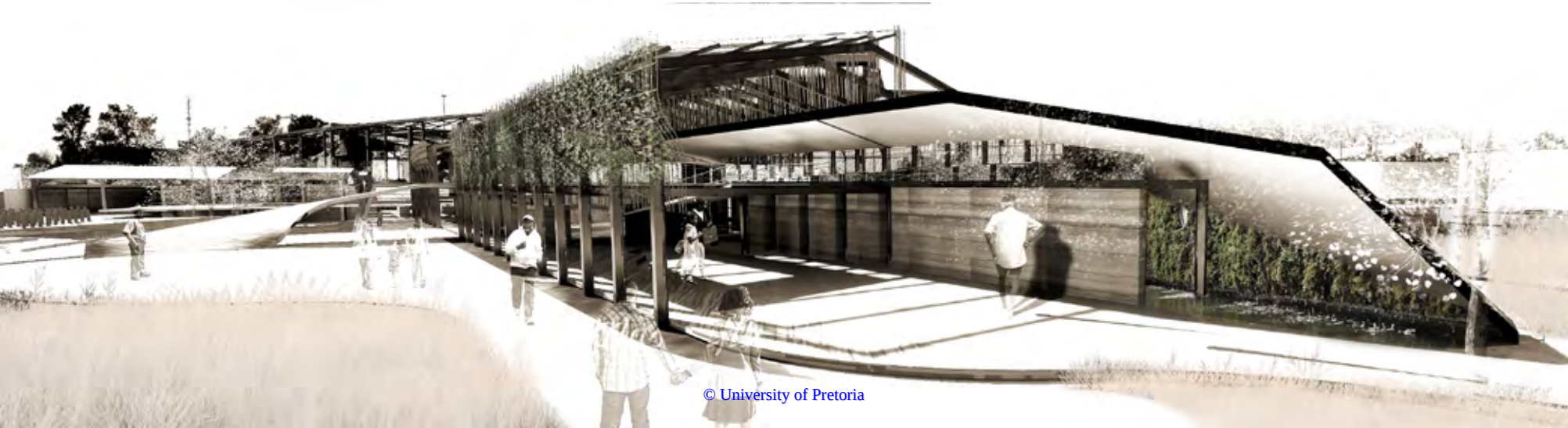
[re]claim

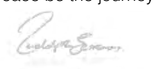
2012

reconciliation of urban place & indigenous meaningfulness
reintegration with ecological systems
reclaiming infrastructure for a new typology



to my closest friends; my dearest family
& our generation
may our companionship grow stronger,
may our efforts be world renowned
& may our contributions be astounding

peace be the journey



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plagiarism report

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

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

I further declare that this dissertation 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.

Signature
Rudolph Erasmus

submittance

Submitted in partial fulfilment of the requirements for the degree Magister In Architecture (Professional)

Department of Architecture, Landscape Architecture and Interior Architecture. Faculty of Engineering,
The Built Environment and Information Technology. University of Pretoria, South Africa.
November 2012

Research Field:
Environmental Potential and Heritage and Cultural Landscapes

Intervention Type
Master planning at regional urban and site scale, proposing community orientated integration into dilapidated industrial areas, aiming to restore connections

Physical Address:
Edge of Babelegi Industrial area and Apies River proposed conservation area
Hammanskraal, Tshwane, Gauteng, South Africa

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about the author

Rudolph Erasmus grew up in Gauteng, South Africa. His passion has always been adventure; travelling and being one with the natural environment, which he believes is the connecting force between all humanity. From a young age, he wanted to become a person responsible for creating a better system of living and continued his academic studies in the field of architecture at the University of Pretoria, South Africa and concluded his BSc(Arch) in 2009 and his Hons(Arch) in 2011.

Work experience in various firms in Johannesburg and Pretoria, and travelling to various destinations has had a major influence on the authors thinking. Specifically regarding the approach towards shortcoming as well as potential in the field of architecture in South Africa and neighbouring African cities.

The author is passionate about architecture; spatial manipulation & creation, aiming in aiding the collective; the environment and the joint unavoidable venture between these two forces.

preface

The methodologies of Modernism and Industrialization and the rigorous application thereof, in isolation, led to a condition where space and place is fragmented, segregated and disconnected by lost, decayed and left over space. It separated the spatial and experiential whole from the human user who inhabits; depends on and experience the space, and failed to contribute to a meaningful livable public realm. The loss in character; uniqueness and indigenous meaningfulness have led to a condition where humans are alienated from their original invention for community: the city.

The inter-relational connection between ecological-; anthropological- and technological systems are disconnected resulting in a condition where resource consumption and availability are no longer in relational proportion to one another and where revolutionary intervention is needed to ensure the continuation of the current living standard and requirements of humanity without degrading the quality for future generations.

This dissertation focuses on the reintegration of anthropological; ecological and technological systems into a holistic, co-habitational intervention on urban; building and detail scale and the establishment of a human and nature centric spatially orientated framework. Attempting to reconsolidate lost; fragmented; left over; mechanistic & decayed space and structure along the ecological corridor of Hammanskraal Industrial zone.

01

approach

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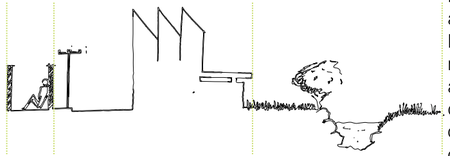

Figure 01 | 1. fragmented condition

Decayed; derelict lost and fragmented spaces and structures are present in the 21st century landscapes. Humanities relationship with nature and space have become segregated and disconnected and the focus shifted to creating environments, not for the needs of its inhabitants but, for the inventions of the industrial revolution and modernist applications.

An approach is necessary to reconnect these fragmented landscapes, attempting to create urban-ecological wholes deeply integrated with the human inhabitant.

To restore the architectural and spatial connection between:
dilapidated infrastructure; nature; and man.
The static, the growing and the living.

Shifting from
the decayed, to the catalysed and finally the restored.

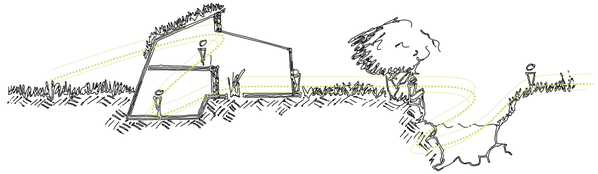

Figure 01 | 2. restored condition

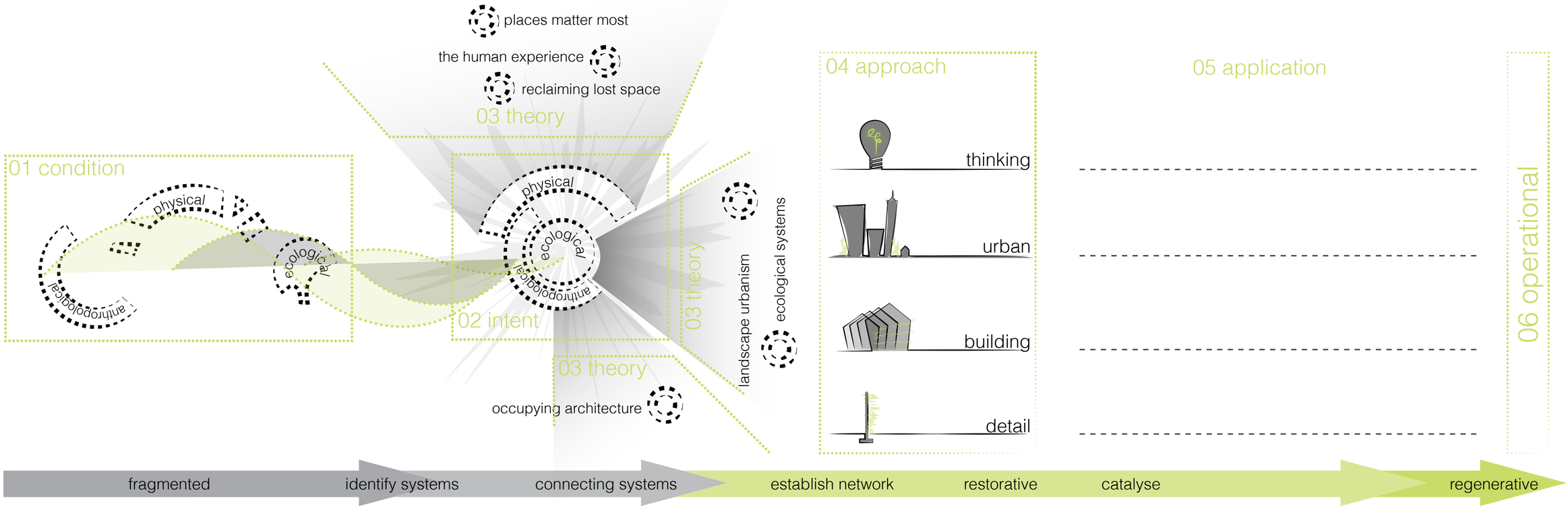

Figure 01 | 3. From theory to application

the inherited condition

It is evident that the urban condition, inherited from a previous generation of form and space creation professionals and that stems from advancements in technology; mass-production and the invention of the automobile, has been the principle methodology and form generating approach which produced and shaped the majority of contemporary Western and American cities

Today, cities and landscapes are dominated by a mechanistic and auto-centric[01] spatial organization, that inevitably destroys the *genius loci*[02] of the authentic landscape and instead produces a *tabula rasa*[03] on which a collection of habitable, serviced forms is linked through auto-centric and service connections, aiming to arrive at ultimate functionality; efficiency and profit. As Le Corbusier states: “A machine for living”
(Le Corbusier, 1923: 023)

During the 1950’s & 1960’s many cities around the world underwent change on an unprecedented scale in terms of built development and in terms of massive highway construction. It is now fairly widely recognized that it also produced physical environments that fall a long way short of public aspirations.
(Tibbalds ,2007: 010)

01 After the Second World War, North American built its cities around the automobile in what is termed as auto-centric (SURENDRA HIRANANDANI:2009)
02 the pervading spirit of a place (MERIAN WEBSTER)
03 Tabula Rasa is the Latin for “scraped tablet.” It is used for the clean slate that is supposed to be the mind of the newly born. (MERIAN WEBSTER)

Figure 01 | 4. Street view in Pretoria

“Modernist design lacked in urban character and form, they ruthlessly applied concepts of ***grid****;* ***simplistic hierarchies****;* ***tidiness****;* ***low densities****,* ***zoned separation****, the international style,* ***large scale engineering****, a* ***severance*** *with* ***history and tradition****, high* ***technology construction*** *&* ***mechanization****”*
(Tibbalds, 2007: 009)

The premodern pre-mechanistic spaces and places - both natural and man-made - with unique character and qualities, history and cultural significance are overlaid with uniform networks of transportation and functional channels housing the movement of human-kinds inventions of the 18th century.

These resulted in the grid of blocks to which spatial creation for primary users, human-kind, are limited to and thus segregate the potential of primary spatial connectivity between these predefined spaces of mechanistic auto-centric movement efficiency.

The above mentioned blocks are further sub-divided in a Cartesian[04] manner into smaller individual unrelated unconnected parts called land parcels that have been further reduced by commodification of land (Sternberg:2000), presenting the ever present problem of private and public space within a city that should belong to the people.

The decisions and methodologies practised have accumulated in a condition where the contemporary cities; spaces and architecture have become unhealthy; inhumane, degraded unconnected; unsustainable and fragmented, resulting in islands separated by vast expanses of lost space with the addition of congestion, pollution and various forms of social stresses
(Corner:2006:023)

04 of or relating to René Descartes or his philosophy (MERIAN WEBSTER)

suppressing nature

Figure 01 | 5. Once natural Apies River

Forces, elements, and nature itself have been countered; suppressed and redirected to align them with the supposed needs of what is believed to be the 21st century topography; functionality; connectivity and organization of the city. There seems to be no efficient place for the natural landscape within the urban realm of hard vertical and horizontal surfaces with its strict requirements. This distinction and separation between the elements resulted in a loss of inherent properties within the connections.

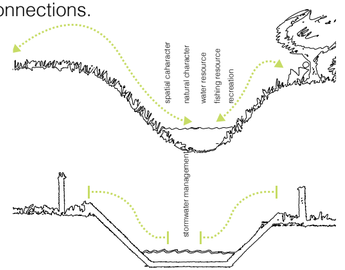

Figure 01 | 6. Apies river transformation

It is this problem that lead to the majority of the cities destructive effects. Humanity and nature was always designed to function in unison with one another, if one argues towards a ‘deep ecology’. Whether it is a result of divine creation or the accumulation of progression and evolution, the entities where always connected and interdependent on one another. It is a relationship that should have never been allowed to deteriorate.

Prior to the standardization of urban environments, this relationship (still evident in select rural non-westernized communities) (BBC HUMAN PLANET:2011) has been a relationship of adaptation and accommodation between the entities. It is a relationship which transcends the individual need and focuses on the collective; the system and the whole.
(“Figure 01 | 5.”)

Figure 01 | 7. The Human Planet-Meghalaya

losing humanity

Figure 01 | 8. Playspace: Andrias Struwig

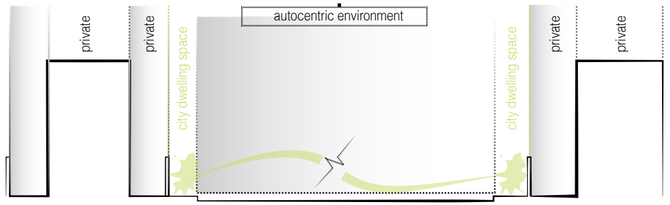

Figure 01 | 9. Illustrated loss of public space

Through the loss of indigenous pre-developed space and place, together with the focus shift towards an industrial and mechanistic world view, the main user of space is neglected. (Carmona:2007:321) ***Scale, materiality, spatiality, and activity-driven inhabitable space is replaced by anthropozemic[01] space in the name of functionality and efficiency.***

The spirit of the city has shifted to self preservation. The space of comfort; safety and interaction has shifted from the exterior towards the defended interior, resulting in a change of the definition of a walled city. It is no longer one city, but rather a collection of individual walled cities. ("Figure 01 | 6.")

01 The machine rules (KIYO IZUMI:1968)

constructing ruins

Figure 01 | 10. Inhumane industrial context

Shifting focus from the urban field, a problem persists on an architectural scale. The modernist application focussed on the creation and development of functional and industrial structures, leaving vast open; lost and fragmented spaces, which is not anthropocentric in intent, but also iconic individual isolated objects.

This object orientated application was not limited to buildings of importance, instead, it was ruthlessly applied to all scales and categories of design. These structures that have *now* become obsolete, are enduring within the landscape, contributing to the lost space and fragmentation of the larger whole. ("Figure 01 | 10.") They have become part of: *"the* ***oceans between the islands*** *within the city"*

The problems left behind are evident as a point in time have been reached where a dramatic shift is necessary in not only the way the world is perceived, but also how humanity functions within its systems.

global precedent

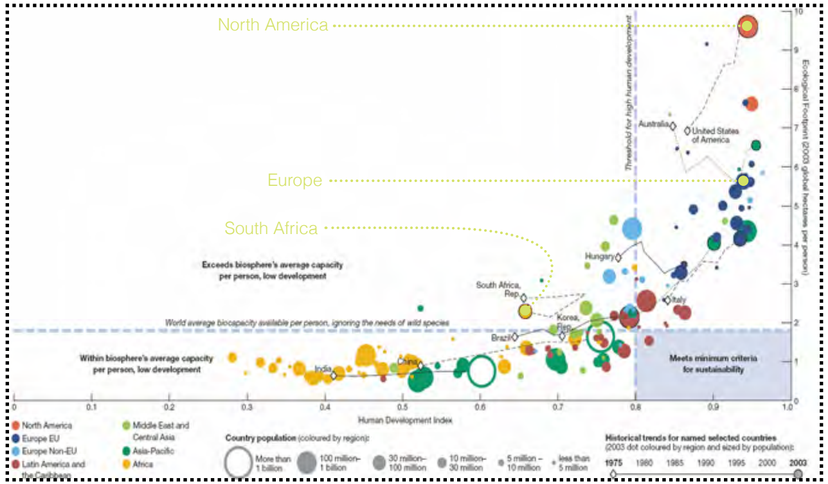

Figure 01 | 11. Human development and ecological footprints 2003

These objects created, with its resultant expanses of lost and unconnected spaces in-between consisting of highways; no access signage and barbed wired walls, unrelated to the natural environment and system result in our fragmented condition.
Western; Eastern and American cities are examples of first world countries where the effects are evident. The consumption and footprints of these cities as illustrated in ("Figure 01 | 9.").

It expresses the inefficiency and effects of the interventions and cities constructed to create a better and higher living standard. (WWF:2003)

Not withstanding, a shift is evident in the manner in which planners; leaders and policy-makers think. The effects of the outdated methodology is evident and drastic changes are made constantly. (EcoSummit:2012)

african duplicate

Figure 01 | 12. Lusaka, Zambia

Contributing to this global problematic phenomenon is the adoption of the aforementioned outdated world view and methodology by uninformed and often misled African cities. The effects of which are destructive to the fabric and genius loci of African sociology; organization and economy. ("Figure 01 | 12.")

It extends to the rural and underdeveloped outskirts of cities and are implemented by governments, promising better lives and standards of living. This phenomenon is evident in South African context of community establishment; reconstruction & development programmes and the inconclusive economic sustainability as well as quality of living & community interaction it holds.

This perception and implementation of planning and architecture within an African context results in spaces that cater for primarily a privately owned auto-centric orientated market as opposed to spatial creation suited to the general inhabitants of the African city.

addressing research

problem statement

Lost and residual space - resultant of a mechanistic world view and the application thereof - fragments and segregates our environment into islands, separated by unusable and lost space. (trancik:2007:064) Character, history, culture; metaphysical space and indigenous meaningfulness is lost and replaced by a *tabula rasa* (tibbalds:2007:010) in attempting to create pure environments for the pure community which does not exist. (Hill:1998:036) Instead it creates place that is not real and has no meaning.

Nature is excluded from the system of life presented by the Cartesian world view still used today, and has been neglected to the point where not only our environments are in danger, but our communities and cities as well.

The author believes that collaboration and intervention is needed to restore and rehabilitate our condition to its original, inter-relational and systemic design

hypothesis

It is possible to create more meaningful; real and responsive architecture and urban place through:

- shifting perception towards a more systemic multi- disciplinary and interrelated environment we inhabit

- the collaboration of humanity and technology within the ecological system.

- the restoration of place to its inherent meaningfulness through placing emphasis on the user and natural experience as opposed to mechanistic isolation.

research question

part 1 l thinking
How can character and indigenous meaningfulness be conserved; integrated into ecological systems and applied within contemporary society?

part 2 l urban
Is it possible to create eco-centric environments within an established industrial urban environment, which will have a catalytic spatial restorative affect on its condition?

Through systemic thinking and application, can spaces be transformed to healthy contributing entities within the larger connection of relationships, both natural and man-made?

Is it possible that through the collaboration of architecture and urban design with other fields in restoration and conservation, a new methodology be implemented, which is able to restore todays dilapidated urban condition?

part 3 l building & detail
How can structure and space (deemed lost & unresponsive) be restored or catalysed to be reclaimed by nature and integrated naturally into the ecological system?

How can humans occupy and interact accordingly with the grown skin attached to the artificial structure?

The issues that arise which are **addressed directly through architectural and urban design application** are most closely related to the approach proposed. These issues can be divided into two categories, the tangible and the intangible

intangible

The status quo of our current world view as opposed to the restorative eco-centric world view and creating user awareness thereof within architectural application and the physical expression of the relationships

Uninformed approaches & decision-making resulting in lost albeit important qualities and heritage being lost. Restoring and conserving of the aforementioned through research; community interaction and responsible architectural application.

The tried and tested methodologies and the staling growth of mainstream South African development. The author challenges the notion of what is economic and sustainable and proposes an alternative typology and methodology.

tangible

Lost; degraded and decommissioned spaces, places, nodes and connections to be reconnected and integrated through eco-centric spatial creation.

Fragmented landscapes, spaces, places, nodes and connections and the restoration thereof through stitching of spaces by eco-centric environments.

Auto-centric orientated landscapes as opposed to eco-centric landscapes replaced or altered to shift focus of the space into the realm of the human inhabitant.

Segregation of nature and man-made landscape elements and influences to be restored through physical expression within the architectural intervention.

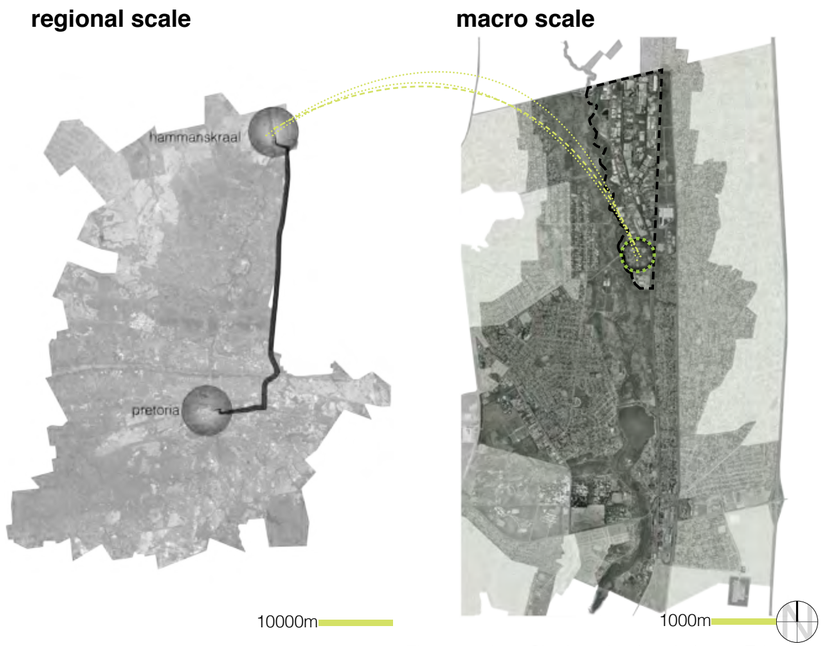

Figure 01 | 13. Site location in relation to Tshwane

The study area focuses on the urban condition of developing communities that are growing into larger cities. It focuses on areas that have a major influence on the adjacent and interrelated environment and have potential to be a contributing and restorative factor.

This dissertation is concerned with the region of Hammanskraal, 40km North north-east of Pretoria CBD, situated in the region of Tshwane, Gauteng.

02

theoretical approach

collaboration of theories 001

literature review 003

theoretical stance 017
thinking scale 019
urban scale 021
building scale 025
detail scale 029

collaboration of theories
methodology

The approaches represented are the culmination of theories researched and are subdivided into three categories:
- anthropological
- ecological
- physical

These theories include the works of:
- Fritjof Capra
- James Corner
- Charles Waldheim
- Jonhathan Hill
- Roger Trancik
- Francis Tibbalds
- Ernest Sternberg

eco-systemic thinking; landscape urbanism; occupying architecture; integrative urban theory

The theories serve as the foundation on which the theoretical approach is formulated, aiming to reconnect and restore the fragmented condition into a holistic condition, inclusive of anthropological; ecological and physical factors.

The approach is divided into 4 categories of different scales:
- Thinking scale
- Urban Scale
- Building Scale
- Detail Scale

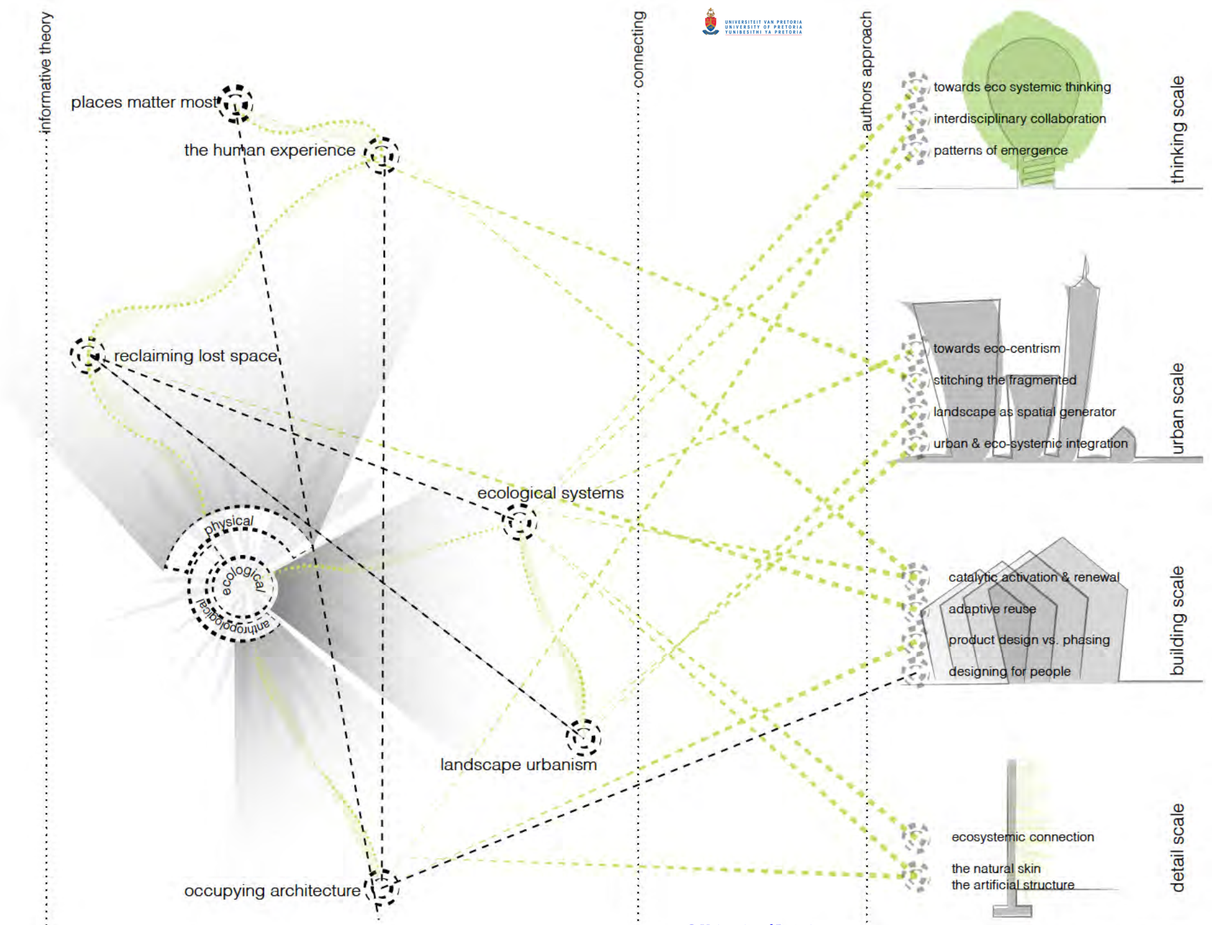

Figure 02 | 1. Theoretical application diagram

collaboration

It is evident from the theories investigated that there is no single correct approach towards the urban design field, instead, as argued by the author, a collaboration of the various approaches is needed to arrive at a responsive methodology and body of precedents to be able to manipulate the urban environment to be responsive to the human experience within an ecologically healthy and functioning environment.

literature review

The following segment reviews the theories that influenced the theoretical approach proposed by the author.

mechanistic world view

Decartes, architect of the mechanistic world view, created the method of analytic thinking, consisting of breaking complex phenomena into pieces to understand the behaviour of the whole from the properties of the parts (CAPRA:1996:019) The statement instigated the first break from the church world view as it implies that through understanding the isolated parts, one can verify the whole without the need to acknowledge deities or unseen relationships as having an influence in our world. His view of nature is based on the fundamental division between two independent realms- that of mind and that of matter. (CAPRA:1996:019)

from parts to the whole

Capra suggests that humanity needs a new world view, that one cannot limit the understanding of the whole to merely the parts. “You can fix a fragment of a piece, but it will deteriorate, because what it is connected to has been ignored” (MINDWALK:1990)

“The behaviour of a living organism as an integrated whole cannot be understood from the study of its parts alone. The whole is more than the sum of its parts. (CAPRA:1996:025)

properties lie in the connections, not the parts, we need to shift our perception

the crisis of perception

“The problem is the way in which we look and understand the world. We need to change our perception.”(CAPRA1995) Humanity is addressing the issues as they arise and is the cause of our current condition. All the systems and thinking methodology is focussed on intervention and not on prevention, fixing the part as opposed to the system.

“from Cartesian thinking towards ecological thinking”

change the way in which life is perceived

ecological systems thinking

Ecological and systems thinking is the new way of looking at the world, assisting in overcoming this crises of perception. Systems, as defined by Lawrence Henderson has come to mean an integrated whole whose essential properties arise from the relationships between its parts, and systems thinking: the understanding of a phenomenon within the context of a larger whole.” (CAPRA:1996:027) There came a reversal of roles defined by Cartesian thinking. The properties of the parts can only be understood from the organization of the whole (CAPRA:1996:029)

“Living systems are integrated wholes whose properties cannot be reduced to those of smaller parts. Their essential and systemic properties are part of the whole and systemic properties are destroyed when a system is dissected into isolated elements.” (CAPRA:1996:036)

The Cartesian paradigm believed scientific observations to be objective. The new paradigm implies that epistemology (the theory of knowledge with regards to its methods, validity and scope. It is the investigation of what distinguishes justified belief from opinion{oxford dictionary}) has to be included explicitly in the description of natural phenomena (CAPRA:1996:039)

it is this thinking that leads to understanding pattern organization and how life manifests

patterns

The idea of a pattern of organization - a configuration of relationships characteristic of a particular system - became the focus of systems thinkers in cybernetics and has become a crucial concept ever since.

“The understanding of life begins with the understanding of patterns”

Fritjof Capra

Patterns cannot be measured or weighed, they can only be understood through mapping. The mapping of a configuration of relationships. Systemic properties are properties of patterns. (CAPRA:1996:081)

conclusion

The process of thinking has been greatly affected by systemic thinking, aiming to arrive at a theoretical approach which is more responsive to the current condition and future development, in collective professional fields. The progression from parts to the whole to relationships to patterns and finally to self-organization affect the manner in which humanity approaches endeavours and ultimately how they are re-integrated into the natural system of which humanity is a part of.

“Whenever we look at life we look at networks”

Fritjof Capra

The theoretical approach of Capra informed the formulation of the authors stance:

shift from auto-centrism towards eco-centrism

urban and ecosystemic integration

ecological awareness

Corner credits the rise of environmentalism and global ecological awareness for the reemergence of landscape in the larger cultural context (CORNER: 2006:023); however, in contemporary school of though regarding landscape, the paradigm has shifted from the original shallow view (as Corner states: “a bourgeois aesthetic or naturalized veil to urban form”) towards acknowledging its potential capacity to theorize sites, territories, ecosystems, networks, infrastructures and to organize large urban fields.

What is problematic though is that even though the accomplishments in environmental restoration is impressive, the exclusion of urban form and process from any ecological analysis remains uncommon (CORNER: 2006:027).

The theory emphasizes that future urbanism should be less focused on form, instead, Corner sketches four themes as a schematic outline for such a practice: process of how things work over time; staging of surfaces; operational methods and the imaginary.

understanding the potential of ecological systems influence the way in which urbanism is approached

towards a new urbanism

The first instance suggests shifting attention away from the object qualities of space to the systems that condition the distribution and density of urban form (CORNER: 2006:029).
“The designation terra firma gives way in favour of the shifting processes coursing through and across the urban field: terra fluxus.”
(CORNER: 2006:030)

The second instance concerns itself with horizontal surfaces “field of action” and suggests continuity; aligning with Rem Koolhaas’s notion that urbanism is directed toward the “irrigation of territories with potential” (architecture consumes the sites potential, whereas urban infrastructure sows the seeds of future possibilities, thus landscape urbanism becomes the instigator and accelerator.

The third instance suggests a reconsideration of traditional conceptual, representational and operative techniques.

The final instance: the imaginary: “the collective imagination, informed and stimulated by experiences of the material world must continue to be the primary motivation of creative endeavour.”

new urbanism ... reliant on the disciplinary realignment leading to a shift in the perception of the building blocks of how cities are built

“the union of landscape with urbanism promises new relational and systemic workings across territories, acknowledging a level of material physicality of intimacy and difference, that is always nested deep within the larger matrix {CORNER: 2006:033}

disciplinary realignment

Charles Waldheim is of opinion that landscape urbanism can be read as a disciplinary realignment in which landscape supplant architecture’s historical role as the basic building blocks for urban design, as it failed to produce a meaningful and livable public realm (WALDHEIM: 2006:037).

Rather, landscape urbanism suggests the use of infrastructural systems and public landscapes, shaping and shifting the organization of urban settlement.
(WALDHEIM: 2006:039)

conclusion

The landscape becomes the framework for urban transformation,suggesting focus on the imaginative reordering of relationships between ecology and infrastructure, de emphasizing the middle scale of bourgeois decorative work and reproduction of typical pastoral imagery of “nature” without intervening in their ecological surroundings in any significant way, instead favouring the large scale infrastructural diagram and the small scale material condition (WALDHEIM: 2006:045)

fragmentation

“The dominant tendency fragments space and cuts it up into pieces. Specialisations divide space among them and act upon its truncated parts, setting up mental barriers and practico-social frontiers. Thus architects are assigned architectural space as their (private) property, economists come into possession of economic space; geographers get their own ‘place in the sun’, and so on”{Hill:1998:002}

user-object

A more appropriate definition towards architecture, is that architecture is more than just a building. Primarily, it is a particular relation between the subjects and the object, in which the former occupies and experiences the latter. (HILL:1998:004) This is not only true for architecture, but for space; text; art or any other phenomenon that displays or refers to the subject-object relations particular to architecture. (HILL:1998:004)

Architecture is experienced in a state of distraction but not a state of unawareness. The aims of the theory present a detailed investigation of the relations between the architect and the user, between design and experience.

user-architect

The utopian problem of both 1980’s community architecture and modernist architectural practice results in a will to create pure forms for pure conditions (HILL:1998:036) This however is clear that it is not the case, the reality of the human condition is not pure and cannot be controlled from a third perspective. It is this characteristic of reality that needs to be embraced. Not only creating for purity, but experiencing impurity to better understand the user

Architects are possessors of both specialised knowledge and conditioned, evolving, understanding as they move between the roles of expert and user. Hill describes the role of architects as “angels with dirty faces”

It is this definition of the architect that emphasizes the architects role in creation of meaningful place. The architect has the potential to experience the second skin; the character, culture and sociological influences and factors of a place of intervention, and interpret the information gathered through specialized skills and knowledge into place which transcends the idea of mere community requirements into creation of place and space which is truly responsive.

defining lost space

Roger Trancik defines lost space as a result of ill informed, two dimensional space without understanding the human condition and its behavioural patters, which in turn leads to unshaped anti-space.

The text of Roger Trancik aims at designing within the niche of site-specific buildings and urban land-use plan, favouring the spatially connected public environment over the mere master planning of objects in the landscape.

the cause

The condition of lost space is a cause of specific influences, these influences according to Trancik are firstly the automobile; secondly the attitude of architects of the modern movement towards open space, thirdly zoning and land use policies, fourthly the unwillingness to assume responsibility for the public environment and lastly, the abandonment of industrial, military and transportation sites. (CARMONA:2007:064) In addressing the issue, architects and professionals should create master schemes with the notion that they become generators of context and buildings that define exterior space as opposed to displacing it. (CARMONA:2007:068) Attention should be directed towards periphery space that is lost on the edges.

the aim

The aim is to create a design environment where individual structures are integrated with exterior open space, as to avoid segregation and separation, by zoning and circulatory systems

"...no building stands alone and architectural solutions, however brilliant, cannot overcome the limitations of the urban fabric in which they are placed."
(ROGER TRANCIK)

Lost space is the leftover unstructured landscape at the base of high-rise towers or the unused sunken plaza away from the flow of pedestrian activity in the city. Lost spaces are the surface parking lots that ring the urban core of almost all American cities and sever the connection between the commercial centre and residential areas. They are the no-man's-lands along the edges of freeways that nobody cares about maintaining, much less using.

Lost spaces are also the abandoned waterfronts, train yards, vacated military sites, and industrial complexes that have moved out to the suburbs for easier access and perhaps lower taxes. They are the vacant blight-clearance sites— remnants of the urban-renewal days—that were, for a multitude of reasons, never redeveloped. They are the residual areas between districts and loosely composed commercial strips that emerge without any- one realizing it. Lost spaces are deteriorated parks and marginal public-housing projects that have to be rebuilt because they do not serve their intended purpose.

Generally speaking, lost spaces are the undesirable urban areas that are in need of redesign— anti-spaces, making no positive contribution to the surroundings or users. They are ill-defined, without measurable boundaries, and fail to connect elements in a coherent way." ROGER TRANCIK

places matter most I f.tibbalds

Places as opposed to individual objectified buildings and auto-centric connections are of more importance to creating a coherent whole. The contemporary architect cannot seem to distance themselves from their ego through creating humble and coherent space, instead, interventions are created as entities unconnected to the larger whole fragmented by highways and residual lost space.

