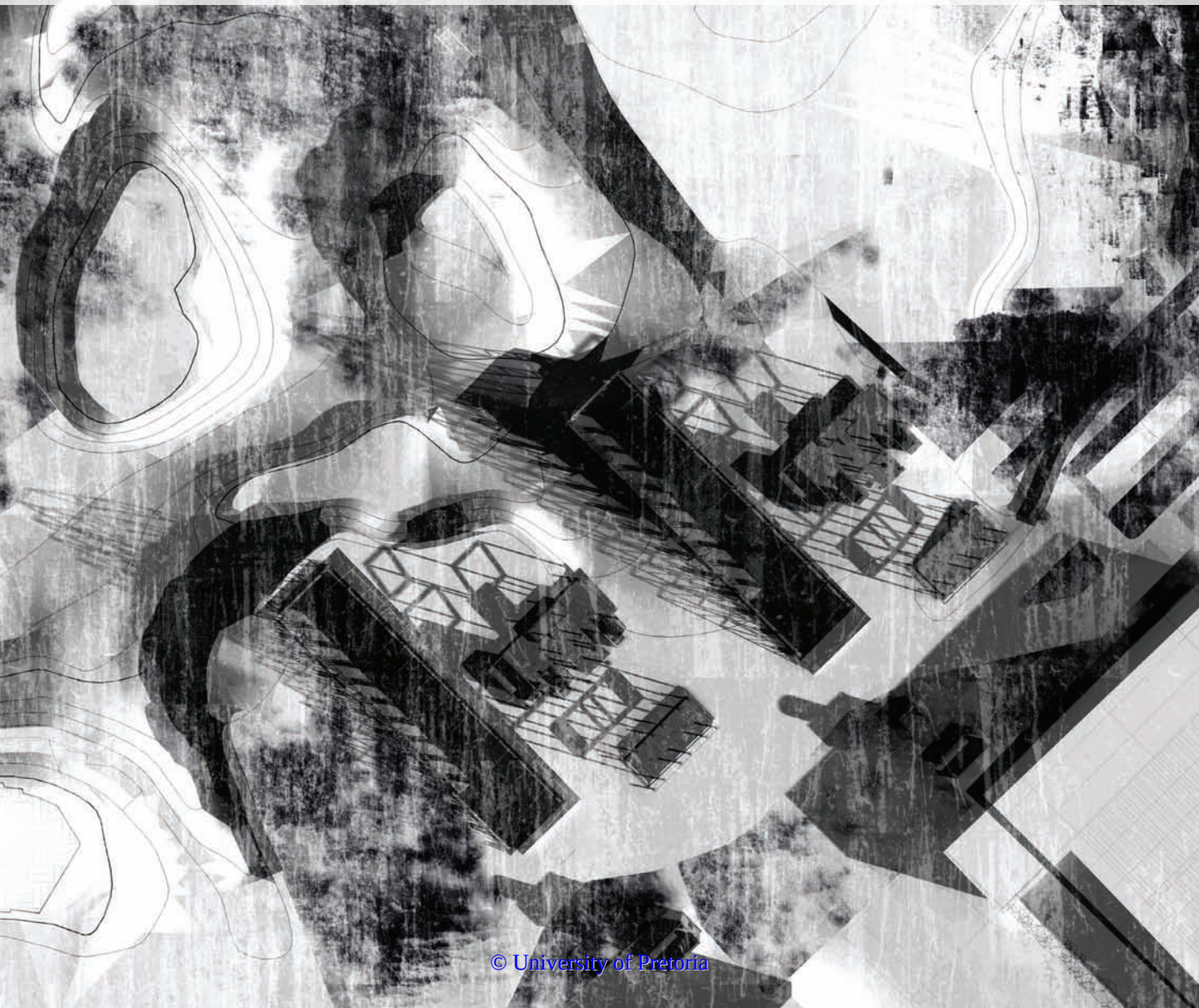
barren praise

an apiary as a placemaking interface in the post-industrial context



barren praise

an apiary as a placemaking interface in the post-industrial context

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Submitted in partial fulfilment of the requirements for the degree of Magister in Architecture, MArch(Prof), to the faculty of Engineering, Built Environment and Information Technology at the University of Pretoria, 2013

Pretoria, South Africa, 2013

Era Brickworks

St Joseph Street, Eersterust, Silverton, South Africa
Erf R/171, 254, 306 Derdepoort 326-JR
25°42'47.65"S 28°18'12.57"E

Magister in Architecture
Post-industrial contexts

Cultural Landscapes/ Environmental Potential
Department of Architecture
University of Pretoria

Thank you to Nico Botes and Arthur Barker for their perpetual involvement and enthusiasm along the way. To the rest, it was good to know I was not alone.

abstract

The relation between industrial enclosures and their environments change in the post-industrial state, which causes a loss of orientation and identification of place. While the inherent character of such a place does not become thinned, it does however become encased in the remnants of industrial activity. The re-assessment, activation and interpretations of the transitions between industrial enclosures and their environments intend to bring the character of a place forward, and therefore emerges its seemingly vague placeness.

The project proposal is situated on the periphery between the industrial and altered natural environment of Era Bricks, a dilapidated quarry which borders on industrial Silverton and Eersterust. The architectural intervention grapples with the transitions between the site's dynamic environmental transformations and the static physicality of its structures. This exploration is manifested as an apiary and beekeeping facility, a formalised industry which cannot be fully contained.

Translated into architecture, the dissertation suggests that beekeeping brings forward and reflects the ungraspable and imposing essence of the post-industrial terrain. Through the layered transitions of this programme, the terrain is aimed at becoming activated in its inherent sense of place.

7 makings 155

8 linger 177

1 overture

That is where my dearest and brightest dreams have ranged — to hear for the duration of a heartbeat the universe and the totality of life in its mysterious, innate harmony. (Hesse 1910:6)

To know *where* one is and to know *how* one is, in other words to orientate and identify oneself within a place, are essential concepts to dwelling, to the essence of a place. To dwell is to be exposed to the totality of a place, an experience of three dimensional spaces interwoven with the atmosphere and with the character of a place.

Norberg-Schulz (1974:423) writes that one may orientate oneself without feeling at home, or that one may feel at home without being well acquainted with the spatial structure of a place. Yet the independently changing experiences of orientation and identification, related to elapsing time, do not thin the inherent character, the essence or thingness of a place. While encased, transformed or buried over time, the essence of a place remains ever present, brought forward through architecture and event.

The emergence of place, in specifically the post-industrial context and terrain, is discussed in the opening chapter as the underlying investigation in the dissertation.

1.1 places

A huge mound of sun-dried brick worn into shapelessness by time, weather and depredation, the Ziggurat at Ur (fig. 1.1) emerges from its environment void of its initial function. Composed of unfamiliar and redundant programmatic spaces, it is the totality of the place that remains. The ruins capture horizontal and vertical elements, laying out a continuity and rhythm between earth and sky, expressing a centralisation, direction and extension.

Norberg-Schulz (1974:422) states that ancient man found it is of great existential importance to come to terms with the genius loci of a place. In ancient Egypt, the country was not only cultivated in accordance with the Nile floods but the structure of the landscape served as a model for the lay-out of the public buildings and gave man a sense of security by symbolizing an eternal environmental order. Exemplary of this is the Mortuary Temple of Queen Hatsheput in Deir el-Bahari of circa 1500 BCE (fig. 1.2). The temple rises from the valley floor in three colonnaded terraces which are connected by ramps. Specific in layout and function, the structure is carved out of and simultaneously into its environment. In a contemporary sense the place has become void of function, yet its sense of place, or its sense of totality, remains gathered and clarified.

Figure 1.1 (opposite above): Ziggurat at Ur, c. 2100 BCE by THE BRITISH MUSEUM (DE LA CROIX & TANSEY (EDS.) 1970:36)

Figure 1.2 (opposite below): Mortuary Temple of Queen Hatshepsut, Deir el-Bahari, c. 1500 BCE by HIR (DE LA CROIX & TANSEY (EDS.) 1970:79)

1.2 placemaking

Buildings relate to their environments by resting on the ground and rising to the sky (Norberg-Schulz 1974:417). They consist of enclosures, which gather what is known, and these enclosures are given function through openings that relate to the outside. This gathering function, or rather this place, is clarified and brought forward through its internal foci, its concrete thingness. This concrete thingness, together with the inherent character of a place allows a complete grasp on the every-day life world. However, certain contexts, such as industrial precincts, work within a fabricated, enclosed system, removed from the everyday life world with no intention of making place.

Industrial contexts relate to their environments in a practical sense only. The industrial context shows an imposing space, yet at the same time an overwhelmingly removed character of place. Where enclosures are given function through openings that relate to the outside, the industrial building does not relate to the outside, but rather relates to itself. This is because the industrial building is drawn from orientation of function, and therefore leaves identification of place to chance.

However, as the industrial context becomes functionless, the physical enclosure becomes untied from the self-relating, function-giving opening. The now functionless structure unravels itself from its enclosure and forms a relationship with the outside.

When the functionally oriented industrial scape becomes functionless, its identification of place is no longer left to chance, but gains the autonomy to become inherent to the place, emerging as part of its environment. Over time, these manifestations of structure and spirit of industrial scape become inherent to the totality of *place*.

Irene Curulli (2006:32) argues that these forgotten yet present places, when interpreted and read, hold an indispensable heritage that stimulate both perception and inspire memory, uncoiling the amnesia of the site instead of clutching onto sentimental nostalgia.

The dissertation explores placemaking in the post-industrial scape where functionless structure and scarred landscapes become inherent to the totality of place within the concept of enclosures relating to their environment through openings. The manifestations of this concept are discovered, unravelled and instilled through intervention, bringing forward the character of the place in its totality and allowing one to dwell, to be.

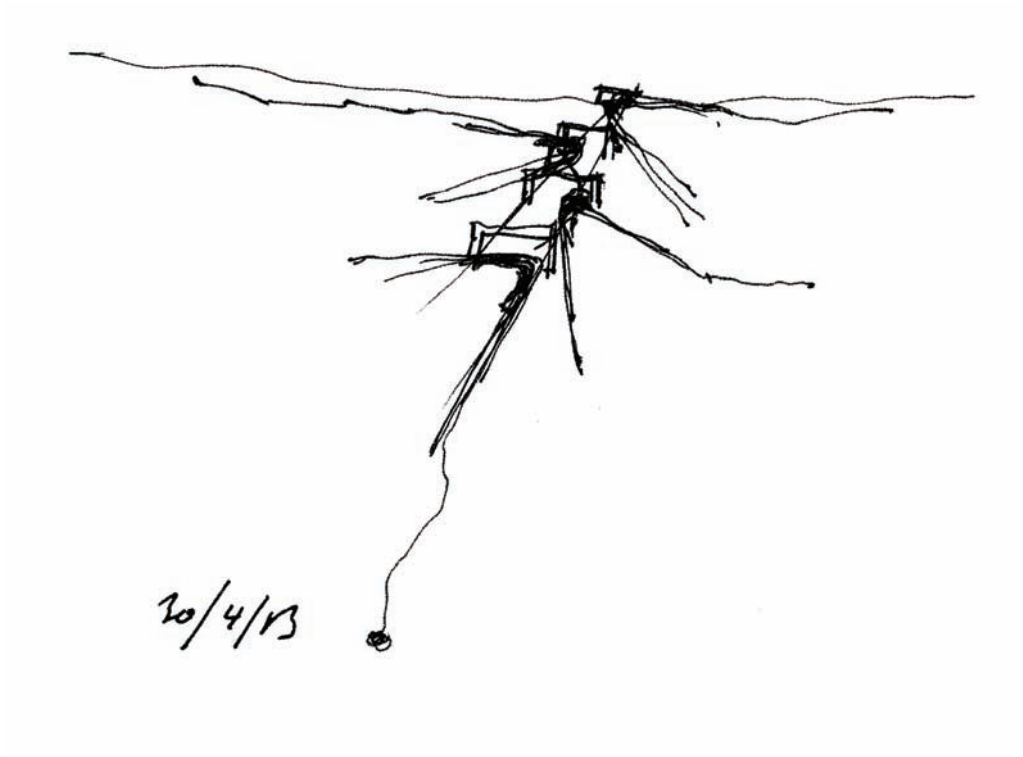


Figure 1.3: Emergent placemaking in the post-industrial scape. Sculpted by intervention, the essence of the terrain is brought forward

1.3 a key note

It was a town of red brick, or of brick that would have been red if the smoke and ashes had allowed it; but as matters stood, it was a town of unnatural red and black like the painted face of a savage. It was a town of machinery and tall chimneys, out of which interminable serpents of smoke trailed themselves for ever and ever, and never got uncoiled. (Dickens 1907:19)

Even though it drove modernisation and conventional living standards, industrialisation furthered individual anonymity and displacement from the inhabited landscape. This passively accepted indifference of purpose and place, this unnatural sense of being was a fully conscious notion as early as the industrial revolution. William Blake speaks of the *Dark satanic mills* that encase a once promised land (fig. 1.4) and Charles Dickens's Hard Times of the early 1900s narrates the cold, harsh state of anonymity and the struggle the individual has within a context that offers no place for man.

Figure 1.4: Coalbrookdale by Night, an iron-making town north of Blake's London creates an impression of the dark satanic mills Blake refers to. (LOUTHERBOURG:1801)

A new look on architecture came forward through industrial development and middle class aspirations. Architectural delimitations became reflective of the accessibility of material and labour, the growing demands of urban society and the desire to gain authority over the natural environment.

The natural environment saw a transformation into imitation and rationalisation. Interpretations of the natural environment only furthered the notion that the enclosure and opening remain limited in a functionally driven place, removed from the inhabited landscape in its truest sense. In substantiation of this is Joseph Paxton's Crystal Palace (fig 1.5. and 1.6), set in Hyde Park for the Great Exhibition of 1851. Indicative of its age and the future, Crystal Palace foreshadowed an era where pure engineering would fuse with the English romantic landscape to become art (Jellicoe & Jellicoe 1975:270). This romantic tendency, this naturalness above formal order, was deeply based in debate, stylistic judgement and emotion (De La Croix & Tansey 1970:626). While captivating and inventive, the essence of place is left to chance.

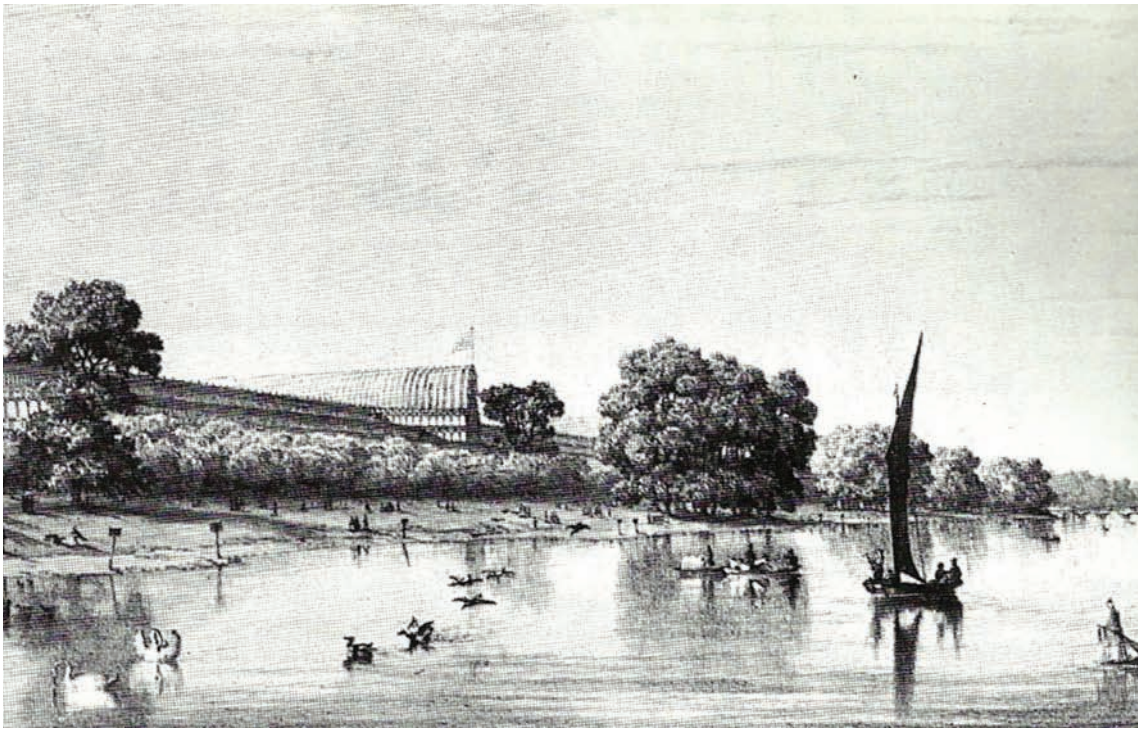
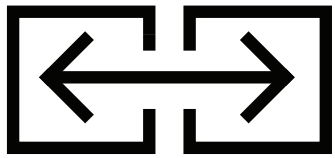


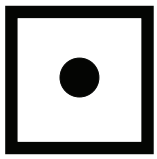
Figure 1.5: The Crystal Palace of 1851, Joseph Paxton (JELLICOE & JELLICOE 1975:271)

The general issue addresses the perception of the post-industrial context. A place is comprised of *enclosures* which gather what is known and is given function through relating its *openings* to the external environment. However, the functionless, post-industrial structure is generally considered vague and meaningless in forging such contextual relationships.

industrial context / / internalized



natural environment / / confined



condition of relationship between industry and natural environment

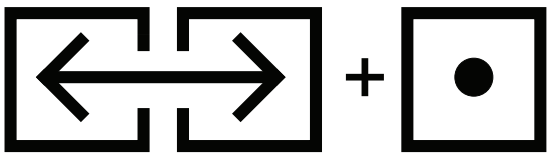
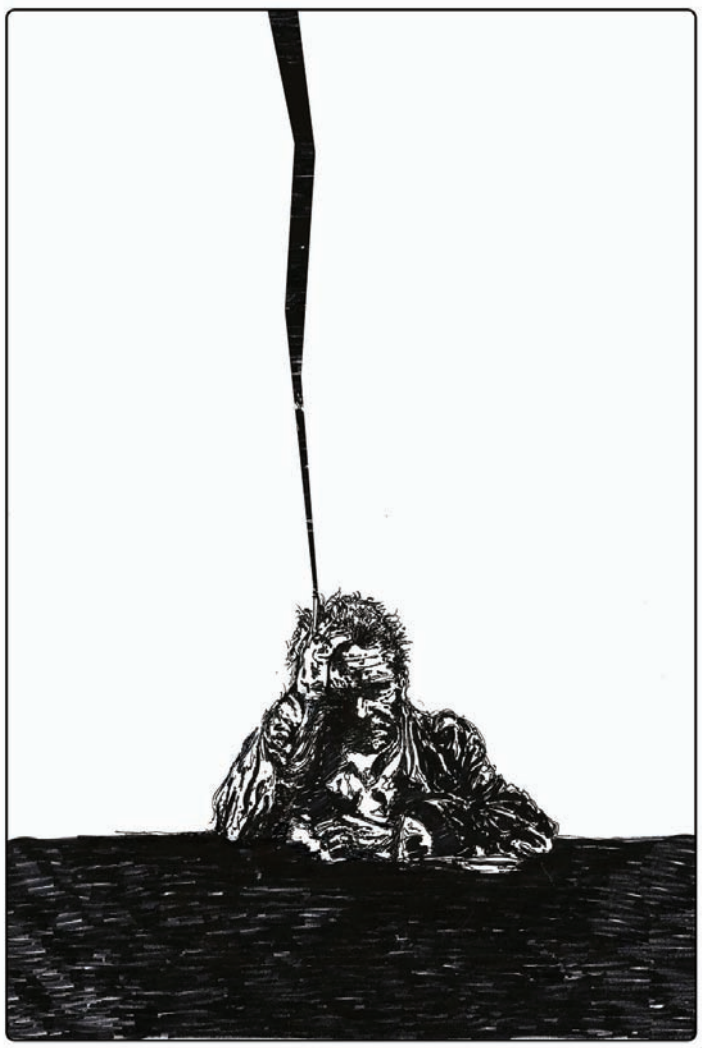


Figure 1.6 (opposite): The Crystal Palace London, 1851, interior, Joseph Paxton (NUTTGENS 1983:240)

Figure 1.7: Characteristic outcome of relationship. A generation of anonymity and question in purpose through inwardly orientated places fosters the removal from the inhabited landscape as dwelling.



vertigos
(industrial context // inwardly orientated places and purpose)

Figure 1.8: Estranged sense of contextual placement

everything scape
(the uninhabited landscape // rationalized and confined)

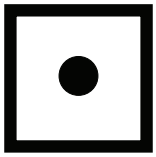


Figure 1.9: Removal from the inhabited landscape

1.4 desert anchors

To dwell fully means to befriend and identify oneself with a place as well as with its orientation. Heidegger (1971:152) reasons that to dwell depends on the totality in function of symbolisation, visualisation and gathering. Heidegger's example of a bridge illustrates this notion where the bridge gathers the earth as inhabited landscape around the stream together in its function as a bridge.

Industrial precincts have the inherent tendency to gather function and character of place in a quantitative sense. Whilst usually being placed in the most appropriate locations, industrial spaces do not consider, or need to consider, the essence of place. Kevin Lynch (1960:7) writes that the world may be broken into named regions, which are organized around focal points and linked by remembered routes. Industrial precincts remain concrete in this sense of spatial function only.

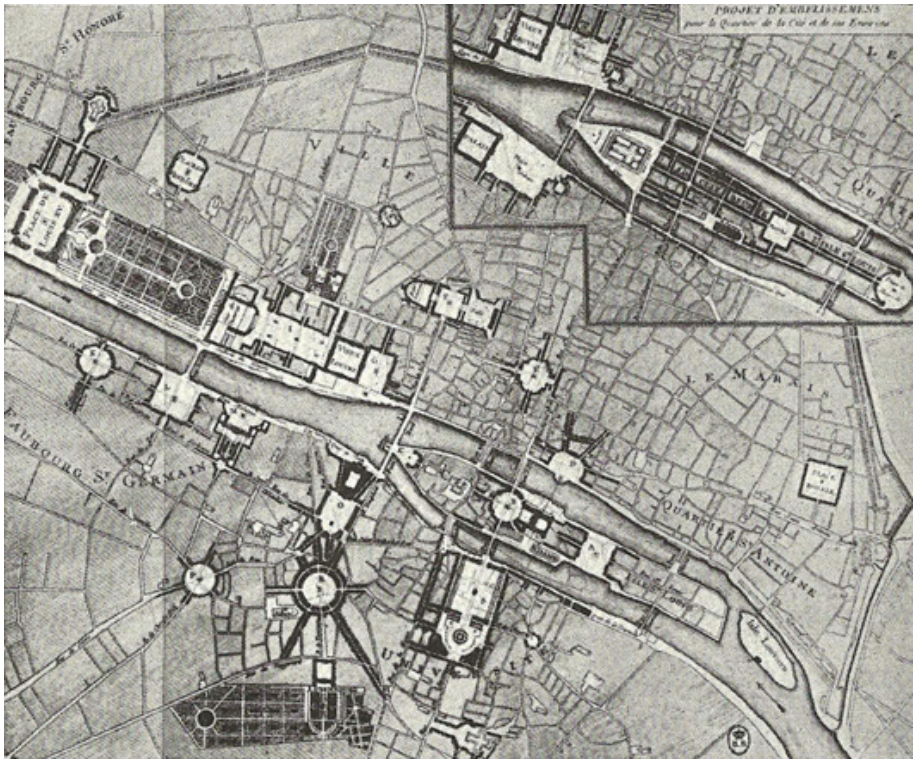


Figure 1.10: Plan of Paris demonstrating the mid-eighteenth century endeavour to organize open spaces of every shape in all possible locations as an analogy to the industrial urbanity by PATTE, 1748 (GIEDEON:1962)

This leaves a fragmented understanding of dwelling, as Norberg-Schulz (1974:423) argues. An urban example of this fragmentation is Patte's plan for Paris of 1748 (fig. 1.10). Even though forming node, path and district, the plan anchors itself wilfully into vastness and an enclosed network of systems. When void of function, these terrains become leftover spaces, leaving gaps in the urban fabric (Curulli 2006:32).

The urban issue deals with the notion of dwelling in the post-industrial context. The urban issue addresses orientation and identification in the post-industrial context to gain public legibility of place. Figures 1.11, 1.12 and 1.13 compare the imposition of industry as a functionally driven environment to the naturally occuring activity within a holistic, yet unseen context.

function of place / / lineaer and imposed

totalities of place / / disregarded and unseen

conditions of a functionally driven context and inhabited landscape

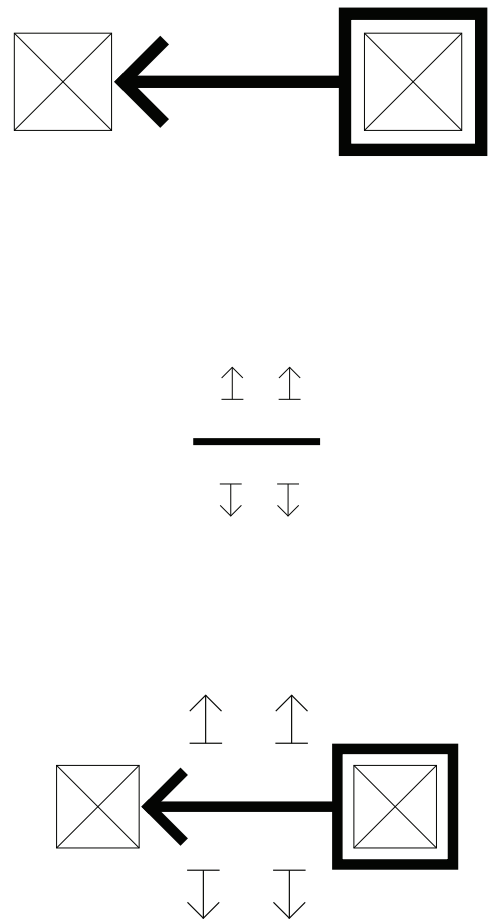
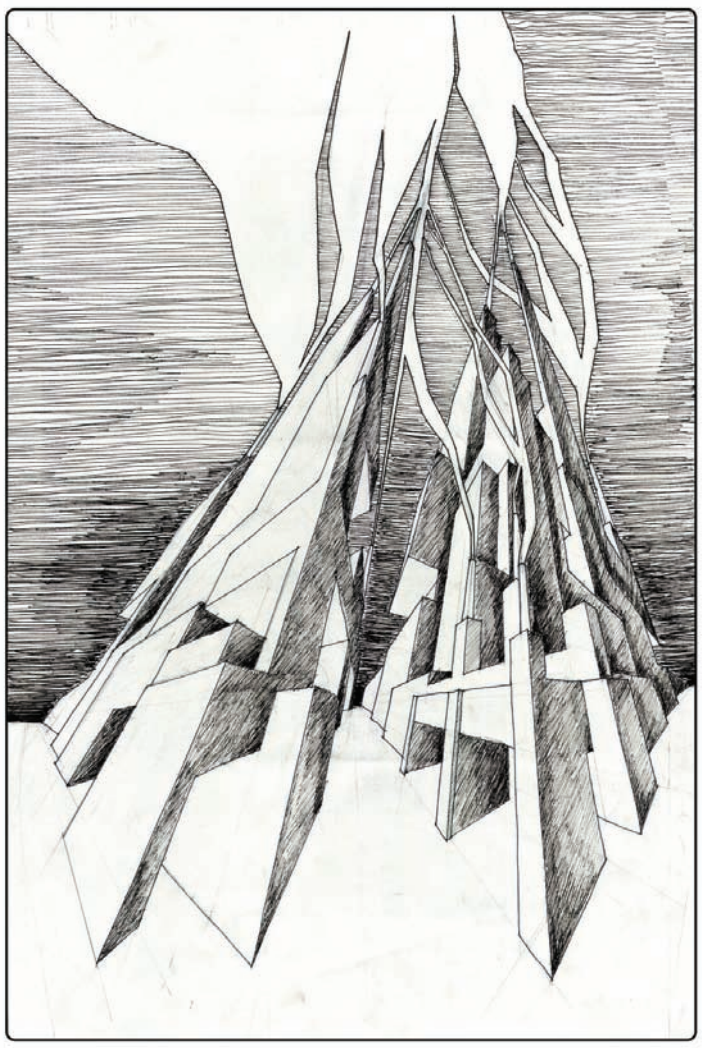
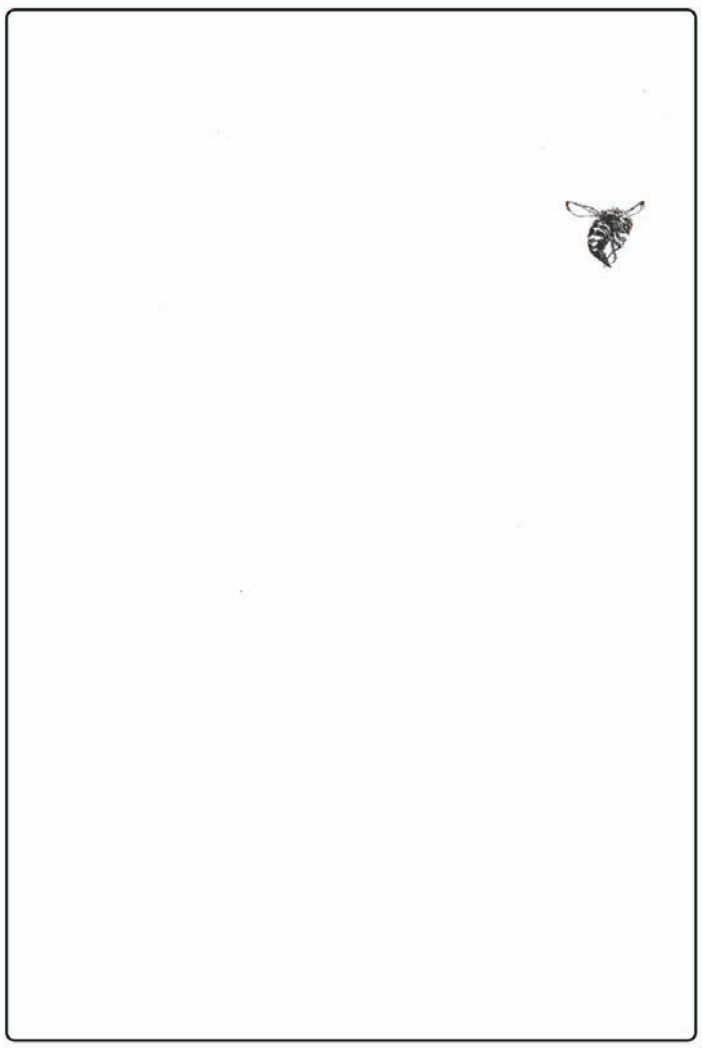


Figure 1.11: Superimposed and unseen everything. Driven by spatial function, the unseen and embedded character of place is overwhelmed and ignored.



superimposer
(imposition of functionally driven place, unrelated to context)

Figure 1.12: Imposition on the natural environment



unseen everything
(naturally occuring activity within an unseen context)

Figure 1.13: Apathy towards the totality of place

1.5 emergent placemaking

The selective gathering function of a place and lack of identification in the industrial terrain result in the remnants being seen as intolerable and as a reflection of contemporary man's dilapidations and anxieties. Intervention therefore, within this context leans toward imposition, ignoring the manifestations of the terrain. Ignasi De Solà-Morales (1996:5) contends in his article *Terrain vague* that these leftover industrial terrains are captured as reflections of derelictions, static which contrasts the utopian visions that the contemporary sensibility holds. These leftover spaces are dominated by the fleeting relationship between the subject and his or her world, conditioned by the rate at which things change (fig.1.14).

Industrial terrains should in their post functional state show potential to be embraced as inherent to the totality of place. This statement is supported by Curulli (2006:33), who coins the term wasteland, a word generally associated with negative connotations. Curulli states that it essentially refers to a land which is left bare to recover for a period of time, requiring close attention instead of apathetic dissection and alteration. Close attention requires an understanding, and therefore forms part of the memories and the stories that the original structure, energies or patterns tell. One deals with imminent demise and birth, which are read and born from perception and memory of the terrain.

Since the modern movement, theorists and romantics have grappled to gain a sense of place in the industrial environment, an overall tendency that leaned towards the vaster landscape and the unseen, yet overt, spaces which ground us within architectural bounds. Mas Yendo explores the reuse of industrial hardware to become inhabitable machines. Within this spectrum, Yendo focuses on psychological effect of industrial architecture within the practical realm (fig. 1.15 & fig 1.16). Yendo explores the qualitative essence of existential space and place making, and in this instance, of machinery. Governed by event, geography, gender, culture and time together with material substance, shape, texture, light, sound and smell, the machine emerges as a place and allows the viewer to anticipate and be placed within the environment.

Figure 1.14 (opposite): Collage; Goya's *Saturn devouring his children*. Saturn, the depiction of time, devours a torn and ripped man. The reflection of an industrial context shows the inevitable dereliction over time, a contrast to the utopian visions contemporary sensibility holds (DE LA CROIX & TANSEY (EDS.) 1970:641)

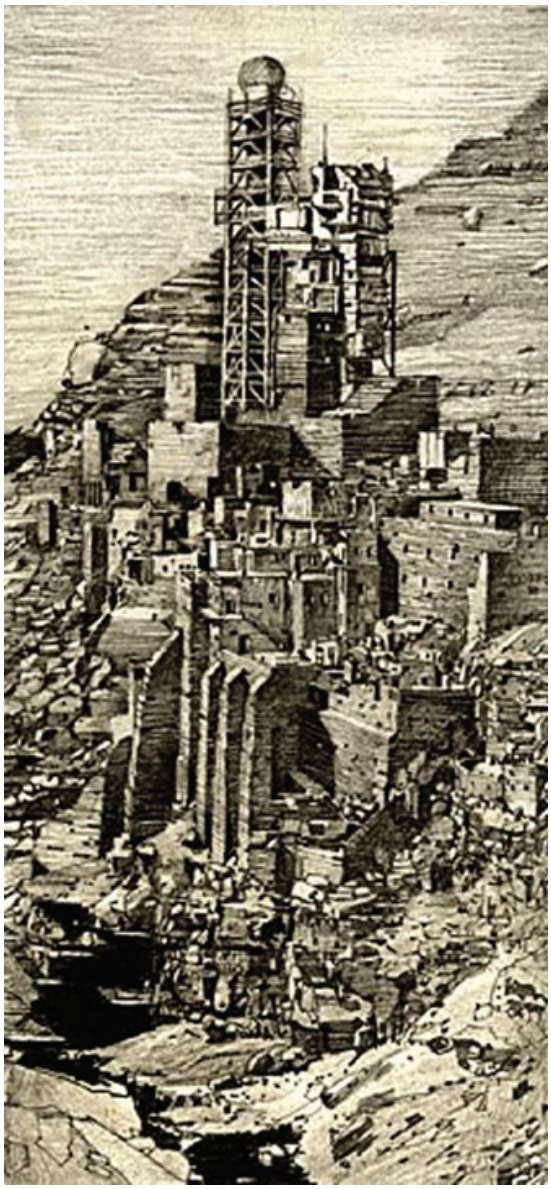


Figure 1.15: UL-9005 (YENDO 2012)

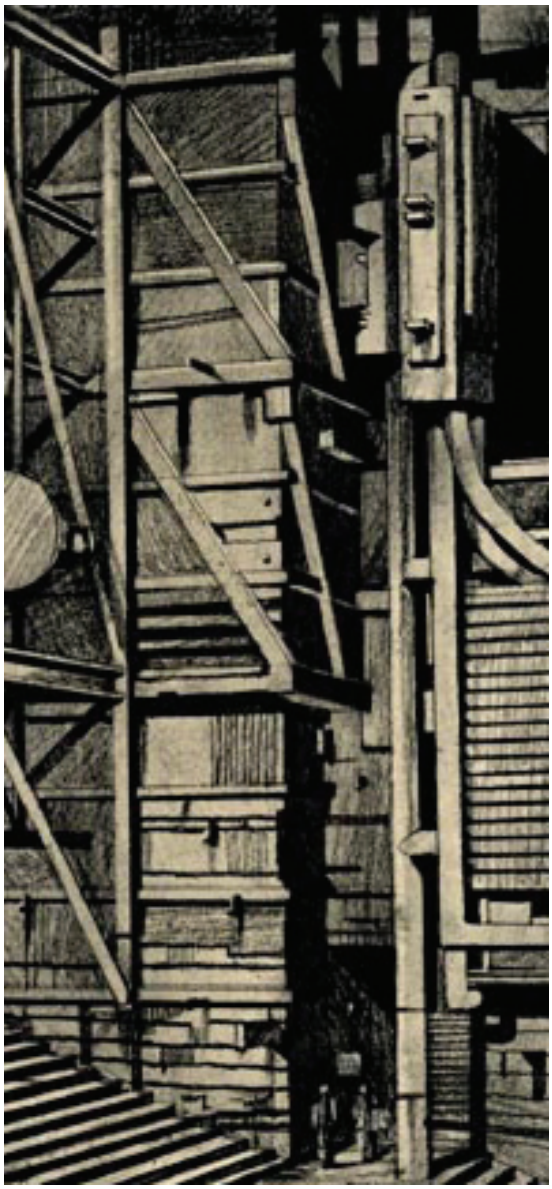


Figure 1.16: Architectural Phenomenology Institute (YENDO 2012)

The architectural issue deals with the emergence of the totality of *place*. Through responsive programmatic implementation, the embedded potentialities and memory of the post-industrial terrain emerge as publicly inhabitable space (fig. 1.17).

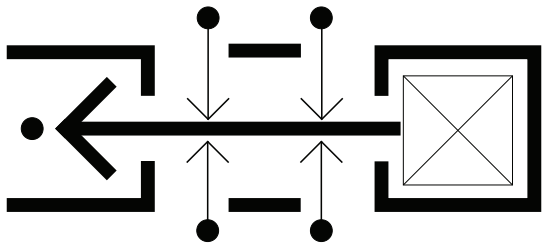
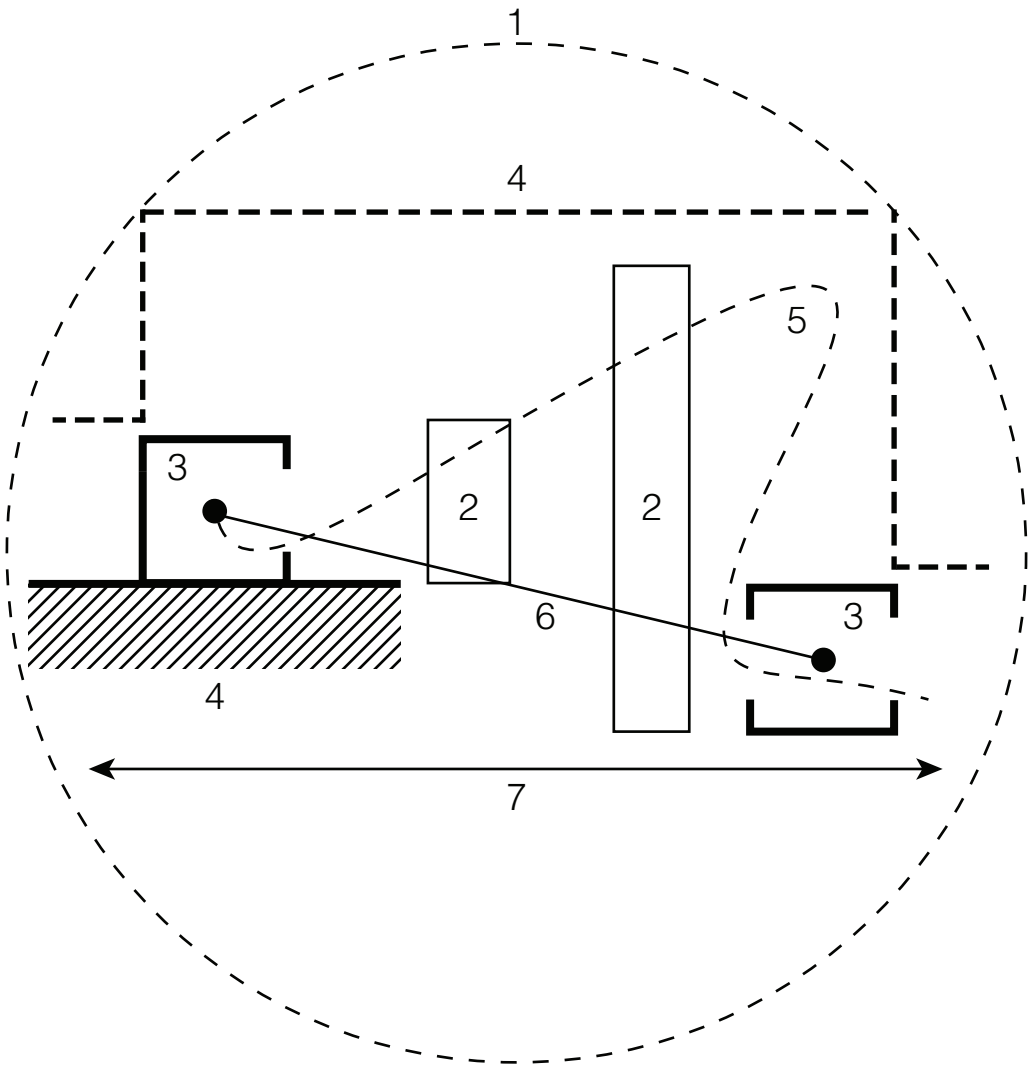


Figure 1.17: Intervention in the post-industrial context. Through intervention, the post-industrial terrain is materialized as inherent to the totality of place. The intervention brings forward the place as a totality, uncovering the unseen and embedded character of place



The dissertation aims to explore and gain an architectural understanding of:

1. Architectural meaning and character of place in the post-industrial context

2. Industrial remnants as inherent to the totality of the terrain

3. Enclosure and opening in the post-industrial context and materialisation of the unseen

4. Tectonic and stereotomic relationships as expressive of place

5. Autonomy of user in the industrial context

6. Management and preservation of a compromised terrain

7. Orientation and identification of place in a vast and alienated scape

Figure 1.18 (opposite): Perceptions of structure and character in the post-industrial scape, manifested as a single totality

Figure 1.19: Diagram of explorations and aims

2 paydirt

By following the dissertation's aims, the industrial context of Pretoria and its surrounds were explored. From the various sites visited, industrial Silverton came across as the most concealed, yet sporadic site. Besides its larger industries, such as the Silverton Shunting Yards, industrial Silverton is made up of many small to medium industrial networks which branch into natural, urban and seemingly post-industrial contexts. Many of these networks are not necessarily apparent and create the impression of dilapidation and inactivity. However, on closer investigation, the areas of industrial Silverton are dynamic, vibrant and active.

The following chapter explores these observations and discusses the studies of a collaborative urban vision. The urban vision group mapped Silverton and its surrounding context historically, theoretically and graphically. The group's context of intervention, which borders on Silverton and Eersterust, is introduced and mapped in terms of an urban vision proposal.

Figure 2.1 maps an early investigation of the apparent and non-apparent relationships which make up industrial Silverton.

silverton - apparent // non apparent relationships

natural environment

industry

user

relationship driver

relationship consequence

koedoespoort shunting yards

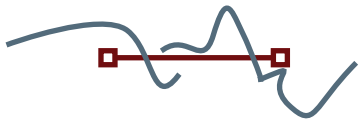
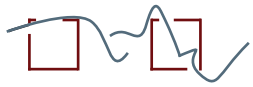
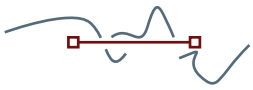
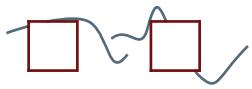
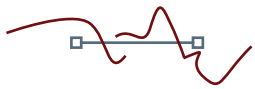
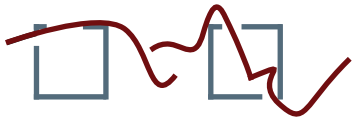
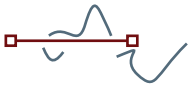
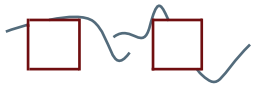
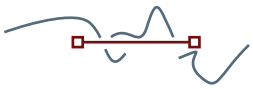
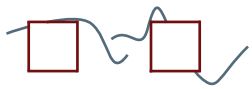
dykor street

era bricks

silverton tannery

silverton station / moreleta street

Figure 2.1: Mapping the apparent and non-apparent relationships between natural environment, industry and user in Silverton (EERSTERUST URBAN VISION GROUP 2013)

	user + industry	natural environment + user	industry + natural environment
	 isolated	 necessitated	 exploited
	 conditional (changes to user environment)	 apathetic	 disregarded
	 integrated	 interwoven	 contextual (industrial reliance on ecology)
	 isolated (removal from user environment)	 apathetic	 disregarded
	 reciprocal (skill and industrial interchanges)	 apathetic	 disregarded

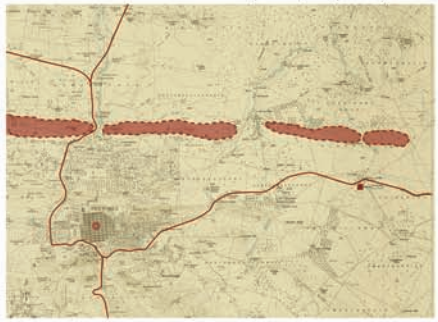
2.1 silverton

Sixty years ago the owner of Derdepoort, a corn farm 11km east of Pretoria, started producing handmade clay bricks from clay found on the farm. Derdepoort was conveniently located between the Moretele River and Rietspruit, and had an abundance of quality clay (Jansen:2013).

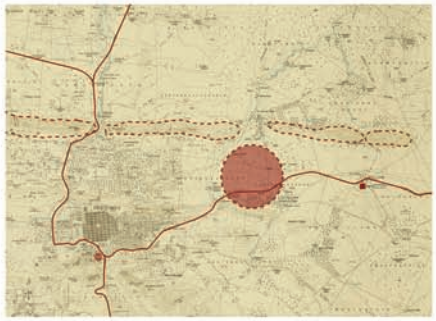
pretoria and surroundings 1908 - church square

railway connecting nelspruit, eastern suburbs and lorenzo marques (maputo)

location of eerste fabrieke 1866



pretoria poorte



location of silver findings 1890's - silverton town

1915 onwards - development of major industries such as koedoespoort railway works, motor engineering, leather and hide businesses, tannery and era brick factory

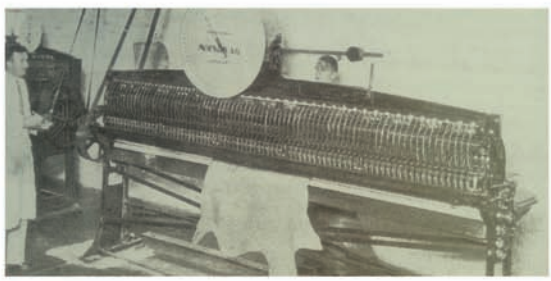
More than 50 years earlier, silver was discovered on the farm Koedoespoort, two kilometres south of Derdepoort. This discovery caused a brief migration of prospectors to the farm, but the rush was short-lived as silver reserves proved to be insubstantial. The silver rush however left a legacy of trade and industry, forming a small town called Silverton. The idea of opportunity and prosperity accompanied travellers to Silverton: The land was relatively cheap, labour forces were available, and existing trade routes connected Silverton to large centres like Lorenzo Marques and Nelspruit (fig. 2.2) (Naudé & Naudé 2007:48).

