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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.

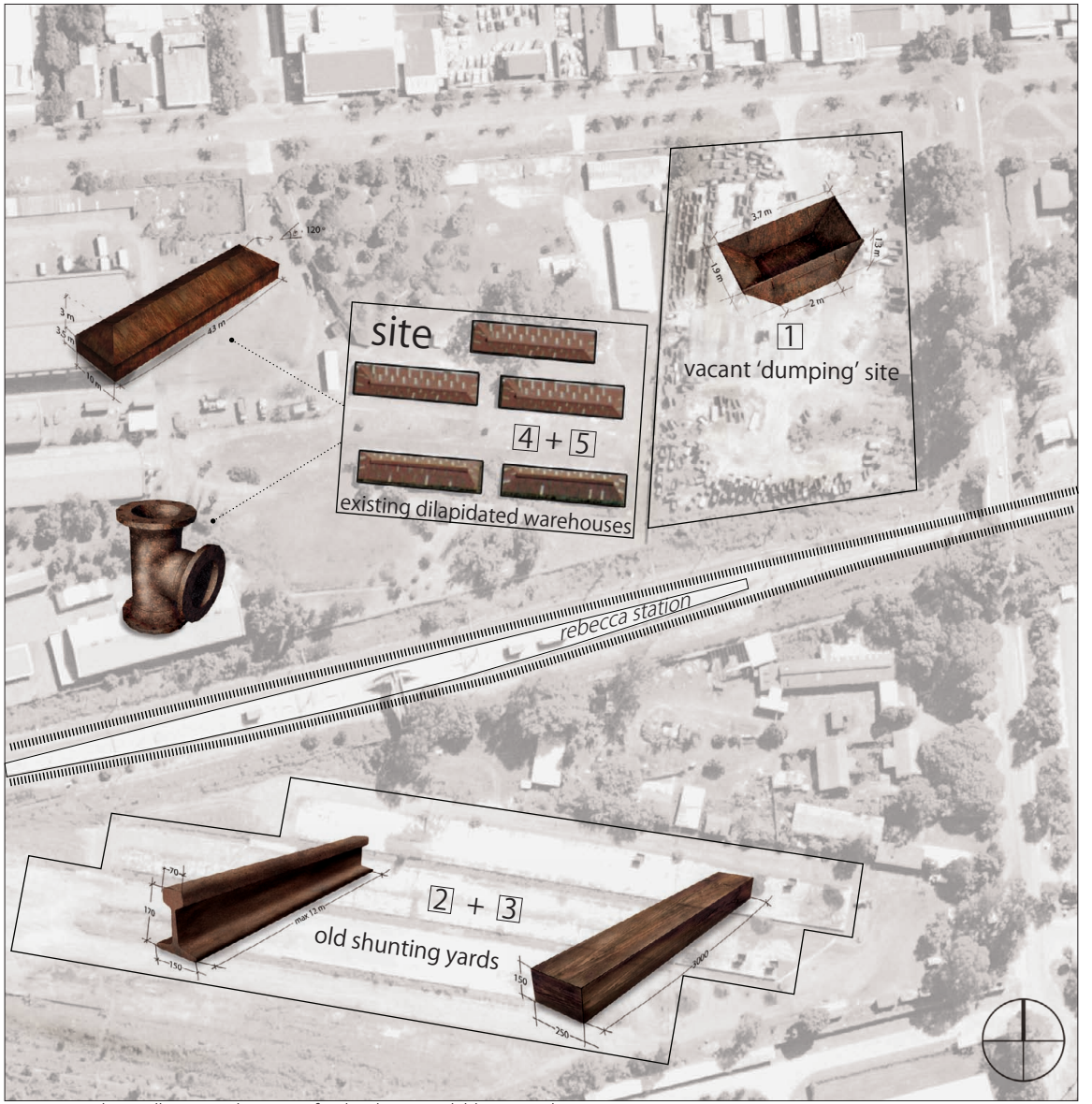


fig. 83 aerial view illustrating location of redundant recyclable materials

01 Dumping / Garbage Containers

Quantity: 328

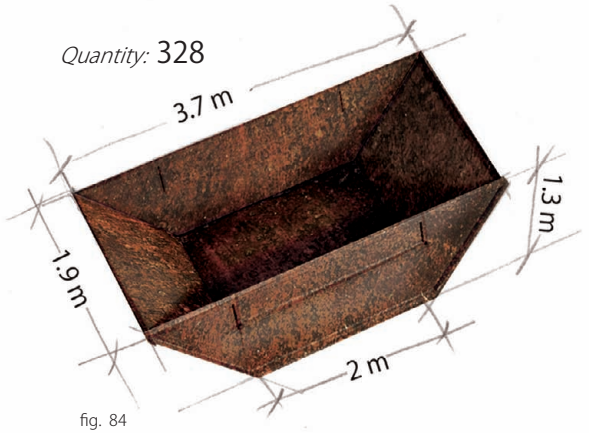


fig. 84

02 Rhodesian Teak Rail Sleepers

Quantity: > 1600

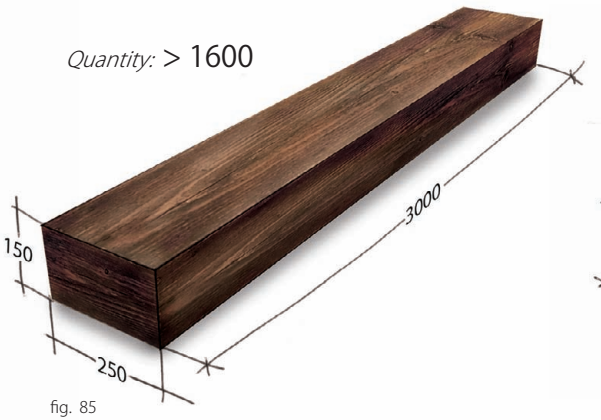


fig. 85

03 Rail Tracks

Quantity: > 4200 m

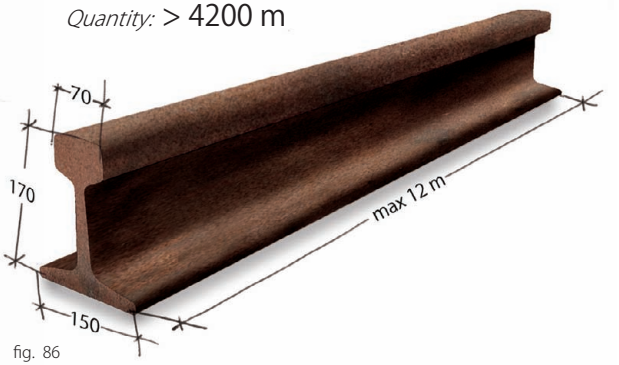


fig. 86

04 Corrugated Steel Sheeting

(existing warehouses)

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

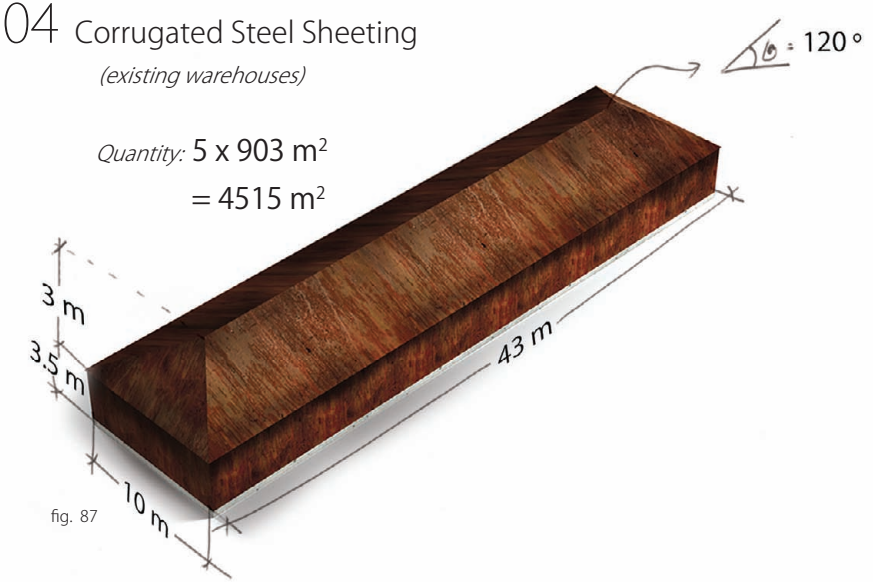


fig. 87

05 Ductile Iron Water Pipes

(currently stored in warehouses)