“we must concentrate on attractive, intricate places related to the scale of people, walking, not driving. We must exploit individuality, uniqueness and the differences between places.”

(TIBBALDS:2007)

Terry Farrell critiques the methodology of modernism on urban scale, stating that objects where fragmented from neighbouring objects through vast expanses of residual land Modernist design lacked in urban character and form, they ruthlessly applied concepts of grid; simplistic hierarchies; tidiness; low densities, zoned separation, the international style, large scale engineering, a severance with history and tradition, high technology construction and mechanization (TIBBALDS:2007:009)

In attempting to remedy this situation, a strong rejection of this philosophical approach is emerging.

the spirit of urbanism

The spirit of urbanism that characterized well-loved traditional towns and cities are re-emerging, placing the focus once more on creating places respective of scale and human activity and experience. “The aim is to create urban areas with unique identities, rooted in a regional and historical context. (TIBBALDS:2007:009)

Theoretically, the approach is to be responsive and have a positive relationship with its existing morphology, as opposed to creating a clean slate on which to construct. Furthermore, spaces, places and fabric should be tightly knit, ensuring and focussing on public space, that it be designed and intended rather than being the result of filling in left over bits.

Challenging the tabula rasa and the constructing-for-the-pure-communities methodologies of the modernists, the new urbanist approach argues that places should be real. It should acknowledge the wider community of inhabitants, users and passers by who have a contributing factor to the spaces they experience.

It is therefor necessary that spaces, buildings, places and environments, which interrelate with the public realm are resultant of research, submergence of the architect into the condition to understand the second skin and to create place accordingly.

multi- disciplinary collaboration

Tibbalds argues and substantiates the authors view that multi- disciplinary collaboration would produce better, more coherent places, because no one profession has all the answers to the complex task of designing livable cities.

He further argues that public places within a town belong to the people of that town, they do not belong to the developers or investors, nor the police or traffic wardens (TIBBALDS:2007:011)

Places take precedence over buildings and traffic. This will be hard for the individual players to accept – be they architects, engineers or developers – if they maintain their professional separations. The more they learn to collaborate – to try to meet agreed, common objectives for the urban environment – the easier and more productive the process will become. (TIBBALDS:2007:011)

the human experience

Urban design inquires into the human experience that the built environment evokes across private properties and the private realm

The urban designer's task is the shaping of human settlements' physical features at scales larger than a single building or a single plot of land. He or she does so through manipulation of the concrete elements of distance, material, scale, view, vegetation, land area, water features, road alignment, building style, and numerous other items that make up the natural landscape and the built environment. (STERNBERG:2007:034)

challenges

Urban design's definition is best not to be described as large scale intervention, but rather addressing the challenges which transcend individual properties and boundaries and intersects the niche of the public realm. The theory of urban design has numerous challenges:

Firstly, it should not advocate one set of design approaches, but rather reveal the principles that underlie several of them.

Secondly, it should make humanity aware of the constituents of the human experience of built form.

Thirdly it should address the both the economic and architectural streams of planning thought.

Lastly, the theory should direct humanity to the features of reality. (CARMONA:2007:034)

commodification

The current condition however is still problematic, according to Sternberg, it is caused by the commodification of land, which he believes cannot be effectively commodified, because it is incapable of encapsulating the human experience, a phenomenon that cannot be commodified.

The reality of the situation if we relinquish commodification is that we have cross parcel boundaries which are interdependent. It is the organicists who eventually set out to reassert the natural growth and wholeness that a "mechanical" market society would undermine. The reasoning behind the failure of market economics as urban form giver lies in the rational thereof: A property owner's decision to build a building can have effects on neighbours and passers by, effects to which these external parties did not agree in any market transaction. If we give thought to the fact that cities belong to the people, this becomes unreasonable.
Urban design and architecture should focus as its aim to retain the integrity of the urban experience, both of the user as well as the developer, across boundaries, creating a holistic system of networks.

Francis Bacon; Jane Jacobs; Kevin Lynch and Norbert Schulz agree with the above mentioned stance towards urban design and architecture and are of opinion of different methods to achieve the creation of collective benefits. Francis Bacon argues towards: "the movement through space to create continuity of experience and that formal spatial rights transcend formal property rights. Kevin Lynch argues towards legibility, the experiential and sensuous qualities of the city:

"A legible city is one whose constituent parts "are easily identifiable and are easily grouped into an over-all pattern" A distinctive and ordered environment helps the resident orient himself, place parts of the city into coherent categories, and acquire a sense of security that he can relate to the surrounding urban world. Hence, the city should be made "imageable," both in the sense that it projects distinctions and relationships that the observer can comprehend and in the sense that it complies with the observer's "mental picture" of the city"
(KEVIN LYNCH IN THE IMAGE OF THE CITY:1960)

Jane Jacobs argues towards vitality, that busy connection channels (streets and space) be vibrant and energized and that it is this essential quality that is needed to create a healthy city & finally Norbert Schulz argues towards indigenous meaningfulness:

"nature forms a comprehensive totality, a 'place,' which according to local circumstances has a particular identity" As dwellers in a place contend with living forces of nature, the place gives rise to mythologies through which it becomes meaningful.(NORBERT SCHULZ:1979)

Instead of buildings and structures emanating individual imposed ideas of the architect or developer, it should integrate and contribute to the meaningfulness, it should express the indigenous meaningfulness, the spirit of the place that emanates from the whole.

theoretical stance

The following segment expresses the design strategies developed by the author in response to the theoretical influences as well as the problematic conditions

towards ecosystemic thinking

The author agrees with Capra in his statement that it is necessary for humanity to change their perception of the world and how elements and entities function in it.

A shift of perception towards perceiving the interconnected relationship of not only life in a metaphysical manner, but space; systems; people & architecture - which are all physical manifestations of relationships & connections - and applying this methodology of perception and thinking in the respective professional fields, will have the potential to restore segregated connections and insure that future endeavours will be based on a platform of firm understanding of its interrelationship and effects in the larger whole

interdisciplinary collaboration

The creation of landscapes cannot be limited to the profession of architecture, or the profession of landscape architecture, or town and regional planners, or urban designers, instead, it *requires a shift towards an interdisciplinary collaborative practice, incorporating various professional fields, previously disregarded and limited to the natural environment* (ecologists, environmentalists, etc.) as well as community participation in the creation of spaces for healthy communities.

Landscapes that respond to this need is our ultimate goal. A shift towards an eco-centric view of our creation of environments results in the creation of environments, spaces and places that fulfil the internal need of being one with nature, achieving deep and integrated ecology.

patterns of emergence

The patterns inherent in relational connections, those that cannot be observed, but instead mapped are the essence of how life functions. (CAPRA:1996:081)

It is also of importance that patterns emerge spontaneously out of their conditions. It is this quality of patterns that pursues the author to experiment with not aiming to create new interventions as a finalized product, but to activate essential properties in order to kick start catalytic processes of pattern creation and emergence. This statement is believed to applicable for not only physical phenomenon, but also anthropological phenomenon.

mechanistic towards eco-centric

Ultimately, we create space, whether it is cities, neighbourhood, parks, workplaces or houses, for the needs, benefits and experiences of humanity. Humans are part of nature and therefor the internal need for spaces and for landscapes that respond to this need is our ultimate goal

Therefor, a shift is proposed: from a point-to-point connection of spaces (related to that of an auto-centric; mechanistic application) towards an un-fragmented continuous *"space-as- connection"* experiential approach, accumulating in a complex system of natural, human and efficient/functional systems.

A shift towards an eco-centric view of our creation of environments results in the creation of environments, spaces and places that fulfils the internal need of being one with nature, achieving deep and integrated ecology.

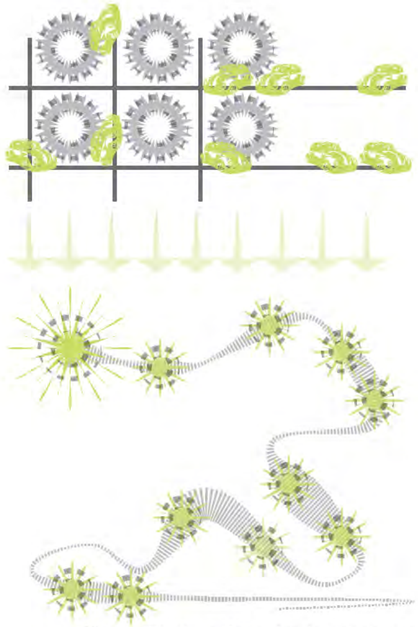

Figure 02 | 2. autocentric to ecocentric

stitching the fragmented

The modernist methodology is evident, where transportation and movement is mainly a point-to-point method of displacement. These anti-spaces have been reduced to functional channels, nullifying the human or natural experiences of the spaces, in essential, creating voids in the landscape; furthermore, fragmenting and cutting the landscape into disconnected destination islands.

The approach in ***stitching the fragmented urban landscape*** *is essential in creating an inter-connected landscape and can be accomplished through* ***identification of the void spaces*** *and* ***activating its inherent potential.***

These anti-spaces main functionality should be challenged in terms of the definition of a healthy landscape. In architectural intervention, this implies that the structure proposed is informed by the experiences, activities, cultural-, historical- and societal needs of humans within the landscape as well as being informed by ecological and natural forces and influences, ensuring the discontinuation of object- oriented design and the subsequent creation of voids within the landscape.

Ultimately, the spaces created through landscape urbanism planning aims at ***creating a binding layer of the urban fabric, shifting from the parts to the whole****, towards a more holistic organization of inter-connected space.*

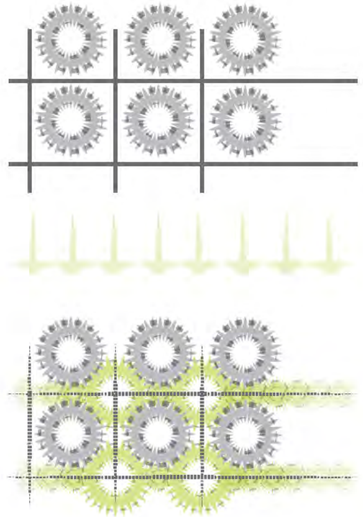

Figure 02 | 3. Stitching the fragmented

landscape as spatial generator

Landscape is the field, urban or natural, in which human experiences are present in. This definition clarifies the cultural-connotation of landscapes, however, it is not healthy as it excludes the role of ecology within the scape. The presence of ecological systems is essential in defining a healthy, productive landscape.

The approach becomes one that focuses on the ***experiences of humans within space*** *and organizing space around the activity of humans and nature.*

Furthermore, ***the authentic pre-developed natural scape becomes the spatial generator*** of developed or undeveloped urban space in the attempt to retain the genius loci of the space, thus preserving and maintaining the unique identity of the spaces of potential development, reintegrating humans and nature, (if viewed eco-centrically) as the primary focus and outcome of design and planning.

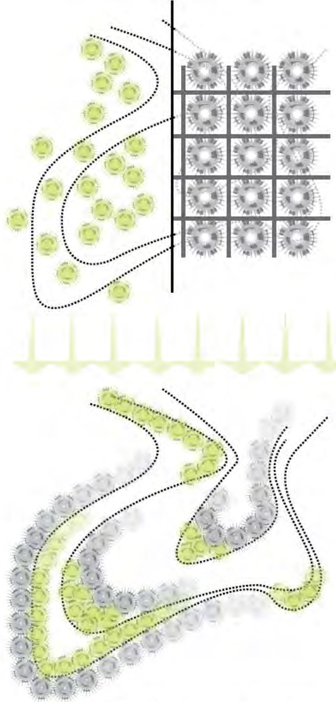

Figure 02 | 4. landscape as spatial generator

urban- & ecosystemic integration

An integral property of restorative urbanism is the healing of the land: In the analysis of spaces that have been decommissioned and discarded as dilapidated or dangerous sites, the force of nature becomes evident in the natural process where nature reclaims lost and uninhabited spaces. *In approaching future development the principle of* ***healing the landscape is of utmost importance****, the healing is not limited to physical qualities of the landscape, urban or natural, but also to anthropological healing of relationships, societal, economical and health conditions.*

This is activated through the implementation and connection of the various, seemingly different, systems of urban efficiency and experience, authentic ecological systems and cultural and societal relationships, ***aiming at creating closed loop systems of efficiency as well as experiences.***

This approach responds to Adriaan Guezes' view of the landscape, not merely being a bourgeois decoration, the ***ecological landscape*** and its systems becomes fundamental in the development of functional and productive space in moving towards a sustainable architecture and urban landscape.

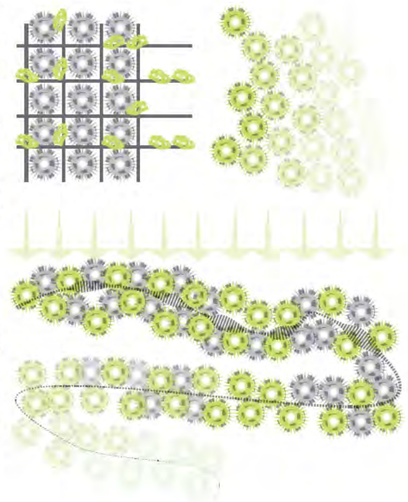

Figure 02 | 5. Ecocentric integration

catalytic activation & renewal

Building on the theory of pattern organization and emergence, the approach implemented towards establishing interventions focuses on the creation of nodes that have a catalytic effect as opposed to construction of entirely new interventions.

Patterns emerge from the creation of key catalytic nodes. These nodes are more capable of defining the larger whole organically and through community intervention than allowing external professionals to impose personalized ideas (however well informed) over the entirety of an environment. The patterns that emerge from a catalytic intervention that grow organically are considered by the author to be more real and personal to the place it occupies and the inhabitants it supports.

The approach suggests activating key properties of a landscape to catalyse the environment into organic growth and development

Figure 02 | 6. Catalytic process

adaptive reuse

Catalytic activation extends to the approach of adaptive reuse in addressing the issues of lost space and structure.

Adaptive reuse aims at activation of derelict; decayed and dilapidated structures; buildings and places through reuse of materials and spaces. *An abundance of lost space and structures are present in our urban environments, that have potential to be restored; conserved; altered; recycled and reused as opposed to construction on untouched healthy sites.*

The aim is to activate the lost and decommissioned spaces and structures that have a demeaning quality on its surroundings to create tightly knit urban spaces inclusive of these once lost structures. It also aims at preventing urban sprawl and growth onto healthy sites through restoration of brown fields and unhealthy sites.

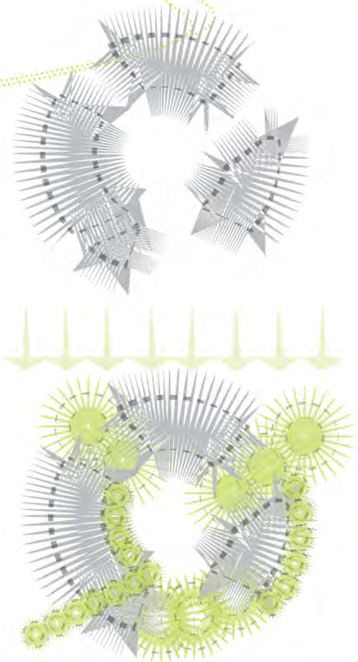

Figure 02 | 7. Adaptive reuse

product design vs. phasing

Product design vs. future phasing is challenging in the contemporary architectural practice view, as clients and developers are ultimately product orientated for economic, profit and feasibility purposes. However, *the landscape should not be seen as a canvas for the creation of static, one-off, works of "art", instead, the landscape is a dynamic system and is influenced continually by various factors.* This is important to consider in following a restorative approach, as it is vision orientated. The landscape ultimately influences and informs the creation of potential development, therefore the creation of these spaces become the catalyst and the connection, the instigator and the activator.

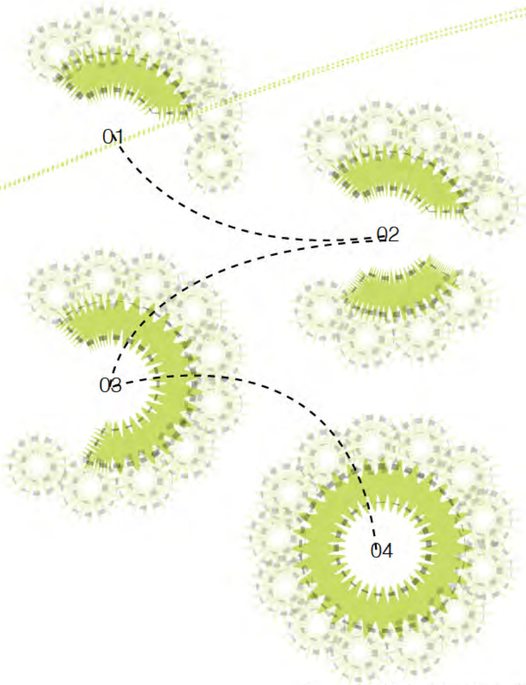

Figure 02 | 8. Phasing diagram

designing for people reintroducing the occupant

In creating space and place, the emphasis should be on reintroducing the occupant and the occupants comfort within the intervention. In aiming to create environments that are more responsive to as well as integrated into the ecosystem, a shift is necessary away from anthropozemic towards anthropomedic space (human-orientated).

However, challenges are evident in the integration of ecological systems into infrastructure and its ability to house and create a suitable habitat for the occupant experiencing the intervention.

Focus is to be placed on the threshold between the user (occupant); nature (the skin) and the infrastructure (the bone) and how they function coherently to create a comfortable; living; efficient whole.

ecosystemic connection

On detail level, the approach seeks the integration of natural materials onto conventional construction methods as well as the integration and establishment of a threshold that is responsive to passively manage the thermal and comfort conditions of the intervention, and be integrated to manage the waste and energy expenditure of the intervention, managed on-site as opposed to being distributed to and from centralized points.

Furthermore, the author is of opinion that the collaboration of ecological elements in the intervention is able to promote healthier living and working conditions.

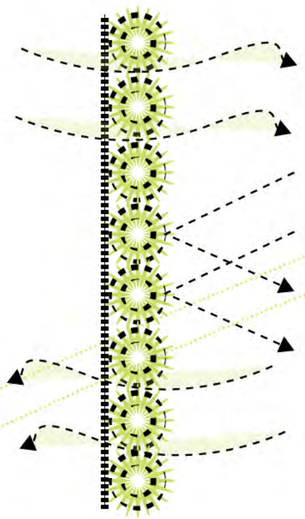

Figure 02 | 9. Ecosystemic integration

the natural skin
the artificial structure

Integration of the natural skin onto the artificial structure and how it responds to and houses the occupant, in collaboration with system integration is the main focus of the intervention on detail scale.

The intervention aims to present the ability of nature to function as an acceptable and responsive living skin in the process of reclaiming old structure as a viable alternative to conventional restoration. Through activation of reclamation points, nature has the ability to reclaim structures fairly quickly. The approach continues in aim to arrive at acceptable programmes that may be housed within these grown skins and how they will be constructed to be responsive of the needs of its occupants.

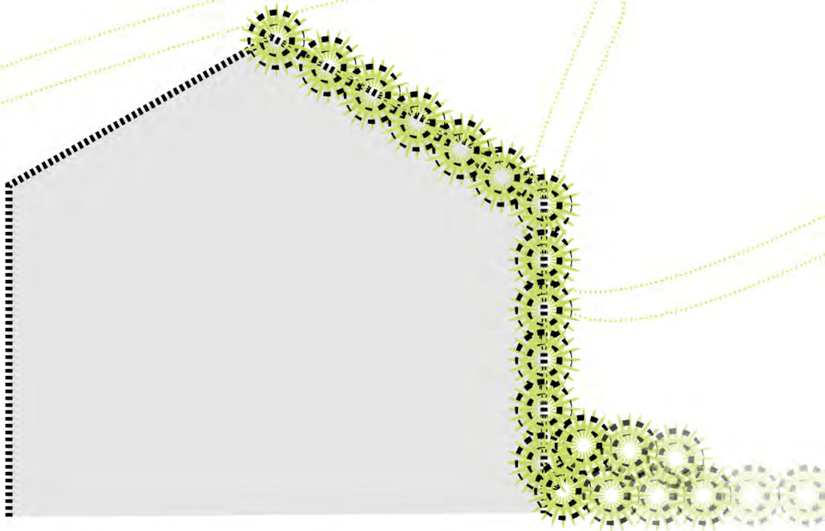

Figure 02 | 10. the natural skin and artificial structure

03

context analysis

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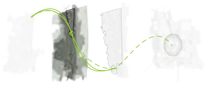


hammanskraal

Hammanskraal was established in 1860, where the first farms were allocated to white farmers, even though it was located in primarily bantu-territory by the Zuid Afrikaanse Republiek. It grew as a white settlement between 1870 and 1890 and in 1920 it was a fully fledged small town with its own police station, train station, general store and an office of the government department of Native Affairs.

In 1942 black people where forcefully moved to the location and Temba was started on the farm called Bezuidenhouds farm. In 1960 Hammanskraal was declared as a homeland for African people, to segregate them from white inhabitants. In 1970 Hammanskraal was declared a self-governing homeland within Bophuthatswa and received its independence from the Republic of South African on 6 December 1977.

In 1994, Hammanskraal was incorporated in the newly formed South Africa, however, it still suffered a number of problems regarding demarcations into the provinces. And in 2001, it was incorporated into Tshwane Metropolitan Municipality.

During the period of the investigation, Hammanskraal is a settlement with a vibrant social structure. The latest survey indicates the population to be approximately 10,000 people (CENSUS2001) However, the unemployment of the settlement is at 43% (CENSUS2011)

quantitative

qualitative

regional scale

macro scale

meso scale

micro scale

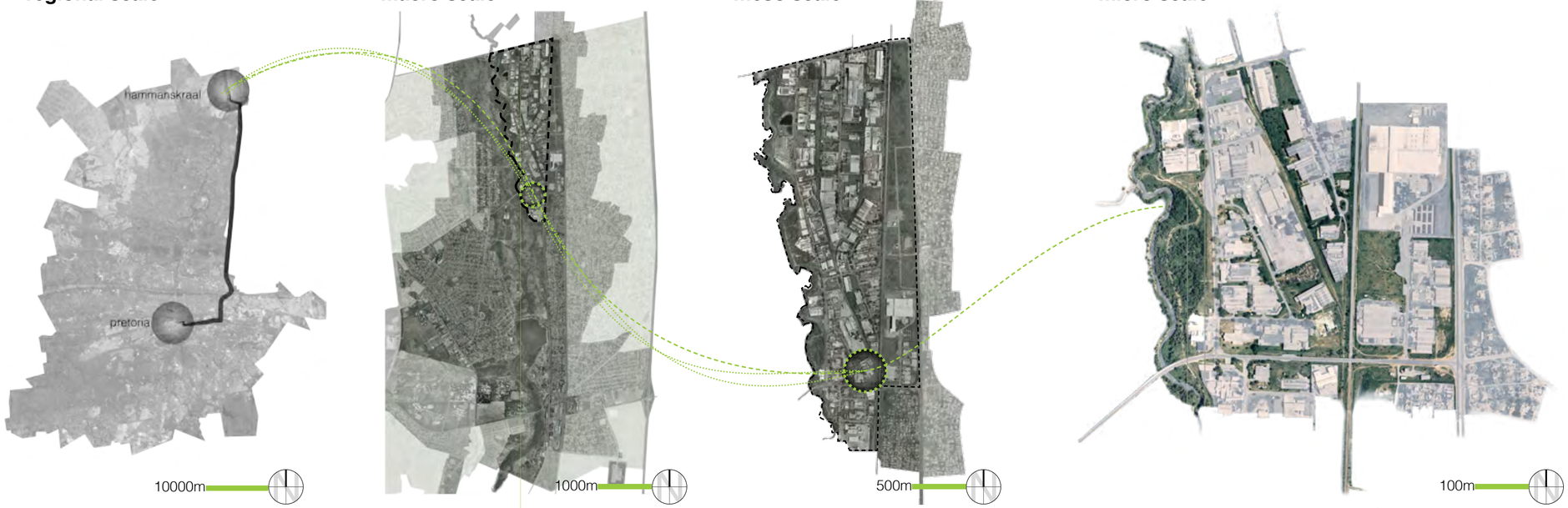


Figure 03 | 1. Context Scale change

The study area focuses on the urban condition of developing communities that are growing into larger cities. It focuses on areas that have a major influence on the adjacent and interrelated environment and have potential to be a contributing and restorative factor.

This dissertation is concerned with the region of ***Hammanskraal***, 40km North north-east of Pretoria Central business district, situated in the region of ***Tshwane, Gauteng***.

The macro and meso scale is investigated quantitatively to familiarize the reader with the context in which the intervention is to be implemented in..

In this chapter, a matrix is implemented to establish which sites are most susceptible for intervention as proposed in chapter 02 & 03. This site is measured qualitatively to ensure that the implementation of the intervention is appropriate to all extents within its context.

time line

Hammanskraal has its roots in the **supplies and cattle trading business of Hamman**, a farmer 'who, while transporting supplies to this area, established a kraal made of thorn tree branches to protect his oxen from lions'. , The kraal became known as Hamman's Kraal throughout farming cycles, hence the present name Hammanskraal.

The first **farms in the area were allcated to the whites**, during 1860, although most of the land has been designated and owned by Africans but embarked as Bantu locations by the Zuid Afrikaanse Republiek.

Between 1870 -90 the **whites settled** in a large portion of the area. which has only been surveyed and transported in the 1890's

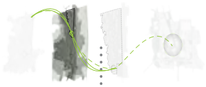
Fully-fledged small town with its own police station, general store, train station and an office of a government department. Native Affairs

The 1903 - 1905 report of the South African native affairs commission calcutates the population of the Hammanskraal area as 27874 in 1904 (Native tribes of Transvaal, 1905:38)

establish kraal

development of land by white settlers

1860 1890 1904 1920



More **people** were **forcefully relocated** to the area

Temba was started on a farm called Bezuidenhoutsfarm when **people** where **forcefully removed** from places such as Lady Selbourne, Orlando and Klipspruit were 'dumped' by trucks on the farm.

Was considered the "only town developed in Tswanaland with 250 housing units

Apartheid government decided to **create 'homelands' for African people** to keep them away from what they called 'White areas'

Hosted a South Africa **Students' Organisation General Student Council meeting** which declared leaders of homelands 'puppets' of the government

The first annual **congress of the Black People's Convention** (BPC) was held here on 16 December 1972

Republic of South Africa declared Bophuthatswa **'self-governing' homeland**.

The **Amandebele**, under the leadership of Chieftainess Kekana, were **forcefully removed from Majaneng** by the Bophuthatswana government.

In June of 1983, the National Forum was held in Hammanskraal. This forum called for the **establishment of a Socialist state.**

In December 1974, a convention called the Black Renaissance Convention, organised by Smangaliso Mkhatshwa and Maurice Ngakane, called for **sanctions on the Republic of South Africa** and declared a **militant approach to the struggle against apartheid.**

Bophuthatswana received its **'independence' from the Republic of South Africa on 6 December 1977**. Mangope's determined to clean his homeland of all non-Setswana speakers

Fall of the homelands, Hammanskraal was **incorporated into the newly formed South Africa** but faced a number of problems regarding its demarcation into the provinces.

The township was **incorporated into the City of Tshwane Metropolitan Municipality**

A **statue of Nelson Mandela** was erected in Hammanskraal and unveiled on 12 June 1999, in honour of "all our heroes black and white, young and old, who sacrificed their lives for democracy".

The Demarcations Board had demarcated Mandela Village as part of Hammanskraal. The Hammanskraal residents dismissed this move arguing that Mandela Village will take the status of their area down.

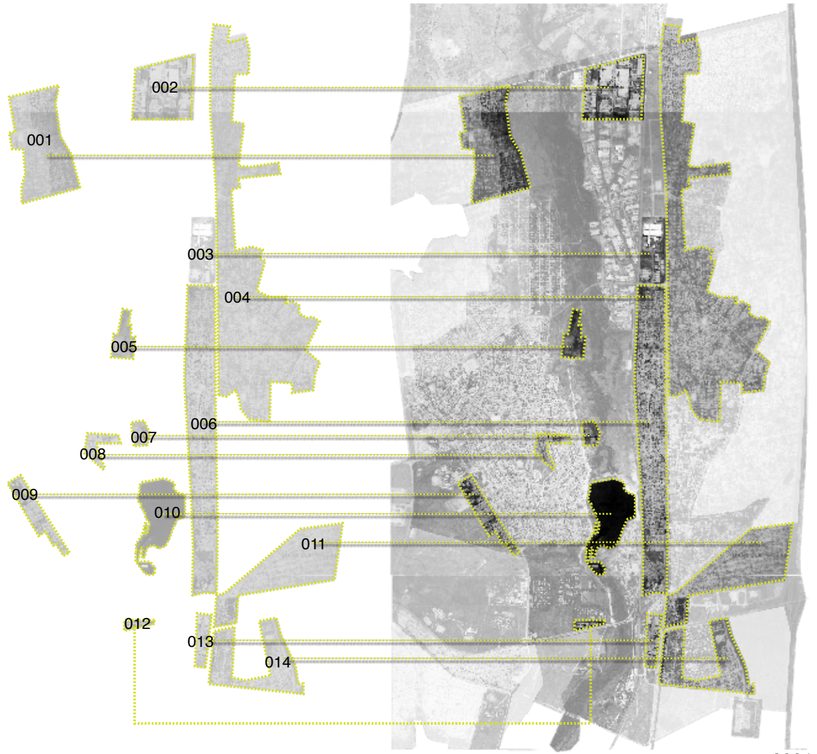
internal conflict resolution

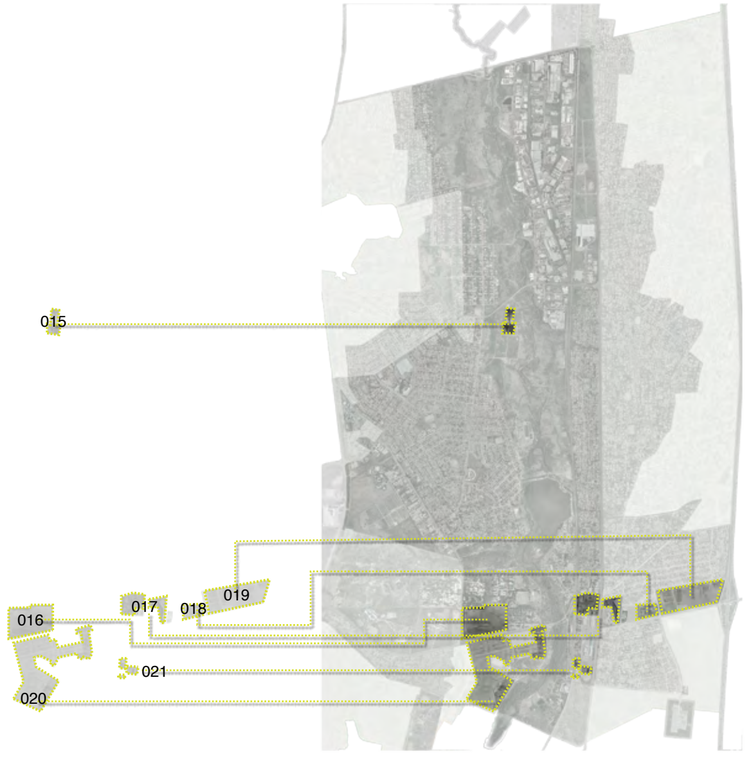
establishment of homelands

struggle against apartheid

steady development

1942 1946 1947 1960 1961 1970 1972 1974 1977 1979 1983 1994 1995 1999 2001 2012





Development 1980-2001

001 Establishment of Majaneng Ward
002 Expansion of Babelegi Industrial park
003 Construction of Nestle Factory
004 Establishment of Marokolong Ward
005 Construction of Water Treatment plant
006 Establishment of Ward Kud-U-09
007 Construction of Water Treatment plant
008 Residential Sprawl of Temba Ward
009 Establishment of Governmental buildings
010 Construction of Leeukraal Dam
011 Establishment of Mandela Village
012 Establishment of Police Academy
013 Commercial centre established
014 Establishment of Hammanskraal Ward

Development 2001-Current

015 Upgrade of Water Treatment Plant
016 Construction of Jubilee Shopping Centre
017 Industrial Commercial Sprawl
018 Establishment of Governmental buildings
019 Establishment of Formal Sport Grounds
020 Establishment of Ward Ged-33-112-JR
021 Industrial Commercial Sprawl

Figure 03 | 2. Historical changes diagram

routes

Figure 03 | 3. Routes

Hammanskraal is situated aproximately 40km North north-east of Pretoria. It is accessible from two main routes. The N1 toll route and the old R101 route to Warmbad.

The internal organization of routes suggest a main transportation corridor with 4 links across the ecological corridor in the middle of Hammanskraal. The routes that protrude into residential areas are a mixture of tarred roads (40%) and gravel roads (60%). There is a lack of pedestrianized corridors and therefor, conditions are harsh when travelling by foot.

The public transport systems are located to the far South of the site as well as the far North, thus it is evident there is a lack of transport in the middle of the settlements.

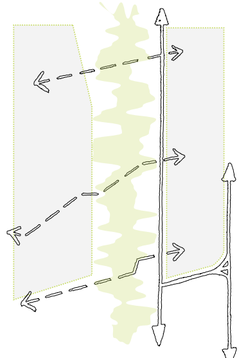


Figure 03 | 4. sketch-route

zoning

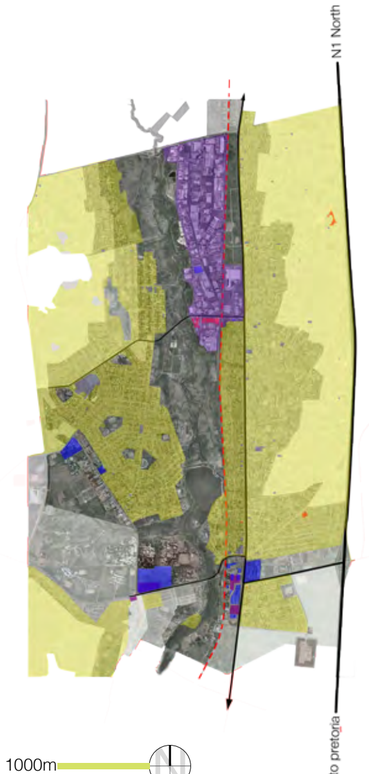


Figure 03 | 5. Zoning

Three zones dominate the majority of spaces in Hammanskraal. Firstly is the mainly residential zones (yellow) that are located on the East and West of the Ecological corridor. Secondly is the commercial areas (blue) located to the South of Hammanskraal and finally the industrial area (orange {eventually] to the North of the site. All these areas are adjacent to the ecological corridor in the middle of Hammanskraal.

There are issues regarding the thresholds between these areas that needs to be addressed, as well as the distribution of commercial areas towards the North of the site.

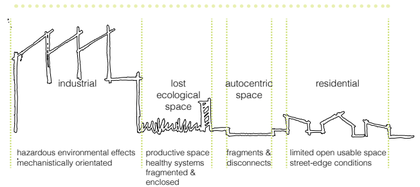


Figure 03 | 6. zoning sketch

cultural diagram

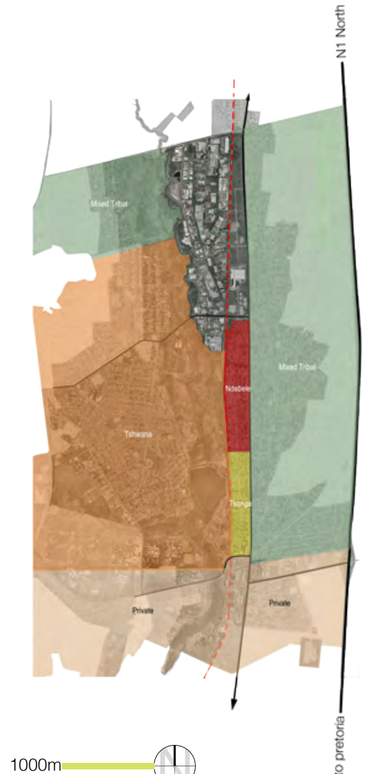


Figure 03 | 7. Cultures

During the internal organization of the settlement between 1942 and 1974, there has been shift in cultural territory. The Tswane speaking inhabitants are located to the West of the ecological corridor and the Ndbele's to the East of the ecological corridor. These areas are defined, however, the expansion of residential areas seem to be integrated and include cross-cultural inhabitants.

Although the settlements are demarcated into territories, it is in no way violent segregation, it is a result of internal organization and since then, integration is evident.

To the South of the site, new areas have established in recent years and are mainly privately owned.

green space diagram

Hammanskraal is constructed adjacent to the Apies river that runs North. Surrounding the Apies River is an ecological green strip that serves as habitat for a variety of indigenous grass species as well as tree species. This green space segregates the two communities, however, it also functions as a resource for the communities, including fishing, grazing, small scale agriculture and recreation.

Figure 03 | 8. Green space and water bodies

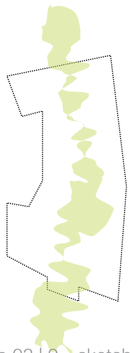


Figure 03 | 9. sketch-greencorridor

ecological quality

Areas of the ecological corridor is damaged, especially adjacent to residential sprawl into the ecological corridor as well as the industrial area. However, the grassland are in a healthy state across the ecological corridor as well as the areas where industrial zones have become dilapidated and have been reclaimed by natural forces. There are a limited number of alien species that inhabit the healthy grasslands.

