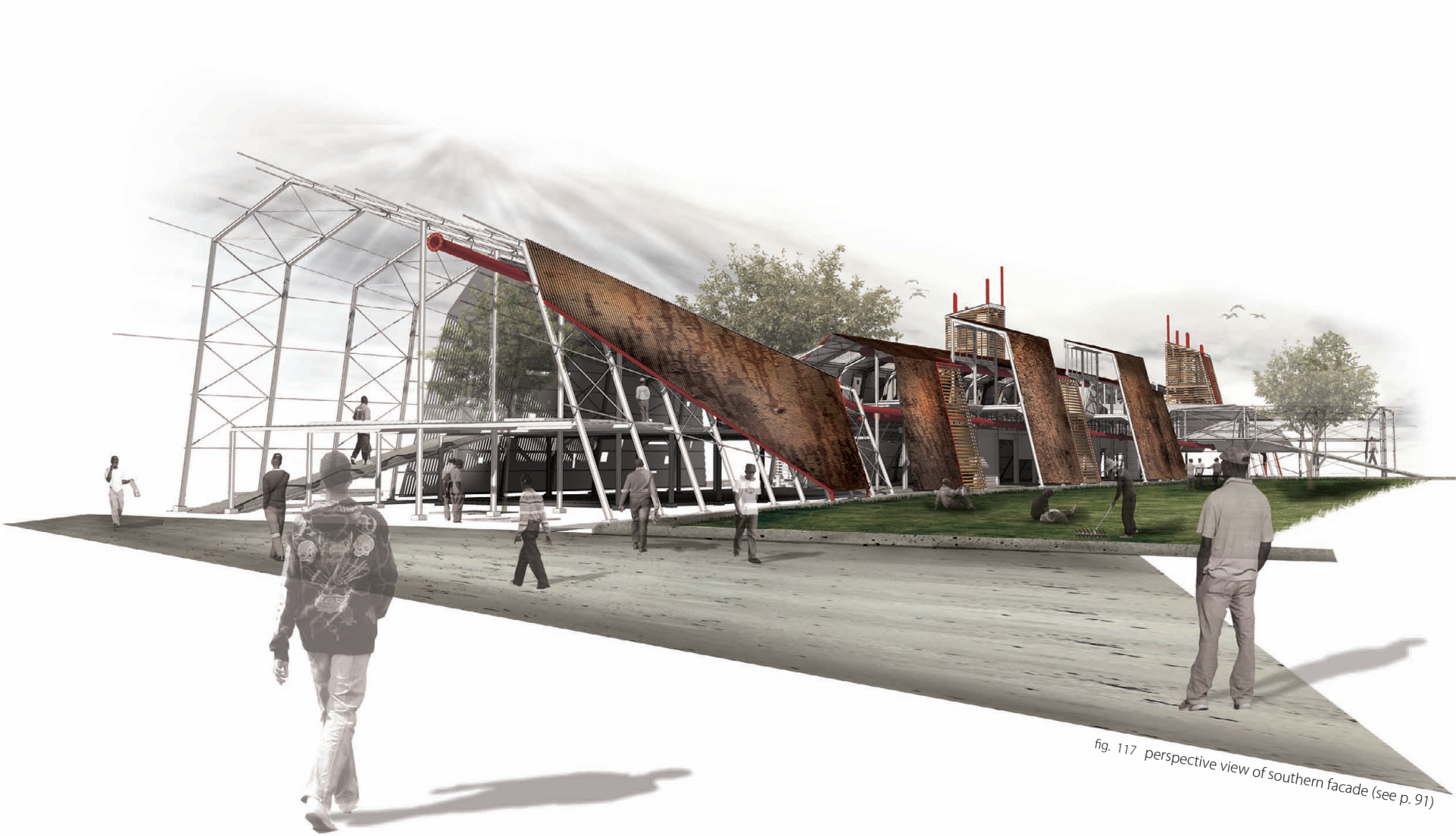


fig. 117 perspective view of southern facade *(see p. 91)*

Site development

With reference to p. 97

Geometry / Axis

A strong linear axis is currently evident on site (determined by the existing five warehouses). This axis should inform the design to a large extend.
The proposed access route between the bridge (Southwest) and the taxi-stop (Northeast) imposes a new axis over the existing warehouses (fig. 118).

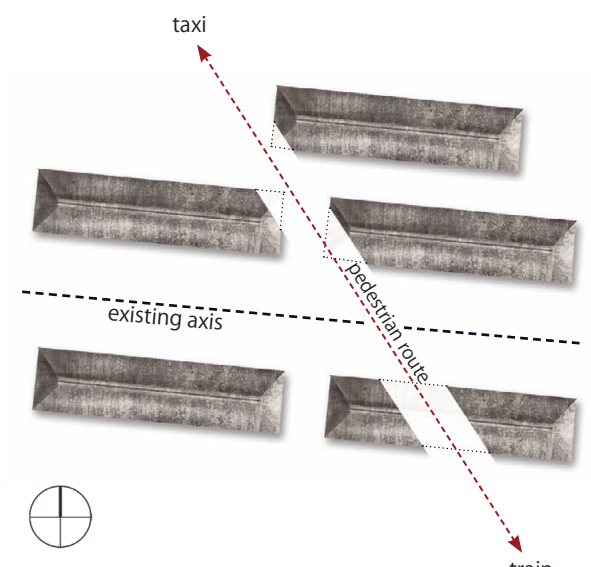


fig. 118 new axis over existing warehouses

Ground Works

In a response to the concept, most of the existing concrete foundations are left unaltered (except for the new pedestrian route). The existing foundations are in a good condition and are appropriate for structural purposes.

Boundaries

The only physical boundary of the intervention is the wall between the proposed retail market and the Department of Water Affairs on the western side of the intervention.

Grid

The design is based on a 3-meter grid running perpendicular to the linear geometry of the existing warehouses.

Concrete Works

Based on the 3-meter grid and the geometry of the existing; concrete footings are cast in close proximity to the existing foundations. These structural footings host the portable frames (rail tracks). The footings should be considered as the most permanent aspect of the design, and would be left unchanged if the building were to be disassembled in future.

Contours

The site is relatively flat, with an irrelevant fall from East to West, and a fall of 1:150 from South to North.

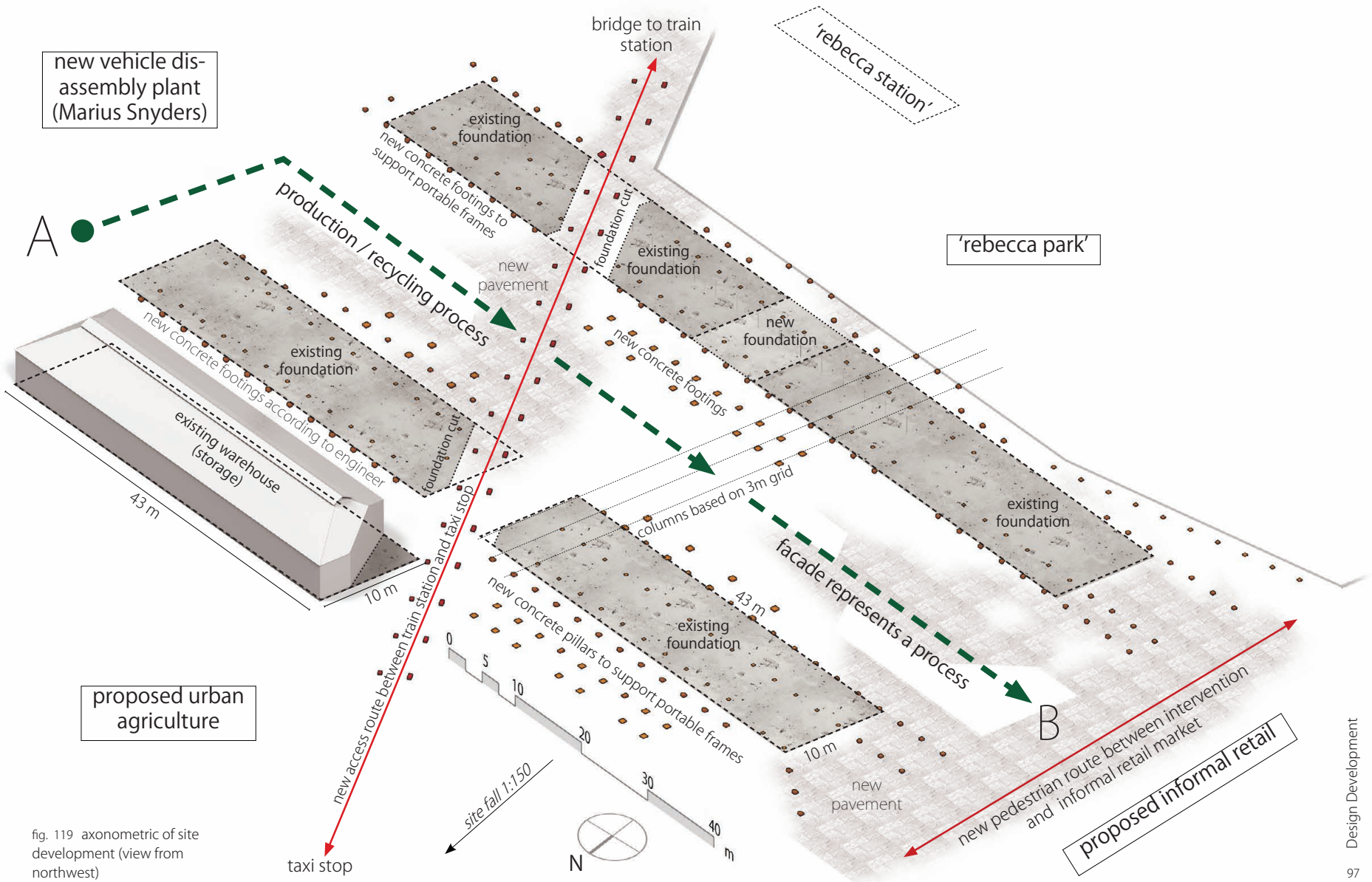


fig. 119 axonometric of site development (view from northwest)

Structure _ *'Portable Frame'*

With reference to p. 99

Portable Frame (Rail tracks)

The portable frames are imposed on the 3-meter grid (perpendicular to the linear existing axis). The frames are fixed to the concrete footings adjacent to the existing concrete foundations (see p.97).

Measurement & Possible Growth

The form and scale of the proposed design are subjected to the quantity of rail tracks available (measured at the redundant shunting yard). This pending/ unfinished design state is evident in the appearance of the building, and allows for further extension (see p. 95)

Dimensions

Angles and dimensions of each element in a 'portable frame' are subjected and determined by the measurements of the existing warehouses. Thus, the form and appearance of the past (old warehouses) will be evident in the future (proposed intervention).

Assembly & Disassembly

The primary benefits of a 'portable-frame' structure are the erection time and simplicity in construction technique. The frames are bolted at each joint, allowing for rapid assembly / disassembly.

fig. 120 Metro-Rail employee assisting author to cut a rail track

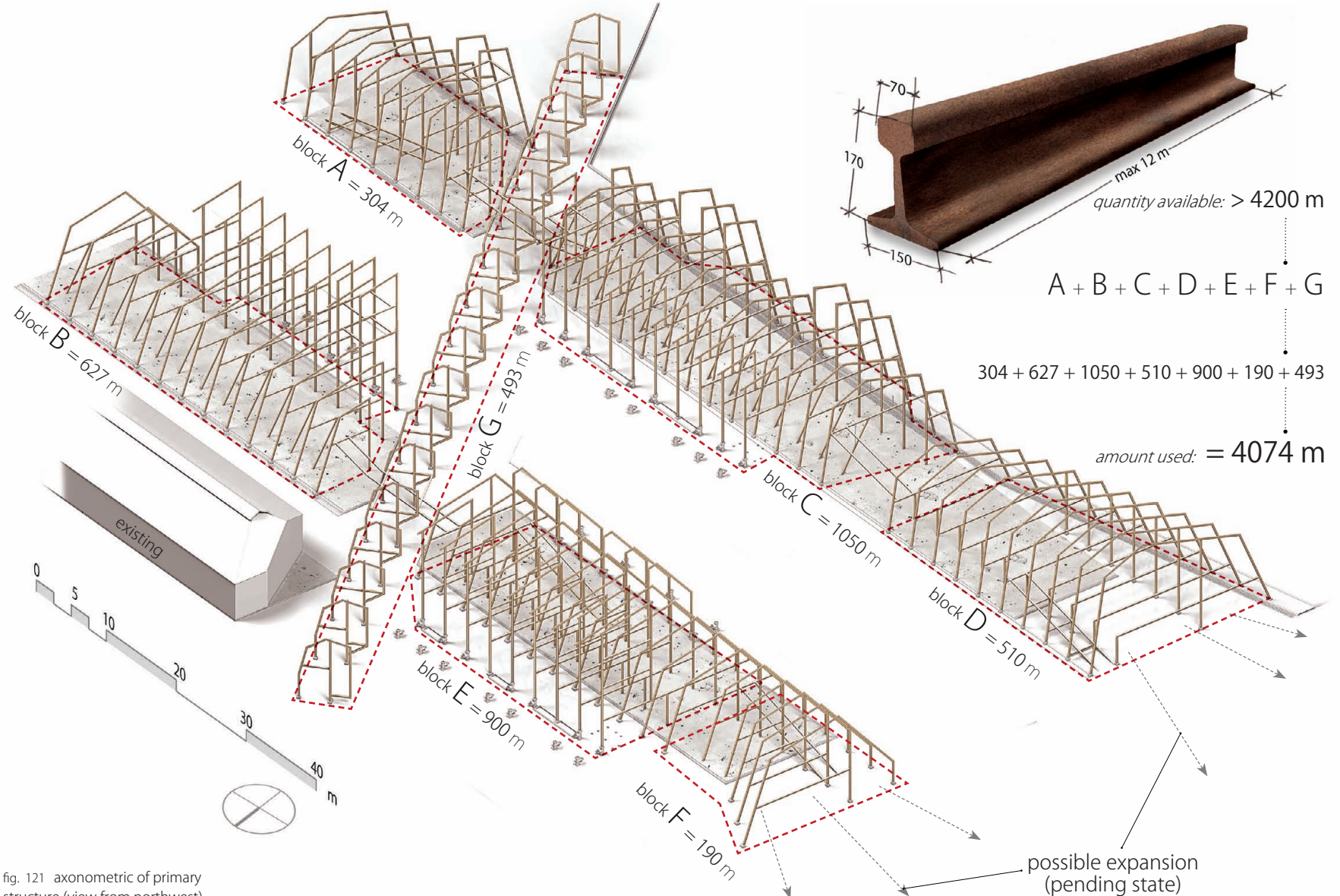


fig. 121 axonometric of primary structure (view from northwest)

Circulation, Flooring & Access

With reference to p. 101

Ground Floor

Circulation

The intention of the design is to maximise public exposure to the production process, allowing pedestrians to meander through the intervention and experience the process of production firsthand (workshops). The separation of the 'blocks' (see p. 101) encourages movement and diminishes a psychological threat of passing through the building.