Quantity: > 1300 m

fig. 88

Residential / Living Environment

Concept _ 01

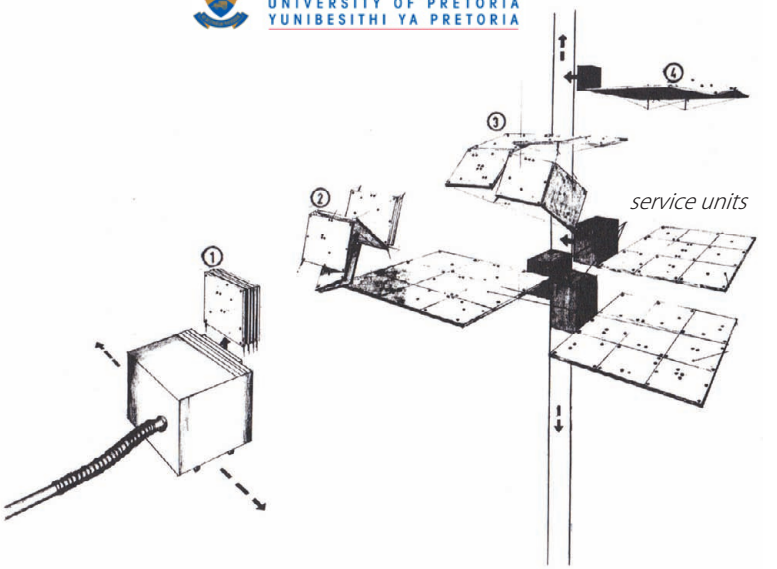


fig. 89 "The erection sequence of a 'Terrapin' structure" (Terrapin bungalo of 1948), Archigram no. 3, August 1963.

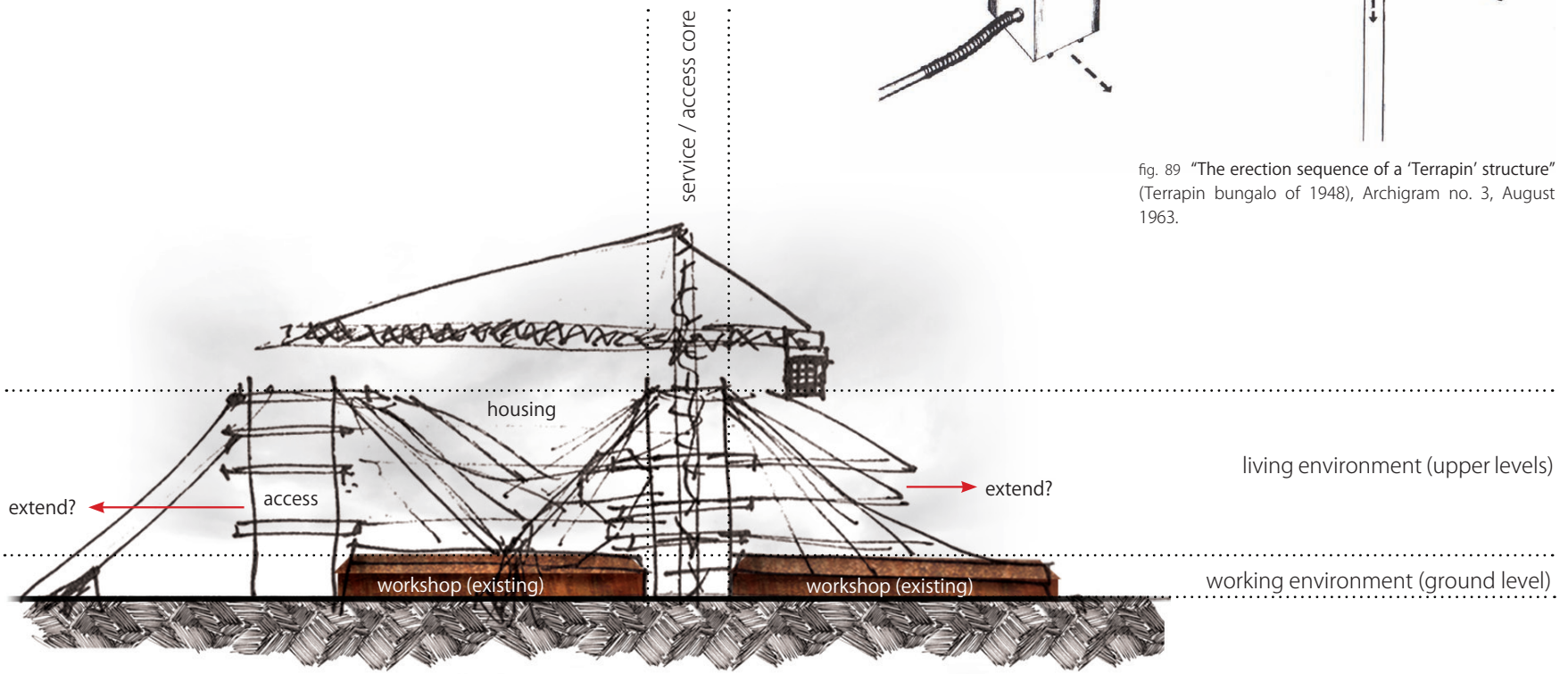


fig. 90 concept sketch based on theoretical principles (southern elevation)

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.