The health of the terra-ecosystem is in a good state. The aqua-ecosystem however has been classified as a disaster area due to the disfunction of the sewerage water treatment facility to the West of Babelegi industrial area. Intervention is necessary to restore and rehabilitate the quality of water as it progresses through Hammanskraal further North.

Figure 03 | 10. Green space and water bodies

agriculture

Agricultural zones are located outside of the main boundaries of Hammanskraal. It produces mainly corn and wheat.

The ecological corridor that runs through Hammanskraal has not been damaged extensively by agriculture as it is limited to household scale agricultural development.

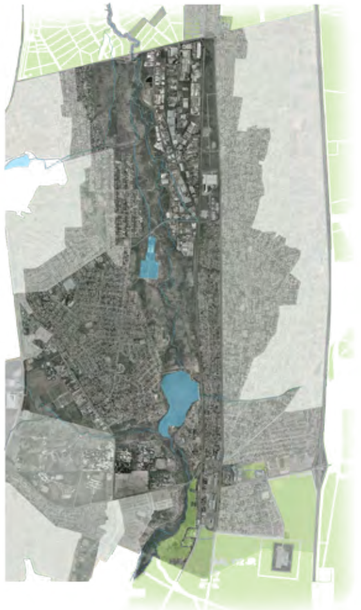


Figure 03 | 11. Agriculture

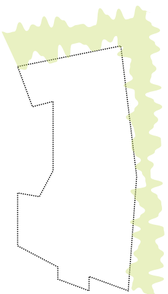
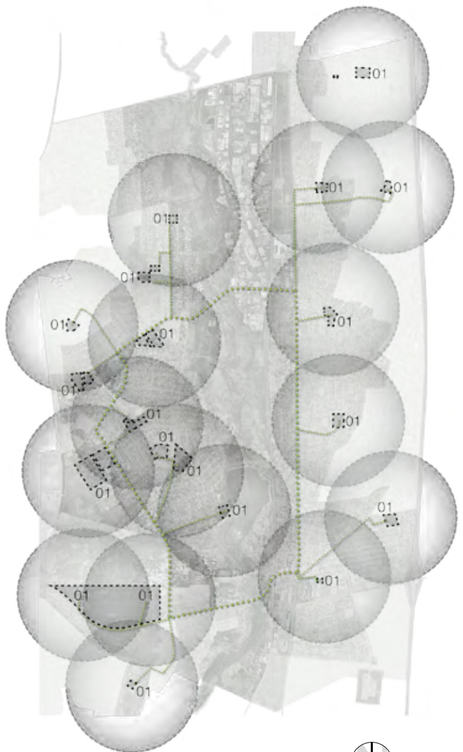


Figure 03 | 12. sketch-agriculture

educational facilities



legend
01 Preschool
02 Primary School
03 Secondary School
04 Tertiary institutions

observations
Hammanskraal has a network of educational facilities, ranging from preschool; primary school; secondary school and community skill building centres. As can be seen in figure.08 the network covers most of the residential catchment areas which are demarcated at 1000m radiuses and these institutions are also easily accessible from the main transportation corridors (green lines)

deductions
Problematic with the 1000m catchment areas are that the corridors linking the institutions are not pedestrianized and present harsh conditions for pedestrian travel.

Furthermore, lacking in the framework are tertiary institutions for advance education

Figure 03 | 13. educational facilities

community facilities

legend
01 government
02 local authority office
03 community centre
04 fire station
05 police station
06 post office
07 hospital
08 clinic

observations
Majority of the community facilities and services are located to the South of Hammanskraal in the Temba ward. The number of hospital; clinics and police stations are limited and community centres are vast distances from one another with no pedestrianized linkages.

deductions
There is a need for services and facilities to the North of Hammanskraal in Ramotsi; Majaneng and Babelegi. The shortage of clinics needs to be addressed as well as the shortage of police offices

Figure 03 | 14. community facilities

sport facilities

observations
There are a vast number of informal playgrounds and soccer fields. These spaces are used by majority of the young community. The formal sports grounds are only used during official games and training and has to be booked. Therefor the formal grounds seem to be under used in comparison to the informal playgrounds and fields. These spaces are activated after between 07:00 and 08:00 and again between 14:00 and 18:00, the periods prior to the start of school and after school & work.

Figure 03 | 15. Sport facilities

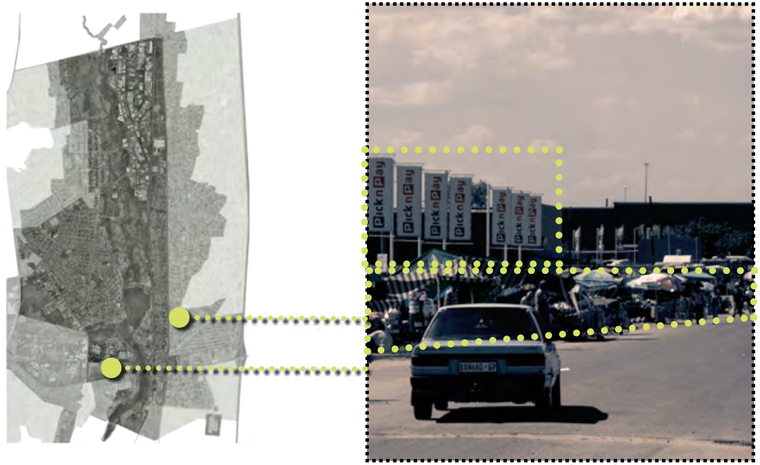


Figure 03 | 16. Commercial road

Upon arrival in Hammanskraal from the N1, the landscape rapidly changes to a populated, non-organized mixture of informal spaza shops and formal shopping centres, which feed the needs of the community of Hammanskraal.

("FIGURE 03 I 16.")

Figure 03 | 17. Local talent

Local talent and people entertaining one another for fun and some for income are evident in the commercial areas throughout the majority of the day. ("FIGURE 03 I 17.")

Figure 03 | 18. Mixed shopping experience

The mixture between self-entrepreneurs and international franchises are evident through the majority of commercial areas and have formed a hybrid relationship, fulfilling the needs of the community. ("FIGURE 03 I 18.")

Figure 03 | 19. Mixed shopping experience

Community interaction was made possible through informal interviews and discussions regarding places and activities of importance. The inhabitants were friendly and more than willing to contribute in a positive manner.
("FIGURE 03 I 19.")

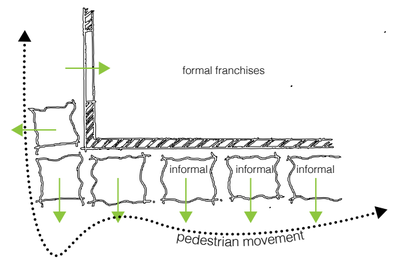


Figure 03 | 20. illustrated formal informal threshold

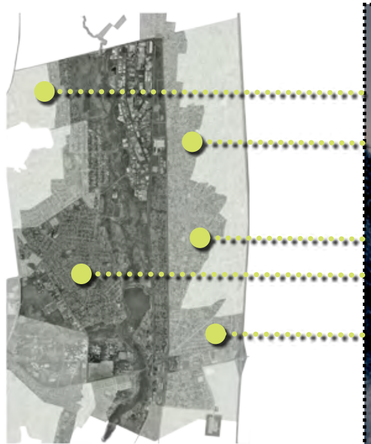


Figure 03 | 21. Residential House

Figure 03 | 22. Boundary Spaza

Figure 03 | 23. Residential House

Figure 03 | 24. Residential House

Figure 03 | 25. Local inhabitants

The residential area is a mixed with informal structures as well as formal structures. Most homes are constructed in different methods and styles; embellished and beautified to express individual character and uniqueness. ("FIGURE 03 I 21."; "FIGURE 03 I 22."; "FIGURE 03 I 23.")

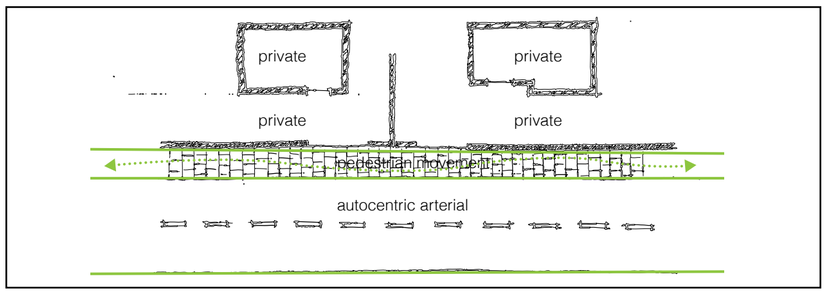


Figure 03 | 26. sketch-housing in hammanskraal

Some residences have integrated smaller spaza shops into their property boundary as an additional source of income. ("FIGURE 03 I 22.")

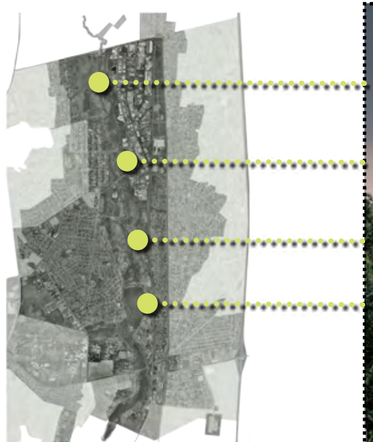


Figure 03 | 27. Leeukraal dam

Figure 03 | 28. Railway through

The ecological corridor of hammanskraal is dominated by the Apies River flowing south through the residential settlements and Babelegi industrial area. The construction of the Leeukraal dam in 1985 aims to serve the community in their water needs and is currently user by inhabitants of Hammanskraal for washing; as well as fishing and recreational purposes ("FIGURE 03 I 27.")

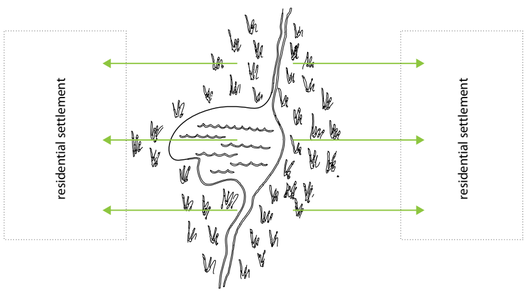


Figure 03 | 29. sketch-ecological corridor and settlements

The ecological landscape is segregated by the railway that is constructed from South to North and fragments the connections between the dependant community and the resources. ("FIGURE 03 I 28.")

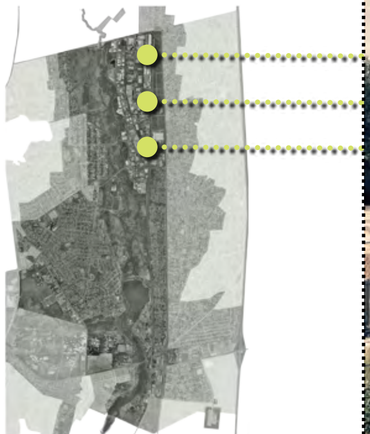


Figure 03 | 30. Infrastructure fragmenting the natural landscape in Hammanskraal

Figure 03 | 31. Infrastructure

Figure 03 | 32. Existing industrial

Figure 03 | 33. Maintained industrial

The industrial landscape is in a state of decay as majority of the factories and structural skeletons are vacant. Nature has begun to reclaim the structures and these are slowly turned into a state of non-usability due to the degrading of materials. However, they retain spatial qualities that can be transformed and restored to positive contributory. ("FIGURE 03 I 30")

Figure 03 | 34. Main steel portal frame

Figure 03 | 35. Boundaries

Figure 03 | 36. Panorama of industrial site

Figure 03 | 37. Nature reclamation

Figure 03 | 38. Industry and Nature

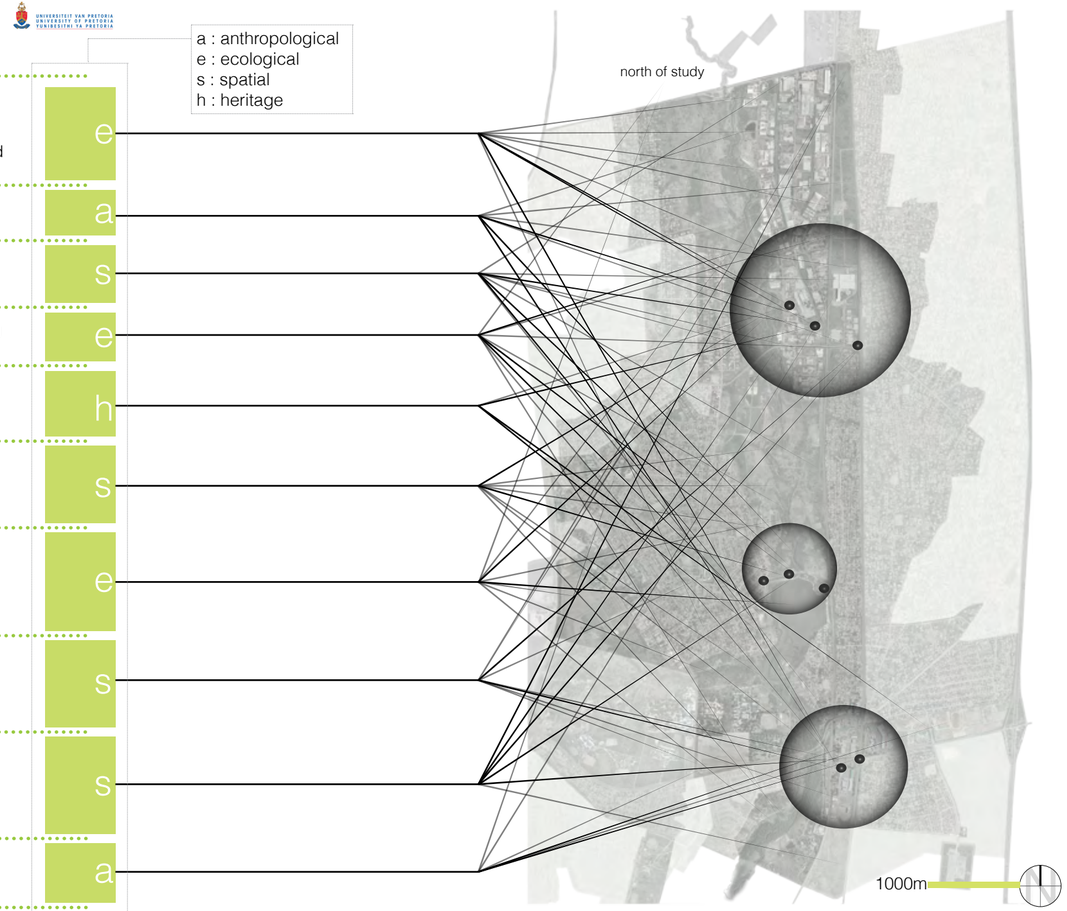
matrix site selection

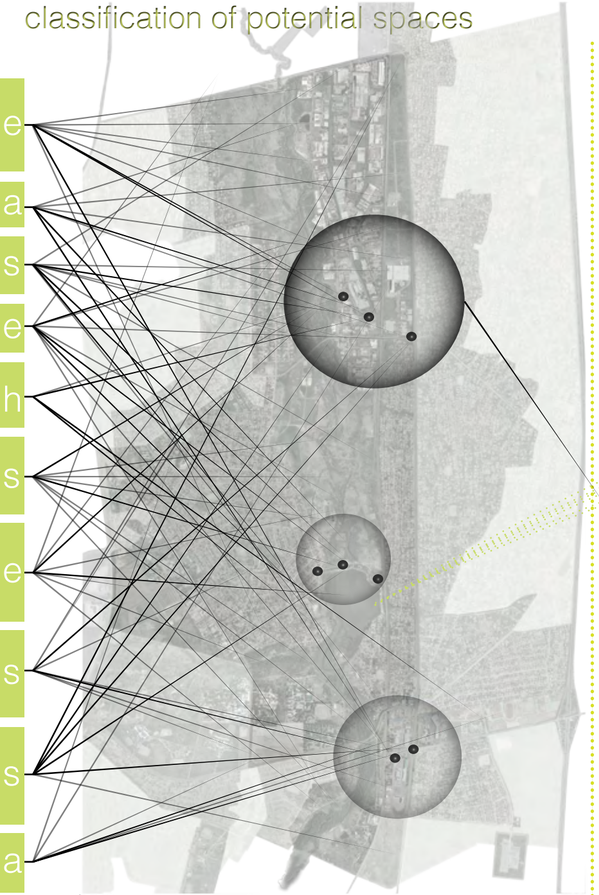
The matrix system aims at defining characteristics & attributes of importance on sites within the study area (Hammanskraal) and progresses in influencing decision making through the early stages of the design development. Through application of the methodology the author believes that a site selection; the identity of the space; its intent; potential and appropriate role players and finally an appropriate programme can be identified and accordingly applied.

matrix of site selection

factor	criteria	
Decayed and decommissioned sites with potential for restoration	Sites that are in a state of decay to the extent that it no longer contributes to a healthy environment according to quick scan mapping (GOTYE:2000) Decommisioned sites that no longer function in a healthy manner, nor house the critical mass it once housed as identifed by observer and affirmed by local users.	e
Unhealthy and inhumane sites with potential for restoration	Sites that do not contribute to a healthy human environment or neglects user comfort for function efficiency	a
Fragmented spaces	Sites and places that are isolated from the whole and no longer integrate with the larger framework or intent Sites that are disconnected due to physical barriers; edges; boundaries	s
Healthy albeit unproductive space for potential development.	Sites that are ecologically healthy (COERTZEN:2012) visually contributory to the larger envirnonment, yet not functioning to its full potential as classifed by the author.	e
Spaces with lost / ill-informed heritage components with potential for intervention	Sites that have heritage significance Sites that have heritage, which have been lost due to ill-informed decision making; intervention application or forgotten	h
Spaces not connected to an auto-centric grid / space where it can be modified significantly	Landscapes or sites that have not been disrupted by auto-centric application and have potential for pedestrianized landscape creation. Landscape or sites that have not been constructed according to an auto-centric grid methodology.	s
Adjacent or inclusive of natural elements of importance and potential	Sites that have direct or easy accessibility to ecological and natural elements, including: grasslands natural water (rivers; dams; wetlands) habitat to indigenous species healthy ecosystems (COERTZEN:2012)	e
Adjacent or inclusive of existing transportation infrastructure/connectable to the larger system	Sites that have direct or easy access to existing established transport nodes (public; private or pedestrian) Sites identified through observer arial mapping of established informal traffic routes (public; private or pedestrian	s
Periphery sites and gateway sites with various influencing factors from all compass directions	Sites that serve as entrance and exit points within the urban condition Sites that are the threshold between different spaces with different characteristics and requirement Sites that serve in the role of linking various socio-economic-cultural- and ecological influences and factors	s
Spaces of prominence / high levels of surveillance and human presence.	Spaces that have critical mass and have potential for the introduction of critical mass Sites that have prominence within the environment, defined as places of activity; movement; congregation & meeting	a

a : anthropological
e : ecological
s : spatial
h : heritage





type

industrial & landscape

intent

restoration & revitalization
responding to industrial heritage
eco-systemic integration
pedestrianized landscape

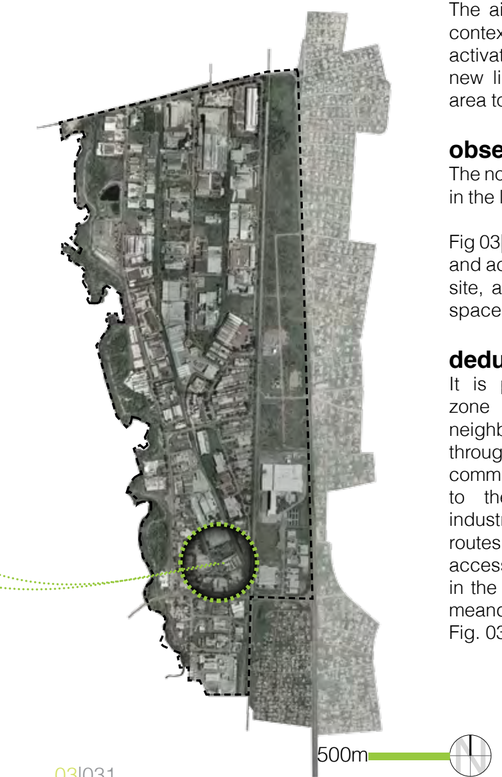
condition

The industrial node is currently in the condition that best examplifies the problematic condition presented in chapter 01. It is in a state of fragmentation & disconnection. Where structures of the modern mechanistic approach litters the landscape in ruins. Where landscape has been segregated from the user and suppressed to minimize interference of the industrial functionality.

Intent

The industrial context provides oppurtunties for adaptive reuse in terms of structure; materiality & functionality into hybrid typologies, structures and skins.

The oppurtunity to integrate the mechanistic with the natural as well as the integration with an anthropological layer is present and serves as the guiding principle in the intervention



aim

The aim of mapping the larger industrial context is to establish positions of potential activator nodes. It also aims at identifying new links to the interior of the industrial area to revitalise the dilapidated condition.

observations

The nodes in fig.03|39 have been identified in the larger framework as activator nodes.

Fig 03|40 & fig 03|41 portray the movement and access of vehicles and people into the site, as well as the current zoning of the spaces.

deductions

It is proposed to re-link the industrial zone with the eastern residential neighbourhood. This proposal is done through the implementation of a new commercial/public threshold as opposed to the immediate transition between industry and residential. selected vehicle routes grant public transport and services access to the sites. The main linkages are in the form of informal dweller routes that meander through the landscape.
Fig. 03|42

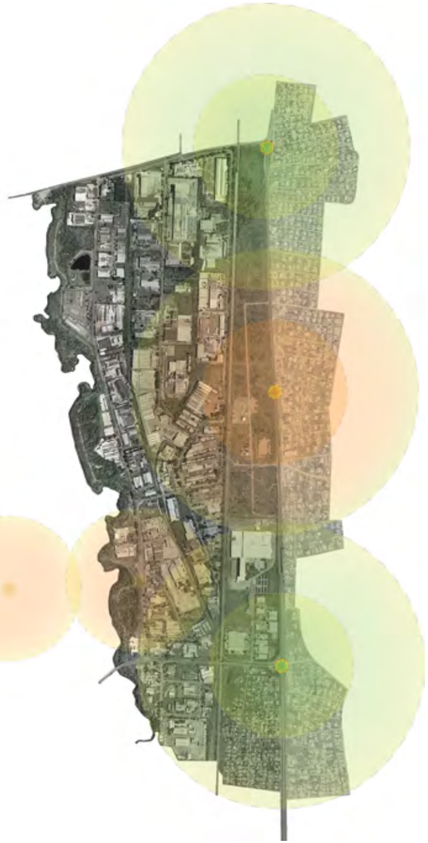


Figure 03 | 39. Map with proposed nodes

Figure 03 | 40. Routes

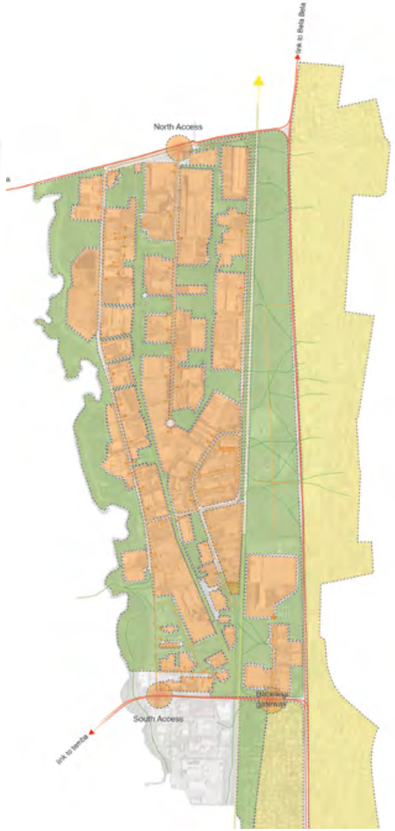


Figure 03 | 41. Existing spaces

Figure 03 | 42. Proposed deductions

Figure 03 | 43. New zoning

site focus

The focus of the intervention is limited to the Southern node in the industrial area of Babelegi. It serves as the gateway of the industrial area

activation of nodes

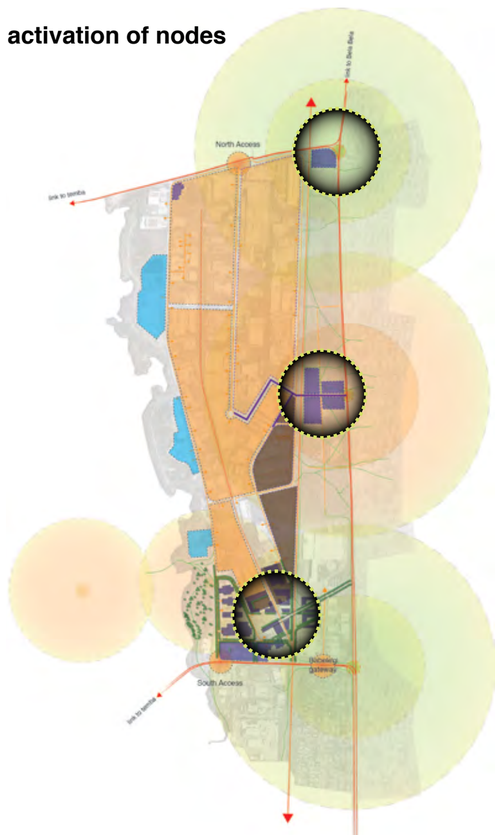
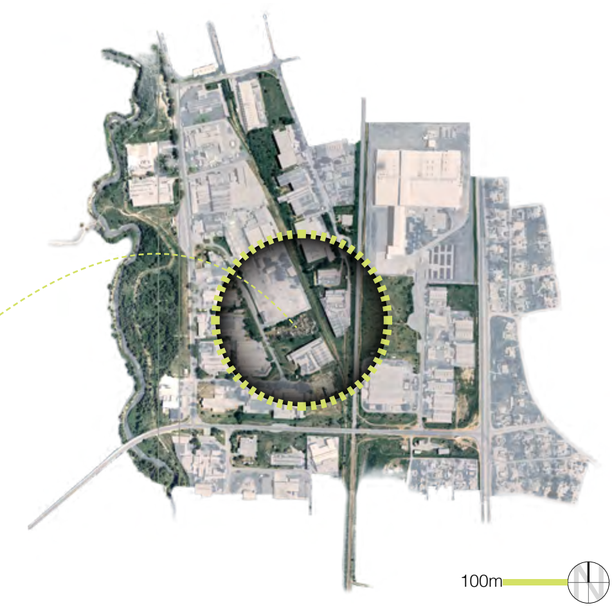


Figure 03 | 44. Massing

focus on southern node.

Figure 03 | 45. Massing



The site is characterised as ***predominantly industrial in intent***, however, it is currently no longer functional. The site is ***scattered with steel structure ruins, which housed mechanistic functions but is now only serving as a memory of what once happened there***. The neglect is evident as dangerous obstacles; materials; waste, and crime lurks in and around the site

Furthermore, ***the natural component has started to reclaim these mechanistic structures, creating, contrary to what is expected, healthy ecological pods*** in between and in the structures themselves in a process of trying to restore the natural processes and characteristic on the site.

The site has transformed over the last 14 years to a quasi-industrial-ecological multi- layered ruin, due to the neglect of the anthropological layer.

Figure 03 | 46. Factory forrest

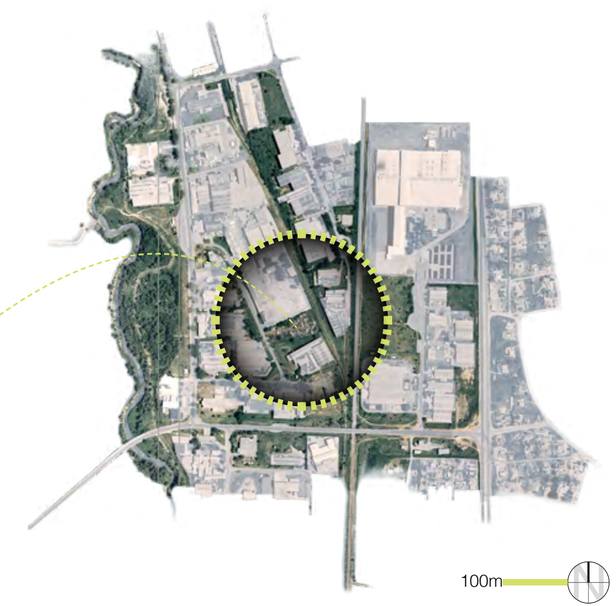
Figure 03 | 47. Factory forrest interior

Figure 03 | 48. Panorama of site

Figure 03 | 49. Main steel portal frame

Figure 03 | 50. Secondary steel portal frame

Figure 03 | 51. Tertiary steel portal frame



There is a distinct industrial materiality which remains on the site, even though most of it is concealed by the natural layer.

These range from the steel structures themselves that protrude from the landscape, as well as the materials which were used to fix the structure to the site and the materials used to enclose the structures in creating space.

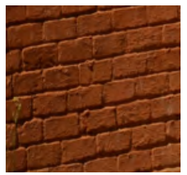
These materials expresses the materiality of what once was an industrially orientated site and gives rise to unique techniques of adaptive reuse that is investigated in chapter 05

where mechanistic materials are used in collaboration with naturally grown and organic screens and skins to enclose and demarcate spaces.




natural








stereotomic




tectonic

existing infrastructure

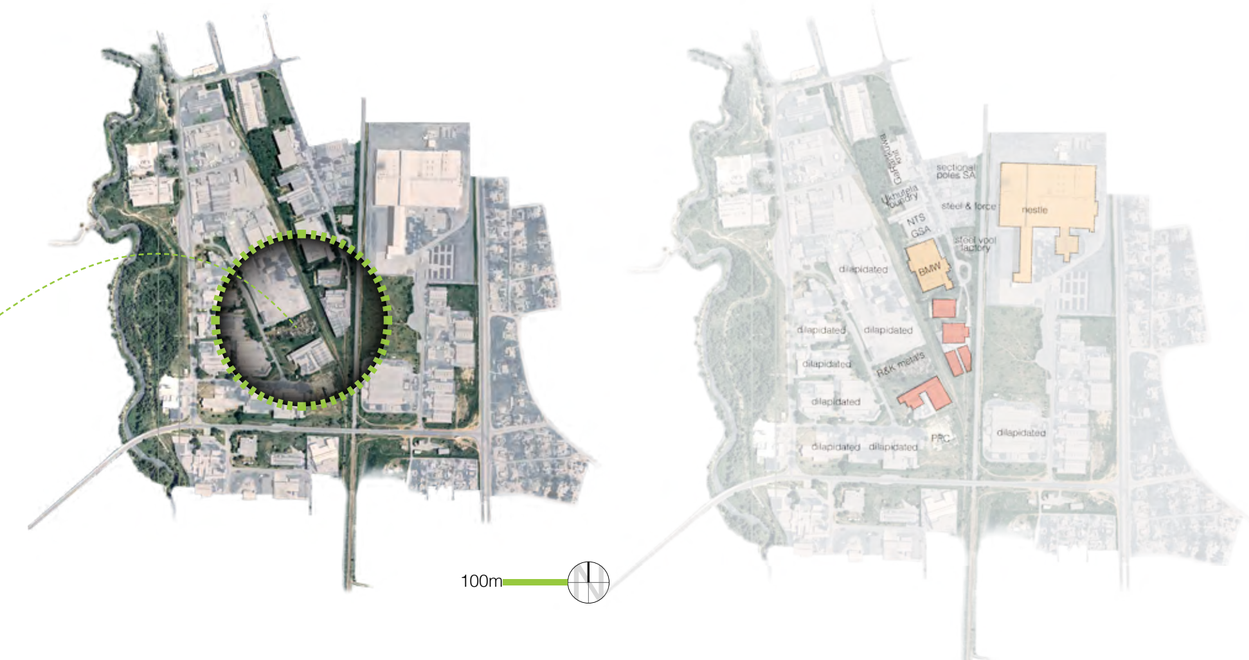


Figure 03 | 52. Existing infrastructure

important routes

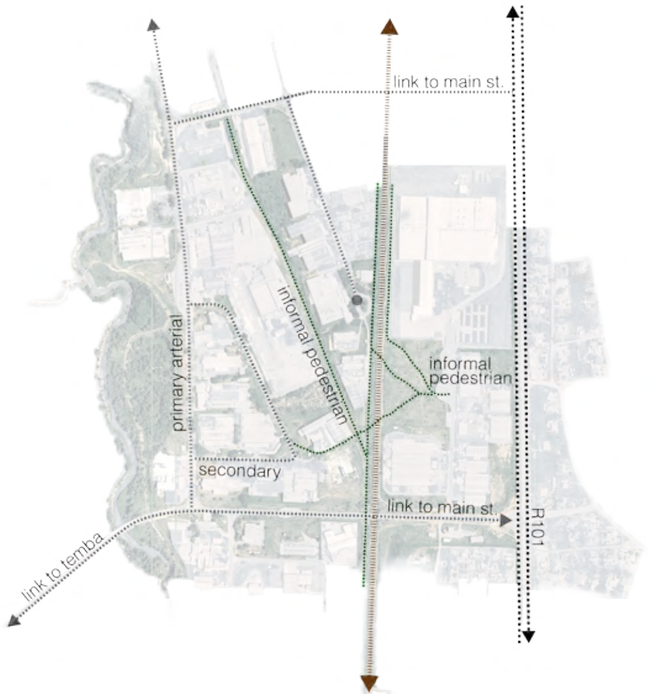


Figure 03 | 53. Important routes

The existing structures are predominantly dilapidated and no longer functioning. The aim of the intervention is to resuscitate existing adjacent industry. However, there are structures that are still in use as "FIGURE 03 I 52." indicates. ***The light orange indicates major role players currently in the industrial area in relation to the dark orange which indicates the dilapidated structures on the intervention site deemed to be reused.***

"FIGURE 03 I 53." indicates the major routes that intersect the site, these are ***vehicular, pedestrian, informal, formal, primary and secondary***. The movement of people currently through the site is limited to early morning and late afternoon due to the lack of activities currently on the site. Not withstanding, the movement, although limited to certain times in its current condition, is of high volume, as people move to and from industry that is still functional.

grid typologies

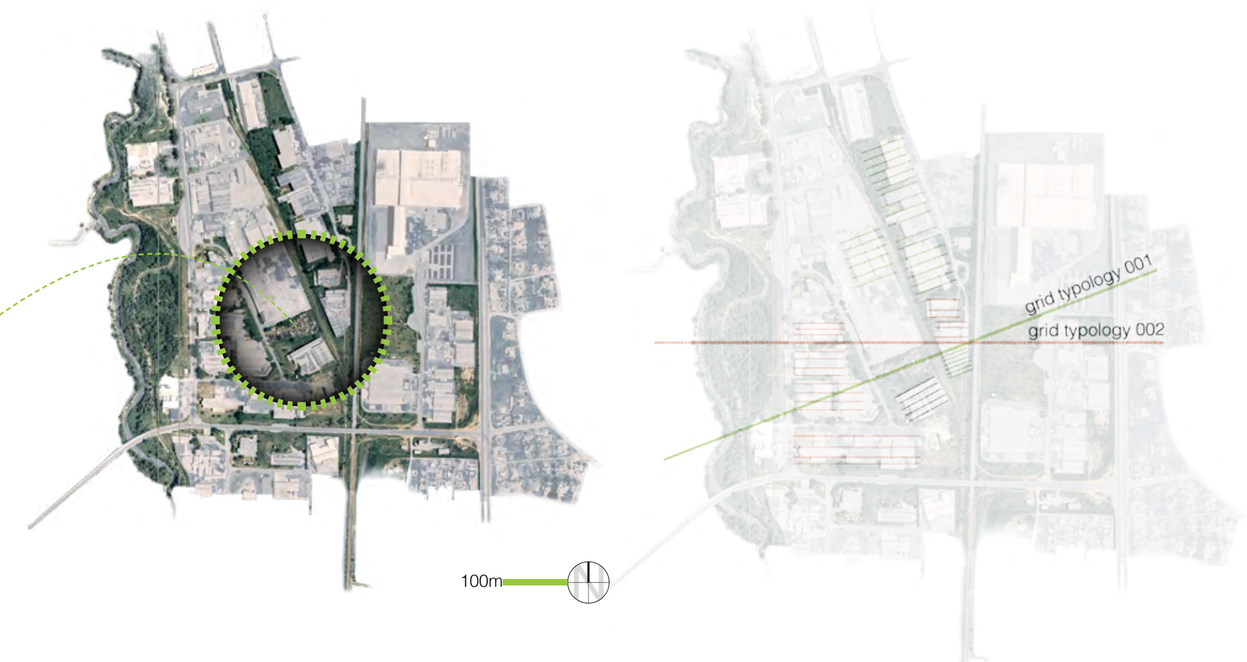


Figure 03 | 54. Grid typology

proposed structures for reuse

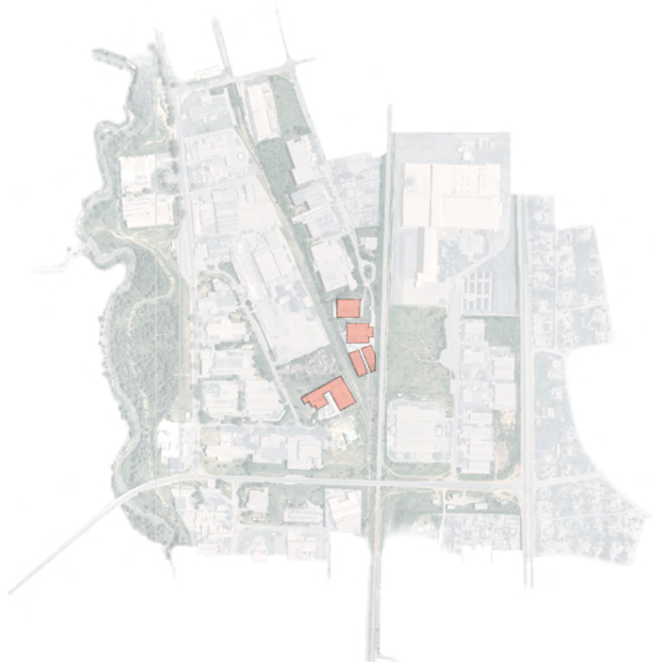


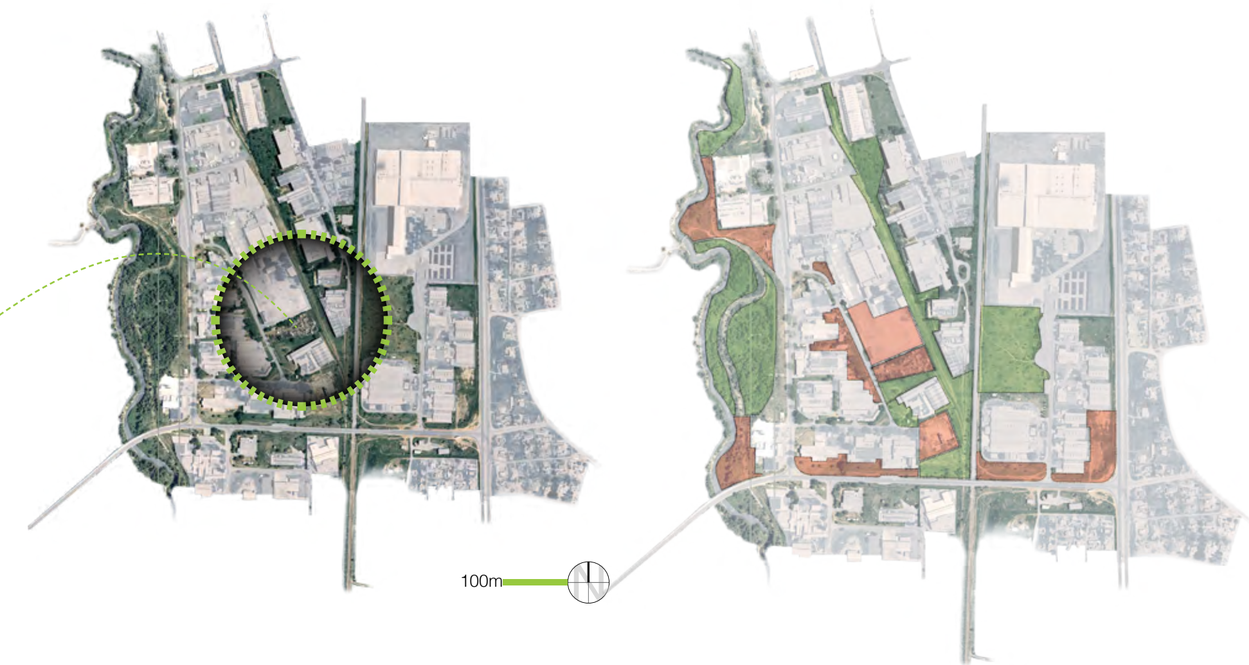
Figure 03 | 55. Proposed structures for reuse

There are two grid typologies that dominate the landscape apart from the natural contours.

