



02_1

ARGUMENT

"When patterns are broken, new world's emerge."

Tuli Kupferberg

02_1.1 Introduction

WNR as natural enclave in the north of the City of Tshwane holds multiple resources in need of some or other form of conservation. Historically the site was home to stone and iron age settlers, soldiers in one of the four built Anglo Boer war forts and many visitors to the botanically significant Wonderboom tree (City of Tshwane 2015). Currently the site serves as one of Pretoria's multiple nature reserves, areas protected against urban development, the destruction of protected fauna and flora and as recreational facility for the urban dweller that seeks the natural environment escape.

The introduction of nature conservation in South Africa, that only started late in the 1900s (Blom 2011:2) sparked nature reserve conservation research and funding from municipalities for this research by environmental organizations. This happened through admission fee control and municipal budget allocations as a result of extensive research done by the environmental organizations on nature reserves. In the current City of Tshwane municipality's deteriorating economic circumstances and recent economic downgrade due to high debt and low growth (Moody's Investors Sector 2017:1) the allocations have decreased and are only sufficient for routine maintenance. Conservation of these reserves are at risk of disappearing and with it the historical and ecological significance. The lack of financial allocations for these areas to fund environmental research organizations in conservation strategies have caused these natural environments into enclaves that are neglected in terms of their environmental and historical significance to the surrounding city. These neglected areas are overgrown with invasive species and hold concealed historical artefacts from public visitation. The WNR as part of the collective of nature reserves in the City of Tshwane is in need of ecological and historical conservation.

Conservation and architecture are not a new collaboration as architectural heritage conservation is an everyday matter of the architectural discipline. Thus, the historical conservation of artefacts can be addressed through architectural intervention by use of conservation strategies in architecture. Ecological

Fig_19 (Left): Wonderboom Nature Reserve and surrounds as focus area (Author 2017).

conservation on the other hand, and the idea that built form, space and technologies can contribute to the generation of capital for ecological conservation might be considered as a new collaboration. The conceptual combination of ecology and architecture are new and have only been considered by few architects such as Ken Yeang as described in *Eco Architecture the work of Ken Yeang* by Sara Hart (2011).

This project's argument will explore the possibility of a positive contribution that Architecture can make towards the conservation of these urban natural protected areas in terms of their ecology and historical artefacts, focusing on the WNR and surrounds (see fig 19).



02_1.2 An approach to contextual conservation.

Urban protected areas are contextually situated in high density built up urban areas. They are natural areas that offer a break away in the form of an experience within nature, attract large numbers of people who live near them and are built on urban constituencies for nature conservation according to the IUCN (Trzyna2014: xi). The IUCN states that they are distinctive due to the number of ethnically and economically diverse people that they attract, their multi-influential governing structures and are subjected to urban scenarios that more remote protected areas never encounter (Trzyna 2014: xi). Conservation of these natural enclaves and their significance is a distinctive scenario that these areas encounter.

Conservation in the broader sense of understanding consists of the active protection and management of physical objects curated by man. The dictionary (Dictionary.com 2017) defines conservation as the “official supervision of rivers, forests, and other natural resources in order to preserve and protect them through prudent management.” Context on the other hand refers to the circumstances that form the environment for the object in which it can be fully understood and related too. It refers to and explains the natural setting where the physical object finds itself. The notion of contextual conservation combines the physical context, its resources, setting and influences as the natural, with the action of conservation in terms of management and preservation as the man-made influence. In the argument these two approaches conceptually meet in the in-between of nature and urban to contextually conserve the natural urban protected area, building on the relationship between man and nature and the partnership that exists between these two approaches within the discipline of art and architecture.

Throughout his existence man has always been in partnership with nature. This partnership is represented in many forms of art, historically and contemporary. Nunzio Paci⁵ personally represents this relationship best with his work on the connectedness that exists between man and nature (Design-

world 2015) (fig 20 & 21). He approaches his artwork with the notion that nature is so connected with man, that it forms the physical human (Paci 2017). The notion of contextual conservation that is conceptualized as a relationship between nature and man, builds on the Paci’s idea of connectedness between man and nature to form architecture.

Within the field of architecture, designers and builders have for many years looked to nature for inspiration. The first depictions of nature as inspiration for art and architecture can be seen in Marc-Antoine Laugier’s illustration of ‘Essai sur l’Architecture’. Laugier explained: “such is the course of simple nature: by imitating the natural process, art was born” (cited in Hvattum, 2004:31). This imitation that is captured to form art, illustrates the first connection between man and nature. Many designers and architectural theorists throughout history have built on this notion of relationship between man and nature and how architecture as the built form, fits and forms part of the idea.

More recently, two contemporary architectural theorists have published work on this notion. Norman Crowe and William Cronon are two architectural theoretical thinkers in this regard, although viewing the relationship from two different approaches. Norman Crowe (1995) argues that the built environment is a form of nature and explains the “idea of the man-made” founded its routes in a historical relationship between man and nature. He states that nature is present in all man-made elements and even though we approach the built form from different angles, nature still presents itself (Crowe 1995:3-27). He further states that the relationship between man and nature is historically bonded by the harmony that exists between them and that architecture should continue to build on and not disturb this harmony.

William Cronon (1995) reassesses the environmentalist’s agenda. He states in his writings that the idea to protect “pristine nature” is flawed. He argues



that humans need not be removed from nature to protect it, as we are a part of it and the removal of humans won't keep nature intact. He continues to argue that humans have not yet learned to live responsibly in nature and that this is where the problem lies. "How can we take the positive values we associate with wilderness and bring them closer to home?" (Cronon 1995: 69-90)

Both these theorists regard the relationship between man and nature as a continuous process and that without the interaction none can survive. Building on these theoretical approaches, the notion of contextual conservation finds its roots in the intervention of man in nature to ultimately conserve.

Contextual conservation focuses on the relationship between the two forces of man and nature and how they can aid, in harmony, each other to form an architecture that defines space for management and preservation. Urban protected areas as the focal point between nature and man within urban environments are the ideal locations to implement and test this notion as they are confronted with problematic influences that other more rural natural protected areas are not confronted with.



5. Contemporary Italian artist – Work viewable at <http://www.nunziopaci.it/>

Fig_20 (Top): Nunzio Paci painting (Designwrlld, 2015).

Fig_21 (Bottom): Nunzio Paci representation of man and the connection to nature (Designwrlld, 2015).

02_1.3 The less-defined landscapes of the City of Tshwane.

The City of Tshwane in the northern part of the Gauteng province contains multiple and differing landscapes. The city's array of landscapes includes parks – formal and other, gardens – national government owned and botanical and reserves.

City parks, such as Burgers Park and Springbok Park are considered as formal, generally designed landscapes that represent a certain period in the city's history and were commissioned by the city council. Parks such as Zita Park and Jan Cilliers Park are considered as other (not formal) that are more suburban of nature and are used by suburban residents. These parks are also maintained by City Parks services but were not necessarily designed or commissioned for an occasion, ceremony or commorancy but rather a result of suburban town planning.

Public gardens on the other hand, are used by a larger group of people and are mostly commissioned by national or provincial structures. Within the City of Tshwane, the Union Buildings Gardens are legislative of nature and a result of state office and the landscape associated with it. The city's botanical gardens hold interest for research and specific plant life of the areas. These gardens are more informal in relation to legislative gardens but are more significant in terms of plant life and the study of plant species for the specific climate and in protected plant enclaves.

The distinct purposely designed areas and uses of these landscapes define them. Nature reserves, also part of the diverse landscapes of the City of Tshwane, do not fall into one of the above categories. They are distinctive due to their variation of functions and scales. They also hold historical and ecological significance that are different to the above-mentioned landscapes and typically contain more natural growth and wilderness landscapes. Due to their wilderness⁶ condition, they are less defined⁷ than parks or gardens. Their less defined nature poses a threat as they are considered to be left to fend for themselves. This self-fending nature of wilderness is optimal in natural areas outside urban environments but due to the external influences of

6. Wild natural growth, not contained or maintained.

7. Little to no man made interventions to define landscape. Less-defined than other natural areas due to the wilderness nature of the landscape.

urban development on inner city natural landscapes, the self-fend option is not viable for urban nature reserves.