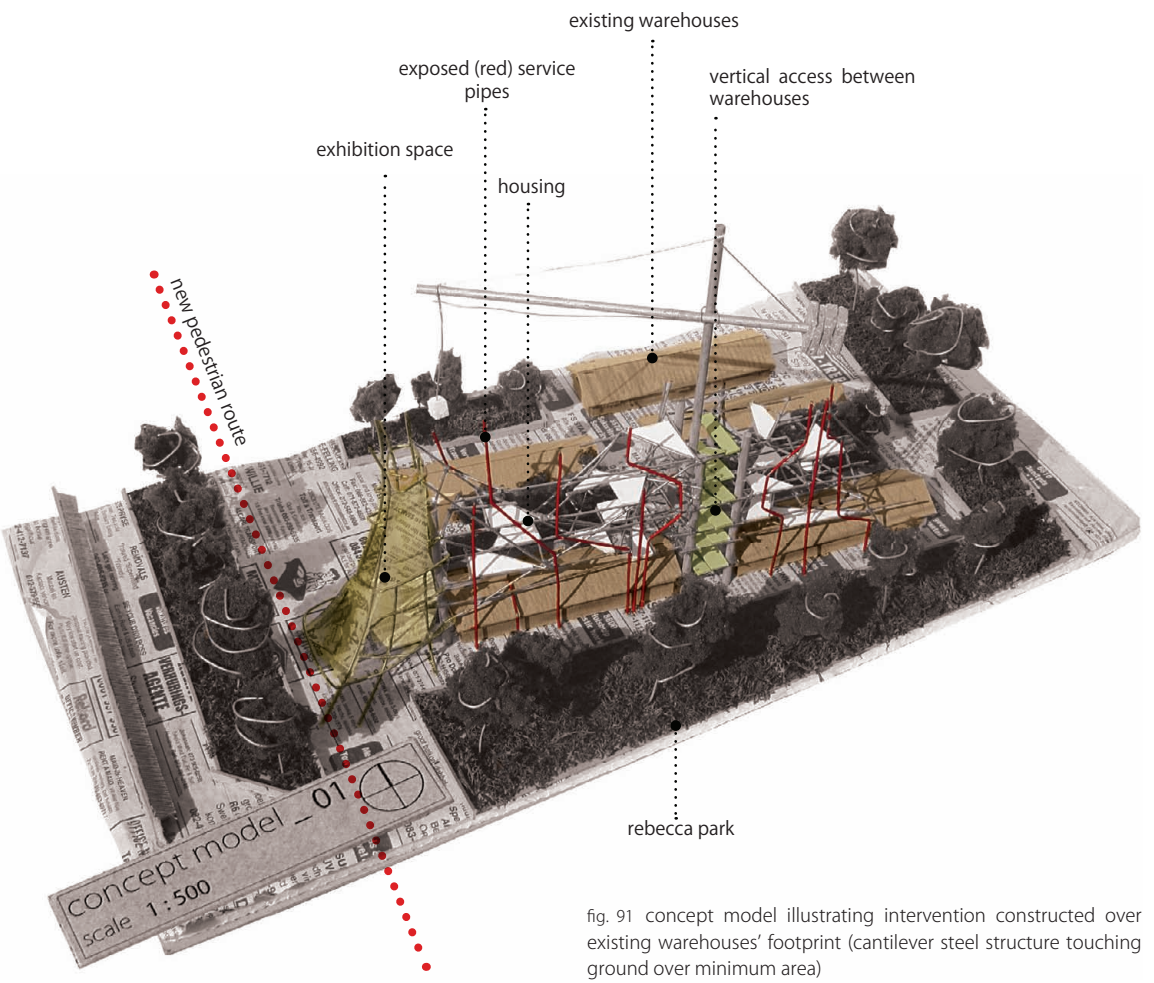


fig. 91 concept model illustrating intervention constructed over existing warehouses' footprint (cantilever steel structure touching ground over minimum area)

Housing Module

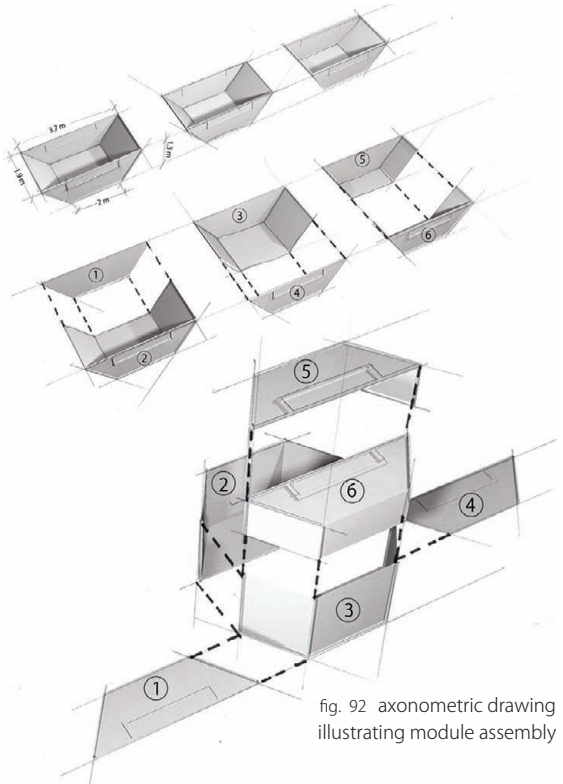


fig. 92 axonometric drawing illustrating module assembly

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).

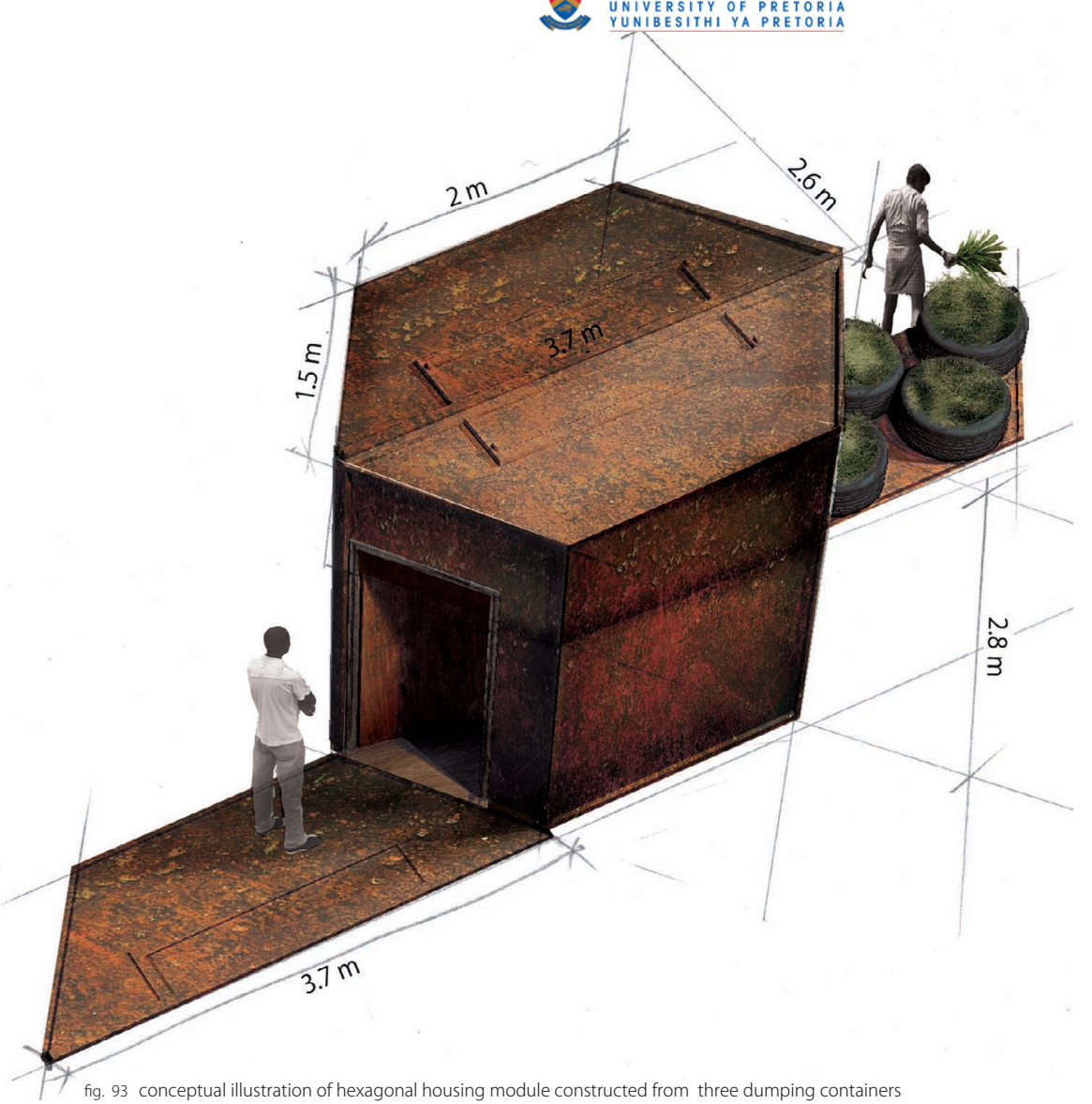


fig. 93 conceptual illustration of hexagonal housing module constructed from three dumping containers