Industries like the Silverton Tannery, established in 1915, paved the way for other smaller industries like a timberworks and meat board (fig. 2.3). In 1949, an engineering and motor works facility was founded. Today, Silverton is still known for its trade and industry, and provides the capital with many of its light industrial services. It is well populated by diverse production industries and is located close to several suburban areas like Eersterust, Meyerspark and Mamelodi (Eersterust urban vision group 2013).

eerste fabrieke - 1866

silverton tannery - 1915

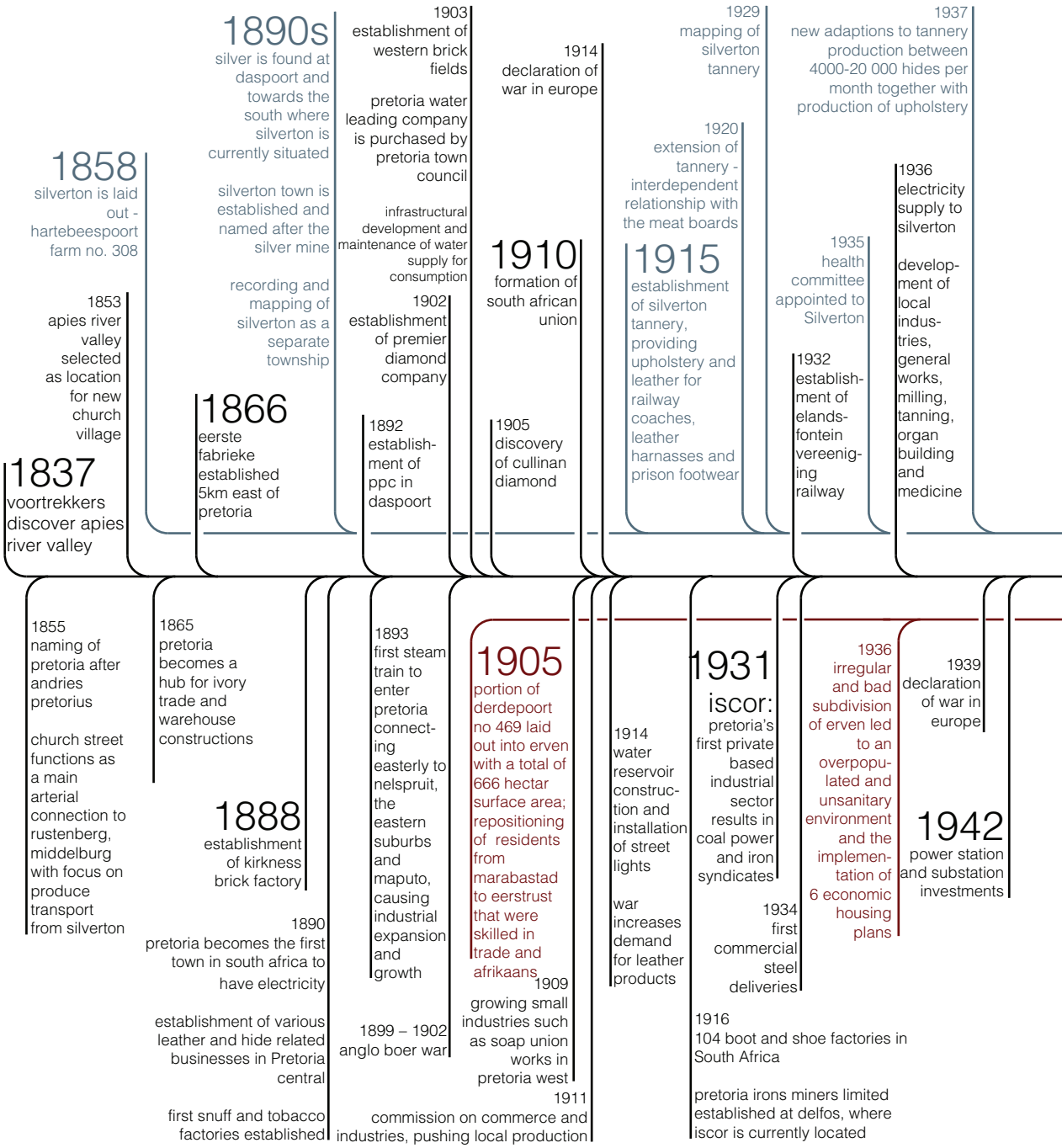
preparing hides - silverton tannery



processing hides - silverton tannery

Figure 2.2 (opposite): Edited maps depicting the historical development and extension of Silverton in relation to Pretoria (EERSTERUST URBAN VISION GROUP 2013)

Figure 2.3: Historical photographs of Eerste Fabrieke and Silverton Tannery (NAUDÉ & NAUDÉ 2007:48)



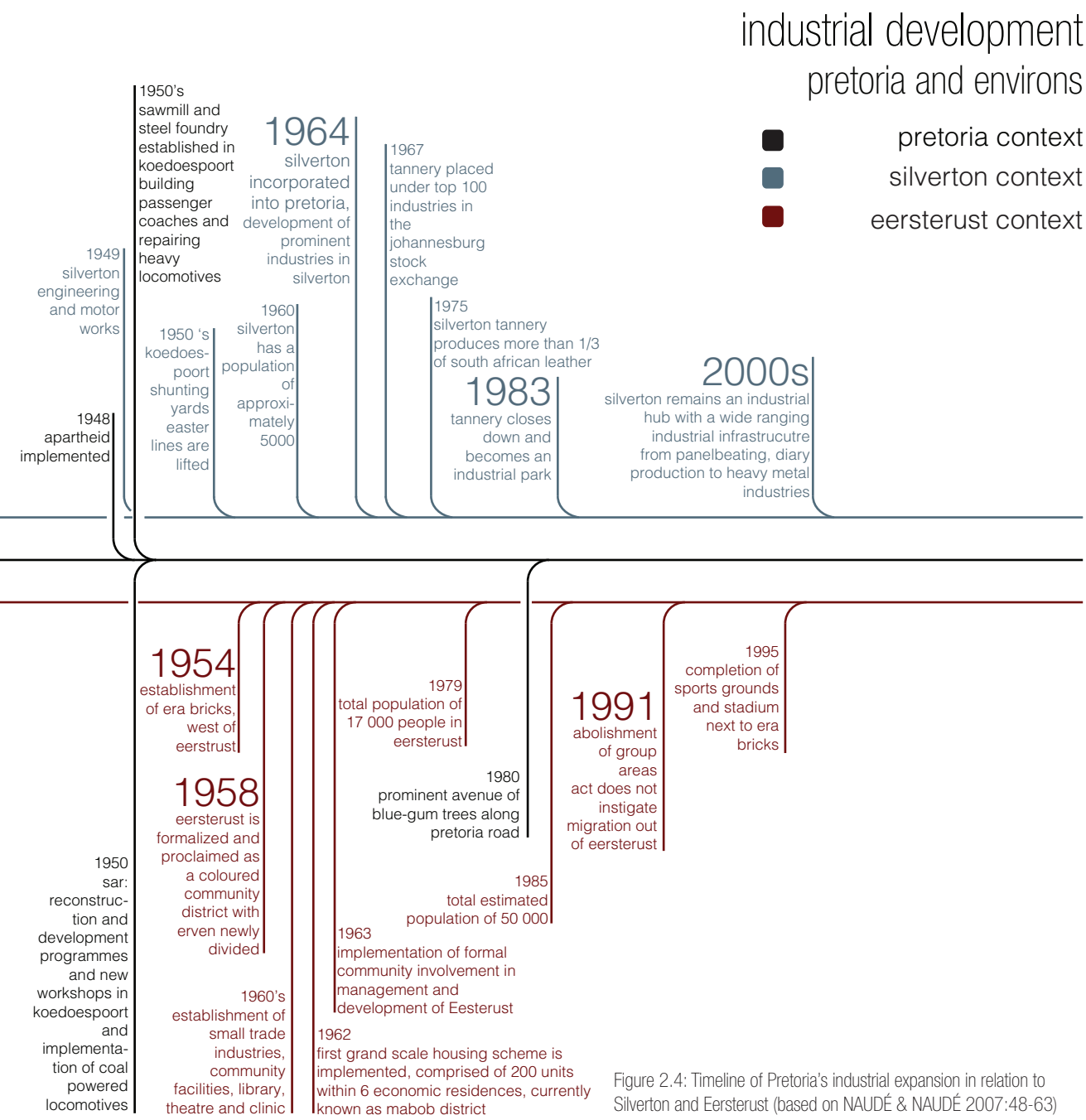


Figure 2.4: Timeline of Pretoria's industrial expansion in relation to Silverton and Eersterust (based on NAUDÉ & NAUDÉ 2007:48-63)

As is evident from the timeline (fig. 2.4), Eersterust, which borders on Silverton, remained predominantly isolated from Silverton's industrial growth. Established as a buffer between old Transvaal suburbia and Mamelodi, it is rumoured that Eesterust was initially a resting place for either the descendants of slaves in the old Transvaal, a stopover for mail coaches on the way to Pretoria Central, or a resting point for the Republican forces during the British invasion (Eersterust 2008). Eersterust was established through the partial subdivision of a farm in Derdepoort that was laid out into erven in 1905 for workers from Cullinan and Premiermyn (Jansen: 2013).

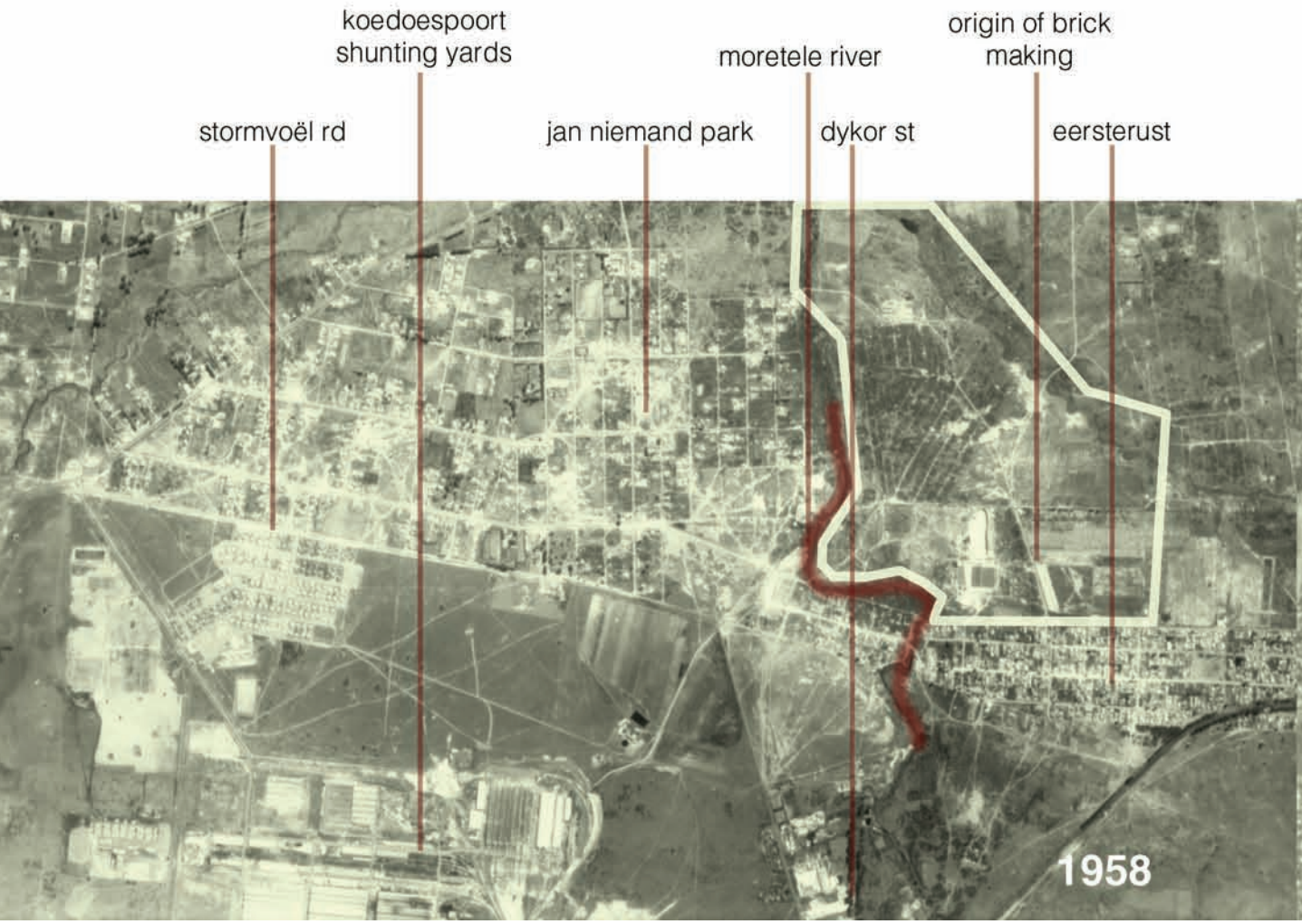


Figure 2.5: The development of Silverton and Era Bricks between 1958 and 1991 (EERSTERUST URBAN VISION GROUP 2013)

Located on the western side of Eersterust and bordering on the Moreletaspruit and Derdepoort, is the Derdepoort brick works, now called Era Bricks. The brick works became well established and became profitable through the support of Silverton during the 1950s. In 1980s the brick works was sold to the company Rosema and Klaver, who founded Era Bricks, a landmark to Eersterust with its tall, protruding chimneys (van Dijkhorst:2013). Figure 2.5 shows the Pretoria's eastern expansion between 1958 and 1991 in relation to Era Bricks.

2.2 era bricks

The brickworks drifts between Jan Niemand's Park, industrial Silverton and Eersterust (fig. 2.6). Excavated, crushed and refined clay is quarried on site and bricks are fired in traditional coal-driven Hoffman kilns. Era Bricks produced an iconic brick, which throughout the 1980's and onward helped build Pretoria and became a common household name within the built environment of Pretoria.

Today the available clay on site has been practically depleted and the brickworks has to rely on the importation of clay. Together with the brick works being archaic in its methodology, production is no longer feasible to maintain. The brickworks is currently burdened by a foreshadow, an inevitable loss of place so common to industrial scapes on the verge of abandonment.

As discussed and supported by De Solà-Morales in the previous chapter, the post-industrial context and left-over industrial terrains are usually seen as reflections of man's derelictions and as contrasts to contemporary sensibilities. Such contexts become either neglected and shunned, or become completely overridden and stripped of their intrinsic qualities.

Decommissioned industrial sites are generally perceived to be of low value and of little fertility. However, such sites are simply undergoing a transition, and may be rearranged into new ways of being. These transitional sites generally offer potential in the form of access, cheap and available land together with providing connections to existing business and public sectors (Eersterust urban vision group 2013).

Era Bricks is exemplary of such a transitional site. While the clay on site has been depleted, the terrain is left altered and the structures practically stand empty. The site offers an infrastructural and environment premise that may easily, and accessibly, latch itself into, and broaden, the surrounding context.

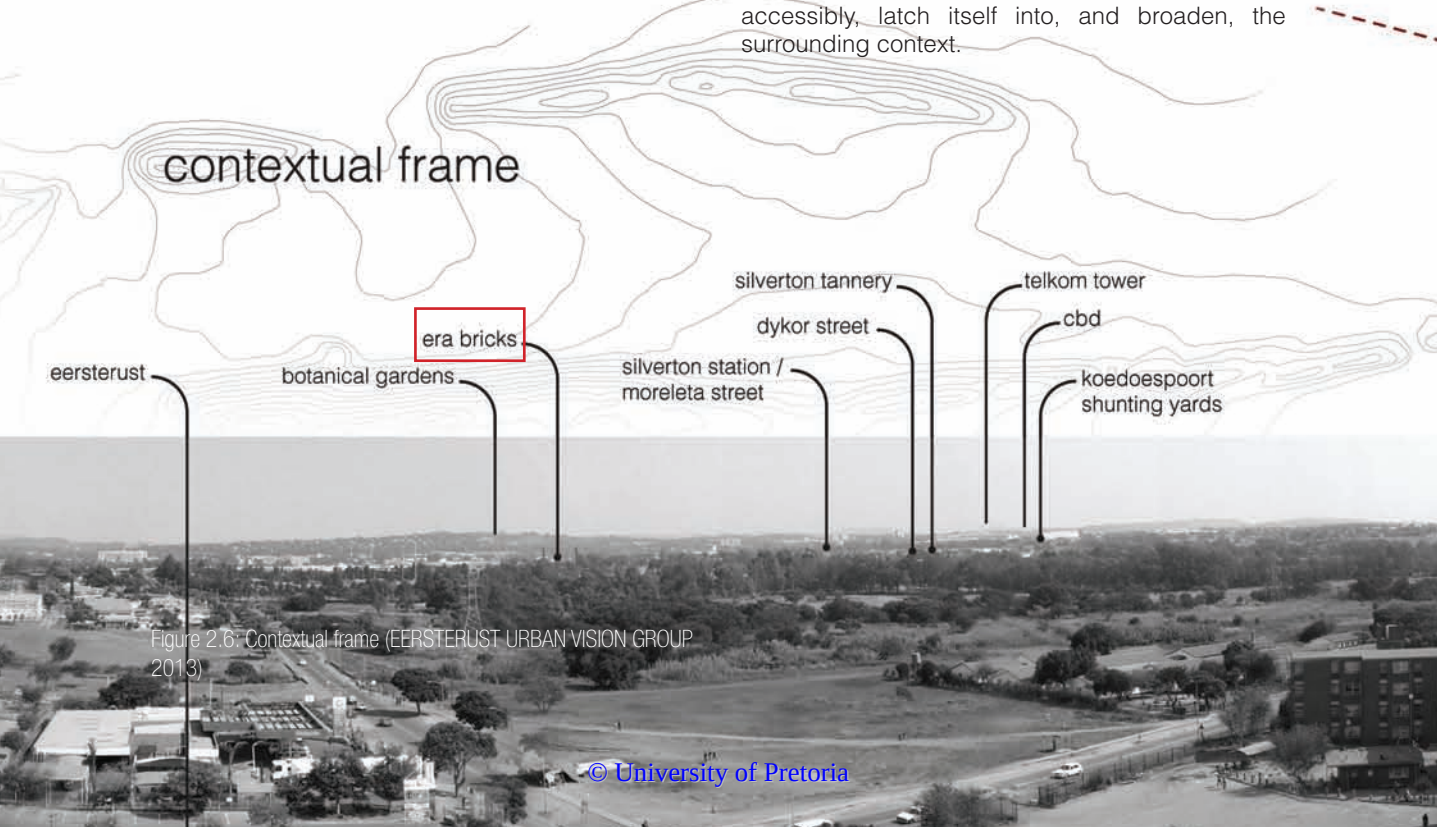


Figure 2.6: Contextual frame (EERSTERUST URBAN VISION GROUP 2013)

Besides having value in terms of the industrial heritage of Silverton, Era Bricks is relevant within its urban context and offers ideal opportunities for ecological, social, industrial and architectural intervention (fig. 2.7).

Figure 2.7: Photographic study of context (EERSTERUST URBAN VISION GROUP 2013)

Whilst in isolation, Era Bricks exists within a rich and diverse network of currencies and flows that are anchored directly into an urban, industrial, compromised and natural environment. This is shown in the photographic study of Era Bricks's grinding pans, rollers, clay storage facilities, Hofmann Kilns and dryers. Evidently, abundant industrial, social and environmental opportunities present themselves (fig. 2.8, 2.9 and 2.10).

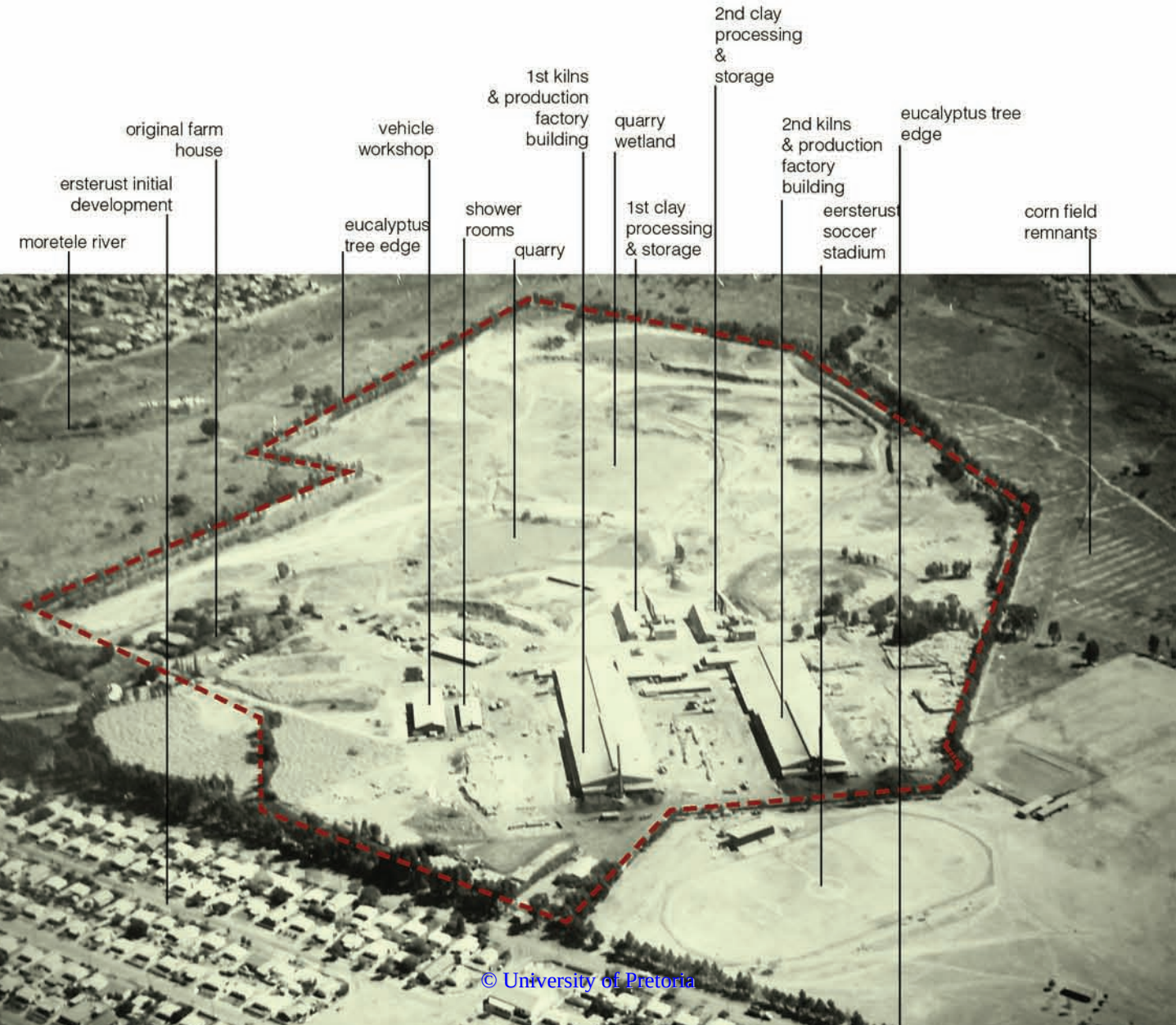


Figure 2.8: Aerial layout of photographic study (EERSTERUST URBAN VISION GROUP 2013)

Figure 2-9: Panoramic view of grinding pans, rollers, clay storage facilities and Hofmann Kilns (EERSTERUST URBAN VISION GROUP 2013)

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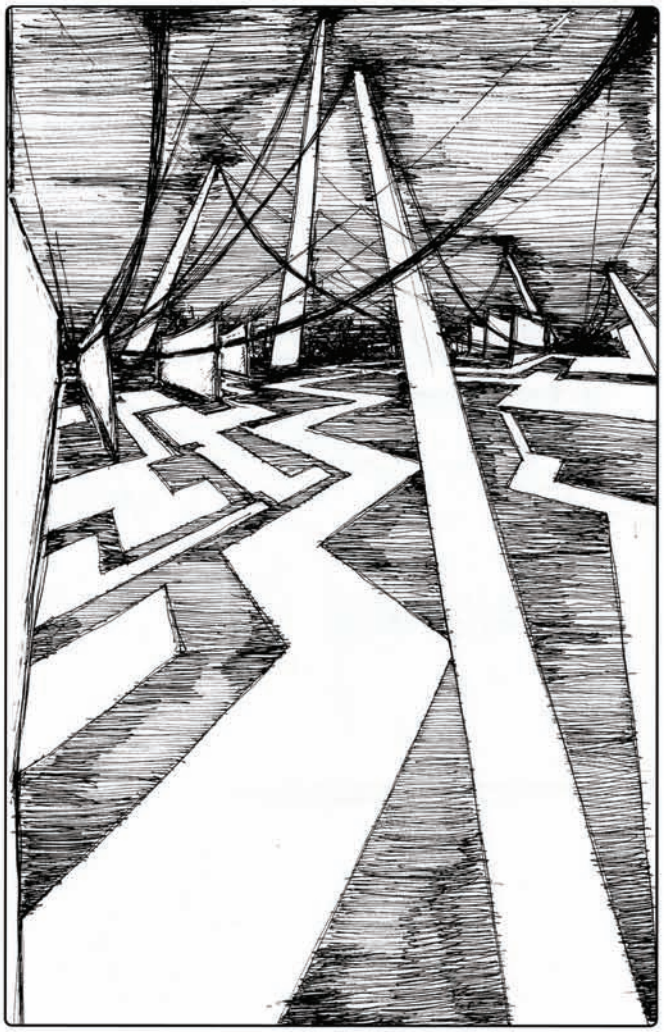
Figure 2.10: Photo study in relation to the aerial layout of figure 2.8 (EERSTERUST URBAN VISION GROUP 2013)



currency (n.)

1650s, condition of flowing, from Latin *currens*, present participle of *currere*, to run (see *current* (adj.)); the sense of a flow or course extended 1699 (by John Locke) to circulation of money

2.3 currencies

Raoul Bunschoten derived a hypothetical model which demonstrates how architecture may be applied as an expression of features that depicts the skin of the earth in a concise manner. The features of the model are generated under local conditions in a field that spans the earth. The features emerge, dissolve, oscillate or remain periodically quiet. Bunschoten addresses the appearance and dissolving of physical objects and the persistence of spatial features. Without creating or suggesting spatial solutions, the model speculates about non-visual and complex situations. Because the model is open to interpretation, it allows itself to demonstrate the various conditions of the skin of the earth. This includes social behaviour and the interactions of urban environments, with each other, and the natural environment (Bunschoten 2001:130).

Similarly, an urban vision for Era Bricks is approached in a manner which considers the tangible and intangible networks of its context. The seemingly dilapidated and inactive yet dynamic, vibrant context rely on a matrix of different currencies. Currencies are not considered as only monetary, but are broadly seen as avenues of flow.

Figure 2.11 is a literal interpretation of the different avenues of flow which overlap, converge or pass each other. While remaining linear, the avenues of flow ultimately form part of a single totality. These avenues of flow present and offer different spatial and programmatic opportunities.

The flow of currencies, in the context of Silverton and Eersterust, comprise a dynamic relationship between apparent currencies, such as the flow of labour and raw material, and non-apparent currencies, such as the transfer of skill and human interaction.

Figures 2.12 and 2.13 explore the different findings and issues of the industrial context. Non-apparent currencies, such as the exchanges between natural resources, are considered of low value, yet support and are integral to, the apparent currencies of high perceived value, such as the exchanges between different end products (Eersterust urban vision group 2013).

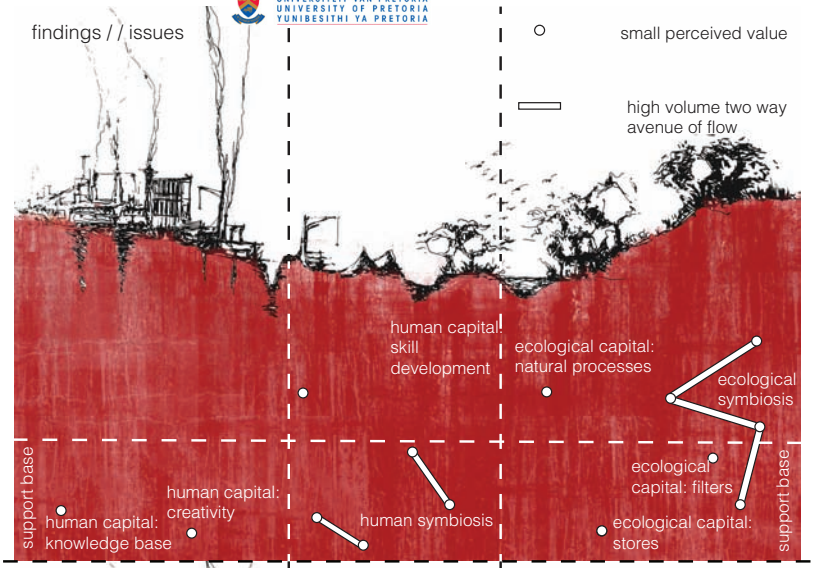
The diagrams attempt to show that industries may be seen as converters between non-apparent and apparent currencies. The underlying issue with this is that the value perception of apparent currencies is internally defined. This results in, for example, a disregard, depletion and exploitation of natural resources and human skill (Eersterust urban vision group 2013).

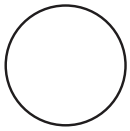
When apparent and non-apparent currencies, such as ecological and social exchanges, have become redundant or forgotten, terrains are seen as cost heavy burdens. However, the relationships and potential of the different currencies remain present and underlying to their sites. The nature and infrastructure of a terrain should therefore be seen as the dominant informants for new interventions while remunerating the imbalances created between the different avenues of flow.

To prevent furthering such conditions in the post-industrial state, the urban vision for Era Bricks must ground itself in the intrinsic qualities of the site: the focal point for the urban vision becomes the relationships between industries, ecologies and compromised environments. Through anchoring itself into and re-addressing the processes and physical premises of the site, opportunities are gained and imbalances are addressed.

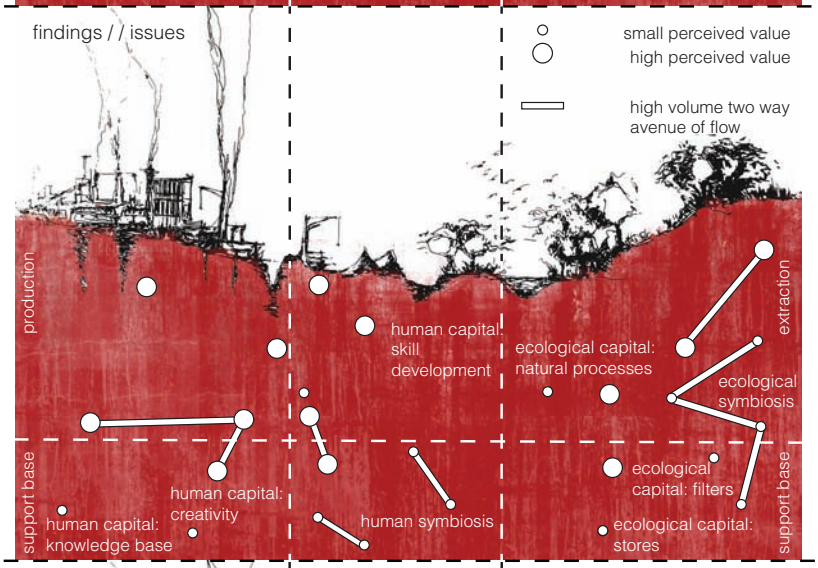
Figure 2.11 (opposite): Interpretative drawing of currencies

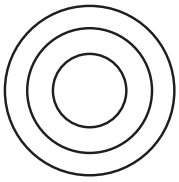
capital:
small perceived value





capital:
high perceived value





industry as converter

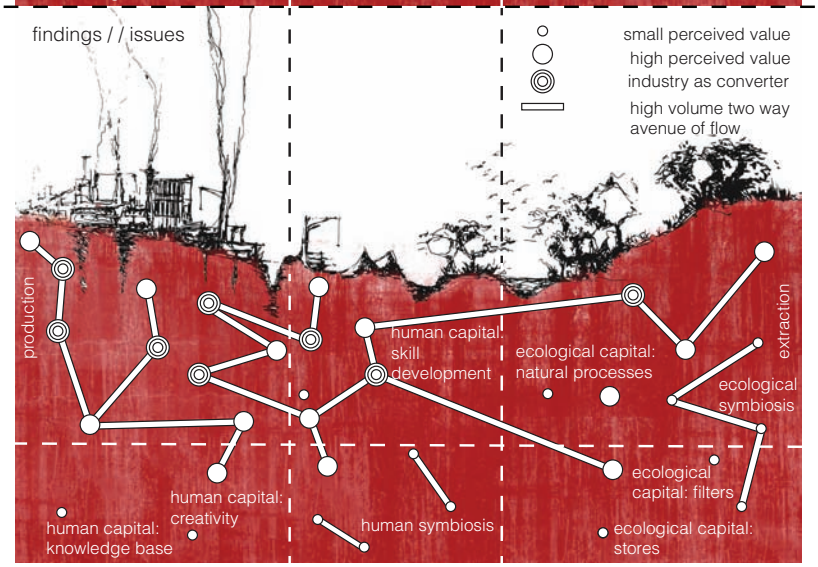


Figure 2.12: Progression between apparent and non-apparent currencies as one way and two way avenues of flow (EERSTERUST URBAN VISION GROUP 2013)

non-apparent currencies (two-way avenues of flow)

ecological capital: natural processes / resources, ecological symbiosis, filters, stores

human capital: creativity, knowledge base, human symbiosis, skill development

apparent currencies (two-way avenues of flow)

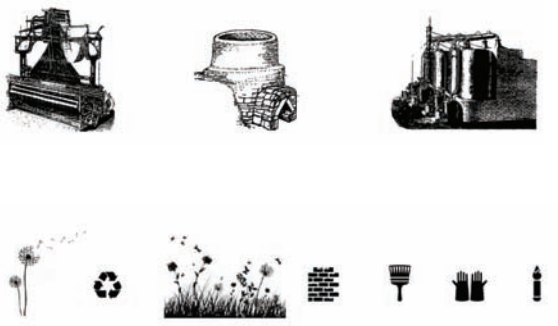
ecological capital: value defined, product based

human capital: necessity based & replacaeble

apparent industry (one-way avenue of flow)

expendable resources

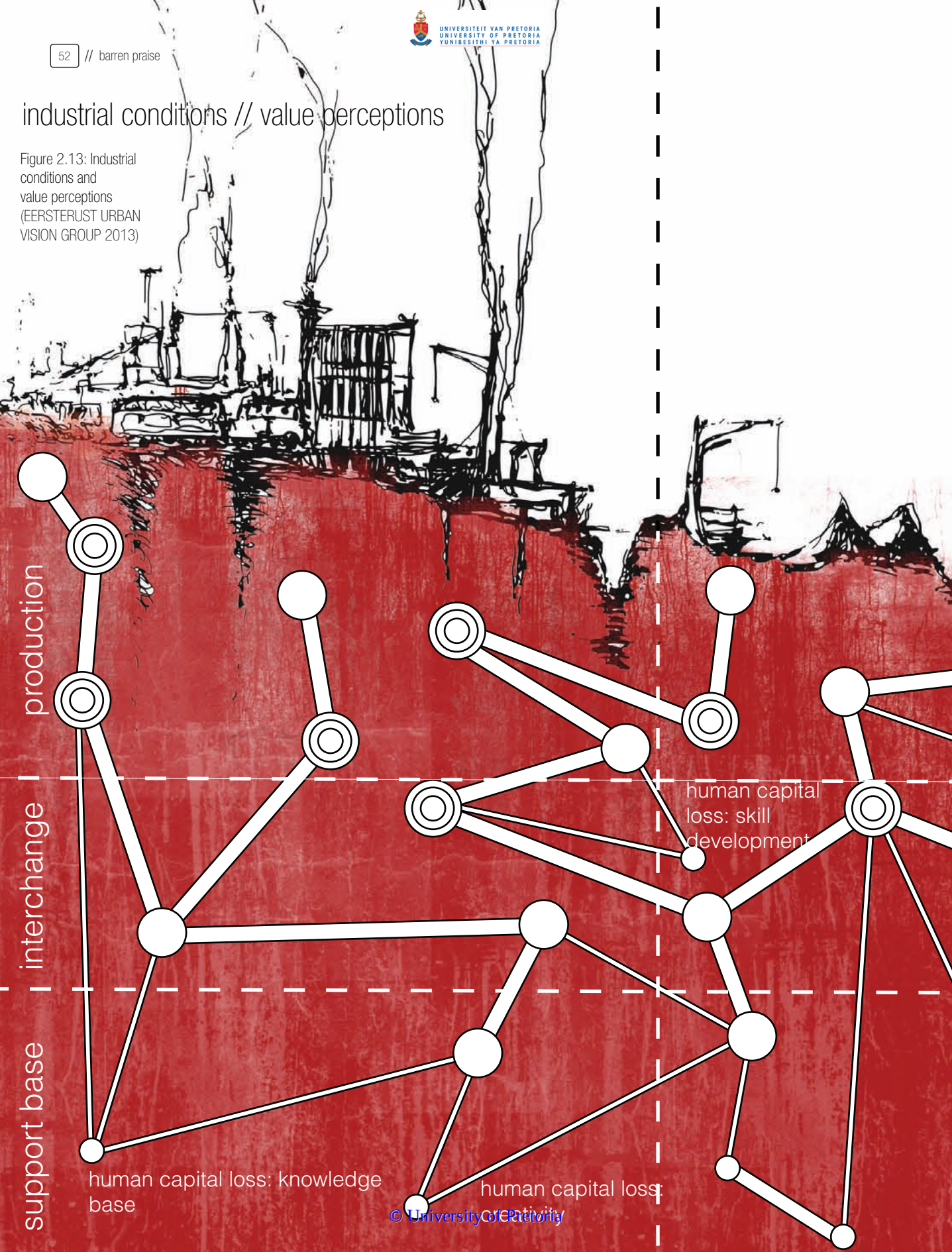
non-apparent industry (two-way avenues of flow)

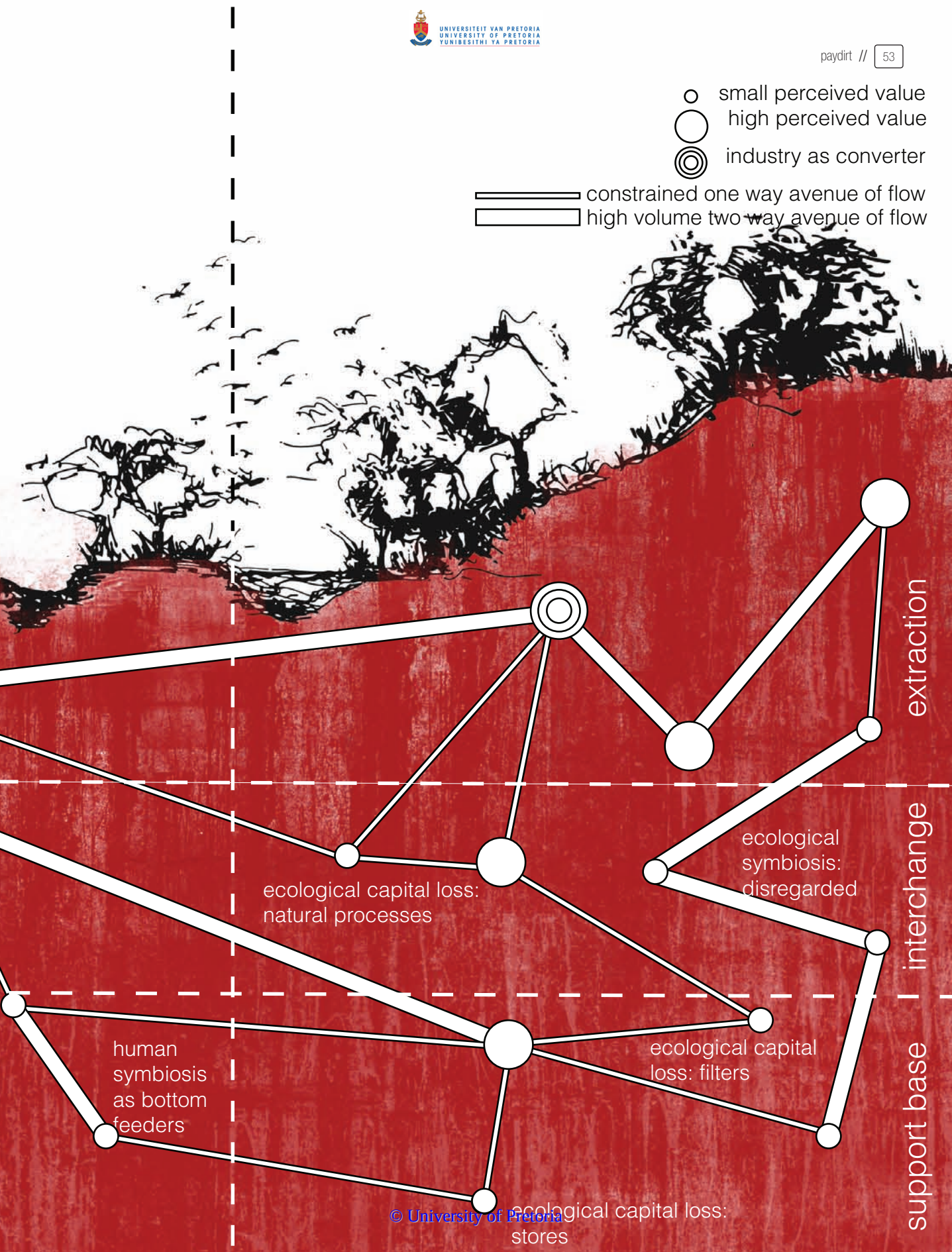


replenishable resources

industrial conditions // value perceptions

Figure 2.13: Industrial conditions and value perceptions (EERSTERUST URBAN VISION GROUP 2013)





2.4 natural industries

The urban vision proposes to address the quarry in terms of natural industries: industries which are reflective of and emergent from naturally occurring processes, or industries which extract and work with raw materials in a mutually beneficial manner.

The aim of the urban vision is to incubate, and promote, the *Zeitgeist* of Era Bricks as a process driven industry in a natural and compromised environment. Through the implementation of various programmatic proposals, the urban vision aims to further the potential of Era Bricks as a premise of natural industries.

Figure 2.14 represents the driving currencies in their literal form of interaction and sets the basis for the urban vision proposal for the precinct.
Effectively, the urban vision allows for interaction between social, industrial, and ecological currencies.

Through management and rehabilitation of the site and the public integration into the industrial premise, Era Bricks is kept active and allows for new opportunities in the vast terrain.

Realized as Era Regional Park, the site becomes an ecological and industrial catalyst which manages and activates the site through exploration and reinterpretation of the attributes that are presented on site (Eersterust urban vision group 2013).

Figure 2.15 contextualizes Era Regional Park by means of a site model and figure 2.16 describes the urban approach of the group: the site's current conditions, the proposed and re-connecting anchors together with the overlapping conditions of the site, collectively result in the imagined growth initiated by the urban proposal. (Eersterust urban vision group 2013).

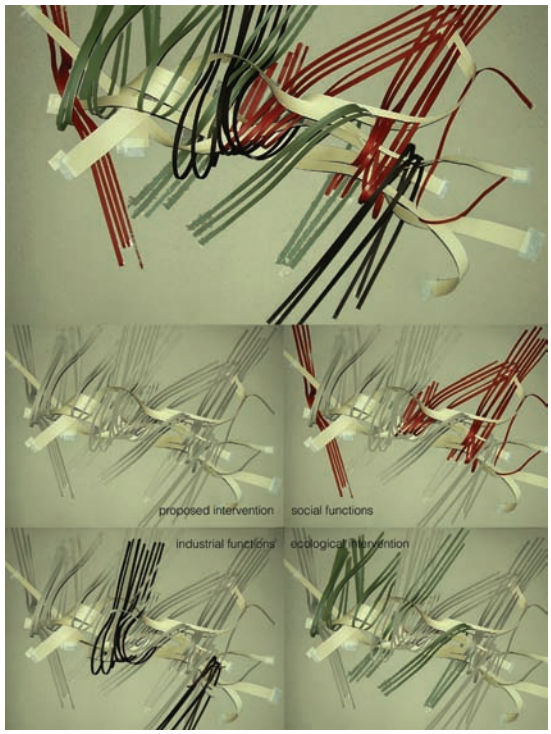


Figure 2.14: Urban approach and reintegration of activity
(EERSTERUST URBAN VISION GROUP 2013)

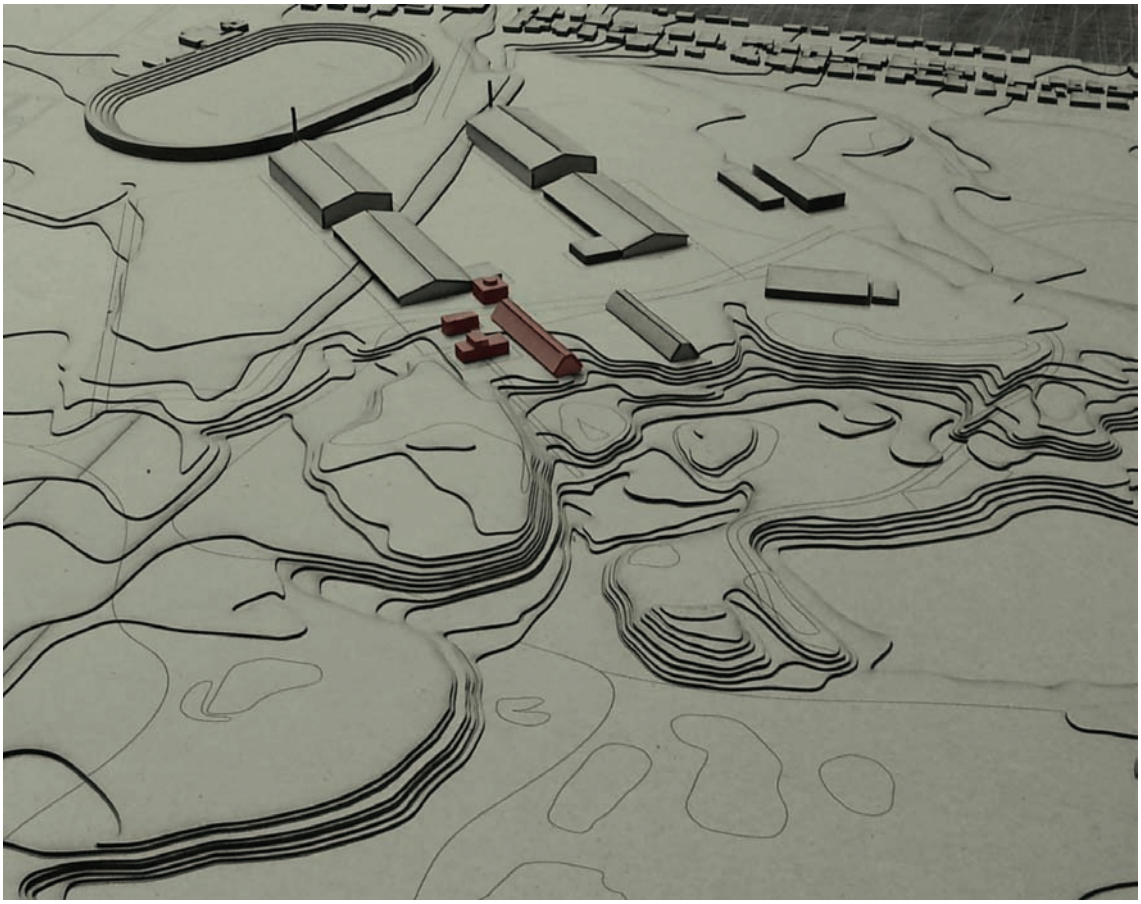
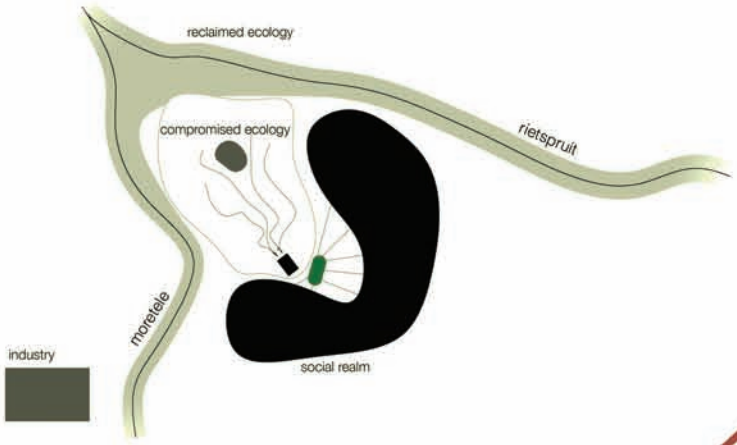


Figure 2.15: Site model of Eersterust Era Bricks (EERSTERUST URBAN VISION GROUP 2013)

1.

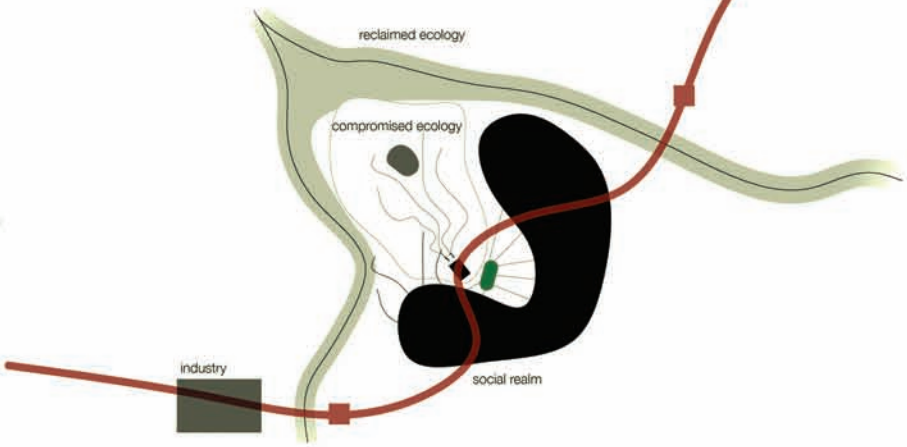
current condition

The site is an isolated element wedged between social, industrial and ecological functions. A historical core spreads legacies into the surrounding context and the existing sporting facilities functions as a social core that concentrates community events near the old factory buildings.



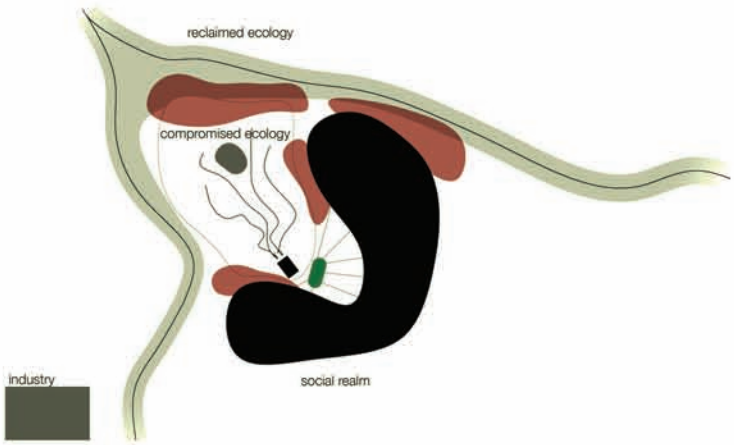
2. reconnect with anchors

A proposed connection enables conditions for all the functions of the site to thrive. This includes historical, ecological, industrial and social events. The areas of overlapping and weaving of the different functions becomes important sites of reconciliation.

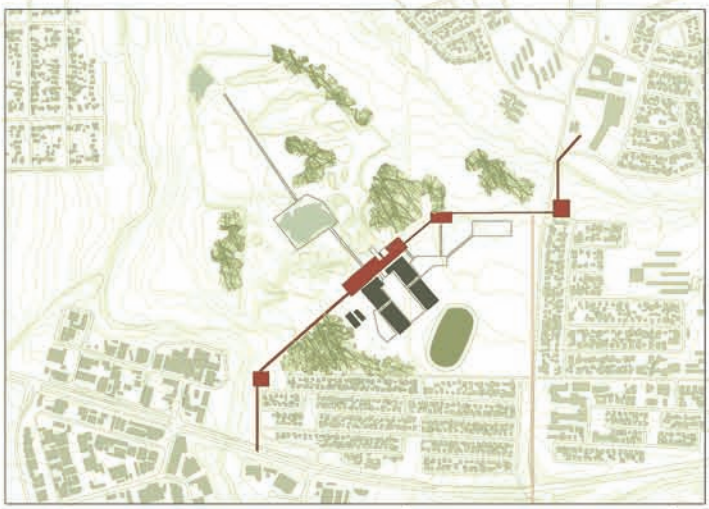


3. conditions of overlap

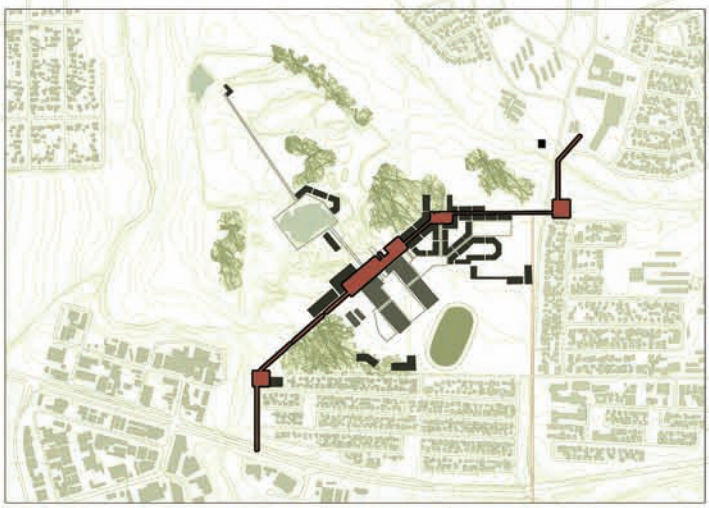
The connection route enables conditions for existence of all the site functions, and is imagined to grow around the historical core and existing stadium.



current site plan



anchors reconnect site



imagined growth

Figure 2.16 (opposite): Diagrams of urban approach (EERSTERUST URBAN VISION GROUP 2013)

Figure 2.17: The anticipated development of Era Regional Park (EERSTERUST URBAN VISION GROUP 2013)

2.5 industrial ecologies

The urban vision suggests that any proposed interventions should be based in apparent and non-apparent natural industries which foster human and ecological symbiosis, and therefore provide long term social, industrial and ecological opportunities. Additionally, the Era Regional Park proposes to introduce social and ecological value within the broader industrial heritage context of Silverton and Eersterust (Eersterust urban vision group).