These are presented in "FIGURE 03 I 54." as grid typology 001 and grid typology 002. Mediation is proposed in the intervention to ensure the appropriate responsive interconnection of existing mechanistic grid typology into natural grids.

"FIGURE 03 I 55" indicates the existing structures that are dilapidated and proposed for reprogramming. ***They are predominantly steel structure skeletons with limited cladding materials remaining. They have similarities in grid typologies, however, there is no underlining pattern present and the structures can be said to have been constructed at random.***

healthy & unhealthy ecological spaces



access to water from river

The terrain consists of healthy and unhealthy ecological sties. ***This is a result of industry that is destructive in nature, as well as industry that has dilapidated and now give eminence to the natural environment*** in which it is able to reclaim and restore the terrain to its original healthy character. Green indicates healthy ecological terrain as opposed to red that indicates unhealthy ecological terrain.

Healthy ecological terrain is identified through the collaboration with Ecologist L.Coertzen, and a report is accessible in the Appendix.

The water available on site is channeled from the adjacent Apies river to the west of the site to 4 points. These points serve as provision of water to the intervention, which is predominantly natural and agricultural in intent.

Figure 03 | 56. Healthy and unhealthy ecological zones

Figure 03 | 57. water supply to site

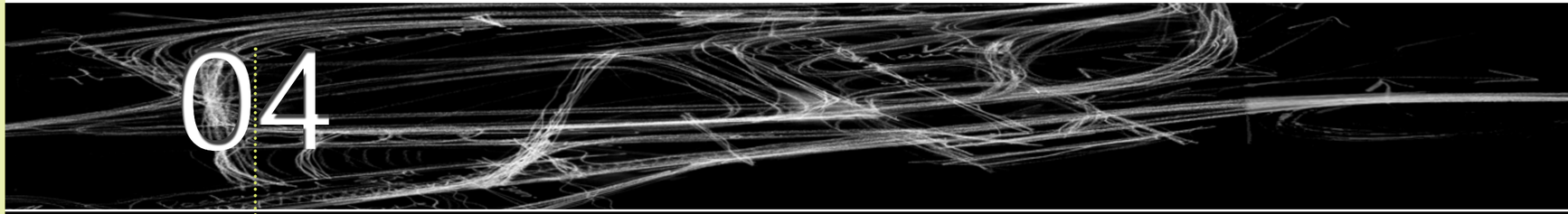
context conclusion

The nature and characteristic of the site deems it appropriate for the application of theoretical ideals and practical architectural application.

The potential of the site lies in the reclamation of existing structures and materials, while restoring the natural ecologically unhealthy sites and conserving the natural ecologically healthy sites.

Furthermore, through the re-activation of adjacent industry, potential is created for additional jobs and thus reducing the current unemployment rate of hammanskraal. Assuming the success of the intervention in activating interest in adjacent industry, the unemployment rate of Hammanskraal may be reduced to 14%

Finally, through ***changing the nature of the site from purely mechanistic towards a multi-functional zone, previously private, limited and dangerous space can be given back to the community and used to serve the community needs i.t.o services, education, recreation, entertainment & community upliftment.***



04

the collective

intent
programmatic concept 003
role players 007

the process
understanding the processes 011
spatial requirements 013
comfort requirements 015
energy requirements 017
feasibility & calculations 018

defining the components
the layers 019
the relationships 021

precedent studies 023

the intent
part a

part a addresses the intent of the intervention, the programmatic concept as well as the potential role players.

intent (CONCEPT)

The intent of the proposed intervention is the ***reconciliation of the problematic- condition identified in Chapter 01 through the application of the theoretical ideals presented in Chapter 02***

This intent is focussed on all four levels of design as argued in chapter 02, being:

- Thinking scale
- Urban scale
- Building scale
- Detail scale

and is applied on the investigated context of Babelegi Industrial zone in Hammanskraal, investigated in Chapter 03

It includes the ***activation of existing functionality on site***, (production and industry) ***not in its conventional typology however and not in isolation*** "FIGURE 04 | 1." ON PAGE 004 as it has been argued that a mechanistic approach in isolation is derogatory to its environment and has a fragmentational result."FIGURE 04 | 1."

Instead, the functionality, nature & character of the existing site is ***developed to function in a cohabitational manner, intertwined and injected with anthropological layers and natural/agricultural layers***.
"FIGURE 04 | 1."

This is done to ensure that the site does not function in isolation, nor does it revert to a monofunctional environment, instead it connects with surrounding industry and serves as a precedent for future sustainable industry, ***connecting existing movement patterns and natural qualities of the landscape to create space for recreation, education, commercial, functional and agricultural development,*** ensuring that the programme becomes connected throughout the larger system and network.
"FIGURE 04 | 1."

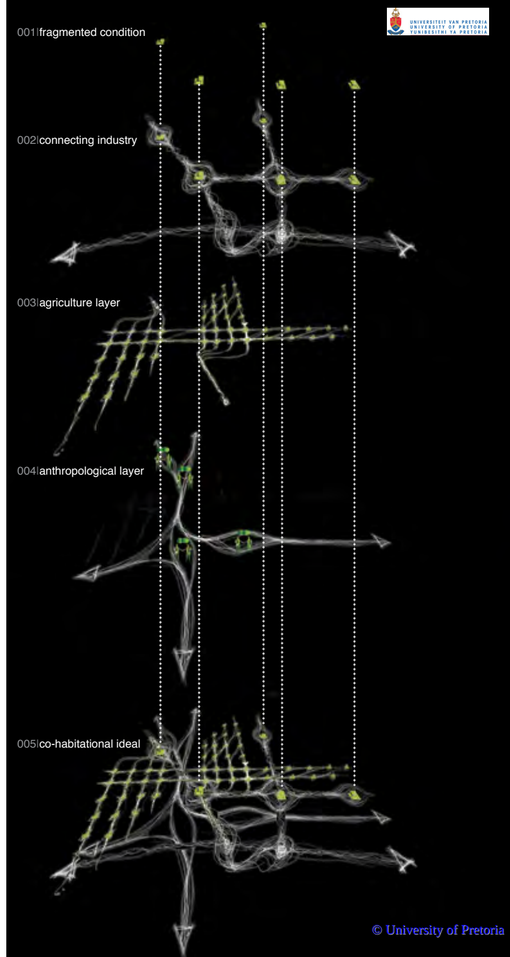


Figure 04 | 1. Multi-faceted layering

Programmatically, the intervention aims to reconcile the three various components into a single, albeit multi- layered spatial experience, inclusive of:

- The existing mechanistic landscape
- The natural environment
- The anthropological component

This approach requires a ***complex pattern of linkages & spaces, mediating between the layers to ensure that components function optimally with limited disruption in processes,*** while at the same time allowing interaction for educational; recreational and experiential benefits.

This requires a layered approach, where different components meet to ensure the most appropriate connectional point between seemingly different functional components.

The intervention's multi- functional programme consists of:

Multipurpose spaces (MP):

A educational centre with a public commercial & recreational component with access from the main routes onto the site. It serves as the gateway into the site. This component includes agri-pods which serve as greenhouses and provide the majority of fresh produce to the formal commercial market and the restaurant components which spill out onto the public edges. It facilitates workshop spaces for educational purposes as well as administrative spaces in the private realm of the building.

Medium Intensity ind. (MI):

The Harvesting centre is the component where the natural landscape is transformed into consumable produce. It is the transition from natural to usable resource through industrial processing. From here, agriculture (NL) is harvested and prepared for distribution, or it is either separated and transported to the higher energy Biorefinery.

High Intensity ind. (HI):

The Biorefinery is responsible for handling the transformation of crops into high energy usable resources, including Bio-ethanol, Biogas, Synthetic natural gas and Biodiesel. It also converts the waste of the adjacent industrial area into electric energy, and thus providing a sustainable solution to the larger framework

Distribution (DB):

The distribution platform is the space into which the products of the Harvesting centre and the Biorefinery flow. It links to the existing railway system that connects the 3 nodes of Hammanskraal and the larger Gauteng province. It is also the node of receiving resources and waste for transformation in the Biorefinery.

Anthropological spaces (AL):

These spaces are anthropological spaces that intersect the mechanistic and natural processes and allow access for users of the site to spaces that were previously limited to mechanistic processes. These include recreational seating, cafeterias, community gardens, educational and learning areas, as well as spaces and routes for travelling across the site, as opposed to travelling around an isolated site.

Natural Landscapes (NL):

The Natural landscape is restored and used productively to produce the crops required for the community and the Biorefinery. Healthy ecological spaces are conserved and are connected to educational components to ensure the transferal of knowledge and future sustainable understanding of healthy processes.

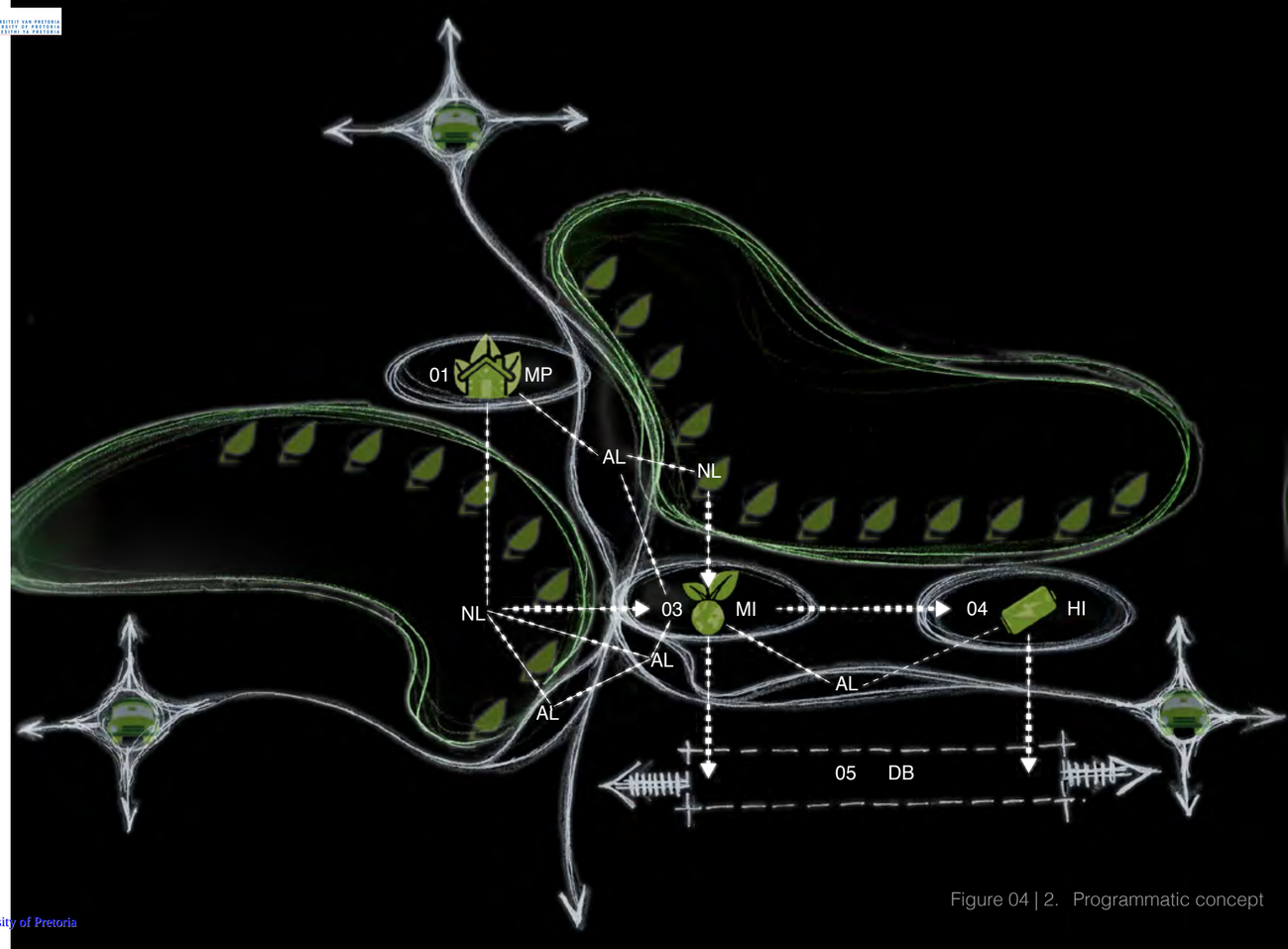


Figure 04 | 2. Programmatic concept

The role players of such an intervention is divided into 5 categories, which include:

- Instigators
- Feasibility partners
- Users that contribute
- Users that experience
- Future maintenance

The main role players of the intervention are those who have interest in instigating such a sustainable energy and food production campus. ***Energree(n) SA and the local government has been identified as role players with the potential to activate the process in a joint-venture.***

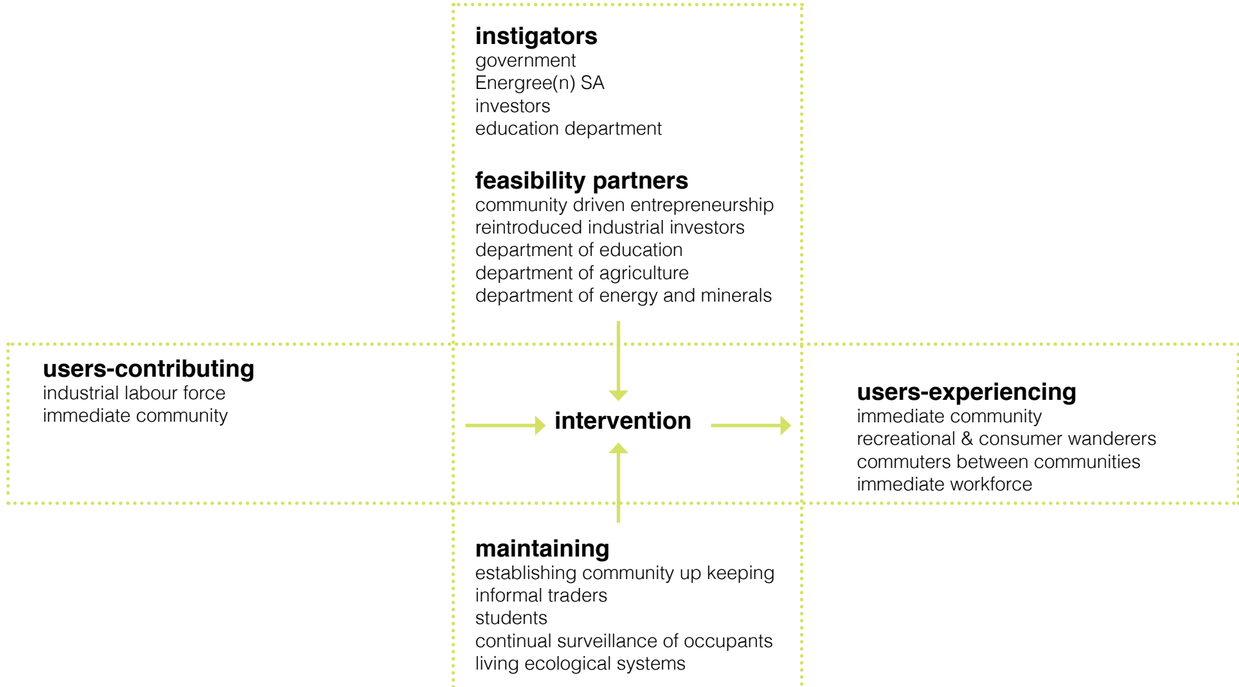
This in turn ***activates a large opportunity for jobs for the local community*** of Hammanskraal, ranging from initial construction, as well as the skill transferal of adaptive reuse and sustainable building techniques, to the jobs created for when the intervention is functional.

The intervention provides access to the community, with private territory being limited to the functional processes.

This allows for provision of spaces that serve as recreational, community serving and educational nodes.

Additional identified users are the workforce of the industrial zone, the population of which has been projected to be approximately 3,200 workers occupying the immediate context from 8:00am who would have had only a mechanistic landscape otherwise

Furthermore, the natural landscape starts functioning as a role player, and not a component in isolation.



the process
part b

part b addresses the functional requirements of the intervention in order to understand the spatial characteristics and requirements for the intervention to function efficiently. It progresses from understanding the process system, leading to the spaces required for each and the subsequent linkages between and in between these components.

The intervention is inclusive of various layers that have specific practical requirements for optimal functionality.

These include:

- functional requirements
- spatial requirements
- comfort requirements
- linkage requirements
- energy requirements

These requirements are to be either met or altered to create a more appropriate resolution of the role that the component has to provide.

Figure x expresses the various processes that are present within the proposed intervention and aims to organize them into a structured solution, that is integrated between all the layers discussed.

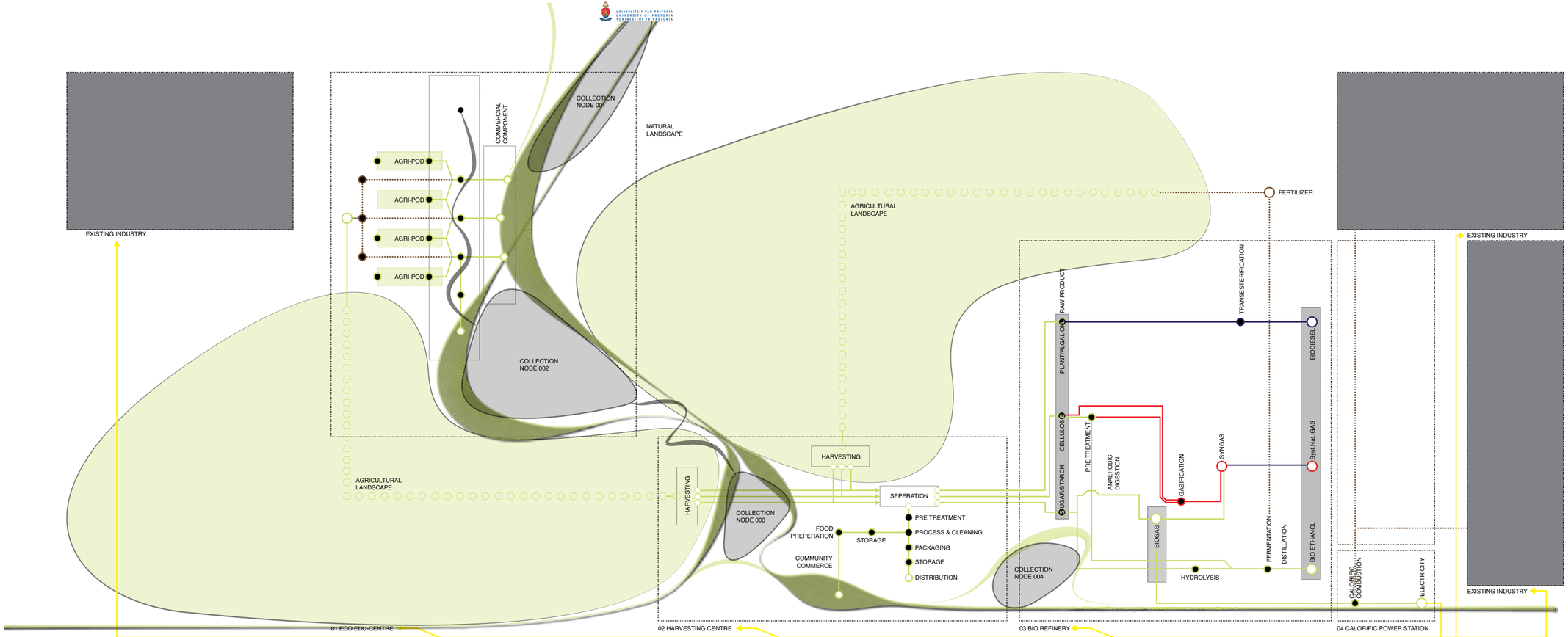


Figure 04 | 3. Understanding the processes

The spaces required in the intervention includes the three layers

- anthropological space
- natural space
- mechanistic space

These spaces are arranged to have efficient functionality, whilst intersecting with the different layers to accommodate the multi-functionality of the site

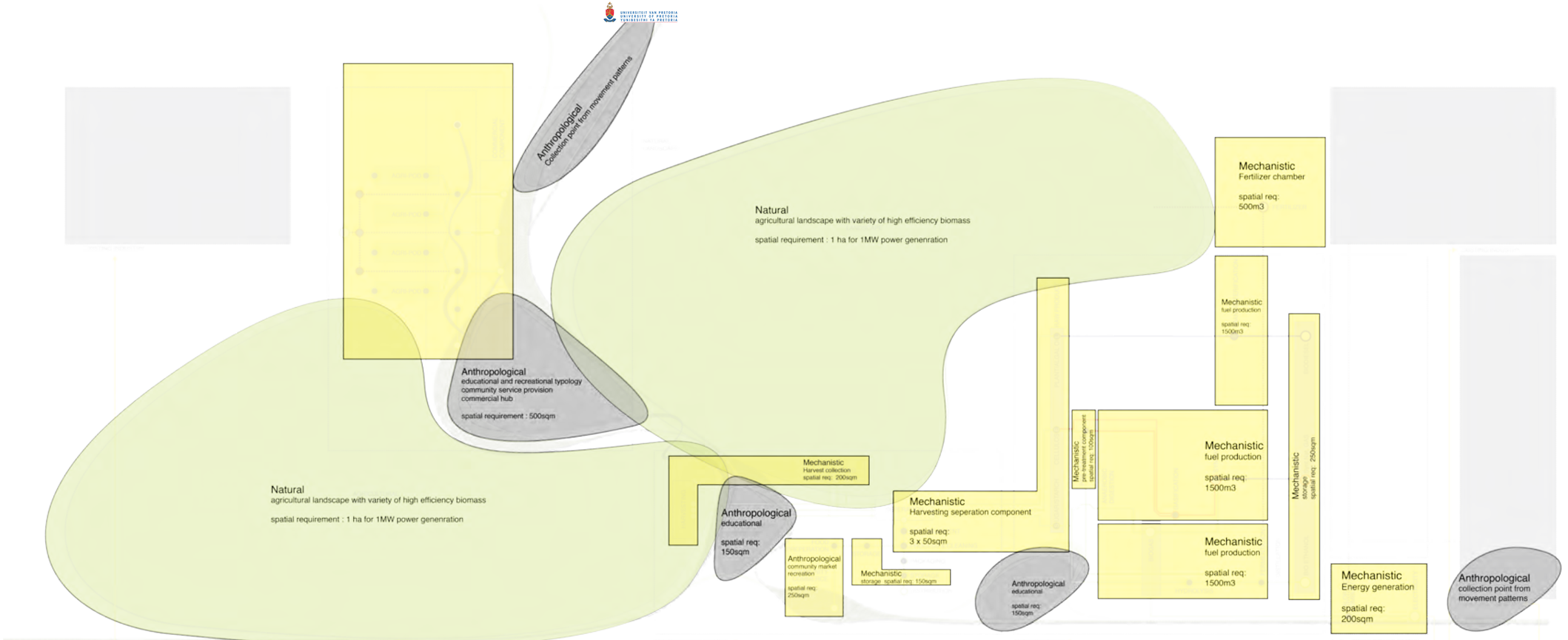


Figure 04 | 4. Spatial requirements according to processes

Different spaces require specific comfort levels defined by the characteristics and nature of the function/space it houses.

Anthropological spaces, housing primarily humans, require the most controlled levels of comfort. Whereas mechanistic spaces do not need the same level of control as it is occupied primarily by non-sensory entities.

The natural landscape is a self-regulatory component and changes according to natural patterns. The spaces created in the natural landscape needs to be controlled however, where humans occupy the space, to ensure comfort in the seasons that the spaces would be used.

Passive systems are preferred to active systems in the intervention as the aim is to create self-regulatory systems through the collaboration of natural systems.

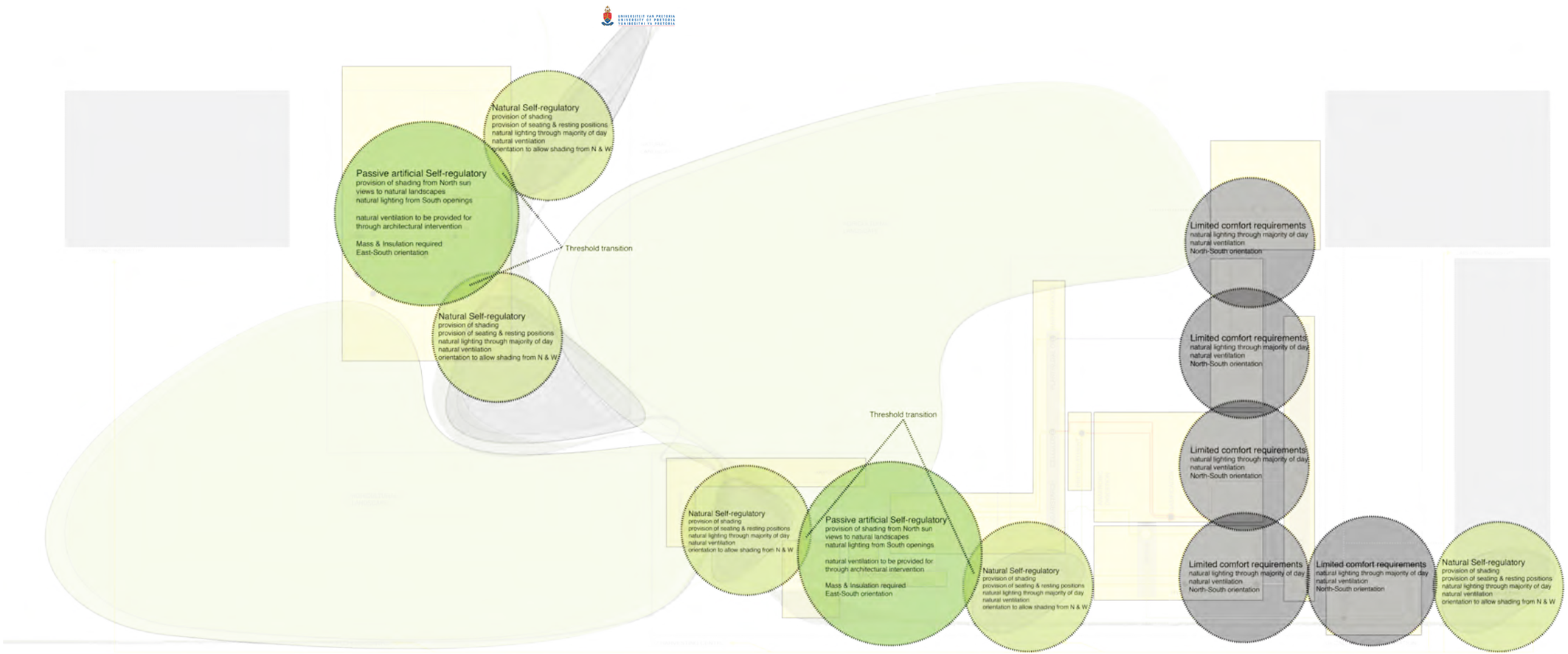


Figure 04 | 5. Comfort requirements according to processes

layers
part c

Apart from the functional requirements of the intervention expressed in part b, part c aims at defining the different layers and the relationships between them, as well as the architectural implications it has.

To understand the layering and connecting of the multi- functional intervention, it is first necessary to define the different layers that execute its presence onto the intervention
"FIGURE 04 I 5."

The following part defines these three layers
- the existing mechanistic layer
- the conserved natural layer
- the injected anthropological layer

The aim of understanding and the intertwining of the various layers in their physical form leads towards the establishment of a biophilic sustainable design language

This exploration and defining component ***serves as the basis from which spatial definition, experiences, scale & materiality are given to process driven-; experiential-; functional- and habitable components.***

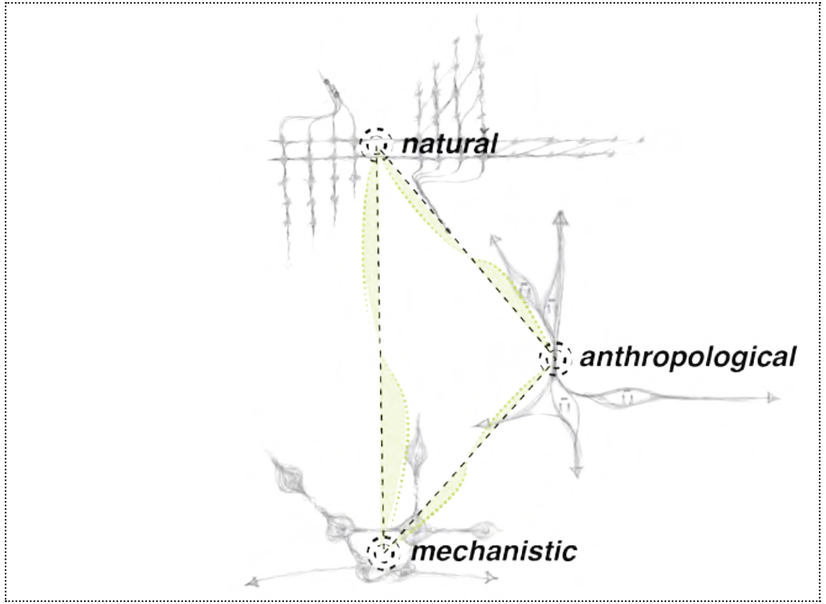
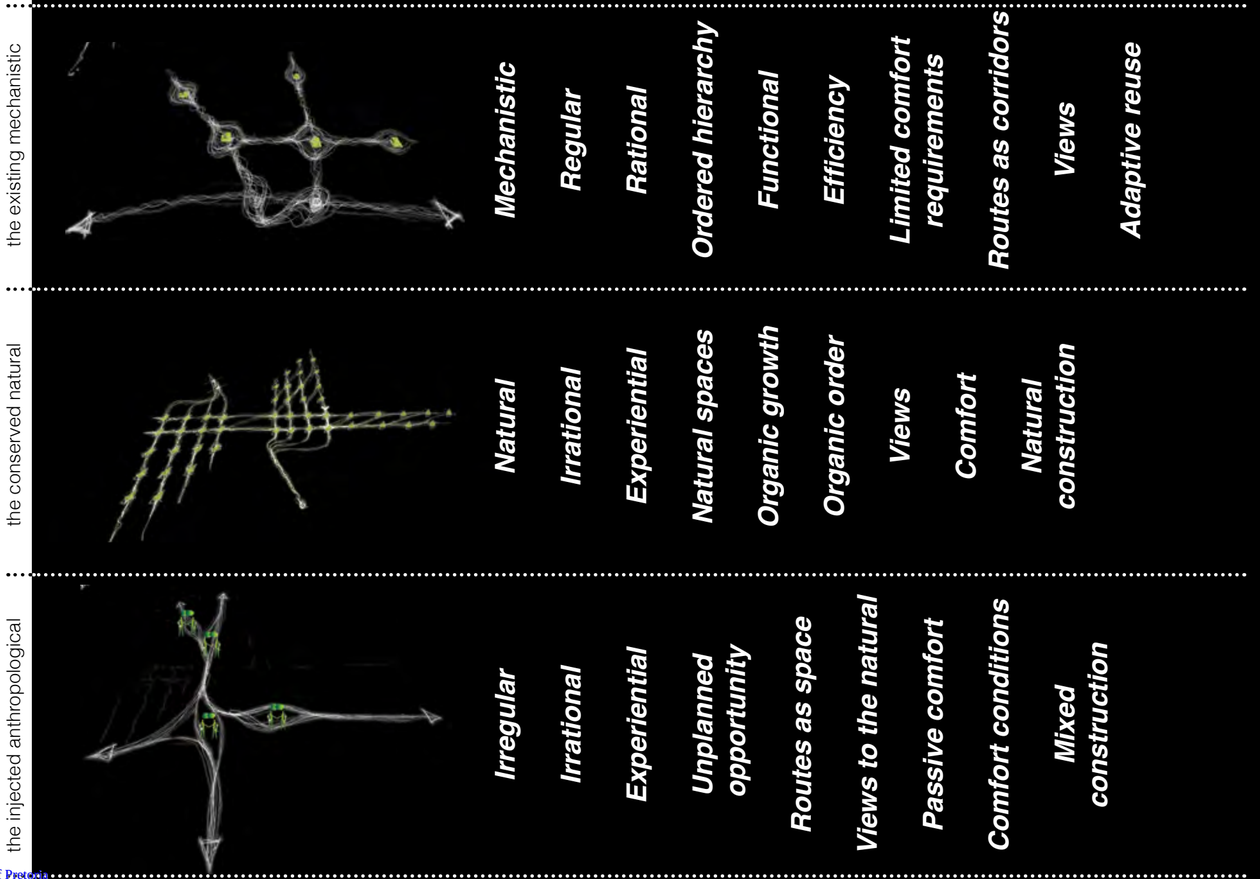


Figure 04 | 6. Various connected layers



The various layers give rise to unique relationships between the layers."FIGURE 04 | 6."