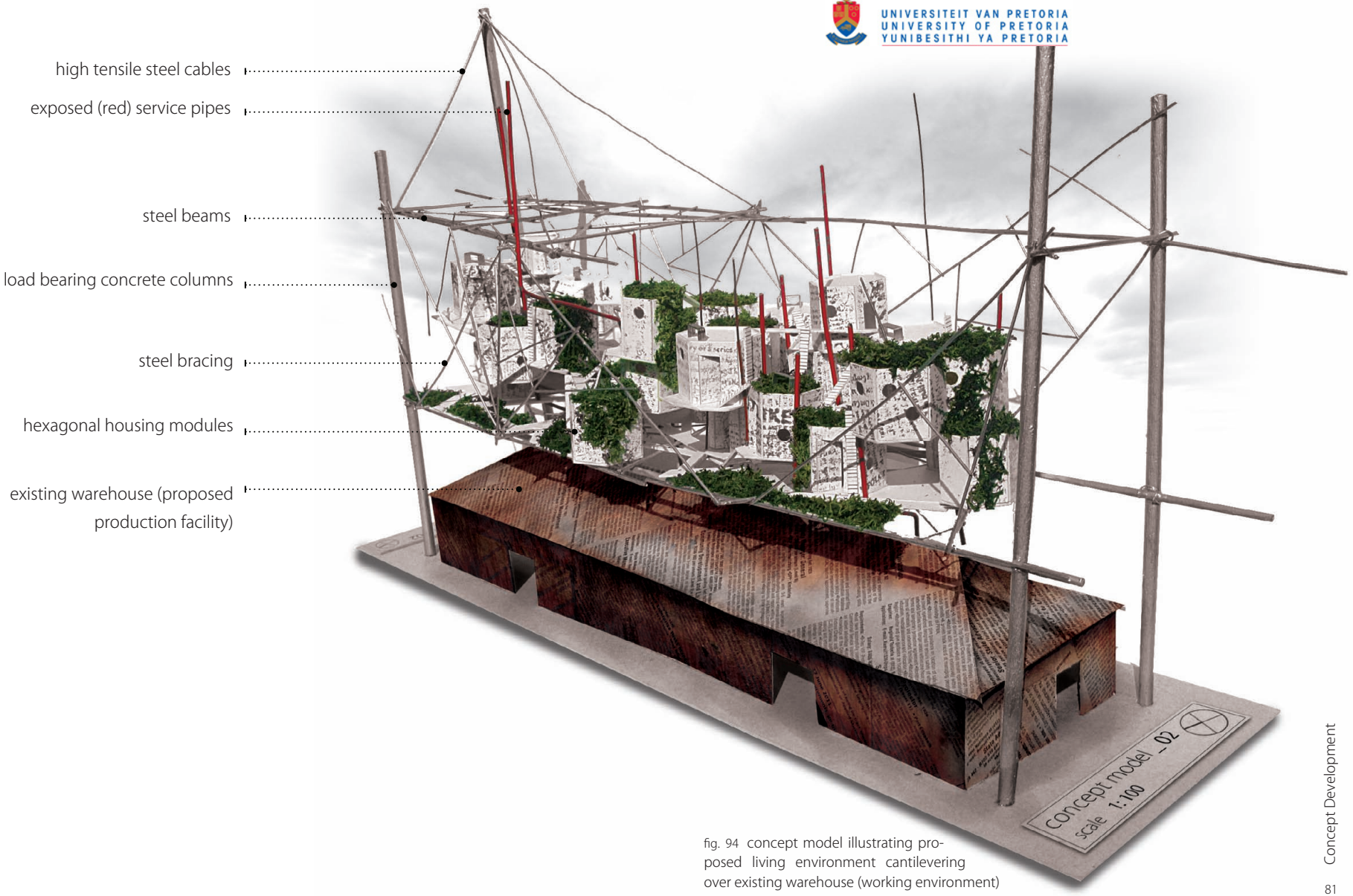


fig. 94 concept model illustrating proposed living environment cantilevering over existing warehouse (working environment)

Elevation - **North**

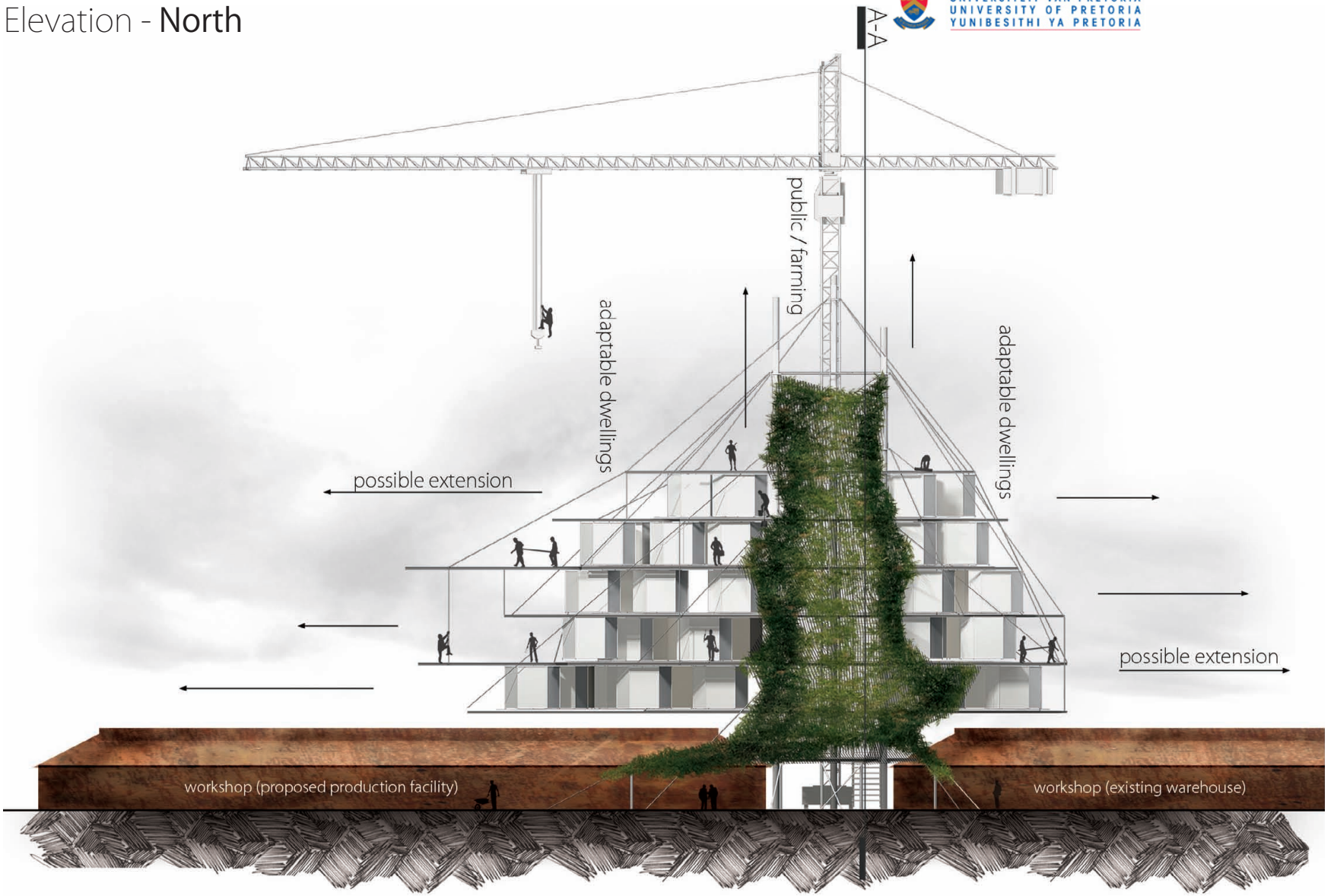


fig. 95 northern elevation illustrating working environment at ground level, and residential environment at upper levels