The urban vision suggests three architectural proposals located centrally on the Era precinct. All three proposals deal thematically with industrial ecologies, and form part of an interdependent cycle that allows for constant adaption and evolution of the site. Figure 2.18 shows the regional park within the proposed industrial context while figure 2.19 illustrates the collaboration and potential productions between the different programmes.

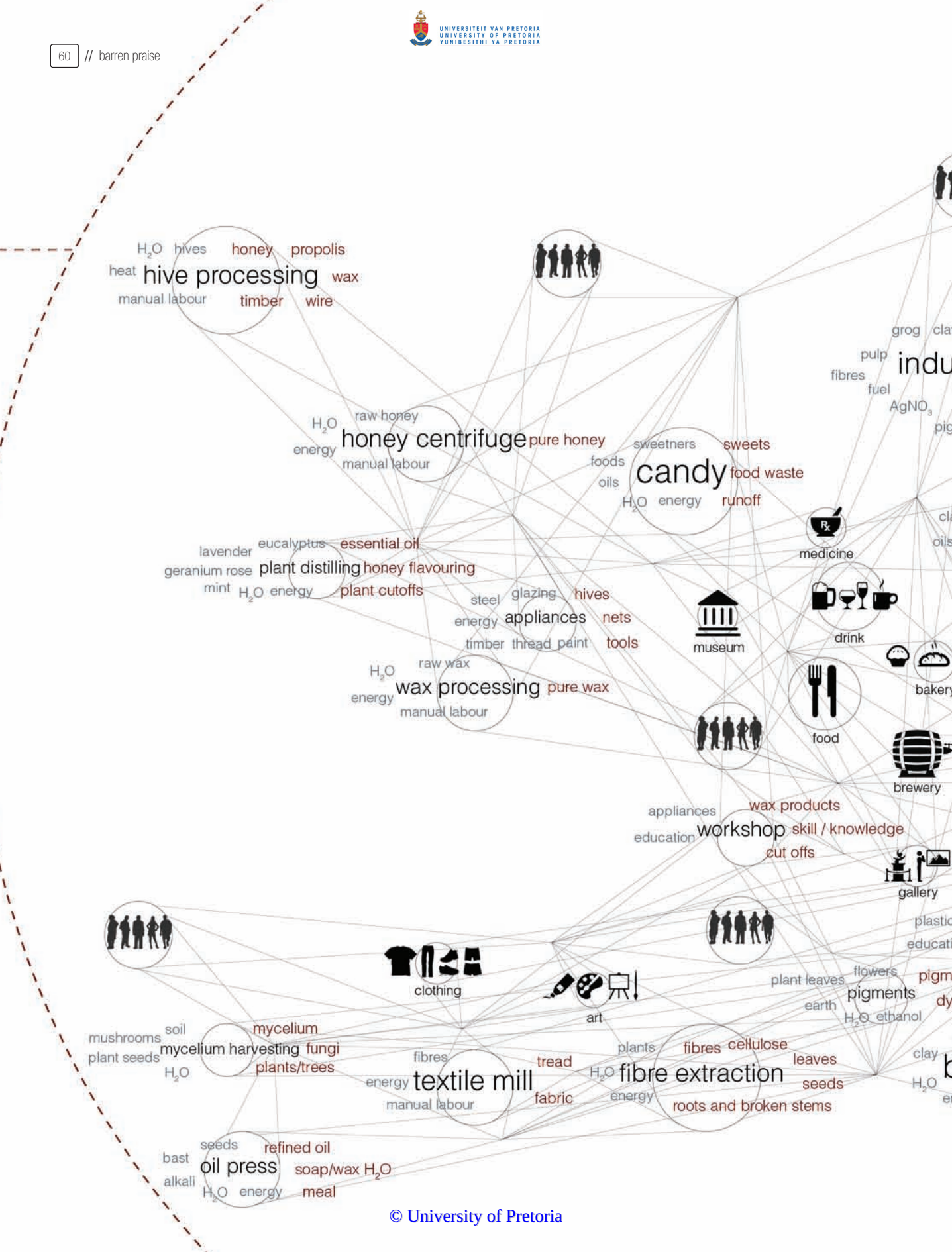
The three proposals are as follows:

Jacques Pansegrouw:
A natural fibre processing plant acts as a translator and creates spaces of interaction with old, new and natural industries, enhancing the significance of each.

Carla Taljaard:
An incubator for ceramic-based industries becomes an architectural solvent for natural, industrial and cultural endeavours.

Carlheinz von Geyso:
An apiary and honey-processing facility becomes a transitional exploration from enclosure to opening, revealing the totality of the post-industrial terrain.

Figure 2.18 (opposite): Programmatic vision and extension of industrial ecologies (EERSTERUST URBAN VISION GROUP 2013)



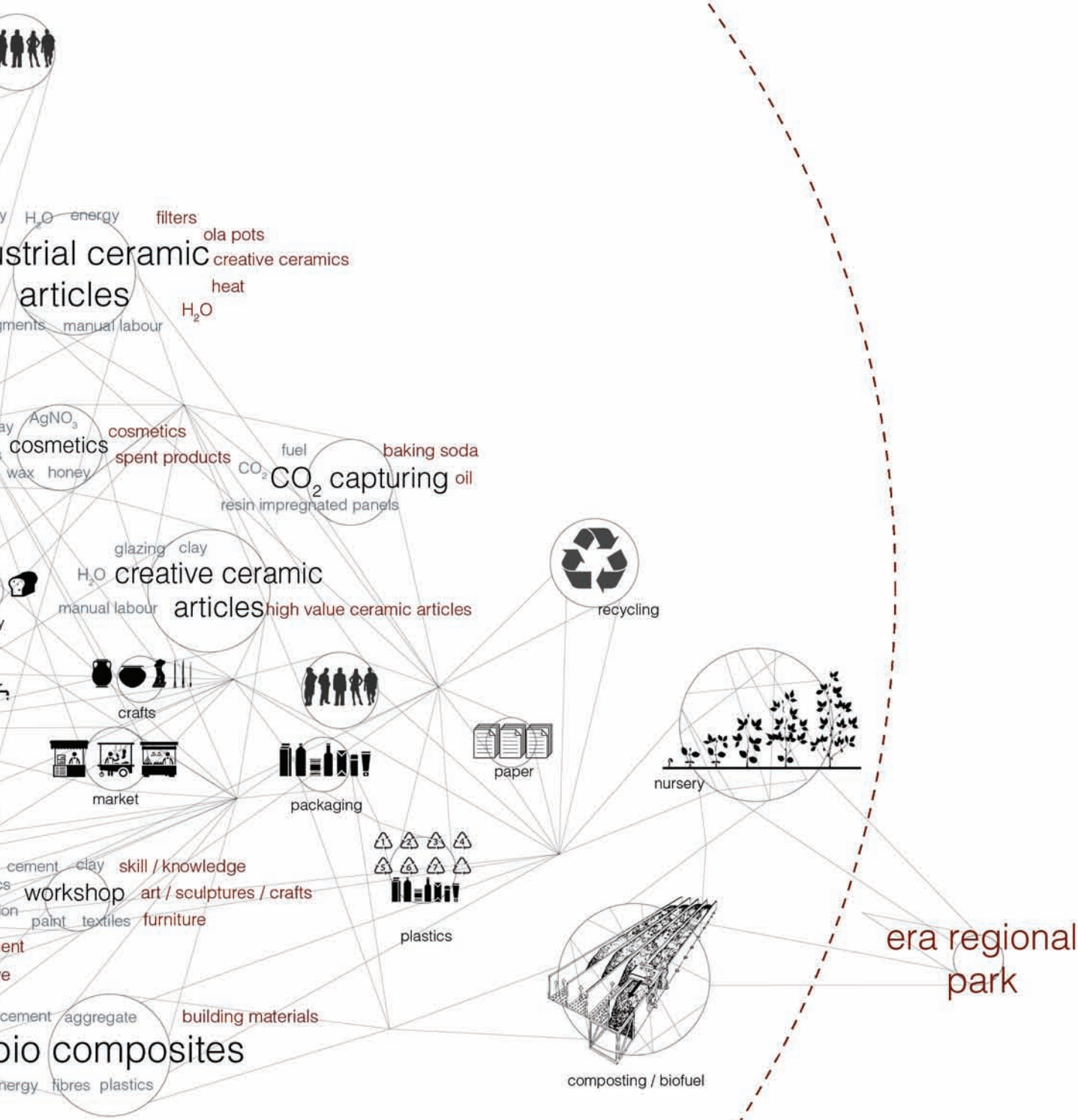


Figure 2.19: Diagram of the collaborative and interdependent industrial ecological cycles (EERSTERUST URBAN VISION GROUP 2013)

2.6 precipice

The broad framework proposal addresses the inevitable and growing isolation and weathering of the macro industrial context within urban and natural boundaries. The specific proposal undertaken in this dissertation however, an apiary and honey-processing facility, mediates physically, and intangibly, between landscape and industrial structure (fig. 2.20).

The proposal for an apiary and honey processing facility encompasses machinery and empty sheds that come into direct contact with the altered natural environment. The context of intervention may be seen as partially removed from the majority of the industrial precinct of Era Bricks, while dealing directly with the altered natural terrain of the precinct.

Because the clay on site has been depleted, the structures stand empty and without function, yet the terrain continues to change and weather within the parameters set by the industrial processes. The transformations of the site continue, and the static impositions of the site, in their functionless state, become emphasized.

The context of intervention is considered within this transition between quarry and industry, aimied at emerging the placeness of the post-industrial terrain. Figure 2.21 shows the context of intervention within the Era Bricks precinct. The aerial study identifies the existing static structures on site, the existing processes involved, and the proposed spectrum of investigation, namely the relevant natural, altered and industrial premises.

The TICCIH (The International Committee for the Conservation of the Industrial Heritage) Nizhny Tagil Charter of 2003 states that conservation of industrial heritage includes preserving the functional integrity and relevant in-situ structures of an industrial site that would maintain value and authenticity of an industrial site. Sites that do not have exceptional historical significance may be adapted to a new uses, while being compatible with the original uses, and maintaining the original patterns of circulation and activity.

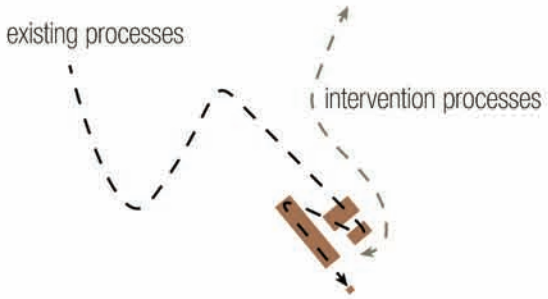
Following the ICOMOS (The International Council on Monuments and Sites) Ename Charter, the best suited strategy for this specific intervention falls under interpretative infrastructure. This refers to physical installations, facilities, and areas at, or connected with, the cultural heritage site that may be specifically utilized for the purposes of interpretation. Interpretative infrastructure includes the supporting of interpretation via new and existing technologies.

The design intervention integrates adaption (modification of a place to suit existing or proposed uses), conservation (maintaining and looking after a place) and compatible use (respectful of cultural significance of a place). The intervention aims to conserve a sense of the original fabric, yet adapt the precinct to a new use which fixates on industrial heritage while promoting and interpreting the proposed visions of industrial ecologies.

While the introduction of new links, nodes, added structures and programmatic interventions alters the site, the existing structures and terrain are aimed at being emphasized and reinterpreted appropriately as a new industrial, urban and ecological precinct.

Figure 2.20 (opposite): Photographs of intervention context

contextul frame



existing processes

a clay pit

b stockpile

c grinding pan

d medium / high speed rollers

e clay storage

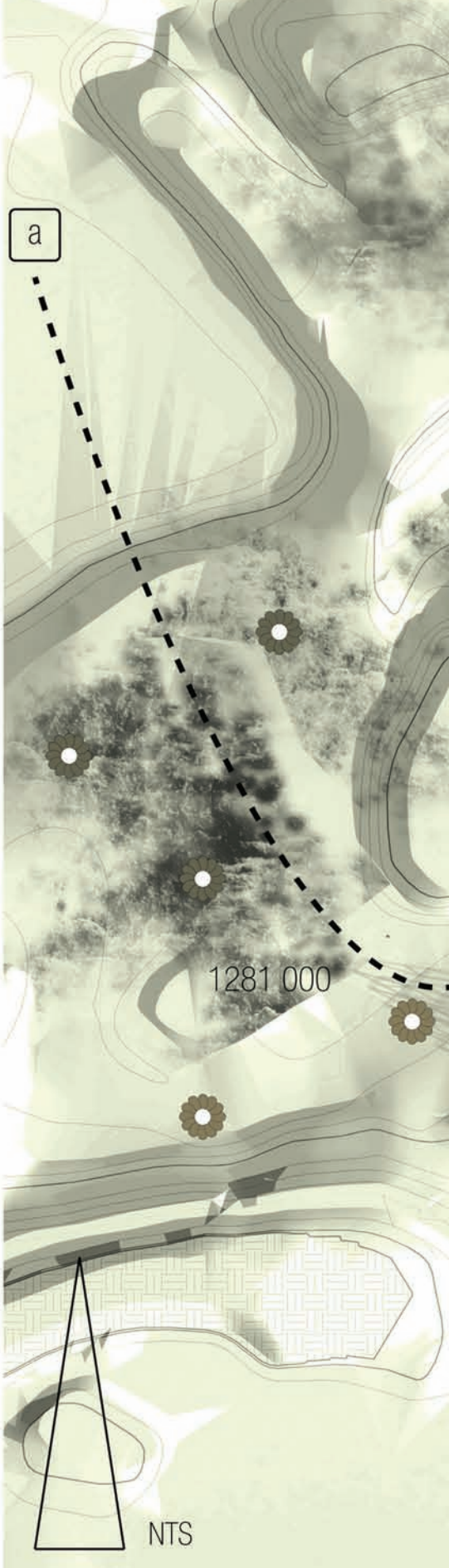
f mixer

intervention premise

1 natural premise

2 altered premise

3 industrial premise



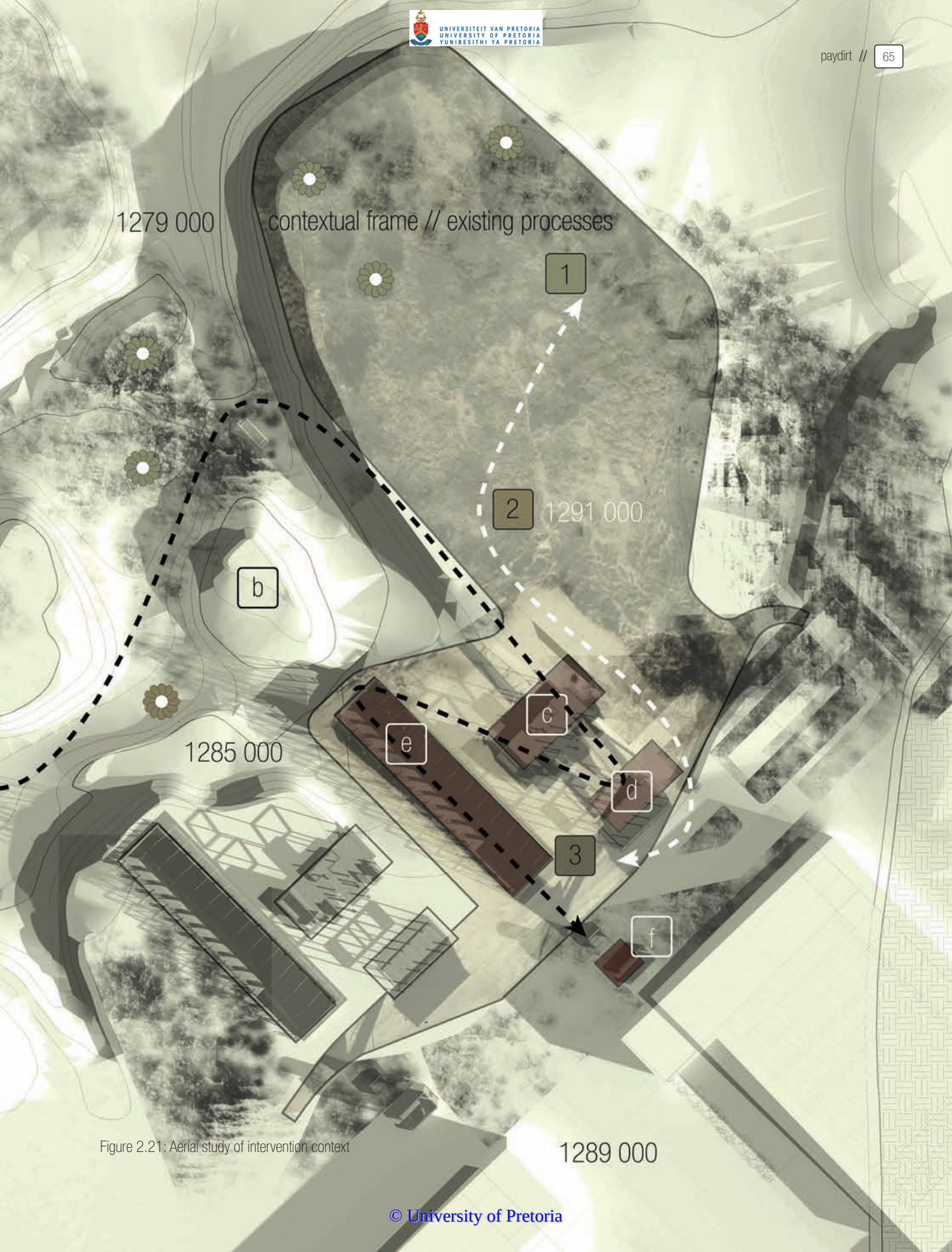


Figure 2.21: Aerial study of intervention context

3 flowermouth

The following chapter discusses bees and the beekeeping industry as a programmatic activator of the terrain. The South African small scale and commercial beekeeping industries are compared, and a programmatic proposal is suggested which addresses their shortcomings. While the intervention is heavily based in this programme, the naturally occurring industry of bees, which is uncontainable yet surrounding, becomes a driving tool to emerge the placeness of the post-industrial terrain.

Figure 3.1: Worker bees entering and exiting the mouth of a hive

Figure 3.2: Landscape with a Watermill (CÉZANNE c 1871)

3.1 to be honeyed

Merleau-Ponty discusses in *The world of perception* (1948:60) that through human experience a place gains emotional meaning. This meaning forges relationships with other qualities of that place. The essence of that place therefore is reaffirmed and not defined by each individual quality within the human experience of it.

Merleau-Ponty explores this reciprocal, interactive and coming forward of different experiential qualities with the analogy of being honeyed: Honey is sugary in the realm of taste and as well as in touch. In its consistency, honey allows itself to be held and to be moulded yet eventually the honey loses this given form and reverts to its original state. The honey shows no signs of interaction with the hands whereas the hands are left entangled in a sticky, external object. The roles of experience are reversed.

Intervening into the terrain draws a parallel to the hands struggling to master, obtain and hold the honey. Because of the dynamic and fluxing territories of environmental transformations on site, the terrain may never be fully grasped. As much as the honey would reverse back to its original form after being held, so the terrain ultimately maintains its inherency after intervention. Yet through interaction the terrain is given meaning and the user becomes entangled in the experience of it.

Merleau-Ponty further addresses the interaction with a place by considering the principles of perspective in landscape paintings. When the laws of analysis are refused, the painting recaptures the feel of the place as seen from different points of view. As with the analogy of being honeyed, the user becomes entangled in the rawness and lingering memory of the place. Merleau-Ponty (1948:55) states that our relationship to space and the interactions experienced is not a relationship between disembodied subject and distant object. A being dwells in space which relates to the experience of the environment as a landscape painting would portray the feel of a place.

The intervention may be seen as an architectural manifestation of the landscape painting (fig. 3.2). Based in observation, detail of the landscape disappears and makes way for the various compositions of areas of light and colour through which an indefinite, subtle image emerges (Naubert-Riser 1991:56).

As mentioned in the opening chapter, where the building moves between openings and enclosures that relate to its environment, the place of the environment emerges. This inherency of place, this transition emerges in a post-industrial scape through physical activation. The intervention effectively aims to activate the essence of the place through programmatic realization. Different spatial perspectives and programmatic interactions would grasp the terrain and emerge the placeness of the terrain. The user is situated into the environment through different spatial functions. Instead of simply moving through programmatic implementations onto the terrain, the site is perceived through the various functions assigned to it. These functions grasp the essence of the terrain, speaking a language of transition through the embedded tangible and intangible qualities of the site.

The building, as a manifestation of programme is like the discovering hands which grasp the honey: through interaction the site undergoes a transition to its inherent, natural state and the user becomes entangled in the enveloping, external context.

This transition from static tangibility to an unseen enveloping totality draws a parallel to the domestication of bees. Bees move around us. Whilst being ever present to a terrain, their industry borders on what is generally considered unseen. The management of the natural industry of bees is exemplary of something which may be physically housed but essentially remains unchanged, uncontainable. While the user may learn from and work with bees, their industry exists beyond our reach and can never be fully mastered (fig. 3.3).

A programme dealing with the static and uncontainable is reflected in the intervention: the terrain may be dealt with, understood and imposed on, but its essence, its totality, has become bound into space and time and is therefore never fully containable. This essence of place, even when statically addressed through the intervention, may be grasped in as much as the industry of bees can be contained.

The programmatic intentions of dealing with bees reflect the manner in which the terrain is considered (fig 3.4): A beehive placed into an environment is considered a tangible, accessible object. Whilst creating awareness of bees, the motions and processes of bees as an industry remain dynamic and mysterious. Similarly, when considering the site as a single totality, the intangible, ungraspable environmental transformations only gains awareness through static, physical activation.

The essence of the place is reaffirmed by recognising and activating the different physical qualities pertaining to the terrain together with embracing the intangible qualities such as geographical changes and weathering structure.

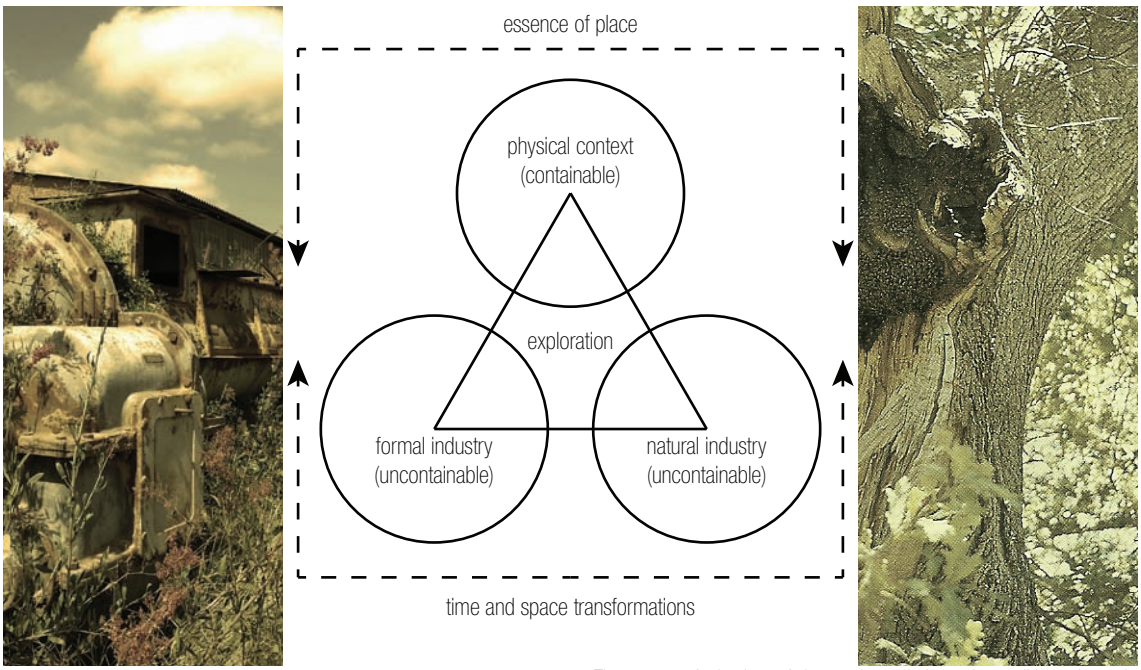
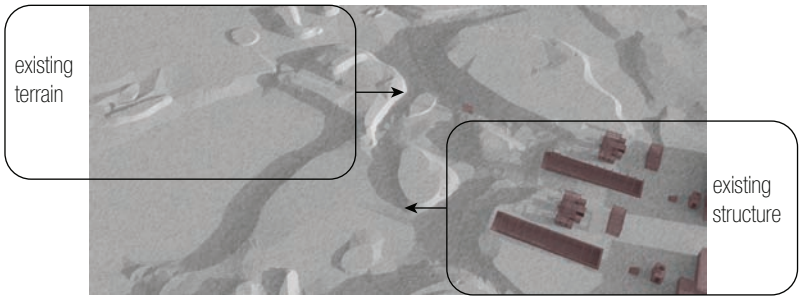
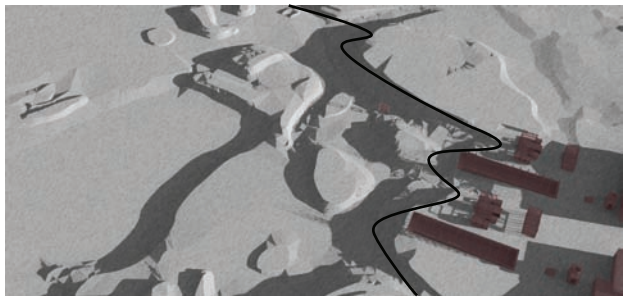


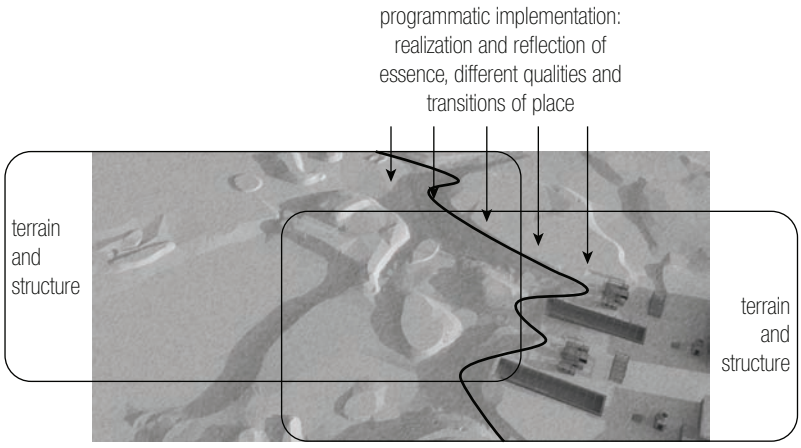
Figure 3.3: Activation of the static and dynamic qualities of terrain and programme



physical context (containable)



time and space transformations (uncontainable)



intervention

Figure 3.4: Programmatic activation of the terrain

3.2 history of beekeeping in South Africa

3.2.1 background

Some of the earliest relationships between mankind, bees and honey can be seen in South African rock art of the Cape and Natal regions.

It is recorded that the San would find bee nests by following honey-guide birds and watching the shimmering of bees' wings against the settling sun (Guy 1972:159). Accomplished traders and honey hunters were the San Bushmen, bartering not only in livestock, but also in honey transported in mammal and leguan skin bags. The Hottentots even made honey beer despite being predominantly nomadic (Seyfert 1930:209).

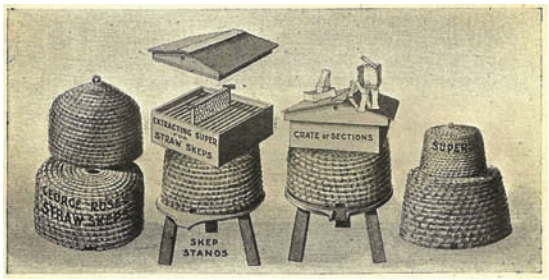
Locally, Bantu honey hunters would build vertical climbing pegs and short rope ladders to reach high nests in colossal baobab trees, establishing some of the first so called natural apiaries (Johannsmeier 2001:6).

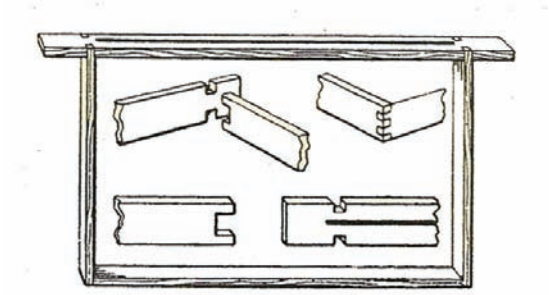
Historically in the South African context, there were no real attempts to domesticate the wild, aggressive African honeybee. Domestication only came in the 1800s with the developing fruit industry in the Cape. Together with industrial infrastructural development, the exploitation of indigenous forests, the establishment of the quick growing pine and the eucalypt forest industry, the basis for today's beekeeping industry was accidentally formed (Johannsmeier 2001:6). According to Hepburn (1993:10), during the Anglo-Boer War in the early 1900s and in the drought and depression years of the 1930s, honey became a survival food for the Afrikaner in rural areas of South Africa.

With the establishment of the first beekeepers' associations in the early 1900s, the field broadened and interest developed (fig. 3.7). A main concern was countering the aggressiveness of the African honeybee. Unsuccessful attempts to import Italian queen bees were made in order to breed a more desirable strain of honeybees.

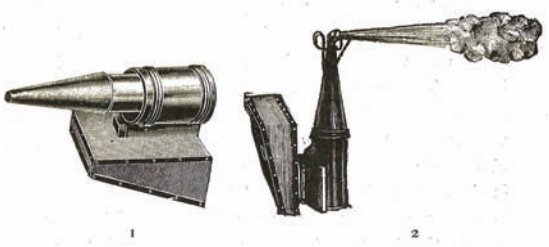
Figure 3.5: A copy of a rock painting from Eland Cave in the Natal Drakensberg showing a honeycomb in the wild (WOODHOUSE 1989:6)

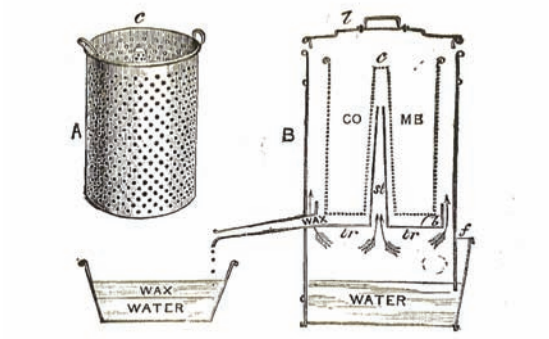
Figure 3.6: A copy of a rock painting from Ebusingata showing a man carrying honey (WOODHOUSE 1989:6)



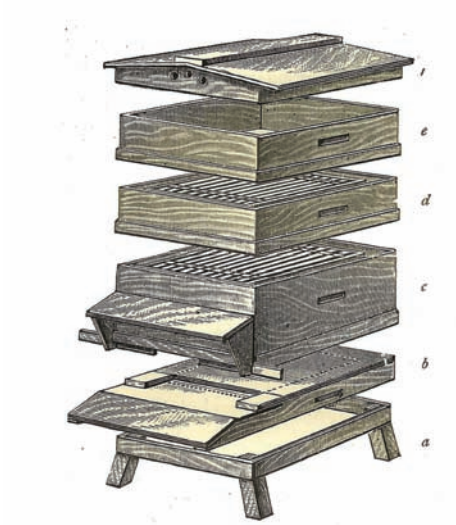


Bar-frame.





A, Perforated comb basket ; B, section of extractor ; *c*, central cone ; *tr*, tray ; *st*, steam tube.



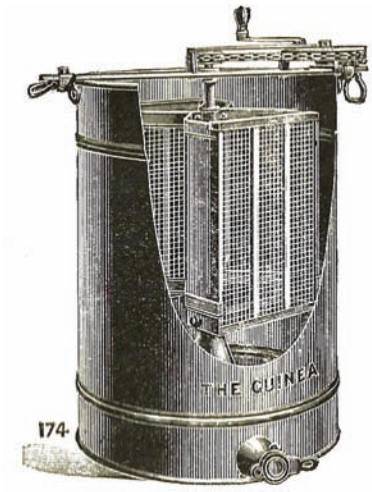


Figure 3.7: Drawings of early 1900 beekeeping equipment (CHITTY 1903)

3.2.2 domestication and trade

In the 1970s, through travelling and touring, influences and equipment would eventually reach South Africa. Together with honey exporting, the industry started to pick up. However, rising competitive market prices and the declining saligna gum plantations were the cause of the industry never fully coming to fruition (Johannsmeier 2001:6).

In the 1980s and 1990s, the beekeeping industry saw a shift from honey production to pollination services. Beekeeping however was never formally introduced into agricultural schools and the trade therefore remained secretive and knowledge transfer was kept to a minimum. Private beekeepers and non-government organisations would eventually start developmental beekeeping courses and training in rural areas which led to an increase in privately trained beekeepers and small scale apiaries (fig. 3.8).

Figure 3.8: An open bee hive with removed frames in a small apiary

3.2.3 state of industry

Towards the end of the 20th century, the South African beekeeping industry became characterized by a shortage of honey and a reliance on imports, despite ample pollination services. Due to unemployment, hive theft has rose to 20% of the total number. Bee losses due to pesticides and disease together with transport costs, lack of knowledge and mistrust amongst beekeepers eventually led to a stagnated but inherently thriving natural industry (Johannsmeier 2001:6).

Beekeepers in developed countries experiences a great demand for pollination services. Currently commercial beekeepers earn more from pollination services than from honey crops. Bee products (besides honey) such as pollen, venom, propolis and royal jelly have become increasingly important and research facilities in developed countries are strongly supported in creating a healthier pollination environment to aid their agricultural platforms (Johannesmeier 2001:4).

Because of radical bee deaths worldwide (Colony Collapse Disorder) caused by pesticides, disease, bee trafficking (packaged bees for commercial crop pollination) and various other unknowns have caused the beekeeping industry to decline in various countries (fig. 3.9). Further growing concerns in the 20th century are characterized by increasing costs, labour, control of pests and diseases which have led beekeepers to rely on non-beekeeping related sources for additional income (Johannesmeier 2001:4).

In South Africa, the beekeeping trade is diminishing; imports are increasing, and the infrastructural field in research, pollination and beekeepers is not expanding. Even though an infrastructural field has been established, it predominantly lacks funding and initiative to involve the small scale beekeeper (Johannesmeier 2001:4).

Figure 3.9: Cover of Time magazine addressing the plight of the honeybee (TIME 2013)

3.3 beekeeping industry

Commercial beekeepers generally have 200 hives or more, whereas small scale beekeepers have less than 200 hives. The South Africa beekeeping market is dominated by approximately 50 commercial beekeepers and roughly 400 smaller commercial beekeepers, owning 60 000 hives in total. Commercial beekeepers produce 80% of nearly 2000 tons of locally produced honey (fig. 3.10). The remaining 20 % comes from approximately 3000 small scale and hobbyists beekeepers (Department of Water & Forestry:2005). Wax and other by-products accumulate to approximately half a kilogram per hive.

Whilst the large commercial sector has shown no expansion or growth of late, small scale emerging beekeepers using small pieces of land and not assuming the size of commercial beekeepers, are rapidly growing. Commercial beekeepers practice migratory beekeeping, having 5 to 7 harvests a year (fig 3.11). Small scale beekeepers on the other hand do not rotate their hives and therefore only harvest 2 to 3 times a year. In the commercial sector a bee hive yields approximately 50 kg of honey, where a wild colony produces about 15 kg of honey (Total Transformation Agribusiness:2005:75).

Besides the profit differentiation involved, the commercial and small scale beekeeping sectors are both faced with various benefits and disadvantages. Figures 3.12 and 3.13 compare the commercial and small scale beekeeping sectors to establish a platform for the programmatic approach.

Figure 3.10: Highveld Honey Farm, Benoni. A commercial beekeeping company and extraction facility

natural industries

wild pollinators
(direct ecosystem services)

managed pollinators
(indirect ecosystem services)

wild pollinators in proximity of crops

pollination services during flowering periods by commercial beekeepers

agricultural systems
reliant on insect pollination

pollination

Scutellata region (northern South Africa)
year round foraging for bees
includes sunflower, grain, sorghum, cotton,
millet and maize

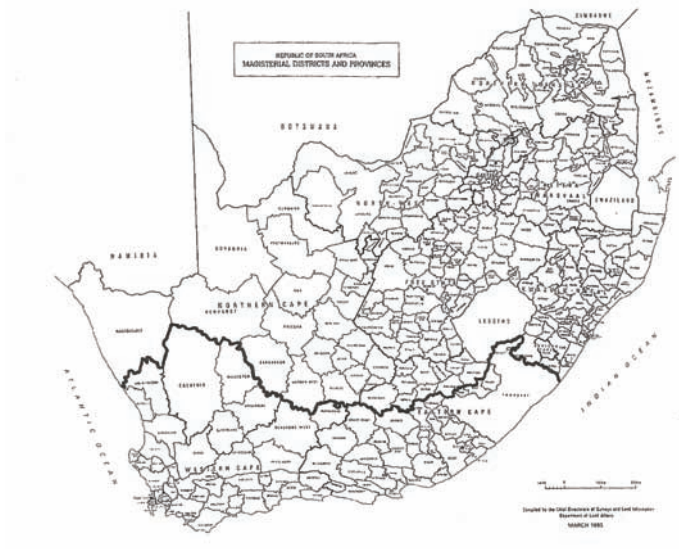


Figure 3.11: Wild and managed pollination by commercial beekeepers in northern South Africa

commercial beekeeping sector

employer // employee based

highveld honey farm cc, benoni

hives placed on pollination fields

heavy vehicular hive transport to storage plant

heavy vehicular transport to pollination fields

mechancial uncapping and extraction

marketing platform and exports

product storage and maintenance

benefits

increased seed yield + foraging sources + high yield honey flow

issues

vast covered distances for pollination services + colony disease + closed trade and expensive operation costs

Figure 3.12: Diagram of commercial beekeeping sector

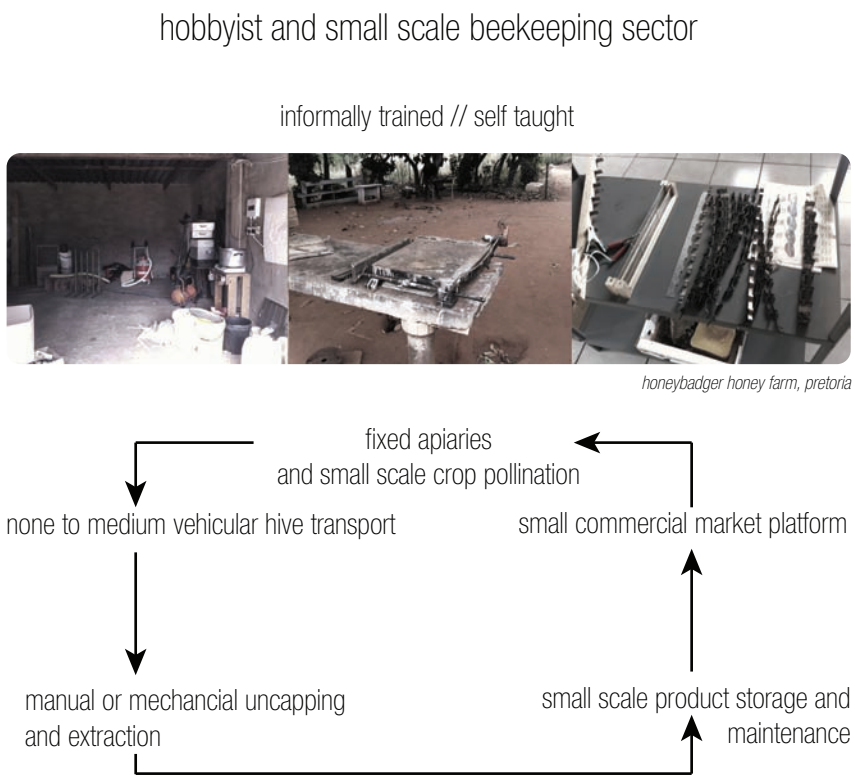


Figure 3.13: Diagram of hobbyist and small scale beekeeping sector

3.4 apiary requirements

For South Africa, apiary site requirements are ideally clearings with a north eastern slope, good air circulation, ready access to water (within 500m of the bees), wind protection, some form of shade in summer, road access to the site, protection from the public and most importantly a suitable source of nectar and pollen (Johannsmeier 2001:54).

Due to the aggressive nature of the African honeybee, apiaries should not contain too many colonies. Twenty give hives per apiary seem satisfactory, spaced at five m in all directions. five hives would need a site of approximately 30 x 30m. Appropriate measures need to be taken to protect the hives from ants and termites with the use of, for example, insecticidal solutions around the perimeter of the apiary site (fig. 3.13).

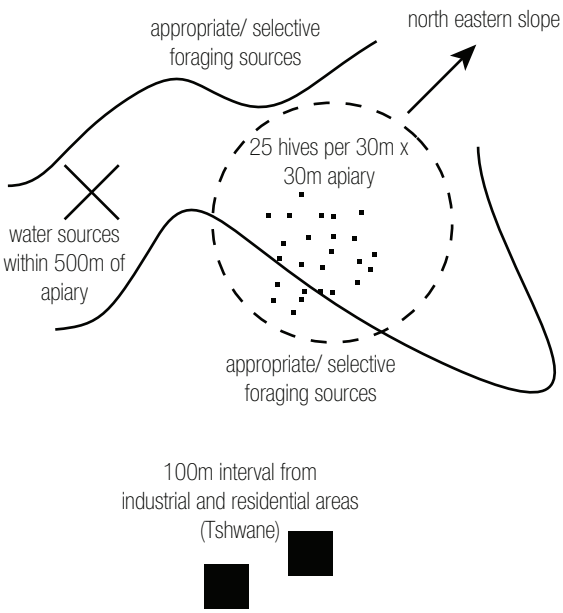


Figure 3.13: Apiary requirements

Foragers discriminate between flower types by learning the scent, colour and shape of the blossom. Each pollen forager remains faithful to one particular species, and mixed loads of pollen are generally very low (Johannesmeier 2001:34).

Beekeeping in South Africa requires registration by the South African Beekeeping Industry Organisation (SABIO). Urban and peri-urban areas such as Tshwane (the given context of the project) require an annually renewable municipal permit to keep bees. Bees must be kept in a solid, weather-proof beehive which is separable from its honeycombs. Beehives must be kept at least 100m away from residences, business premises or public places, and should be surrounded by a fence that is at least 1,5m high.

The isolated site, which largely has to pertain to the beekeeping by-laws and regulations of Tshwane, is scattered with Eucalyptus plantations and water sources, setting an ideal platform for potential small apiaries and. With the addition of vegetation, the Era precinct can become a ideal foraging source for colonies within the area (fig. 3.14).

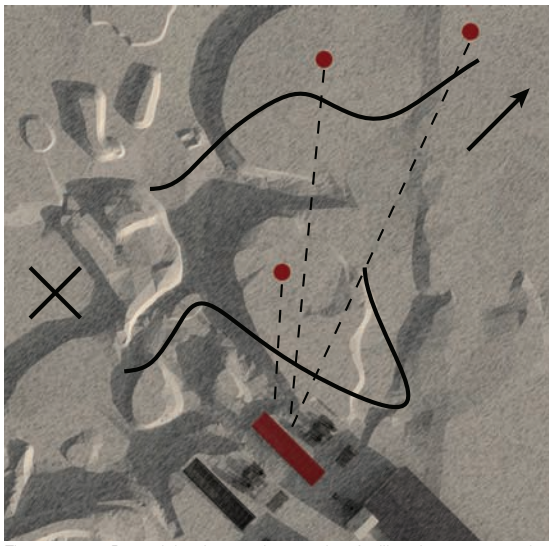


Figure 3.14: Potential apiary and extraction facility placement on the site

3.5 exemplary // existing programmes

3.5.1 training

The Agricultural Research Council (ARC) has initiated 96 beekeeping projects in 7 Provinces, targeting to establish 5000 emerging beekeepers and establishing affiliations with beekeeper associations, marketing platforms and commercial integration.

The ARC initiated the self-help programme Beekeeping for Poverty Relief in 2001, where poor communities can develop entrepreneurial and apiary skills. The programme spans across all provinces in the country and is funded by the Department of Science and Technology, the Department of Social Development and the Department of Agriculture.

The Beekeeping for Poverty Relief Programme of the ARC initiated and developed a platform for small scale beekeeping. They focus on training, basic equipment and marketing. Where normally smallholder beekeepers would have to obtain their own tools and equipment to harvest and process their product, the ARC has set up a processing facility in Umtata which currently enables 16 small scale beekeepers to deliver capped super boxes to the facility which processes and bottles their honey.

Already various small entrepreneurial businesses and programmes in the field have started to establish themselves in South Africa. Makana Meadery in Grahamstown, for instance, provides basic beekeeping training services and advanced beekeeping services at the town's old power station property. Aspirant beekeepers have access to between 80-100 beehives in the area for training purposes. The Worcester Polytechnic Institute (WPI), as an additional example, promotes projects which support urban beekeeping livelihood strategies in Cape Town since 2001.

3.5.2 pollination and foraging research

To address the decline in pollinators and pollination services which will affect food production and human livelihood, a Global Pollination Project has been set up (inclusive of South Africa) with the general aim to document the diversity of pollinators, to increase current taxonomic information on pollinators, to monitor pollinators, to assess their economic value and impact, to study key pollination systems and to practice and promote the use of pollinators in agro-ecosystems (SANBI:2013).

Through programmes such as the Honeybee Forage Project in South Africa, funded by the Working for Water Programme of the Department of Environmental Affairs' Environmental Programmes branch, the knowledge base of forage resources and forage species is slowly growing. It concerns itself nationally with foraging resources, spatial data of honeybee forage resources, alternative honeybee forage resources to invasive species and optimal honeybee forage management.

The Honeybee Forage Project aims to build a knowledge base, to promote management practices, and to provide capacity buildings producing materials, providing training and mainstreaming the issue of beekeeping, pollination and foraging (SANBI:2013).

Figure 3.15: Avocado field cages used for pollination research (JOHANNSMEIER 2001: 268)

3.6 programmatic intentions

The programmes and building suggestions promote entrepreneurship whilst recognising the importance of beekeeping, forestry and its potential on local level development as summarized in figure 3.16.

Even though Tshwane does not have the highest beekeeping potential in a commercial sense (Total Transformation Agribusiness 2005:77) establishing a profitable incentive for beekeeping by facilitating and training beekeepers in and around the region, is beneficial to the general beekeeping industry and the agricultural and forestry sector. Besides being a valuable tool for conservation, beekeeping is a form of agriculture which has an overwhelmingly positive impact on the natural environment, allowing a non-destructive economic benefit from floral resources and indigenous forests, whilst being crucially relevant to pollination of economically important plants (Agricultural Research Council 2013). Commercial beekeepers utilise the natural resources for beekeeping operations around the city, yet communities remain uninformed about the trade.

The intervention aims to purchase, handle, package and sell honey and honey by-products from remote groups to create a diversity in products. A honey processing factory, making diverse of honey and wax by-products, sets a market platform which acts as the driving incentive for small scale beekeepers.

To increase the number of beekeepers and to further the beekeeping incentive, a high-volume processing and packaging facility for hive products is established. This facility provides small scale beekeepers with access to equipment, storage and handling facilities. The driving production at the facility is the manufacturing of honey products, such as: hard and soft candies, extracted raw honey, bottling, exporting and selling honey and, lastly, mead production. Besides establishing itself into the public interest, the facility exposes the public to honey and honey candy productions. Forming the programme around a thread of public interaction with the facility, a social incentive is established which would, in accordance with the proposed urban vision, attract public into what would be generally an isolated industrial premise.

A research centre incorporated into this beekeeping facility aims to document the diversity of pollinators in peri-urban areas in order to increase current taxonomic information on pollinators, to monitor pollinators, to assess their economic value and impact, to study key pollination systems and to practice and promote the use of pollinators in agro-ecosystems.

Various high nectar yield plantations, which include both indigenous and invasive species, manage the site in terms of soil erosions and dust management whilst also providing foraging sources for the wild and locally placed bee hives. Additionally, the agricultural infrastructure creates a direct platform for behavioural observation of different bee colonies. Figure 3.17 propose different bee plants and vegetative support systems, which provide a year-round foraging platform that aid the production lines and spatial experiences of the terrain. The plants chosen range from area dominant to invasive species. The intention is to provide a diversity of flora for bees, which would introduce area dominant species into the management of the terrain and introduces alien plant species that offer foraging, industrial and spatial opportunities. For example, lavender and mint, alongside the on-site existing Eucalyptus plantations, provide opportunities outside of being only foraging sources. Lavender, mint and Eucalyptus, for example, are ideal plants for steam distillation and the extraction of essential oils. The extracted essential oils are complimentary to the honey candy production and in the medicinal by-product sector outside of the facility. Thus, any by-product, from either bees or plants, offers multiple uses to the terrain, bees and production.