First floor

Circulation *(Pre-cast concrete panels)*

The hollow-core concrete panels installed in the building indicate the movement route throughout the intervention. These walkways allow users / pedestrians to access the housing units and 'flexible' spaces in a linear fashion. Even though these routes are integrated within the building, it should still be considered as a semi-public entity.

'Flexible' space *(Rail Sleepers)*

The Rhodesian Teak timber sleepers (recycled from shunting yard) used for flooring, indicate the 'flexible' space on first-floor level. Panels are light (considering pre-cast concrete) and offer the building's users the opportunity to move these panes to different locations. Thus, allowing the user to determine the geometry and layout of spaces according to personal needs. These 'flexible' spaces are provided with services throughout the intervention, allowing for various different programs in a response to ever changing social needs.

Vertical Access

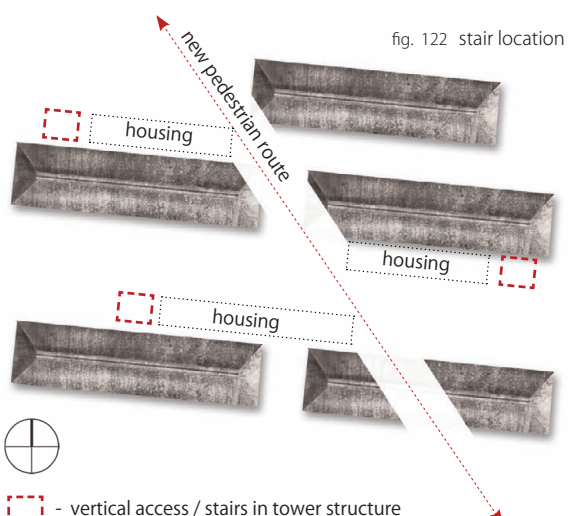


fig. 122 stair location

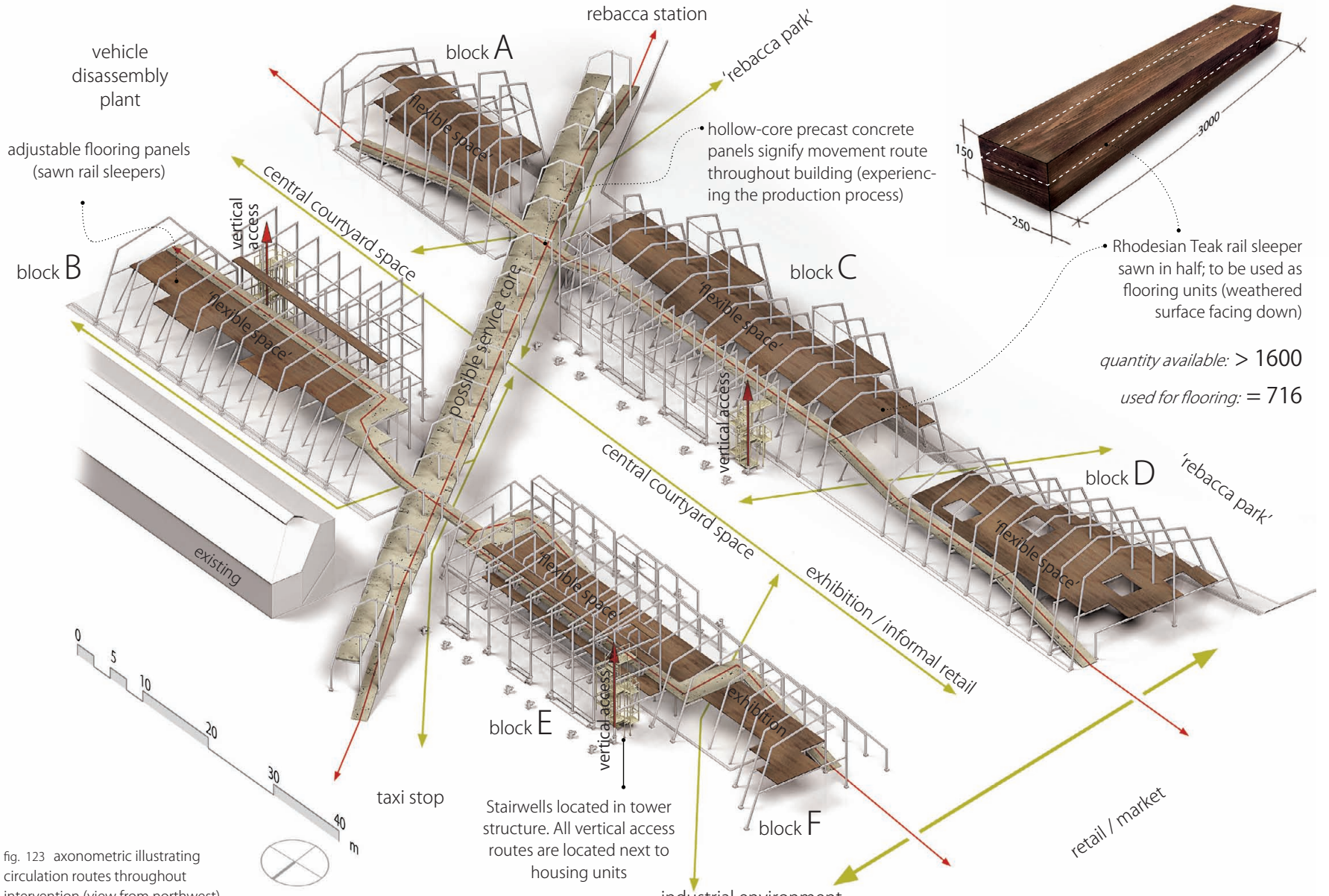


fig. 123 axonometric illustrating circulation routes throughout intervention (view from northwest)