The UN world cities report (UN-Habitat 2016; 6) proves that urban development is escalating and it can be seen at nature reserves as the urban development influences on nature reserves are escalating. In recent years the City of Tshwane have made strides to keep the negative urban influences on natural areas at bay by installing fences around nature reserves and natural areas. The actions of the municipality, although little are appreciated but the intervention of fences holds more disadvantages than advantages for nature. With fences nature are not allowed to migrate or source the needed resources from other areas to survive the deterioration from urban influences. The fence is the element that creates the enclave that falls into self-decay. If the edge/fence of nature reserves are approached differently and developed to aid both environments this deterioration will be an issue of the past.

These fences cause a lack of interaction between different natural realms that normally adapt to the urban condition to keep the present ecosystems in balance. The fence also prevents nature from gaining the needed resources, such as migrating fauna and the advantages they bring from other natural enclaves. Due to this disconnectedness, loss of biodiversity becomes evident in nature reserves and they are burdened with destroyed ecosystem balances and an overload of invasive plant species. This imbalance in natural ecosystems, forces nature into forced adaptation without the needed resources from other natural environment or aid from environmental organization management to rehabilitate. The effects are clear, as nature reserves no longer hold preserved vegetation. Dr. Dianne Spear⁸ states that the biggest threat to nature is the way we as human beings live our lives. She continues to state that nature that has direct human interaction or influences are limited to appropriate adaptation without human intervention. (Spear 2017). With the lack of intervention by environmental organiza-

tions to aid the ecosystems to adapt to urban influences, these natural enclaves are at risk of losing their indigenous vegetation they are known for and becoming destroyed lost landscapes.

Mr Ernst Wohltitz (2017), director of nature conservation at the City of Tshwane explains that nature reserves, according to the city's legislation, is supposed to have a buffer zone that prevents urban development to impact these areas, but with further investigation it was found that these do not exist or that the city considers any infrastructure, that is technically urban development to be a buffer zone. Nature reserves furthermore hold historical cultural artefacts that are sometimes protected by relevant sections within the city's or country's legislation. Where these artefacts are used for tourism and/or recreational functions to fund management and upkeep, the natural environment have proven to be in a better state. Unfortunately, due to the number of historically significant sites within the city, not all are protected by city organizations in this manner. Historically significant sites, such as Fort Klapperkop and Fort Schanskop have proven to be more interactive with the urban environment and the interaction has caused a better relationship between the two. Fort Wonderboom, within the WNR, has not seen this interactive spirit and the degeneration in relation to the other two mentioned can be seen within the reserve.

This natural decline within the WNR presents the opportunity to define this landscape by the resources on site and make this reserve also protected within current management structures, putting conservation in the hands of the reserve and not relying on municipal management to keep the reserve's ecological and historical significance intact.

8. UCT, African Climate and Development Inifinitive (ACDI) research fellow:

Designation: Collaborative Adaptation Research in Africa and Asia (CARIAS) and Adaptation at Scale in Semi-Arid Regions (ASSAR). Expertise: Climate Change Adaptation, Invasion Biology, Biodiversity, Conservation, Biogeography.



02_2

INFORMANT - CONTEXT

"Architecture is not a private affair; even a house must serve a whole family and its friends, and most buildings are used by everybody, people of all walks of life. If a building is to meet the needs of all the people, the architect must look for some common ground of understanding and experience."

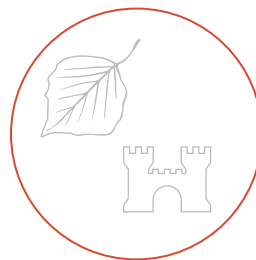
John Portman in Architectural Digest

02_2.1 The context – Introduction to the Wonderboom Nature Reserve

The WNR is situated to the north of Pretoria CBD and forms part of the Magaliesberg mountain range. The reserve occupies roughly 200ha of mostly ridge topography and has many cultural ties with the history of the City (City of Tshwane 2015). The WNR is most recognized for its Wonderboom tree and the recreational spaces provided for urban dwellers of the Pretoria North residential areas. The WNR is mostly visited over weekends for a traditional South African family braai or family gathering. It is also home to one of the four Anglo-Boer war forts, the forgotten stone age shelter cave, protected eco-systems, a part of the Apies River and relicts of iron age shelters.

The Magaliesberg mountain range, considered to be among the oldest mountain formations known to man (Magaliesberg 2008), plays a significant role in the historical uses of the site. The mountain stretches approximately 120km from the Bronkhorstspuit Dam in the East to Rustenburg in the West. The mountain acts as destination for enthusiastic mountain climbers and a large part of the mountain forms the backdrop of the Pretoria city centre. The WNR, as part of the mountain, is demarcated in the centre of the mountain range. Cut off by a Kloof formed by the Apies River in the west and a vehicular road to the east, the site is entered from the North, adjacent to a recently completed retail centre.

The kloof to the west not only carries the Apies River in its basin but also a high traffic road and a passenger railway. Both infrastructural additions were based on historical routes running through the kloof to the North of the city. At the cliffs of the kloof, the forgotten stone age cave is hidden behind a man made, non-operational waterfall commemorating the 50th anniversary of South Africa becoming a Union in 1910. It is speculated that the cave was once home to settlers of the stone age (Blom 2012:20-22). According to archaeological records, artefacts dated to 2 million years ago were found at the Wonderboom early stone age site (Van Vollenhoven 2008:13). This research site covers approximately 650 m² around the Wonderboom



area (Blom 2012:20-22). According to Anton van Vollenhoven (2008:13) the natural context of the reserve would have been an ideal hunting and settling area for the early Stone Age civilizations. Tools found by prof. Revel Mason in 1955 proved this as he stated that the kind of tools discovered had many similarities to tools made at Sterkfontein about 1 million years before. Speculating that this part of the mountain was also used for manufacturing of stone age utensils (Carruthers 2000:214-216).

On the southern slope of the mountain lies another ancient archaeological finding. This is estimated to be have been built in the 1600s and are Middle to Late Iron Age rock formations. Several of these line the top part of the Reserve. Carruthers explains that these formations and artefacts found in the area were from a cultural civilization that Van der Ryst & Meyer (1999: 96-98) explains as Late Iron Age, between 1000 and 1800 AD. Unlike the settlers from early Iron Age cultures, Middle to Late Iron Age settlers tended to settle on the top part of mountains. Carruthers explains this change in settling to a higher need for militaristic protection and better security (Carruthers 2000:224). Even though the stone formations could also have been from later Tshwane tribe cattle herders, the Late Iron Age artefacts found in the area make the possibility viable.

The WNR also hosts one of the only four built Anglo-Boer war forts. The forts were commissioned and constructed during the second Anglo-Boer war by the Government of the ZAR as a direct response to the Jameson Raid and the documentation found on a British spy, Captain Robert White, during this time (Van Vollenhoven, 1998: 51). Even though the forts were never tested in battle the history of fortification of the capital as a response to possible threats forms a significant role in the military history of South Africa.

The rich history of shelter and protection present at the WNR makes this site significant in the relationship it has with the urban environment that surrounds it. The theme of nature as context and

history as man in relationship with one another is evident on the site. Contradicting this relationship in the historical timeline is the lack of interaction between these two forces today. The reserve, rich in history and significance is deteriorating due to no continuous interaction.

Fig_23 (Left): General Issue Diagram - Problem Statement (Author, 2017).

02_2.2 An analysis of site.