Figure 3.16 (oposite): Diagram of programmatic intentions as a transition between the natural (beekeeping) and formal industry (production and market platform)

programmatic proposal

natural industry

research

training

localized outsourcing

obtaining

extraction

processing

storage

production

display

public/user

formal industry

service

1

localized apiary identification

moot plains bushveld peri-urban environment (Silverton region)

2

education/ research/ outsourcing

training and outsourcing urban/peri-urban bee and pollination research

3

infrastructural provision

gear
10 frame production colony
d sugar and pollen substitute
30 frame hive
fertile queen
20 000 worker bees built up over 40 days

4

on site facilitation

uncapping, extraction, gravity clarification, filtering, wax melting, bottling tanks

5

manufacturing/ accessibility/ maintenance

hive, frames and equipment

feeders, smokers, hive tools, extractors, supers, frames, wax sheets, queen excluders

additional:
inner covers, brood chambers, floor lids, hive stands, gear

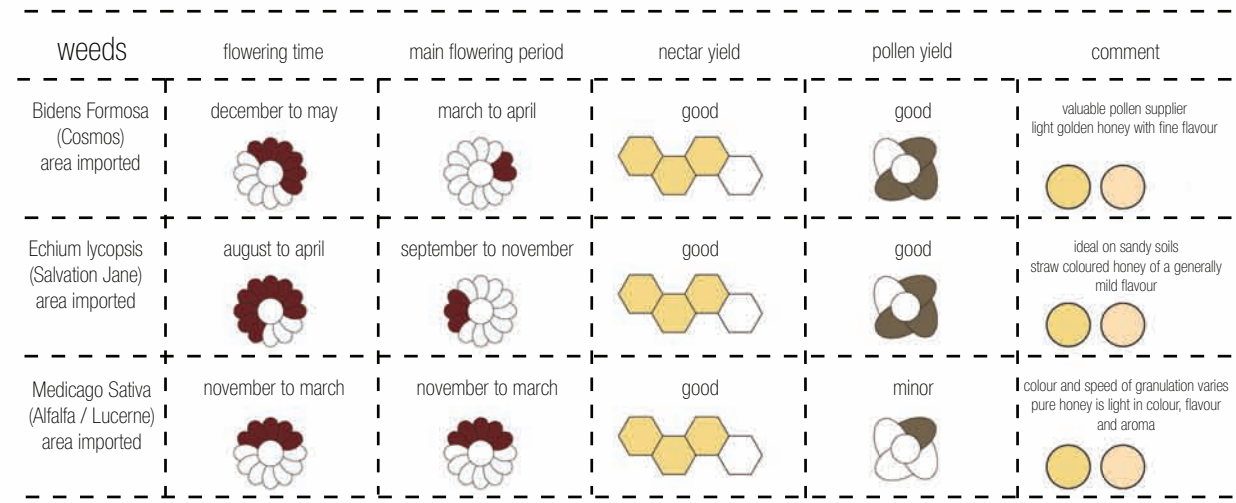
6

market platform

branding, bottling and labelling
raw honey branding
hard and soft honey candy production
mead production
by-products sold and reused (wax, propolis, royal jelly)

bee plants
moot plains bushveld

trees	flowering time	main flowering period	nectar yield	pollen yield	comment
Acacia tortilis (Thorntree) area dominant	july to march	august to october	good	moderate	nectar is secreted by extra floral nectaries on the leaves
Acacia caffra (Common Hook Thorn area dominant	july to november	september to october	good	minor	light, mild, slow granulating honey, seldom obtained pure
Dombeya rotundifolia (Wild pear tree) area dominant	july to september	july to september	minor	good	short flowering and early brood stimulant light coloured, pleasant honey
Ziziphus mucronata (Buffalo Thorn) area dominant	october to april	november to february	good	minor	long flowering period produces a dark, reddish brown honey with a strong malty taste
Eucalyptus globulus (Blue gum) area imported	april to december	july to october	moderate	moderate	amber honey of fair density and flavour pollen reportedly good for bees
shrubs	**flowering time**	**main flowering period**	**nectar yield**	**pollen yield**	**comment**
Protea caffra (Highveld Protea) area dominant	november to january	november to january	moderate	moderate	dark in colour, strong aroma and taste slow granulating with coarse texture
Rhus Lancea (Karee) area dominant	may to september	june to july	moderate	good	dioecious, winter pollen source dark, strong honey
Euclea spp. (Guarri) area dominant	september to april	september to april	moderate	moderate	honey is light in colour, exceptionally good taste, granulates rapidly with a fine grain



supporting vegetation and uses

herb	bee factor	candy	culinary / other	medicinal/ essential oils
Borago Officinalis (Borage)	80%	✓		✓
Rosmarinus officinalis	80%		✓	
Coriandum Sativum (Coriander)	85%		✓	✓
Lavandula angustifolia	55%	✓		✓
Thymus vulgaris (Thyme)	50%		✓	
Mentha piperata (Mint)	60%	✓	✓	✓
Ocimum basilicum (Basil)	80%		✓	

Figure 3.17: Potential area appropriate bee plants and supporting vegetation and uses

3.7 site management and productions

The intervention serves as a programmatic prototype and place of exposure. Along a route through the processing facilities, the aim is to expose the public and potential entrepreneurs to the beekeeping trade through interaction, apprenticeships and classes. Essentially, the building intervention is a physical and visual translation of an encapsulating programme that has the intention of making the public and potential entrepreneur aware of the trade. Beekeeping is not necessarily complex. As is clear from figure 3.7 which shows beekeeping equipment from the early 1900s, equipment has not changed much over the last century. Bees remain uncontainable and where man intervenes, only a certain amount of interaction can occur. Figure 3.20 shows the author's first engagement with bees, which was a surprisingly different experience than initially expected. The perception gained from the experience was that patience, skill and understanding is essential, but is only gained through physical interaction. Crucial to the programmatic realisation, therefore, is physical exposure to the different processes and allowing public, entrepreneurial and industrial interaction to promote the trade.

The on-site productions range from utilising the vast scape as a production premise to converting the existing structures as points of product distribution. The existing eucalyptus plantations, together with the proposal of various area dominant and imported plant species (fig. 3.17), act as foraging sources and set the basis for promenade spaces. The existing structures become and inform the dominant public spaces which sell and display the products.

Mediating between environmental character of the place and existing structure, the following phases of production occur:

-Terrain management and vegetation proposal

-Localized apiary and beehive placement

-Plant drying and essential oil distillation

-Honey harvesting, preparation, uncapping, motorized and manual honey extraction, gravity clarification, liquefying and wax melting, bulk hive and barrel storage

-By product winning such as reclaimed wax, propolis and royal jelly for further internal and external beekeeping, medicinal and culinary uses

-Beekeeping training, equipment repairs, maintenance, washing and equipment production (frames, wax sheets)

-Testing, honey fermentation and mead production Hard and soft honey candy productions

-Variety of on and off site bottling of raw, filtered or creamed honey

Figures 3.18 show the different parallel and linear processes suggested for the processing, packaging and research facility, ranging from natural industry to market platform.

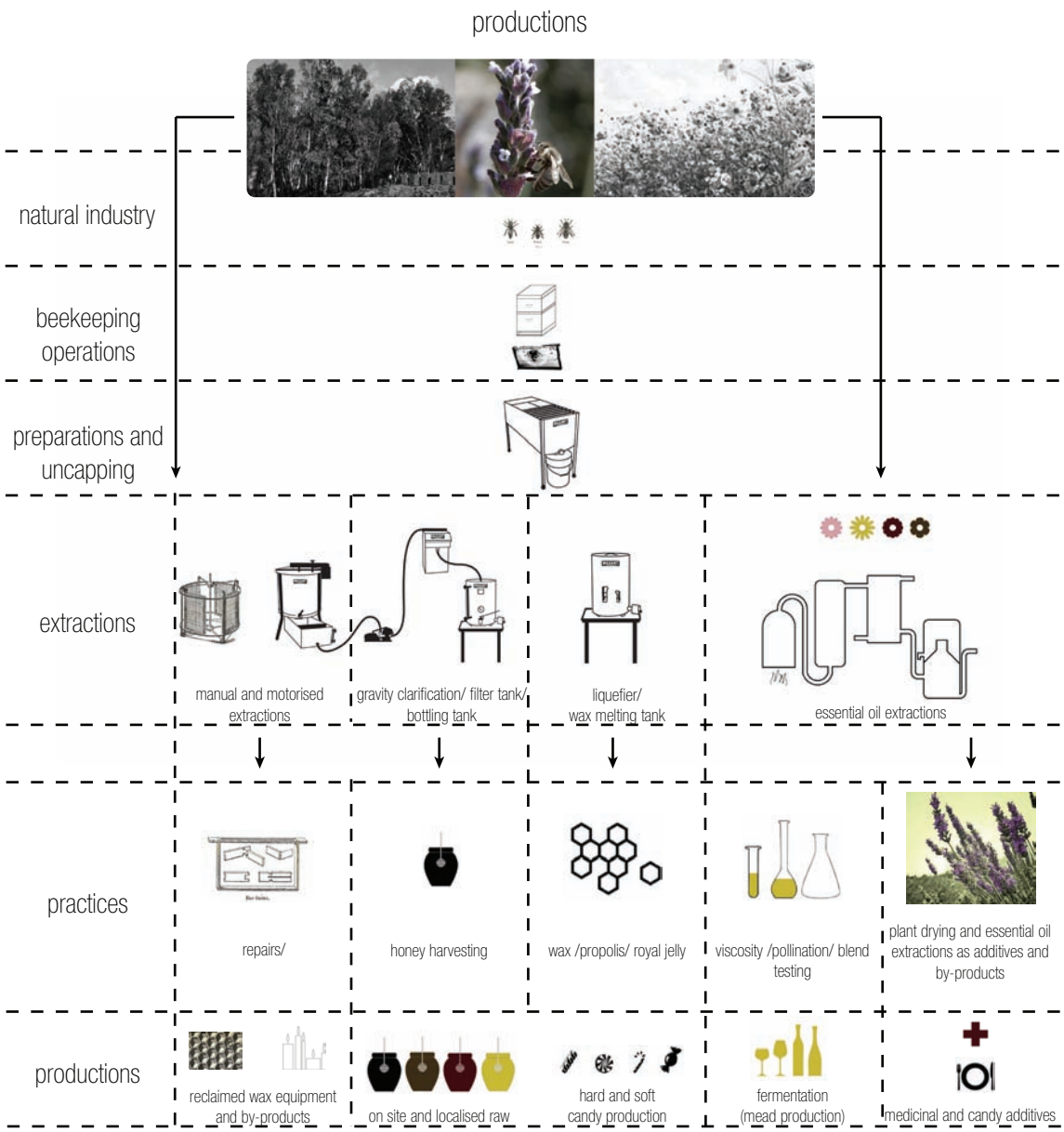


Figure 3.18: Diagram of production processes and supporting vegetation

3.8 clients and programmatic aims

Because of the complexity in promoting the small scale beekeeper and beekeeping industry, the integration of groups that have executed similar programmes and deal with the same social problems and conditions in the beekeeping trade, becomes crucial. Facilitating and promoting the participation and active integration of the following parties encourages, orientates, guides and further improves the programmatic management of the vision.

Department of Water Affairs and Forestry (DWAF)

The Plant Protection Research Institute of the Agricultural Research Council (ARC-PPRI)

South African Bee Industry Organisation (SABIO)

Beekeeping for Poverty Relief Program (BPRP)

South African National Biodiversity Institute (SANBI)

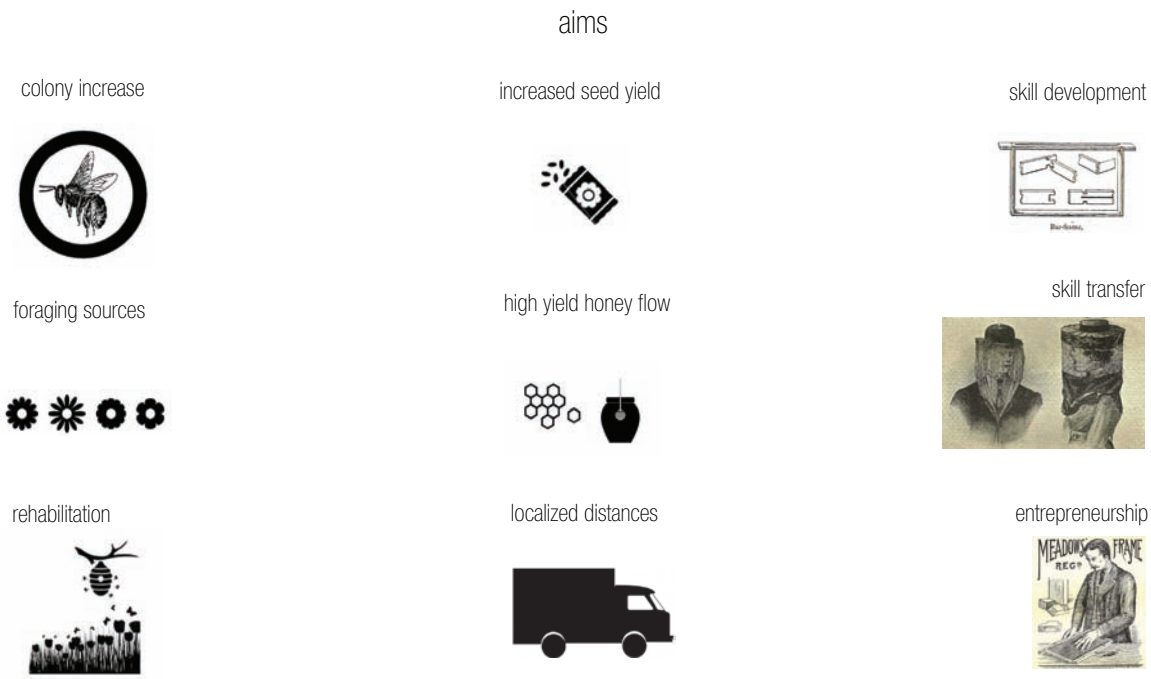


Figure 3.19: Aims of processing, packaging and research apiary facility

Figure 3.20 (opposite): Urban engagement with bees

4 transitions

Transposed to the urban key, the enthusiasm for these vacant, expectant, imprecise, fluctuating spaces is a response to our strangeness before the world, before our cities, before ourselves. (De Solà-Morales 1996:9)

The post-industrial context is understood as a static object in time which is removed yet imposed on its ever changing context. The theoretical discourse maps and reads the landscape in terms of the struggle and transitions between the static imposition of structure and the perpetually altering nature of terrain. While integral to one another, separate characteristics are identified and explored as tools to collectively materialize a programmatically driven intervention.

4.1 totalities

Untitled_Space is a series of publications which deals with the built environment as a social process that is absorbed in architectural questions and possible answers. Paul Toornend (2005:1) states that where architecture manifests itself, much, if not everything, stops existing. Untitled_Space therefore seeks justification in a reorientation of architecture to its specific material context as an explicitly open space. Where architecture is born from its immediate material context, it becomes a transformation, rather than creation, within space.

Toornend continues by stating that architecture becomes a manipulated image of its environment, a literal form of perception within context and surrounds. What is there already is closely looked at and interpreted to not only inform design, but to become a reflection and a response of context. This transformation manifests itself within the immaterial context with as much leverage as in the physical context. For example, the heritage and ideologies of Modernism are opened up collectively and not simply seized as remnants. Various opportunities and interpretations within the spectrum are embraced, gaining relevant yet open ended and accessible social significances.

Untitled_Space 02 considers the typological essence of roof and wall (fig. 4.1). As a series of fragmented and converged T-shaped glass pavilions, a spatial interface between rural landscape and urban motorway is gathered without it being physically enclosed. Depending on the intervention, the obvious or concealed come forward, selectively and collectively revealing the essence of place through an almost infinite number of places.

De Solà-Morales' states that the word *vague*, of Latin and Germanic origin, refers to sea swells and waves of water, implying movement, oscillation, instability and fluctuations. The site, as a terrain vague, holds infinite qualities and interpretations of static and dynamic qualities of place. The intervention and interpretation of the site, however embracing of the loci, the vacancies and existing conditions, aim to understand the terrain through programmatic intentions and programmatic understanding. As a filter assigned to the terrain, programmatic understanding becomes the tool which makes sense of the place in time and space, in an abstract as well as literal sense.

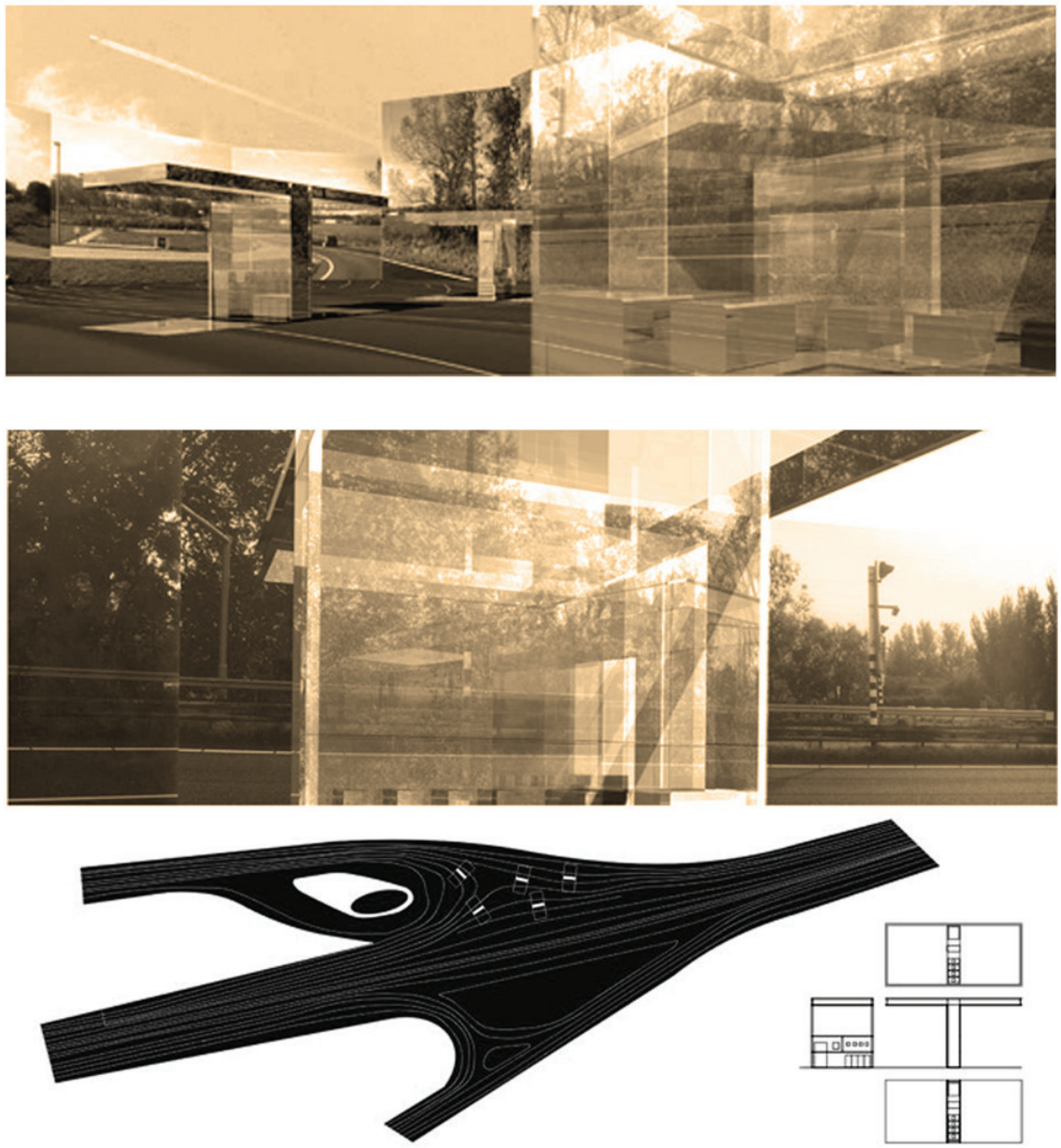


Figure 4.1: Untitled_Space_002, Sassenheim (NL), November 2000 (TOORNEND 2013)

4.2 the eternal present

Abstraction in the Greek sense of aphaeresis, means *the process as well as the result of the withdrawal [of the eye] from the particular, accidental, inessential, in order to obtain the general, inevitable, essential*.

Siegfried Gideon (1962: 11) states that by bringing together the essential characteristics of an object into one abstract artistic concept, it offers us the most important means of systematically arranging the boundless multiplicity of that object. Such objects approach us in our perception, our imagination, and even in our thoughts.

Enric Miralles explored architecture not as a static work, but as a constant discovery, an exploration of time and space. Miralles's architecture materializes through being impermanent whilst embracing change and variation. Architecture becomes a process first through seeing and studying, then through interpreting and establishing a relationship and lastly, giving something in return (Quirós et al. 2000:1).

At Miralles and Pinos's Igualada Cemetery, instants of time are collected as a journey through the undertaken spaces. The building is based in exploring, discovering and revealing the place, provoking thought and memory. Similarly, Miralles and Pinos's Olympic archery range in Barcelona is shaped by retaining wall functions and requirements for archery training and competition, is anchored into the terrain while allowing a dynamic roof plane articulation and reflection of the earth as reminiscent of the athlete's movement in a static manner.

Miralles's work relates largely to the manifestation of time and space as a journey that is linked to previous references of meaning, whilst producing new discoveries. Both experiential and referential, Miralles's work moves within the present experience of space, whilst at the same time referring to previous or future events. Miralles expressed these layered experiences through overlapping plans and sections as they would appear during the journey through the cemetery or archery range, emphasizing singular moments in time and drawing importance to certain spatial experiences without having a preconception of the spaces (fig. 4.2).

The post-industrial context is seemingly static in time, showing a removed yet imposed sense of space. The continuum of time remains overwhelmed by the specificity of space. This context of the terrain is seen as empty, yet functionally specific sheds within an altered landscape. The intervention aims to reflect the static essence of the post-industrial remnants whilst placing the user within an extended, dynamic environment.

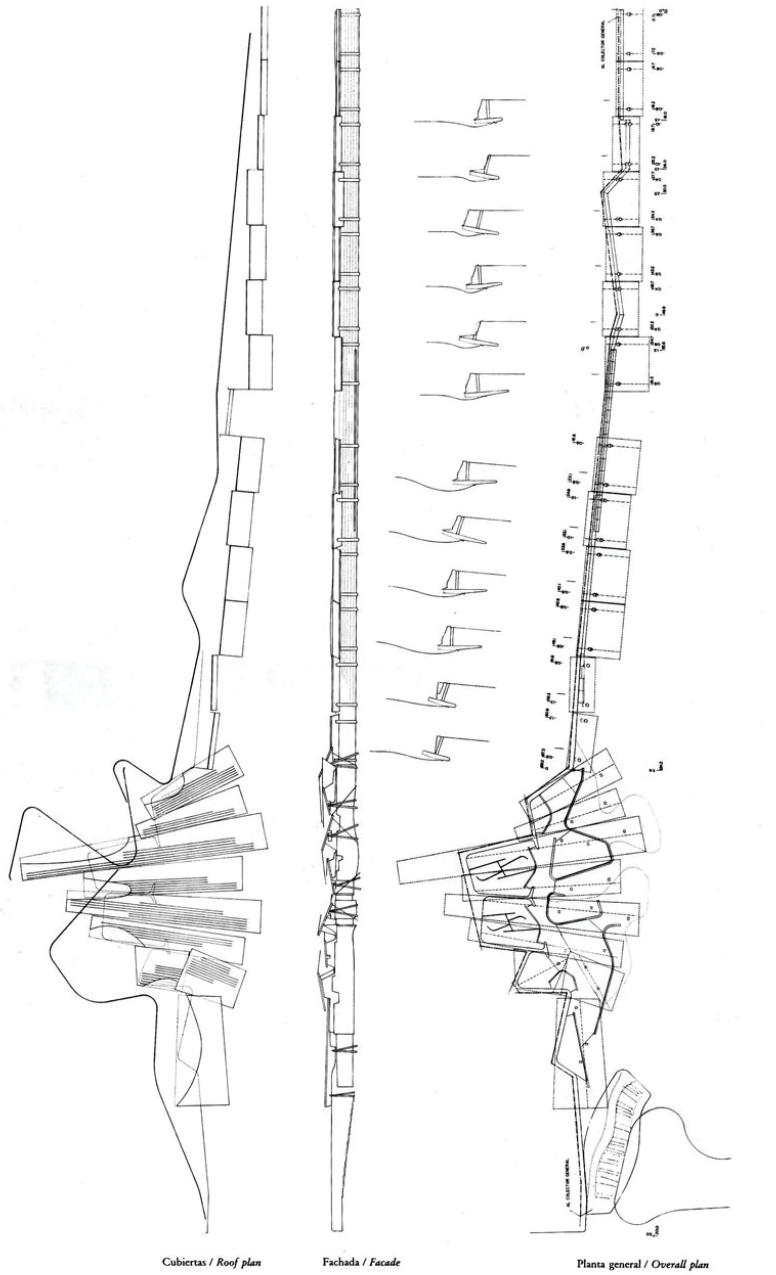


Figure 4.2: The architectural plan as a map – drawings by Enric Miralles (FUNAMBULIST 2013)

4.3 segues // continuity of form

This dissertation explores the platform of between the static, yet temporary, and the loss of spatial specificity. Whilst moving within the spectrum of enclosure and opening that relate to the environment as a totality, the context is initially understood by way of fragmentation.

Through exploration and intervention, the qualities of the place, however, emerge as integral to one another. The intervention becomes a gathering image and experience of the post-industrial terrain; a transitional exploration of space implemented through programme, and informed by setting, converge the findings that form structure and generate a contextual response. A blatantly altered state sets the platform for subtle intervention.

A segue is a term used to describe an uninterrupted transition from one piece of music or film scene to another. The dynamic, uninterrupted inevitabilities in time and space is that which has made the post-industrial terrain become integral to the totality of place.

The architectural interpretation of time and space, therefore, are the tools of intervention as applied to the basic understandings of architectural elements of form.

Francis D.K. Ching introduces *Architecture: from, space and order* with a description of the primary elements of form. The transitional growth from a point to a one dimensional line, from the line to a two dimensional plane, and from the plane to a three dimensional volume set the basis of architectural design (Ching 1943:2). Whereas Untitled_Space 02 considers the manifestations of the typological essence of roof and wall as an architectural interface, the dissertation explores the specificity of space and continuum of time as primary elements of form in placemaking.

The essence of a place does not remain captive to the physicality or conceptual understanding of the terrain as static form, despite the remnants thereof visualized as an almost still photograph. The terrain is dynamic, even if seemingly static. The genius-loci of the post-industrial terrain is evidence of this. The space/time spectrum has transformed and almost merged the primary elements of form imposed and existing to the place, for the terrain is understood as a single entity in the post-industrial condition.

The following diagrammatic interpretations of the site (fig. 4.3, 4.4, 4.5, 4.6 and 4.7) bring the elements of form, as discussed by Ching (1979:2-32), into direct contact with the space/ time spectrum of the site. The analysis aims to unveil the apparent and non-apparent qualities of the site as dynamic. The analysis intends to accumulate different static concreteness within the transformations in the space time spectrum. Progressively, the conceptual development takes this notion and explores the tools which activate this totality to inform intervention.

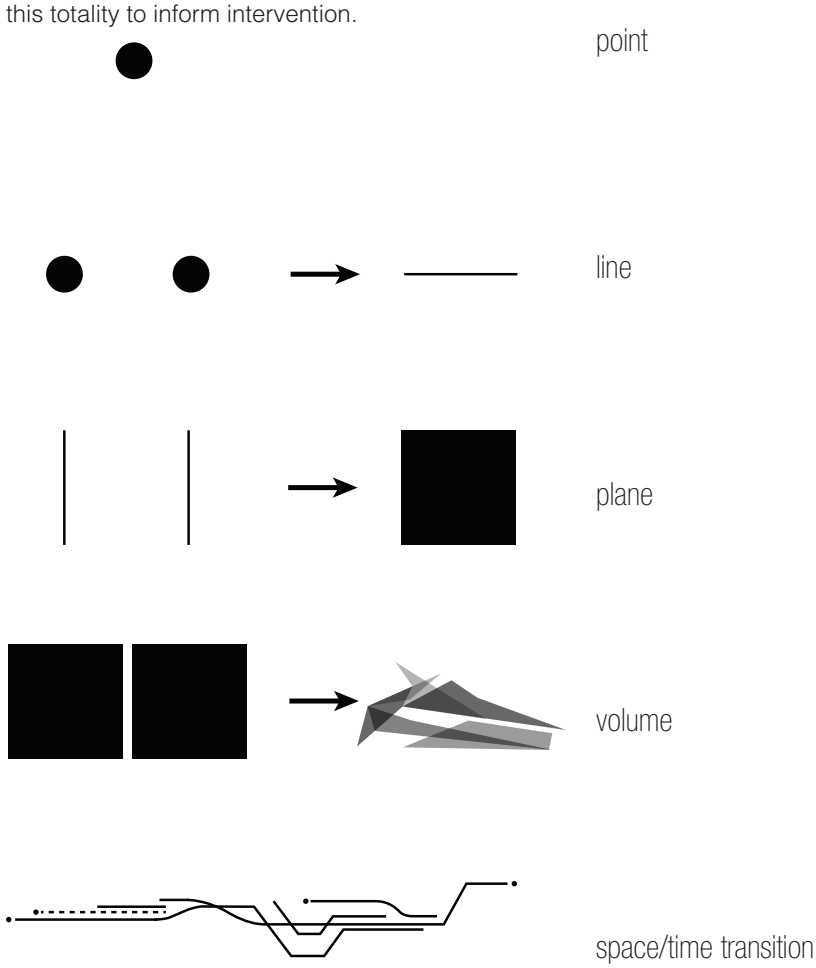


Figure 4.3: Diagrams of the elements of form, bringing the site into direct contact with the time/space spectrum.

4.3.1 traces

silence of ruins speak clearer than any kind of intervention (Curulli 2006:39)

A point marks a directionless position in space, an identification of different elements. The leftover terrain is understood as various points, as different objects which are primarily explored as the separate elements which make up the site. The different points as observed are the physical recordings of the terrain, the reminders of an industrial scape. Whilst static and silent, the identified structures, with the natural elements, depict the time based transformations and the current conditions of the terrain.

point

terrain

physical recordings of memories

industrial remains act as reminders

argument for time based transformations and current conditions to prompt interpretations

silence as reference

the site does not require an immediate function; the wasteland is left to recover, allowing an openness of interpretations

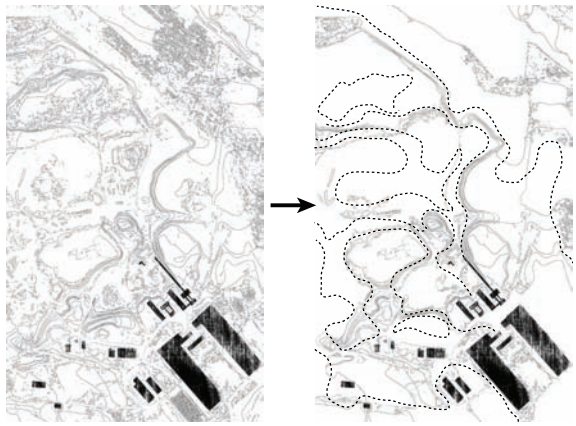
extractions

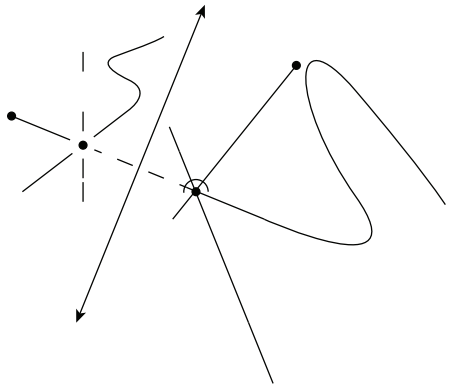
traces within site from lost industries

changes over time

nothingness and silence reveals subtle characteristics

1





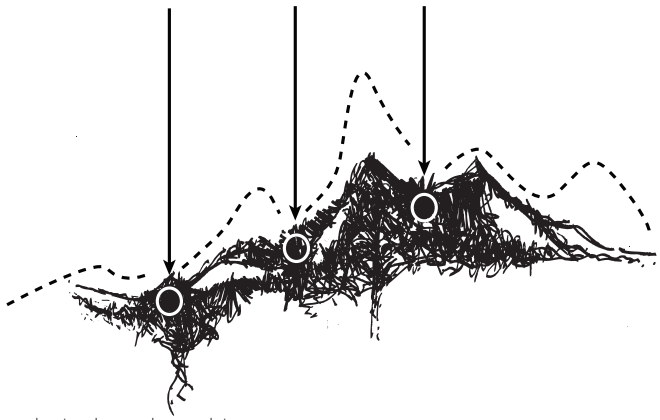
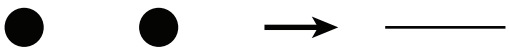


Figure 4.4: The leftover terrain understood as various points

4.3.2 amnesia

physical memory of a lost industrial process remains an object in landscape, announcing the presence of a building (Curulli 2006:29)

The extension of a point is considered a line, a connection with direction and position that sets the static point in motion. Lines culminate as resulting connections and objects in landscape. While objects are static, the remnants visually express movement and orientation, a connection from one activity or space to another. This physicality, this culmination of lines, provides a body for the memory of the terrain. The intervention moves within the realm of this body, captivating the embedded memory of place.



line

building

recollecting physical memory of processes

memory valorises the aura of place

argument for industrial rigidity to inform sense space and orientation in site

physicality of processes as reference

the physical presence provides a body for memory; structures are seen as objects in landscape, recollecting physical fragments of industrial processes through intervention

extractions

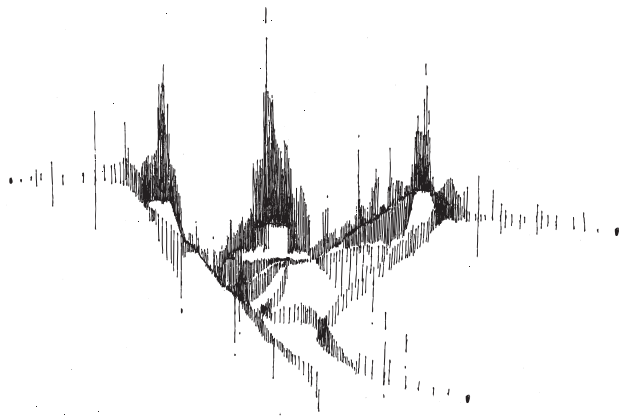
objects in landscape

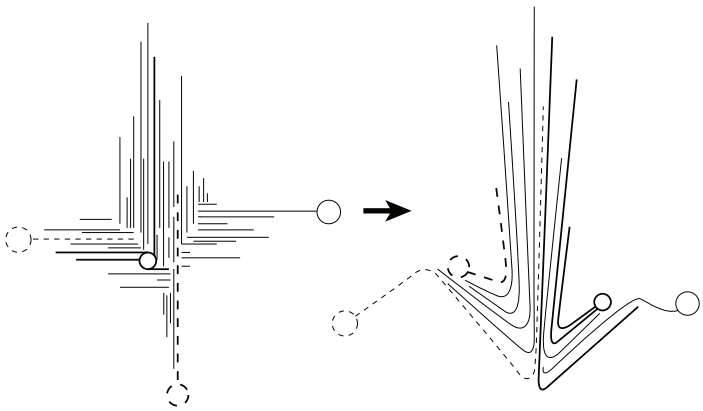
physical remnants of processes

emergence of blatancy and fragmented context

1+1

2





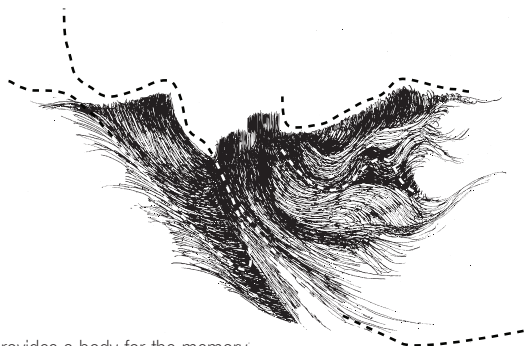


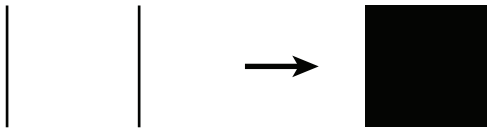
Figure 4.5: The culmination of lines provides a body for the memory of the terrain

4.3.3 absence (revealing)

programmatic continuation and evolution becomes an instrument to trigger remembrance (Curulli 2006:37)

A plane may be described as a visual membrane between two or more lines. Interpreted in terms of the post-industrial context, the plane becomes the directional connections between the objects in landscape and altered terrain. A direct result of the functionally driven context is that each structure and the altered landscape works within the hierarchal procession of extraction to product.

In its barren state the site still holds onto the programmatic infrastructure of the place. By maintaining or re-interpreting the processes of the existing structure and terrain, a certain consciousness of the past is brought forward and the potential of the remnants and of the site are uncovered. The absence of function is beneficial to create directional, yet open ended intervention. The identification of processes is followed by interpretation, where the identified processes become the tools that realize intervention



plane

programme

consciousness of past through programmes

embedded potentialities of site and structure

argument for absence of function to lend large range of modifications and experimentation

past inscriptions as reference

absent and unrevealed programmes become utilitarian where processes and site potentials form new space and industries

extractions

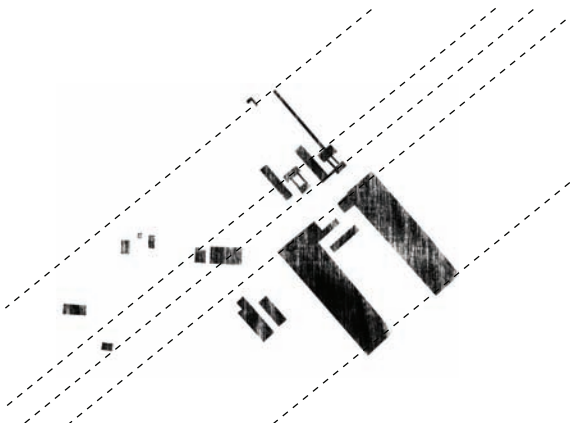
reveal context of programmatic remnants

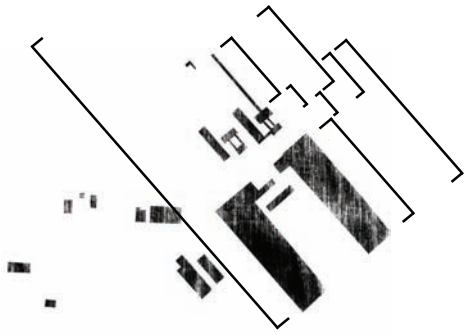
unearth directional open endedness

dynamic programmes extracted from absences (site) and remnants (structure)

1+2

3





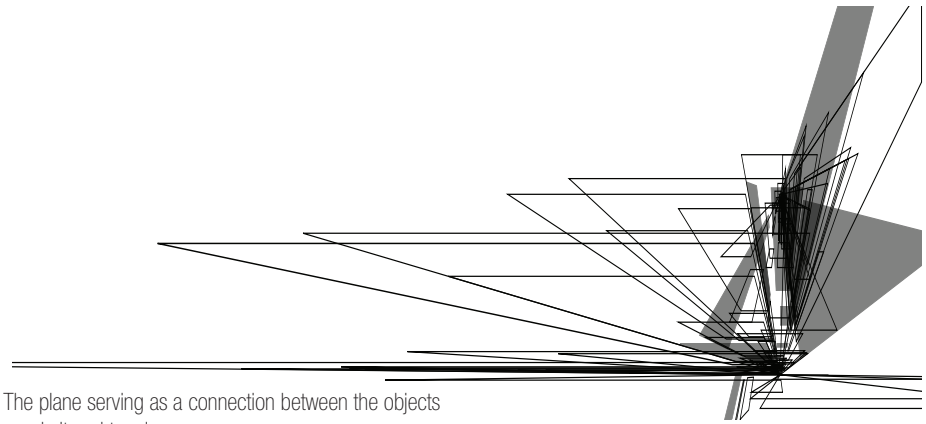
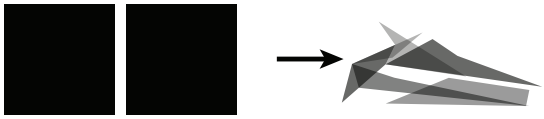


Figure 4.6: The plane serving as a connection between the objects in landscape and altered terrain.

4.3.4 manifestations

urgency of an imminent demise is peeled back and destructured, layered into the seemingly unpopulated space (Curulli 2006:33)

A volume is an extension of planes other than into its intrinsic direction. The essence of the place is where the point, line and plane become apparent as a totality. The leftover spaces and the objects in landscape make visible the terrain through meeting, passing, connecting and segregating the process, the structure and the landscape. Where the various aspects of the terrain meet as objects and processes, the past, present and future conditions are dealt with and emerge as a vibrant and sculptural relationship between the tectonic and stereotomic. The traces (site), memories (structures) and past and present potentials (programmes) are destructured, moving the intervention within the openings and enclosures of the terrain.



volume

structures

inactive tectonic processes

sterotomics industrial repercussions

argument for addressing now static but sculptural relationship between tectonic and sterotomic

destructuring skins as reference

wilful manipulation of the formal and informal gives way to the destructuring of traces (site), memories (structures) and potentials (programmes) to allow spatial manifestations

extractions

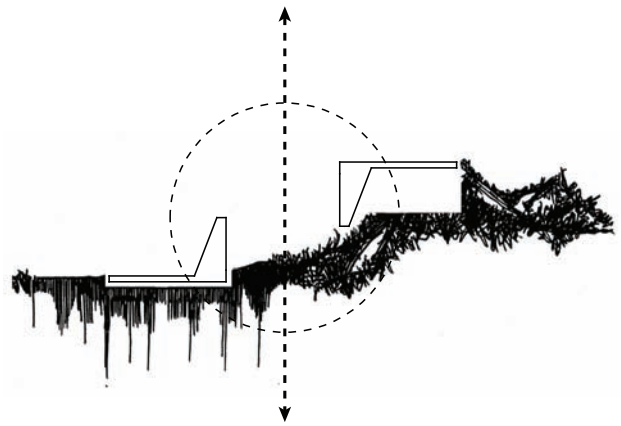
physical and structural peeling back

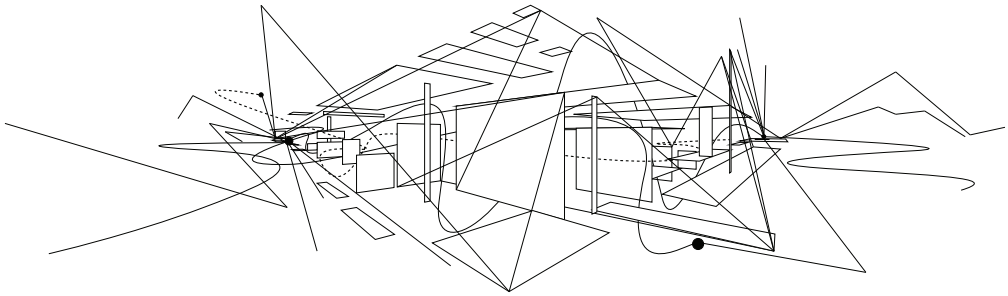
mediation of character, scales, proportions, arrangements, edge conditions, colour, materials through specifics (tectonics) and repercussion (stereotomic)

refamiliarization and spatial manifestation

1+2+3

4





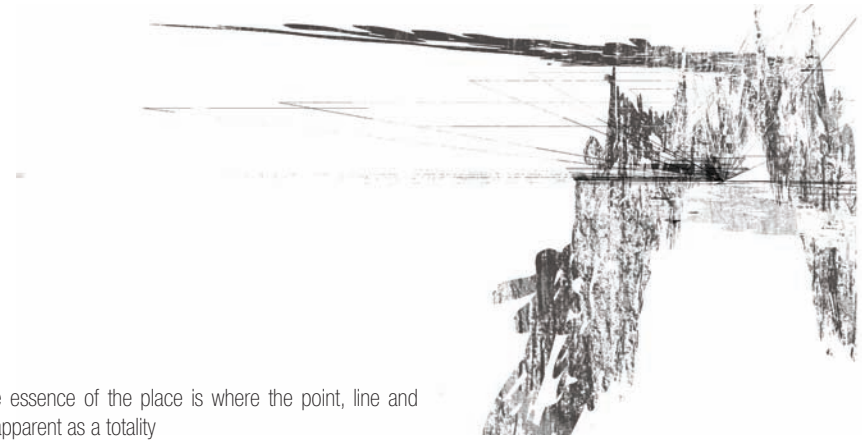
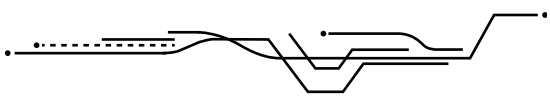


Figure 4.7: The essence of the place is where the point, line and plane become apparent as a totality

4.3.5 transitions

the continuity of segments envelope and reveal a context specific architecture, exposing the language of abstraction

The elements of form within the space/time spectrum are brought forward through an analysis of the delimitations of site and programme. While considered as constant factors to the site, the delimitations are understood within the plasticity of a dynamic state. As an incision, the delimitations would alter the terrain while creating a deep sense of awareness of place.



space/time transition

converge

claim authenticity for the new

conjure real and intangible memory

argument for surfacing events

emergence of perceptions and events as facilitation

bridging distance between past and present through an uninterrupted transition between traces, memories, potentialities and manifestations

extractions

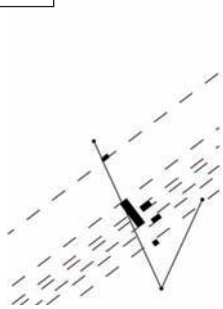
transitions informed by perceptions

emanation of old and new processes

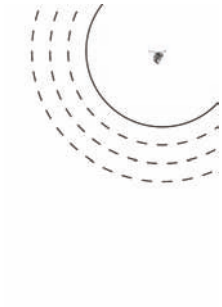
holistic placement into an industrial landscape and sense of event

1+2+3+4

5

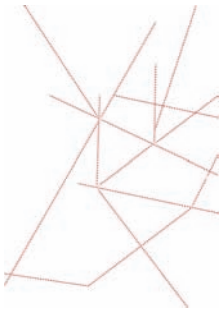


enclosure
(formal industry)



opening
(natural industry)

building
(imposed character)



placemaking
(enclosure relating to environment through opening)

post terrain
(embedded character // structure and site)

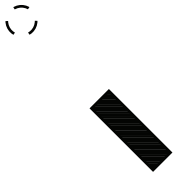
Figure 4.8: The delimitations explored in transition

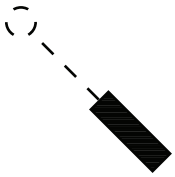
The programme, as reflective of the exploration between opening and enclosure, is a visible and tangible concreteness which anchors itself into the intangible through the elements of form as identified.
Miralles found that the journey is the most important element in architecture: an experience of the different layers of time (Quirós et al. 2000:2). The industrial terrain draws a parallel to this experience of different layers; yet as mentioned, where Miralles explored the movement through space in time as a journey, the intervention explores the transition between the static object and altered terrain as the platform which grounds, yet activates, the constantly changing layers of the site.

Figures 4.9, 4.10 and 4.11 show that the different layers between openings and enclosures become obscured over time. The layers of the site, such as the existing routes or processes of production, only surface when the terrain is activated. However, the layers, tangible or intangible, are only made sense of when considered collectively. Depicted in figures 4.10 and 4.11, where the different layers are simply stacked on top of one another, the terrain becomes illegible. However, where the layers are allowed to influence and determine the emergence of the other, a sense of orientation and identification of place is gained.

programme // static
(enclosures)

industry // dynamic
(openings)

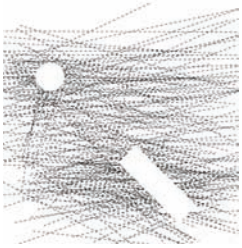




terrain // singularity
(place)

placemaking
(enclosure relating to environment through opening)

intervention // transitions
(emergence of place)



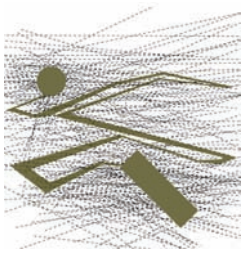


Figure 4.9: The different layers between openings and enclosures that have become obscured over time surface through activation

disassembly // characteristics of place

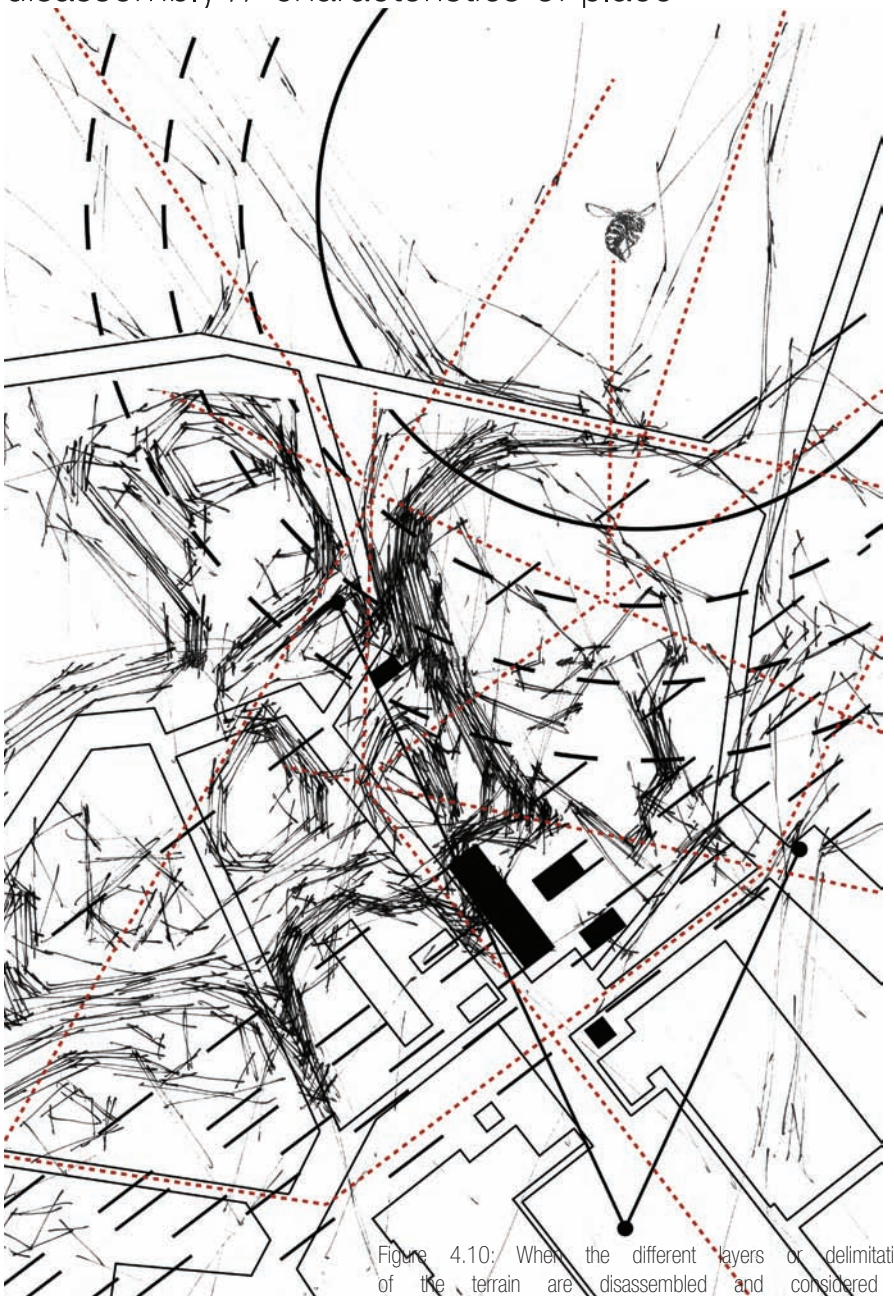


Figure 4.10: When the different layers of delimitations of the terrain are disassembled and considered as individual characteristics, the terrain becomes illegible

emergence - totality // interpretation of place

openings
(industry)

enclosures
(programme)

transitions
(placemaking)

Figure 4.11: The terrain is understood as a collective between opening and enclosure. Brought forward through intervention, the site gains orientation and identification of place

5 incisions

We have an interest in landscape when we feel the need to stretch our eyes. Along with this common understanding - and probably because of it - the term landscape enjoys a comprehensive career as a metaphor... Every chaotic totality is assembled into a unity as soon as it is labelled a landscape. The term "urban landscape" sheds a redeeming glow upon the most dejected neighbourhoods; "industrial landscape" transforms any romping ground for the ravages of industry into an object of aesthetic sensibility. (Smout & Allen 2007: 3)

The design underwent a continuous exploration to undercover the terrain as a single entity. While consciously remaining an imposition on the site, the building approach attempts to present itself as inherent to the terrain. The different conceptual approaches are presented as incisions into the landscape, which collectively gather the placeness of the terrain through the programmatic manifestations of the existing, and the proposed structures and conditions.