Section A-A

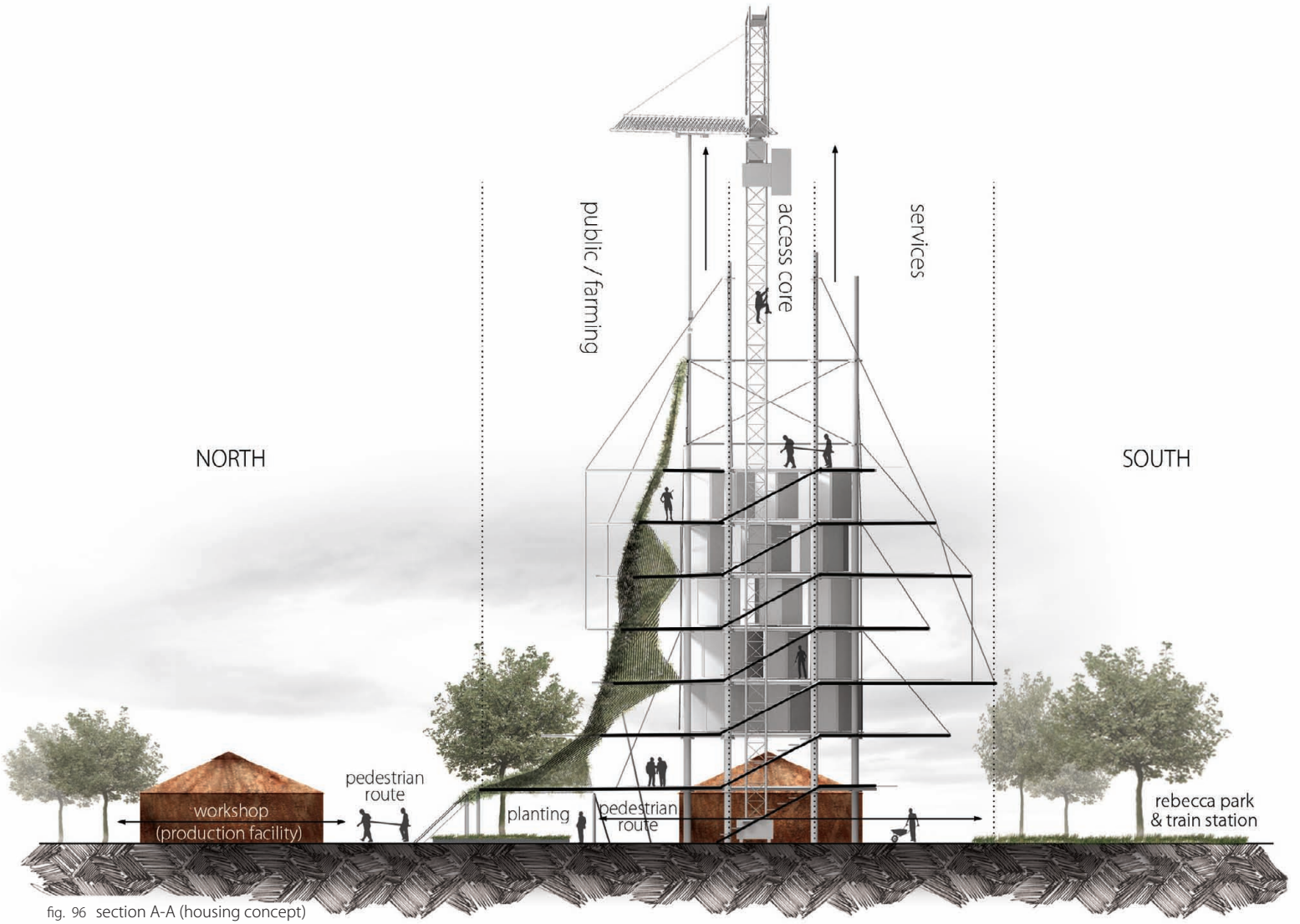
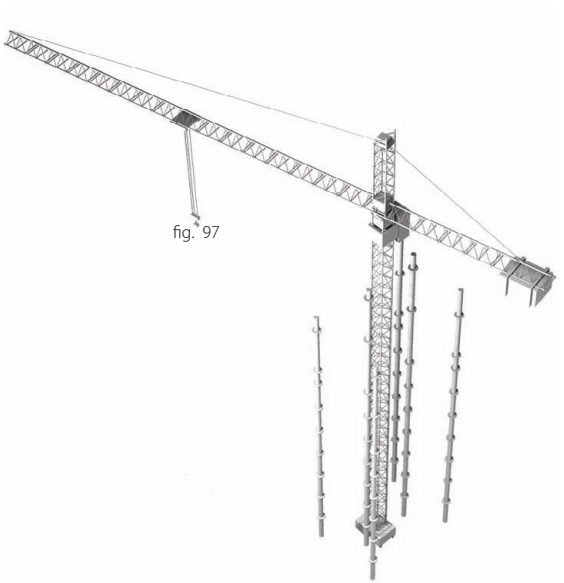


fig. 96 section A-A (housing concept)