An investigation into the site and research focus area was conducted between January and March 2017. The process consisted of two students evaluating the site and conditions first hand from a series of visits. Visual and analytical site documentations were gathered and discussed in terms of spatial and problematic influences to present possible architectural solutions. The discussions highlighted the following problematic considerations:

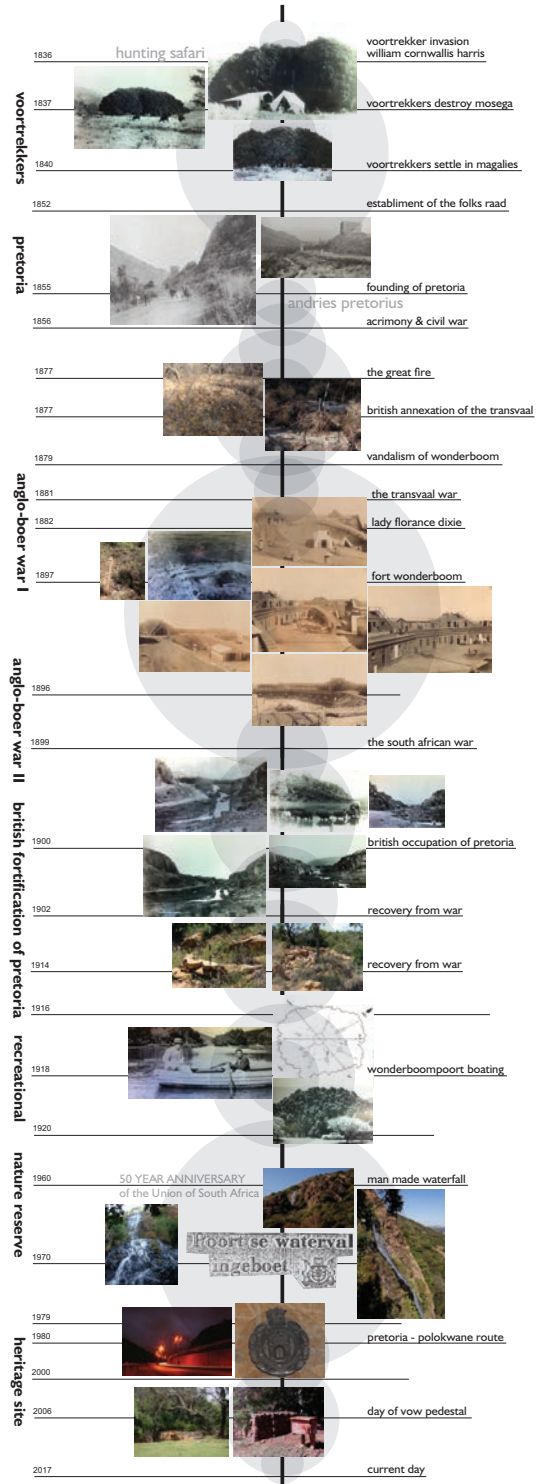
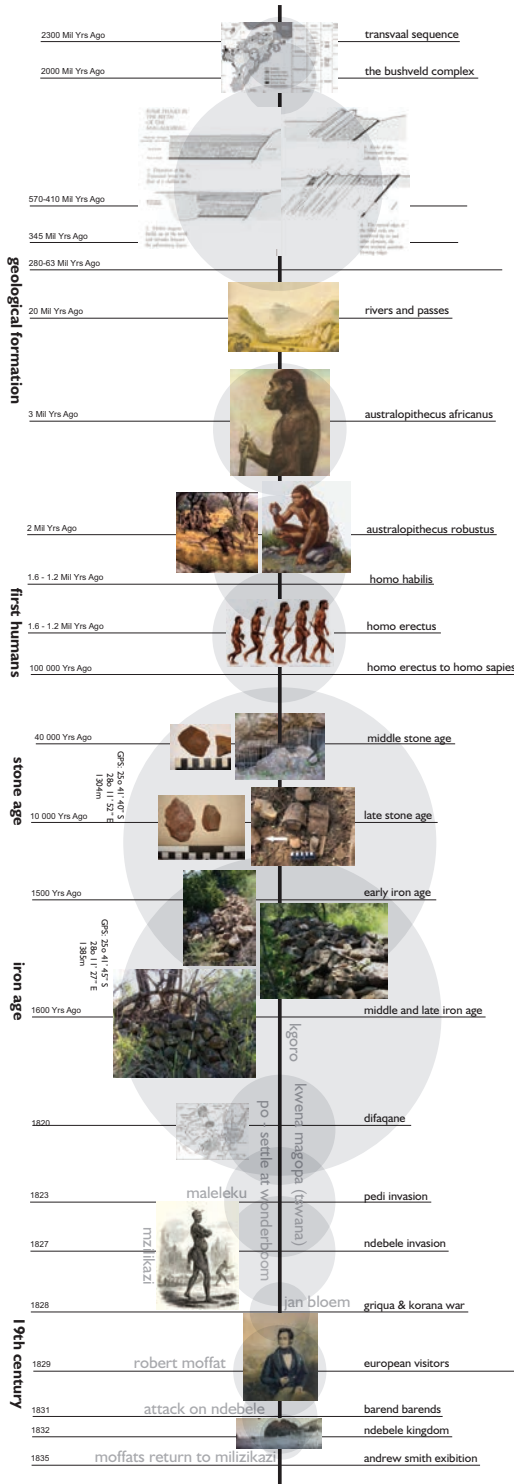
- Firstly, the site was completely isolated. Three main roads to the North, East and West cut off all free flow pedestrian access to the site. A smaller residential boundary on the southern edge made pedestrian access viable but the reserve's fence prevented pedestrian access. Only one entrance of the three visible entrances was accessible on the Northern edge. This entrance was mainly for vehicular traffic and designed with the motorcar in mind. The service entrance on the eastern fence is not accessible due to heavy traffic and placement of the entrance on the top of the hill. The third entrance in the quiet residential area on the southern edge was completely overgrown and rarely if ever used. No traces of a pedestrian entrance were found.
- The recreational activity spots were concentrated to one corner on the north-eastern edge of the site, with staff housing around the focus area of the Wonderboom tree. Signage of the history of the site was present around the tree and a good explanation of the site was obtained. A small hidden path through thick growth at the base of the hill, just behind the info signage, made a hike possible to the old fort and the cave. Little signage was visible along the route and no focus points for the multiple view points over the city and northern suburbs were present.
- Invasive plant species were visible along the route and tree suffocation by invasive species were observed. Some parts along the route had paved rock paths alongside sheer cliffs that opened the tree canopy for city views. The southern ridges' plant growth was completely different from the north and traces of invasive plants were found here too. At the base of the southern edge, next to a water stream, a herd of Impala had made their home. This was not surprising as no designated pedestrian paths went down the mountain on the southern side.

- The fort is in ruin and vandals have taken the opportunity to scratch their names next to the names of soldiers of the Anglo-Boer war into the rock to remember the occasion of their hikes. The site is deserted and feels like a destroyed urban playground in the middle of nowhere. The history of place wants to shout out its existence, but the desertedness keeps it at bay. Just west of the fort a few informal dwellers have occupied the old cell phone tower shelter and made it their temporary home. The cell phone tower is no longer in use but the beacon on top of the hill still exists. Just to the north of the fort and cell phone tower, in the dense overgrown hill cover, the historical rock formations present themselves, forgotten and disguised in the greenery of the hill. A further hike down the Northern hill presented the lonely path to the dysfunctional waterfall. At the edge of the fall, access to the cave is now prevented by a palisade fence.
- Around the main entrance on Lavender Road, another problem became evident as no form of drinking water provision was present. After a hike, a single tap in the middle of the grass field was considered as the only source of drinking water. The sense of isolation on the site became more evident and a good understanding of lack of interaction was gathered. It became evident that this lack of public amenities was the main problem that the site faced. After some discussion of the experience by the author and fellow colleagues, it was concluded that, on an urban scale, the site needed an approach that related to the main objective of interaction. Within the main objective of urban interaction, an urban strategic vision was formulated that considers access, edge, connections and facilities as the main issues to address.

The following section visually demonstrates the investigation done of the context to formulate the urban strategic vision. Firstly, it showcases the mapping, analysis and investigations done of the existing site and surrounds. It builds on this investigation and demonstrates the urban strategic vision in relations to the context and investigations. These conceptual diagrams are taken further to strengthen the choice of site. After the final choice of site is shown, the Urban Strategic Vision is applied to the micro site to formulate a proposed starting point for the intervention.