5.1 terrain

De Solà-Morales (1996:4) describes the French word *terrain* as referring to a large and blurrily defined area of territories which are expectant and awaiting intervention. Even though potentially exploitable, such territories contain a predefined notion of physicality and placeness. Stemming from the French word *terrain*, the site is considered as a terrain in a post-industrial sense. Through various site visits, the terrain underwent a series of analysis, investigations, assumptions and discoveries with the hope to uncover its physicality and placeness.

However, isolated analyses, investigations, assumptions and discoveries remain largely quantitative. To collectively, and qualitatively, grasp the site in its existing and expectant spectrum, an understanding and coming forward of the static and dynamic qualities of the site is required.

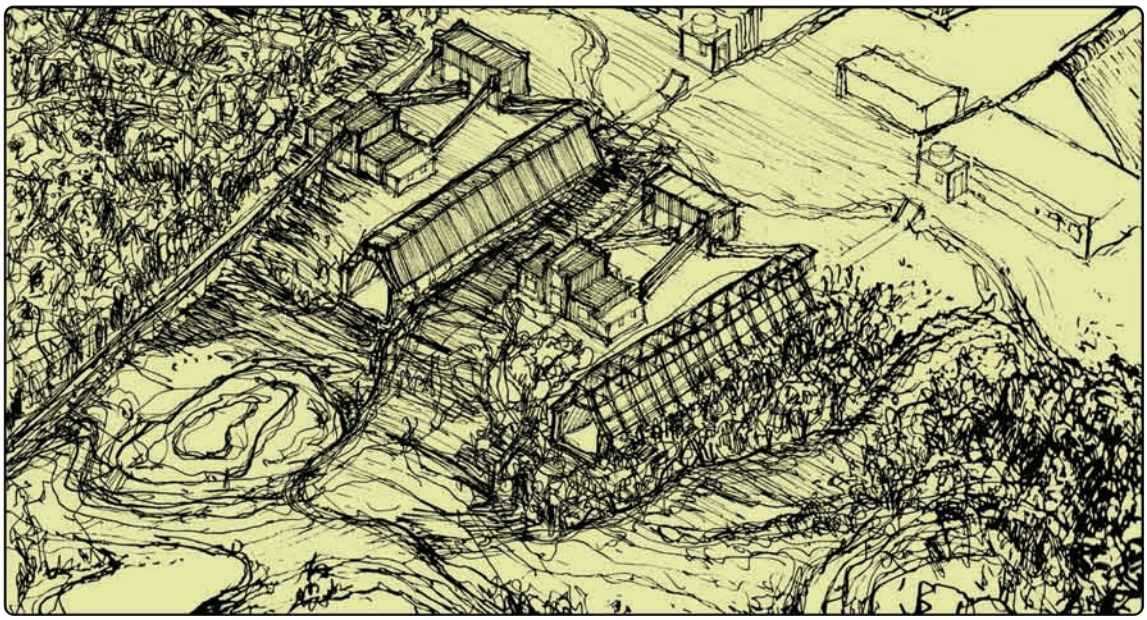
In *Augmented Landscape*, Laura Allen and Mark Smout scrutinize the intrinsic features of the landscape. Architectural intervention becomes a response between the dynamic and fluxing territories of environmental transformations, such as the forces of nature, geography, climate, geology and land uses, together with the static physicality of structure on the terrain.

Similarly, the framework comprises post-industrial scape which encapsulates structural physicality, memory of production and environmental transformations. The brick drying chambers and clay furnaces are interpreted as fully static in structure and context in the post- industrial state (fig. 5.1). The furnaces, housed clay bricks and tired from fifty years of brick firing, are now worn out and morphed by industrial processes. Charred from years of firing, and lined with smoke and debris, the brick factory is ingrained with the frozen moment in time of production.

Figure 5.1 (opposite): The brick drying chambers and clay furnaces after 50 years of production

The proposed intervention is to be situated on the periphery between the industrial, natural and altered environment of the precinct. This context comprises industrial structures within a continuously changing environment. The architectural intervention becomes a transitional exploration between the dynamic and fluxing territories of environmental transformations and the static physicality of structure.

Besides being ideal for beekeeping due to the nearby water sources and abundant eucalyptus plantations, the proposed site physically deals with the static and dynamic relationships between industry and natural environment.



precint

Figure 5.2: The proposed portion of intervention, situated on the periphery between the industrial, natural and compromised context

The intervention addresses and attempts to deal with the dynamic and fluxing territories of environmental transformation within the static place of structural disuse. The site is composed of static, visibly ordered structures together with the altered landscape that is resultant of this (fig. 5.2).

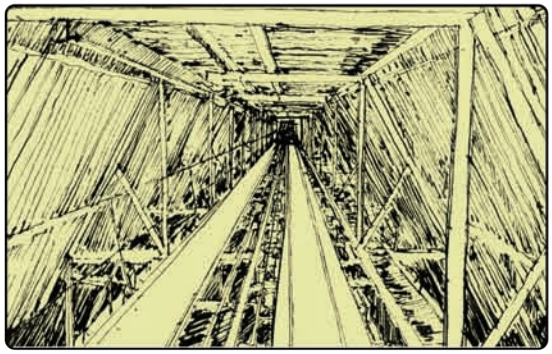
Because the quarry has come to a standstill, the structures stand empty and the terrain reads as a directionless, undiscovered moon scape (fig. 5.3). The compacted ground, old remaining roads and structures indicate past activity, but the rusting of the sheds, their collapsing, and weed overgrown mounds that continue to change geographically, express the inevitability of time, the uncontainable essence of the environment (fig. 5.3).

The existing structures at the intervention, unlike the drying chambers and kilns of the precinct, are largely unchanged from their production processes. The dominating evidence of the memory of production is seen through the altered terrain, the clay pits and the stockpiles nearby the structures, together with the signs of aging and disuse which are direct results of natural and climatic time based attributes (fig. 5.4).

terrain

building

object in landscape



structure

Figure 5.3 (above): The altered terrain and abandoned structures on site

Figure 5.4 (below): The aged terrain and largely unchanged structures

5.2 dissection

The intervention aims to take on the local specificity of the place, while illuminating a sense of nature as it inhabits the place and reflects the ephemeral character of the terrain. Smout and Allen further one's understanding of the restless landscape through using observational and representational concepts of architecture as tools to expose the terrain. Terrains are documented, examined and understood in terms of events, collectively grasping more than static space and material (Smout & Allen 2007:3).

The site is understood in terms of past, present and future events. By drawing sections across the landscape, the information of different events with their resultant effects on the site is made visible and legible (fig. 5.5). Singularly, these different sections of the terrain capture the relationship between industry and landscape, or rather, the various physical results between the static and dynamic factors of the site. However, only a collection of the sections speak of and represent the events and the totality of the terrain. Therefore, whilst the sections are studied in isolation, they are, in their architectural manifestations, always considered as a whole.

Because the three existing structure operated in a series of functional and visible processes that extend beyond their physicality, the fragmented sectional observation and understanding of the terrain present the initial measures to guide the intervention. Figure 5.6 considers the different sections in the context of static structure, industrial procession, points of excavation and undisturbed terrain.

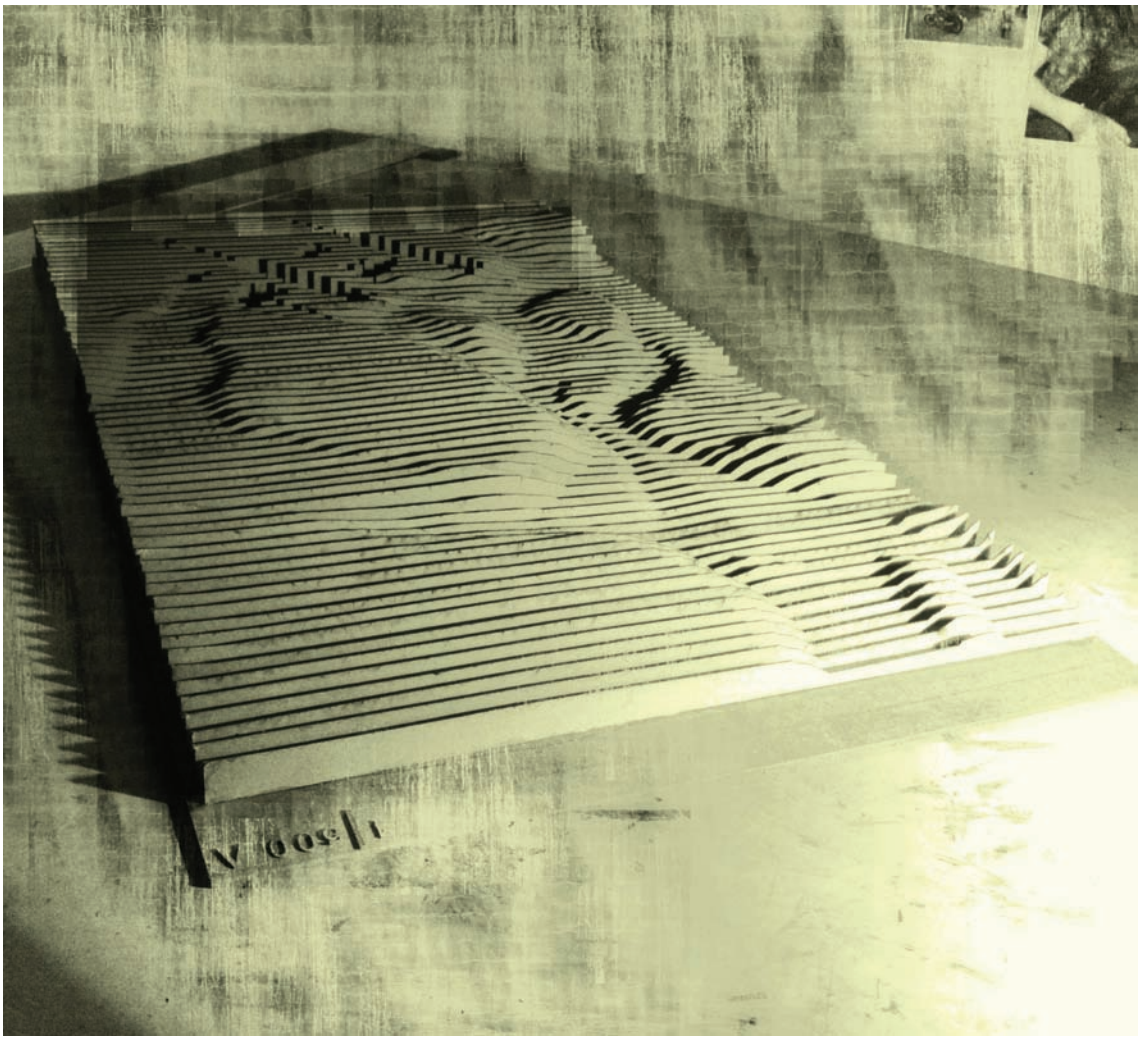


Figure 5.5: Collective sectional representation of the terrain

1.
The intervention consists of and includes of the three existing imposed structure grounded into the hard, level and compacted surfaces.

The existing industry physically determines and orientates the intervention and is conceptually followed through in the intervention

2.
The existing buildings' function left behind an extracted and altered terrain.

The structural and terrain remnants are physical, static informants. The extracted portions become points of stabilisation and grounding of the intervention.

3.
The physical and intangible processions between different functions are evident.

The transition from natural to processed material informs the intervention physically (by means of structure) and conceptually (through expression of programme)

4.
Nodes and vistas are formed along routes used to transport material from clay pits, stockpiles and grinding.

Nodes connect and orientate the intervention between points of altered and imposed terrain.

5.
Implementation of the intervention activates the place through presenting industrial procession and embracing environmental transformations by means of imposed and orientated programme based structure.

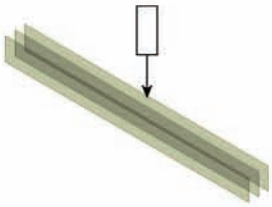
Figure 5.6 (opposite): Sectional studies of terrain

incisions

1

industry
(dynamic)

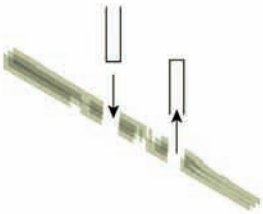
imposition of structure



2

remnants
(static)

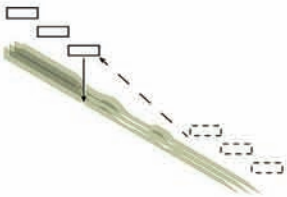
extractions of terrain



3

programme
(transition)

processes between openings and enclosures



4

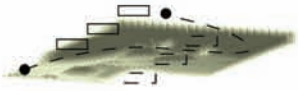
intervention
(static transition)

orientation and identification of place

5

activation
(dynamic transition)

emergence of place in totality



5.3 vagueness

The various sections contain different information and languages, yet in their fragmented, sectional state, they do not add any value. To fully grasp the site and context, the fragmented sections are ultimately brought together to embody the site and character. Architecturally, the intervention bases its spatiality on the converged perception of the different sections. The different sections, or rather, the dynamic transition from the openings to enclosures of programme, are ultimately housed through static structure.

Yet this physical representation through sections fixates on the tangibility of the terrain. The essence of the site, as an enveloping totality, is layered with further lost intangible qualities. The effect time has on space and together with the continuously altering state of the terrain is integral in emerging the place as a totality. The intervention must speak beyond the physical state of the site and address the industrial and post-industrial site, structure and terrain as a totality, as addressed in figure 5.7. The intervention, as a manifestation of programme, struggles with the physical placement into the ungraspable, the enveloping continuum between structure and terrain.

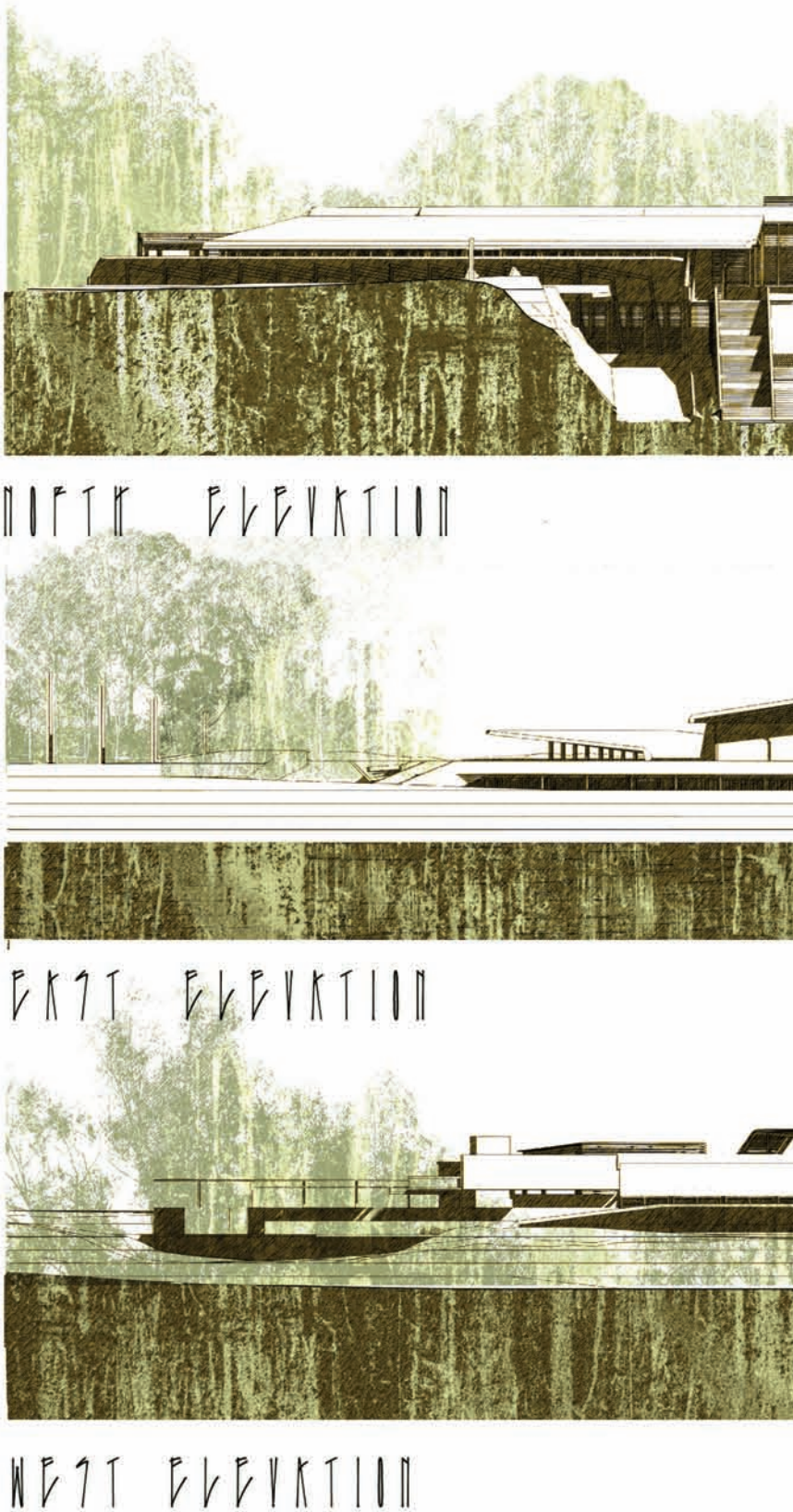


Figure 5.7 Early conceptual elevations exploring object in landscape through submergence, protrusion and remnants.

The Pompidou Centre in Paris required continuous internal spaces and technical infrastructure for the display of different services, resulting in the workings being placed, and thus expressed, on the exterior (Nuttgens 1983: 292). With this project, Renzo Piano and Richard Rogers inverted and made blatant that which is usually unseen. This infrastructural manifestation of architecture both reflected the idea of unprogammed internal spaces and its celebration through outward expression of services and intent.

As with the Pompidou Centre, the architectural statement and intent of outward expression is both relevant and crucial in the dissertation. The quarry expresses its attributes outwardly as a result of the inward requirements and functions. The site displays industrial function yet currently, in its post-industrial state, is redundant and is left bare, directionless and vague.

The site almost seems contradictory. Specific industrial objects rest in and project onto the perpetually changing and weathering quarry. The state the quarry is in is a direct result of the static, now functionless objects whilst the functionless objects are only grounded because of the quarry. Between these outwardly expressed and interdependent attributes rests the loci of place hovering in time and space. The transition between these qualities of the site becomes the driving point of interest to the intervention. The intervention, which is essentially a static physicality, must move programmatically into the dynamic essence of place to address the notion of transition.

This idea is substantiated through comparison to Bernard Tschumi's Parc de la Villette. The park is made up of constant, on-going discoveries and reconfiguration between the natural and the man-made. The park dwells between intentional and unintentional space, evoking orientation and freedom within an organized realm (Archdaily 2011). Where parks are usually considered as programmed, Tschumi's design proposed a user defined space that is open for interpretation. The park is programmed around 10 themed gardens that are not only intentional and blatant, but also something one would stumble upon. The park therefore may be seen as a series of separate, yet interconnected static objects that reflect dynamic tendencies and allow for various interpretations.

The design intervention at the quarry proposes to be visibly ordered around its programme, yet aims to anchor itself into the altering state of the terrain. The scape in its totality, comprising static objects, weathering materials and changing terrain is multifaceted. Because in its unprogrammed, functionless state the site is difficult to grasp and understand, points of reference to the tangible and intangible are set through programmatic intentions. The functions of programme become the elements which determine what is brought forward in the terrain.

The programmatic intentions aim to bring forward the essence of the place: a flaneur who experiences the terrain must be exposed as much physically and directionally to the proposed industry as to the vagueness of the terrain, when moving through the site.

The vagueness of the terrain as a whole relates directly to the layers of space that have been shaped by the existing industry yet constantly change and reveal different moments in time (Quirós et al. 2000:1). The proposed facility statically ranges from the point where bees roam and forage for honey, to the eventual point where the product is sold. However, bees and their realm of industry can never be fully contained, much like the context, the constantly altering terrain, remains ungraspable.

Figure 5.8 explores the development of enforcing programme and making place between the different extremities present on site. The diagram depicts a series of transformations and emergences that the terrain undergoes through the intervention. The intervention is realized through the programmatic procession from natural to formal industry, as a dynamic, enveloping totality between opening and enclosure. As a static, architectural object, the intervention presents a structural language between grounding the building, stabilising the ground (stereotomic) and housing the programmatic requirements (tectonic).

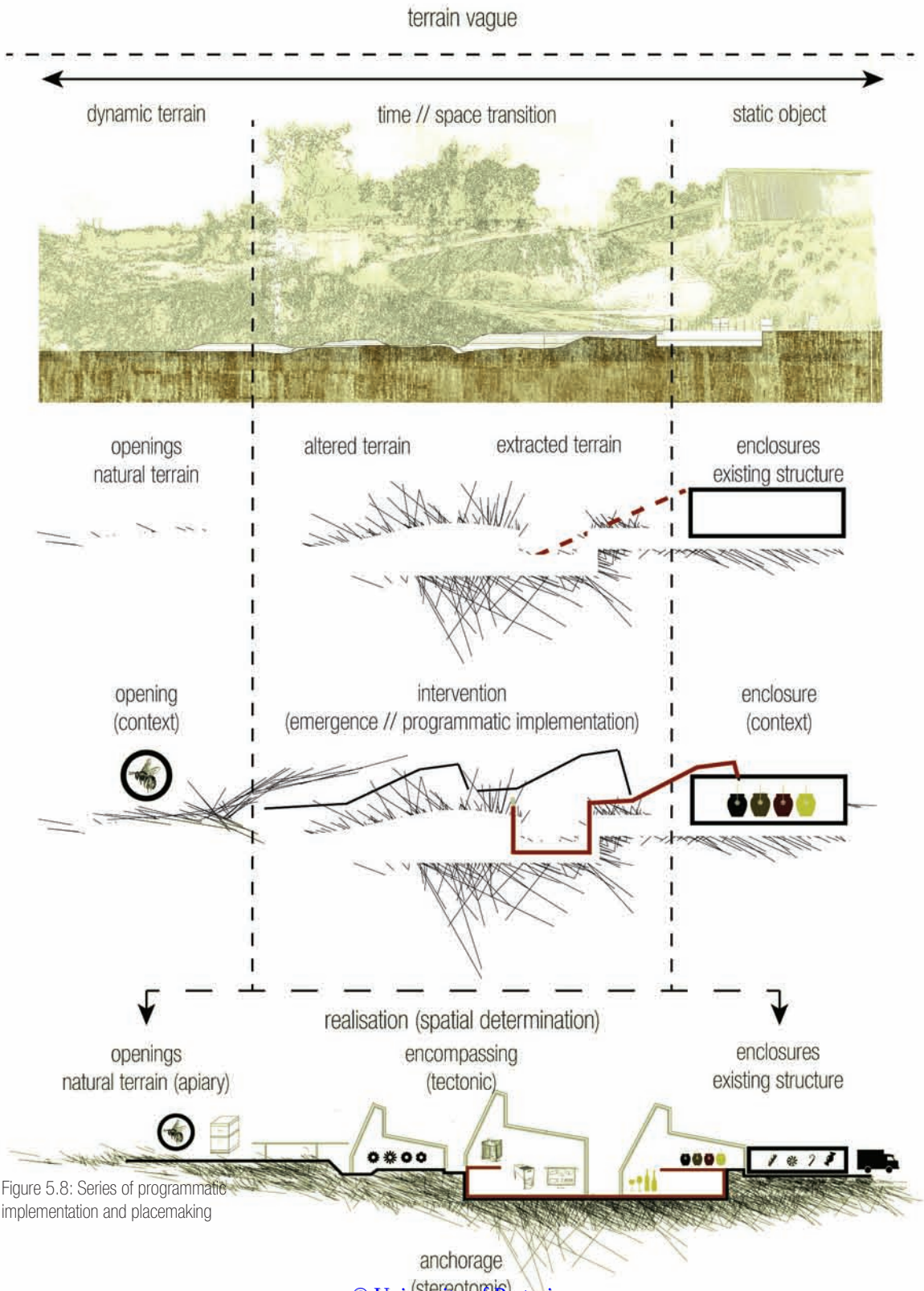


Figure 5.8: Series of programmatic implementation and placemaking

5.4 intangible hives

Our most fundamental relation to the gigantic is articulated in our relation to landscape, our immediate and lived relation to nature as it surrounds us […] We move through the landscape, it does not move through us. This relation to the landscape is expressed most often through an abstract projection of the body upon the natural world. Consequently, both the miniature and the gigantic may be described through metaphors of containment – the miniature as contained, the gigantic as containers. (Stewart 1984:71)

Making tangible a programme which cannot be fully grasped reflects of the essence of the terrain: the notions of bees and beekeeping compliment the argument of scale, working with immediate surrounds, expressing a landscape and gaining consciousness of place and function (fig. 5.9). Beekeeping becomes a statically imposed structure which relies on the unseen and is informed by the context, echoing the language of the terrain in its current, post-industrial state.

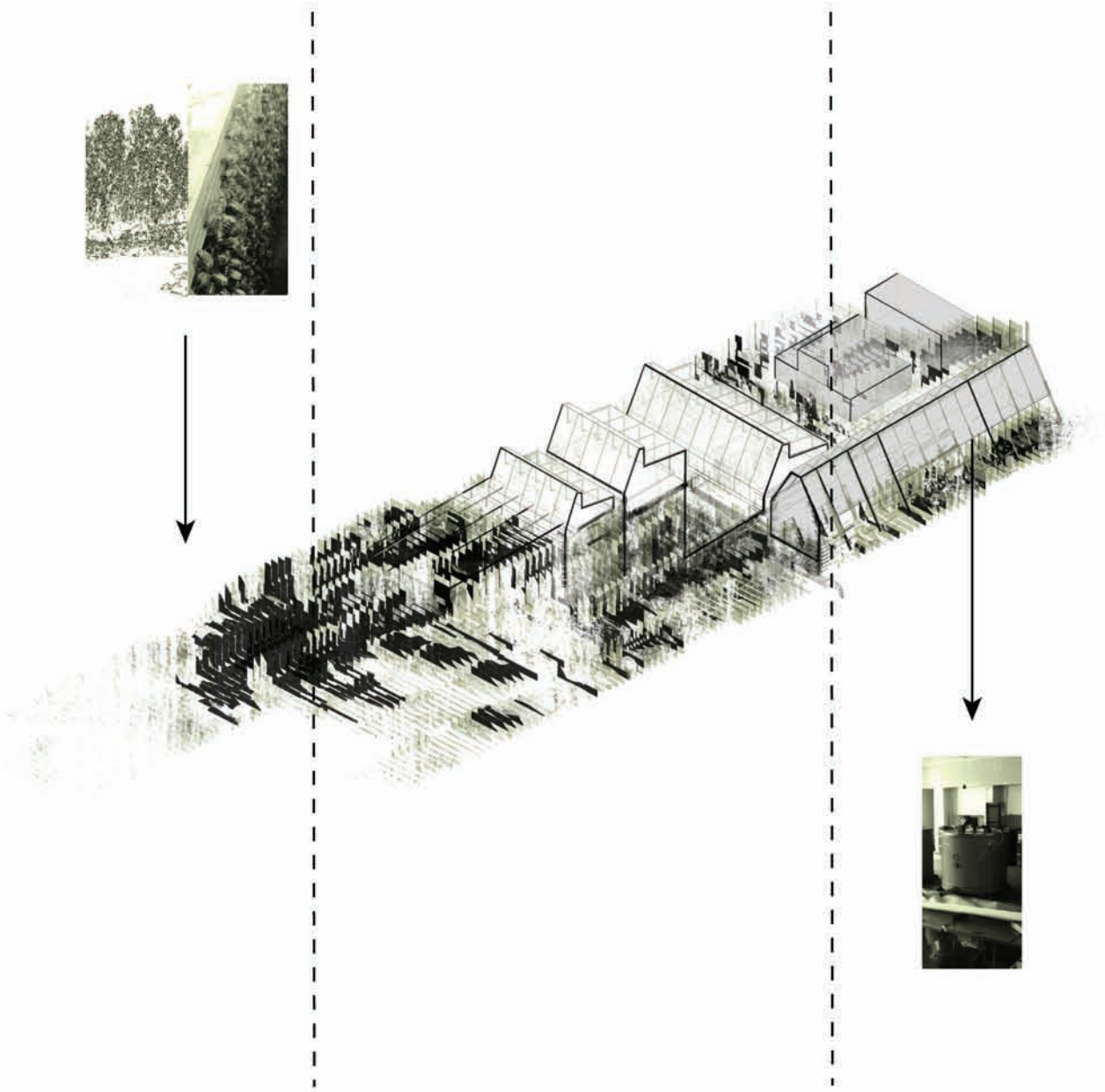
Figure 5.9 (opposite): Conceptual diagram of architectural language between altering terrain and static structure

architectural layering

natural premise // apiary

transitions (impositions and altering terrain)

formal premise // production



Through the programmatic activation of the terrain, the ungraspable becomes a direct reference and experience to the user. Bees, as an industry, are physically brought forward through new function-specific architecture and management of the terrain. Although hives and facilities for beekeeping are provided, where the bees forage, roam or how they behave can only be observed through the intervention. While the intervention is static and based in the transition from an open, natural premise to a formal, enclosed premise, the industry itself remains ungraspable.

This relates to the idea that even though the quarry and the evidence of a lost industry are present, the essence of the terrain can never be fully contained because of its dynamic and fluxing environmental transformations.

As depicted in figure 5.10, the intervention extracts the qualities which make up the terrain and layers them according to site management, design intention and programmatic requirements. Statically, these attributes move between open floor surfaces, retained landmasses, framed structures and adjustable, and opaque, building skins together with bringing forward the unseen industry of bees.

The following drawings are selected images from the discovery, exploration and implementation of programme and design onto the terrain. The transitional explorations between openings and enclosures have remained constant throughout the investigations and discoveries, whereas grasping, expressing and emerging the terrain through intervention proved continuously difficult of which to gain a foothold.

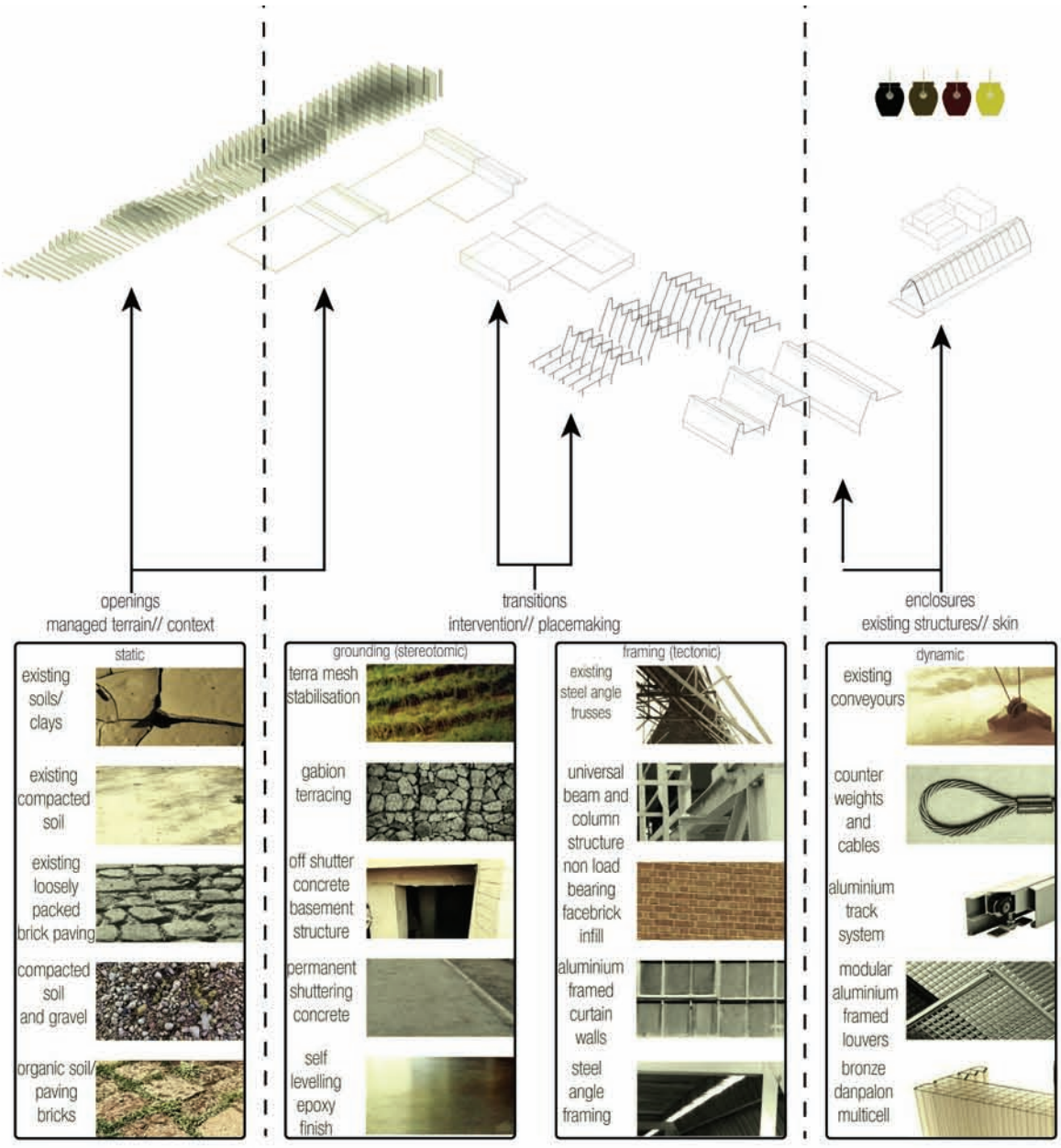
Figure 5.10 (opposite): Conceptual depiction of the layered tectonic and sterotomic attributes between the natural and formal premise

architectural layering

natural premise // apiary

transitions (impositions and altering terrain)

formal premise // production



5.5 translations

The following drawings are selected images from the discovery, exploration and implementation of programme and design onto the terrain.

The transitional explorations between opening and enclosures have remained constant throughout the investigations and discoveries, whereas grasping, expressing and emerging the terrain through intervention proved continuously difficult and challenging.

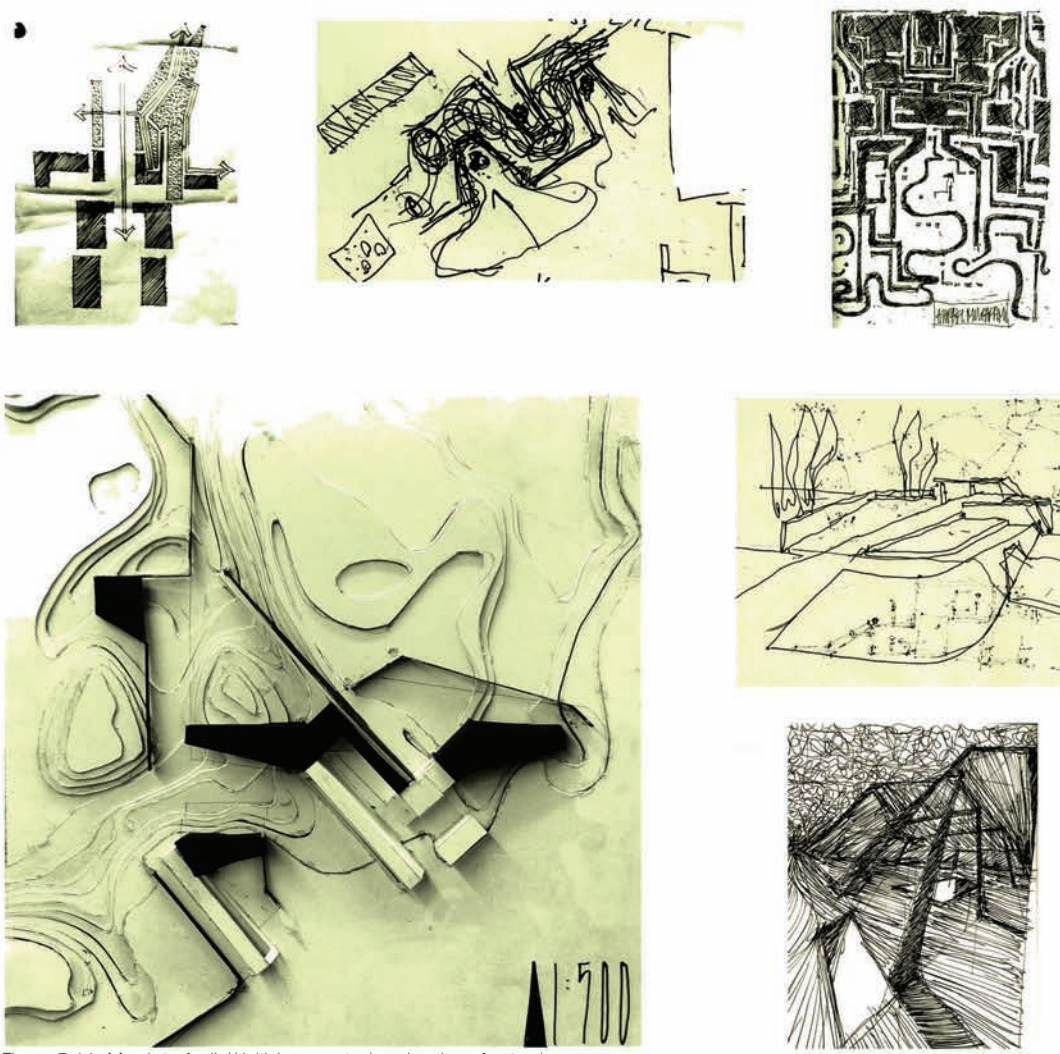


Figure 5.11: March to April // initial conceptual exploration of natural and formal industries

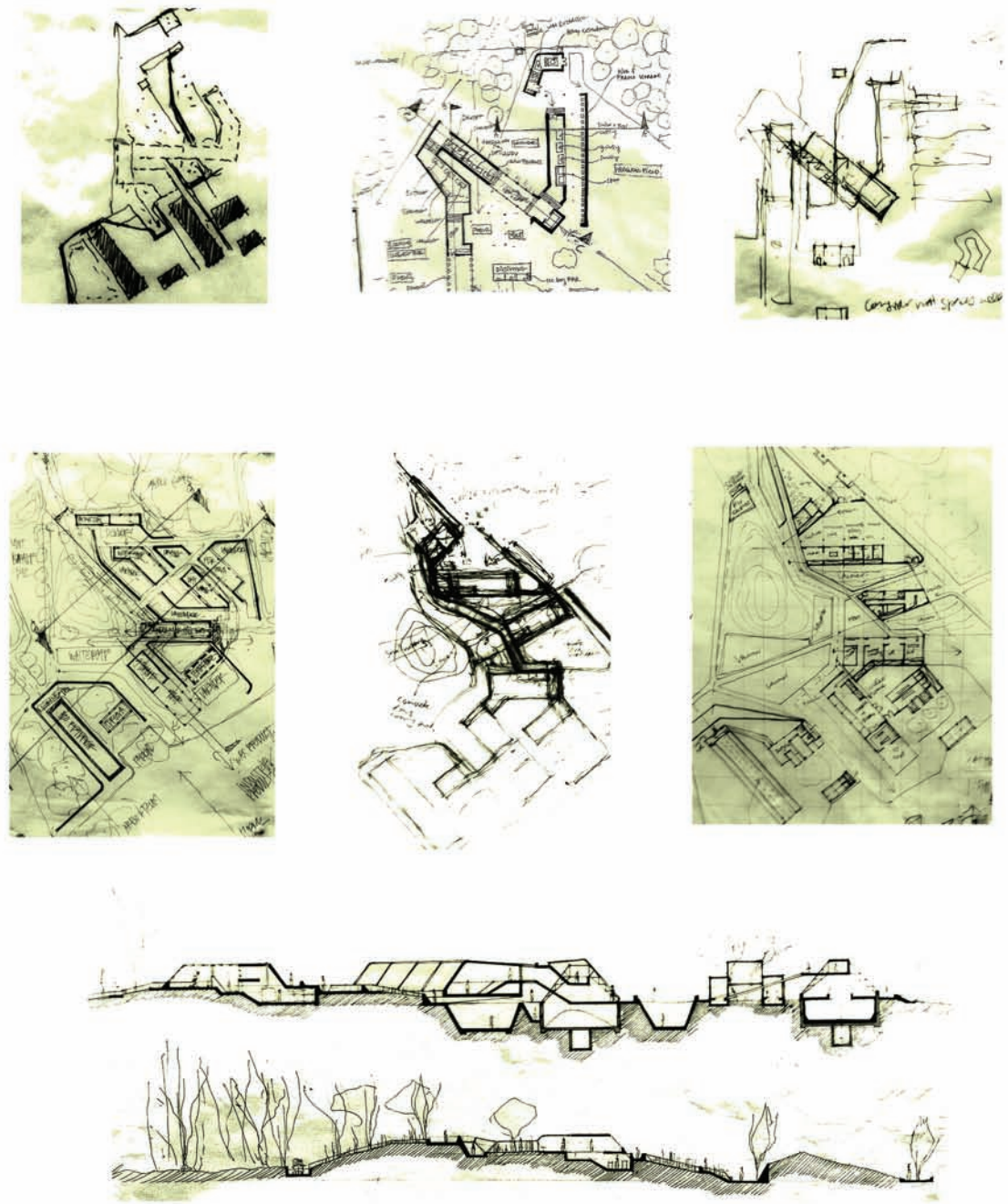
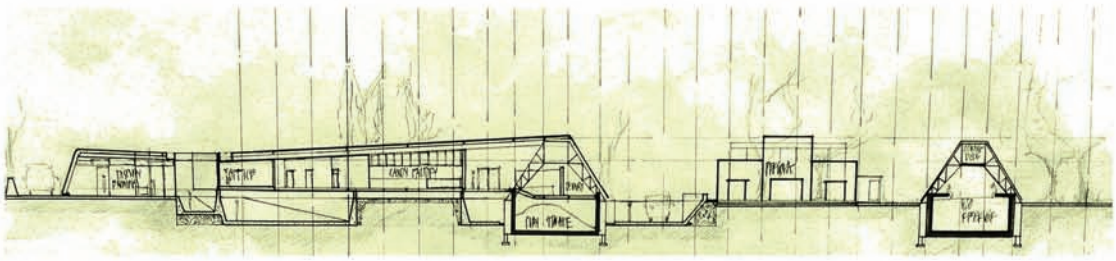


Figure 5.12: April to May // early planning and sectional exploration



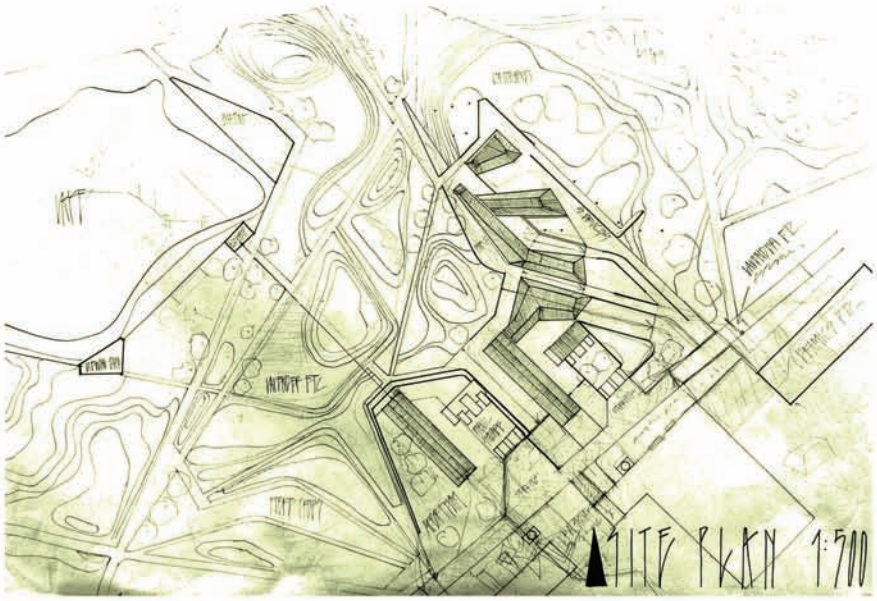


Figure 5.13: May to June// exploration of submergence, protrusion and retaining elements

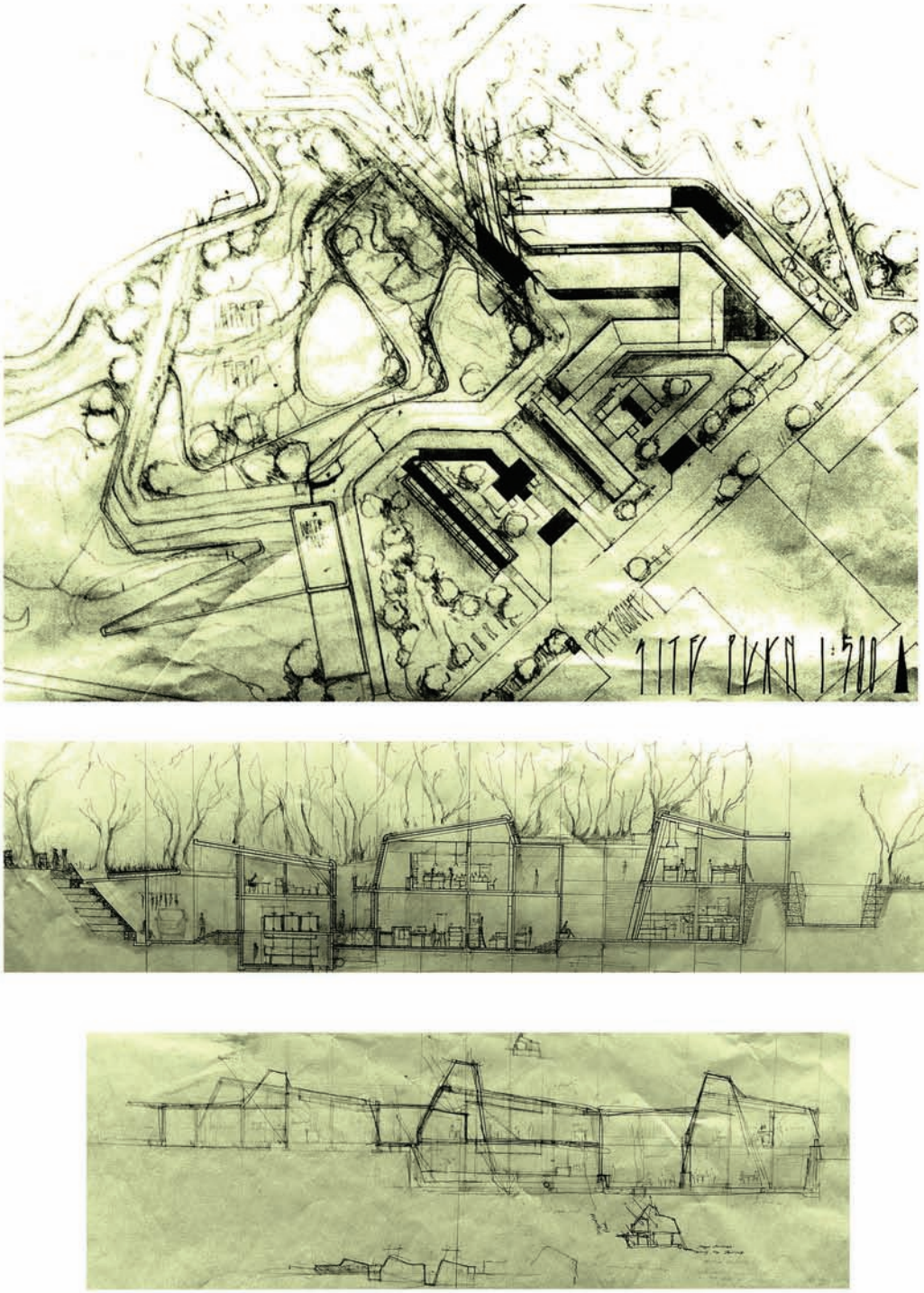


Figure 5.14: July to August// exploration of terrain management and public integration