- the mechanistic & the anthropological
- the anthropological & the natural
- the mechanistic & the natural

These layers are defined as:

- functional relationships
- biophilic relationships
- sustainable relationships

It's the relationship between the layers that give rise to an architectural language in an existing mechanistic landscape, responsive of the inherent need humans have to interact and understand the processes and qualities of nature on a physical plane as well as a systems plane. While acknowledging the relationship between the two seemingly opposite layers (that being mechanistic and natural) and establishing a language that challenges the conventional seperation of these layers.

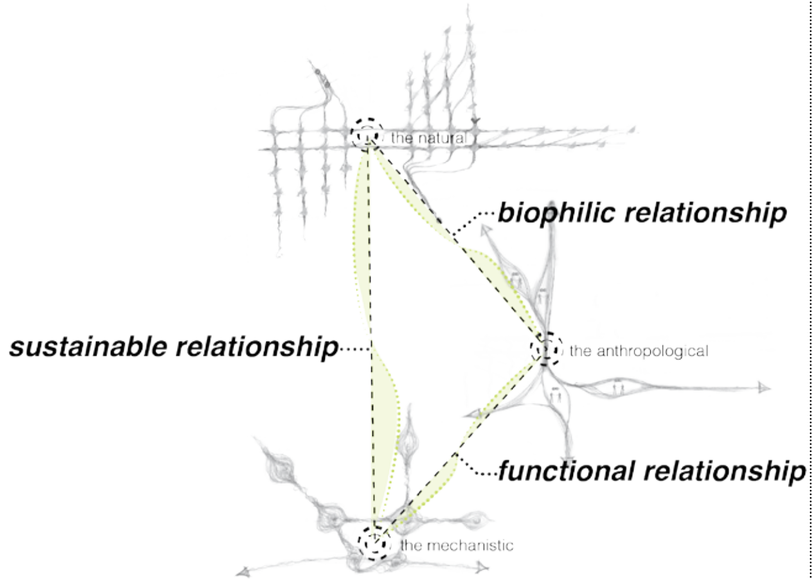
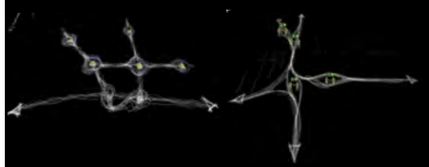


Figure 04 | 7. Relationship between layers

functional relationship

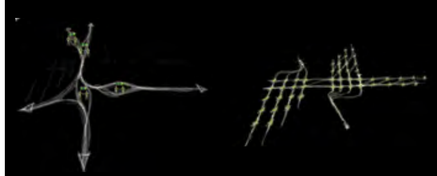


The relationship between the ***anthropological layer and the mechanistic landscape is one that is constructed for functionality and efficiency***

sustainable relationship

The relationship between the ***mechanistic layer and the natural layer is one that requires sustainable intervention to ensure the continued condition of our natural environment is protected and conserved***

biophilic realtionship



Finally, the relationship between the ***anthropological layer and the natural layer is one that relates to the inherent biophilic relationship humans have with nature. Therefor, the relationship should be protected and strengthened.***

precedent studies
part d

The precedents investigated are examples of efficient reclamation and layer integration. They do not relate to the functionality of the intervention. Rather it relates to architectural application.

the high line : new york

Figure 04 | 8. New York High line

James Corner Field Operations
Construction completed 2009

New York High line is the product of lost and unproductive space reclamation through ecosystemic integration into the urban core and existing infrastructure and the pedestrianization of space, which original intent was anthropozemic in functionality and character. It is the physical manifestation of James Corner's landscape urbanism theory, suggesting that the landscape is more capable of organizing & restoring contemporary cities.

the condition

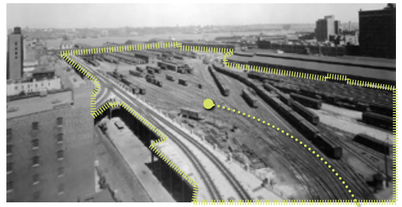


Figure 04 | 9. West side rail yard

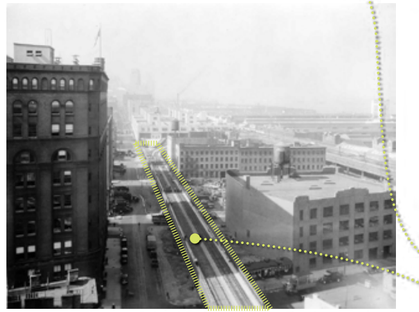


Figure 04 | 10. St. Johns Park terminal

The original high line was constructed in 1930 as part of a massive public transport upgrade, lifting the industrial space 30 feet above the pedestrian landscape. Instead, It fragmented the pedestrian landscape. The high line functioned until 1980 and was decommissioned, consequently, the space has been lost & non-functional infrastructure dominated the landscape. In 1999 the High Line was proposed to be demolished.

the approach

The interventions aims are to reintegrate natural systems into the urban environment & reconsolidate the pedestrian to the urban landscape. The infrastructure that dominated the landscape is utilized as a host to the natural systems (figures), reviving lost space and creating new opportunities, not only in the project itself, but also that adjacent to it, thus having a catalytic reviving effect on its environment. It serves as linking distances previously unthought of being linked through pedestrian landscapes, thus activating community interaction & activity

Figure 04 | 11. High Line section

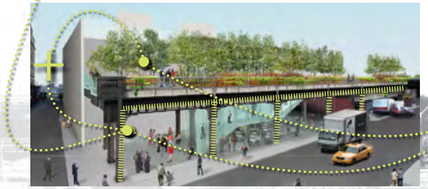


Figure 04 | 12. High Line perspective

the product

Figure 04 | 13. High Line by Bugbrook

pedestrianized landscape

Figure 04 | 16. High Line by N.Iznoz

Figure 04 | 14. High Line by Christina Macaya

reclamation activation

Figure 04 | 17. High Line by J.Blough

Figure 04 | 15. High Line by N Paula

ecosystemic integration

Figure 04 | 18. High Line by B.Munger

the result

the result of the intervention is a healthy collaboration of ecological systems, anthropological integration and adaptive reuse of existing infrastructure and technology.

contribution

The precedent serves as a guide to potential intervention, opportunities and its ability to reorganize anthropozemic spaces to create healthy pedestrian landscapes, integrated ecologically. It also addresses the issues of heritage and how to approach it from an ecological and anthropological point of view.

untamed : kirschtenbosch

Figure 04 | 19. Untamed by E. Daffonchio

project information

Architect: Enrico Daffonchio
Sculptor : Dylan Lewis
Poet: Ian Mcallum
Exhibited June 2010 to June 2011

"A collaborative project exploring the restoration of the lost balance between humankind and nature"

IAN MCALLUM

the approach

Untamed is a project of cross professional collaboration, aiming at restoration of properties inherent in connections as opposed to isolated objects. It is the reconciliation of humankind with nature and nature with structure.

The artists of untamed are of the opinion that humankind have become disconnected with its roots in nature and restoration of the relationship is essential to content coexistence.

exploration

The project is a product of contextual integration and relational connections. It connects with its non-urban context exterior through the threshold towards the interior space. The rusted steel symbolising the artificial creations of humankind entwined within the grown natural skin combined in harmony to create a space that is neither interior nor exterior, yet fulfils the requirements of being shelter to the elements.

As one enters from the exterior to the interior, one is aware of the growing natural presence in the structure as the natural walls seem to grow larger as one progresses. The natural qualities are made evident by the light quality that enters; the vibrancy that is reflected, a property inherent in the natural skin and the way light interacts with it. The natural elements such as wind is allowed to penetrate the structure, creating a pleasant environment within the South African, Cape Town climate.

One progresses through a series of nonlinear spaces that are visually accessible from anywhere in the structure, yet it is separated by lightweight glass walls with poetry of Ian Mcallum that ensures the spaces are still read visually as separate and unique spaces.

The spaces are created for the public and although this is an exhibition project, sets a precedent of what potential there is in creating public spaces. Public spaces that are appropriate in scale; experience and relational to humanity; nature and the artificial.

the product

contextual integration

Figure 04 | 20. Untamed against context

threshold relationship

Figure 04 | 21. Untamed interior

Figure 04 | 22. Untamed eco-collaboration

ecological construction

Figure 04 | 23. Untamed - planting detail

the result

The author believes the project is a great example of how natural elements and conventional construction methods can be collaborated to create a compound architecture that is responsive to its environment and its occupants while maintaining to be functional throughout.

contribution

The precedent exhibits the connectional qualities between technology; mankind and nature in a physical manifestation of the potential achievable solutions. It serves as contextual integration precedent; the role of thresholds and the power it has. Finally, the project expresses detailed construction methods of how nature can be collaborated in a compound construction.

application conclusion

From the investigations made in chapter 04, ***an architectural language can be envisioned as one that is responsive & embraces the existing condition and nature of the site, as well as one that integrates the anthropological and natural layers to create a co-habitational typology*** on all four intervention scales being thinking-; urban-; building- and detail scales.

This approach ensures the multi-functionality and potential usage of the site as time progresses.

Subsequently ***it is the relationships between the layers that give rise to the architectural expression. The mediation of these conditions, being the rational and the irrational, the corridors and space; the ordered and the chaotic; the functional and the experiential; the mechanistic and the natural,*** leads to solutions investigated in chapter 05 and ultimately the product.

05

design development

diagram of development 001
concept dev. sketches 003

urban
- identifying the existing 009
- injecting new programme 011
- programmed character 013
- proposed movement 015
- reusing and reclaiming 017
- shaping the inbetween 019

building
- functional parti 021
- structural parti 022
- spatial parti 022

detail
- materiality 023
- integration 024

conclusion 025

The process of development is initiated as expressed in fig.05|01 through identification of the existing condition and follows a series of nonlinear design iteration. The rational and the irrational mediates between one another in the process of design development.

The processes lead toward the ***mediated intervention where the mechanistic, the natural and the anthropological take equal importance in the intervention***, creating a balanced environment.

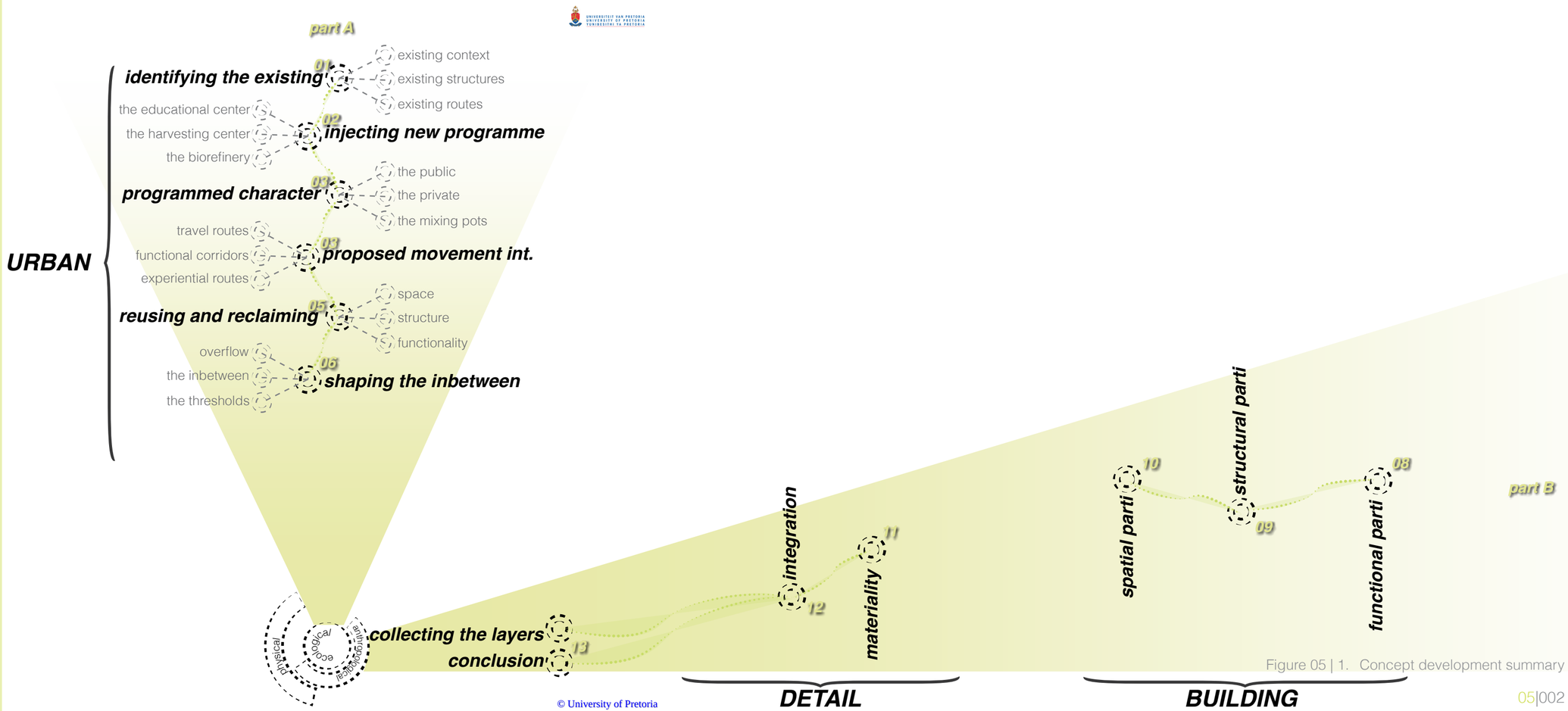


Figure 05 | 1. Concept development summary

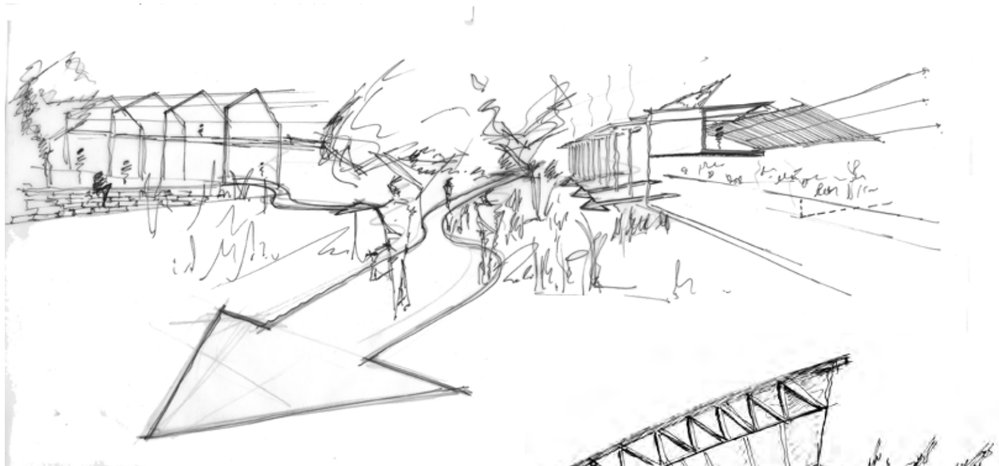


Figure 05 | 2. Concept sketch of integration

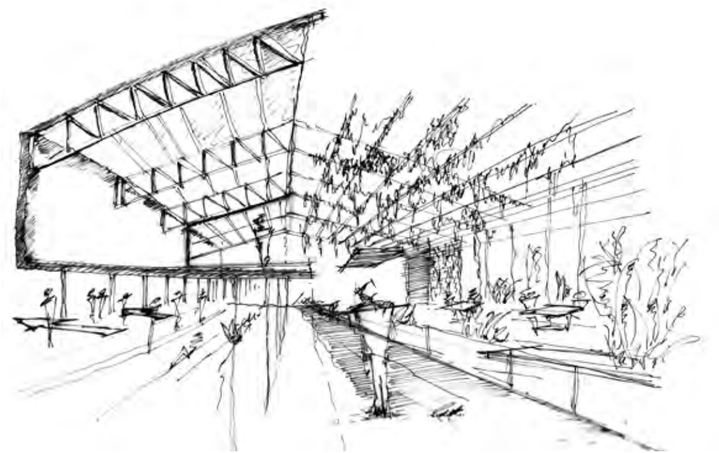


Figure 05 | 3. Interior natural collaboration

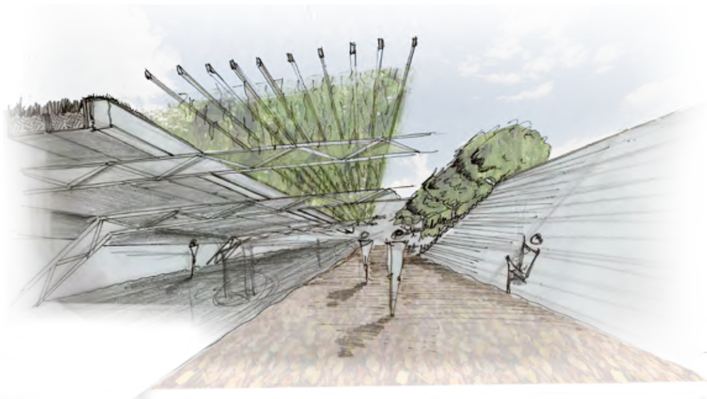


Figure 05 | 4. Outside open walkways and human spaces

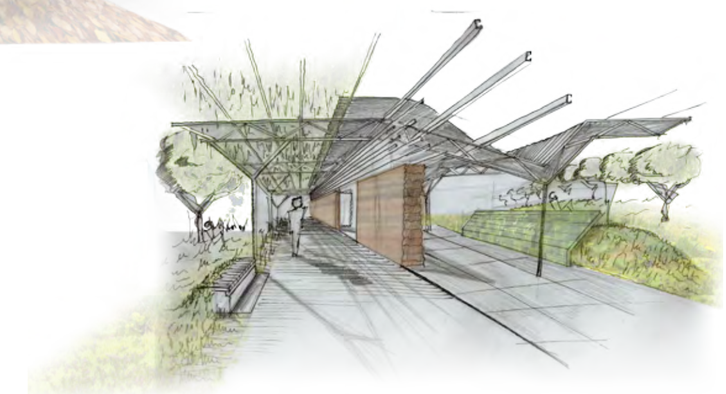
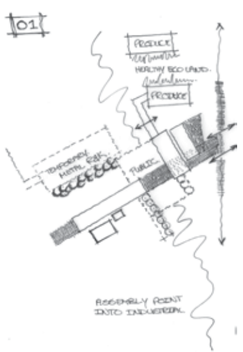


Figure 05 | 5. Terminal concept sketche

Figure 05 | 6. Planning 001



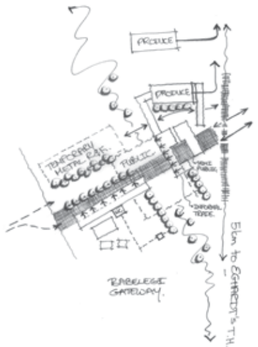
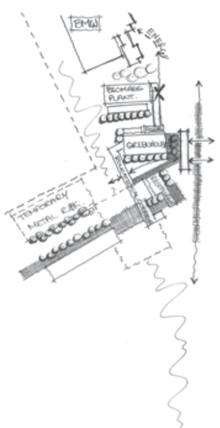


Figure 05 | 7. Planning 002

Figure 05 | 8. Planning 003



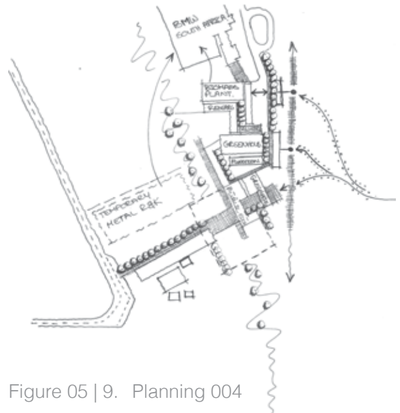


Figure 05 | 9. Planning 004

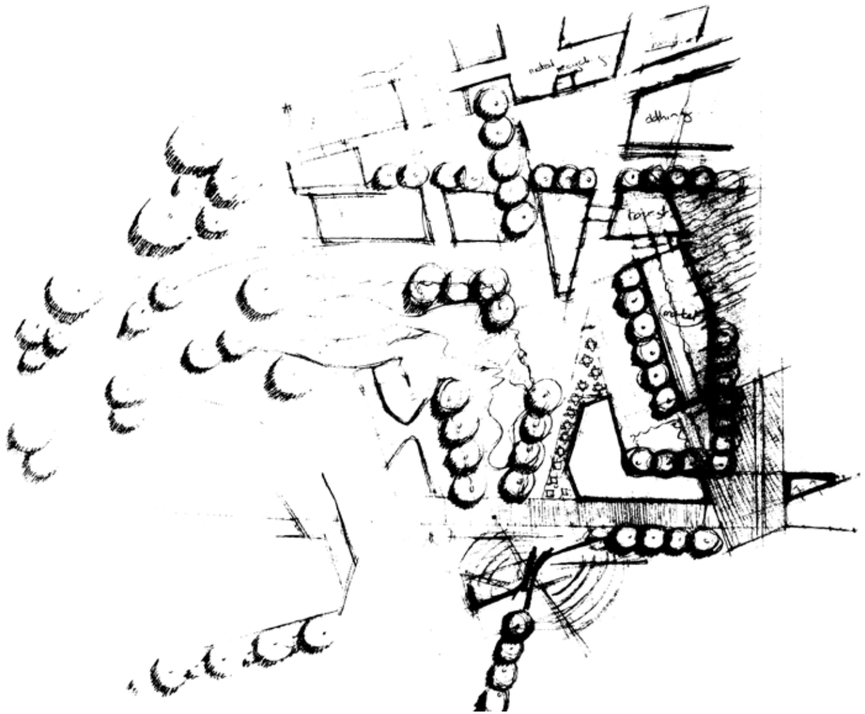
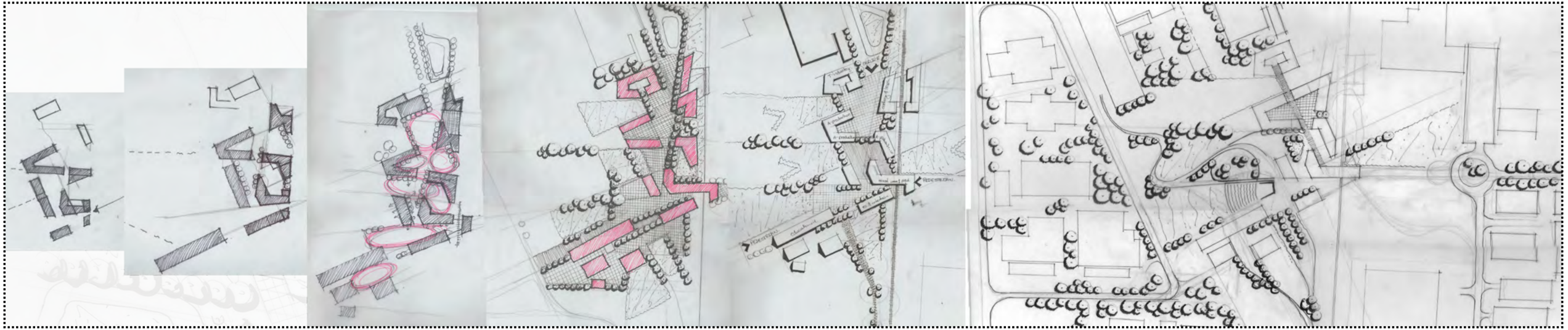


Figure 05 | 10. Initial planned landscape



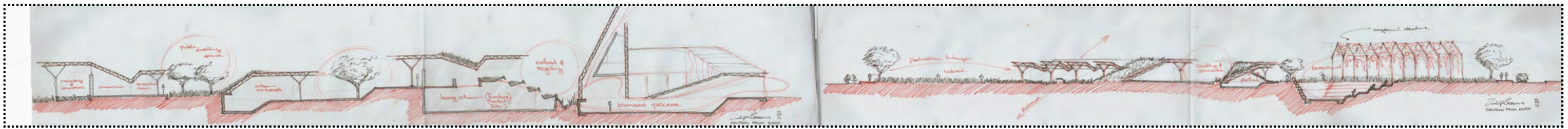


Figure 05 | 11. Concept development sequence

identifying the existing

The intervention is dependant on existing infrastructure and links in with adjacent industry. Therefor, it is essential to understand the condition. Structures used in the intervention is identified, as well as existing movement routes, spaces and nodes.

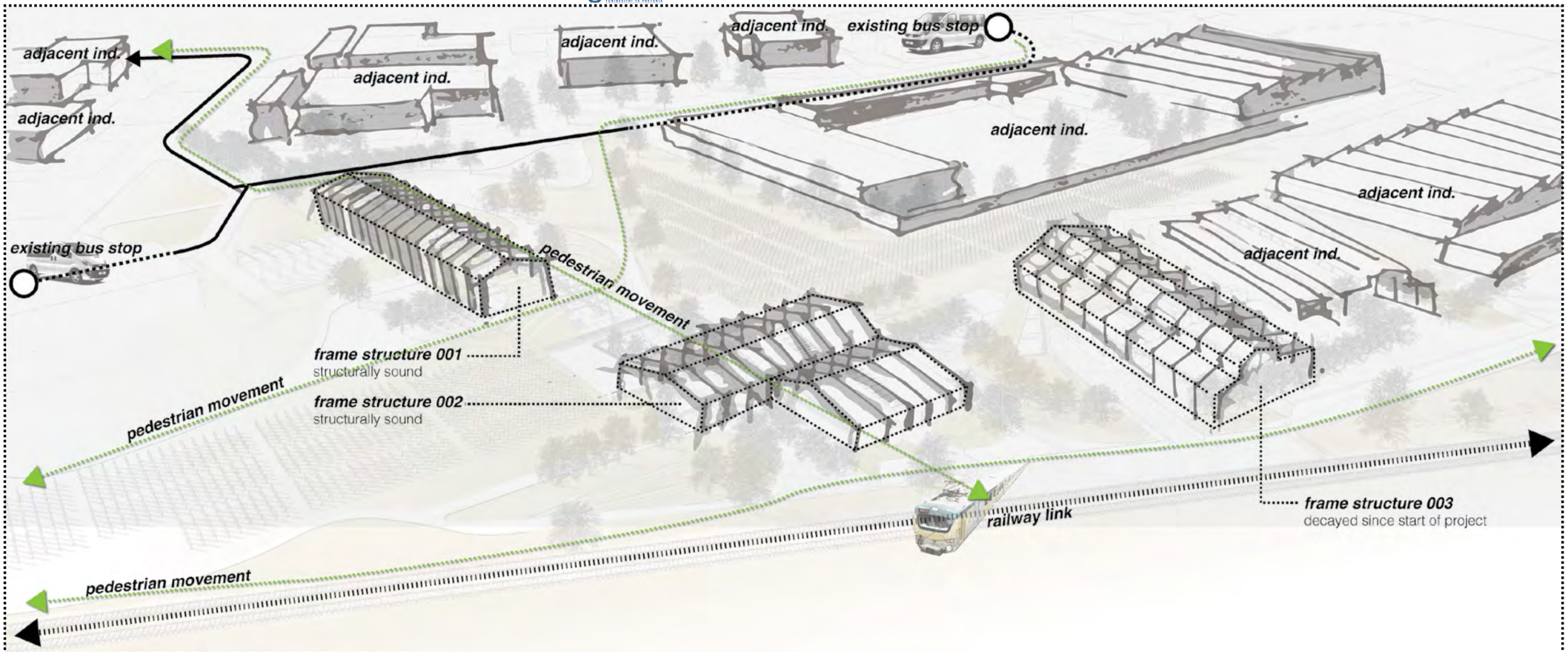


Figure 05 | 12. Identifying the existing

injecting new programme

Overlaying the existing the condition with new programmes deemed appropriate according to research in chapter 04.

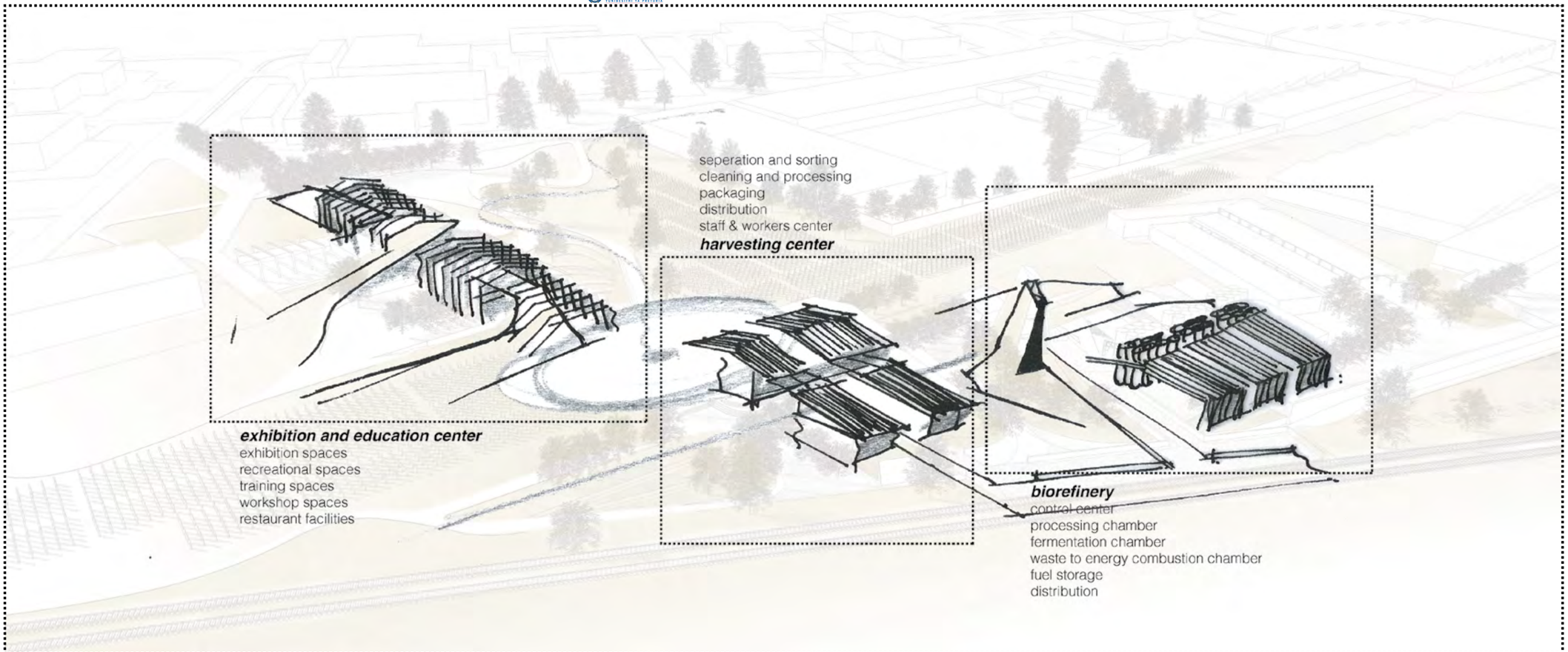


Figure 05 | 13. Injecting new programme

programmed character

The landscape is divided into three categories:
- multi layered space
- medium intensity industry
- high intensity industry

With the variation of programmes, it is neccessary to create spaces that are accessible by the public as well as spaces that are restricted to the public. Spaces are defined not through conventional methods of walls and borders. Instead, through differentiating the levels, floor coverings, and planted edges

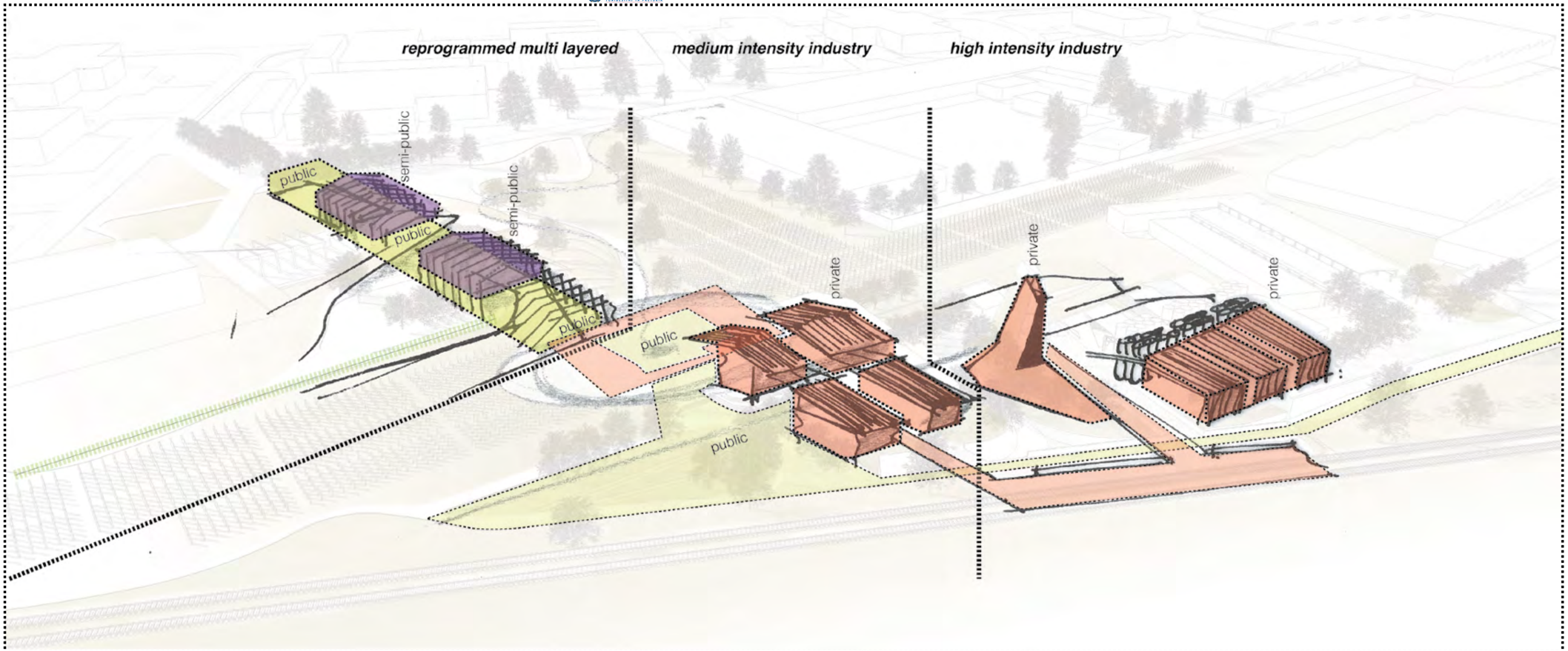


Figure 05 | 14. Programmed character

proposed movement

The spaces defined are through identification of existing patterns and the modification of these patterns into a collective systems of routes and spaces. These routes and spaces have different characteristics according to their proposed function, being either experiential or functional.

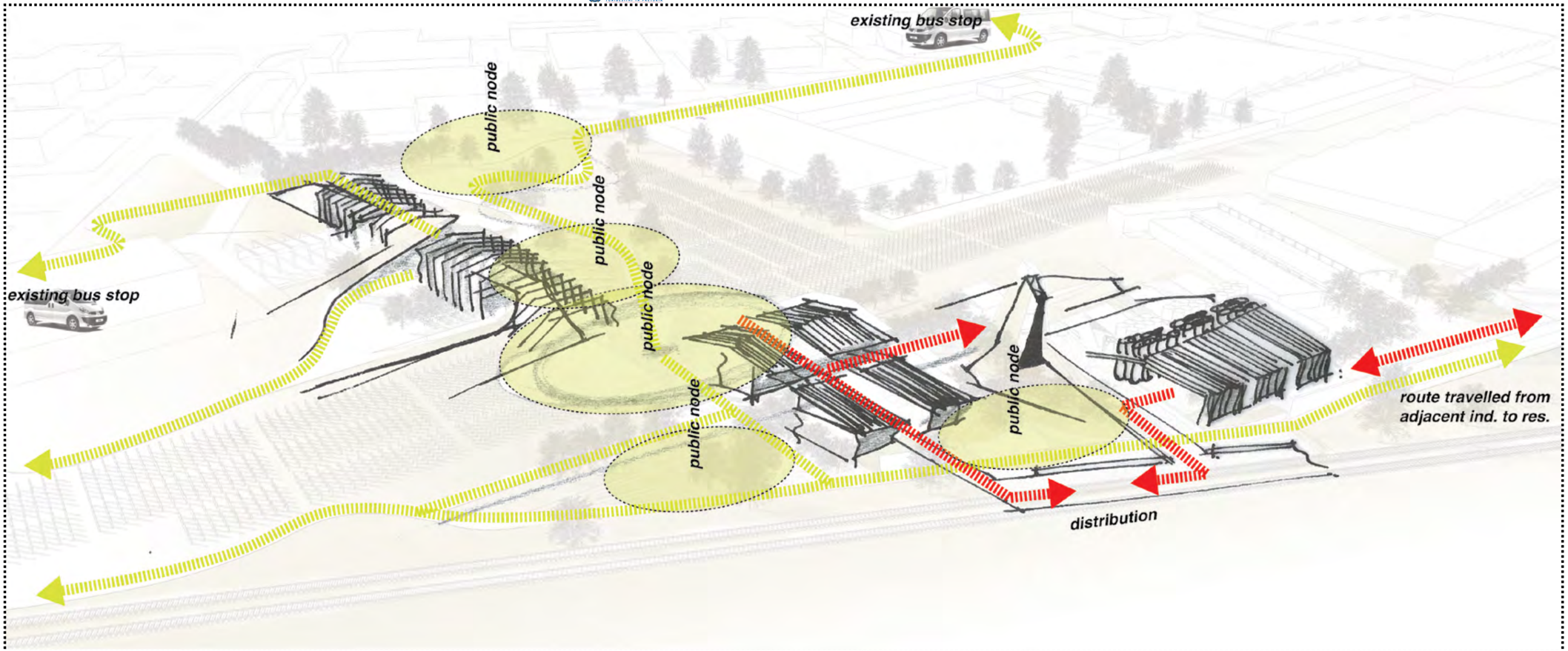


Figure 05 | 15. Proposed movement

reusing and reclaiming

The structures and materials that are reused in the intervention are identified. These materials are adapted to suite the needs of the proposed intervention and to supplement additional structures, spaces and enclosures.