Where applicable the visual diagrams elaborate on the text to further explain the considerations and actions of the investigation done. This section is mainly image driven and must be seen in conjunction with the contribution article and the informants as stipulated and explained.

Fig_24 (Left): Historical Timeline of Wonderboom Nature Reserve (Author 2017).



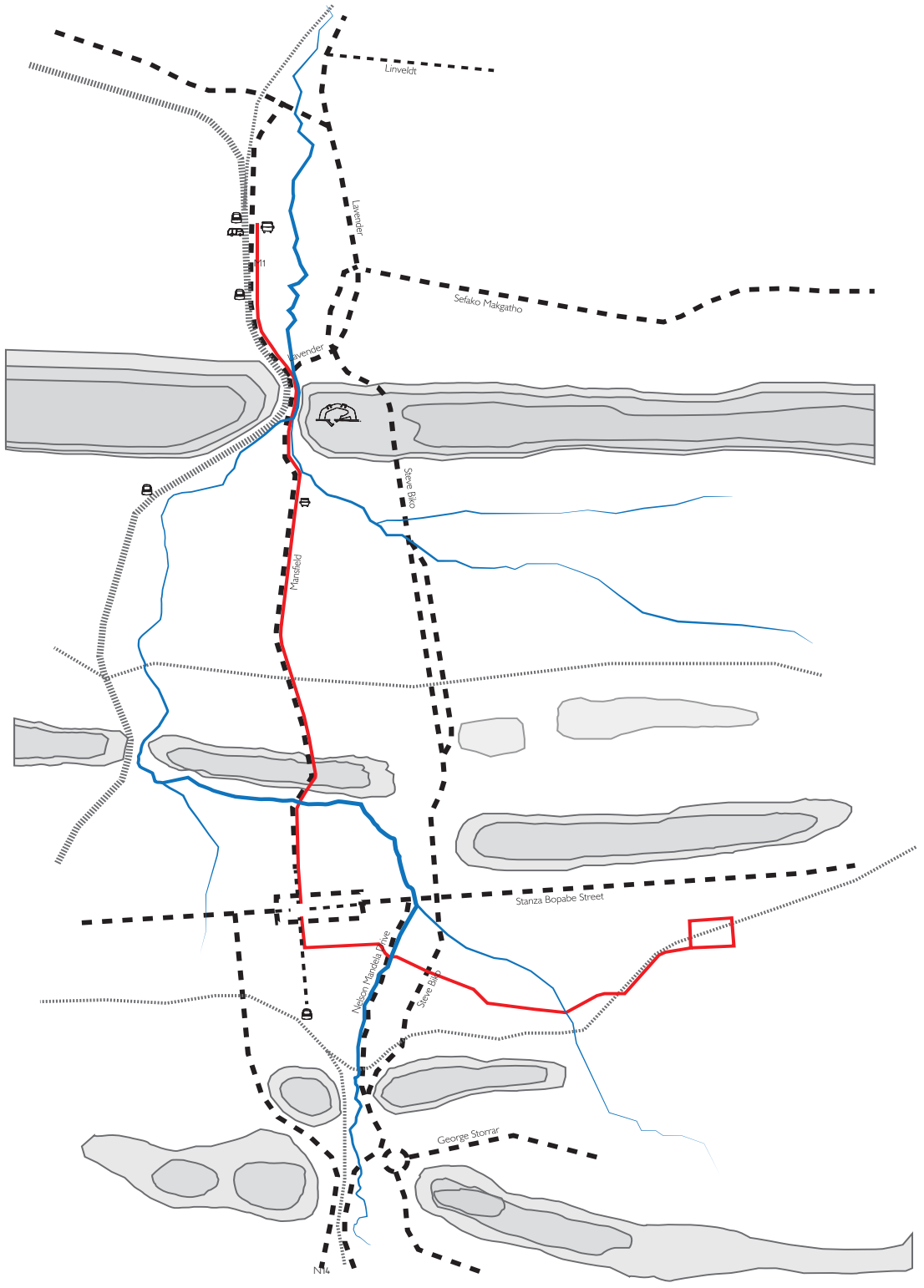
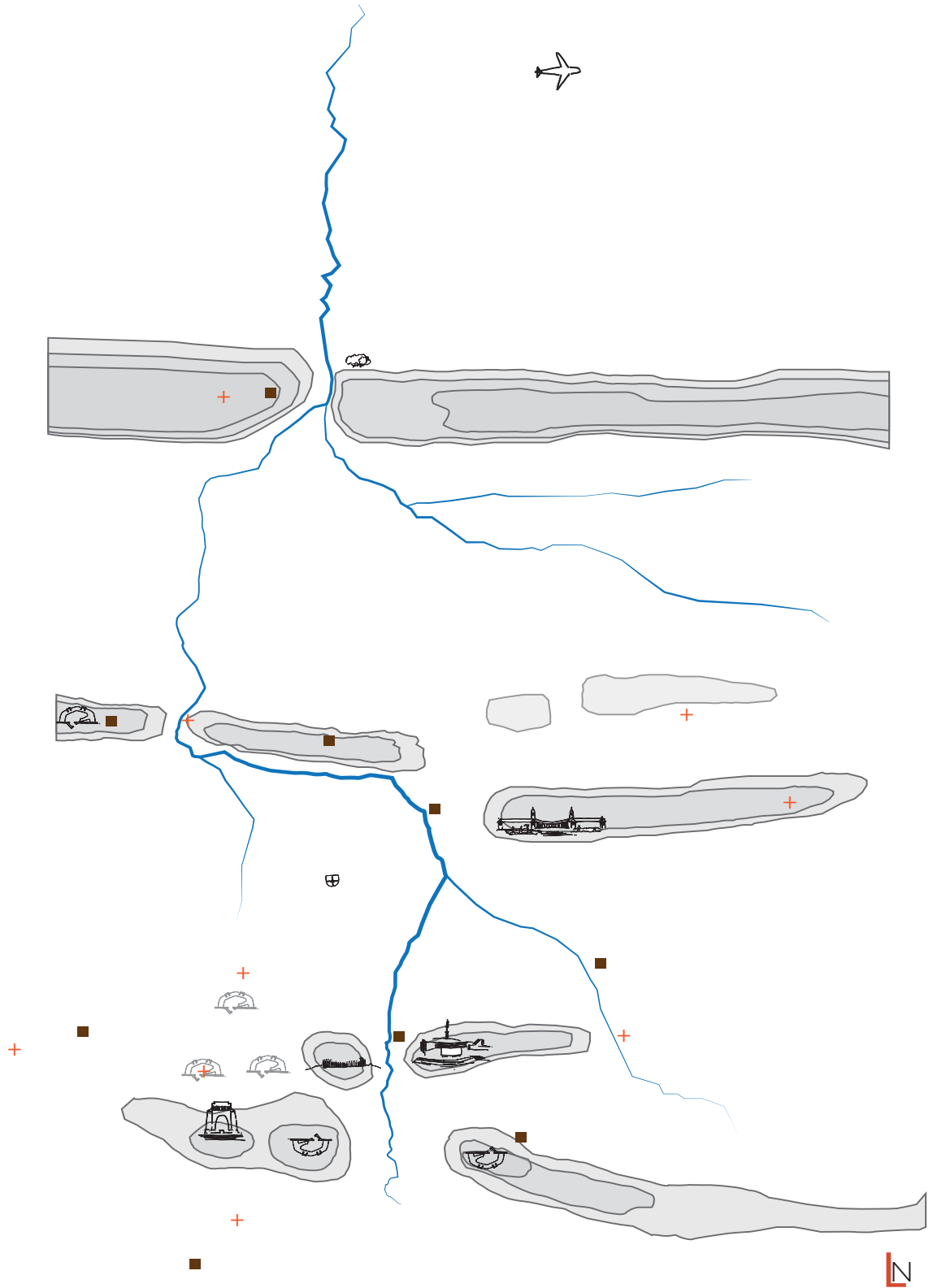
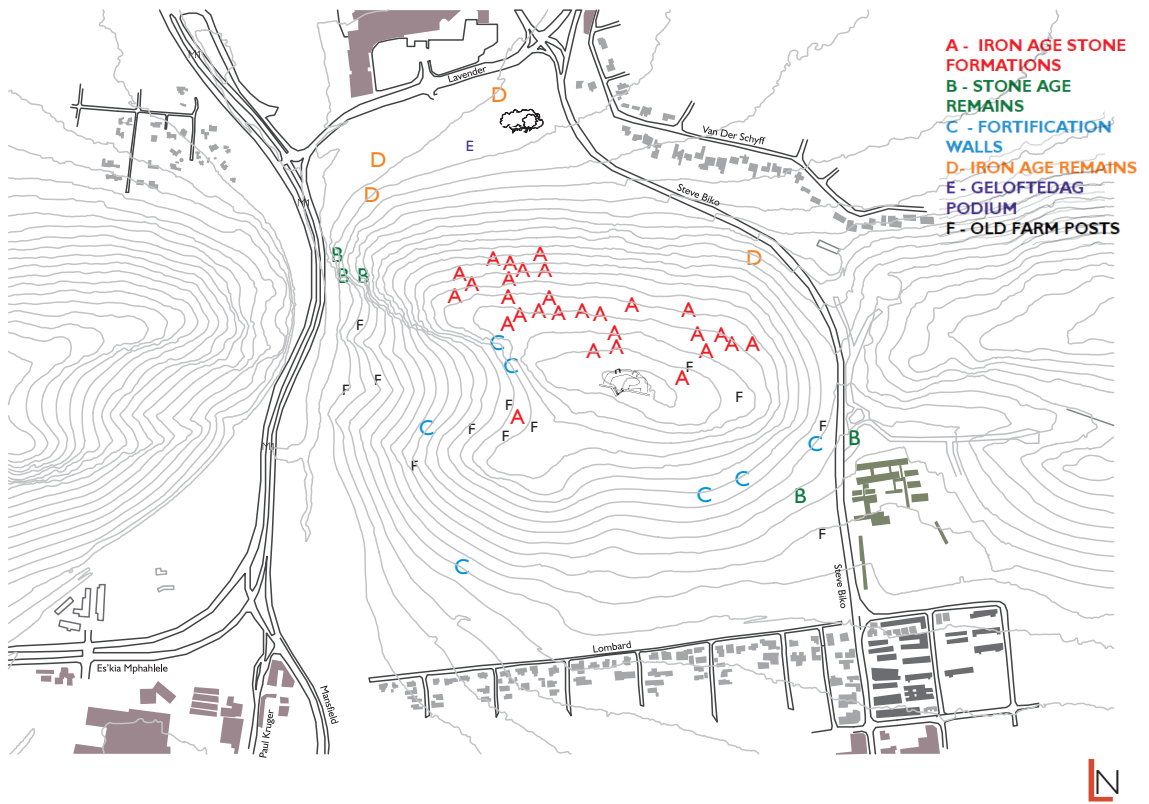