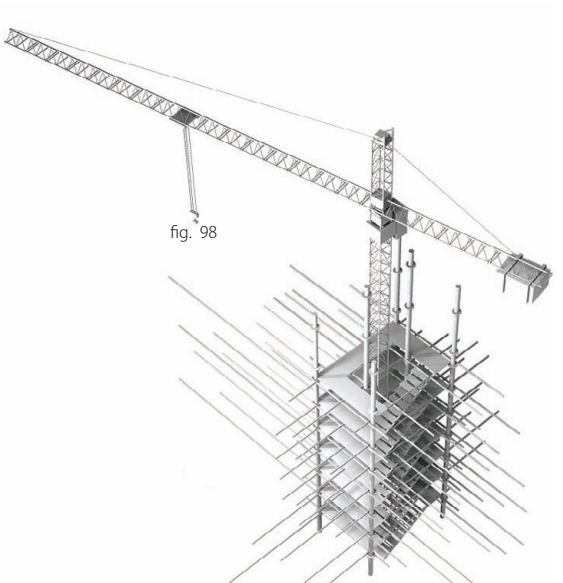
Structure Assembly Process

phase 1



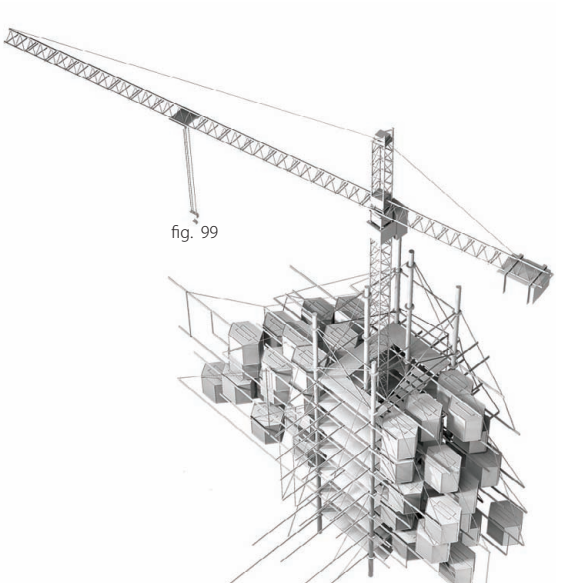
- structural columns & service core

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

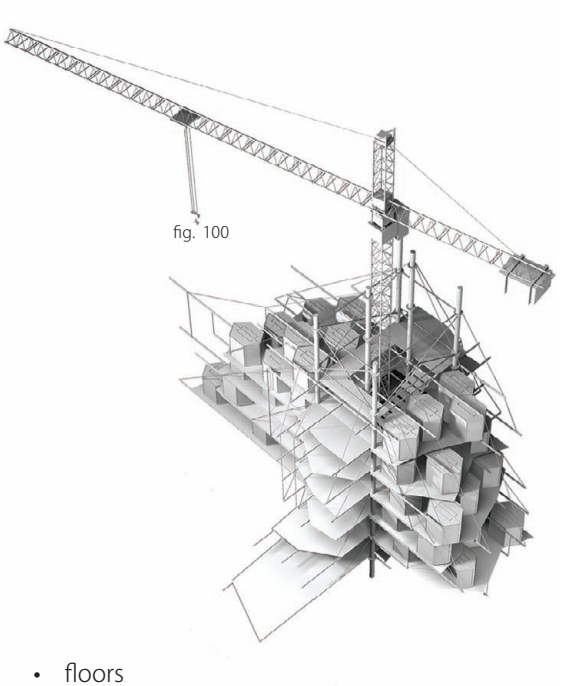


fig. 100

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

phase 5

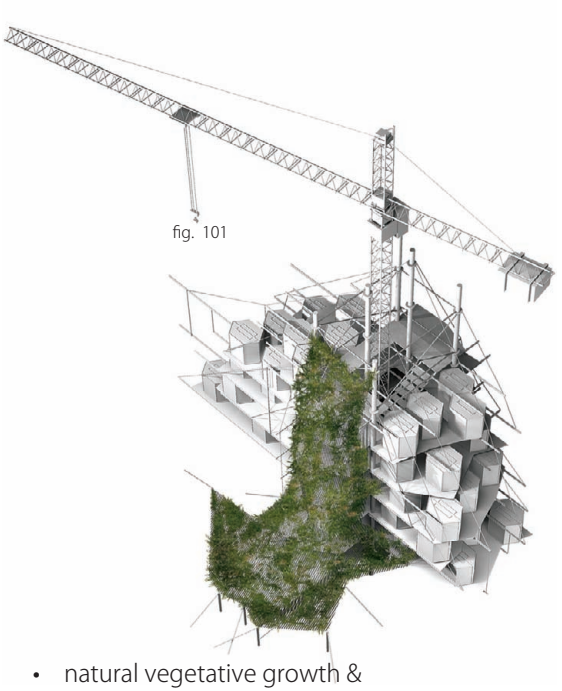


fig. 101

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

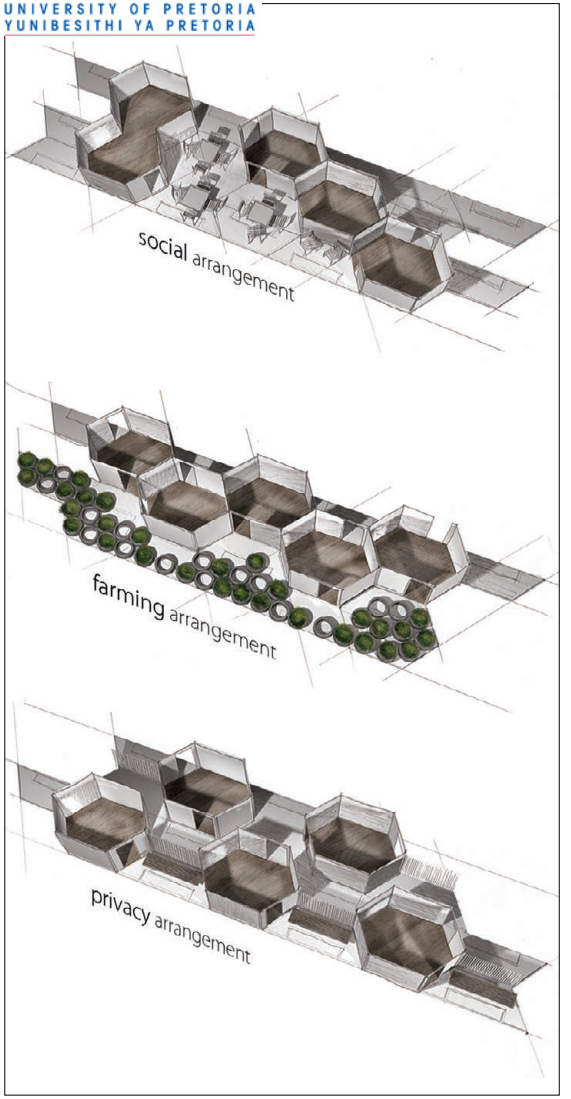


fig. 102 representing the ideology of a *'bee-hive-structure'*, multiple floor layouts are achievable by arranging modules according to social preferences.

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

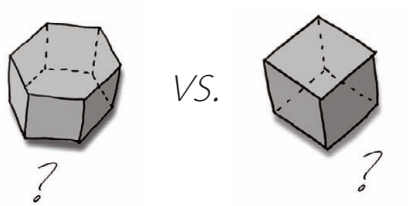


fig. 106

- 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.

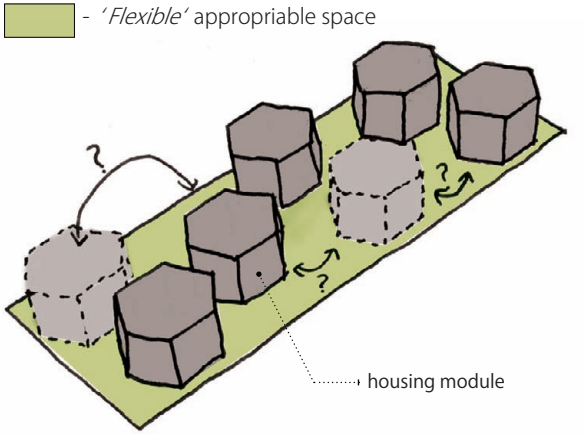


fig. 104 'flexible' social spaces determined by modular configuration (private housing units)

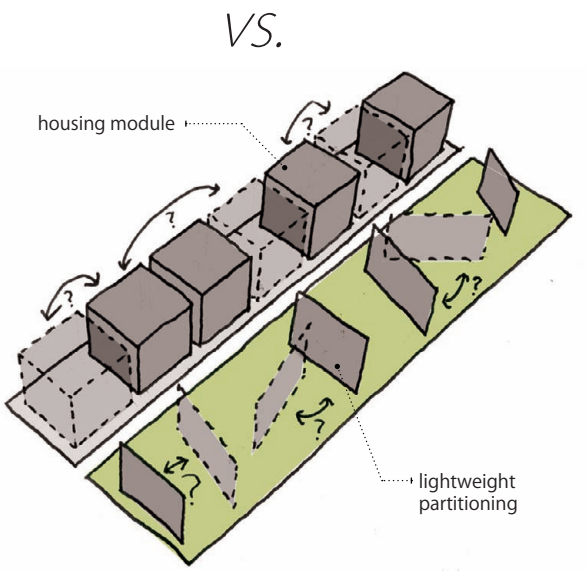


fig. 105 'flexible' spaces determined by lightweight partitioning (independent from module displacement/configuration)

Production Facility / Working Environment

Concept _ 02

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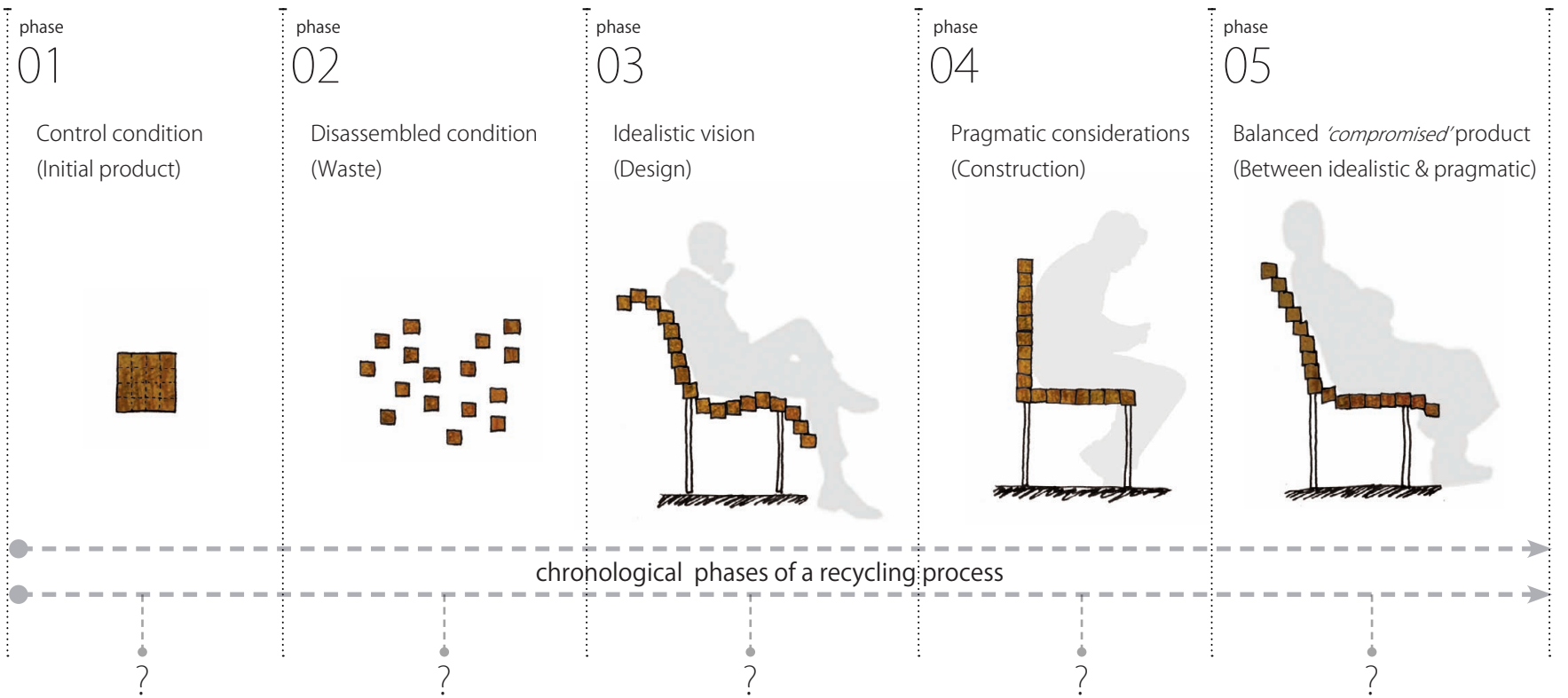
'the halfway house' = Production Facility = Recycling Process