Services & Environmental response

With reference to p. 103

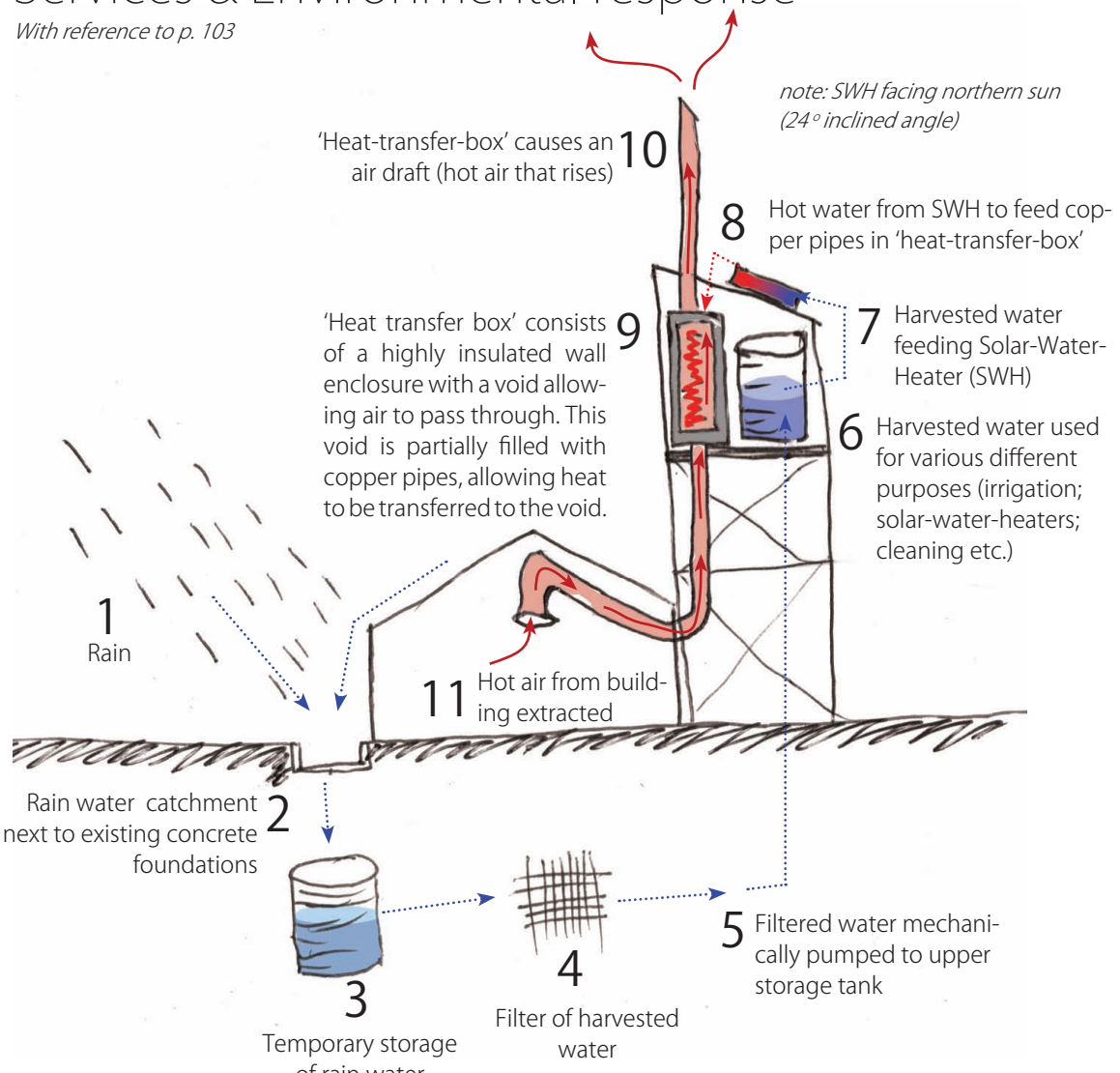


fig. 124 heat extraction concept

A Similar Process

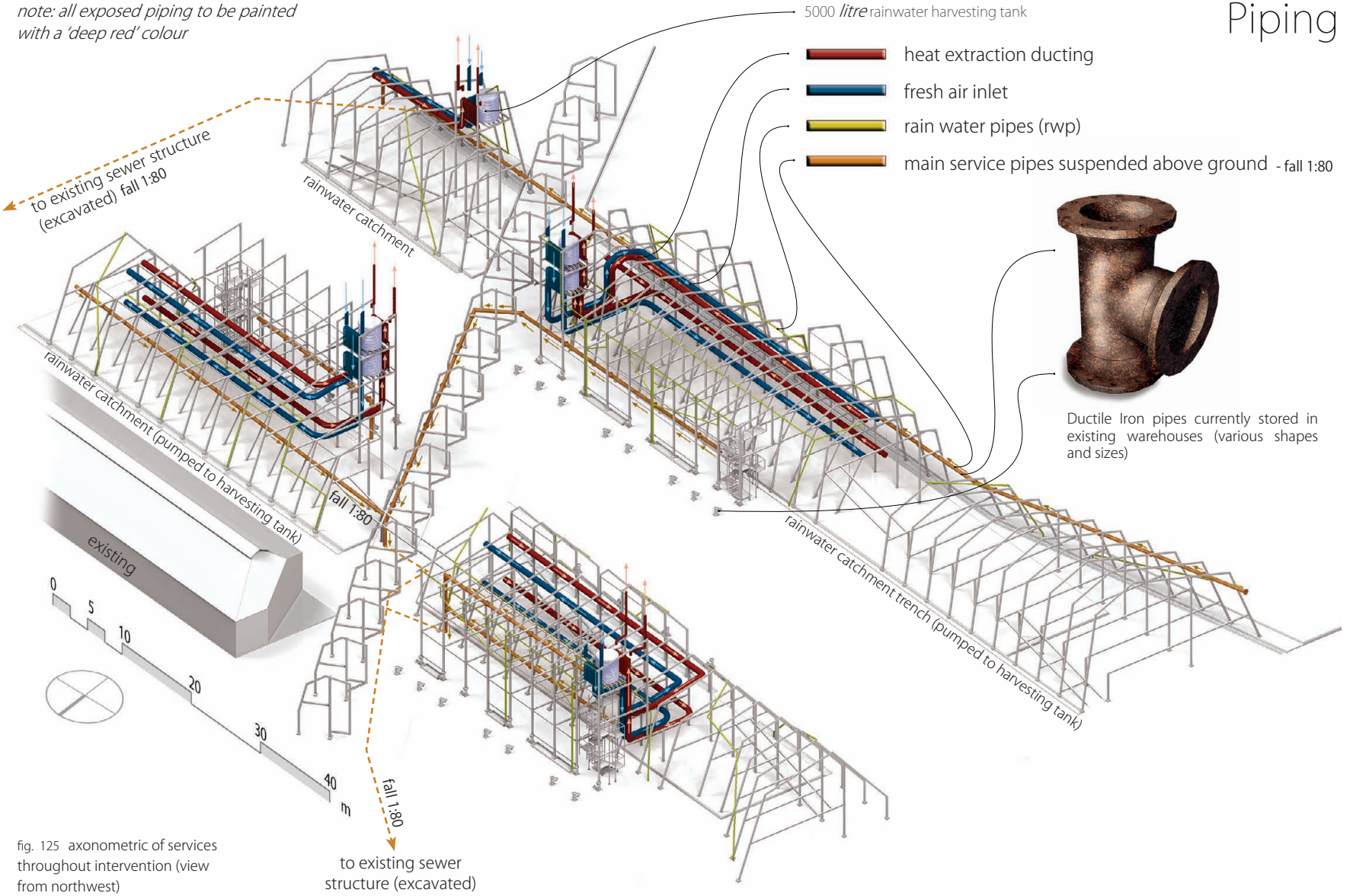
As with the illustrated heat extraction method, the concept of providing the building with fresh cool air works on a similar fashion. However, instead of the copper pipes being filled with warm water (from SWH); the pipes will be filled with a cold liquid / gas. This causes an air draft moving down (cold air falls)

Exposed Services *(see p. 103)*

Main service pipes are exposed above ground level allowing for easy access. These pipes host various services (electricity, water, sewage etc.)
The exposed service pipes allow for easy adaptation and forms a vital part of the architectural language. These services are located throughout the entire intervention, allowing for programme alterations.

Piping

note: all exposed piping to be painted with a 'deep red' colour



Ductile Iron pipes currently stored in existing warehouses (various shapes and sizes)

fig. 125 axonometric of services throughout intervention (view from northwest)

Housing & Structure

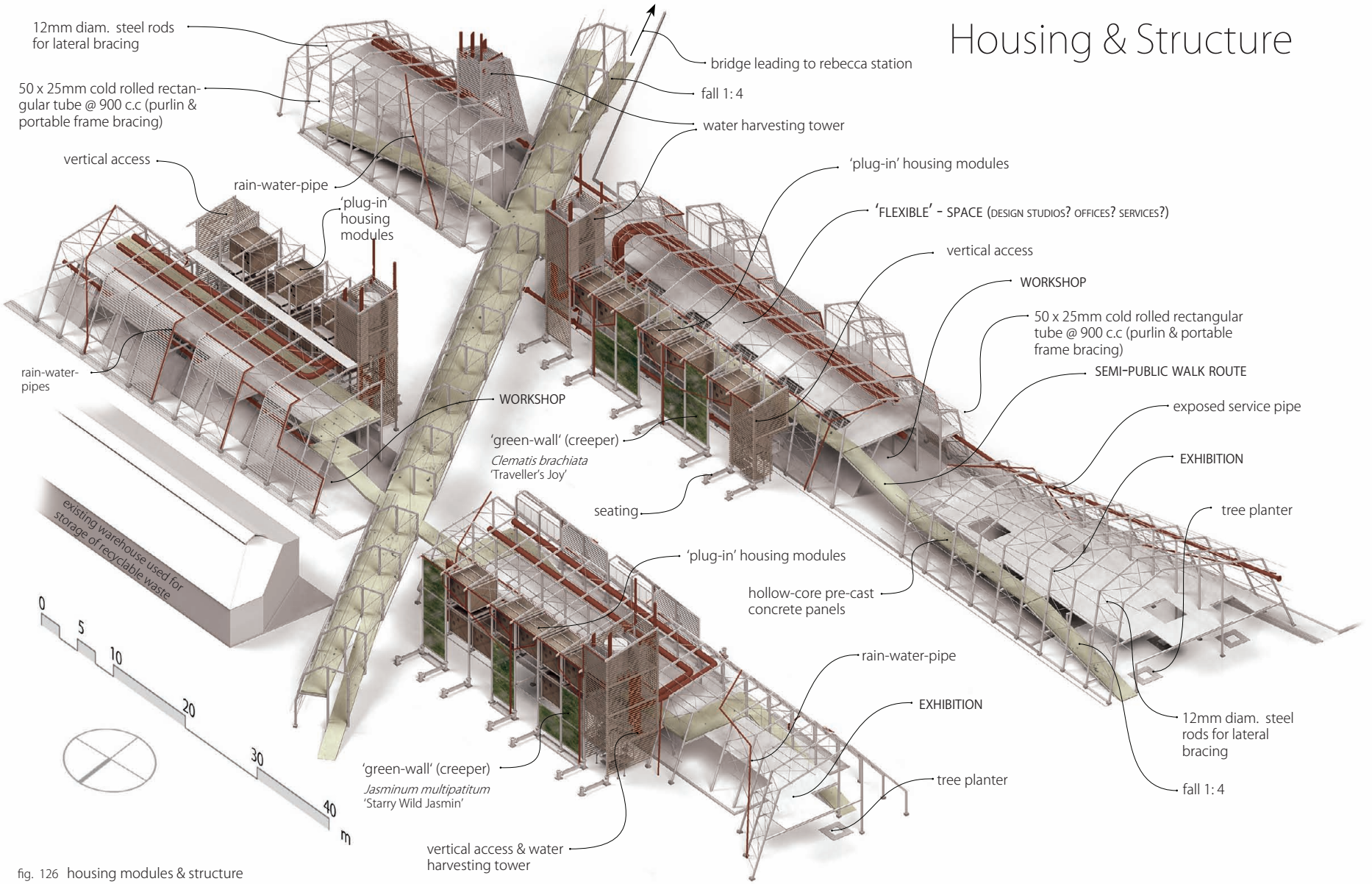


fig. 126 housing modules & structure

Skin

Steel sheeting from existing warehouses:

quantity available: 4 x 903 m²

= 3612 m²

A + B + C + D + E + F + G

= 283 + 611 + 764 + 508 + 581 + 220+ 645

= 3612 m²

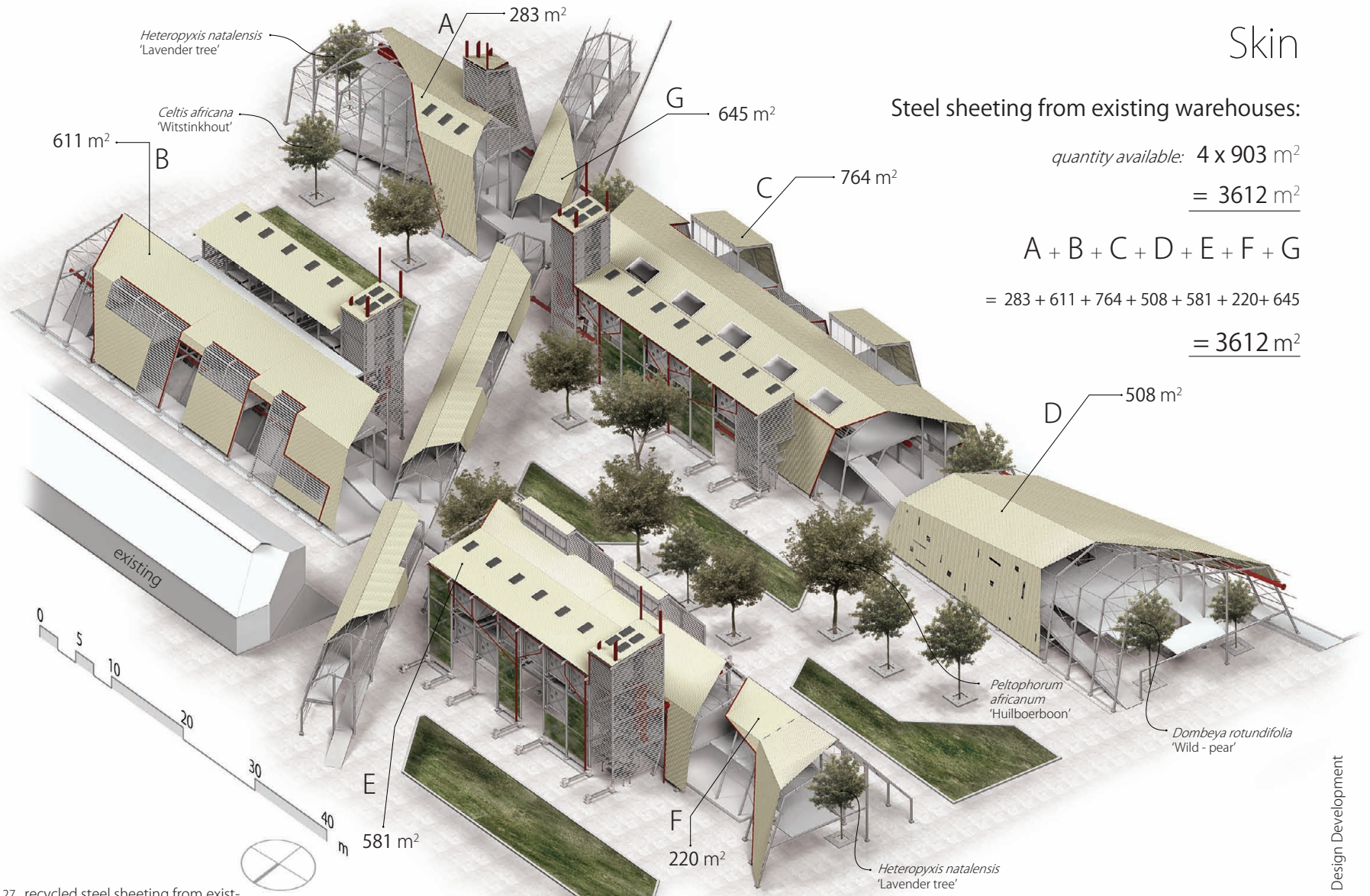


fig. 127 recycled steel sheeting from existing warehouses (view from northwest)

Chapter _08
Drawings

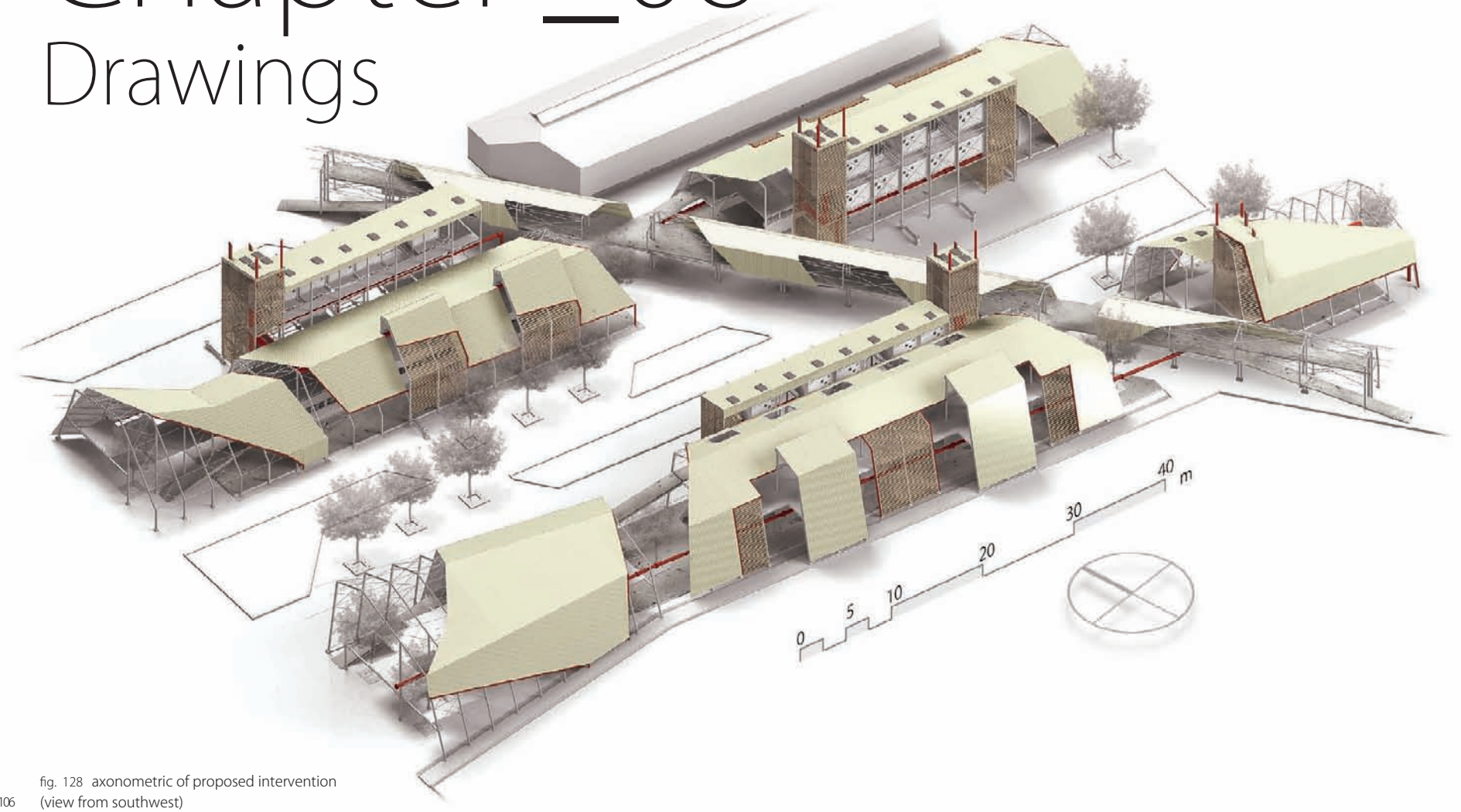


fig. 128 axonometric of proposed intervention (view from southwest)