Fig _25 (Left): Macro Investigation: Ridges and Access Routes (Author 2017).

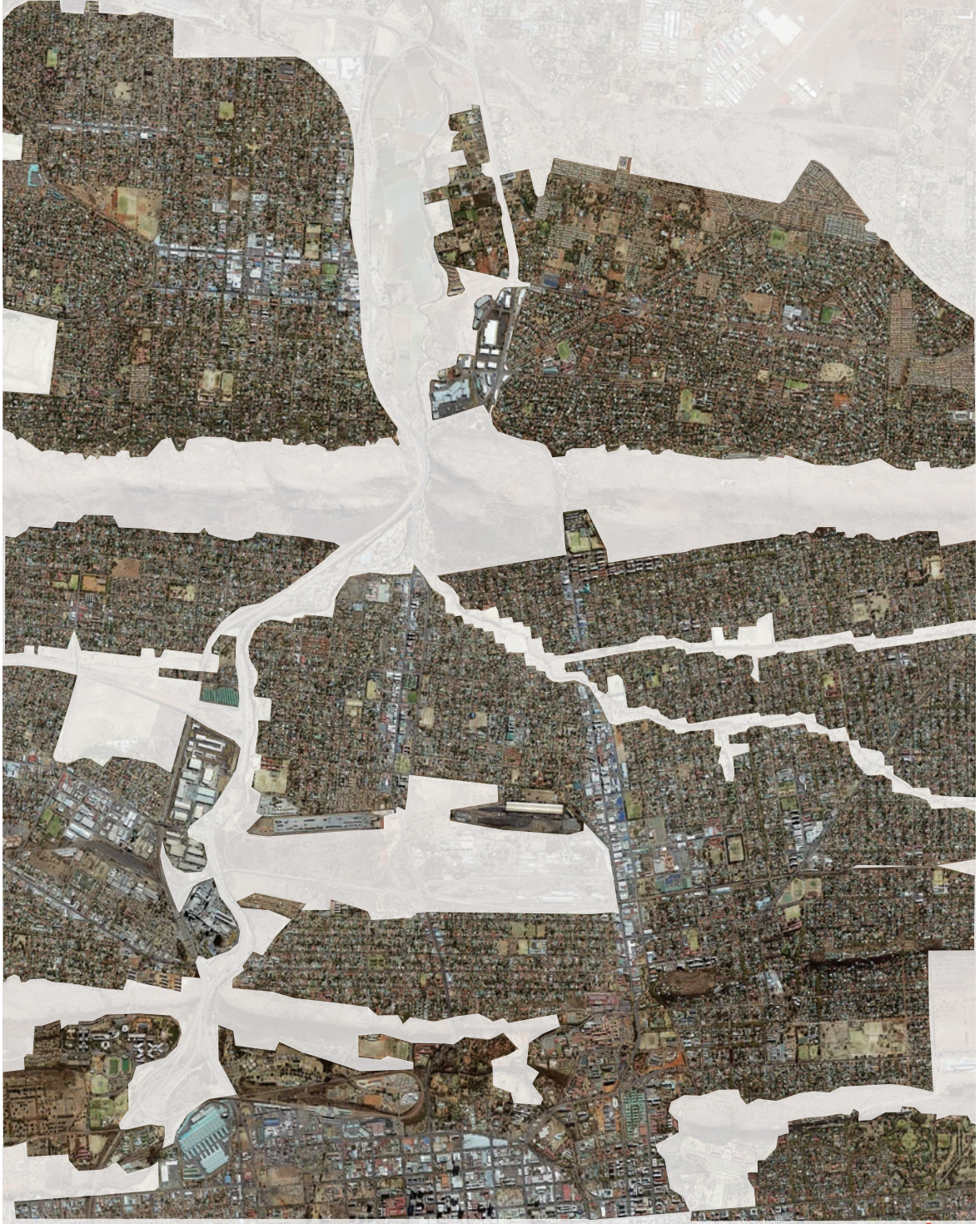
Fig _26 (Top): Micro Investigation: Site and Access Routes (Author 2017).