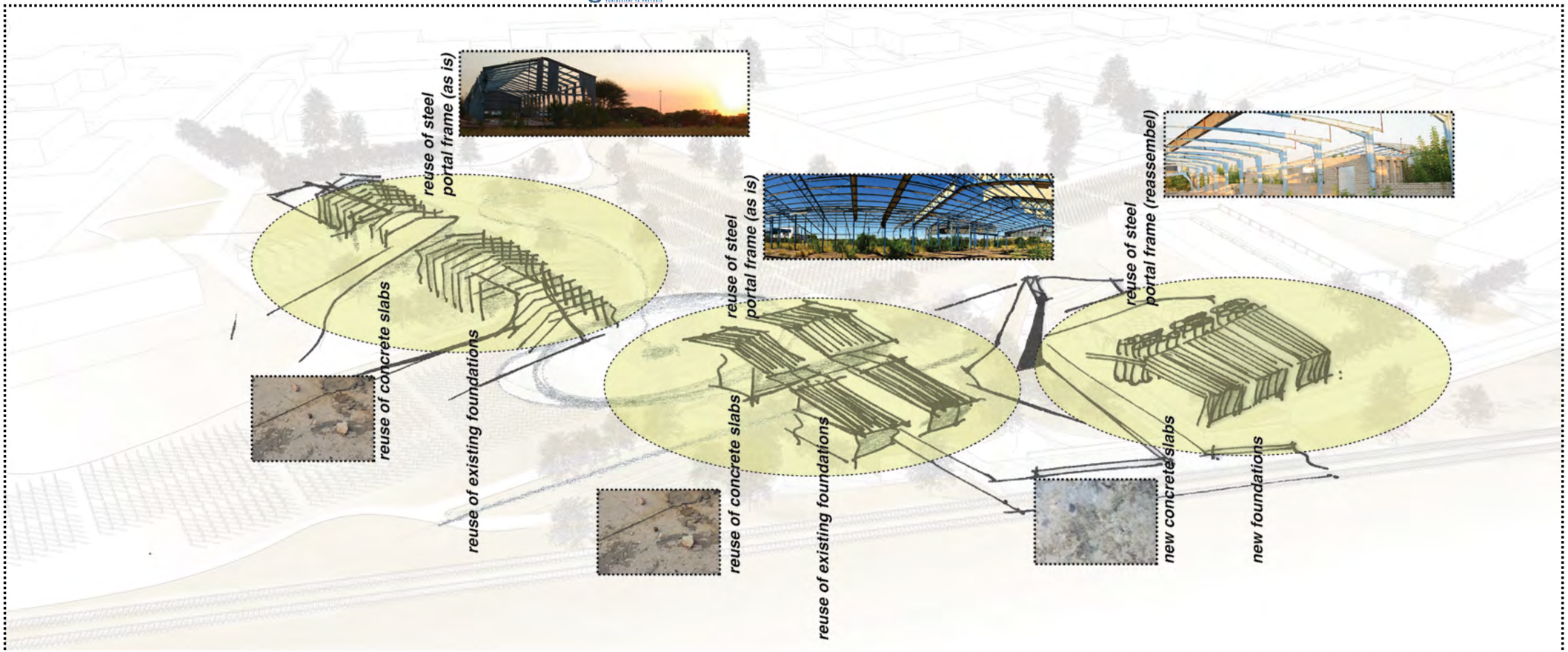


Figure 05 | 16. Reuse and reclaim

shaping the inbetween

Opposing the conventional typology of object architecture, the spaces that are in between the structures are designed to interact with them and to create usable and experienced natural spaces.

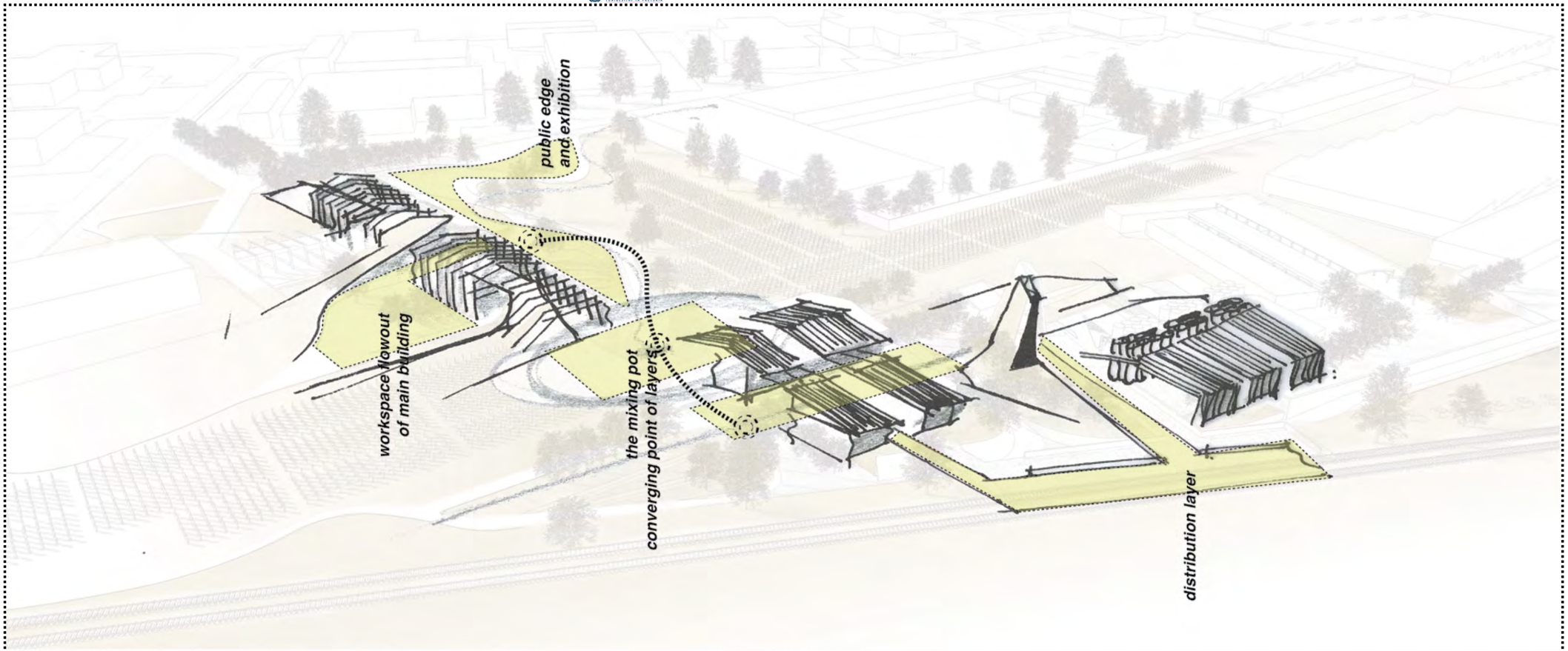


Figure 05 | 17. Shaping the inbetween

functional parti

The functional parti expresses the mixed use of spaces and how the aim to intersect one another in creating spaces that are multi-programmed, multi- layered and experienced in a new manner.

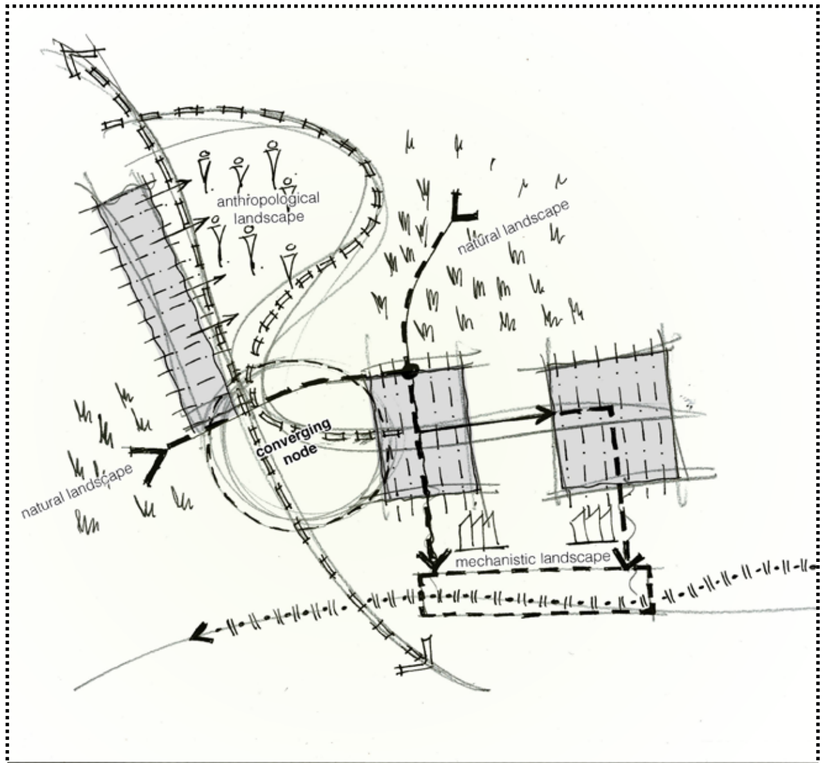


Figure 05 | 18. Functional parti

structural parti

All steel structures are reused and reprogrammed to facilitate new spaces within. Materials that are used to define spaces in the intervention are sourced from the site itself. Where the landscape is excavated, the earth is used and processed into rammed earth structures and adobe brick. Where the landscape is drawn into and over structures, indigenous plant species located on site are used.

The aim is to create a methodology of construction that is responsive to the available skills and materials locally on site.

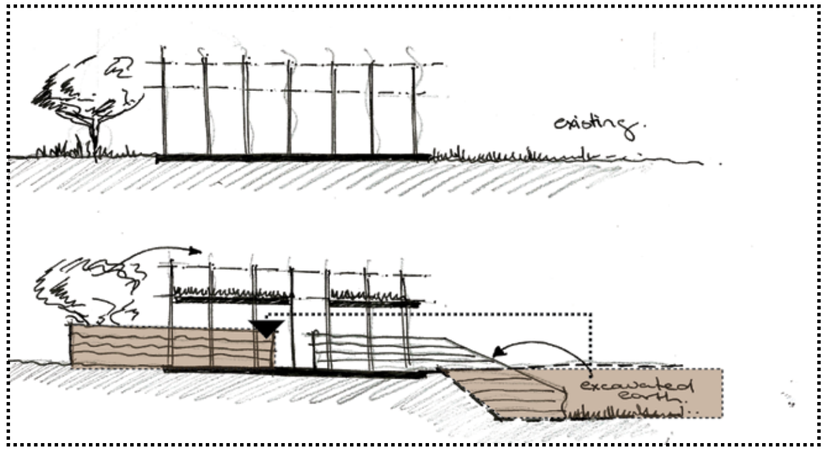


Figure 05 | 19. Structural parti

spatial parti

Spatial differentiation is defined through changes of levels. The public realm is on the ground level and follows the carved landscape, whereas the private spaces are located in the structures on the first floors.

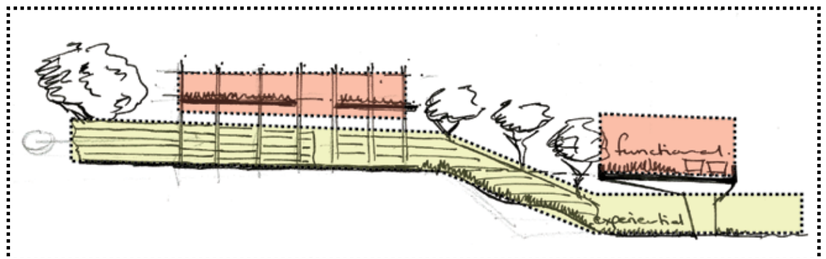


Figure 05 | 20. Spatial parti

Currently, the structures and natural landscape stand in isolation from one another. The materials that are available on site has the potential to be integrated into the intervention in collaboration with the natural landscape. The choice to integrate the natural landscape is to control internal conditions of spaces while overlaying a mechanistic landscape with the natural character of the pre-developed site.

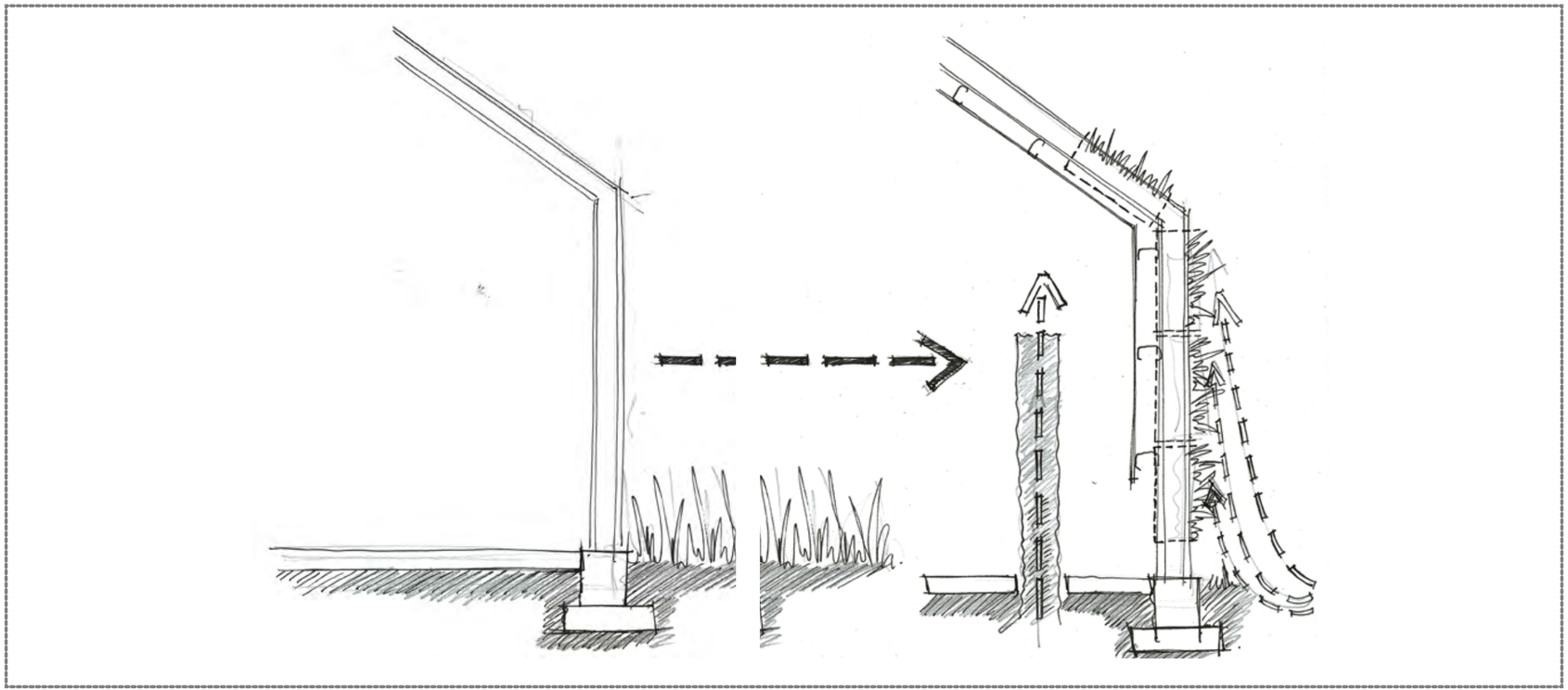


Figure 05 | 21. Material integration

06

Figure 06 | 1 Exterior view of entrance to education and exhibition center

intervention

intervention overview 001
exhibition & education centre 005
expression 005
plan 007
section 009
harvesting centre 011
expression 011
plan 015
section 017
biorefinery 019
expression 019
plan 021
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intervention conclusion 025

intervention overview

The intervention encompasses a large area of space and is divided into three distinct parts, being connected through experiential routes and spaces. These parts are categorized and expressed in fig x as follows:

exhibition and education centre
harvesting centre
biorefinery

These interventions have specific characteristics as they mediate between humanistic and natural spaces as well as the existing mechanistic landscape**, finally **arriving in spaces where the thresholds are indistinguishable and the three entities of space become a coherent whole.

Chapter 06 expresses the constructed intent; spatial intent; materiality; experiences; and functionality of the intervention.

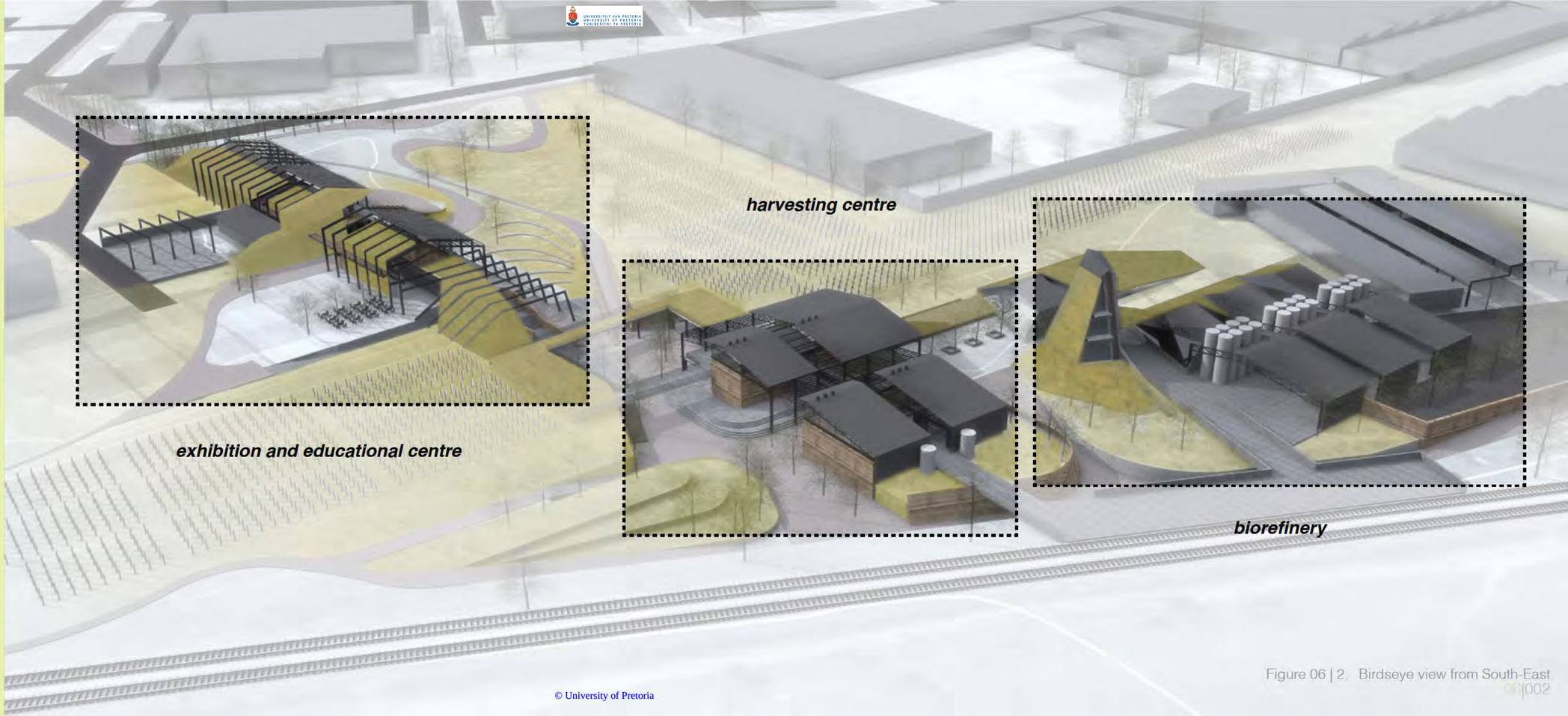
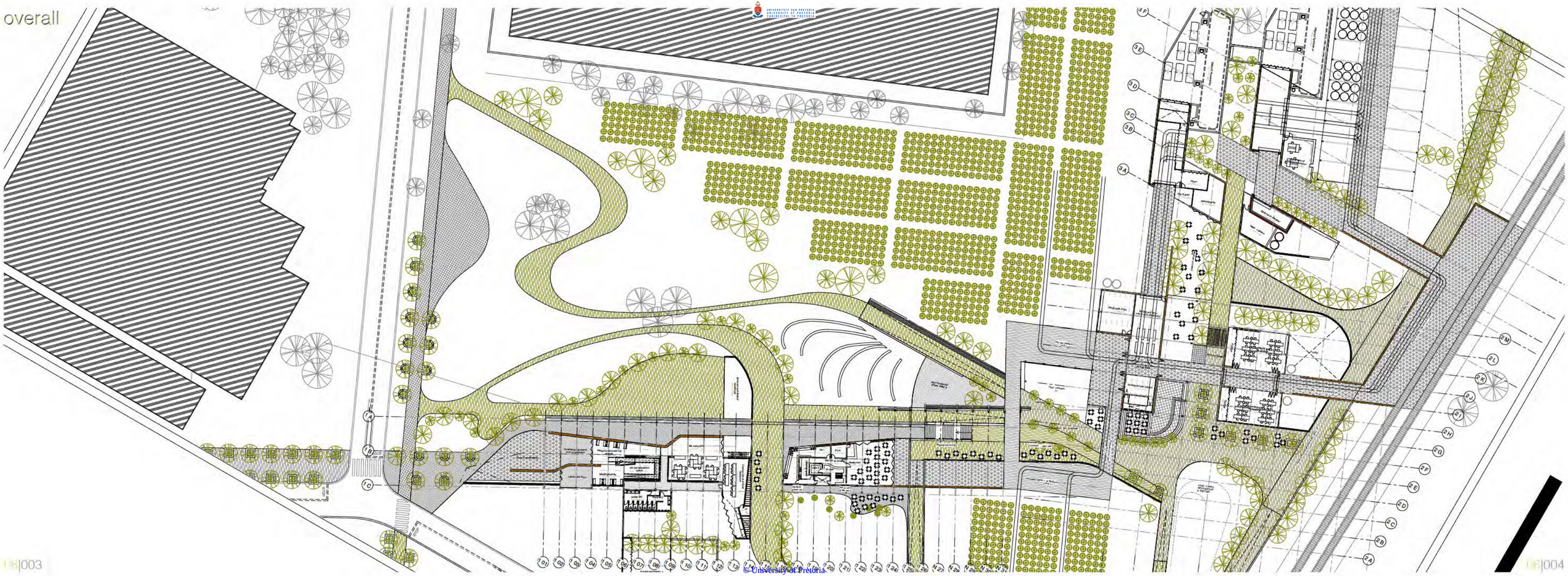


Figure 06 | 2. Birdseye view from South-East

overall



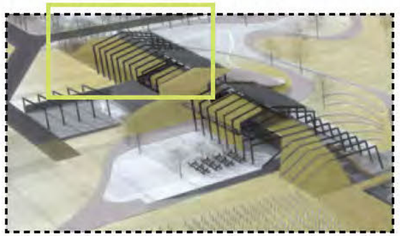


Figure 06 | 3. Birdseye view from South-East

The education and exhibition centre houses exhibition spaces that are of a quasi-internal-external nature and draws users through its various spaces with different characteristics. Furthermore, it houses training centres and workshop spaces where additional training is presented to the community wishing to join in the interventions long term goals.

The centre is of a public nature and is permeable and open to the community on ground floor, however, the centre is private on first floor, where administrative functionality takes eminence over publicly accessible space.

The centre flows out onto the open market court on its eastern edge, where its edge facilitates recreational activity, inclusive of a restaurant, organic deli and various small formal shops.

Figure 06 | 4. Exterior view of entrance to education and exhibition center

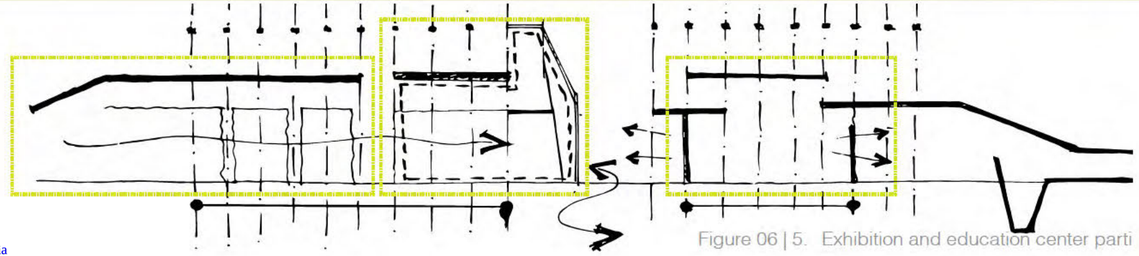


Figure 06 | 5. Exhibition and education center parti

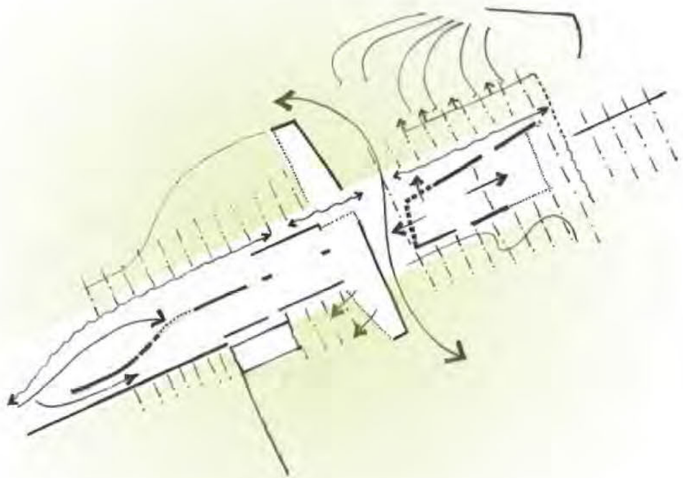


Figure 06 | 6. Education and exhibition center parti plan

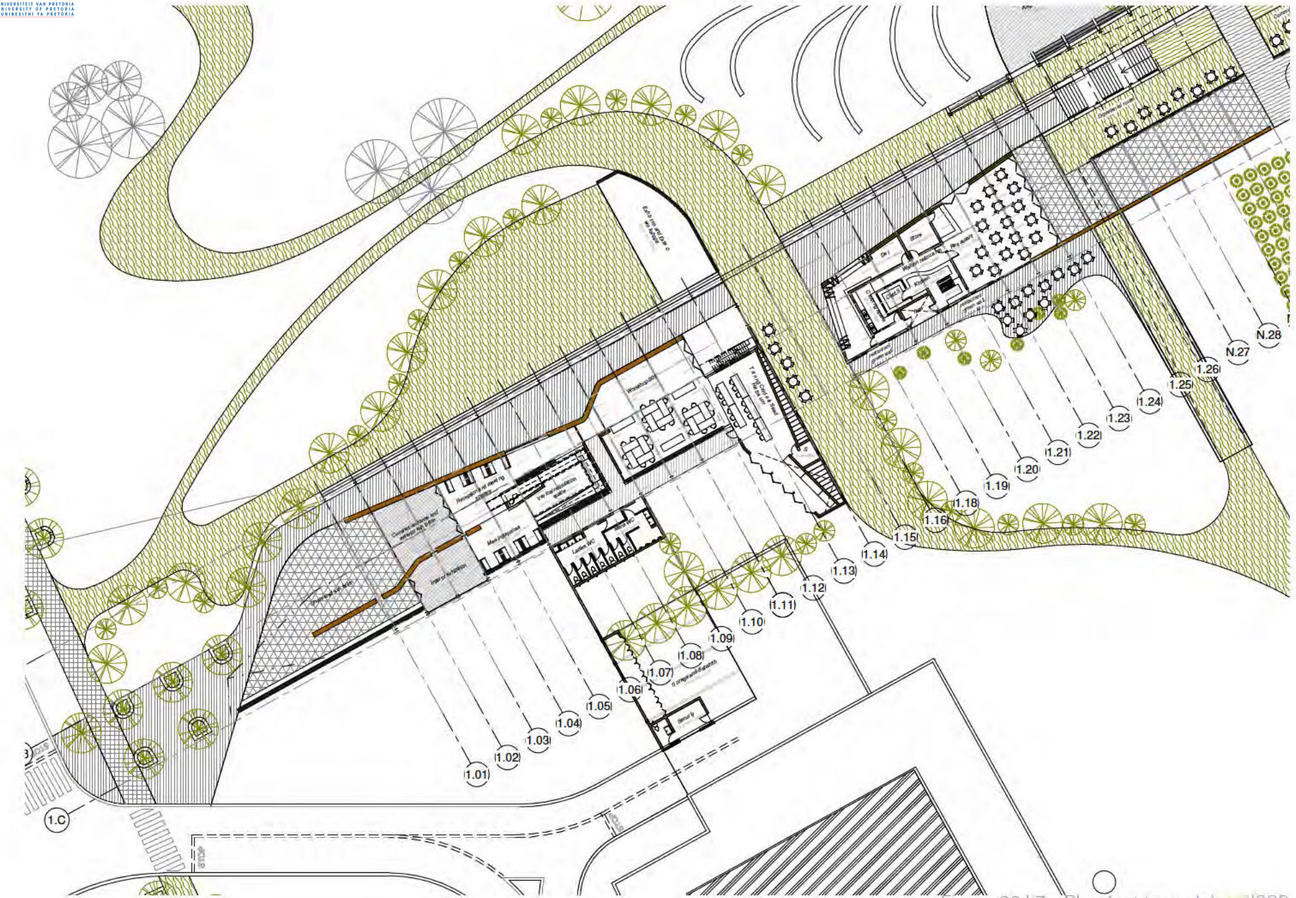


Figure 06 | 7 Plan (not to scale)

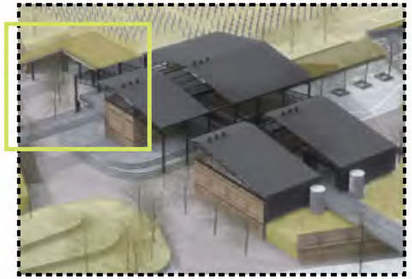


Figure 06 | 8. Birdseye view from South-East

The harvesting centre facilitates the equipment necessary for the harvesting process, along with the separation thereof. The biomass harvested is separated and distributed to either the biorefinery or the harvest process, packaging and distribution centre. From there it is transported to the local market or the commercial node South of the site via railway.

The facility also houses the spaces necessary for workers, inclusive of washing facilities, bathrooms, lounge and canteen.. The harvesting centre forms an edge for the converging centre where the various layers meet one another, therefor, access to the facility is restricted, while the edges form secondary functions for the informal market space.

Figure 06 | 9. The converging center of industries

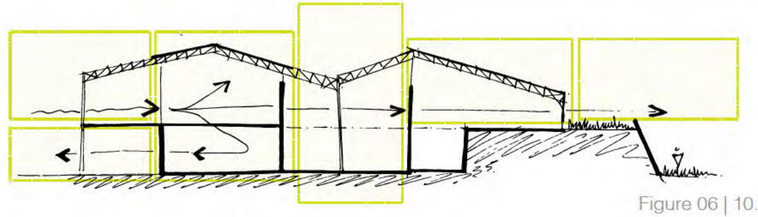


Figure 06 | 10. Harvest center parti

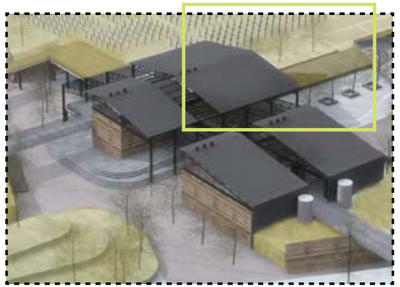


Figure 06 | 11. Birdseye view from South-East

Figure 06 | 12. Harvesting center to biorefinery link

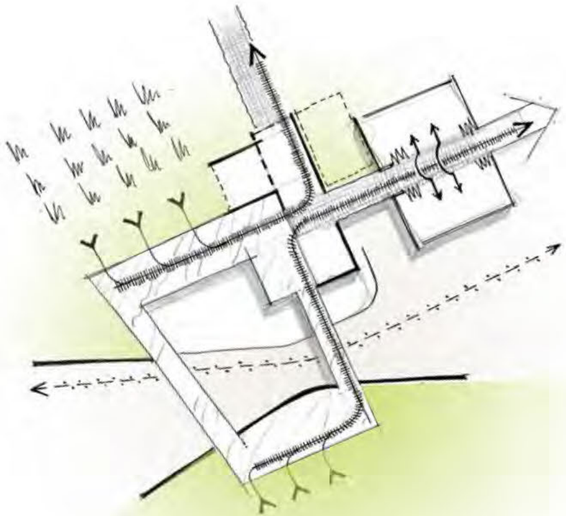


Figure 06 | 13. harvest center parti plan

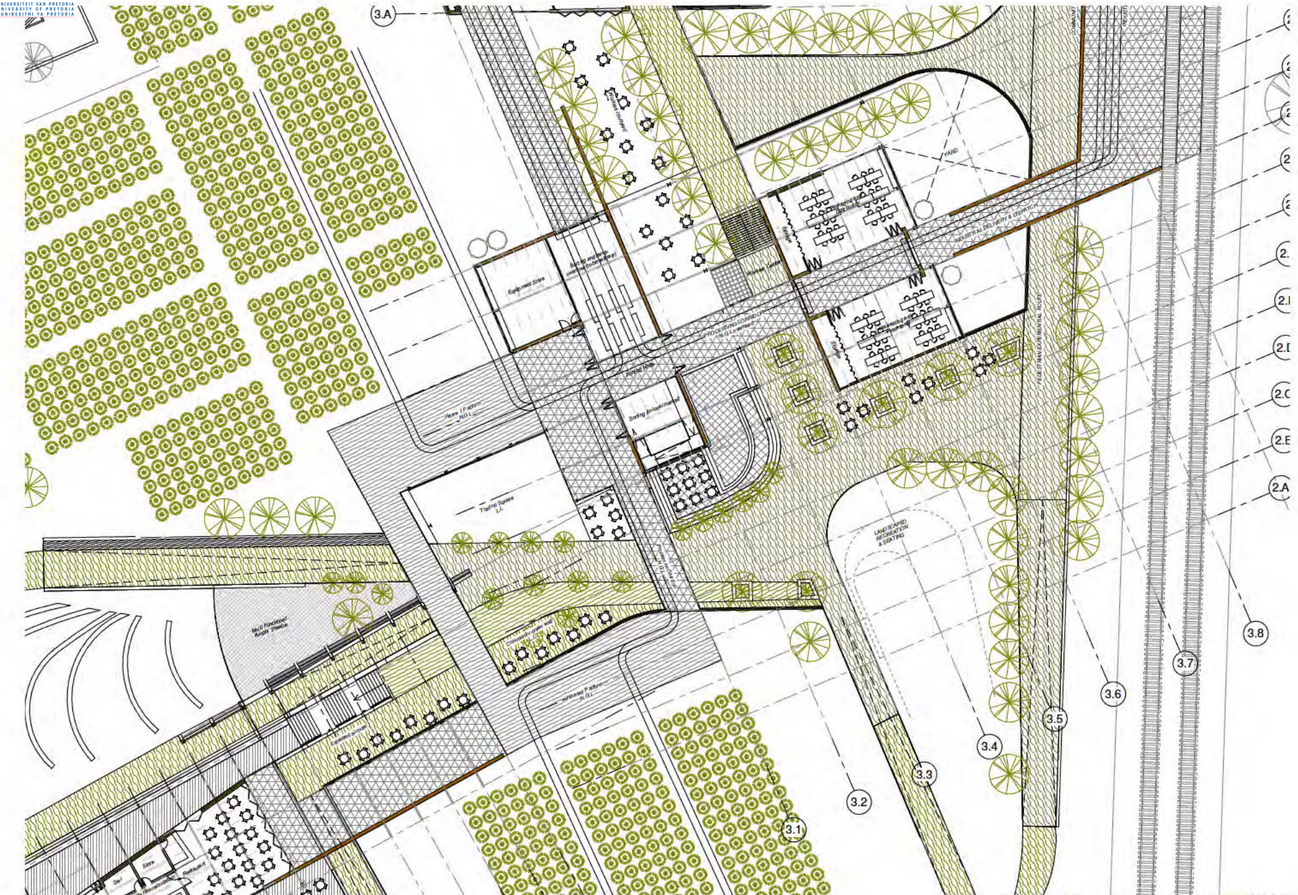
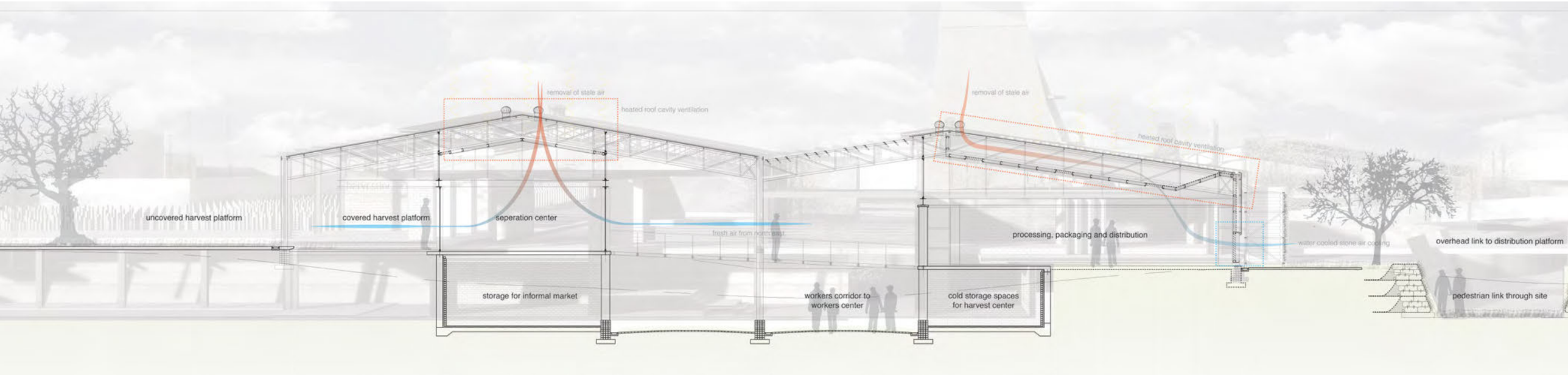


Figure 06 | 14. Plan (not to scale)



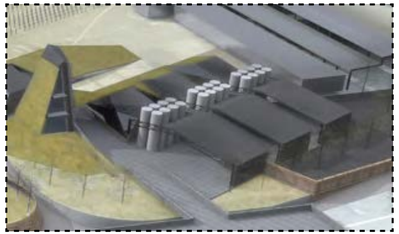


Figure 06 | 15. Birdseye view from South-East

The biorefinery is the final step in the processes facilitated for on the site. This is the production node for biofuels and the waste-to-energy conversion process. From here, energy is distributed to the adjacent industries. Biofuels are stored and transported via railway to the southern commercial node in Hammanskraal.