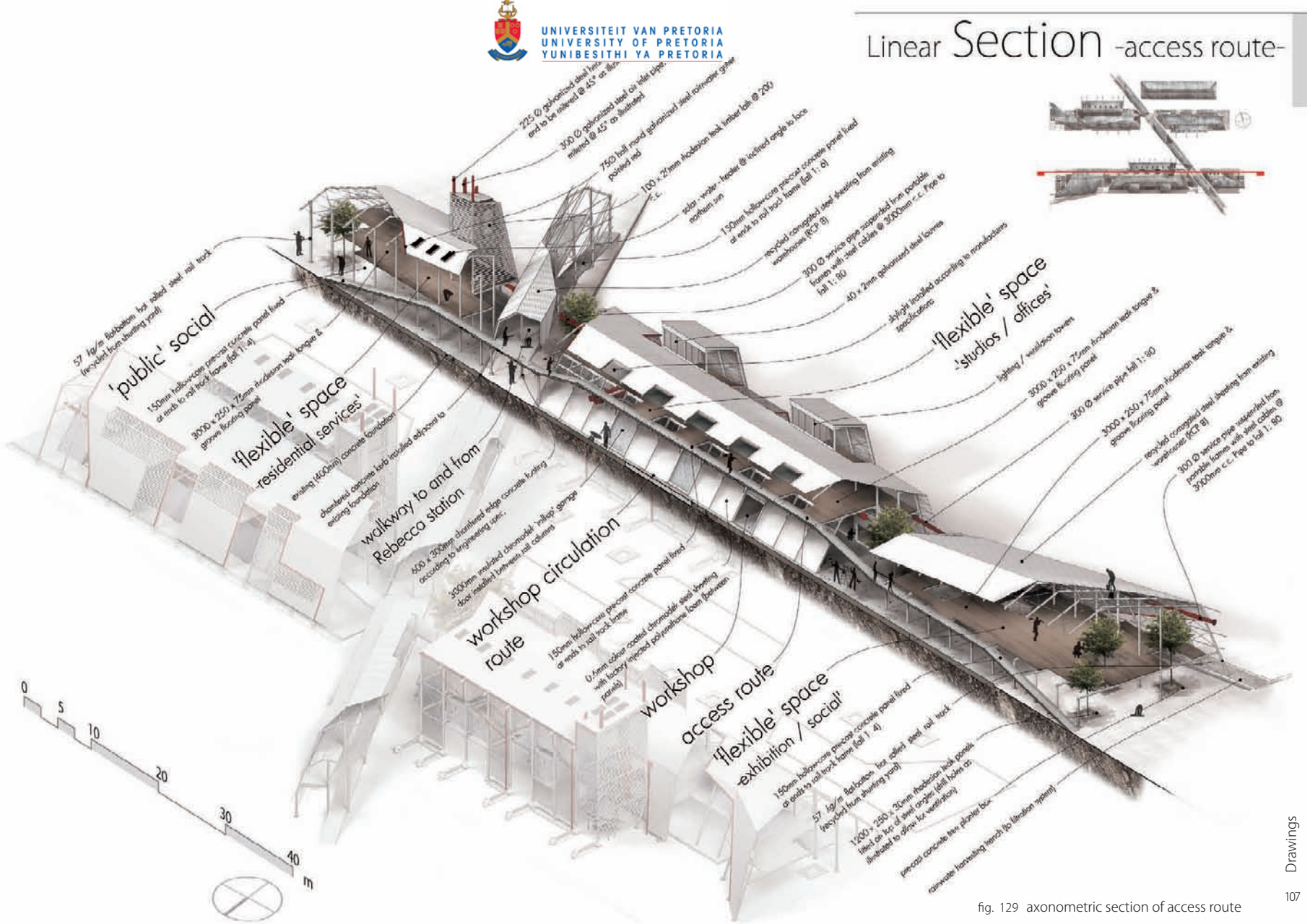


fig. 129 axonometric section of access route

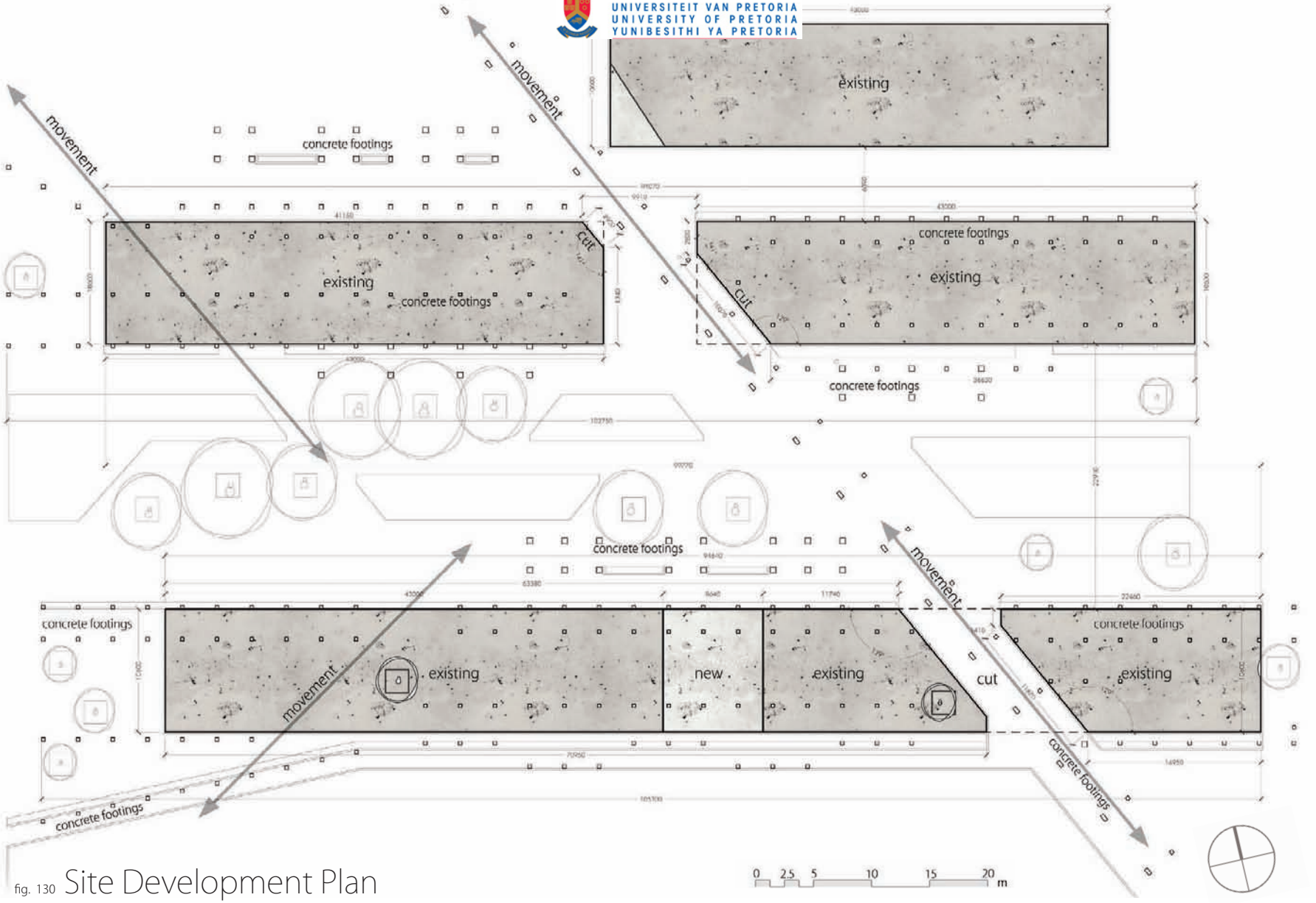


fig. 130 Site Development Plan

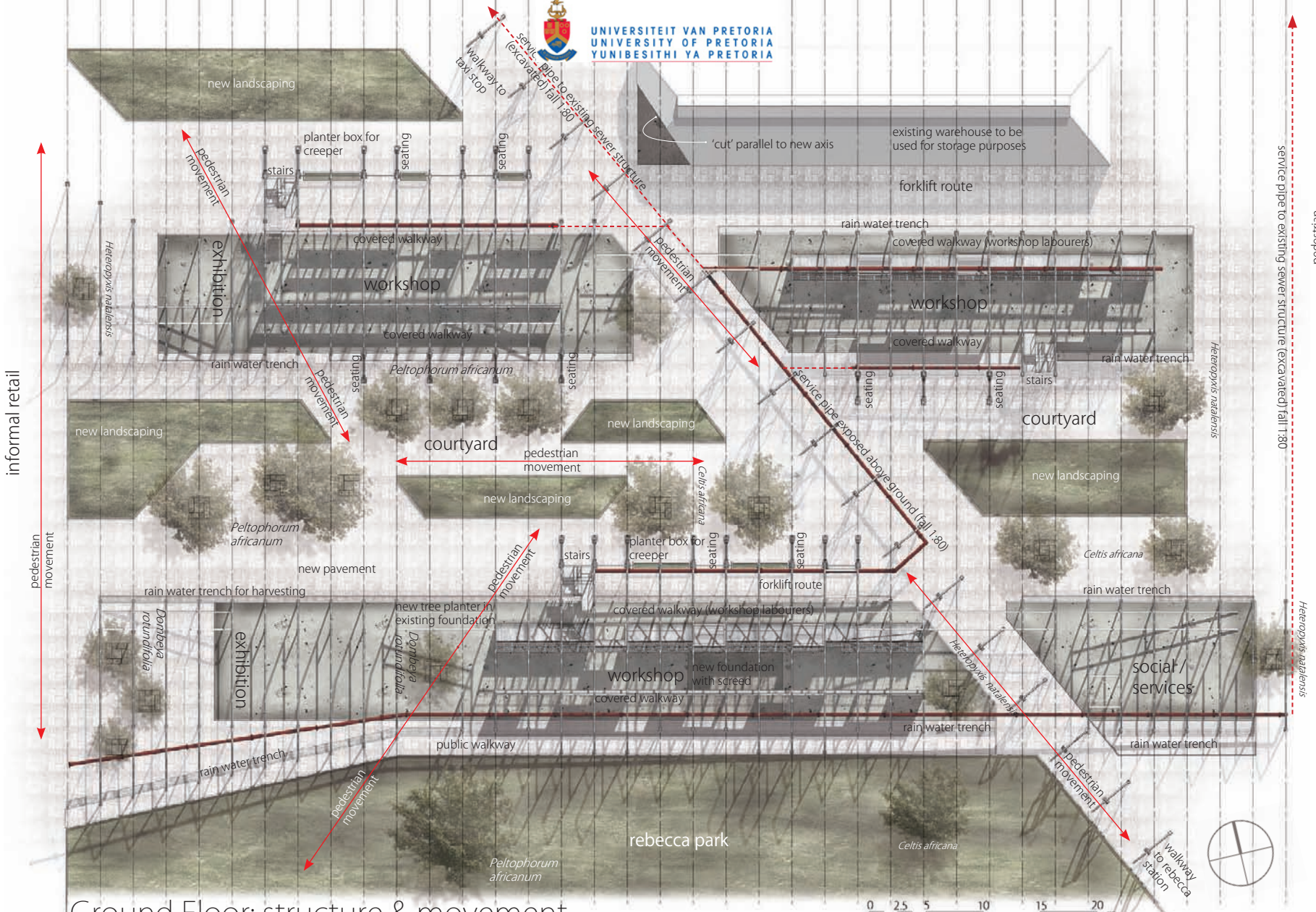