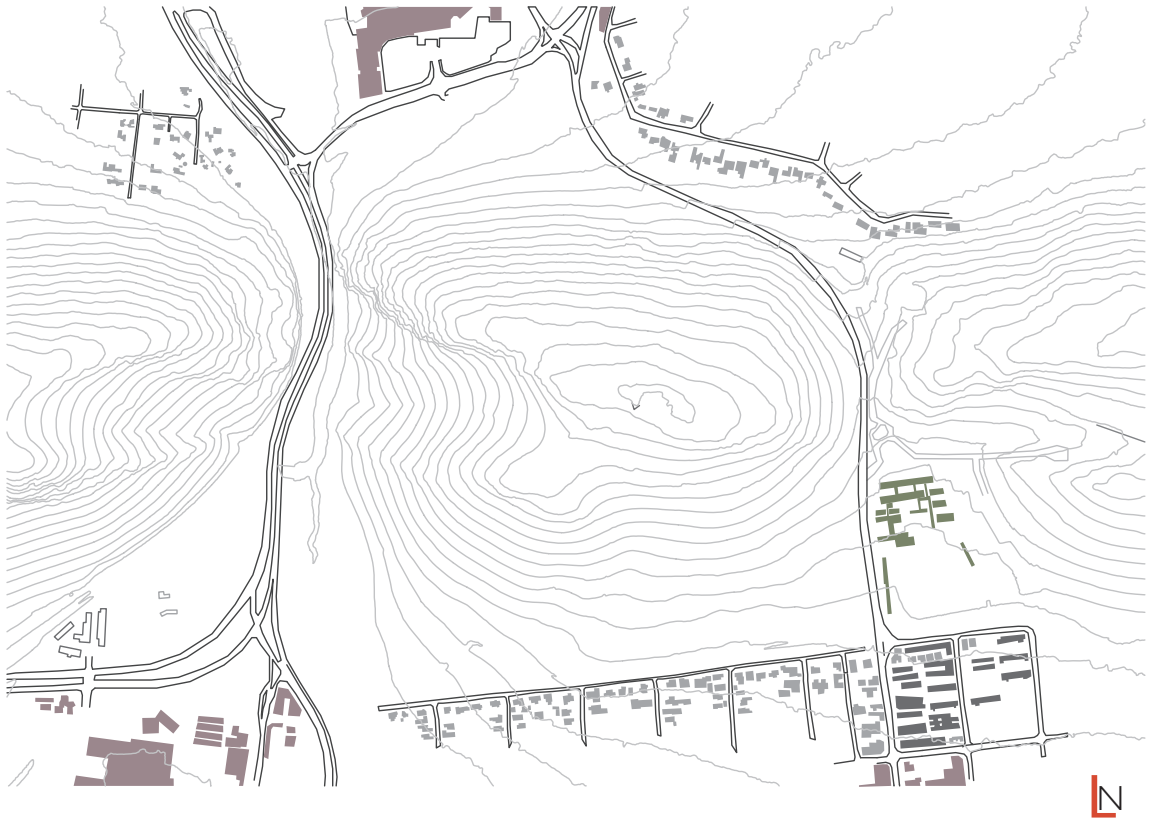




Fig_27 (Left): Macro Investigation: Ridges and Landmarks (Author 2017).

Fig_28 (Top): Micro Investigation: Site and Landmarks (Author 2017).





Fig_29 (Left): Macro Investigation: Build in relation to unbuild urban landscape (Author 2017).
Fig_30 (Top): Micro Investigation: Density surrounding site (Author 2017).





Fig_31 (Left): Macro Investigation: High Density Urban in relation to the Natural Magaliesberg Mountain (Author 2017).

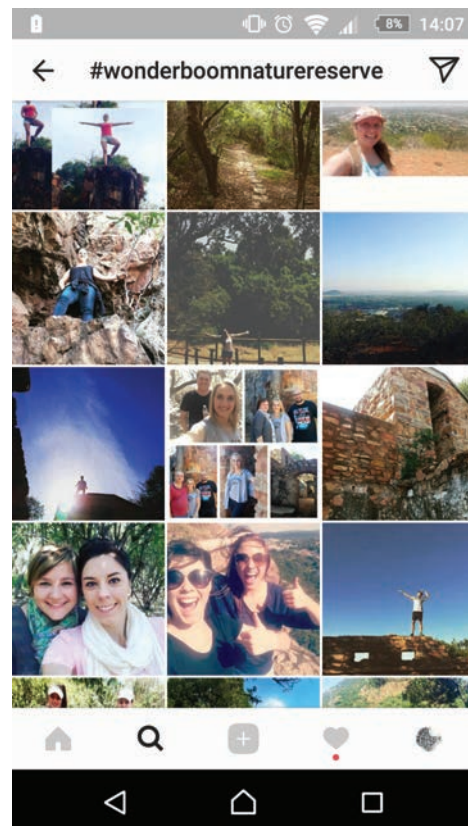
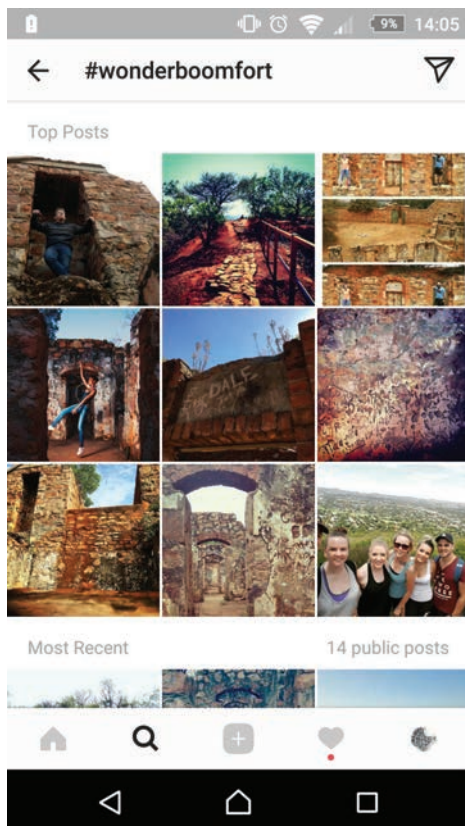
Fig_32 (Top): Micro Investigation: Nature Reserves in relation to the greater Tshwane Region (Author 2017).

Social media tracking as mean for investigation is a rather new concept. The investigation considers this aspect in terms of visitor review by means of social media's hashtag tracking. This enabled the investigator to a general visitor feedback and the reaction visitors have when visiting the site. Three main platforms (Instagram, Facebook & Google Review) were utilized to gather information on the visitor's experience.

Fig _33 & 34 (Bottom): Instagram Investigation: #WonderboomFort #WonderboomNature Reserve (Krieger & Systroom 2010).

Fig _35 (Top Right): Google Investigation: Search - Wonderboom Nature Reserve (Author 2017).

Fig _36 (Bottom Right): Facebook Investigation: Search - Wonderboom Nature Reserve (Zuckerberg, Moskovitz, Saverin, McCollum & Hughes 2004).



Wonderboom Nature Reserve
Pretoria

4.1 ★★★★★ 32 reviews

Sort by: Most helpful

Grayhan Harrington
In the last week
★★★★★ Have great history and a nice place to take photos.
Helpful?

Bradley Slabbert
3 months ago
★★★★★ Visit the Wonderboom (Giant fig tree) with great historical value and take a short hike up the hill to an old fort. Braai facilities available
Helpful?

Hennie Prinsloo
7 months ago
★★★★★ Nice hike and good braai and picnic spot. Hike up to the fort and back can be done in 1.5 hours. A lot of steep steps on the way but beautiful views from the top.
Helpful?

Jeremy van Zyl
3 months ago
★★★★★ Clean with braai facilities etc. Nothing to write home about.
Helpful?

Awyn Lubbe
3 months ago
★★★★★ Braai facilities available, hike up the mountain to see the fort, or just experience the wonder boom
Helpful?

Cohen Mkhomazi
5 months ago
★★★★★ Very beautiful place to be and hang around with your mates.
Helpful?

Obed Phahlane
3 months ago
★★★★★ Braai and hiking tracks
Helpful?

★★★★★ ☆
4.1 out of 5
32 ratings

Rae Smith
a year ago
★★★★★ I have come here multiple times, There are a number of features at this reserve: The Fort of the hill, An abandoned fort that is very interesting to go and see. Ther is also an (artificial) waterfall that is quite mystical. There are Braai facilities, and a very old fig tree that is central to the naming of the area "Wonderboom" it is a must see.

There are also Zebra, and buck in this nature reserve but usually stay on the otherside of the mountain.
Helpful?