The majority of spaces in the biorefinery are of a mechanistic nature, therefor, spaces are lowered into the landscape to minimize the visual impact on the landscape, while allowing secondary surfaces to be populated by the natural landscape. Access hatches are provided for spaces which require regular maintenance.

The biorefinery serves as the catalytic activator for adjacent industry through provision of sustainable energy for the area, while recycling the majority of waste created in the industrial area.

Figure 06 | 16. Biorefinery

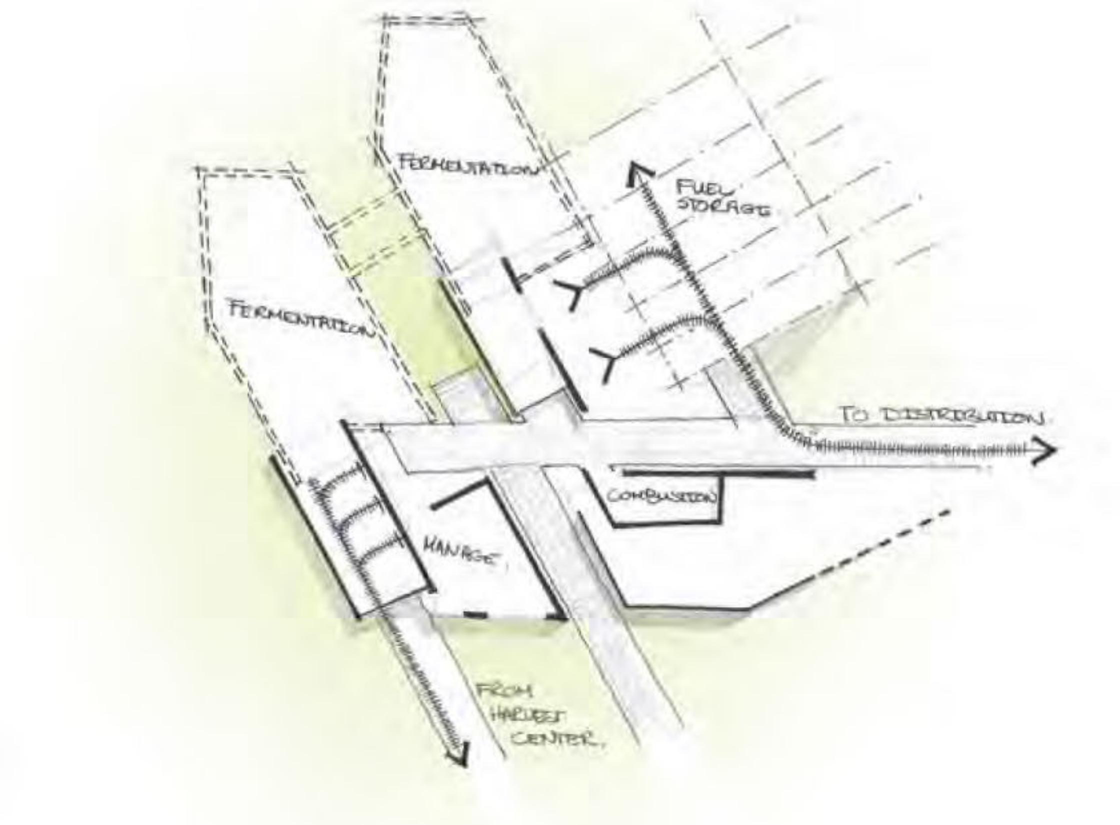
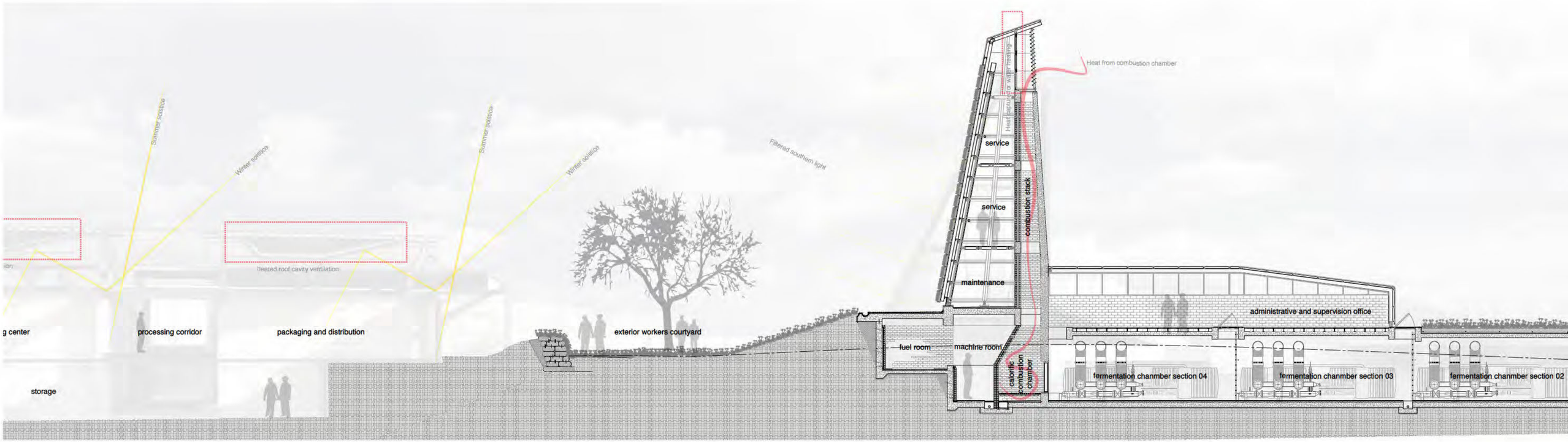


Figure 06 | 17. Biorefinery parti plan

Figure 06 | 18. Plan (not to scale)



intervention conclusion

The intervention aimed at ***creating spaces that facilitate the natural layer, the anthropological layer and the mechanistic layer***. These spaces and space defining elements draw from all the layers. ***The spaces created are collaboratory to one another in the experience it provides to the user of spaces that would previously be unaccessible or restricted***. While allowing the general user access to the site, functionality is facilitated and feasibility of the programme is justifiable.

The intervention influences the immediate industrial as well as residential zone, ***creating a reclaimed landscape and acting as a catalytic space for adjacent industry to respond accordingly, providing growing career opportunities to the nearby community of Hammanskraal***

07

Figure 07 | 1_ blueprint section by author

technical

structure and skins 001
materials from reuse & site resources 005
natural materials 007
specialist materials 009
comfort management 011
sectional explorations 013
technology applications & systems 021
SBAT 029
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education and exhibition centre edge 033
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structure and skins

The section deals with the sourcing of materials used in the intervention. It includes the materials that are available on site, the materials generated from the sites resources, specialist materials that need to be brought onto the site and finally the natural indigenous materials reintroduced to the site.

The choice of materials and the collaboration between them is one of the main driving factors in achieving the theoretical ideal investigated.

The very nature and character of the materials reflect either the mechanistic, natural or anthropological qualities of the intervention.

These materials are categorized according to proximity, either being sourced on site or being imported from outside the site.

The chapter investigates:

- method of construction / sourcing
- structural or screening
- thermal qualities
- water characteristics
- lifespan and durability

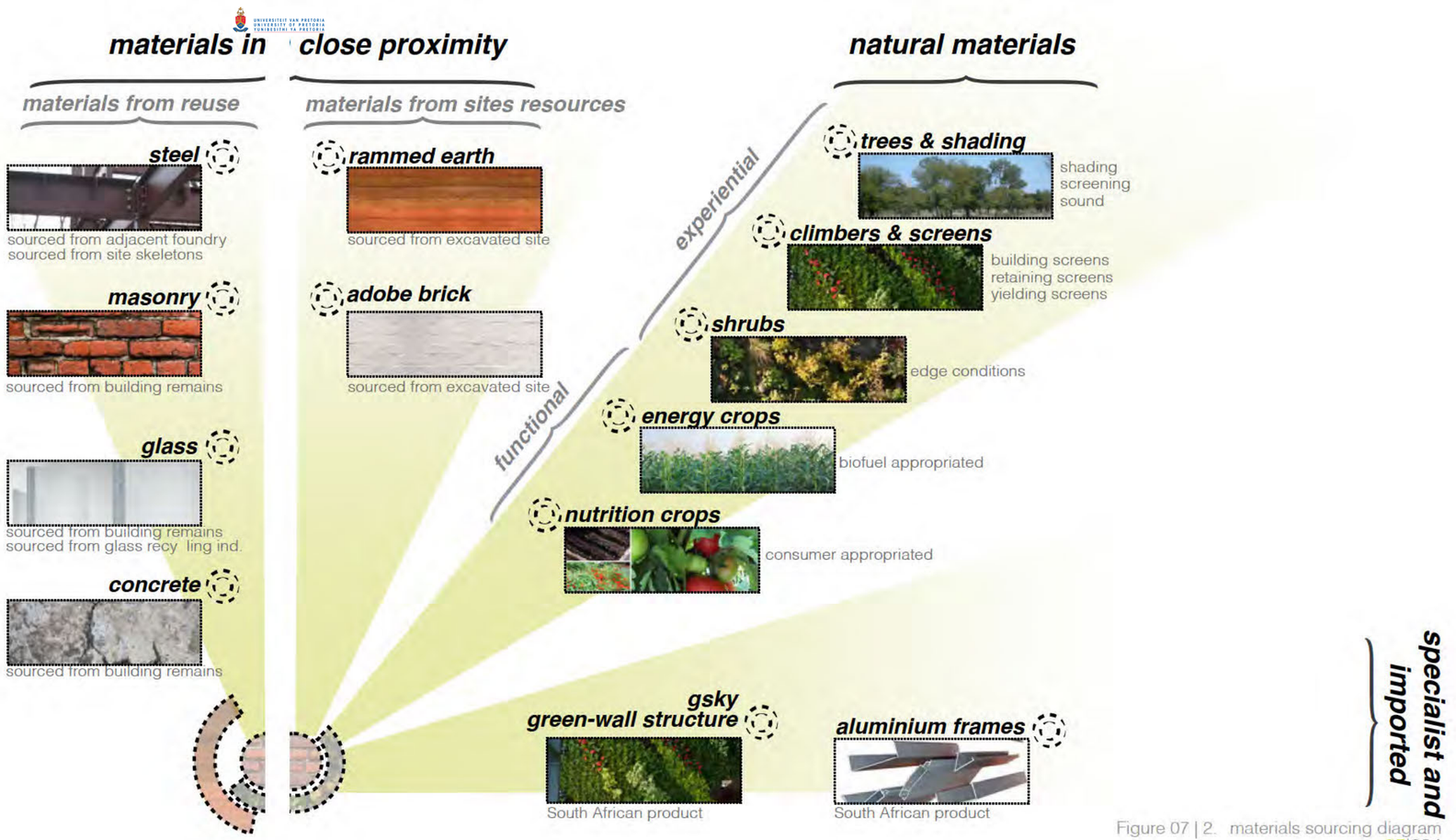


Figure 07 | 2. materials sourcing diagram

materials from reuse

Figure 07 | 3. steel beams on site

Steel

The site houses predominantly steel remains in the form of structures and steel sheeting. Most of the structures are still in a good condition and is able to be adapted to fit the needs of the interventions intent. Steel that is not usable and steel that is sourced from the nearby junkyard 100m North of the site is transported to the foundry located 800m North of the site, where it is smelted and used to create new sections used in the intervention.

The construction of additional steel frames and interjecting members within the original steel frames are phase 1 of the entire project to create viable structural enclosures to protect the earth construction following excavation.

Figure 07 | 4. masonry remains on site

Masonry

Masonry is used sparingly in the intervention, mainly as infill in spaces that require modular entities and applications where it will not be visible or have a major impact on the design rational. All masonry used are sourced from site and cleaned to be used again in the intervention.

- Masonry is used in applications where thermal value is of negligeable impact.
- All masonry is enclosed and protected from the elements and DPC is used where deemed appropriate.

Figure 07 | 5. glass panels

Glass

Glass is used primarily in the tectonic sections of the intervention. Furthermore, it is limited to the private realm (first floor and higher) to prevent damage and breakage by users that have gained access to the site.

- All glass is enclosed and shaded appropriately, therefor no specialist glass is used.
- All glazing to be 12mm safety glass.

materials from site resources

Figure 07 | 6. earth construction underway

Rational behind earth construction:
The decision in using earth construction as the main vertical space defining elements is the rational of using the sites resources in providing for the construction of the intervention. Furthermore, earth construction is a sustainable building practice. It expresses the very nature of the material in its true form which is essential for the intervention.

Appropriate soil conditions
The soil conditions of the Hammanskraal region serve as a suitable medium from which earth structures can be formed and created.

Benefits
- Availability
- Low embodied energy
- Pollution free
- Non-intrusive
- Non-toxic
- Low U-value

(SINHA 1992: 46)

Figure 07 | 7. sirewall rammed earth

Rammed earth

Rammed earth structures are used predominantly as main vertical elements that intersect the intervention, as well as in defining spaces where limited work traffic is present.

All rammed earth structures are enclosed to protect them from the elements. Where the rammed earth structures extend beyond the roof lines, they are sealed.

The material has a unique and rich character that extends the language of the site, the theory and the intent.

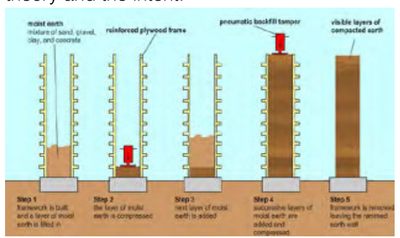


Figure 07 | 8. plastered adobe bricks

Adobe brick

Plastered adobe bricks are used in spaces that have higher work traffic and where compacting of rammed earth structures are not viable. Adobe bricks are created on site and create additional job opportunities for the immediate community.

The additional benefits of adobe bricks are the variability of size in construction. It is inexpensive to create and has a low U-value which deems it as a highly viable alternative to brick construction in spaces where thermal comfort is of importance.

Maintenance is required on earth structures, and therefor they should be properly protected against the elements and managed by personal on site to ensure durability in its life span.

experiential

Figure 07 | 9. acacia trees in near proximity

Trees

The choice of trees are defined by the type of function and experience intended. Trees are sourced locally as there is a large flora body in the Hammanskraal region.

Tall trees are intended for shading purposes where people congregate under and include:

- Acacia burkei
- Acacia robusta
- Sclerocarya birrea subsp. caffra

Short trees are intended for restricting edge conditions as well as sound barriers. they include:

- Burkea africana
- Combretum apiculatum
- Combretum zeyheri
- Terminalia sericea
- Ochna pulchra
- Pelrophorum africanum
- Rhus leptodictya

Figure 07 | 10. GSKY greenwall system

Climbers and screens

Climber flora is used in direct application with the artificial construction. It serves as seasonal screening and assists in regulation of internal conditions

The climber plant identified that has the best resiliancy year round, as well as most appropriate for architectural application is:

- Aparagus buchananii

Figure 07 | 11. Semiahoo shrubs on site

Shrubs

Shrubs are used to define edge conditions; define movement routes and demarcate territories identified as being private or public.

Tall shrubs define more definite spatial territories, both accesibly and visually. They include:

- Combretum hereroense
- Grewia bicolor
- Strychnos pungens

Short shrubs define spatial territories while allowing visual continuity. They include:

- Agisanthemum bojeri
- Indigofera filipes
- Felicia fascicularis

functional

Figure 07 | 12. biofuel crops

Energy crops

The choice of crops are determined by the maximum energy yield per hectare, as well as the availability of crops in the region

The crops used as biomass include:

- maize
- potatoes
- wheat
- grasses

Figure 07 | 13. community garden

Nutrition crops

The choice of materials and the collaboration between them is one of the main driving factors in achieving the theoretical ideal investigated.

The very nature and character of the materials reflect either the mechanistic, natural or anthropological qualities of the intervention.

These materials are categorized according to proximity, either being sourced on site or being imported from outside the site.

The chapter investigates:

- method of construction / sourcing
- structural or screening
- thermal qualities
- water characteristics
- fire resistance
- life span and durability

All abovementioned trees, shrubs, climbers energy crops and nutritional crops are indigineous to the region (COERTZEN, 2012)

Figure 07 | 14. GSKY greenwall system

GSKY Green wall system

The flexible, modular system can be installed on virtually any outdoor surface in any hot or cold climate, and is designed to resist heavy winds and wind driven rain. Built for quick and simple deployment, the GSky Smart Wall system is naturally beautiful, environmentally friendly, durable, easy to maintain and remarkably economical.

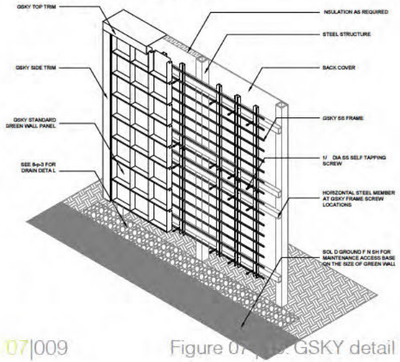


Figure 07 | 15. GSKY detail

1. Stainless steel panels can be customized to fit any design or wall type.
2. Non-soil structural growth medium is non-eroding to ensure plant longevity, and much lower maintenance than loose soil systems.
3. Plants as per region specification
4. Remote irrigation system with temp. and moisture sensors. High efficiency since water is used only when needed.
5. Stainless Steel Frame Wall Mounting System

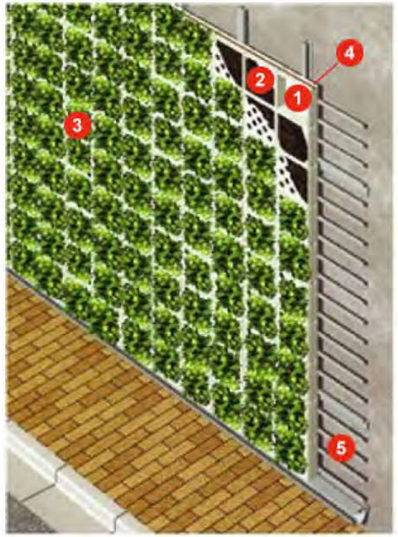


Figure 07 | 16. GSKY panel construction

The system is chosen for its low U-value, high thermal comfort levels, self manageability and indigenous adaptability. The system is installed as a clip-on to the existing steel structure, and is appropriate for both internal and external conditions.

The nature of the material expresses the theoretical ideal concerning the integration between mechanistic and natural materials. It furthermore integrates the user to space defining entities through biophilic principles.

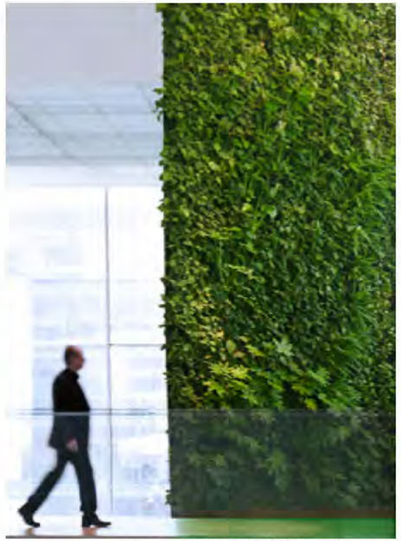


Figure 07 | 17. GSKY application

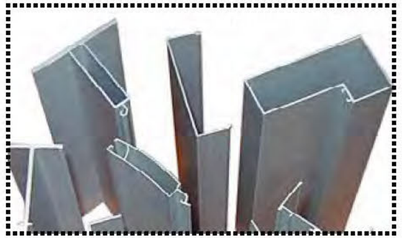


Figure 07 | 18. aluminum extrusions

Aluminium

Aluminium is used for window frames and is chosen as the most appropriate material due to its high durability with limited required maintenance. All aluminium is transported to the site as there are no options available in a 10km radius.

comfort management

The section investigates the methods of comfort management in spaces, as well as the technologies used to assist therewith.

The comfort levels of the education and exhibition centre are of high importance as it is a space for human experience.

Solar gain and lighting

The orientation of the structure is aligned East-West to capitalize on the North sun during the majority of the day. Seasonal shading screens assist in regulation of internal thermal conditions by allowing the sun to penetrate the interior of space during the winter periods, and by screening the sun during summer periods.

Clerestory south openings allow for diffused southern light to penetrate the interior with no additional solar gain

Ventilation and cooling

The enclosure is permeable at the lowest and highest points to allow for natural ventilation. These openings are user operable to ensure conditions suitable to the specific occupants at any specific time. Cooling is provided through watered stone components as detailed in fig.07|24

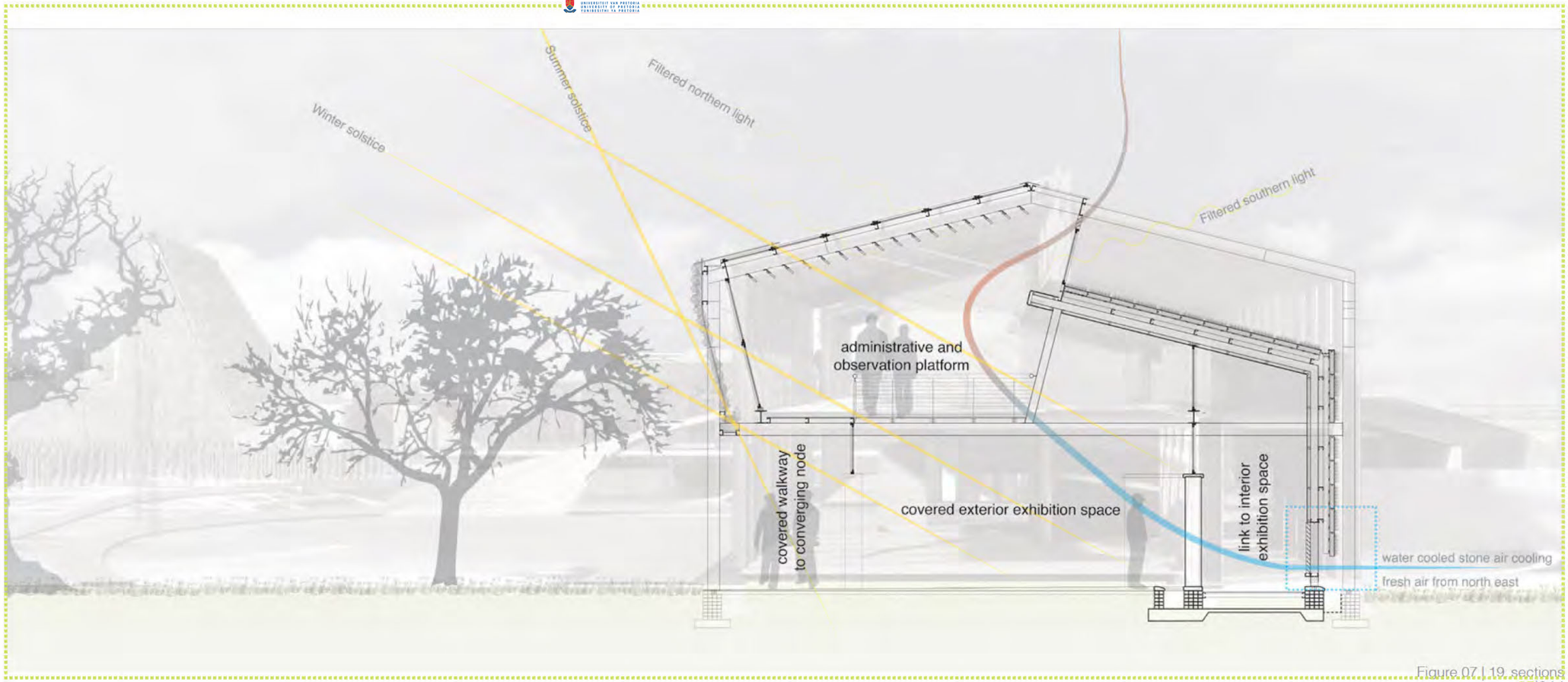
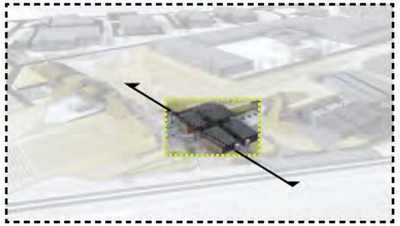


Figure 07 | 19 sections



The comfort levels of the harvesting centre are of high importance as it is the space that will be used mostly by human occupants in a working function. Therefor, the space needs to be cooled and heated appropriately throughout the year.

Solar gain and lighting

Natural lighting penetrates the enclosure from the north. It is managed through light-shelfs that allow direct sunlight during the winter and diffused sunlight during the summer. The space is furthermore naturally lit through the clerestory that wraps around the space and is shaded to prevent glare.

Ventilation and cooling

Natural ventilation happens through similar watered stone cooling components on the lowest point of the enclosure. The air is draw through the space and upwards through the use of heated roof cavities. (fig. 07|28)Passive ventilation is mechanically assisted to ensure optimum efficiency all year round.

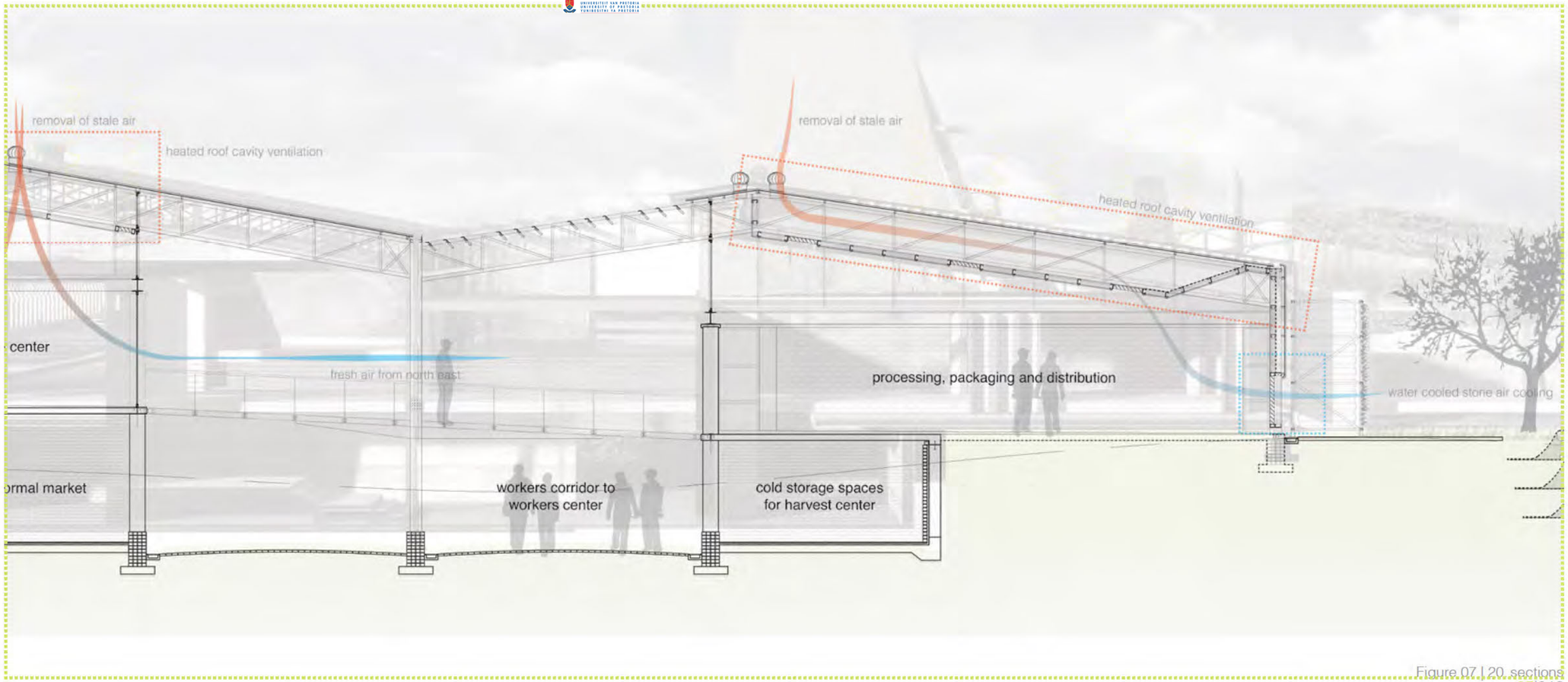
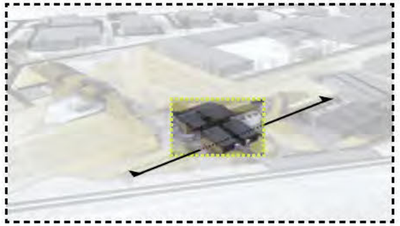


Figure 07 | 20 sections



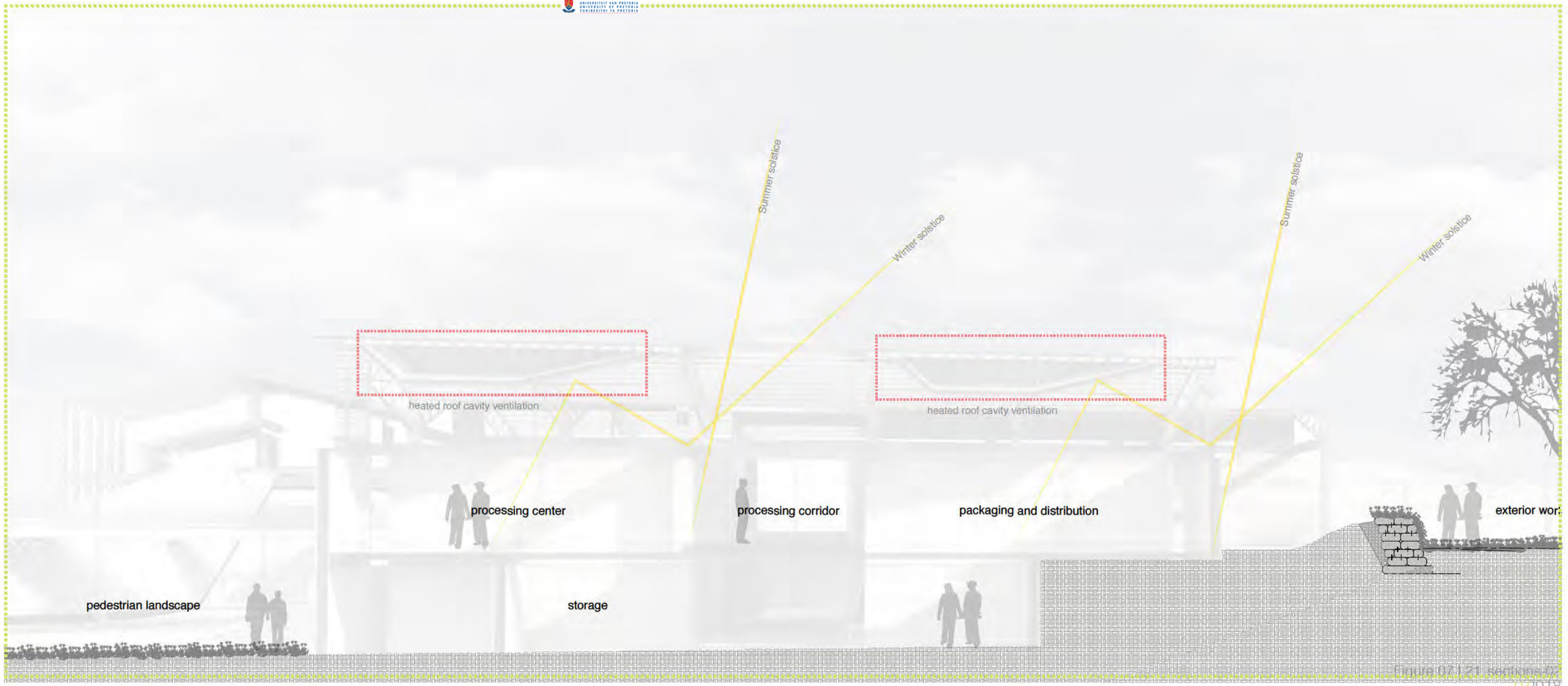
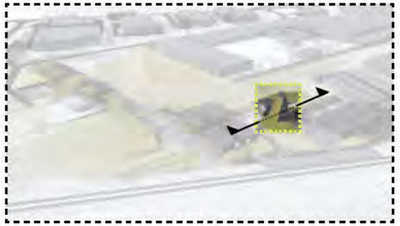


Figure 07.21 sections 02



The comfort levels of the biorefinery are not of a similar nature to the education and exhibition centre, or to the harvesting centre. The biorefinery is predominantly mechanistic in nature and functionality, therefor conditions are less strict. However, spaces that house occupants responsible for management and monitoring needs to be comfortable.

Solar gain and lighting

Natural lighting is provided in user occupied spaces and spaces where regular maintenance is to be conducted. (filtered southern lighting)

Ventilation and cooling

Limited ventilation openings are present to assist in capturing fermentation gasses that are used in the combustion process. Spaces with users are ventilated to the outside.

Heat generation

Heat is captured on the vertical facades of the combustion chamber outlet and used in the catalytic optimization process to ferment biomass more rapidly.