fig. 131 Ground Floor: structure & movement

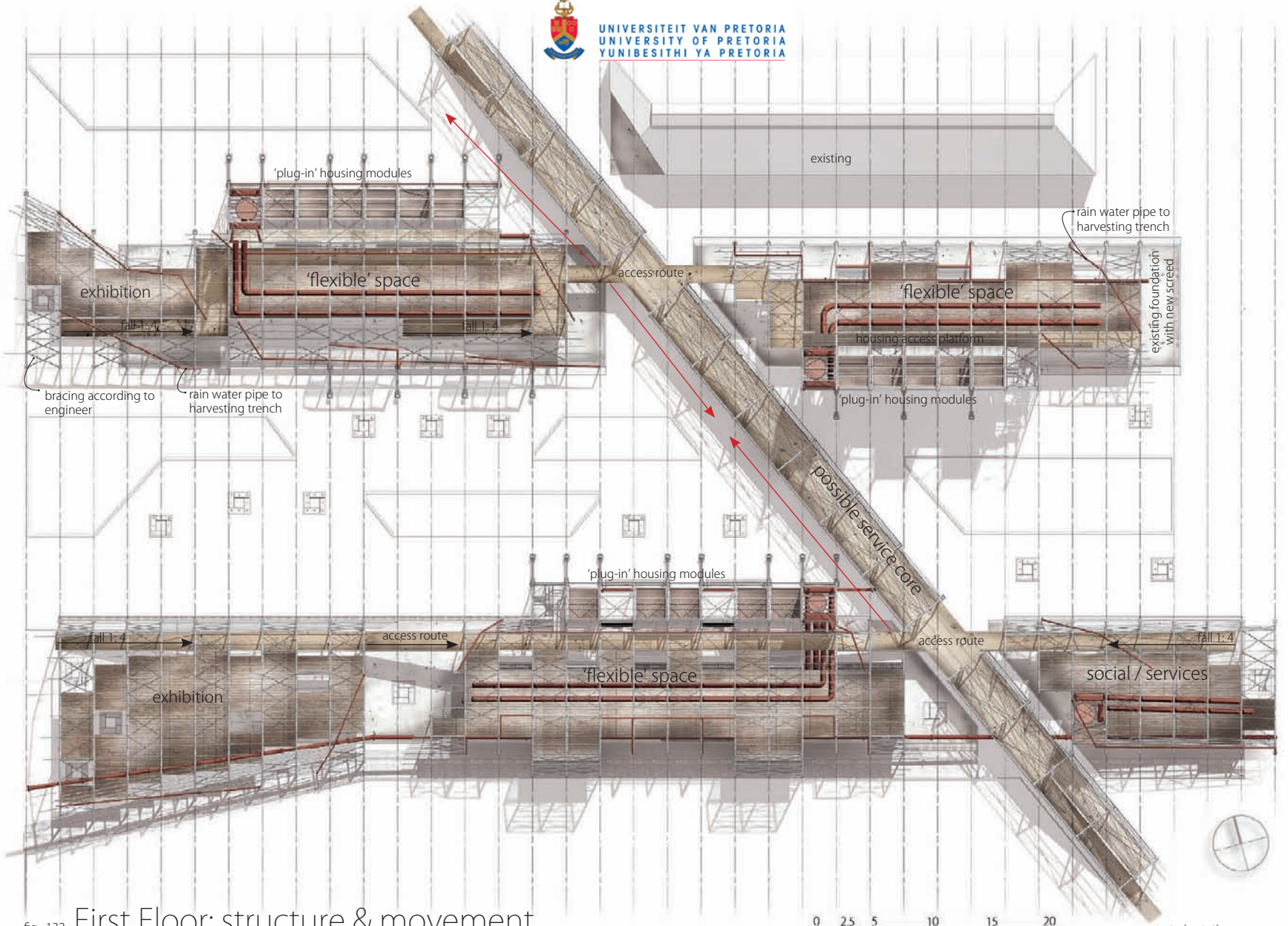
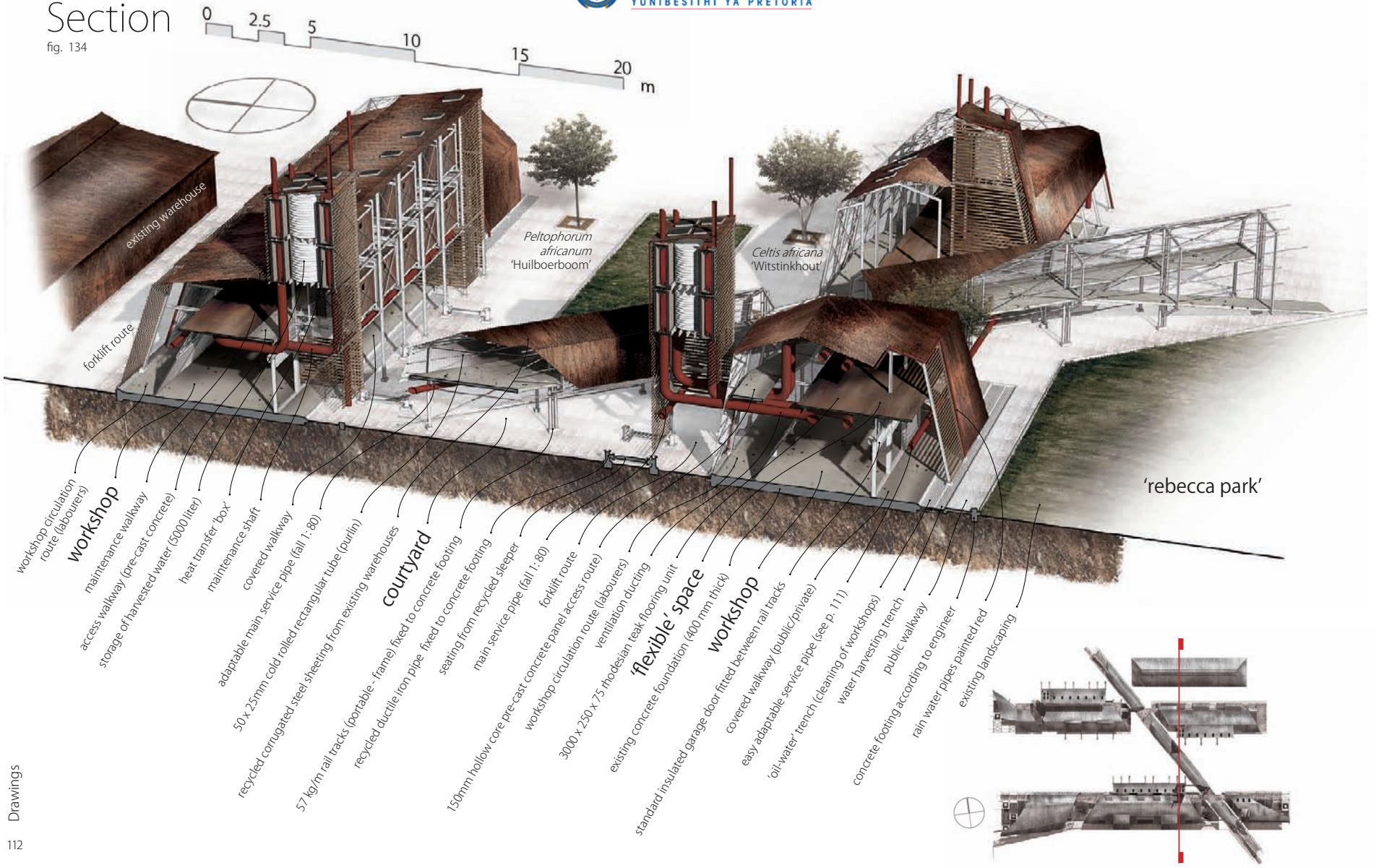


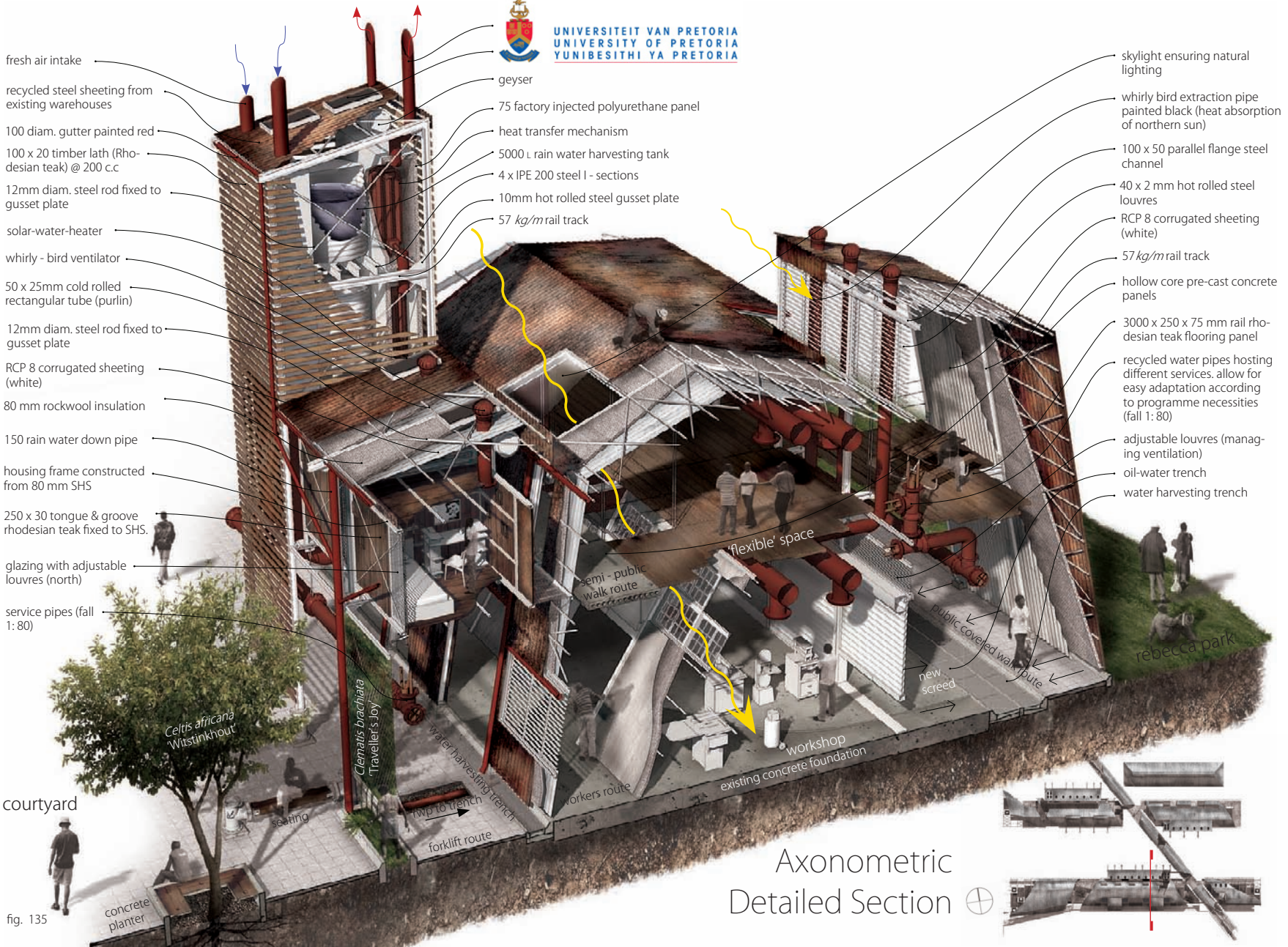
fig. 132 First Floor: structure & movement