fig. 108

fig. 107 chronological phases of a recycling process



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

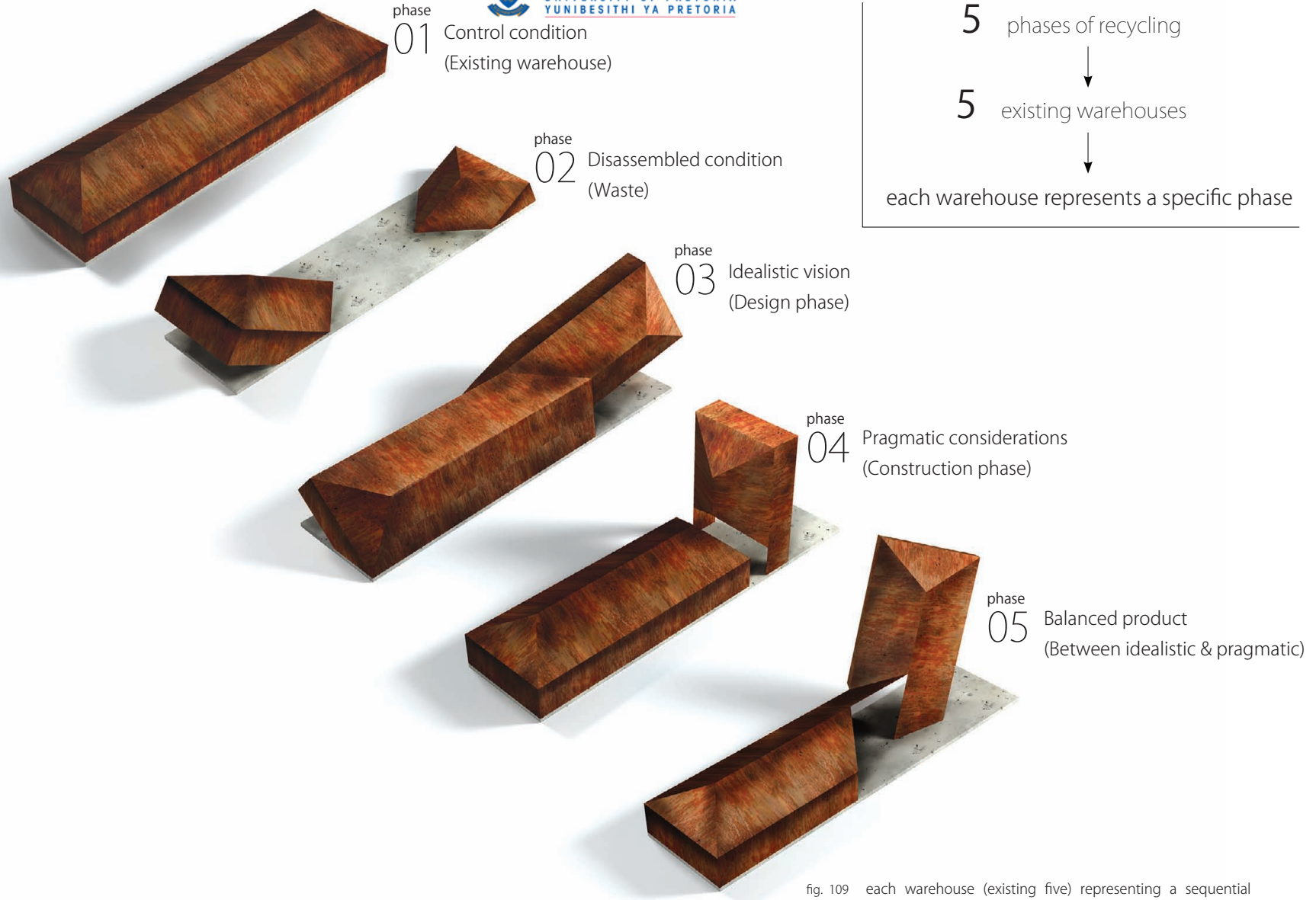


fig. 109 each warehouse (existing five) representing a sequential phase in the recycling process.

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

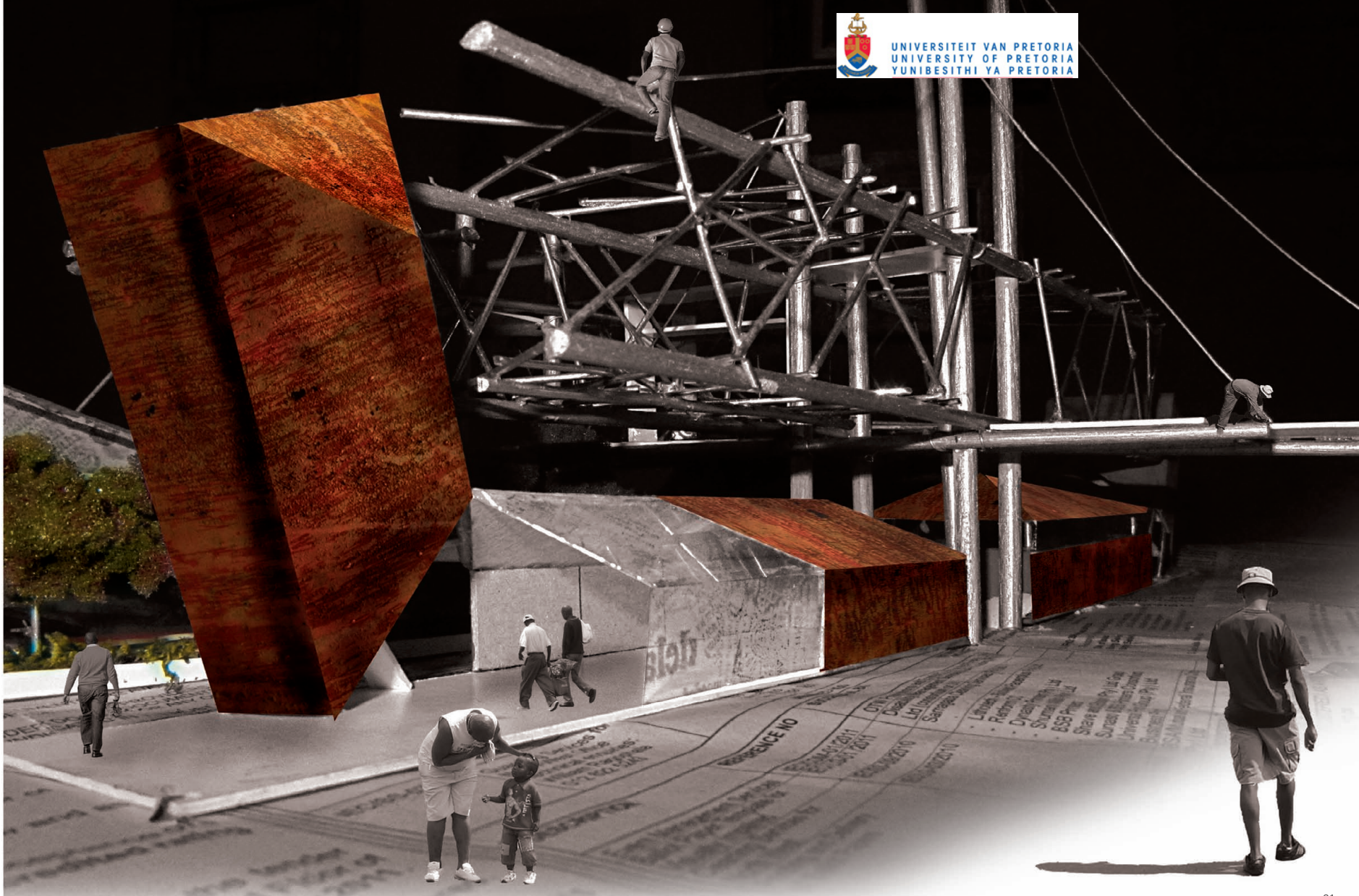


fig. 111 concept model illustrating perspective view of southern facade (principal facade)