Christo Smit
4 months ago
★★★★★ Went there on a family outing and was pleasantly surprised. Entrance fee is very modest at <=R35 per adult. The drought induced dryness aside, the braai facilities and lawns are adequate with plenty of shade available. Lawns and the natural surroundings (like packs of dassies running around) provide ample entertainment for young kids and for the more grown up, the fort at the top of the koppie (be sure to take water and a hat) will engage you. If that does not work, the excellent view of Pretoria and the surroundings (from the Voortrekker monument to power plant cooling towers in the north) will definitely delight. Don't expect the Elder tree when visiting the actual Wonderboom but it is still worth seeing.
4

f wonderboom nature reserve

Wonderboom Nature Reserve
National park

3.8 ★★★★★ 163 public ratings

Unofficial Page · Located In Pretoria, South Africa

★★★★★ ☆ ☆
3.8 out of 5
163 ratings

[User] I drive past the Wonderboom Nature Reserve (Steve Biko street) every week day afternoon on my way home from work. I am always very excited about that part of the road, as there is sometimes Impala or Zebra standing very close to the fence, and since the fence is right next to the street, it almost feels like I am in the Kruger, watching these beautiful animals as I drive by them very slowly in the afternoon peak traffic. There is just one thing that is bothering me terribly and I can't keep quiet anymore, as it seems to be getting worse by the day. I don't know when last staff from the nature reserve saw that side of the reserve, but it is absolutely horrendous! It looks like a rubbish dump! The worst part is that the rubbish is not only next to the road, but also on the reserve grass next to the road and also on the reserve grounds, which means that the animals are very likely to eat that rubbish and get seriously sick or worse, die from it! Can someone not do something about this? It is really a sore eye. It looks horrible! I can't believe that no one knows about this or does nothing about this. How can you let a beautiful nature reserve like that be destroyed and tarnished by all that rubbish. It just doesn't make sense. It's a nature reserve for crying out loud! It's just very, very sad... Please advise. I would love to hear your view on this.

Like · Comment · about 4 months ago · 5 reviews

Public photos

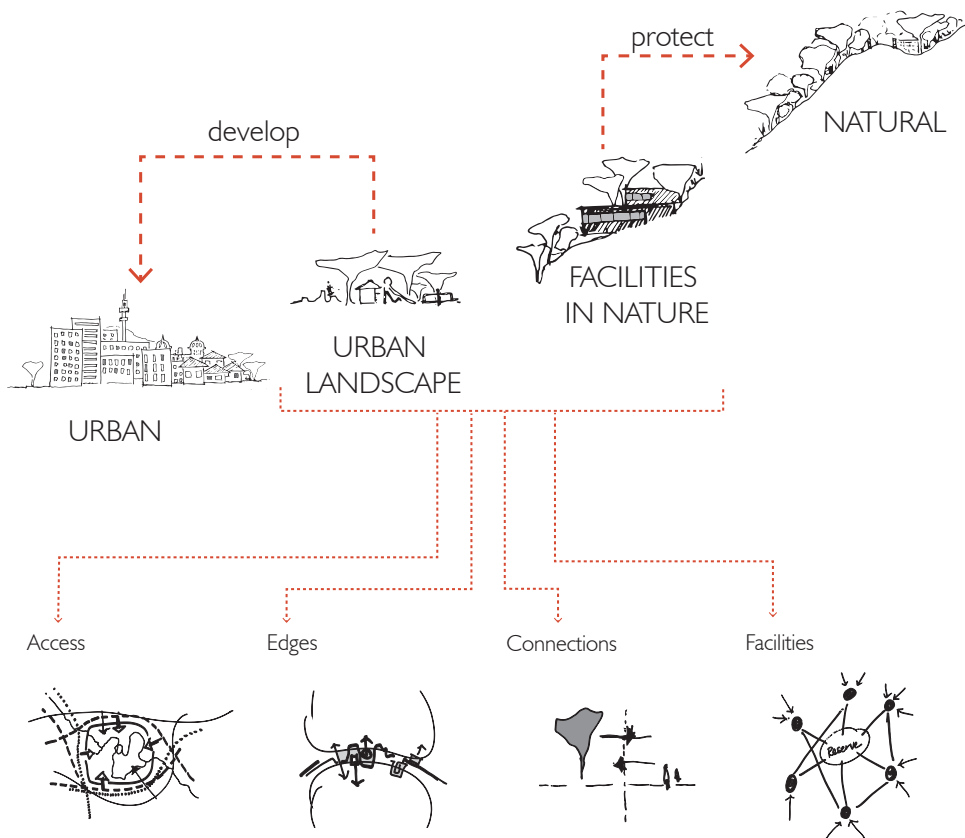


See all public photos

02_2.3 Urban Strategic Vision (USV)

The urban strategic vision is developed from an understanding and deliberation of the analytical investigations done. The vision addresses the less-defined landscape challenges and sets out a hypothesis that can be implemented and tested by means of a general strategic vision approach. The urban strategic vision hypothesis states that architecture is proposed as a frame of reference in the landscape to create and improve awareness of urban wilderness areas to ultimately conserve and emphasize the uniqueness of these places. The implementation and test strategy for the hypothesis considers a general, simplistic approach of balance of development and protection between urban and wilderness that is extended to detail by four sub-categories; Access, Edge, Connections and Facilities (fig 37).

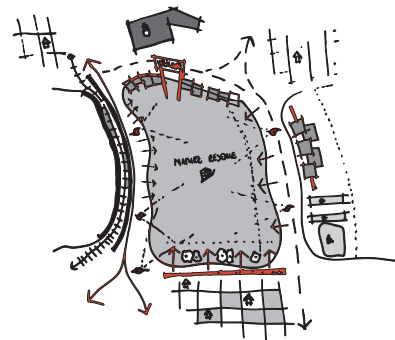
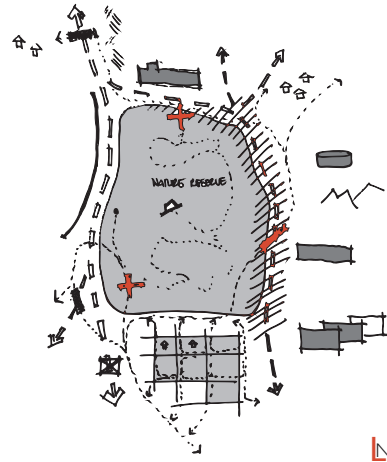
Fig_37 (Right): Urban Strategic Vision Approach (Author, 2017).



Access, the first strategy sub-category, considers the main approaches to and from the site and how these routes need to be developed for optimal site awareness. Ted Trzyna (2014) co-founder of the IUCN urban specialist group and president of the InterEnvironment Institute at the University in California states that access is a global problematic issue to be addressed when it comes to Urban Protected Areas. He suggests that direct public transport needs encouraging and the supply of well-mapped routes that makes provision for bicycles and pedestrians also needs attention. The access sub-category, as focus subject, initiated from problematic questions raised in the analytical investigation discussion. How do architects improve the existing circulation paths and extend existing access routes to draw more feet into the reserve? In the discussions, more feet into the reserve was an efficient architectural approach to address awareness and enhance interaction between nature and urban. The proposed implementation to address the approach of more feet was set out as a principal implementation strategy to achieve smaller focus aims. The following principles regarding access are proposed within the urban strategic vision:

- Focus on alternative modes of transport for example bus, train, cyclists and mainly pedestrians.
- Slow down routes surrounding the site to facilitate interaction with and visibility of activities along route.
- Increase access points - physical access points, but also visual access for awareness.
- Use architecture as way-finding tool to draw attention as beacons for pedestrians/cyclist in the landscape.

Secondly the urban strategic vision studies the edge conditions. What would the best edge condition for the site be and what must be done to achieve these edge conditions? The analytical investigation discussion suggested that the edges of the nature reserve needed to be addressed as they have become physical barriers keeping interaction to the site to a single point. The edges of the reserve were also considered as a favourable area to intervene between nature and urban as it is situated directly between the two environments. The urban strategic vision sets out the following principles to be implemented



Fig_38 (Top Left): Access conceptually implemented at Wonderboom Nature Reserve (Author 2017).

Fig_39 (Bottom Left): Edges conceptually implemented at Wonderboom Nature Reserve (Author 2017).