fig. 133 Roof plan

Section

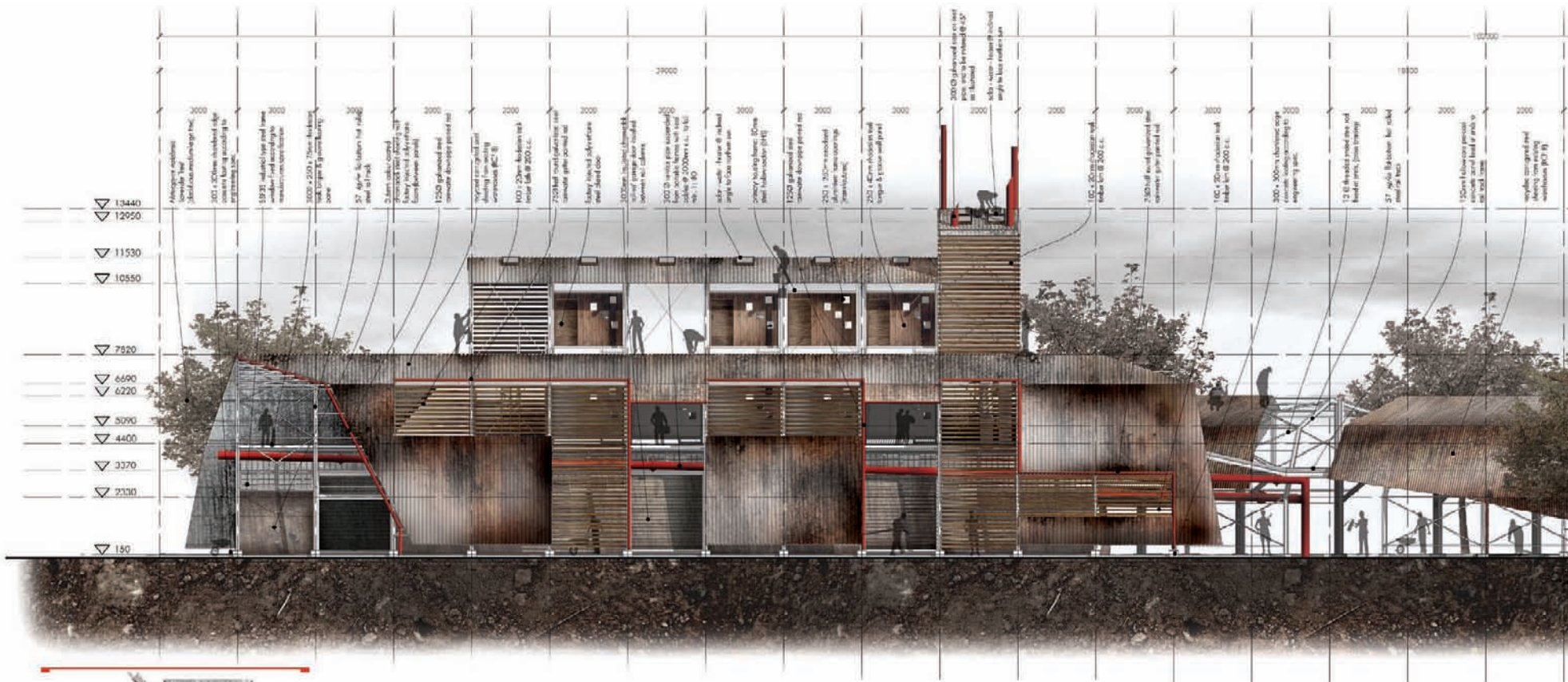
fig. 134

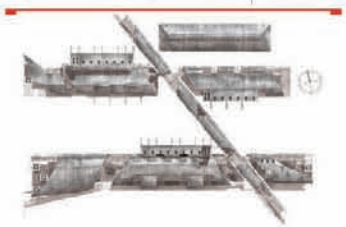




Axonometric Detailed Section

fig. 135

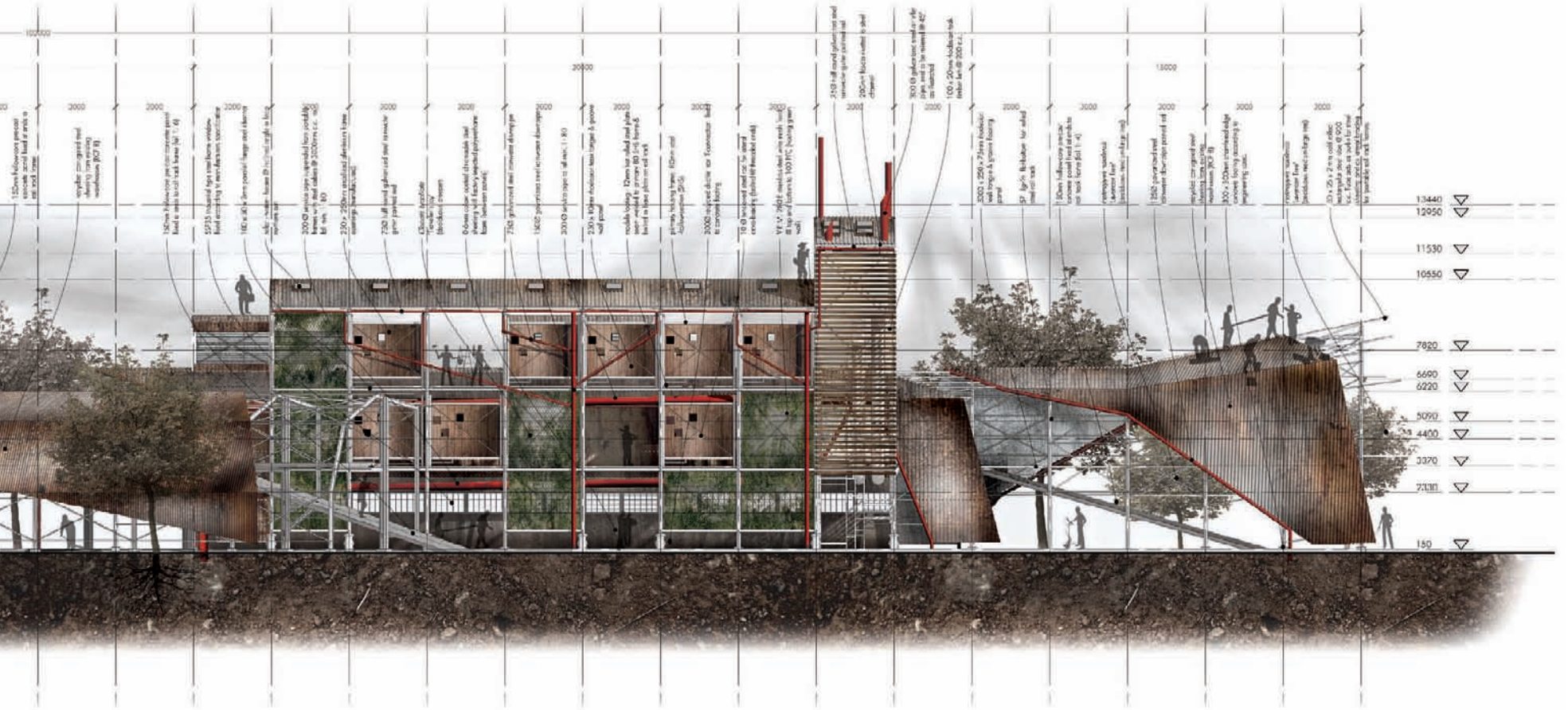




Elevation North -view from Carl street-

scale 1: 100

fig. 136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12950
11530
10550
7820
6690
6220
5090
4400
3370
2330
150

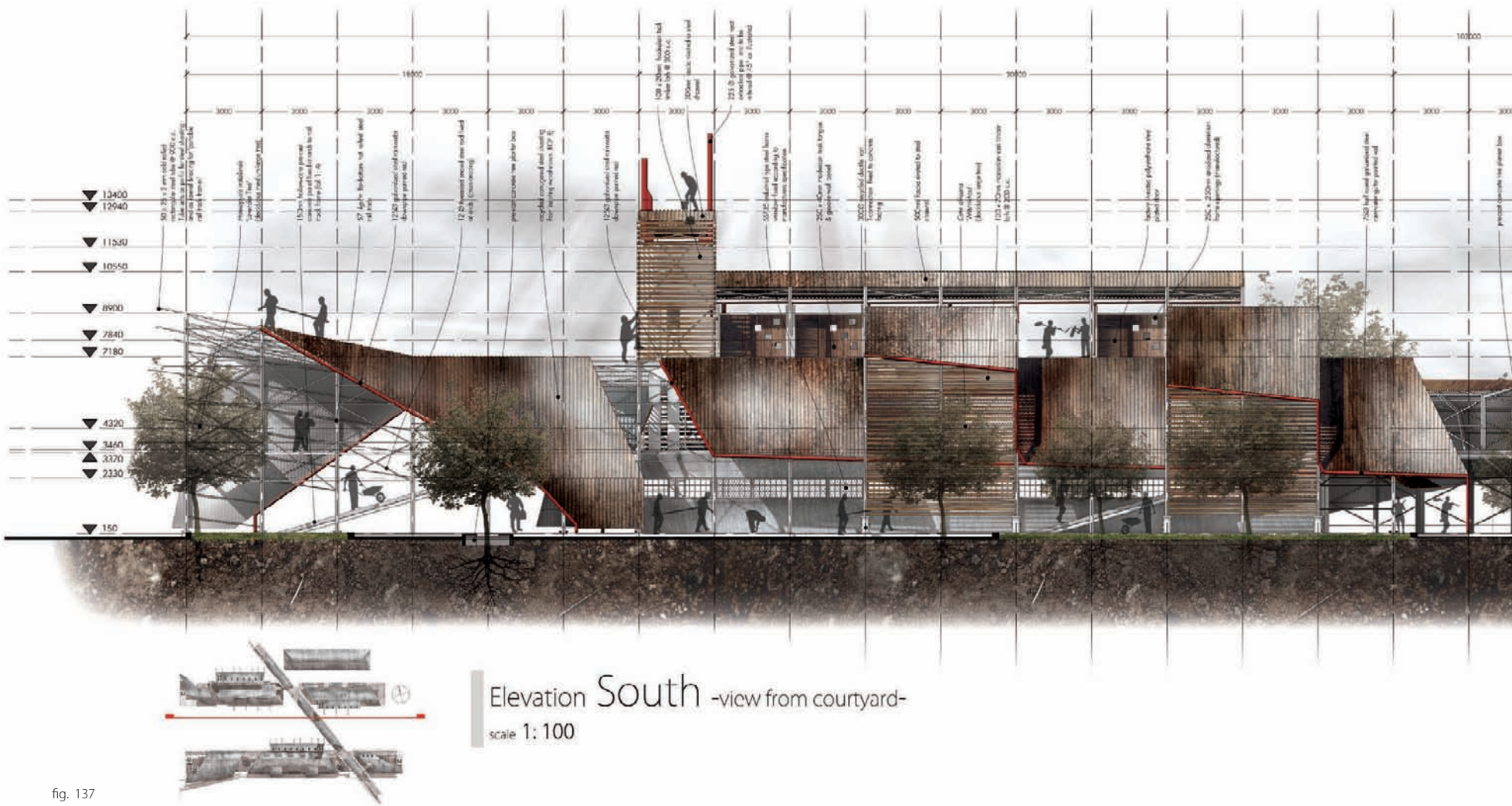
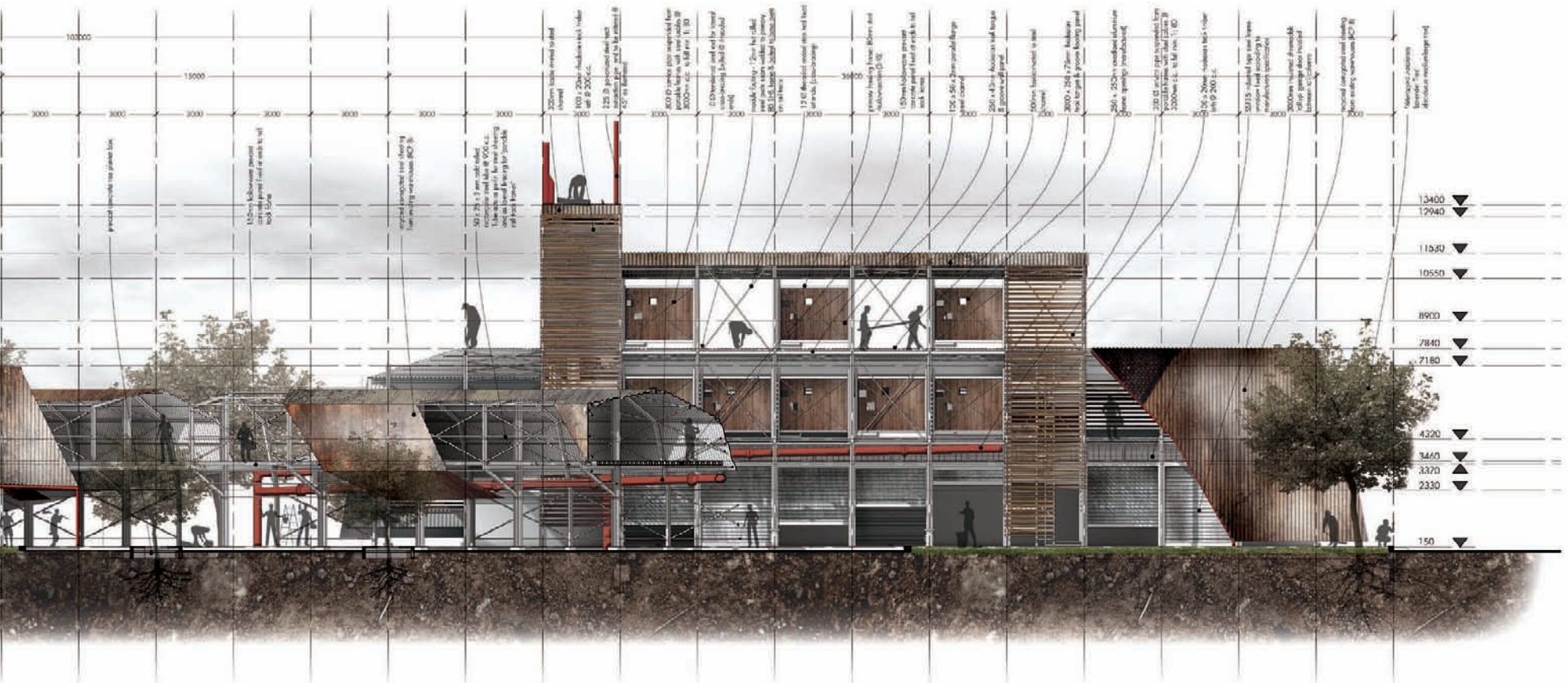