Areas for Improvement

Warehouse representing a specific phase

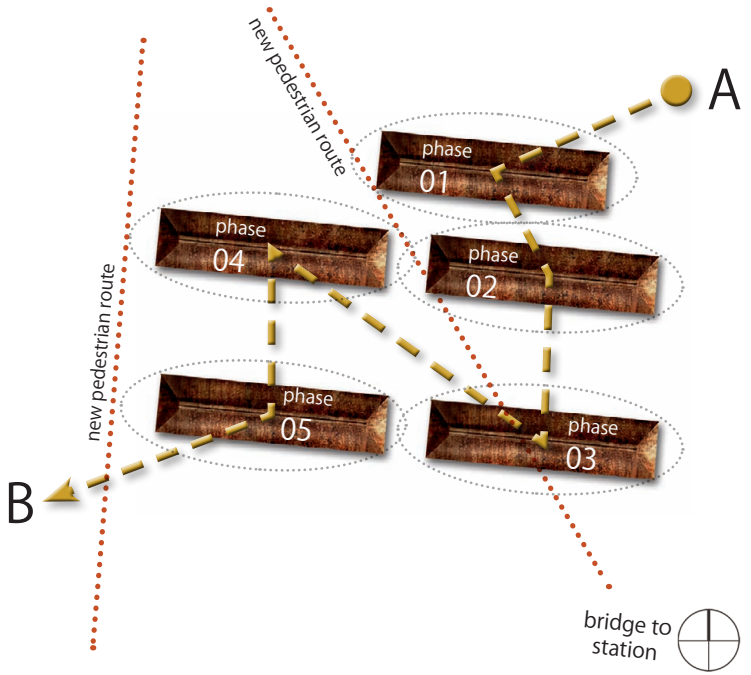


fig. 112 disorientated meandering process

- 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

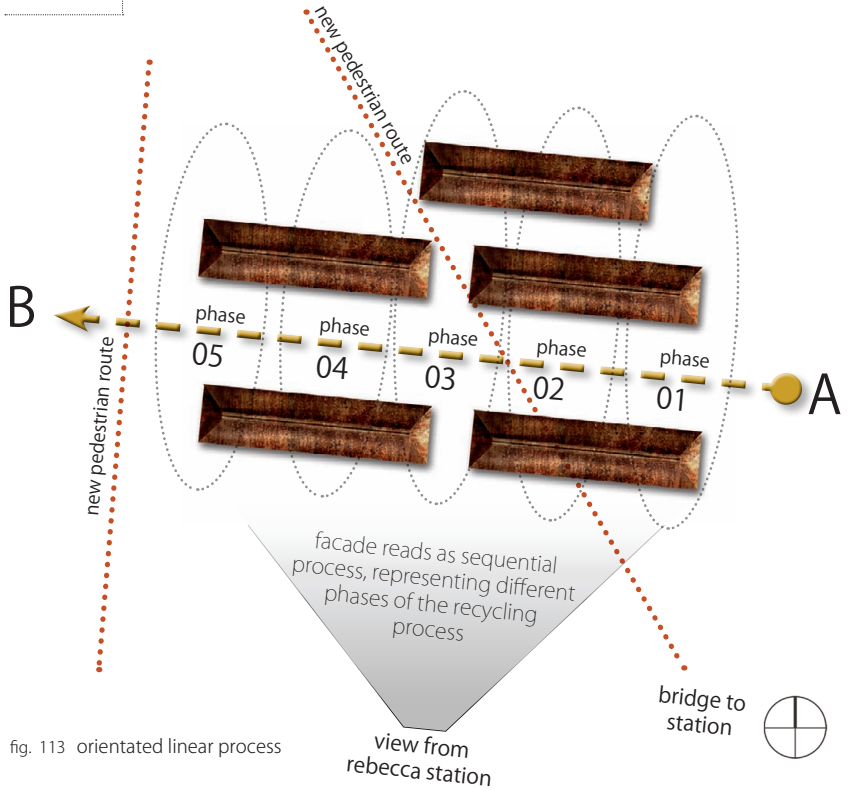


fig. 113 orientated linear process

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

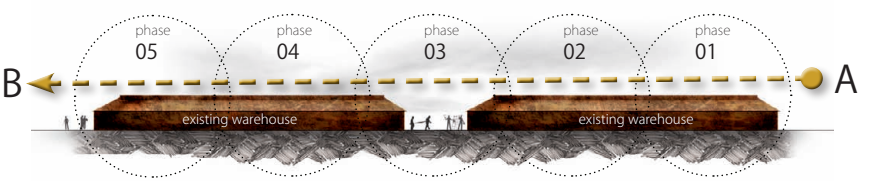


fig. 114 southern elevation (view from Rebecca station) reading as a linear process from East to West

Concept Development Process

Summary

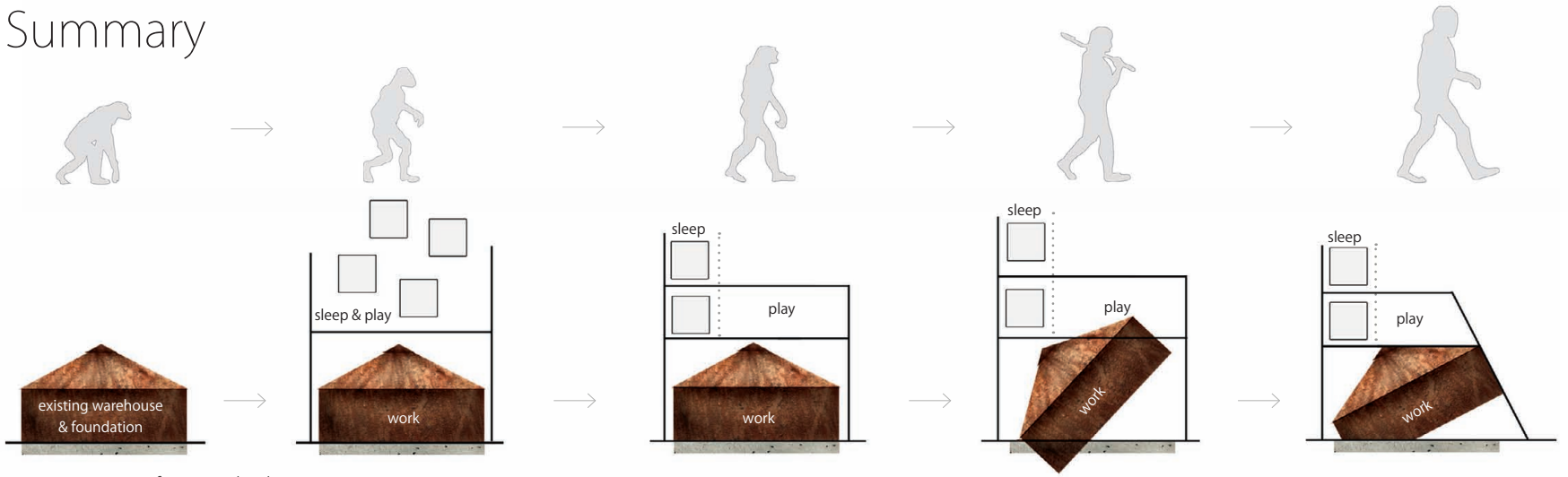


fig. 115 summary of concept development process

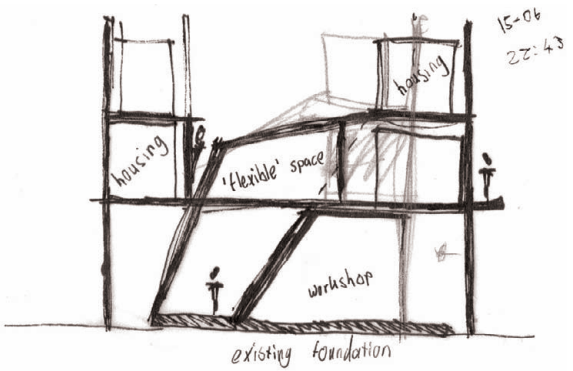


fig. 116 Most influential concept sketch illustrating the integration of the working and living environment. Angles and dimensions are subjected to measurements of the existing warehouses on site

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.