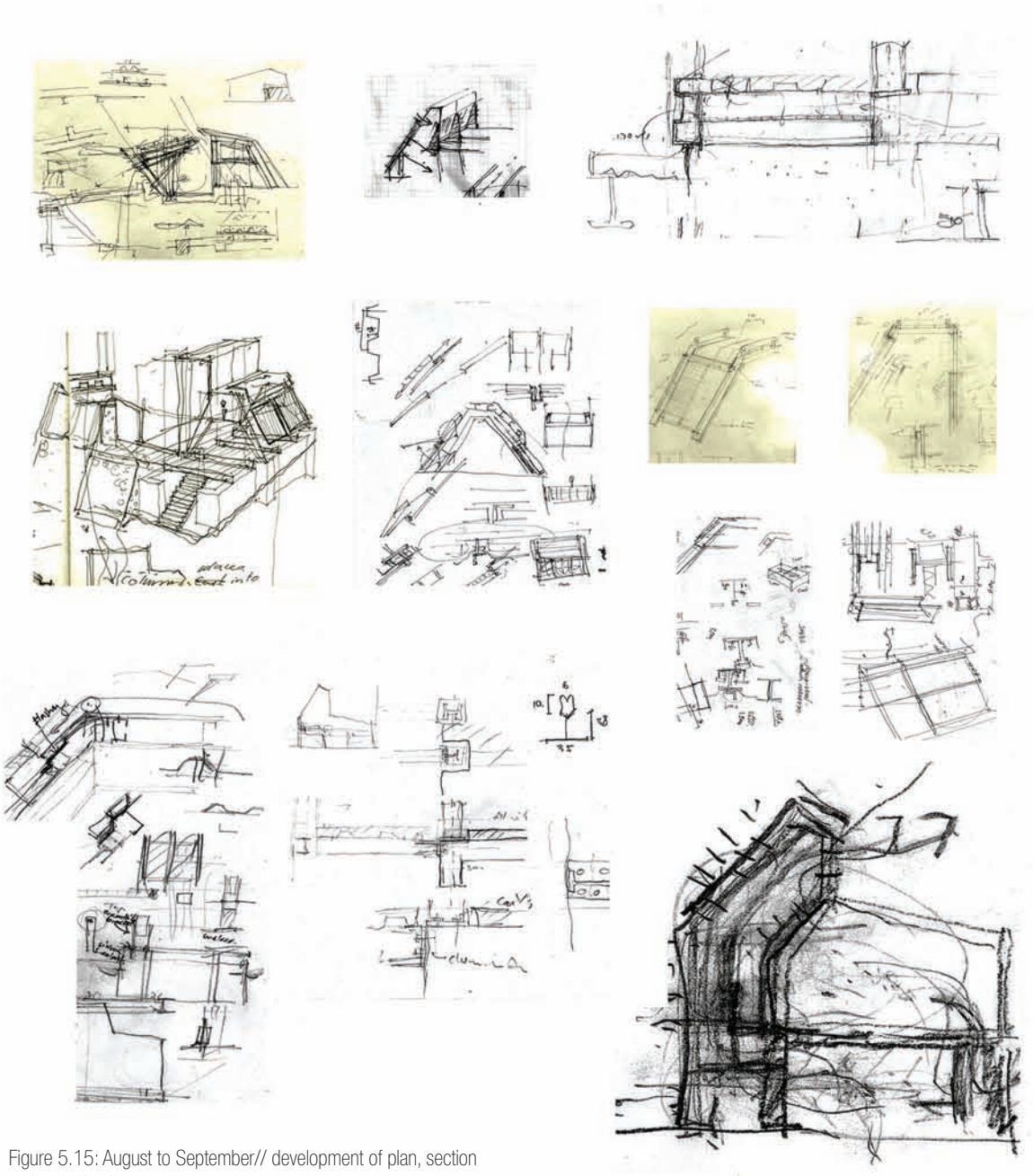
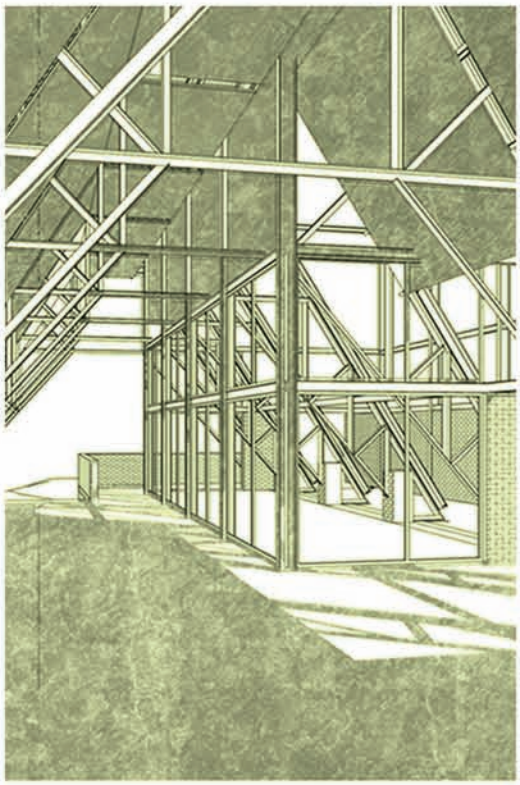
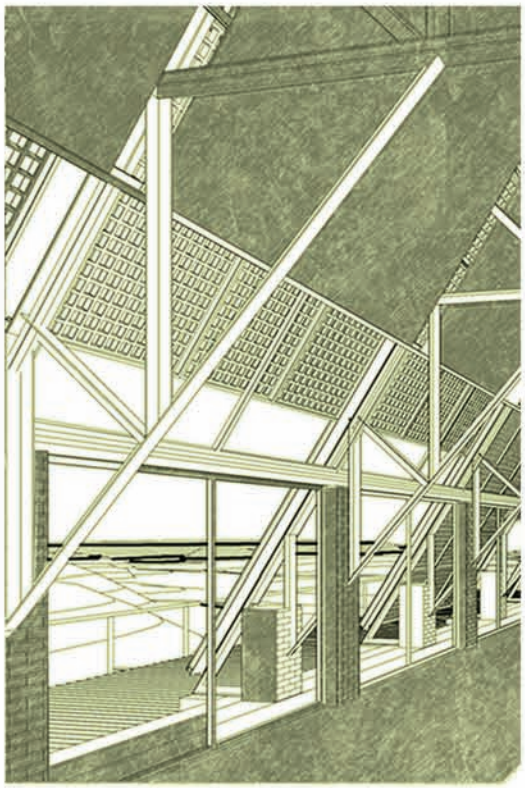
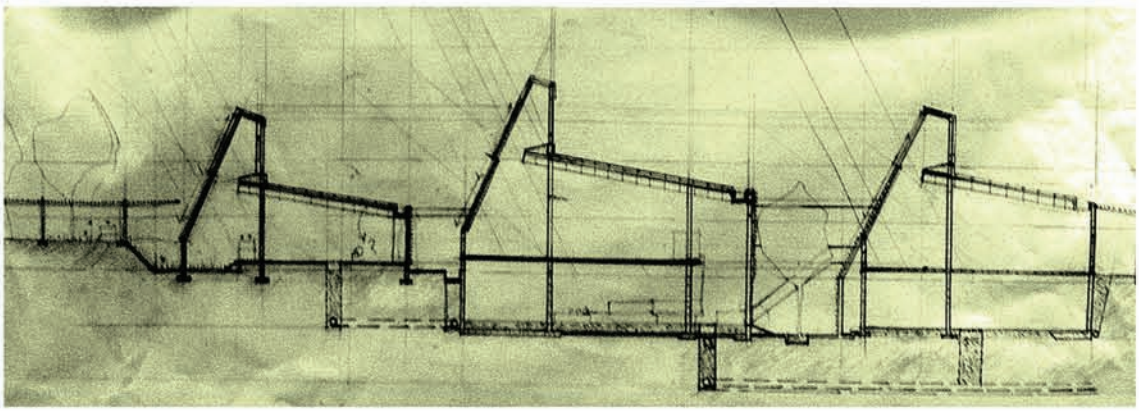


Figure 5.15: August to September// development of plan, section and tectonic elements







6 ritual

The precedents investigated tie into forms of ritual. The examples investigate buildings as mediums that bring forward or make visible the programmatic, the ceremonial, the sacramental, the formal or the habitual. With different intentions and outcomes, the precedents are projections of the qualities of place according to programmatic and contextual intentions.

In specific relation to the dissertation, the precedents are considered in the contextual transition between openings and enclosures on a theoretical, physical, public and management level. The precedents considered were largely based on the programmatic and architectural responses to different contexts to become submerged, protruded or inserted into their terrains.

Figure 6.1: Igualada Cemetery Locality Plan (drawings by Enric Miralles)

6.1 theoretical premise // exploration of space in time

Igualada Cemetery, completed in 1995
Catalonia, near Barcelona, Spain
Enric Miralles and Carme Pinós

Built into an old quarry, the Igualada cemetery in Catalonia outside Barcelona is a place of memory concerned with those that were laid to rest and left behind through an experiential architecture and through space and time.

The Igualada cemetery is a metaphorical statement on the passing of time. The building links, the past, the present and the future by meandering through memory, architecture, site and landscape in a series of street-like and communal spaces (fig. 6.2).By relating time and space, a real and eternal present is created, one which connects the present to a remembered past and manifested future, placing the user in a continuous time experience. The cemetery blends into the essence of the site, projecting spatial and temporal change through materiality and responsiveness , which makes present the past and the future experiences in time and place (fig. 6.5) (Quirós et al. 2000:3).

Figure 6.2: Igualada cemetery as a public route through space and time (JANSSEN 2010)

extraction

An emergence of space in time is experienced as a programmatic journey through the essence of place.

Miralles explored pre-existing conditions that bring forward the memories of the terrain together with the meaning of burial places. The cemetery is manifested as a long man-made path (fig. 6.1, 6.2, 6.3 and 6.4) built as part of the landscape while presenting different experiences of spaces and instants of past, present and future. It incorporates both the specificity of space and continuum of time. Architecture of time may therefore be described as a composition of various and diverse ways of experiencing layers of time (fig. 6.5 & 6.6) (Quirós et al. 2000:1). Without a pre-conception of space, Miralles explored the site as a productive accumulation in plan which is read as a map layered with information.

Similar to the Igualada cemetery, the intervention visibly promotes the work of time through the exploration of weathered surfaces, unstable topography and the empty weathered structures of the quarry. Through the physical, programmatic activation of these spaces, the time spectrum reaches into past, present and future of the site (fig. 6.7).

Figure 6.3: Igualada Cemetery entrance, a physical transition through the quarry by MALLOL & MORETTI, 2005 (FLICKR 2013)

Figure 6.4: Igualada Cemetery by MALLOL & MORETTI, 2005 (FLICKR 2013)

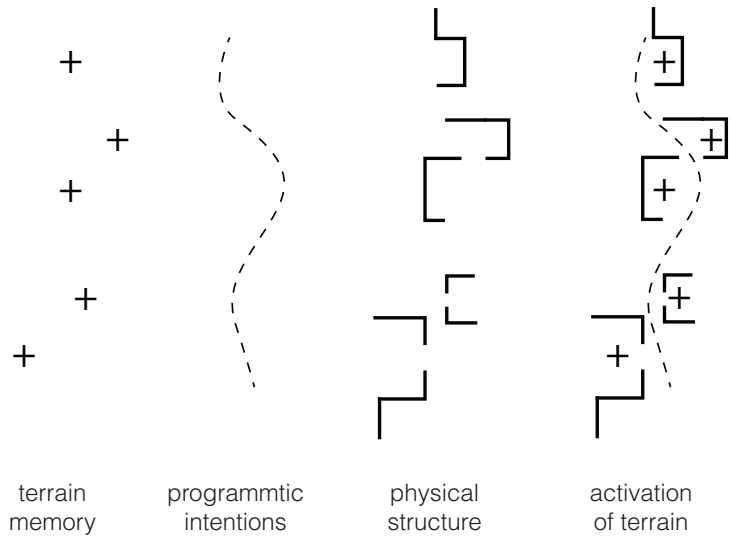


Figure 6.5 (above left): Exterior projection of embedded space at Igualada Cemetery by THAKKER, 2010 (FLICKR 2013)

Figure 6.6 (above right): Igualada Cemetery interior spaces by THAKKER, 2010 (FLICKR 2013)

Figure 6.7: Diagram of extraction: manifestation of programme in time space explorations

Figure 6.8: transition between exterior and interior space at the Bruder Klaus Chapel by LUDWIG: 2011 (C+A: 2011)

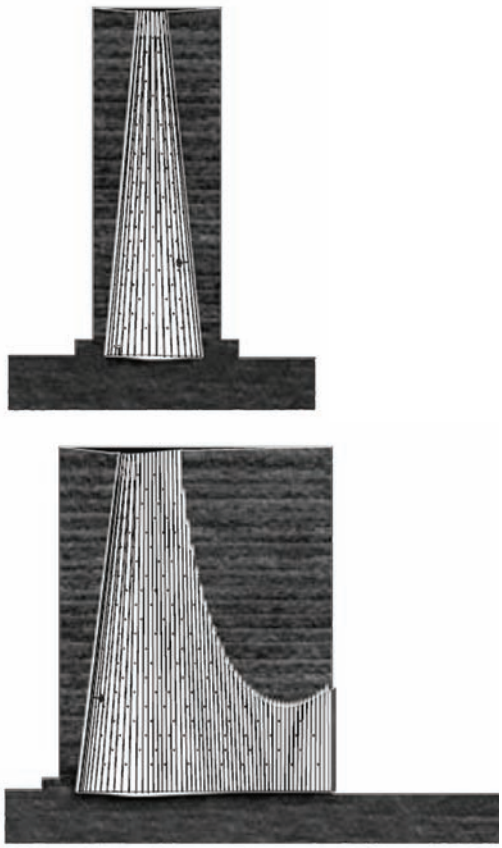


Figure 6.9: Bruder Klaus Chapel - sections depiction of building and material processes (C+A 2011)

6.2 physical premise
// spatiality of object in landscape

Bruder Klaus Field Chapel, completed in 2007
Mechernich-Wachendorf, Germany
Peter Zumthor

As an object in a landscape, the seemingly impenetrable Bruder Klaus Chapel gives virtually no clues as to what lies within. Accessed by a narrow gravel path leading to a triangular steel door, the building comes across as a mysterious monument in landscape (fig. 6.10) (C+ A 2011:32).

The chapel was constructed through arranging 112 slender tree trunks into a form, which was then covered with 500mm thick layers of concrete, consecutively cast over 24 days. The tree trunks were later set alight, leaving behind a charred concrete interior shell. Each band of concrete is representative of not only the physical construction, but also represents an hour of the day (fig. 6.9). An artisanal floor of melted recycled tin-lead was later transferred onto the concrete base by hand and a heavy triangular steel door added to the entrance. Besides being both monumental and a heavy object in a landscape, the interior reaches into the spiritual realm, juxtaposing the tangible heaviness of the exterior of the structure (fig. 6.8). On entering the chapel it is dark and claustrophobic. Yet by moving through the space, a burst of light through an overhead oculus lights the interior up. In addition, light is introduced into the spaces through glass plugs inserted at the holes of the removed shuttering ties (fig. 6.11) (C+A 2011:41).

Figure 6.10: Bruder Klaus Chapel, an object in landscape by LUDWIG, 2011 (C+A 2011)

extraction

An internalized object in landscape is experienced through immediate and intangible exterior realms. Even though the chapel is firmly rooted in the landscape, whilst blatantly isolated from the exterior world, it embraces its environment: the chapel is open to rain from above and is experienced through the light entering it from above (fig. 6.11). Built from local material and marked by casting phases, much like the rings of a tree show age, the chapel is rooted visibly in the processes that realize it. The chapel is made a place by bringing qualities of the exterior context into the physicality of the structure, such as rain, natural light and the smell of charred wood.

Where the industrial building is an isolated object in landscape, based in inwardly orientation of function, the chapel is materialized through relating its function to its direct environment. The chapel celebrates its reference to its context and the visible expression of material and process, contrasting spatial qualities and the manipulations of light (fig. 6.12).

The post-industrial building holds the same potential yet in a concealed manner. In the post-industrial context, the relation to the context is embedded as ruins in time and lack of function. Weathered and overgrown surfaces, functionless mechanics and compromised topography become the references for intervention, celebrated and brought forward by physical, static structure.

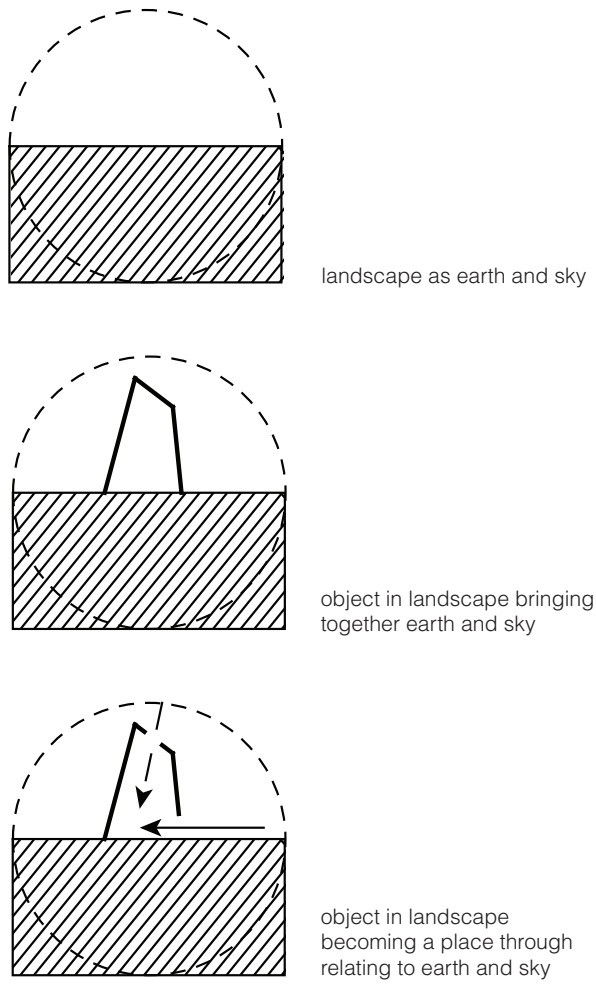


Figure 6.11 (opposite): Interior atmosphere brought forward by physicality of material expression and contextual characteristics such as natural lighting by MAIRN & SAVORELLI (C+A 2011)

Figure 6.12: Diagram of extraction: an object in landscape is given spatial relevance through external determinants

Figure 6.13 (above): Museum of Modern Literature – rational spatial descent is expressed and given physical presence through materiality

Figure 6.14: Museum of Modern Literature - Public passage mediated between exterior and interior conditions and requirements by RICHTERS, 2007 (C+A 2011)

6.3 public premise

// public progression through space

Museum of Modern Literature, completed in 2006
Marbach am Neckar, Germany
David Chipperfield Architects

Located in Marbach, Chipperfield's Museum of Modern Literature pays homage to writers such as Friedrich Schiller and Franz Kafka and houses artefacts and manuscripts from the Archive for German Literature. The museum is rooted in its relation to the scenic park of Marbach, embedded in its topography. Different layers of elevation capture viewpoints over the distant landscape. Terraces utilize the steep slope of the site to express different characters of place. The museum is entered on the highest terrace, progressively submerging into the terrain while being respectful, yet contrasting, to the neighbouring National Schiller Museum (fig. 6.13 & 6.17).Thin concrete columns, without capitals or bases, are spaced away from and are wrapped around the symmetrical sides of the museum, sitting slightly over the exhibition galleries and acting as mullions for glass walls (fig. 6.14 & 6.15). External spaces, such as terraces and podiums, are formed of linear planks of sandblasted pre-cast concrete with limestone aggregate, cutting into whilst still grounding the vertical rhythm of the columns (C+A 2011:16).

Due to the sensitivity and fragility of the work on display, the exhibition galleries are dark controlled spaces. In preparing the visitor to the dark exhibition galleries, the descent into the museum is a progressive movement through various environmentally controlled spaces. Simultaneously, the descent borders on a naturally lit gallery, bringing the enveloping context into the internal world of literature (fig. 6.15 & 6.16). The rational spatial descent and experience is expressed and clearly defined by solid materials, adding physical presence to the rationality of the building (C+ A 2011:22).

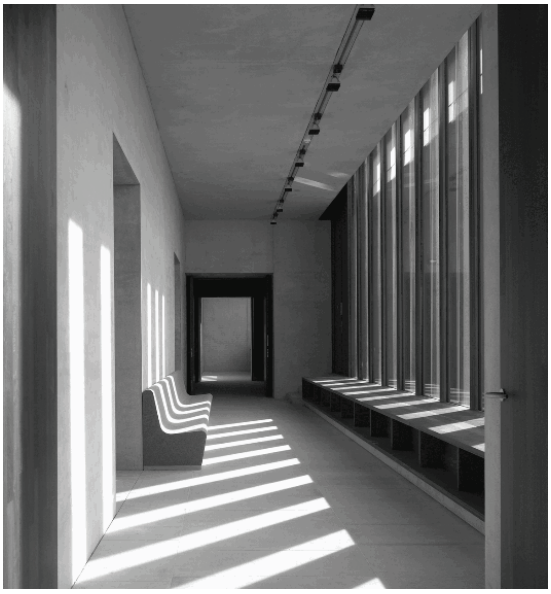


Figure 6.15: Museum of Modern Literature - exterior columns act as mullions to interior spaces by RICHTERS, 2007 (C+A 2011)

Figure 6.16: Museum of Modern Literature - gradual descent into museum by RICHTERS, 2007 (C+A 2011)

extraction

While expressing procession through space, by means of different environmentally controlled spaces and the vertical rhythm of the columns, the building is grounded and creates vistas through the stark linear platforms that step into the terrain and house the structure. The visitor is gradually exposed to various spatial experiences that simultaneously capture the surrounding, open context and the controlled internal environment (fig. 6.16). While the museum is tied between a fully submerged, dark space and open landscape, the user is constantly reminded of and exposed to both qualities of place; the internal as much as the external spaces exist in relation to one another, creating an experience of open vastness that is shaped around a controlled environment (fig. 6.18).

The intervention aims to expose the user to various elements of the landscape and processes of industry along the route of the site. On moving through the building, the user is removed from, is brought into or is taken along the terrain. The intervention may be seen as winding public roads along store fronts in a busy street. The user would, as along the busy street, experience the separate spaces as part of a whole. Functional spaces, together with the vistas of the terrain and building, move from being submerged to being fully emerged. This progression comes forward through engagement and programmatic implementation.

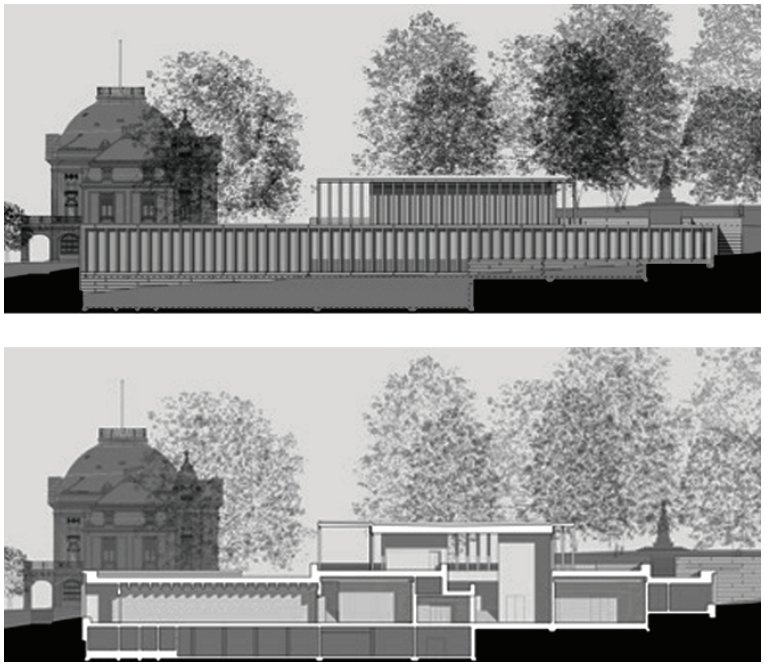


Figure 6.17: elevation and section of Museum of Modern Literature - submerged and embedded spatiality gains expression through rhythm of building and relation to context by HAMMERSCHMIDT, 2007 (C+A 2011)

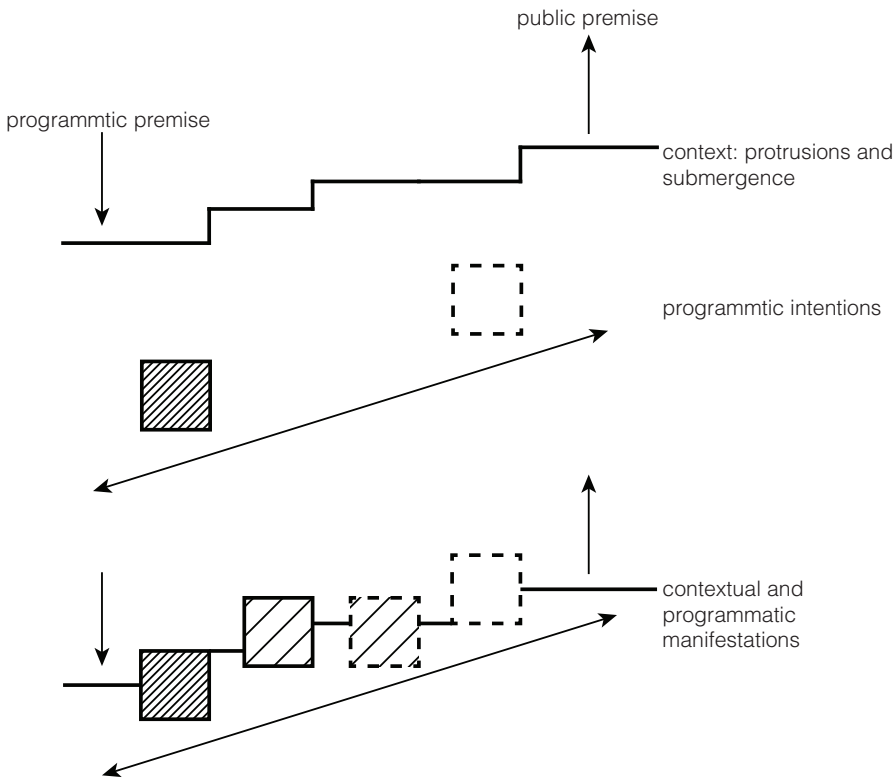


Figure 6.18: Diagram of extraction: a terrain specific and experiential progression through space and programme

Figure 6.19: Olympic Sculpture Park before and after construction by BENSCHNEIDER, 2008 (HUBER: 2008)

6.4 management premise

// potentials of compromised terrains

Olympic Sculpture Park, completed in 2007
Seattle, Washington,USA
Weiss/Manfredi Architecture/Landscape, Urbanism

Built on an 8.5 acre industrial brownfield dissected by active railroad tracks, the Olympic Sculpture Park aimed to restore public access to the city's waterfront and to establish a setting for large works of art (fig. 6.19). The project, envisioned as a functioning ecosystem, had to deal with 60 years' worth of contamination and had to nurture native plants to reclaim lost sections of shore lines. Based on creating a new urban edge that bridges the railroad tracks, the site's past as a fishing precinct, oil depository and infrastructural corridor is revealed. The precinct is comprised of carefully constructed spaces that exhibit art and capture views of the surrounding context (Huber 2008:6).

The project bridges art with the city and with nature, through civic placemaking. The project is a series of unfolding planes that reconnect the city to its waterfront through infrastructure and public interfaces which recover the landscape. The project reclaimed the landscape through topographic rehabilitation, saving the site from neglect and treating the landscape as an artefact, and active instrument. On an urban scale, the open spaces set the platforms for new connections and continuities that intertwine built and natural elements. While being a completely invented landform which provides service routes for the site and platforms for art, the altered terrain reclaims the site with a post-industrial vision that has included a complete cleansing of the contaminated soil and has included the implementation of agricultural intervention (Huber 2008:8).

The project relied significantly on site temperature, sunlight, drainage system, utility lines and transportation infrastructure. The foundations of the park are modular retaining walls that bisect and dissect the site's geological and historical layers. Roofs and terraces collect rainwater using planting to slow run-off, percolate the soil and collect water into a drainage system. Biological concerns encompass layers of soil separated by geotextiles, mechanically stabilized earth, groundcovers, planted native vegetation and reinforced seawall shelves with a submerged buttress, resulting in a new aquatic habitat (Huber 2008:10).

extraction

The design proposal addresses the conflicts and tensions of the post-industrial context, mediated through unprecedented encounters and interaction with the natural context and urban setting. Because the Olympic Sculpture Park design restored its beaches, migrated Salmon has returned to the location.

The terrain of the quarry, which has been drastically altered over the last 50 years, has adopted an inherent barren quality. To return to its original state is not feasible or the intention. The aim is to re-establish area dominant plant species and to introduce new eco systemic branches which will physically aid in the management of the terrain together with supporting the programmatic and conceptual intentions.

Together with understanding the terrain in sections and stepped terraces as retaining elements, the site is managed and the character of place is brought forward. Through controlling and channelling run-off, while layering, stabilising and retaining soil around the programmatic requirements, a platform is set for natural and implemented vegetation growth in a public environment and becomes a place for natural industries (fig. 6.20 and 6.21)

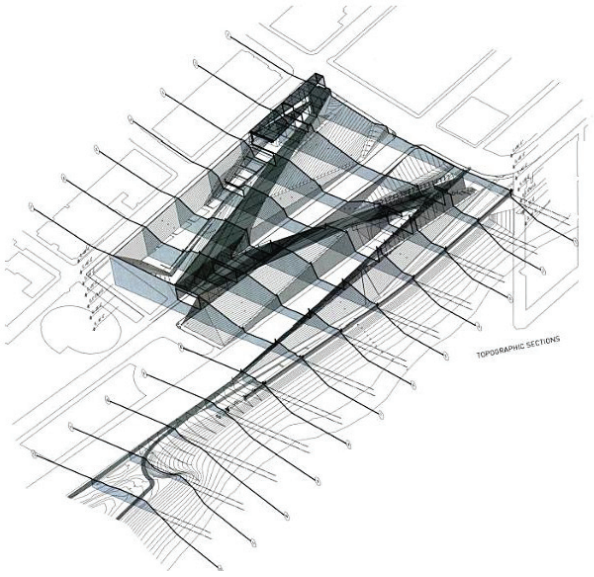


Figure 6.20: As a synthetic entity, the reinforced landform serves the site on a cultural, urban and ecological level (The Museum of Modern Art 2005)

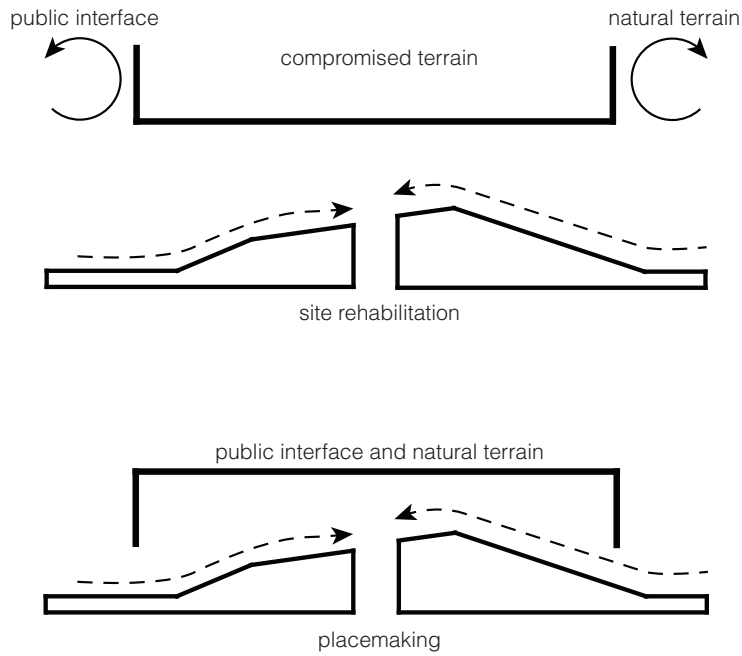


Figure 6.21: Diagram of extraction: terrain rehabilitation bridges a compromised terrain

7 makings

Kenneth Frampton (1995:26) states that because the building is situated at the interface of culture and nature, it is as much about the ground as it is about the built form. In this context, the imposed structures on the terrain have become as formative and integral to the place as the processes which have altered, and continue to alter, the site. The conceptual approach explored this context as an architectural transition between the dynamic, natural territories of the site and the static physicality of structure.

Spatially, the design discussed the programmatic anchorage and framing within this transition. By being placed into the continuously altering terrain and being brought into the proximity of bees, the ungraspable becomes a direct reference and experience to the user.

Comparative to the bridge which gathers the earth as inhabited landscape, it has been determined that the experiences are ultimately housed, and brought forward, through static structure. The following investigation concerns itself with the expression and construction of the static structure, its assembly and function.

7.1 expressions

The full tectonic potential of any building stems from its capacity to articulate both the poetic and the cognitive aspects of its substance (Frampton 1995:26). In the given post-industrial context, this substance is difficult to define:

While the design proposal is overwhelmingly programmatic, its articulation is based in the vague anchorage and framing of the terrain. The design intervention is faced with an on-going struggle between imposition on the terrain and meandering within its altering state and memory. The physical realisation of the intervention therefore wants to be of the site, while still being a separate element.

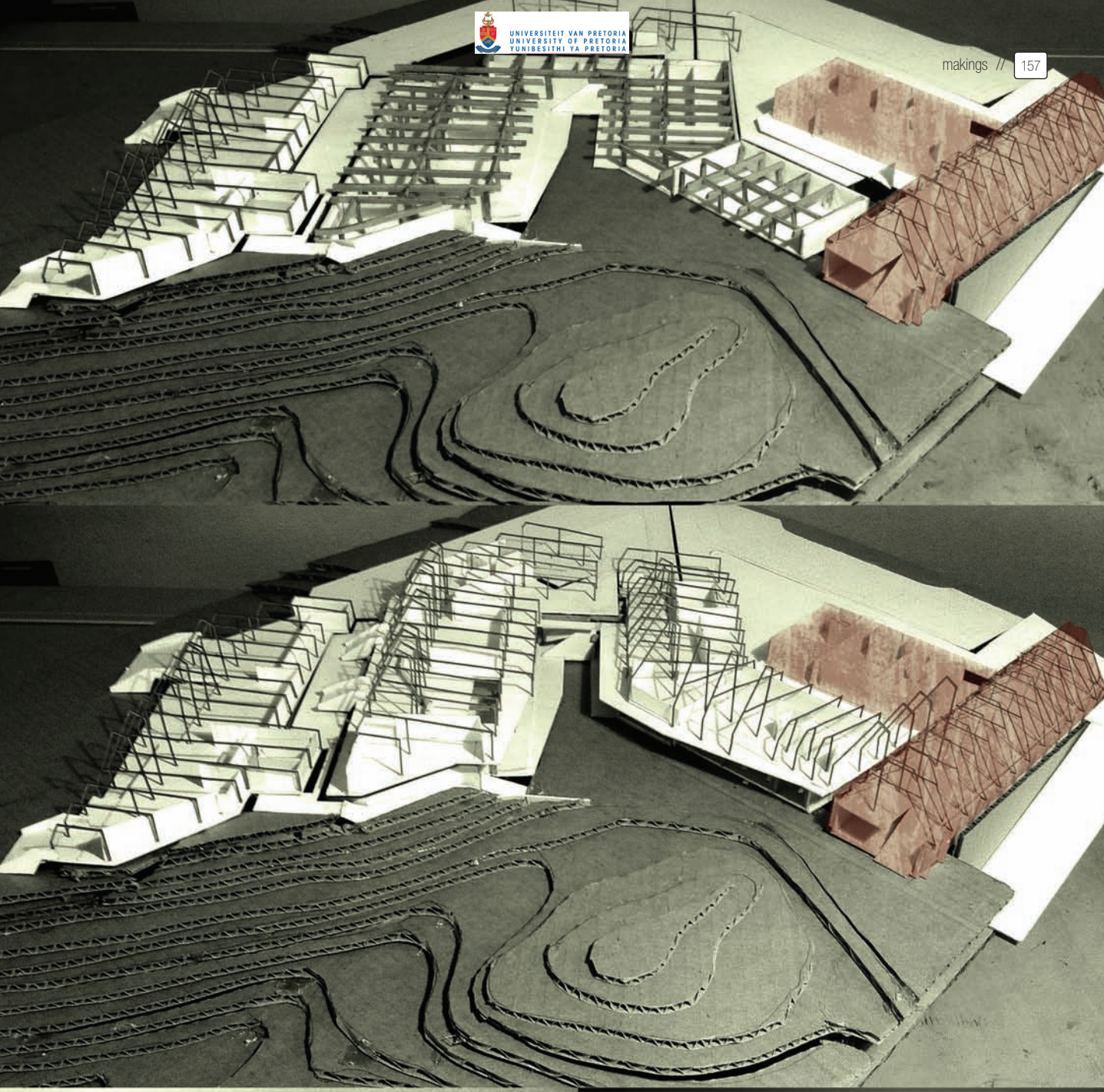
The intervention is as much a programmatic realisation as the existing structures of the terrain. Yet because the existing precinct is industrial, its architectural expression is considered as unintentional. The articulation and expression of the intervention therefore, as a structure, becomes increasingly difficult to determine.

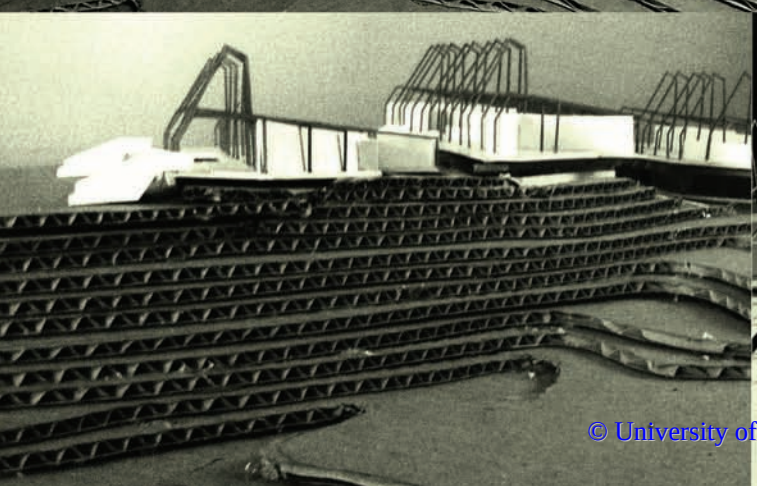
In its functionless state however, the industrial precinct presents various architectural informants, such as the reinterpretation of structural physicality where new functions are assigned. The intervention would therefore ultimately take on the expression of the existing, while being fundamentally different.

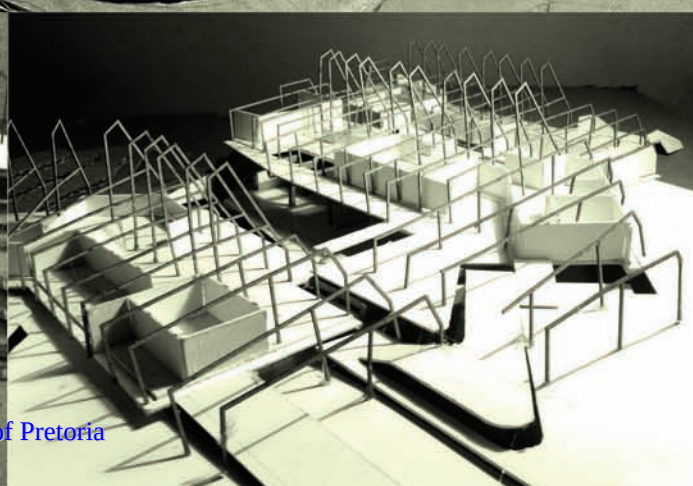
Following this rationale towards the existing, the intervention is made physical through framing its functions while being heavily grounded in the topography of the site. However, based in the conceptual approach, the grounding and framing occurs transitionally as depicted in figure 5.8 of chapter 5.

The intervention is materialized and expressed through an insertion into the existing structures, anchorage into the altered terrain, and lightly framed structures that step into the landscape. Figure 7.1 explores this transition as a structural expression, showing the insertion, grounding and framing of the design.

Figure 7.1 (opposite): Structural investigation of the design proposal







The proposal's context comprises of structures allocated on the highest point of its immediate context, enveloped by a series of existing routes. The terrain slopes in a northerly direction, with the main existing clay pit and water source at the lowest point of the immediate context. The soils of the terrain vary between loose and consolidated clay soils, and the vegetation is broadly zoned as belonging to the Moot Plains Bushveld. The ground floor of the intervention extrudes from the existing structures onto primarily stable soils, while the proposed basement level and routes extend into the stockpile area, which consist of unconsolidated clays (fig. 7.2).

Figure 7.2 (opposite): Diagram of the terrain characteristics and placement of the intervention in the context

existing structure

clay pit and water source

existing routes

terrain
Clastic sediments and minor carbonates and volcanics. Soils often stony with colluvial clay-loam

vegetation
eucalpytus plantations / thorny savanna dominated by various acacia species in the bottomlands and plains

intervention proposal

7.2 placement

The building is subdivided into three main portions. The levels of the existing storage shed, together with a four meter level change, determines the floor levels of the three portions. Removed from the existing structure the furthest is a single story foraging and pollination centre, resting on foundation pads. The hive-processing and honey candy production facilities are both double-storey structures, consisting of a ground floor and basement level which transfer the structural loads to foundation pads (fig. 7.3).

The public platform, access routes and promenades along the basement and ground floor level vary in material, since they meander along different portions of the terrain. Where necessary, the existing material is removed and suitable ground fill and gravel is imported, compacted in a 150mm deep layer. Service roads are tarred, or where less active, paved with bricks on a sand layer and stabilised soil as per Engineer.

Because the terrain slopes continuously, the construction of a water detention pond is proposed at the lowest point of the context, which collects channelled surface runoff from the basement level. The water is then taken to the existing clay pit and water source via a discharge pipe.

Along the continuous fall of the quarry, gabion lined terraces are proposed which follow the contours of the terrain and retain the soil along its descent. Where steep slopes exist along the promenades and pathways, embankments are protected and lined with Green Terramesh.

Figure 7.3 (opposite): Diagram showing ground floor and basement allocation with levelled surfaces and terracing

1. water detention

2. excavations / retaining

3. levelled surfaces

4. terracing

1. foraging and pollination research

2. hive processing / maintenance / repairs

3. honey processingand candy production

7.3 routes

The buildings are primarily accessed along Filander Avenue and the proposed parking facility on the eastern side of the buildings. To be readily accessible, services are housed along the eastern side of the building, adjacent to the proposed parking area and turning circle.

While the public is free to roam the terrain, dedicated routes are laid out which take the visitors from the public square through the main existing storage shed, and along the western façade of the buildings. This promenade is anchored with a meadery on the basement level, exposing the visitor to the various processes and activities of the buildings. A staircase, on filling, accesses the ground floor level along the western façade of the basement, and takes the visitor to the proposed beekeeping garden. Additional, unprogrammed routes are laid out along the terraces which lead the visitor to a proposed quarry garden (fig. 7.4).

Figure 7.4 (opposite): Diagram showing service routes and publicly accessible spaces

services and
access routes

1. beekeeping
garden

2. ground floor
meadery

3. quarry garden

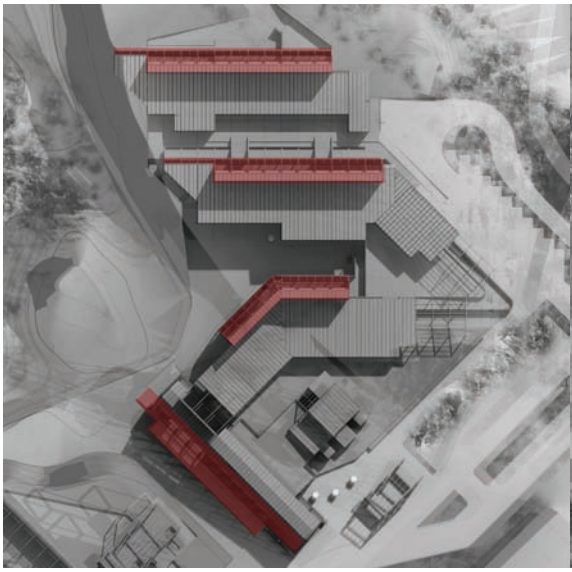
4.Filander Avenue &
public square

7.4 orientation, access & services

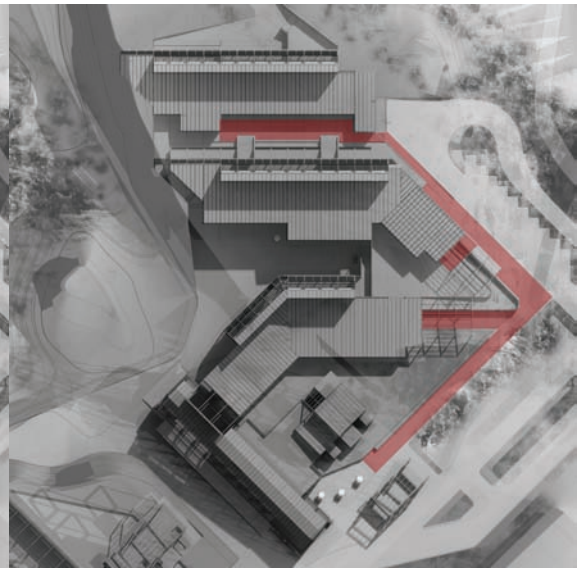
The existing main storage shed is longitudinal along an east-western axis. Because the intervention proposal latches onto the existing structure, a change in building orientation becomes necessary to optimize northern solar gain. The shift in orientation also makes various spatial opportunities possible, and allows for a separation of publicly and privately accessible spaces, such as the open courtyard and meadery on basement level. The north facing structures are further justified by the separation of the different programmes of the intervention, while connecting them along a dedicated access route along the eastern façade.

Wet services are located at readily accessible cores within the buildings, and electrical service cores are aligned in the design layout, with a main distribution board located at the existing grinding-pan shed (fig. 7.5).

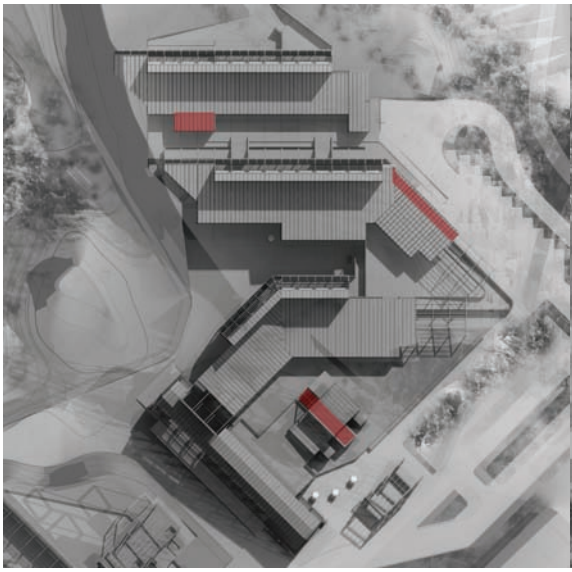
Figure 7.5 (opposite): Diagram of building orientation of existing structure and intervention, access routes and service placement



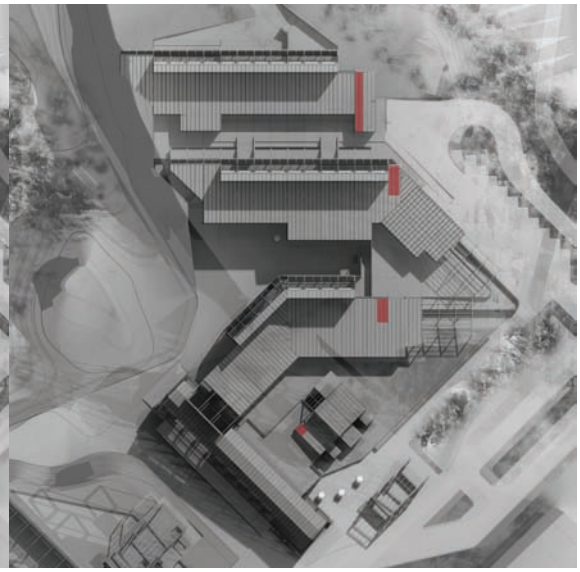
building orientation of existing structure and proposed intervention



worker access



aligned electrical services



wet services

7.5 terrain management

The existing-west facing storage shed does not have a ground floor level, but has double volume basement. The floor slab of the basement level has sluices spaced at certain intervals, which open and let the stored clay drop into a lower longitudinal basement. The clay is then conveyed to a clay mixer on ground floor level south of the shed.Because the shed and mixer are in disuse, their infrastructure offers opportunities to intervene on (fig. 7.5).

The addition of a ground floor into the existing main storage shed results in the basement level becoming a wasted void. It is therefore proposed that the basement is used as a water storage tank facility. According to an estimated water budget for the project, the monthly demand for potable water is 115m^3 for approximately 150 occupants. With an effective catchment area of approximately 5000m^2, sufficient water may be collected to sustain the monthly water demands. The remaining water in the tanks is the most during December because of a stored water build up throughout the year. The water in the tanks are sized and numbered according to December's total volume of 700m^3. The existing shed has a storage area of 450m^2, making the storage of approximately fifty 10 000l Jojo low- profile tanks possible (fig. 7.6).

Prior to storage, the collected water undergoes a purification process to become potable: water is collected along the building in channels and is taken to a storm water system at a 1:100 fall. The water is passed through a trash trap, followed by an oil trap. Water is then slowly passed through an artificial wetland to remove the dissolved mineral contents of the water. The artificial wetland is allocated in a second, open and abandoned shed, adjacent to the main storage shed. Before the water is pumped to the storage tanks, the water is passed through a UV-filtration system which removes any microbes in the water (fig. 7.7).

An additional water reservoir is suggested to irrigate the proposed quarry garden. During activity, the existing clay pit and water body on the lowest point of the terrain were used to manage the dust on site. The water body is proposed to be used as irrigation, and therefore does not require treatment. The clay-water is pumped from the water body up to a water reservoir on level with Filander Avenue via a sludge pump. Water channels with controllable sluices lead from the reservoir to the quarry garden. Overflow water is collected along the western edge of the terrain and channelled into a detention pond at the lowest point of the terrain.