13400
12940
11530
10550
8900
7840
7180
4320
3460
3370
2330
150
Elevation South -view from courtyard-
scale 1: 100

fig. 137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2330
150

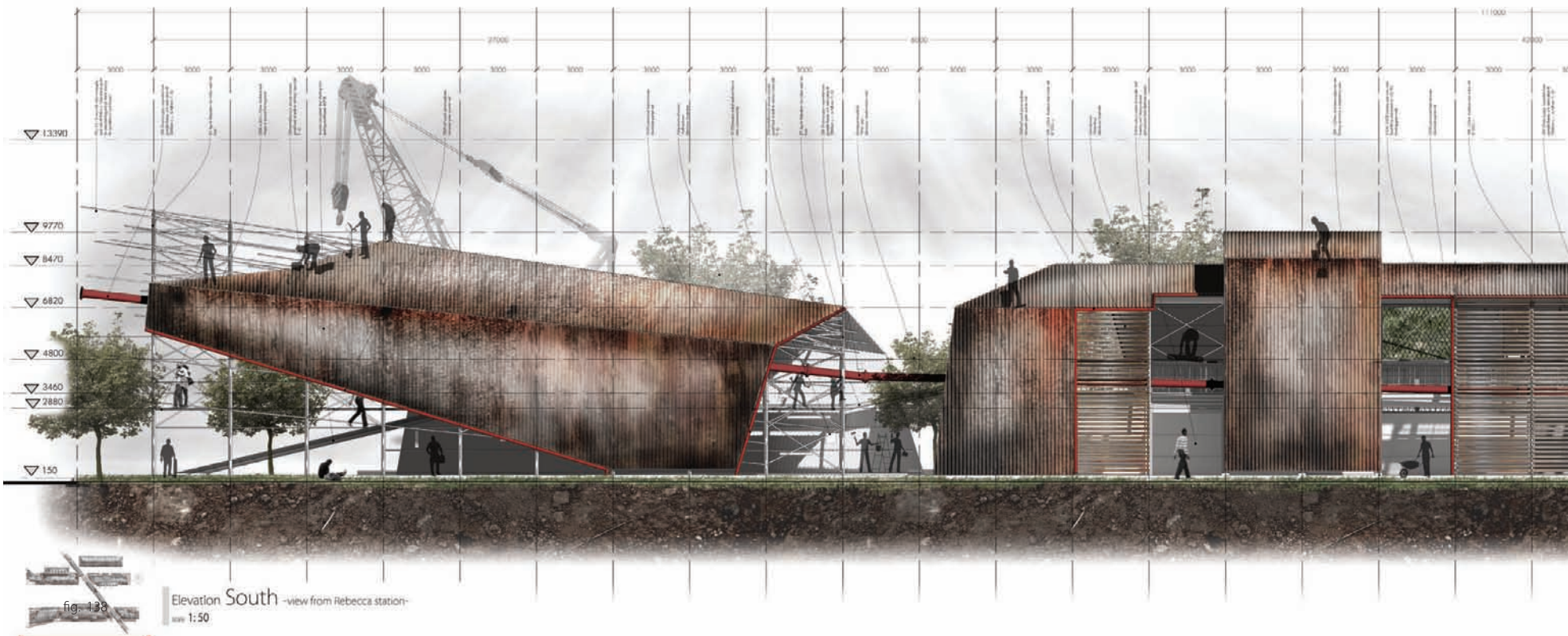
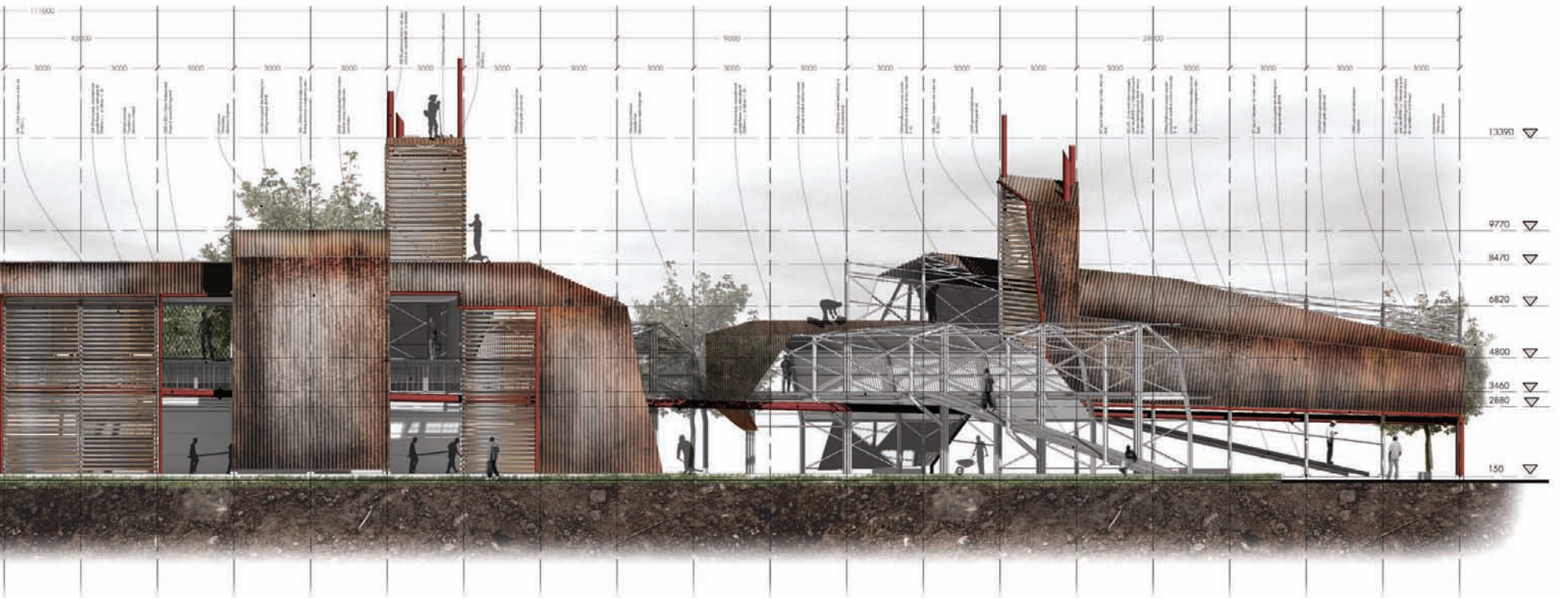


fig. 138

Elevation South -view from Rebecca station-
scale 1:50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9770
8470
6820
4800
3460
2880
150

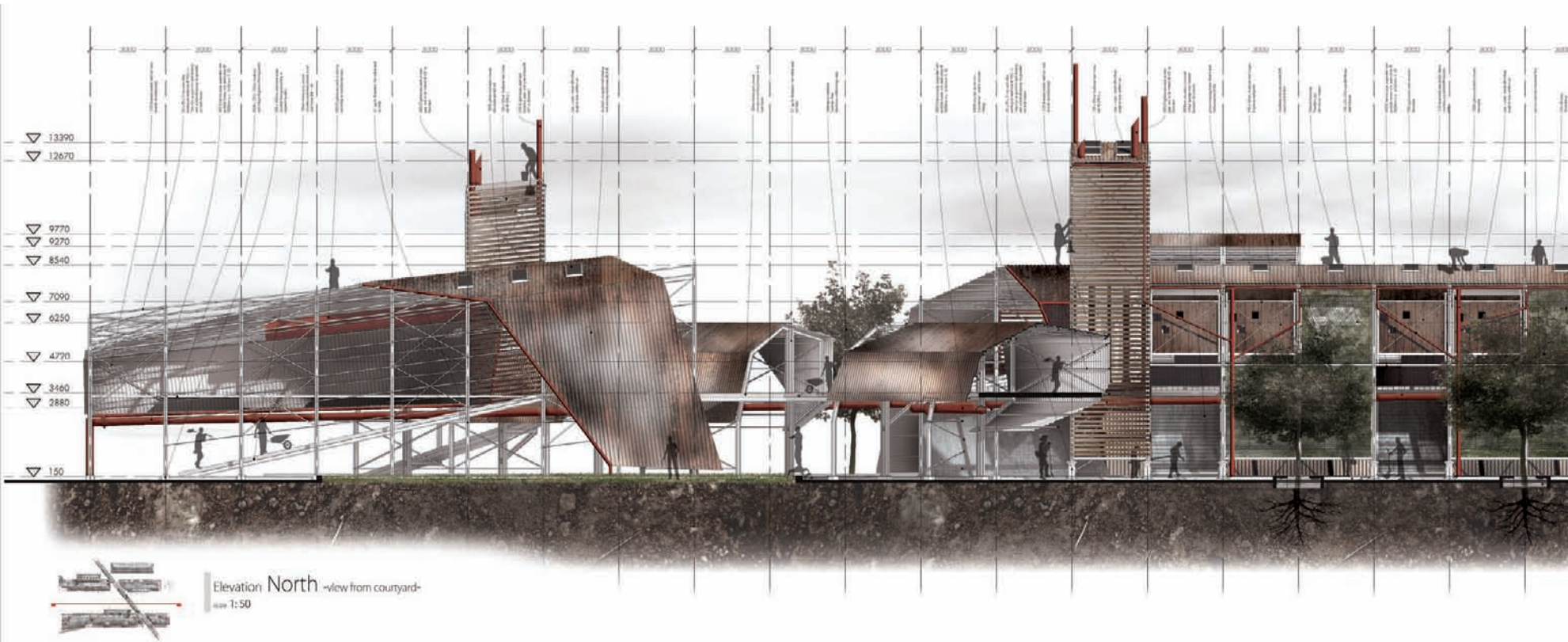
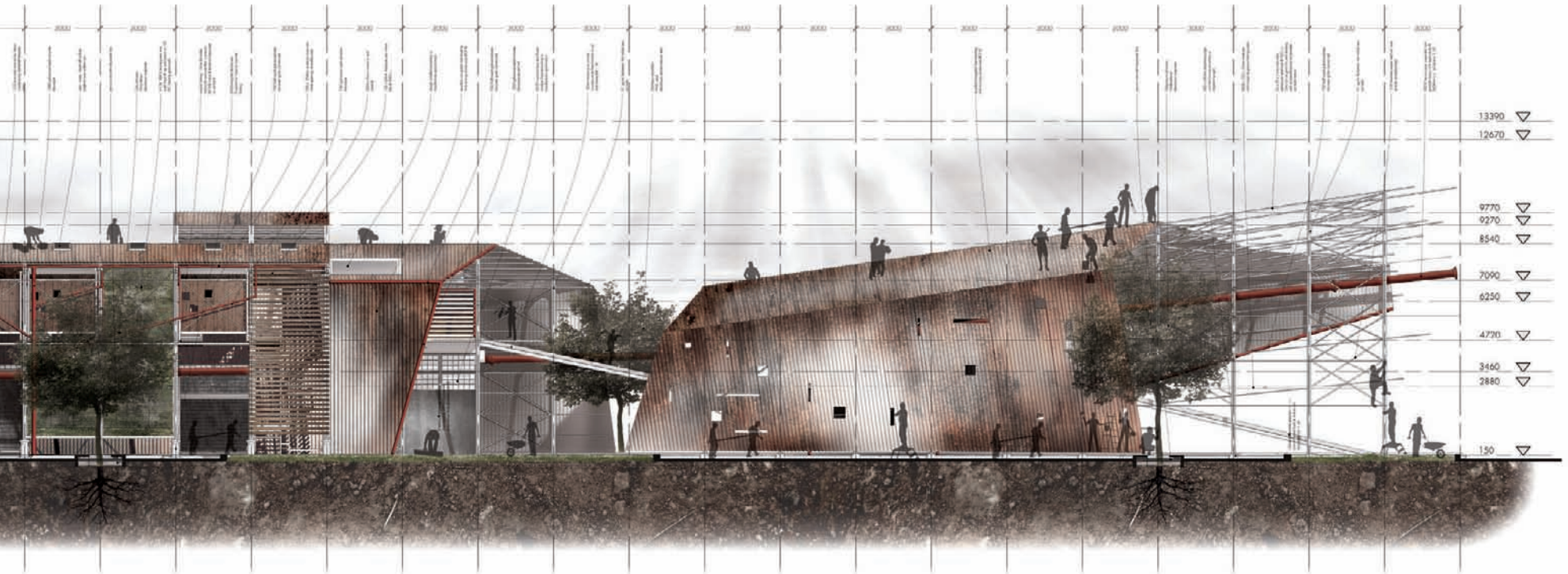