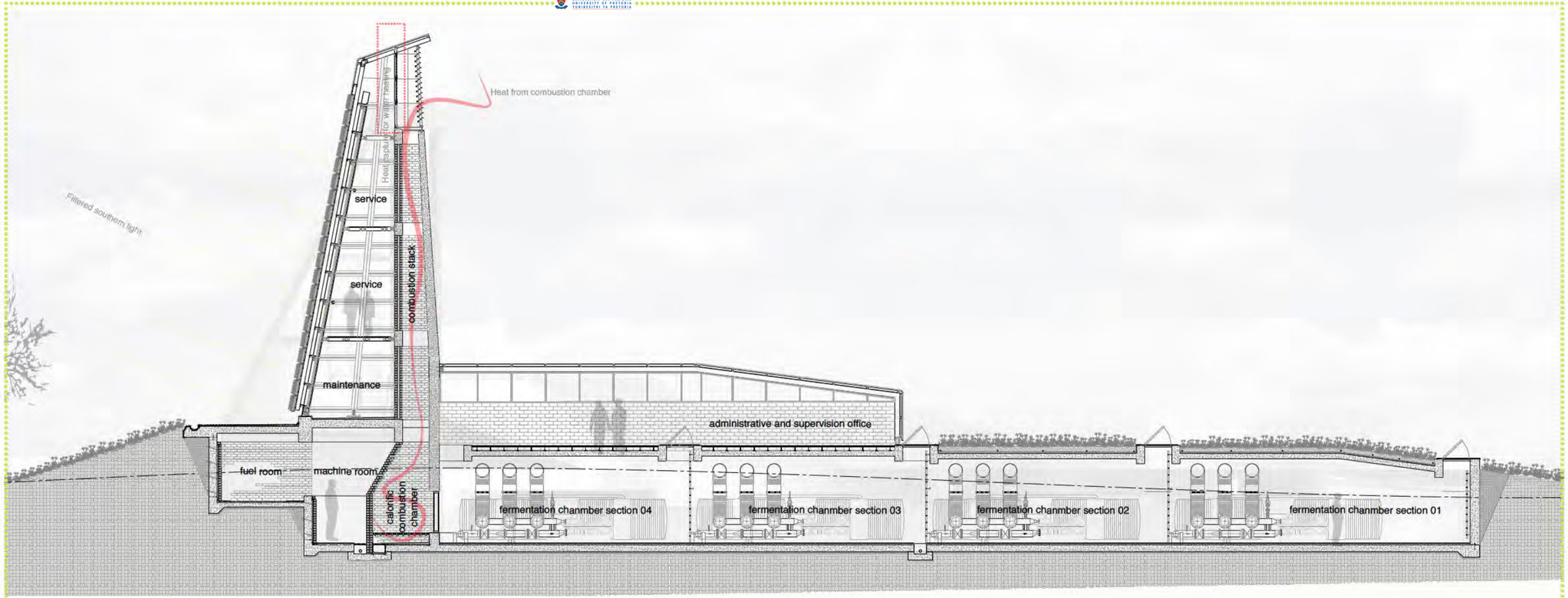
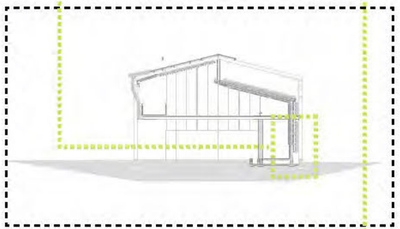
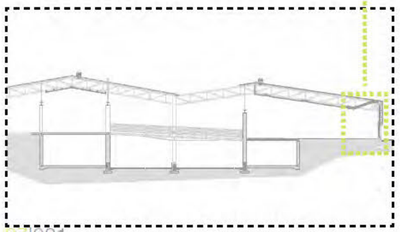


Figure 07 | 22. sections-02

ventilation

Figure 07 | 23. Birdseye view from South-East





water and stone cooled system

Air drawn from the exterior passes through the system where it is naturally cooled. Water is dripped at regular intervals over stones stacked in a galvanized steel mesh. The amount of air that passes through the system is user controlled and can be managed according to the season and the required internal conditions.

The system is located in spaces that require specific thermal comfort levels for human occupancy.

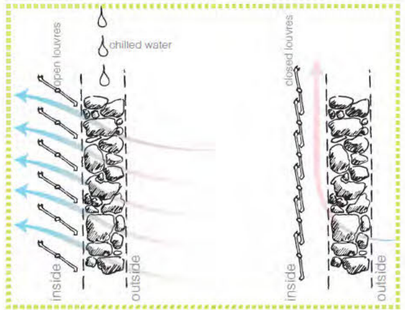


Figure 07 | 24. diagram of stone cooled system

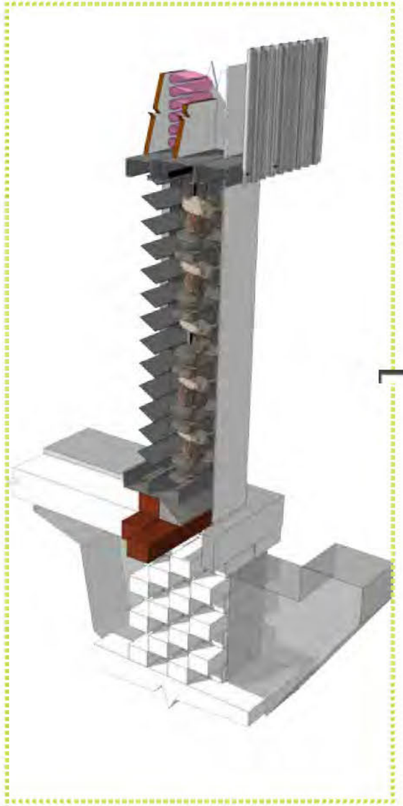


Figure 07 | 25. 3D stone cooler

water and stone cooled system

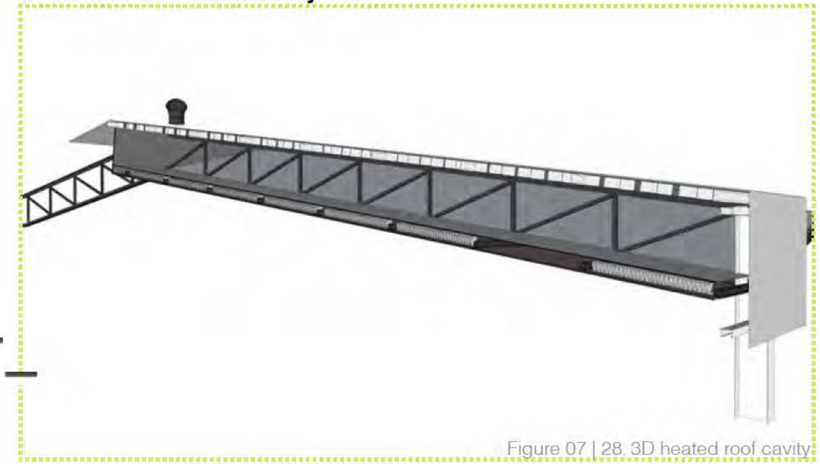


Figure 07 | 28. 3D heated roof cavity

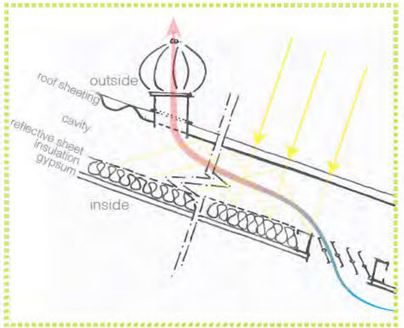


Figure 07 | 26. heated roof cavity

Stale air is removed through a heated roof cavity. By allowing solar heat to penetrate the cavity, and controlling the transfer of heat to the interior, cool air is drawn upwards and out through mechanically assisted vents.

Heat is retained in the stereotonic structure through the use of a honey comb steel grid filled with massed geo-gel.

collaboration

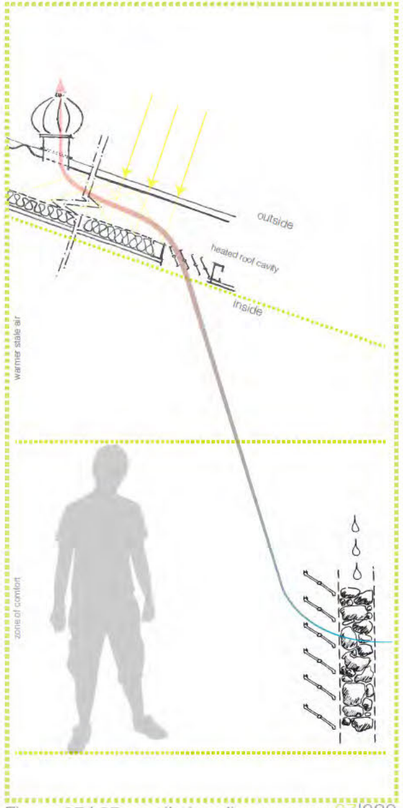


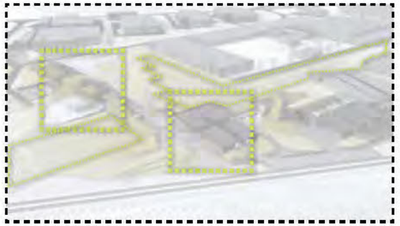
Figure 07 | 27. ventilation diagram

The primary source ***of energy is generated from the fermentation and combustion of biomass harvested from the immediate region.***

There is 4 ha of reclaimed natural space designated for planting seasonal crops with high energy yield.

The biorefinery is not only responsible for the energy production of the intervention, but for the adjacent industry in an attempt to re-invigorate the industrial area.

The appropriate crops used in the intervention along with its seasonal growth periods and harvesting times, KW energy per hectare and the final energy produced through the biorefinery is expressed in the diagram.



Alongside the sustainable generation of energy, is the use of water in a similar manner. Available sources include rainwater and the Apies river to the west of the site. Rainwater is harvested, from both buildings as well as from the site. This potable water is used for the required facilities on site as well as irrigation of the agricultural landscape.

Water used is recycled and reused for irrigation a maximum of two times, afterwards, water is directed into permeable surfaces of the site, minimizing municipal required facilities.

rainwater from roofs

Assume 80% Efficiency at 674mm per year
Usable volume
=Efficiency x Area x Rainfall
=0.80x(960sqm+500sqm+600sqm)x674mm
=1,110 752lt per year.

rainwater from site

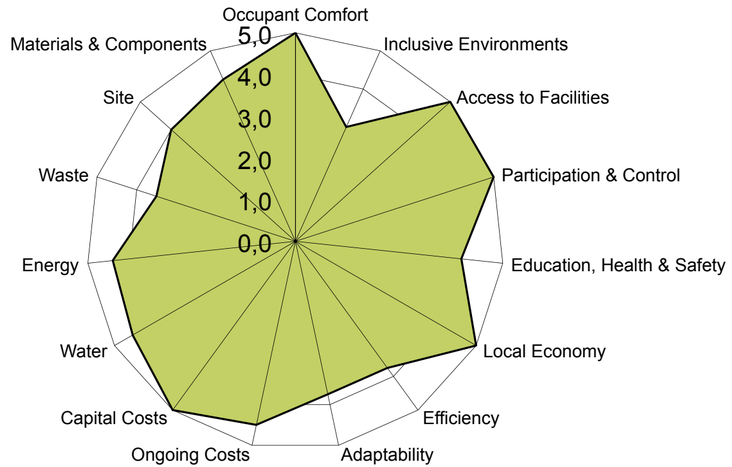
Assume 40% Efficiency at 674mm per year
Usable volume
=Efficiency x Area x Rainfall
=0.40x(8000sqm)x674mm
=2,156,800lt per year.

water from river

Water from the river is used as a supplementary resource during the dryer periods of the year. It is distributed via existing pipelines to the agricultural landscape.

water recycling

Water is recycled for reuse in agricultural application through the Portos system locally available.



Social	4,4
Economic	4,4
Environmental	4,1
Overall	4,3
Classification	

The SBAT score has been awarded according to the median by three professional practicing architects:

- DE LANGE, J.L.
- WEBBER. M
- MALAN. F

Technical information is provided by the author, while the general scores have been provided by the professionals. The score awarded is a design score, and therefor is susceptible to change in real world construction and continued operation.

The score indicates a high level of sustainability in all three categories:
- Social
- Economic
- Environmental

The continued development and expansion of the intervention should be guided by the current level of predicted sustainability.

details

Detail sections investigates the edge conditions of the intervention in terms of materiality, construction and thermal comfort.

Figure 07 | 29. Birdseye view from South-East

Figure 07 | 30. East-West section cut

close up 001

close up 002

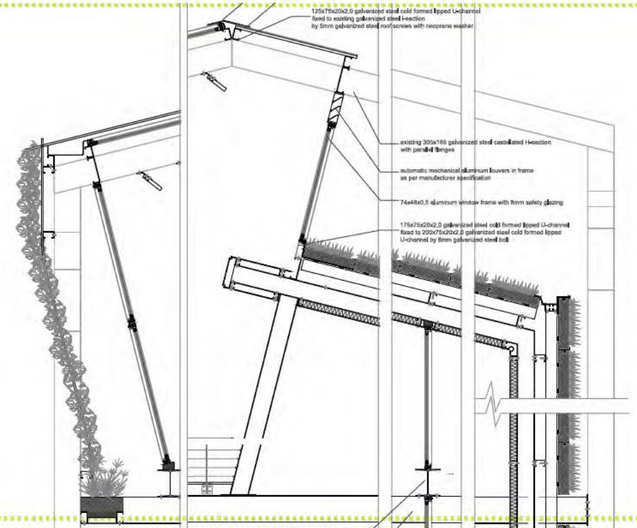
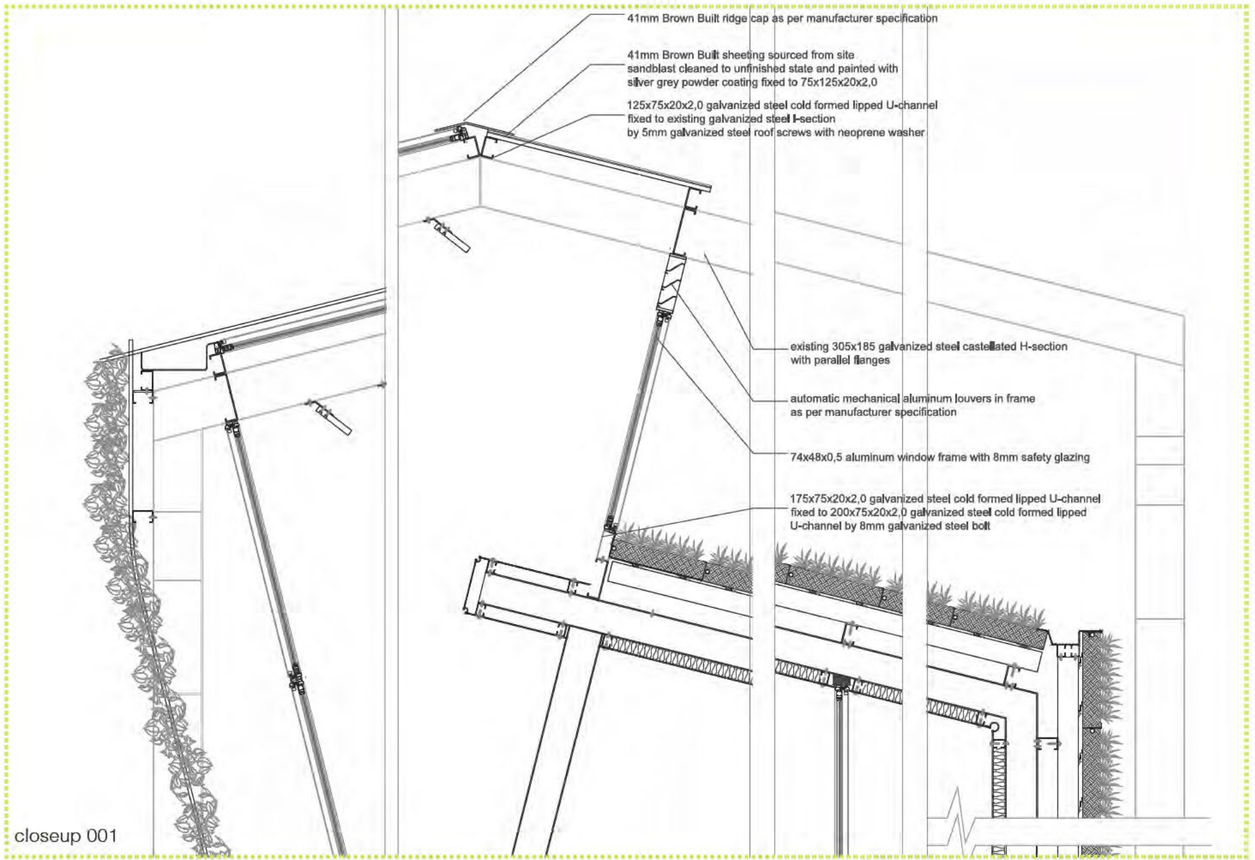


Figure 07 | 31. Exhibition Centre Edge Details



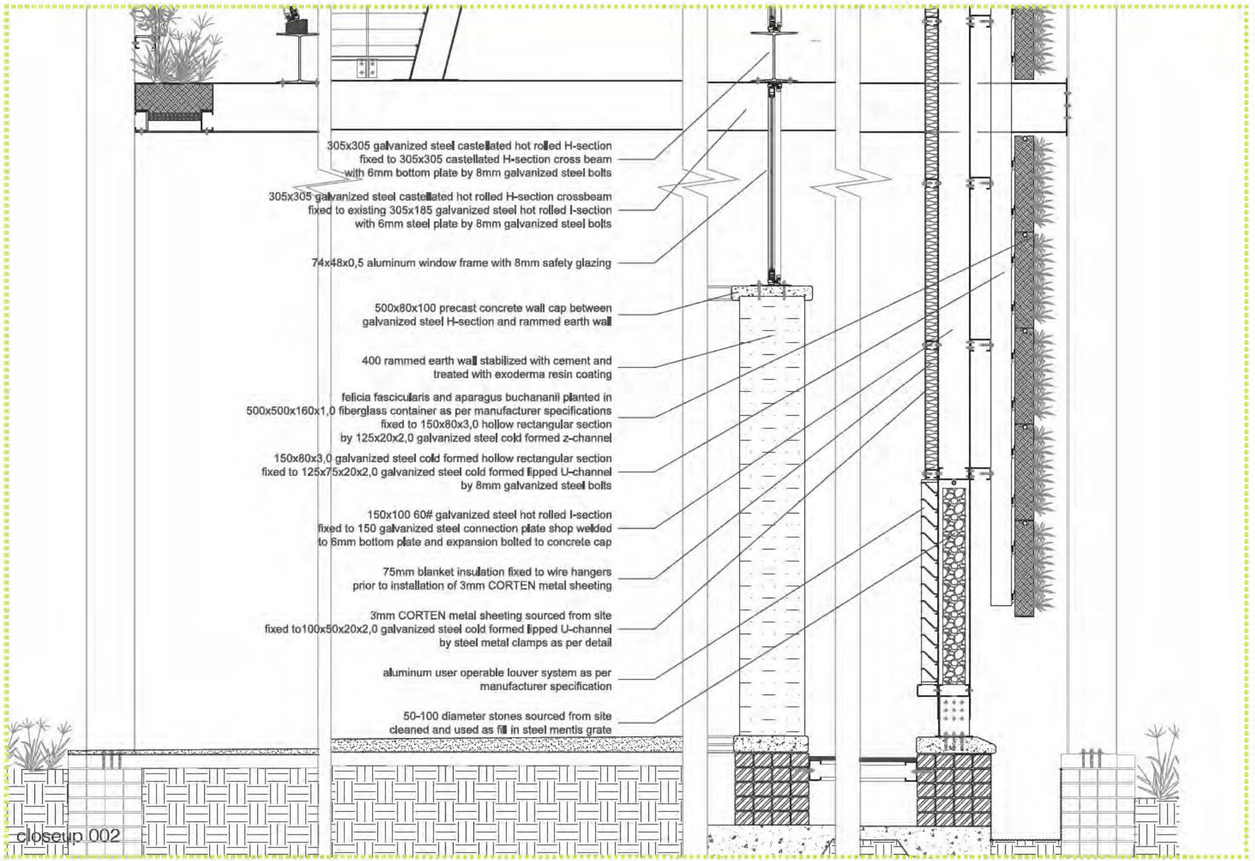


Figure 07 | 32. Exhibition Centre Edge Details

Figure 07 | 33. Exhibition Centre Edge Details

Figure 07 | 34. Birdseye view from South-East

Figure 07 | 35. East-West section cut

close up 001

close up 002

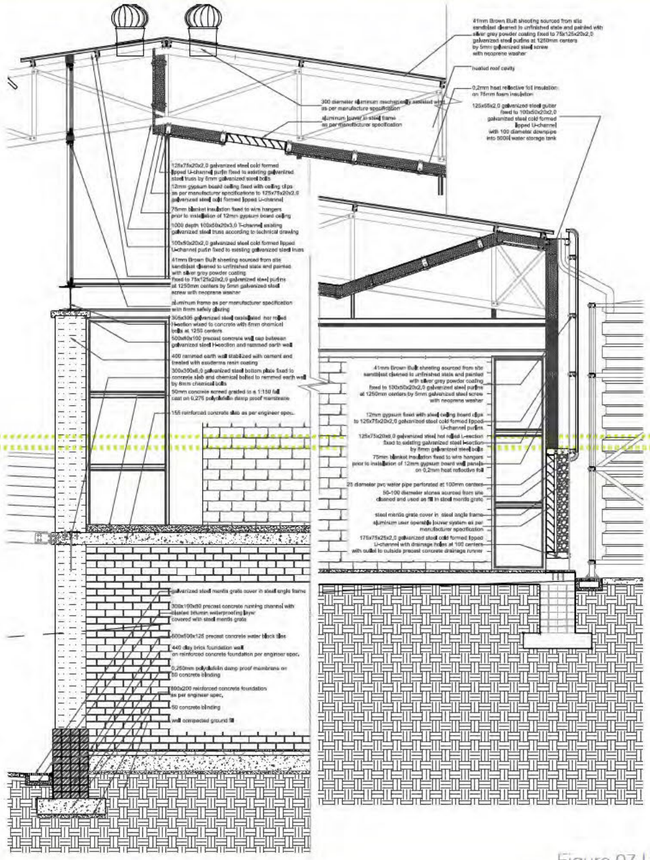
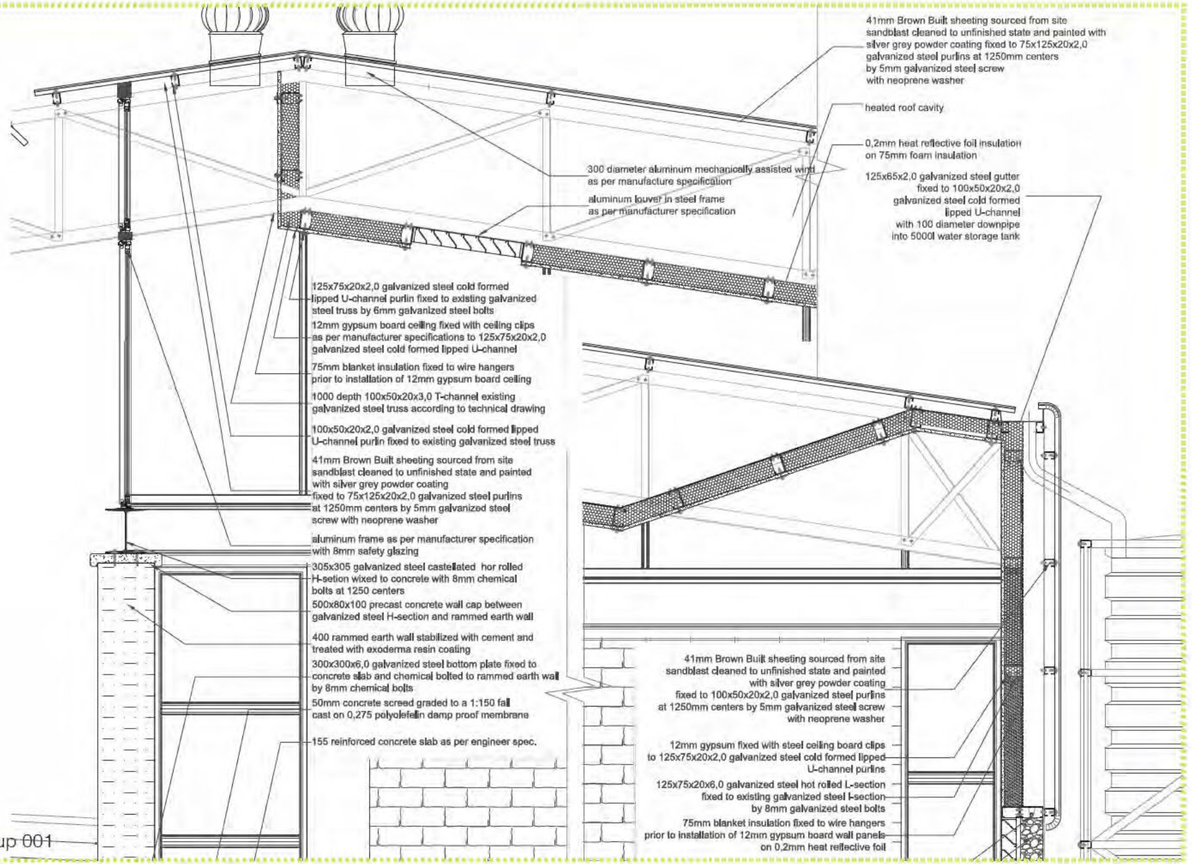
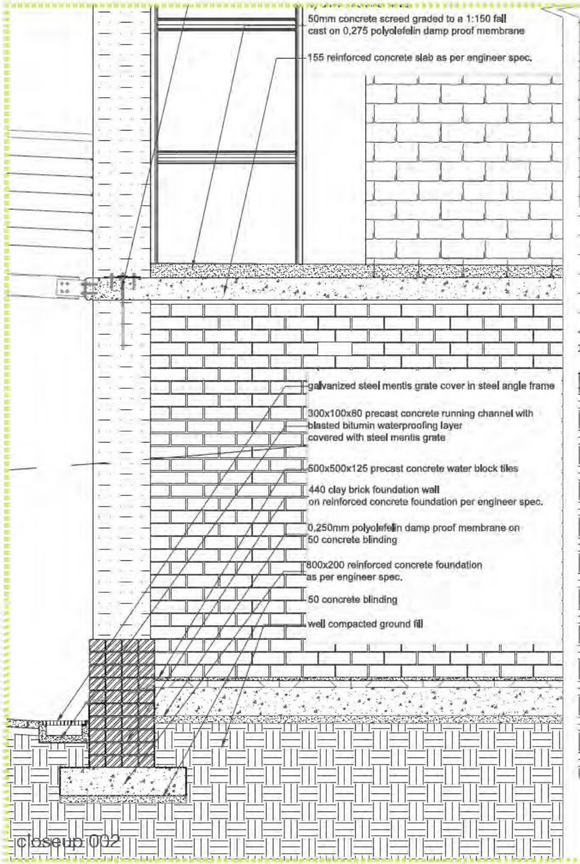


Figure 07 | 36. Harvest Centre Edge Details



closeup 001



closeup 002

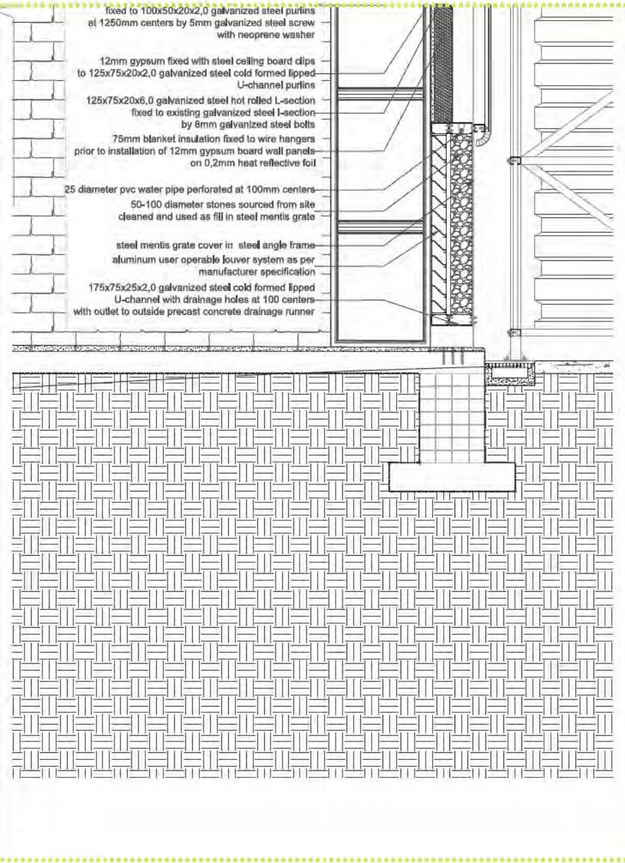


Figure 07 | 37 Harvest Centre Edge Details

Figure 07 | 38 Harvest Centre Edge Details

Figure 07 | 40. Birdseye view from South-East

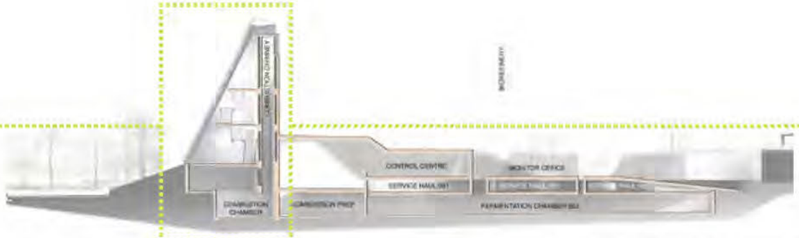
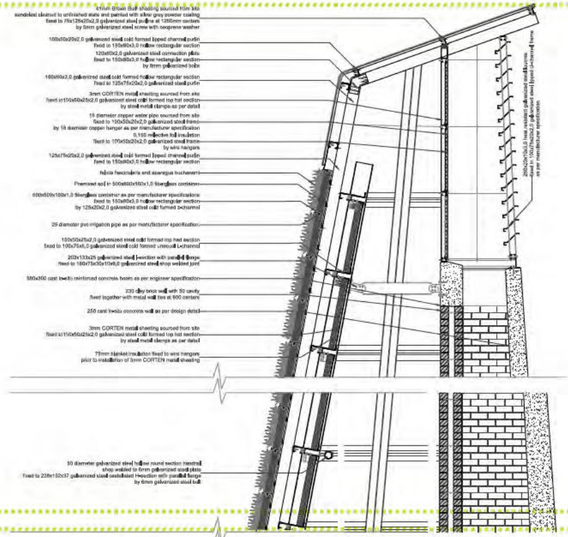


Figure 07 | 39. North-South section cut



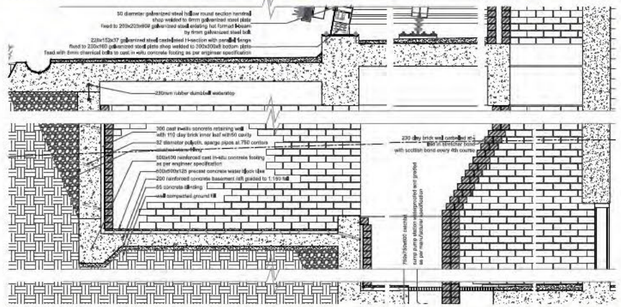
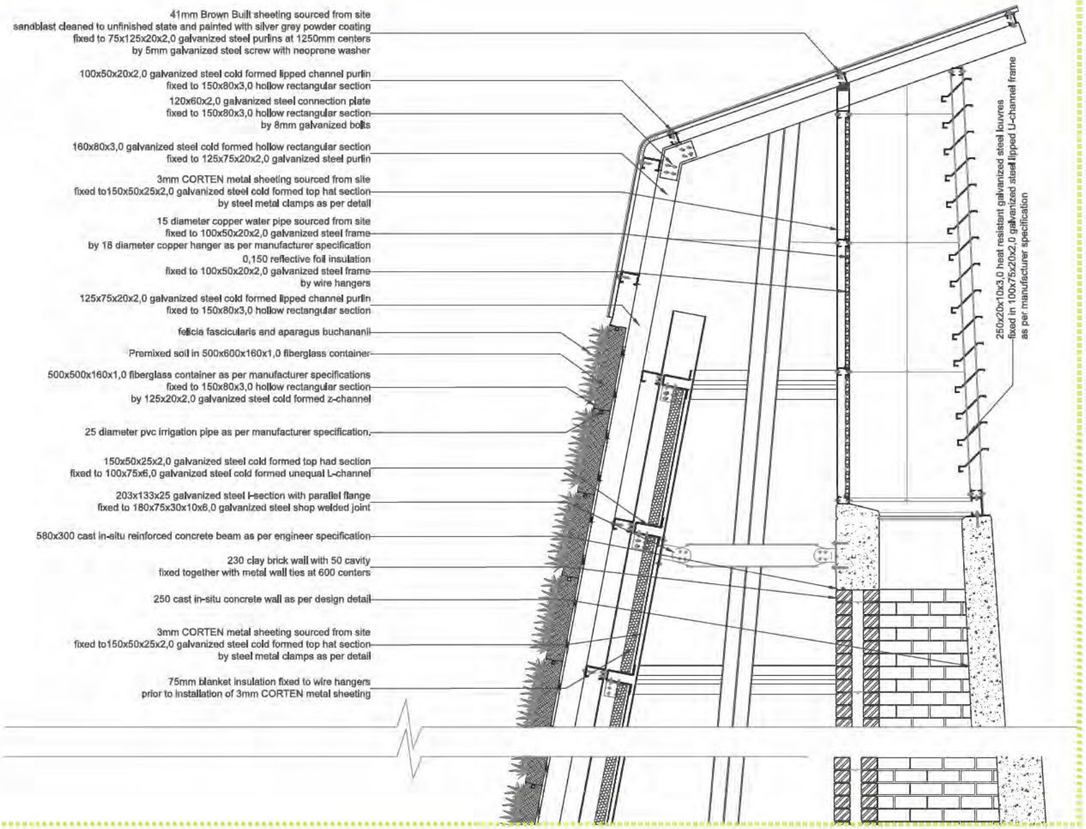
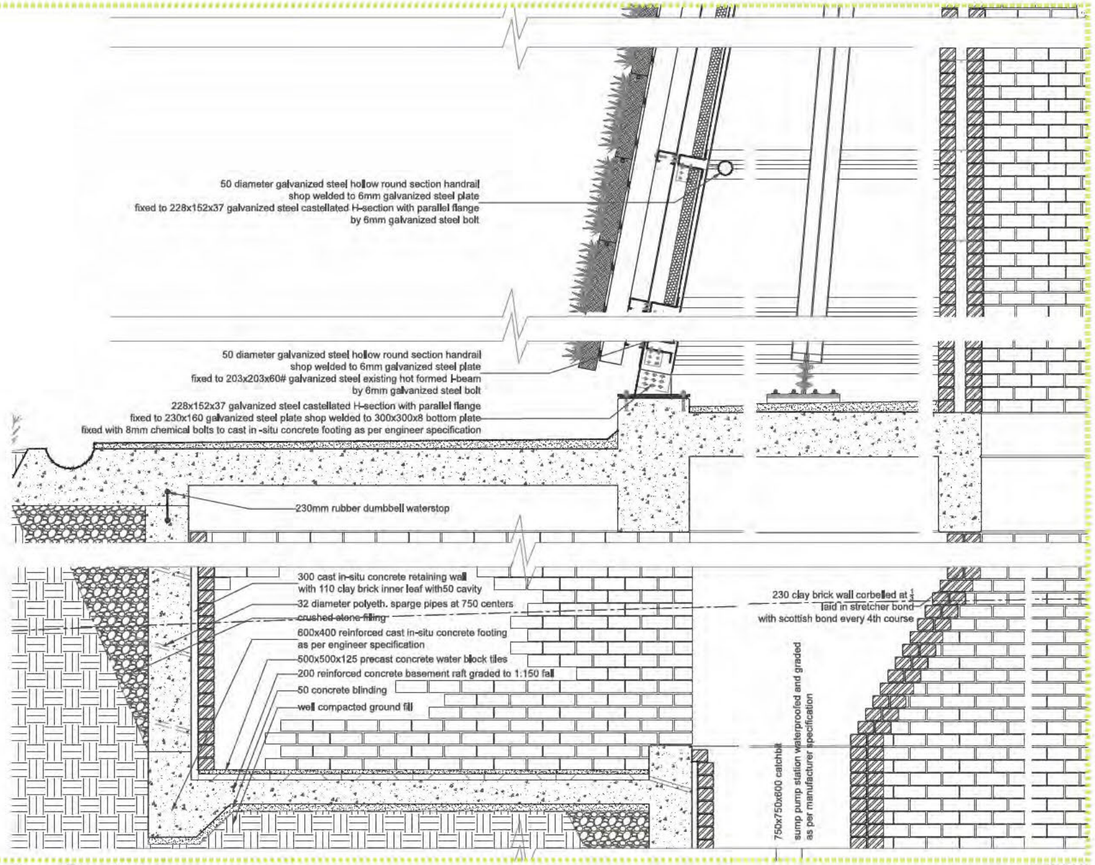


Figure 07 | 41. Biorefinery Edge Details



closeup 001



closeup 002

Figure 07 | 42 Biorefinery Edge Details

Figure 07 | 43 Biorefinery Edge Details

technical conclusion

Through reuse and adaptation of materials available locally and on site, in collaboration with the natural environment, it is believed that a eco-centric intervention can be implemented on a spatial as well as technical scale.

The systems implemented are easily created and managed as opposed to expensive construction and comfort management systems. At the same time, the construction of these systems create career oppurtunites while contributing to skill development and knowledge transferal to the local community.

reconciliation of urban place & indigenous
meaningfulness reintegration with ecological systems
reclaiming infrastructure for a new typology

project conclusion

The intervention aimed at ***creating spaces that facilitate the natural layer, the anthropological layer and the mechanistic layer***. These spaces and space defining elements draw from all the layers.

The spaces created are collaboratory to one another in the experience it provides to the user of spaces that would previously be unaccessible or restricted.

While allowing the general user access to the site, functionality is facilitated and feasibility of the programme is justifiable.

The intervention influences the immediate industrial as well as residential zone, ***creating a reclaimed landscape and acting as a catalytic space for adjacent industry to respond accordingly, providing growing career opportunities to the nearby community of Hammanskraal***

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07 Technical

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Peaceful Regards,