1. double volume clay storage
2. sluices
3. conveyer and roller system
4. clay mixer

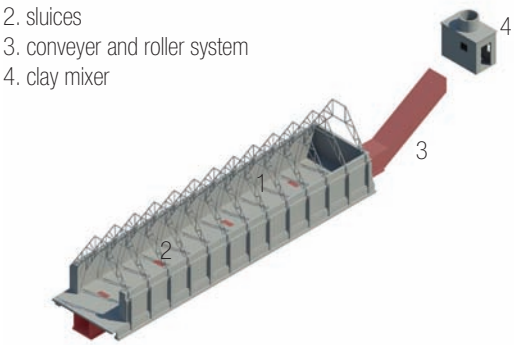


Figure 7.5: Existing shed and function

1. ground floor addition
2. basement water storage tanks

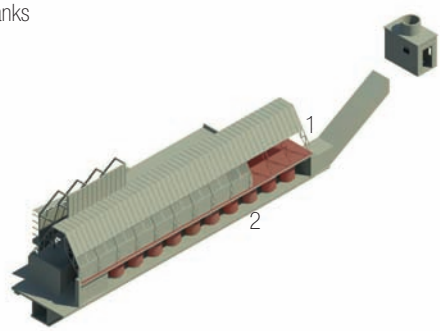
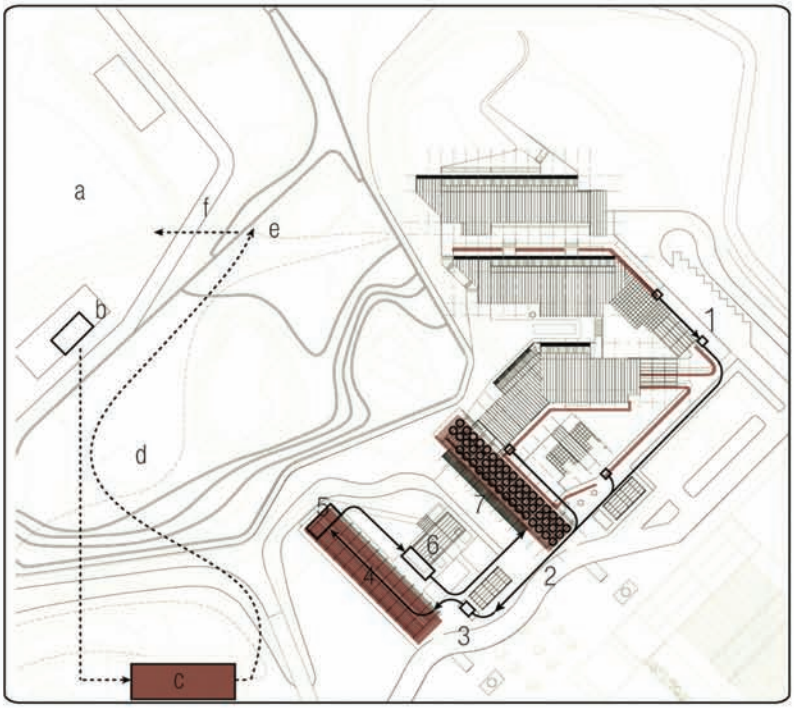


Figure 7.6: Proposed conversions of existing shed



water management

irrigation

effective areas to be irrigated: 10 000m²
total area to be irrigated: 21 000m²
water requirement per month in summer: 3360m³ per month
water requirement per month in winter: 2625m³ per month

approximate water reservoir sizing: 1200m³

a. clay pit and water body
b. sludge pump
c. water reservoir
d. water channel with sluices
e. detention pond
f. discharge pipe

potable water system

200m³ monthly demand
catchment area: 6500m²
effective catchment: 5000m²
accumulative water remaining in tanks: 700m³
proposal: 70 x 10 000l tanks

1. runoff collection points
2. storm water channels
3. oil trap
4. artificial wetland
5. booster pump
6. UV filtration
7. storage tanks

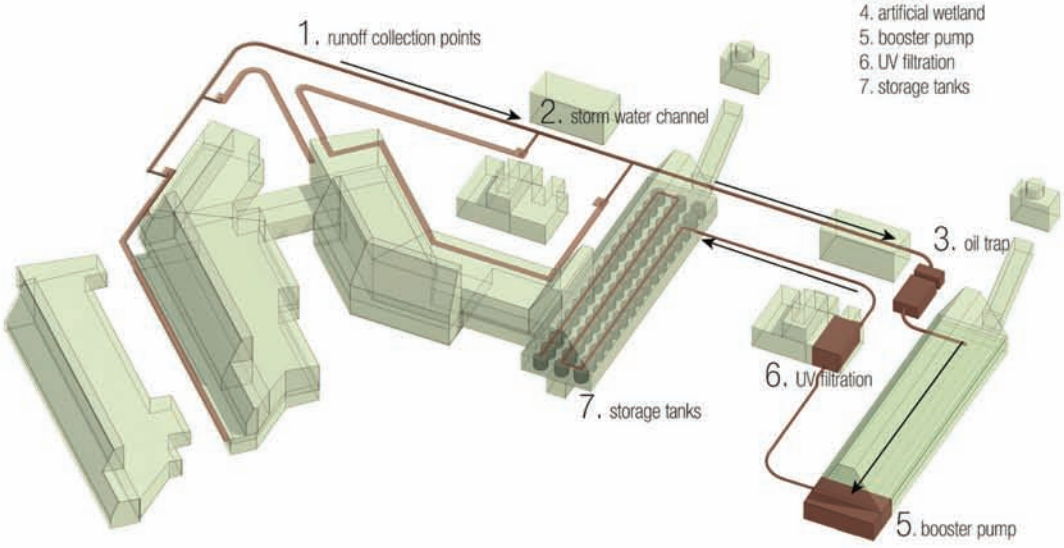


Figure 7.7: Water collection and on-site management

7.6 substructure

The basement of the existing storage shed rests in the four meter level change, where it is submerged towards the south and open towards the north. This notion of a partially embedded basement is continued in the intervention. The basement spills out onto a proposed levelled, public platform which mediates between the level changes of Filander Avenue and the quarry. Excavations would be necessary since the soils on basement level, along the meander through the quarry, are to a large degree unconsolidated.

The basement is constructed from retaining walls and columns at four meter intervals. Where full excavations occur and retaining walls are required, it is proposed that cast in-situ reinforced concrete with torched on waterproofing and treated soft-board are used. Because the basement sits within a sloping terrain, sub surface drains covered in no-fines concrete are placed underneath the surface bed.

Since the basement has to carry varying spans and loads, 680mm deep reinforced cast in-situ concrete beams are suggested that rest on the columns and carry the transfer loads of the super structure. Reinforced concrete floor slabs are cast level with the top of the beams, allowing for an adequate ceiling along the depth of the beams. Additionally, the modular layout of the columns provides means to construct non-load bearing brick infill and glass facades along the open fronts of the basement.

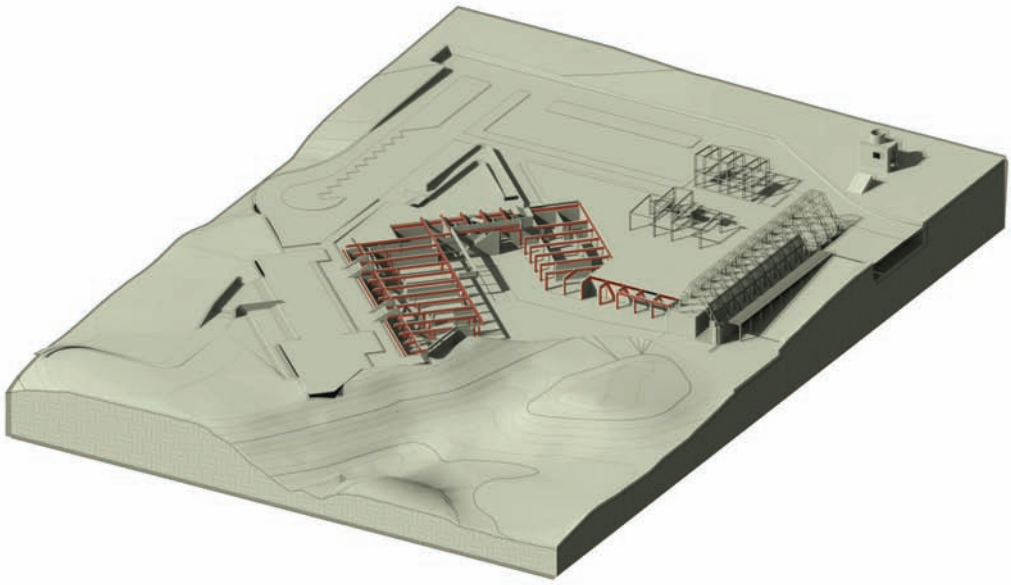


Figure 7.8: Diagram of excavations and substructure

7.7 superstructure

The structure of the ground floor level comprises of assembled, modular structural steelwork. For the majority, the steelwork follows the columnar spacing of the basement, yet speaks an independent language by resting on, extending over, or anchoring into the basement level. The steel profiles are constructed from universal I-sections which span between four and ten meters, welded where necessary off site, and bolted together on site. Pockets are left open in the soffit of the basement with anchors cast into position. The steel frames are then bolted into position and the pockets filled with grouting.

Where the steelwork of the super structure spans past the basement soffit, independent footings, with bolts cast into position, are provided. In order to prevent the further use of shutterwork, the floors are provided by means of permanent shuttering slabs after the steel profiles have been bolted into position.

Because the ground floors are largely light industrial spaces and deal with honey, the floor slabs are finished with self- levelling epoxy to allow for easy cleaning. External slabs and surface beds are wood floated screeds.

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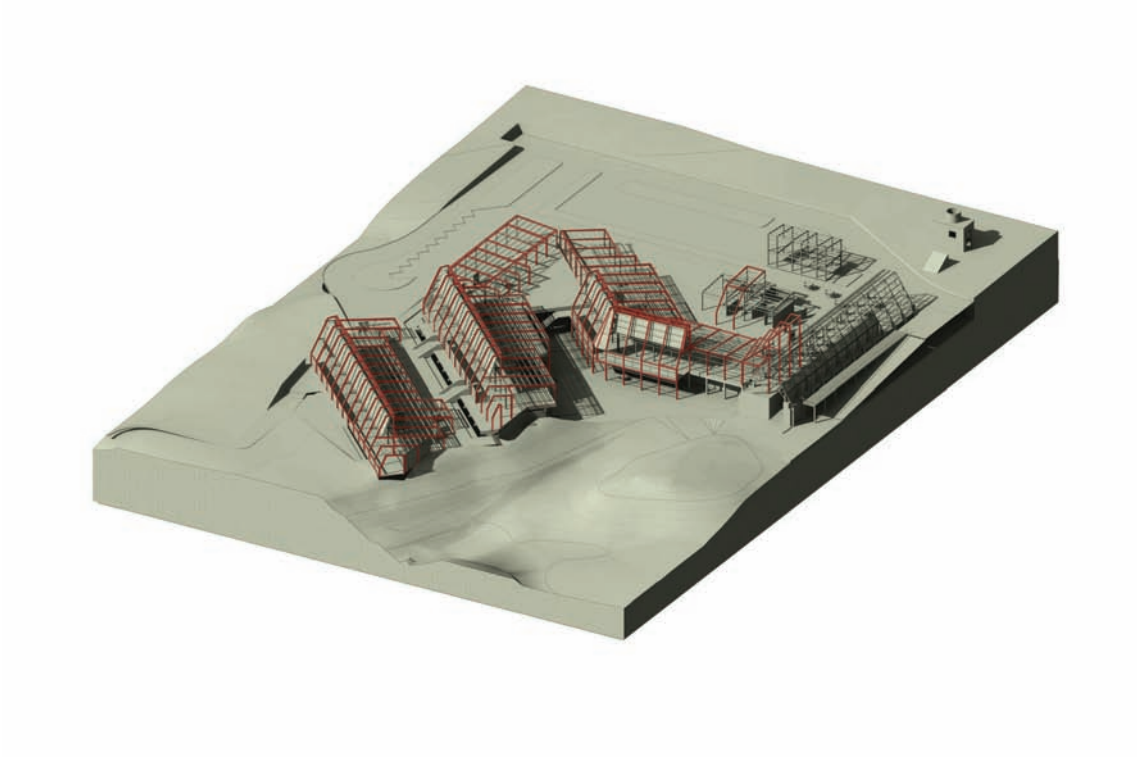
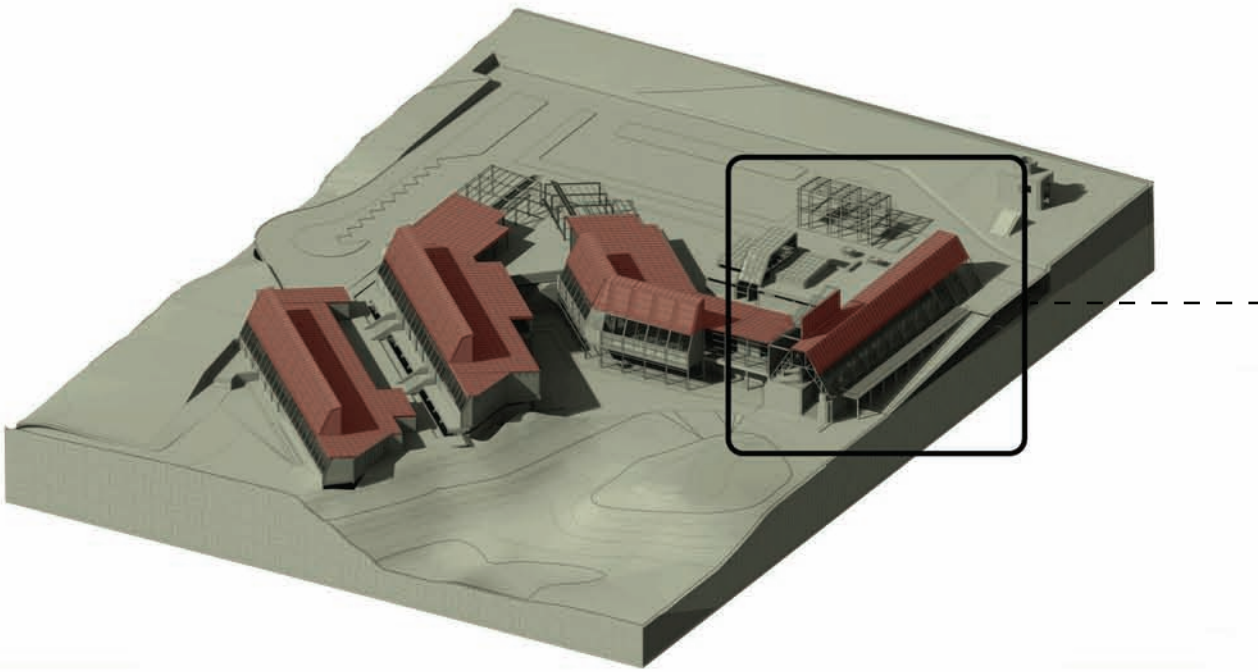


Figure 7.9: Diagram of superstructure

7.8 shed

Because the existing main double volume storage shed is proposed to be converted into an open and publicly accessible space, a ground floor slab is inserted and a steel framed decking is added along the western façade. While not ideal in terms of orientation, the decking is necessary to broaden the thin existing storage shed.

To fully activate the existing shed, it becomes necessary to remove the existing sheet metal cladding which wraps around the shed. A proposal is made to add an adjustable façade along the western length of the shed. The design proposes a sliding screen system which controls western solar access and movement into the spaces. The existing steel trusses, spaced at 4 meter intervals, are kept as the structural support for the shed's roof as well as for the support frames for the sliding screens. Top-hung sliding tracks are bolted into runner channels which are welded to each of the existing steel trusses. Light steel framed screens with counter-weights are fastened to these sliding tracks, which allow the western façade to be opened or closed in segments. Figure 7.10 depicts an explosion of the proposed addition of the sliding screen system to the shed.



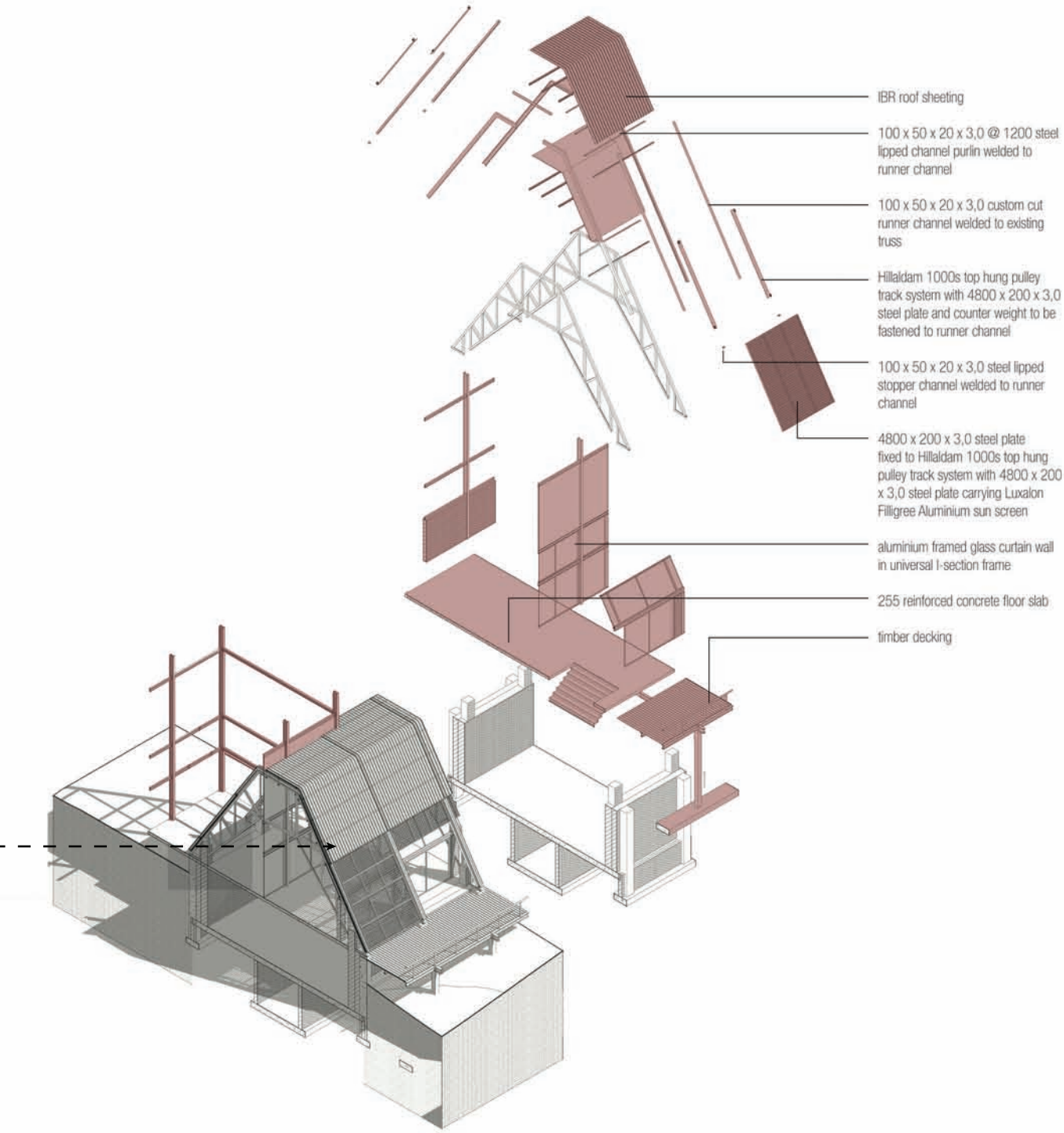
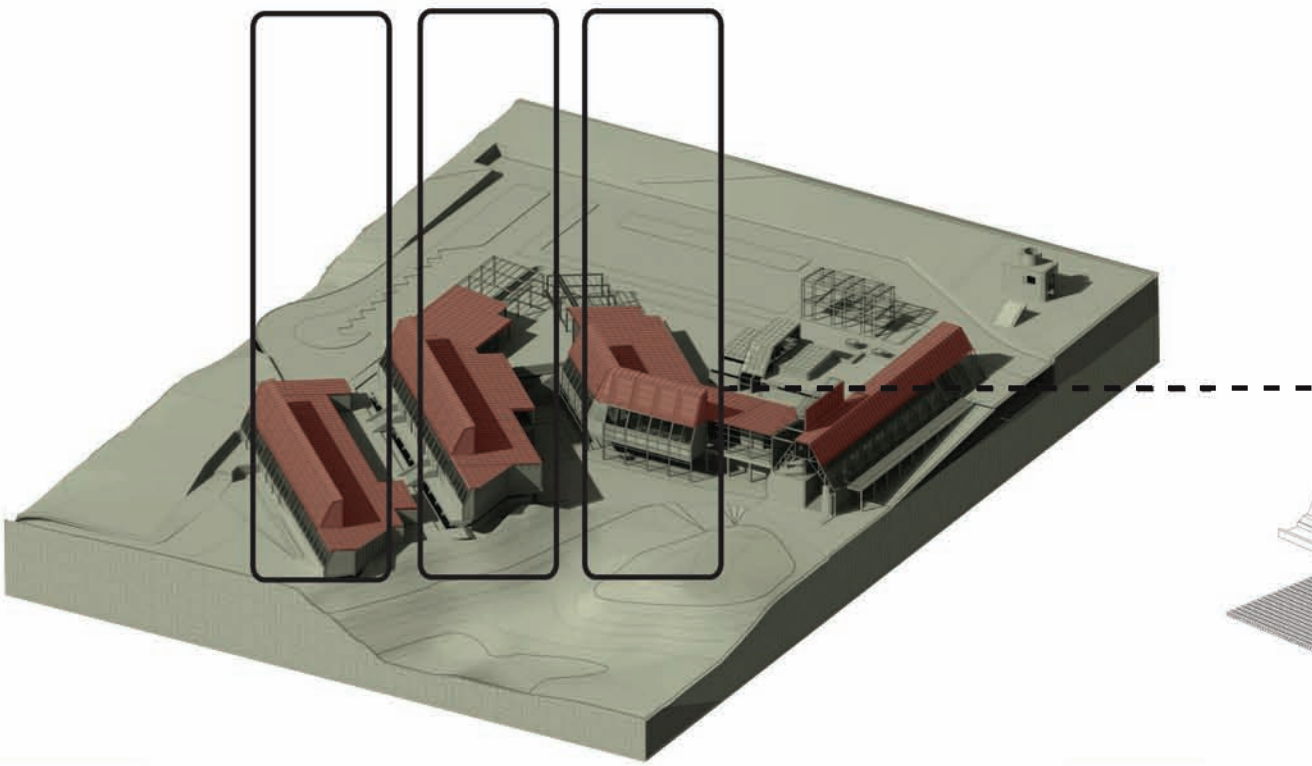


Figure 7.10: Insertions // exploded segment and exploration drawing of the intervention into the existing shed

The system applied to the existing shed is adopted by the proposed north facing structures, continuing its façade language and function. Where figure 7.10 explores the approach to the façade of the existing shed, figure 7.11 investigates the steel frame construction and façade profile of the new structures. In addition, the structural steel for the sliding screen is designed to facilitate solar assisted stacks along the top length of the northern façades.

While the screens of the existing structures slide underneath IBR roof sheeting, the screens of the independent, north facing structures slide underneath clear compact Danpalaon. While the screens cover the lower portions of the north-facing glazing, the northern roof line is kept exposed to solar radiation: the screens are designed to run in channels which rest in the steel frames. Since the clear compact Danpalon wraps around the top of the steel frames, the screens slide underneath the Danpalon, which permits unobstructed, direct solar radiation into the stacks, adding desirable heat gain.



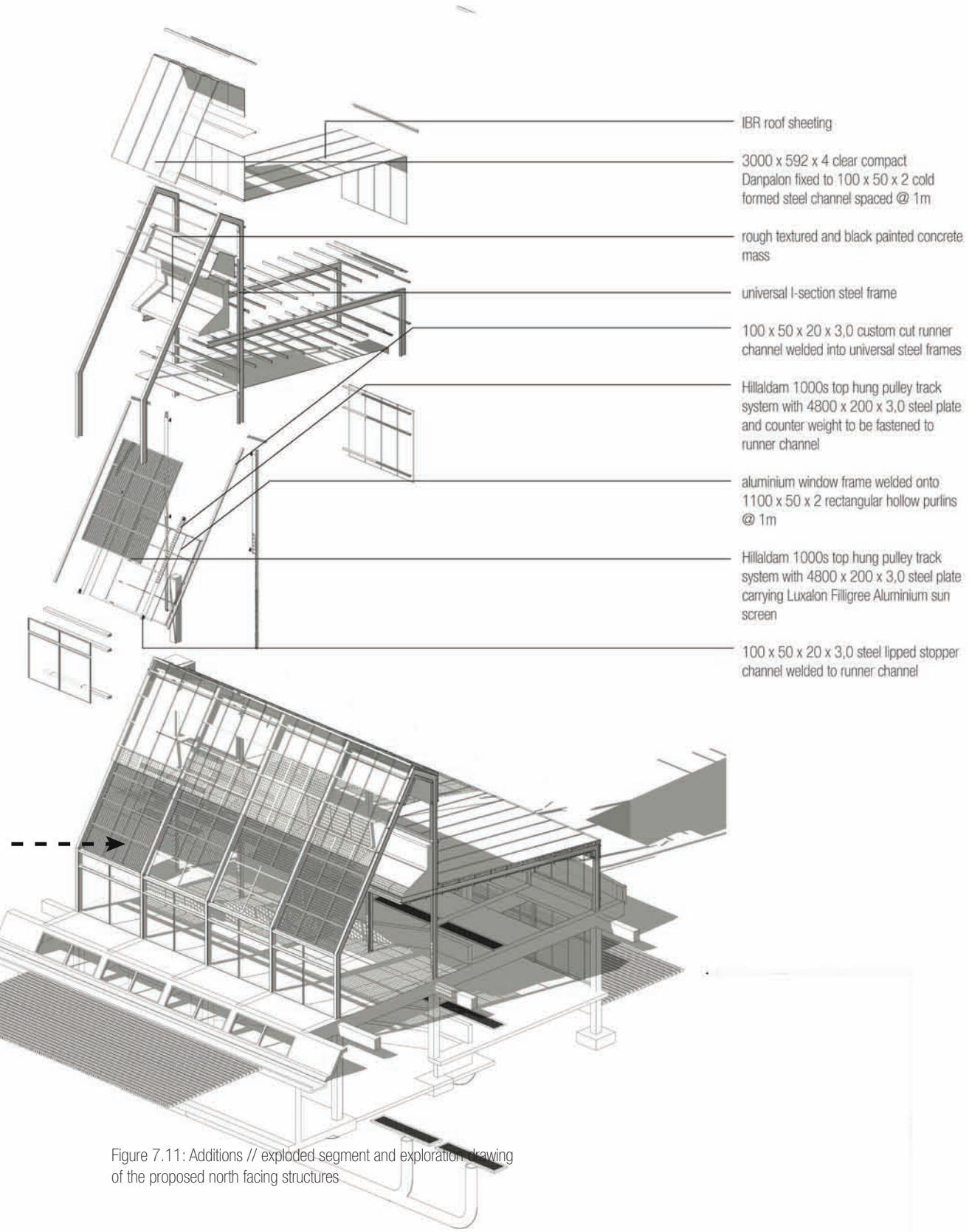


Figure 7.11: Additions // exploded segment and exploration drawing of the proposed north facing structures

7.9 system

Solar assisted stacks are intended to passively ventilate the buildings, while maintaining, and lowering, internal room temperature. The solar assisted stacks of the buildings are located above unobstructed spaces along the northern façades. Additionally, the rising hot air from the basement level is channelled along the basement ceilings, passing through steel grids placed underneath the stacks. The stack openings are on ceiling level in the occupied ground floor space, while the stack exhausts are fixed to pressure relief dampers along the highest points of the buildings. Any backflow of air or entry of rain is therefore prevented.

Because the building proposal is not a series of storeys but rather single and double storey structures, the solar assisted stacks are limited in terms of height. While taller stacks work more efficiently, the design proposal relies on multiple stacks to decrease the area that each stack has to ventilate. Since the stacks are consecutive along the northern façades, 100mm thick Isotherm Insulation covered with 12mm Everite Nutec Flatsheets compartmentalize each stack in 4m intervals, minimizing the effective area that each stack has to heat up.

7.9.1 ventilation

The solar assisted stacks need to primarily be effective when the maximum temperature averages are reached in Pretoria, namely between September and March. For the design proposal, the maximum external temperature is considered to be 27˚C. The temperature of the solar assisted stack is therefore required to range between 30-50˚C, while the desired internal room temperature should ideally range between 20-22 ˚C.

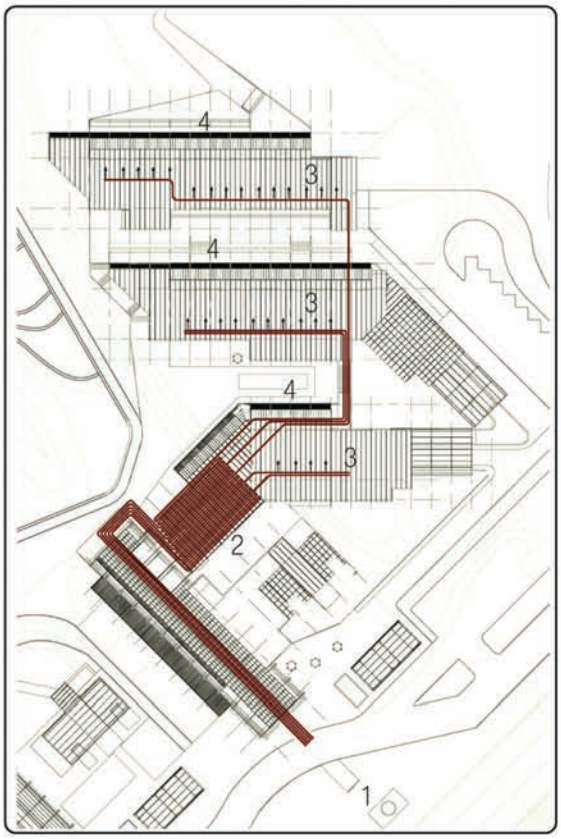
The assumption has been made that a 3m high solar assisted stack with an inclined glass face, optimally exposed to the sun, lined with rough textured, black painted thermal mass, and with a duct area of 2.25m^2, may ventilate a volume of 190m^3 at an air flow rate of approximately 1m^3 per second.

In the given scenario, a single floor area per building is 600m^2 and has a volume of 2400m^3. Ten solar assisted stacks per building would therefore have to ventilate an effective volume of 240m^3. While the physical area of the solar chimney is 2.4m^2 with a height of 5m, a desired air flow rate of 0.6m^3 is achieved if the chimneys operate at 10 air changes per hour. Additional factors such as unwanted shading or friction were considered in the design but not taken into account in terms of the air flow rate.

7.9.2 fresh air supply

Fresh air is supplied by means of earth pipes. The desired drop in temperature is taken as 5 ˚C. The proposal suggests that each floor is supplied with a main earth tube of galvanized steel which subdivides into secondary feeders into the internal volumes. Each floor has an area of 600m^2, with a volume of 2400m^3, requiring 10 air changes per hour.

The lengths of the earth pipes for the design proposal were established following a volume of flow to pipe length ratio according to a study done by Awadukt Thermo. In the given scenario, the required volume of flow is taken as 24 000m^3 of fresh air per hour. The pipe length would therefore, based on the volume of flow to pipe length ratio of the study, be 2,000m in length to allow an adequate drop in temperature. Because a 200mm diameter pipe which is 2000m in length is not feasible, wider earth pipes, with a diameter of 500mm, is considered.
The total pipe volume of the given 200mm diameter pipe,which is 2000m in length, would be approximately 60m^3. The same pipe volume, with a 500mm diameter, would have a length of 300m, which is considerably more viable.



ventilation

ambient temperature: 27℃
desired internal room temperature: 20-22 ℃
air changes required per hour: 10
single floor area: 600m²
single volume: 2400m³
reference volume per stack: 240m³
desired air flow rate: 0.6m³ per second

proposal:
10 solar assisted stacks per building
single stack ventilates an effective area of 240m³
internal stack temperature: between 30-50 ℃
physical area of stack: 2.4m²
height of stack: 5m

fresh air supply

ambient temperature: 27℃
desired internal room temperature: 20-22 ℃
ground temperature: 18℃ in Pretoria
desired drop in temperature: 5 ℃

volume of flow required per single volume:
24 000m³ of fresh air per hour

proposal:
500mm diameter coiled galvanised earth pipes
single pipe length to each building: 300m

1. fresh air inlet
2. 500mm diameter coiled galvanised earth pipes
3. secondary feeders into internal volumes
4. solar assisted stacks ventilating at 0.6m³ per second

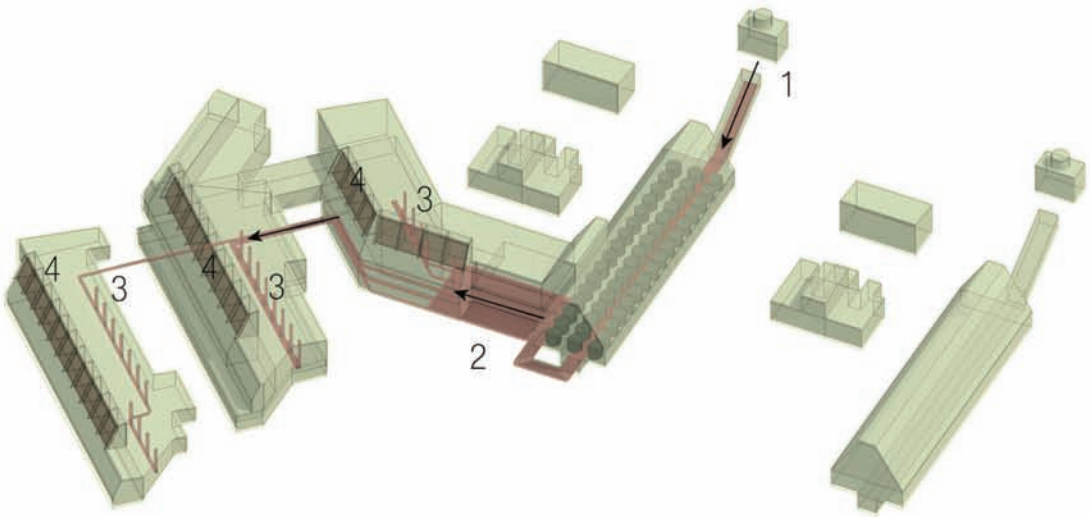


Figure 7.12: Fresh air supply diagram

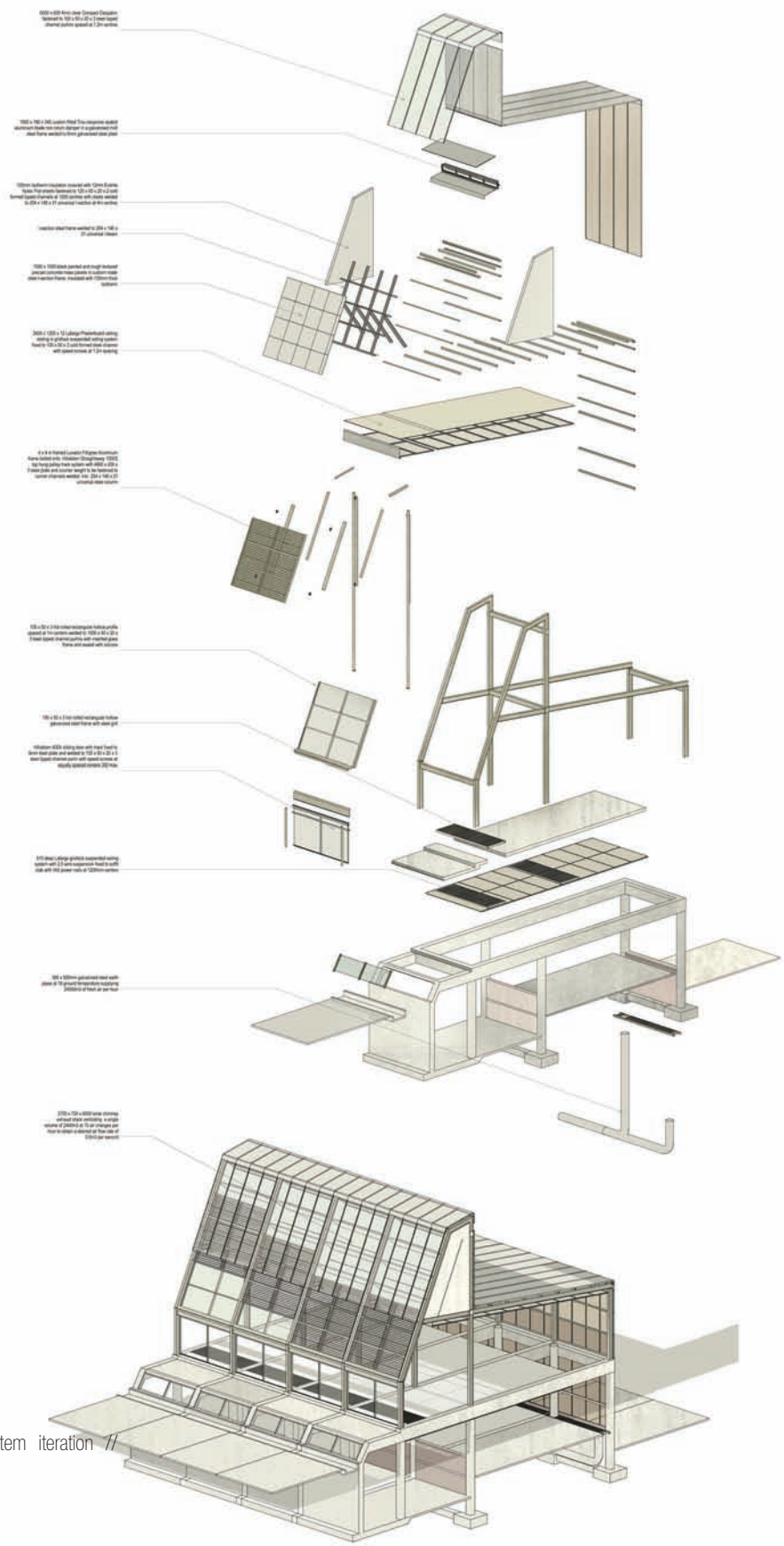


Figure 8.1: Structural and system iteration // orthogonal explosion

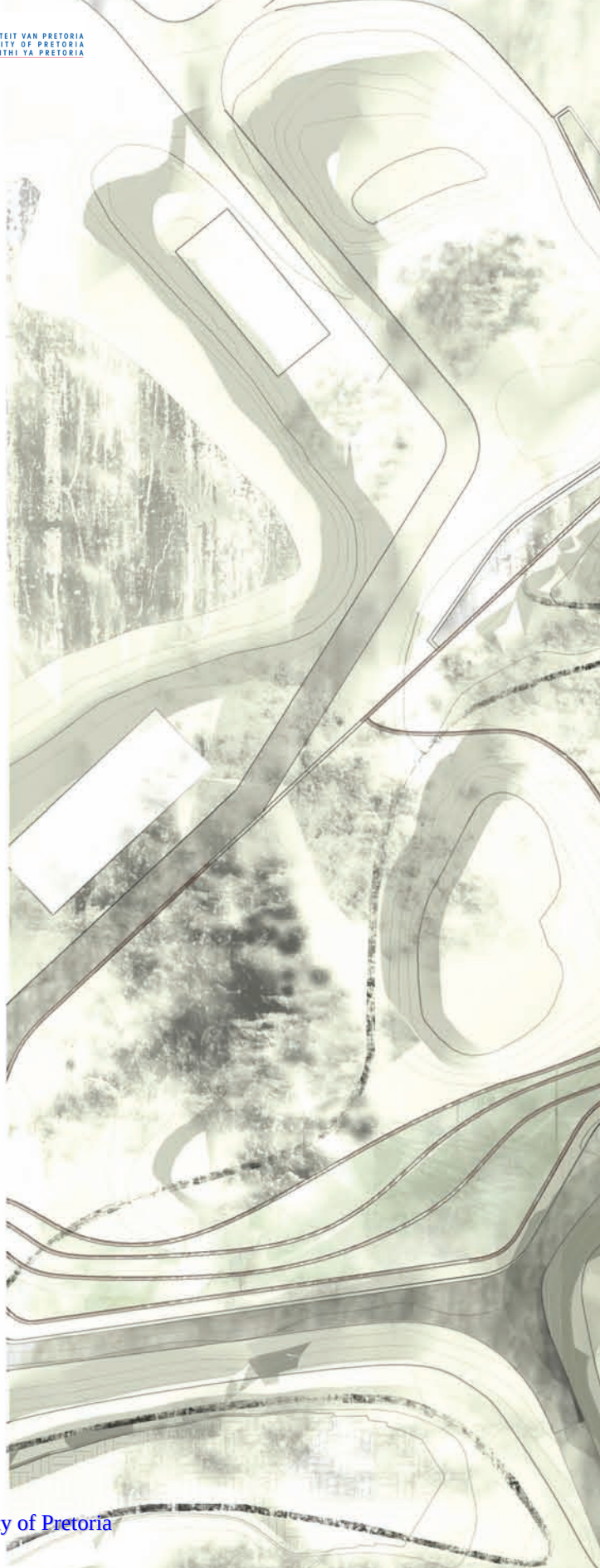
8 linger

The deduction made is that industrial precincts are inwardly orientated, which foster a removal from the inhabited landscape. In the post-industrial context, this inward orientation becomes inherent to the totality of place. In order to emerge the scape in its totality would require these imposed and inwardly orientated qualities to come forward within the ungraspable, collective essence of the place.

Because of this, the investigation in the post-industrial context proved to be an on-going and perpetual struggle. While the programme activates the terrain both physically and theoretically, the relationship between the imposing and ungraspable essence remains fragmented and difficult to place.

The architectural intervention brings the subject into the premise of emergence, yet the experience is conclusively assessed as overwhelmingly subjective. Comparatively, when brought into contact with an industrious beehive, a distinct odour may be picked up. Despite knowing that the odour has to be a blend of wax, pollen, propolis, wood and pheromones, it is difficult to describe. Even without being able to fully define or place the odour, it remains unique and unforgettable. So the intervention lingers in the experience of the post-industrial terrain: the intervention does not reveal the terrain's contents, yet it places a person into the context, and would therefore emerge the totality of place as a subjective, yet orientated, experience.

8.1 end note



site plan NTS

Figure 8.2: Site plan

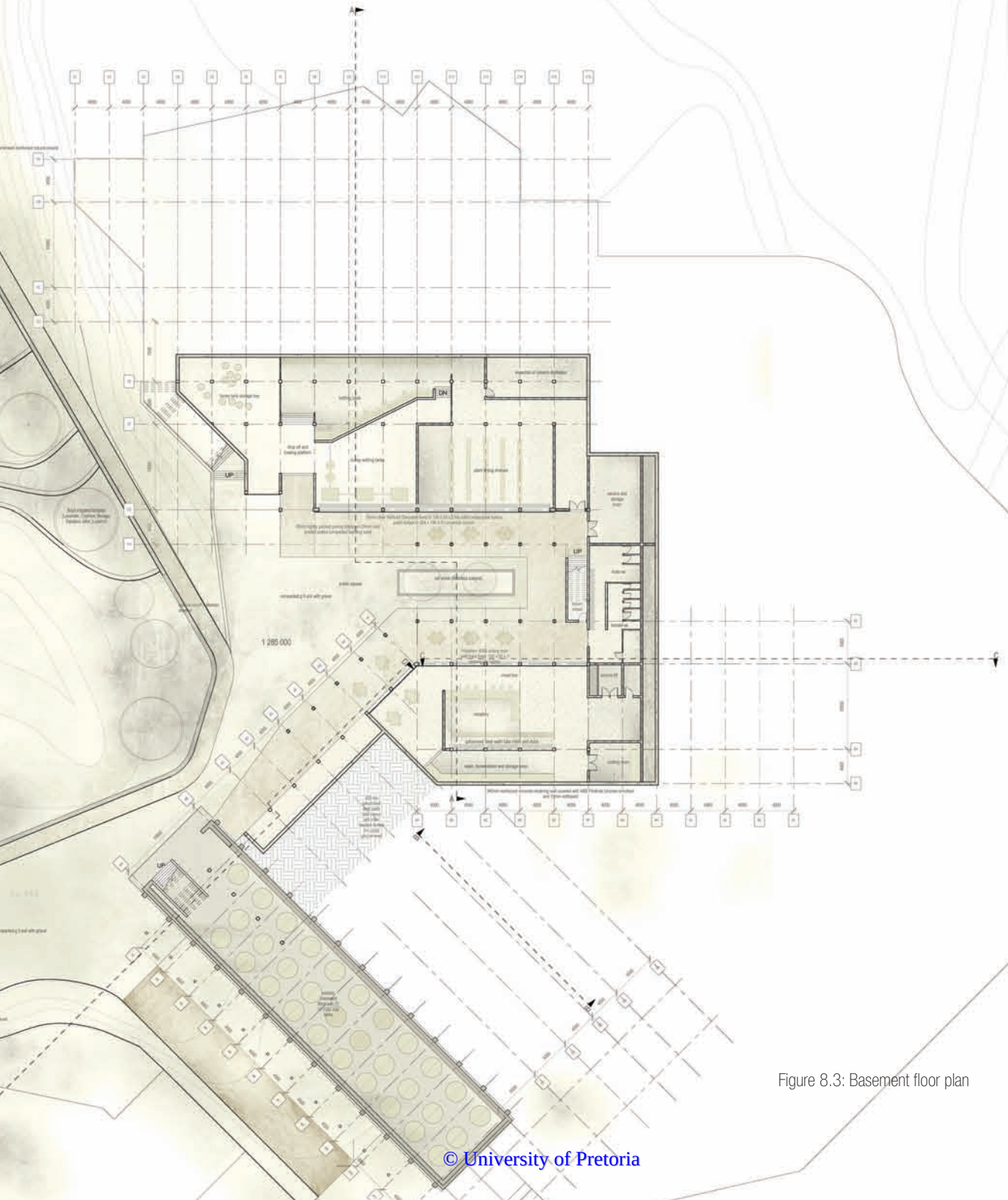


Figure 8.3: Basement floor plan

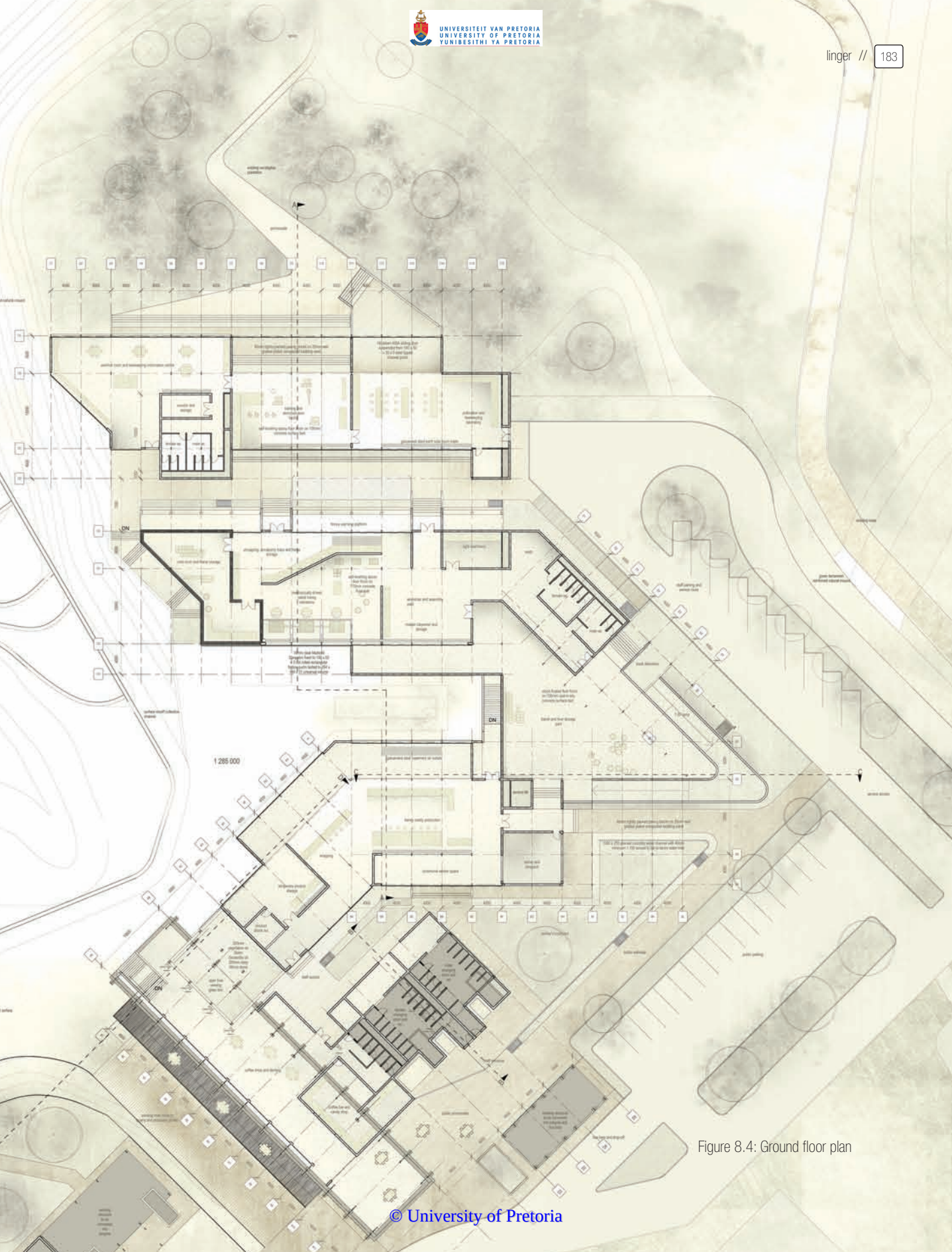
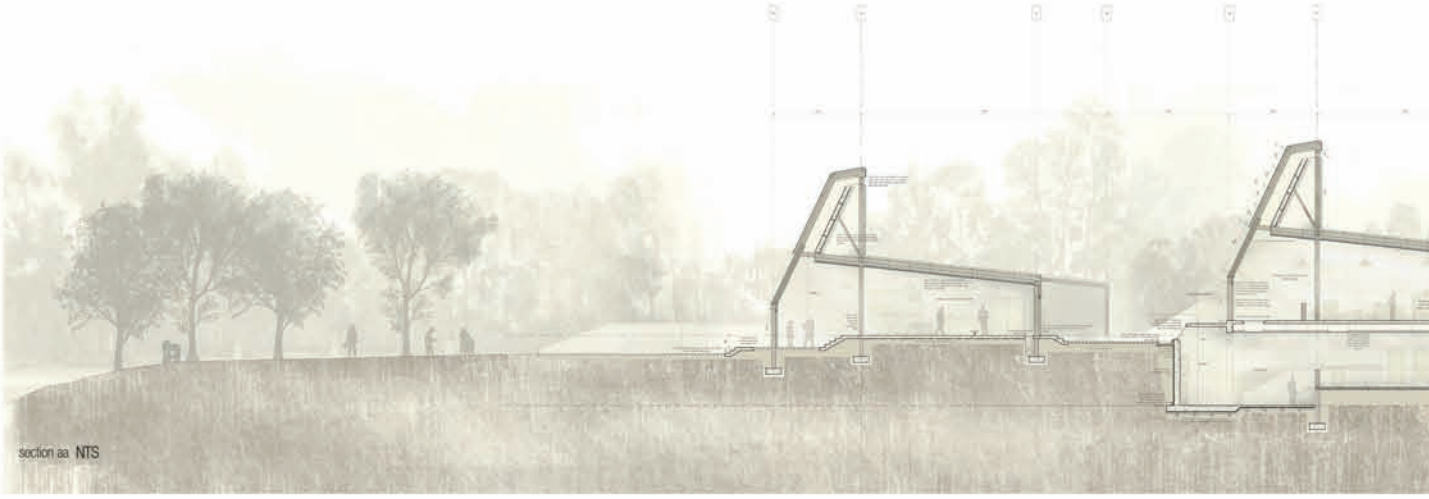
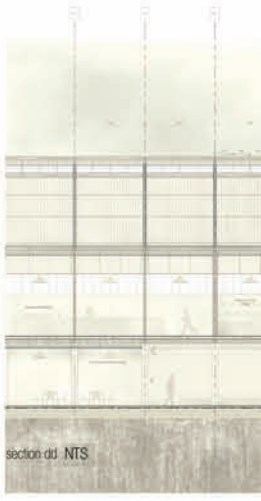
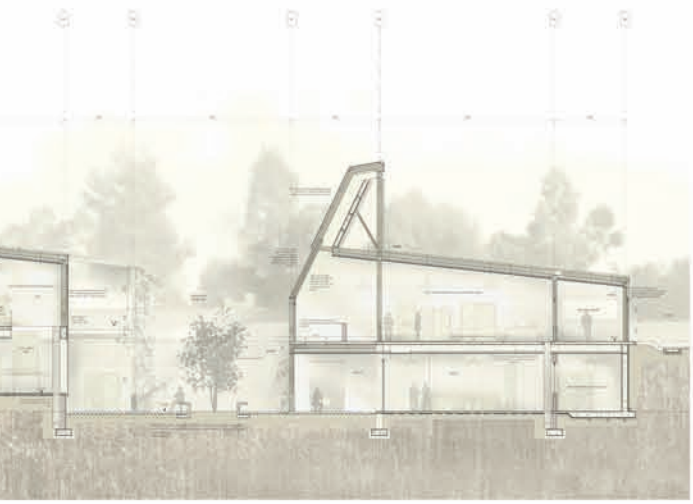