13390
12670
9770
9270
8540
7090
6250
4720
3460
2880
150
Elevation North -view from courtyard-
scale 1:50

fig. 139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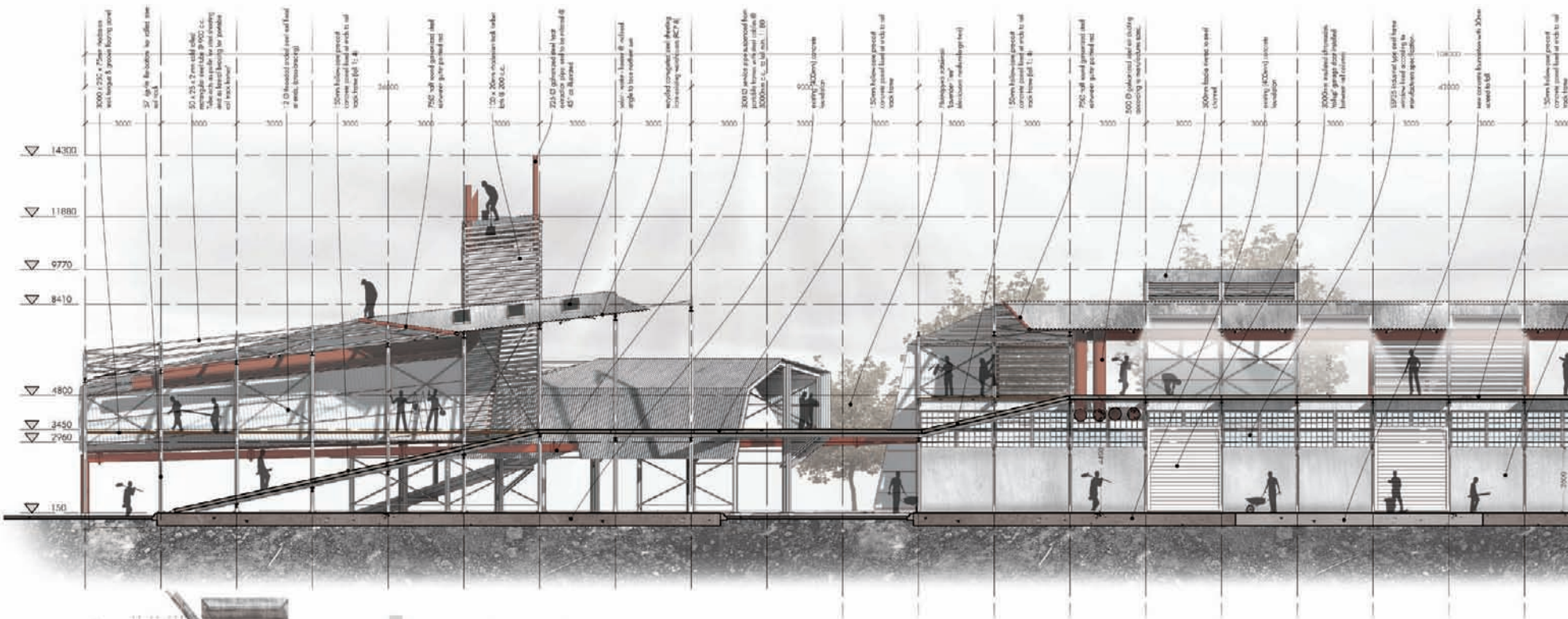
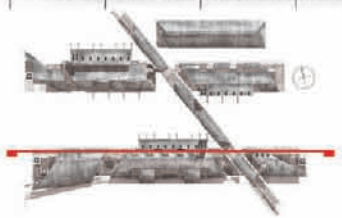
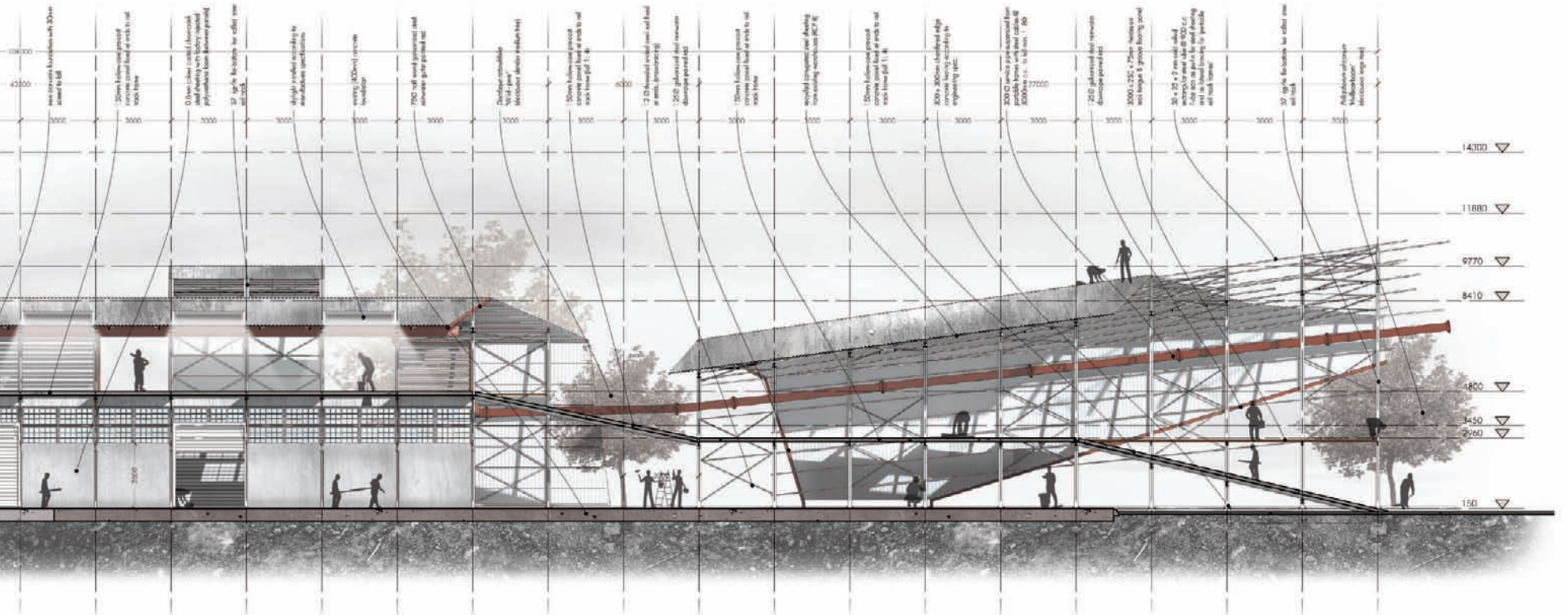




Linear Section -through access route-

scale 1: 100


14300
11880
9770
8410
4800
3450
3260
150

Physical Model

 fig. 141 southern facade from courtyard

fig. 142 perspective of central courtyard

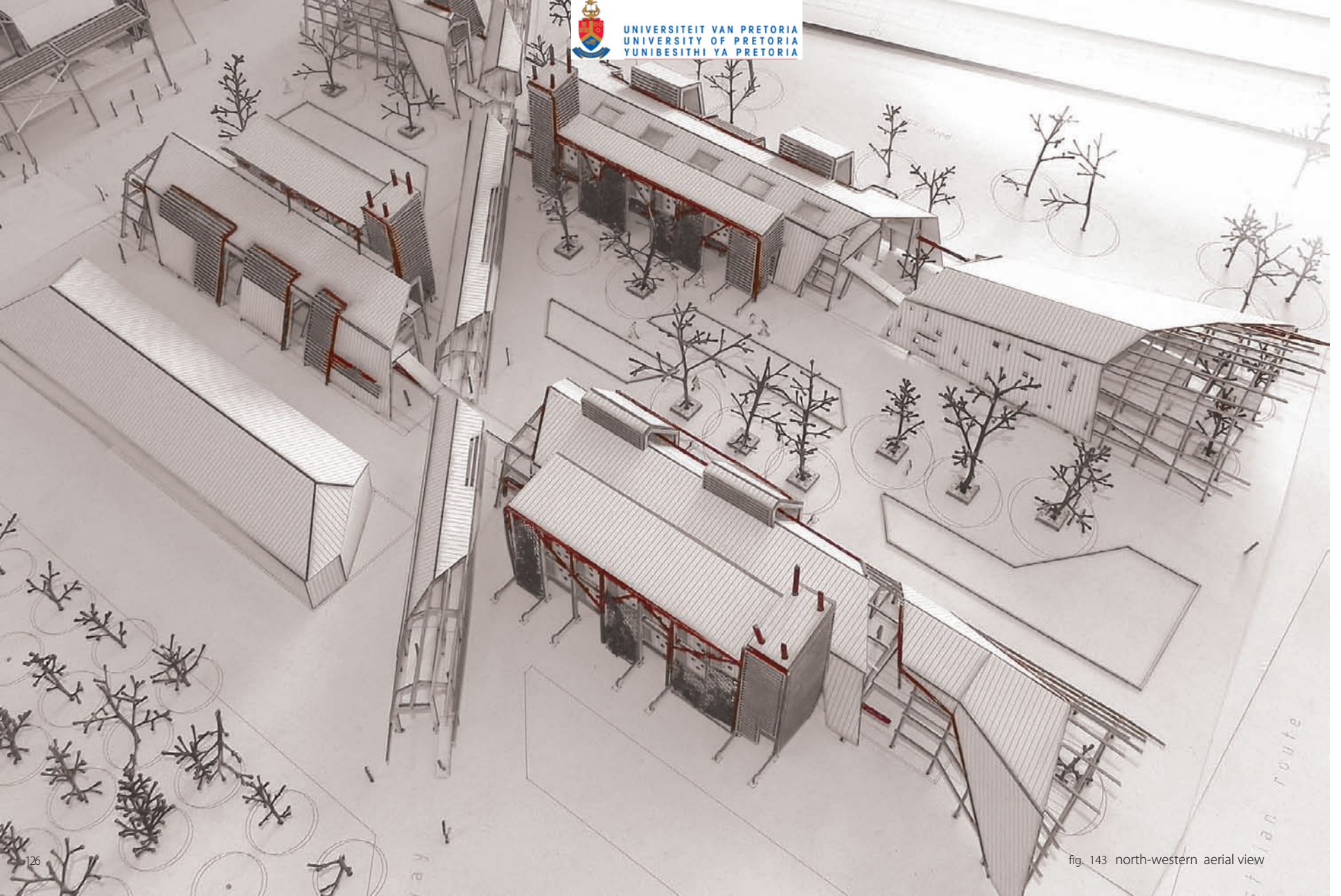


fig. 143 north-western aerial view

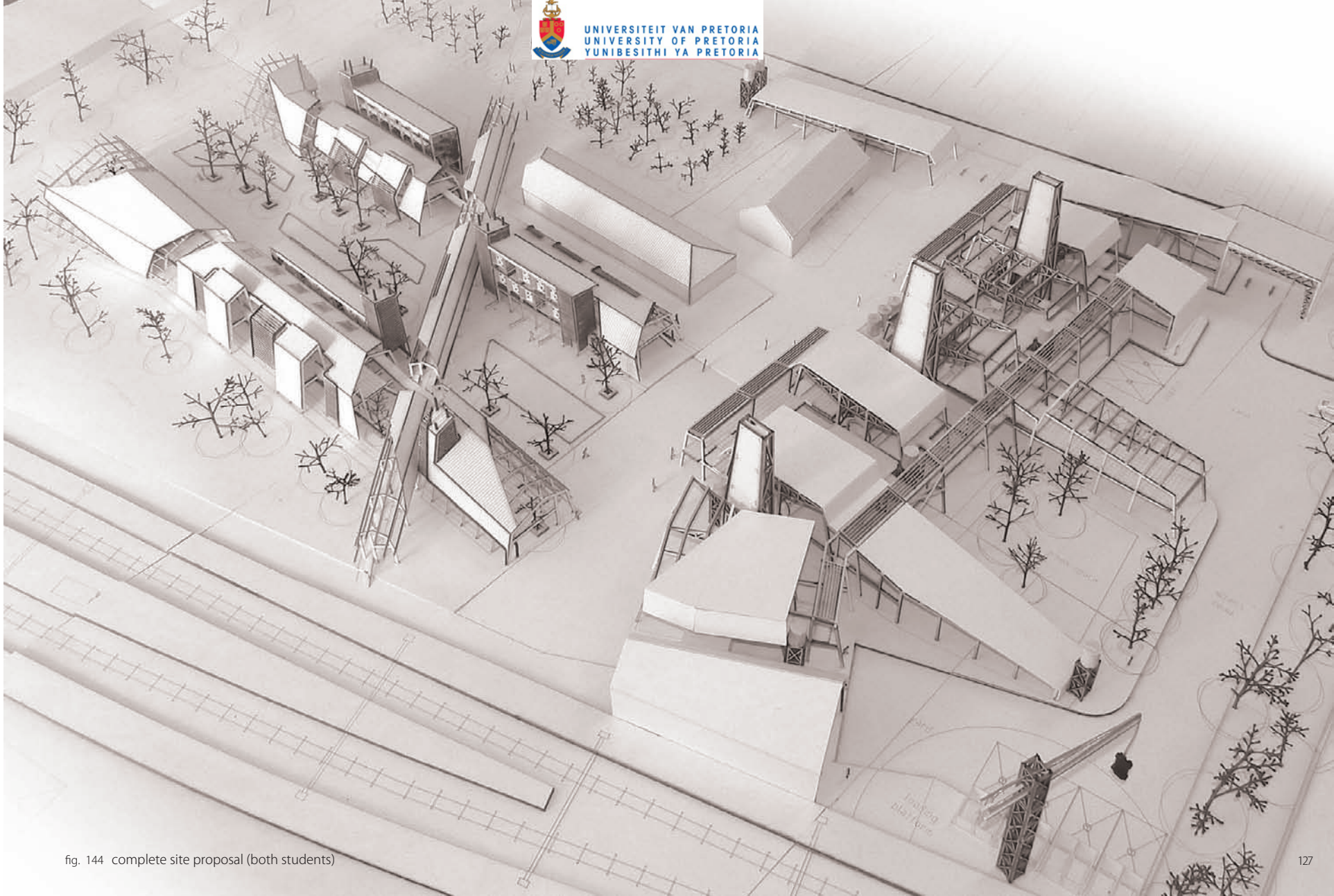


fig. 144 complete site proposal (both students)

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All photographs, diagrams, images and sketches by author, unless indicated otherwise

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08 _ Drawings

_ Physical Model

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