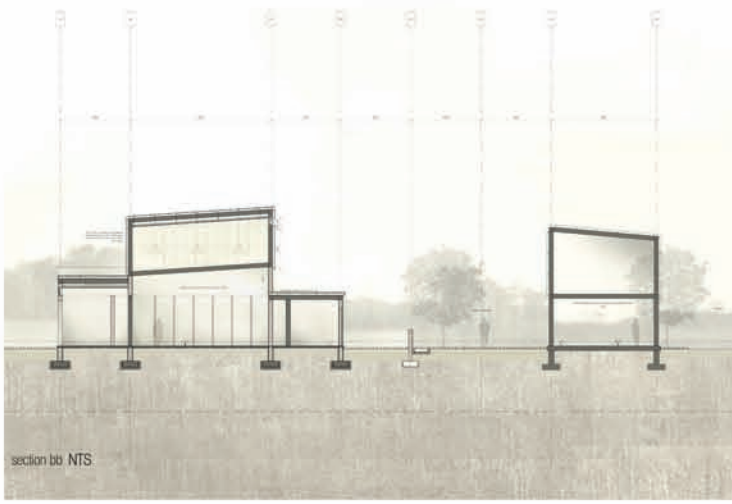
Figure 8.4: Ground floor plan

Figure 8.5: Sections aa, bb, cc & dd



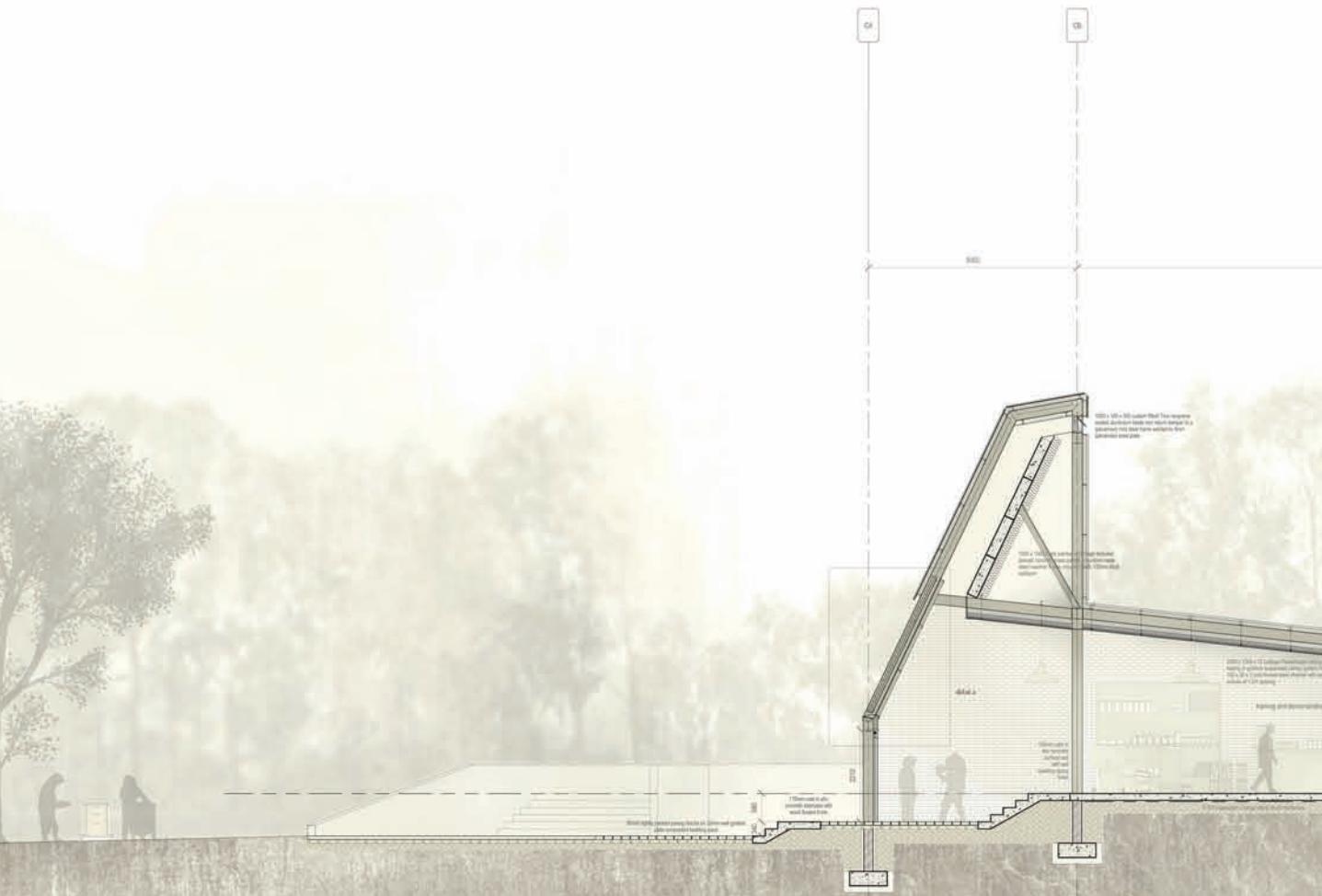






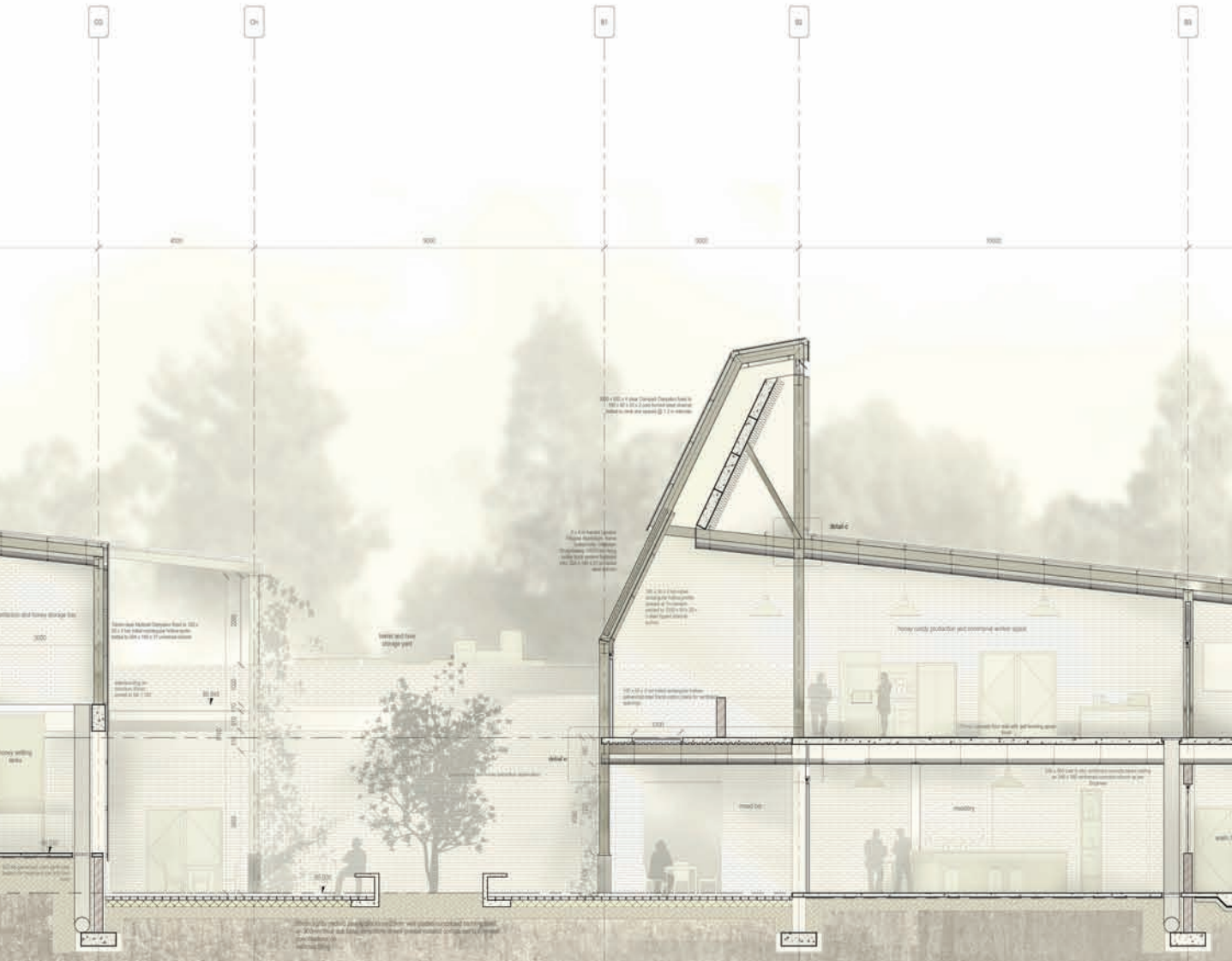
section bb NTS

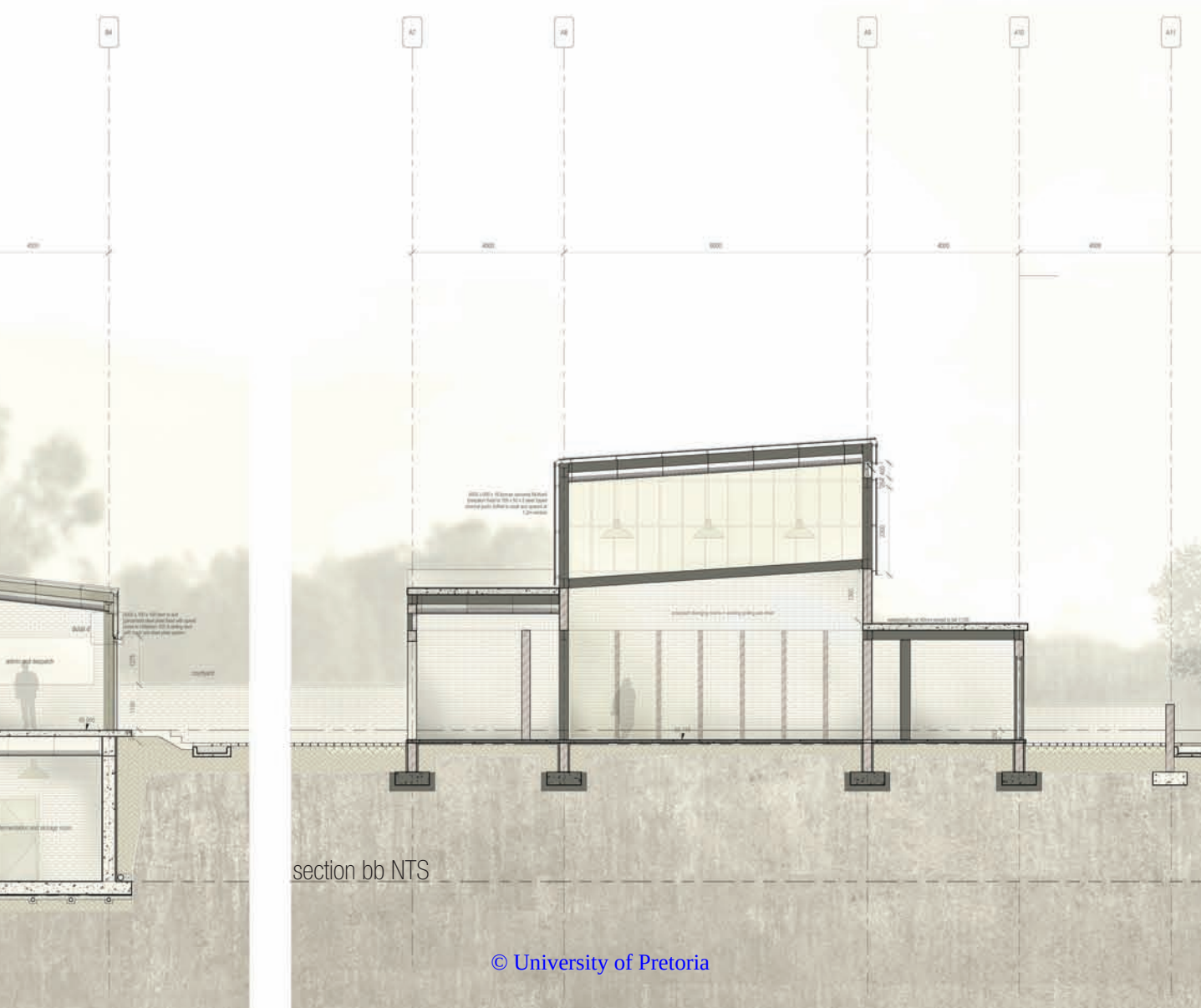
Figure 8.6: Sections aa & bb



section aa NTS

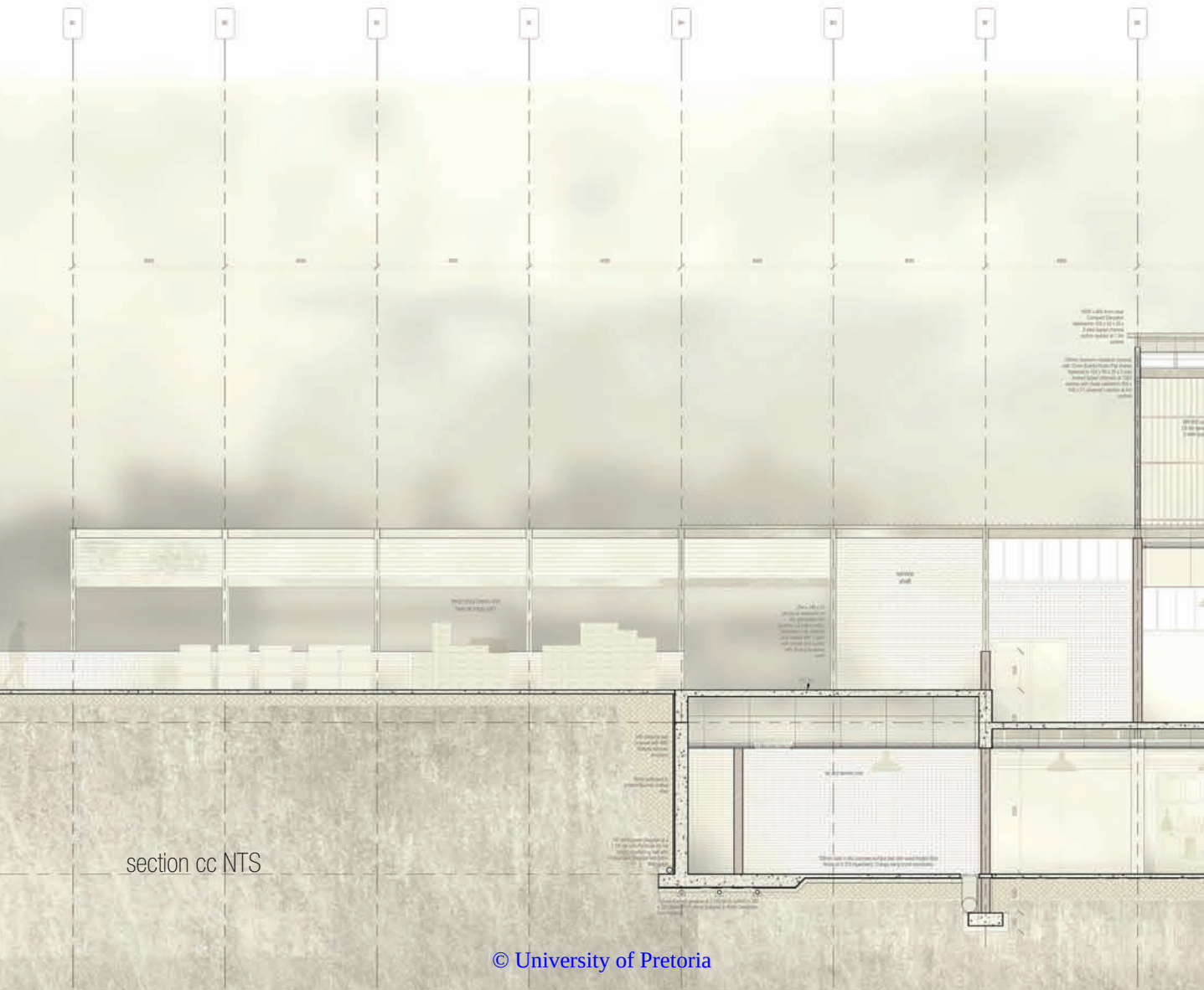
Figure 8.6 (continued): Sections aa & bb





section bb NTS

Figure 8.7: Sections CC & DD



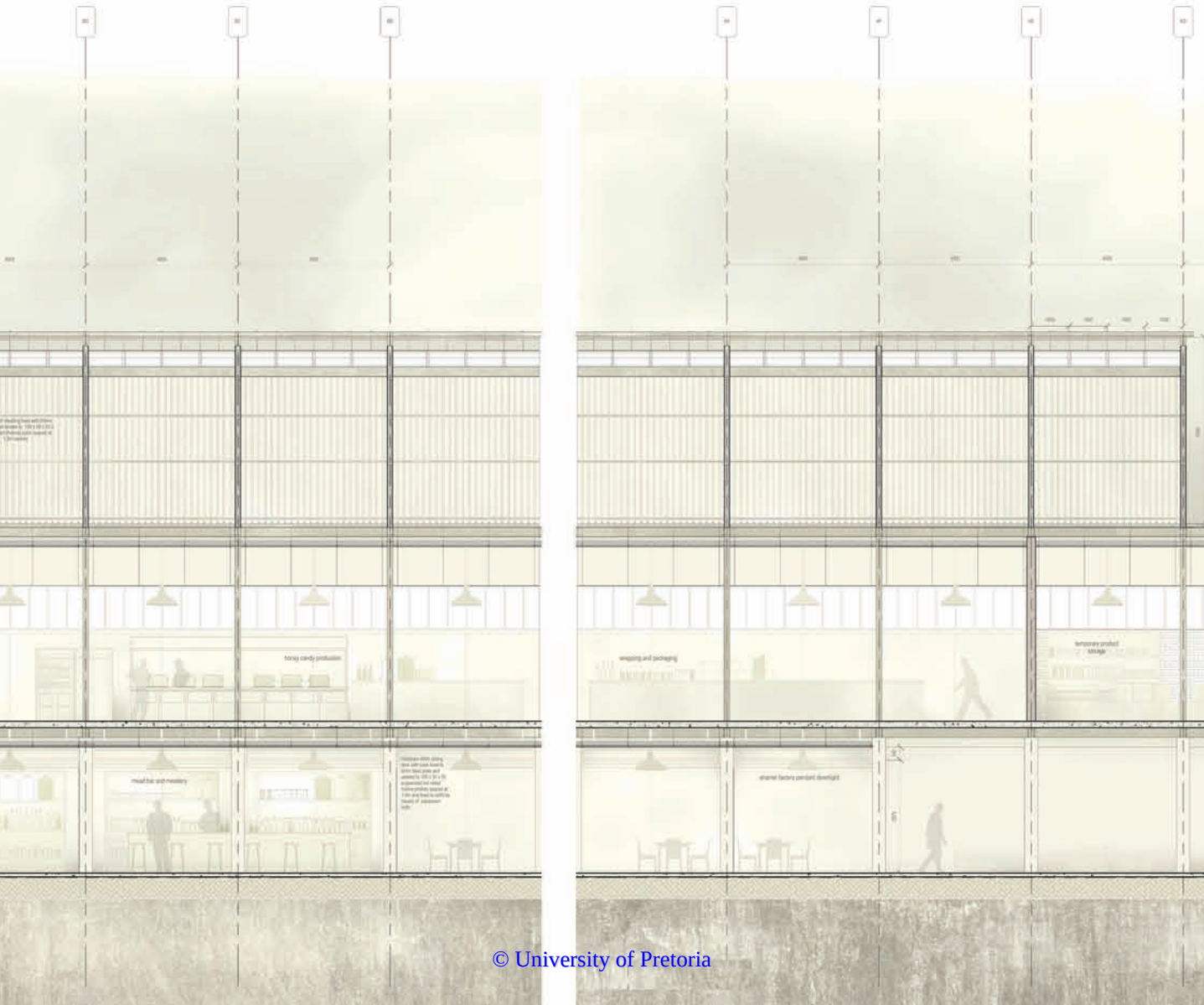
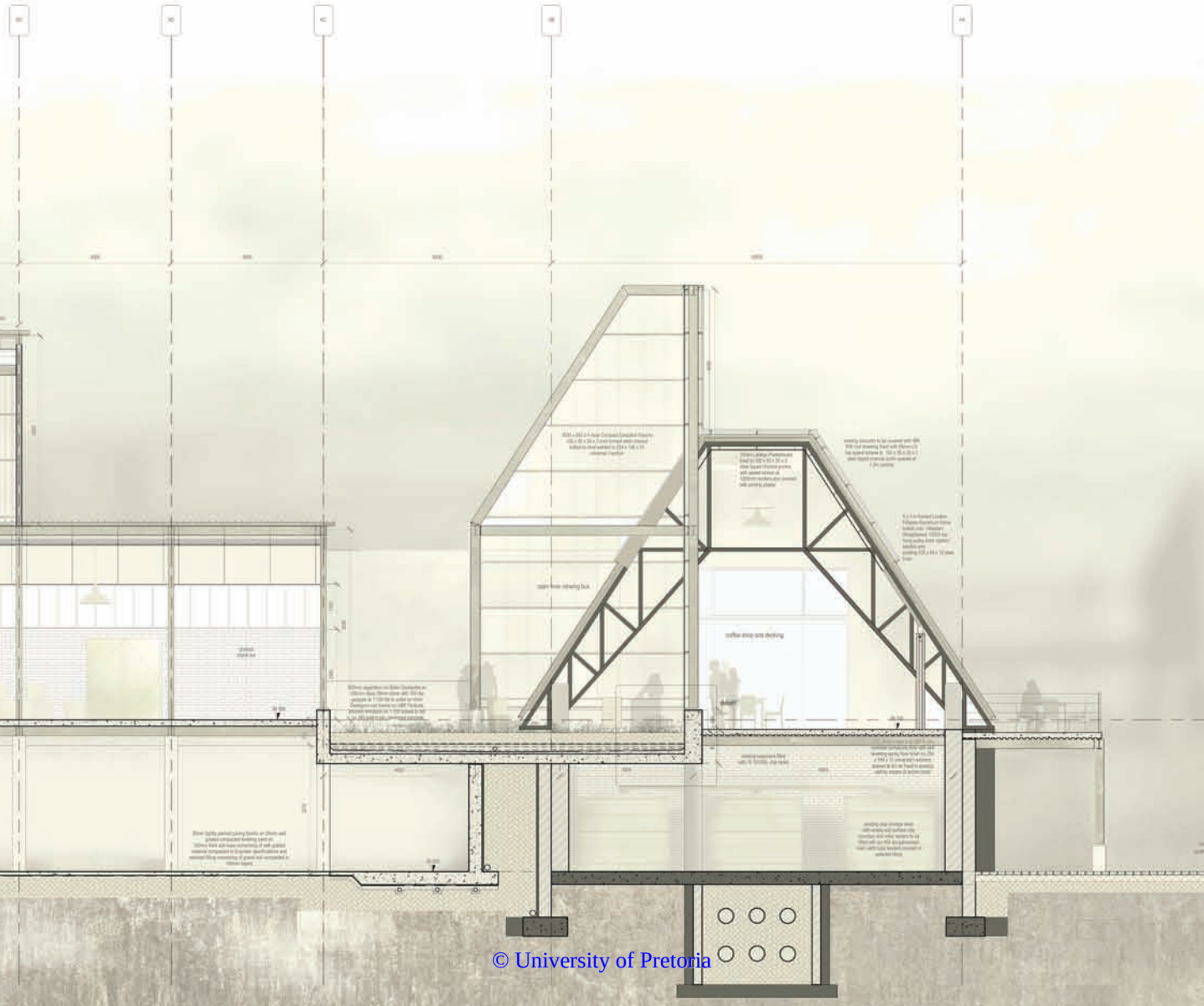
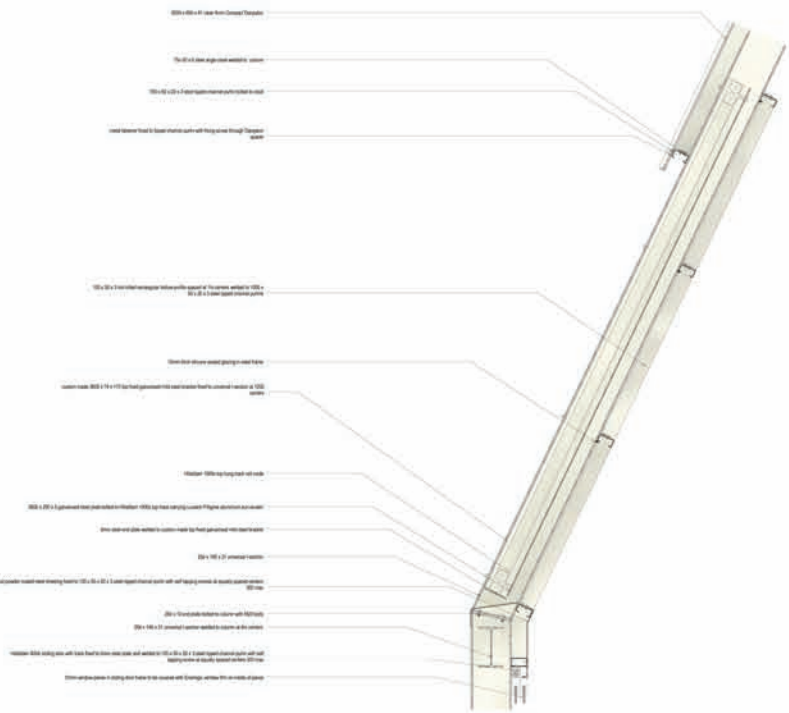


Figure 8.7 (continued): Sections cc & dd



section dd NTS

detail a NTS
dynamic



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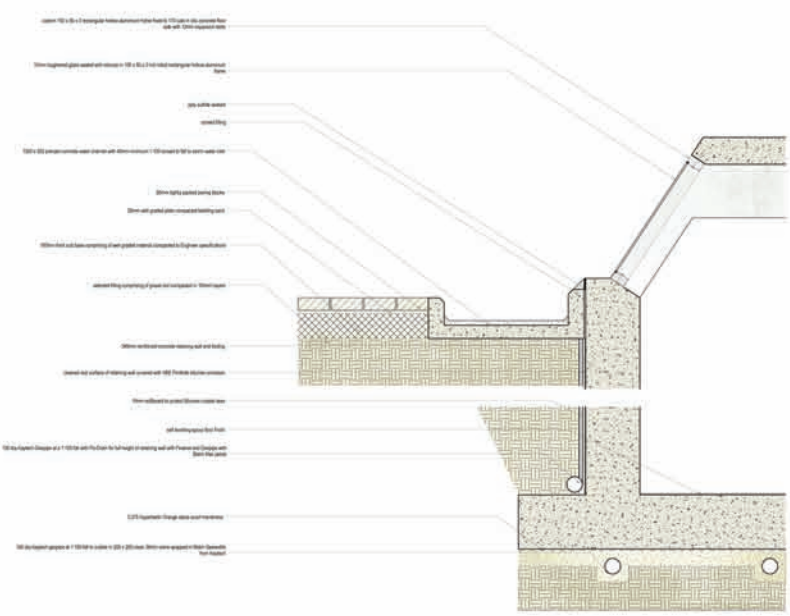
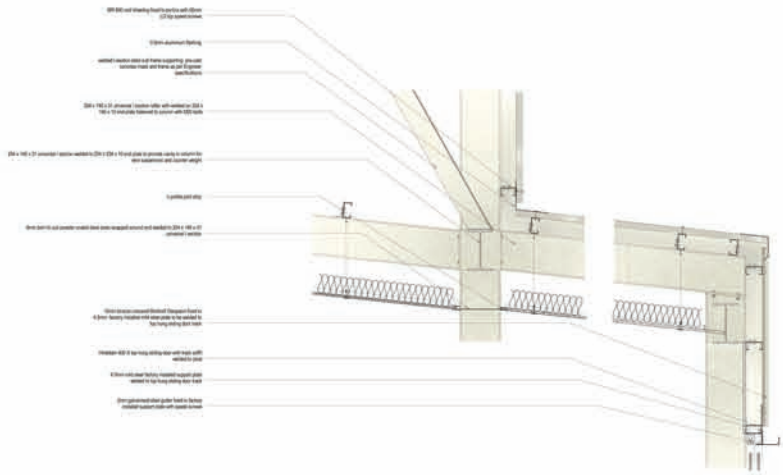
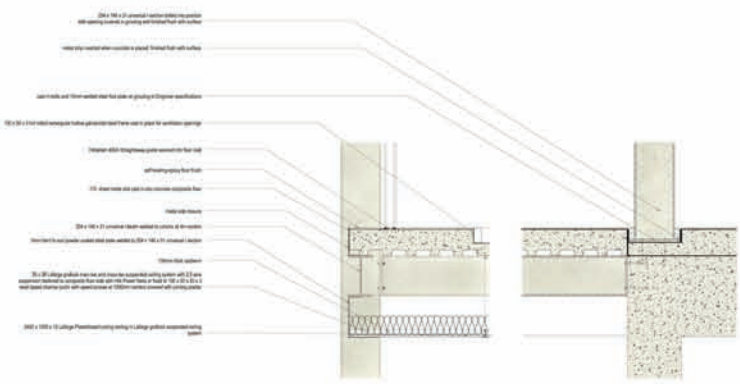


Figure 8.8: Details a, b, c, d, e & f

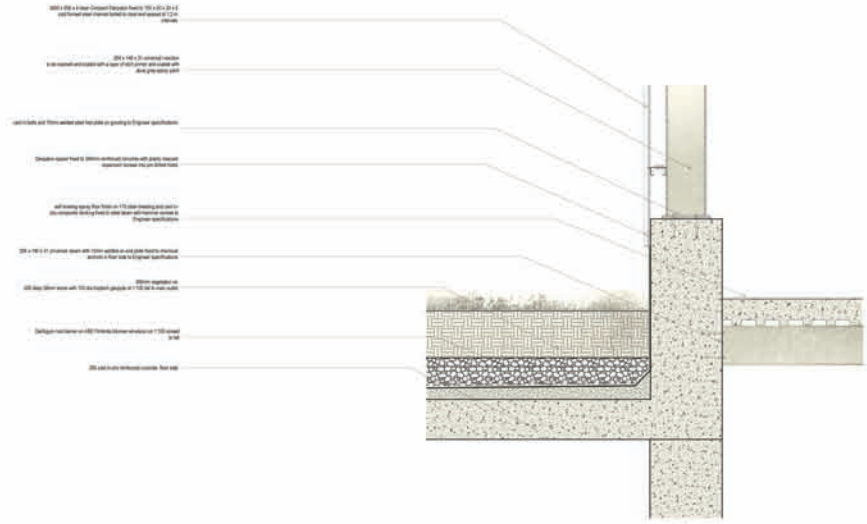
detail c and d NTS
framing



detail e NTS
anchorage



detail f NTS
openings // enclosures



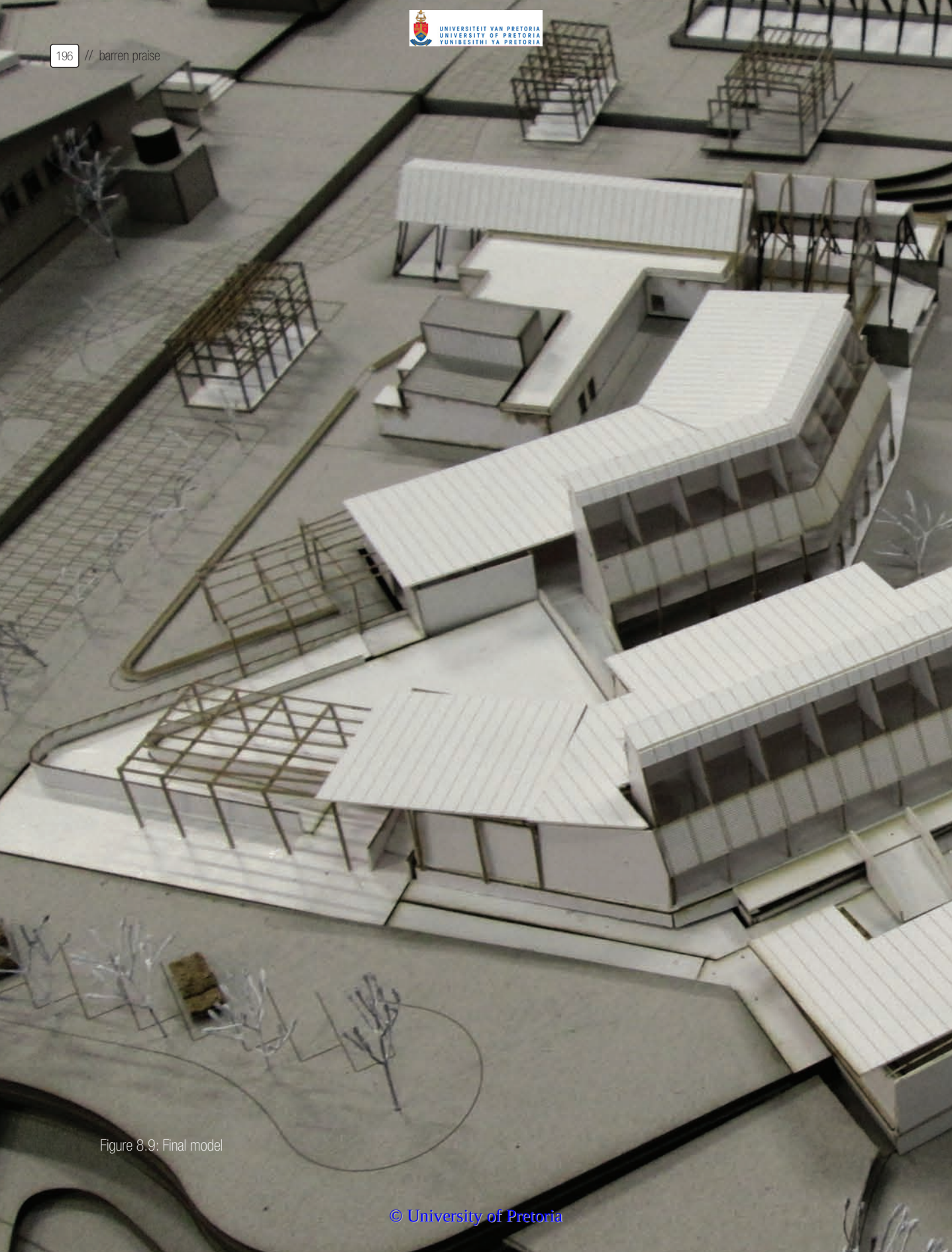
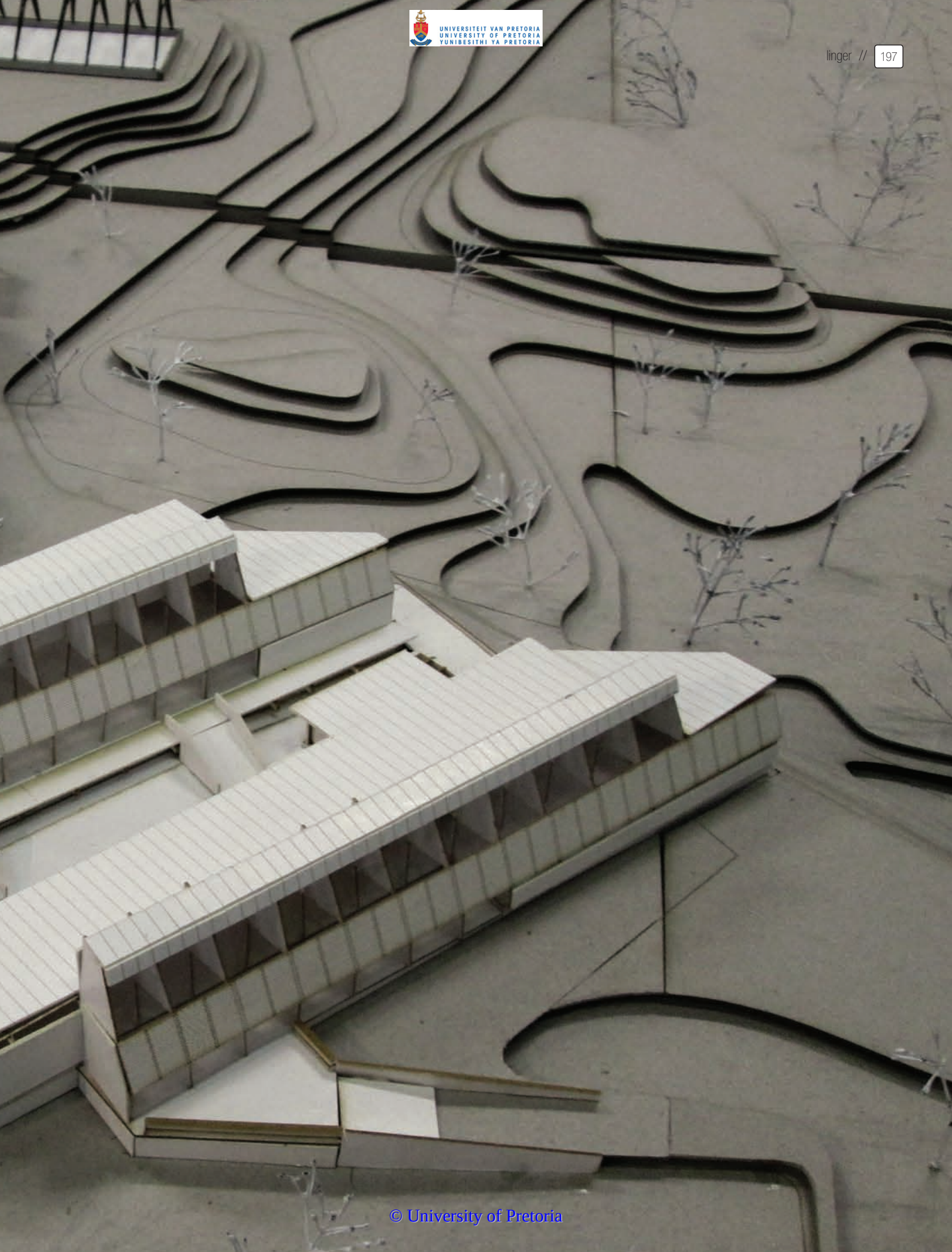


Figure 8.9: Final model



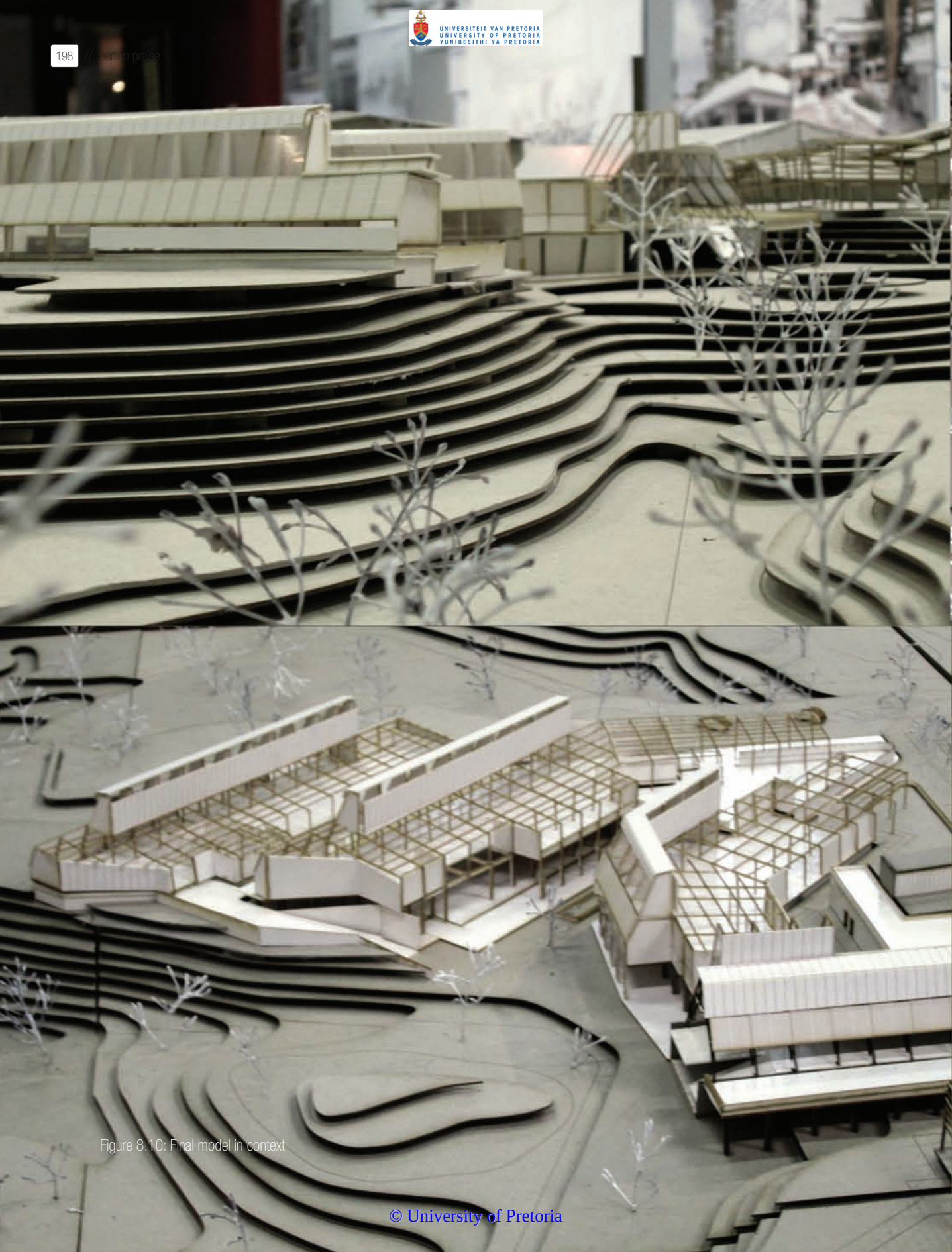
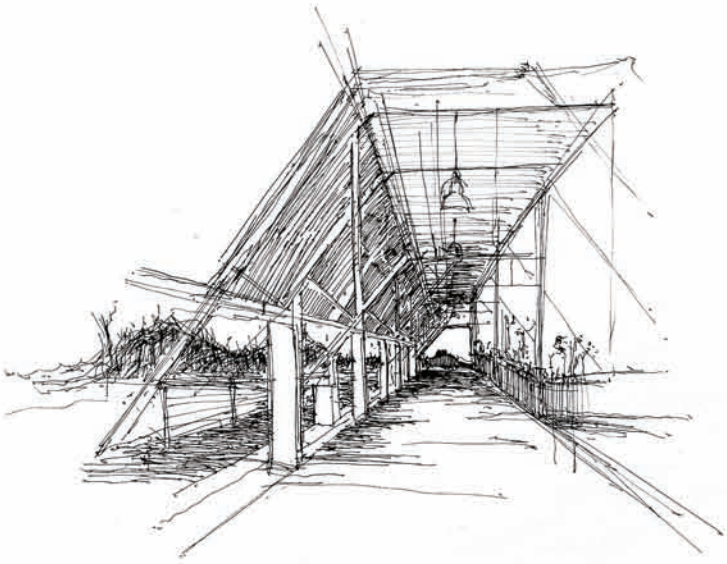
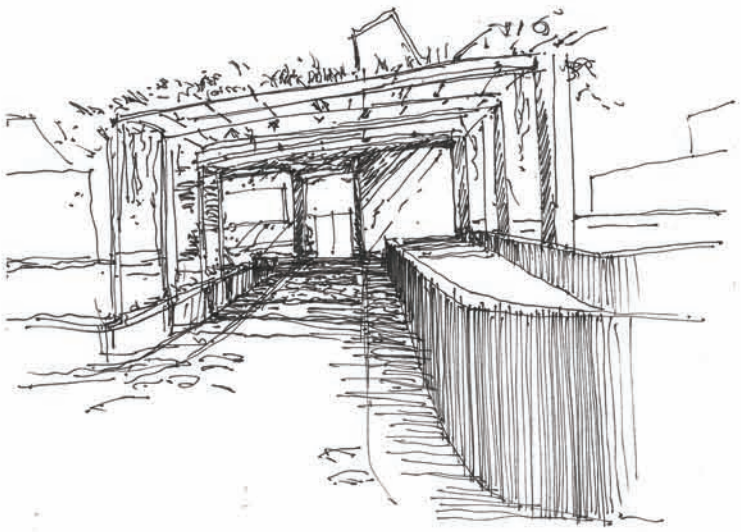


Figure 8.10: Final model in context

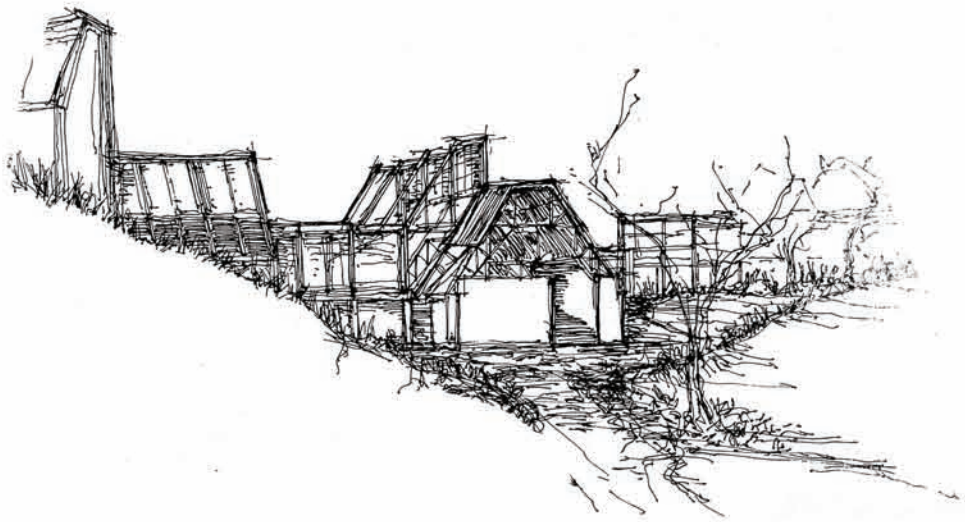


openings // enclosures

anchorage // framing



processions



totalities

Figure 8.11: Conclusive vignettes

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The premise for the dissertation was set in the notion of attempting to unfold and understand the abandoned post-industrial context. The title of the dissertation was inspired by Trap Them's musical album Seizures in Barren Praise, which segments and narrates the stories of a fictional ghost town.

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8.3 list of figures

1 overture

2 paydirt

3 flowermouth

4 transitions

5 incisions

6 ritual

7 makings

8 linger

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 been previously submitted by me for a degree at this or any other tertiary institution.
No part of my thesis has already been, or is being currently submitted for any such degree, diploma or qualification.
I 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.

Carlheinz von Geyso
November 2013