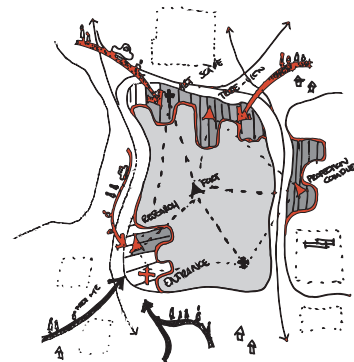
to achieve the goals set out:

- Overall: Improve visual access and awareness of the site.
- Define boundaries/buffer zones and celebrate entrances on high traffic routes.
- ‘Lend’ natural environments to residential/quiet areas by recessing boundaries into the reserve and facilitating visual access to nature.
- Programs on the site’s edges should serve both natural area and urban area and consist of diversified programs.

Thirdly the strategy considers the connections between nature and urban. This subject as sub-category was developed as a result of the edge conditions approach and focuses on the extended relationship between nature and urban. It questions how the urban strategic vision can improve these connections to define the landscape and create points of interaction between nature and urban. “Our connection with the environment is our first level of experience, and one of the most important” (Shankar 2011). The urban strategic vision approaches connections with the following principles:

- Bring people to nature and nature to people.
- Rehabilitate urban green areas as recreational facilities that increase the value of surrounding neighbourhoods.
- Create a network of green spaces that facilitate movement.
- Create new roads to increase passive surveillance of these green areas.
- Adapt building / site interfaces towards the natural areas to increasing passive surveillance.

Lastly the urban strategic vision sets out possible facility provisioning to guide future interventions in their program. These facility considerations are to ultimately complete the strategic vision and prove the hypothesis in its objective to become a frame of reference and protect the landscape. The sub-category facilities, become the bridge between the urban strategic vision and the future possibilities for intervention on the site. It considers questions relating to where and what functional form architecture can start to have to achieve the objective frame of reference in the landscape. Although this sub-category does not physically spell out the programs,



Fig_40 (Top Right): Connections conceptually implemented at Wonderboom Nature Reserve (Author 2017).

Fig_41 (Bottom Right): Facilities conceptually implemented at Wonderboom Nature Reserve (Author 2017).

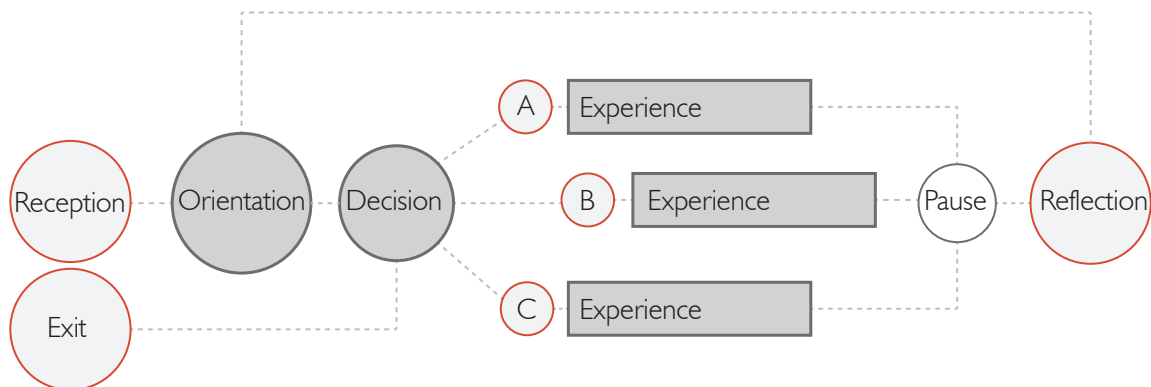
it generally states the starting point that programs need to address. The following principles are proposed under the facilities sub-category:

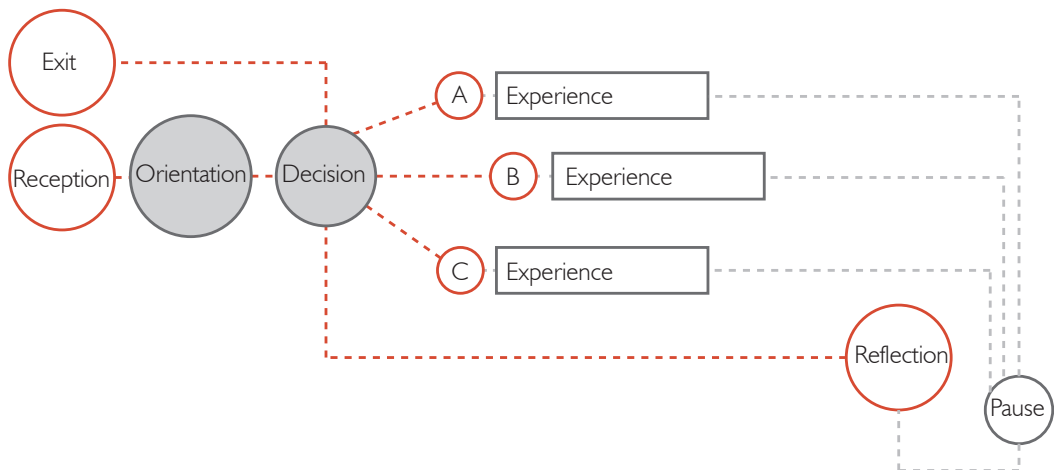
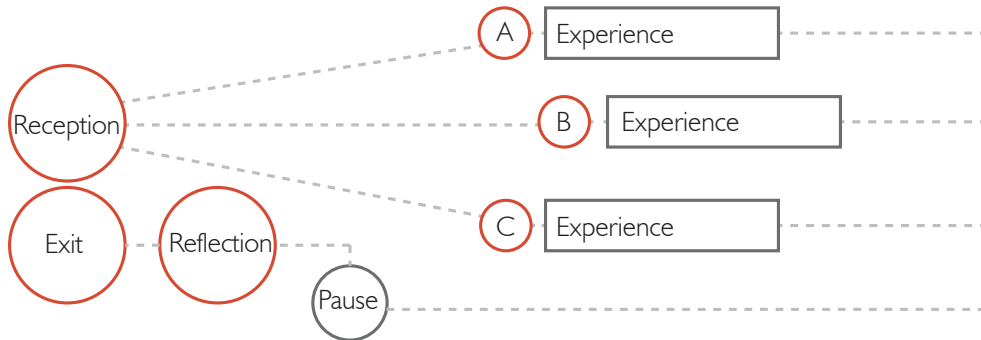
- Introduce innovative programs that make the site a daily destination (work) as well as weekend destination (recreational) and provide for a variety of users.
- Promote urban natural spaces for what they are worth – easily accessible, important recreational natural space for urban inhabitants (including lower class)
- Facilities and programs should be mixed-use, attracting a variety of stakeholders and users to the site.

The principles as set out under the four sub-categories are practical implementation considerations. With further debate between colleagues on the urban strategic vision it was found that the vision needs to address an additional side to the practical/physical. The sub-conscious or emotional understanding of space was proposed as additional consideration which was based on the idea of an ideal space flow, a unique way in which to address an urban vision regarding the sub-conscious and the understanding of the human decision-making process.

A second layer was developed and added to the urban strategic vision. This layer can be described as the ideal space flow diagram (fig 42). The concept of ideal space flow is formed from the idea that architecture can be developed from understanding the experience gained through space. "Architecture has meaning, and matters to us only when it is experienced, when all other senses are simultaneously engaged in its inhibition, and when it provides the setting in which the acts and rituals of daily life take place" (McCarter & Pallasmaa 2012:5). The urban strategic vision takes this approach to architecture and develops a model as diagrammatic representation of the ideal experience space flow for the context.

The model is developed as the ideal, how the architect intends the user to utilize the space. Predicting the path, the user will take and the spaces needed along that path. Understanding how the user will enter, make a decision and then experience the space of the function provided. After the user has been subjected to the experience or have experienced the space, the user is paused and placed into a space to reflect on the experience gained. This mentally builds an image in the mind that is remem-





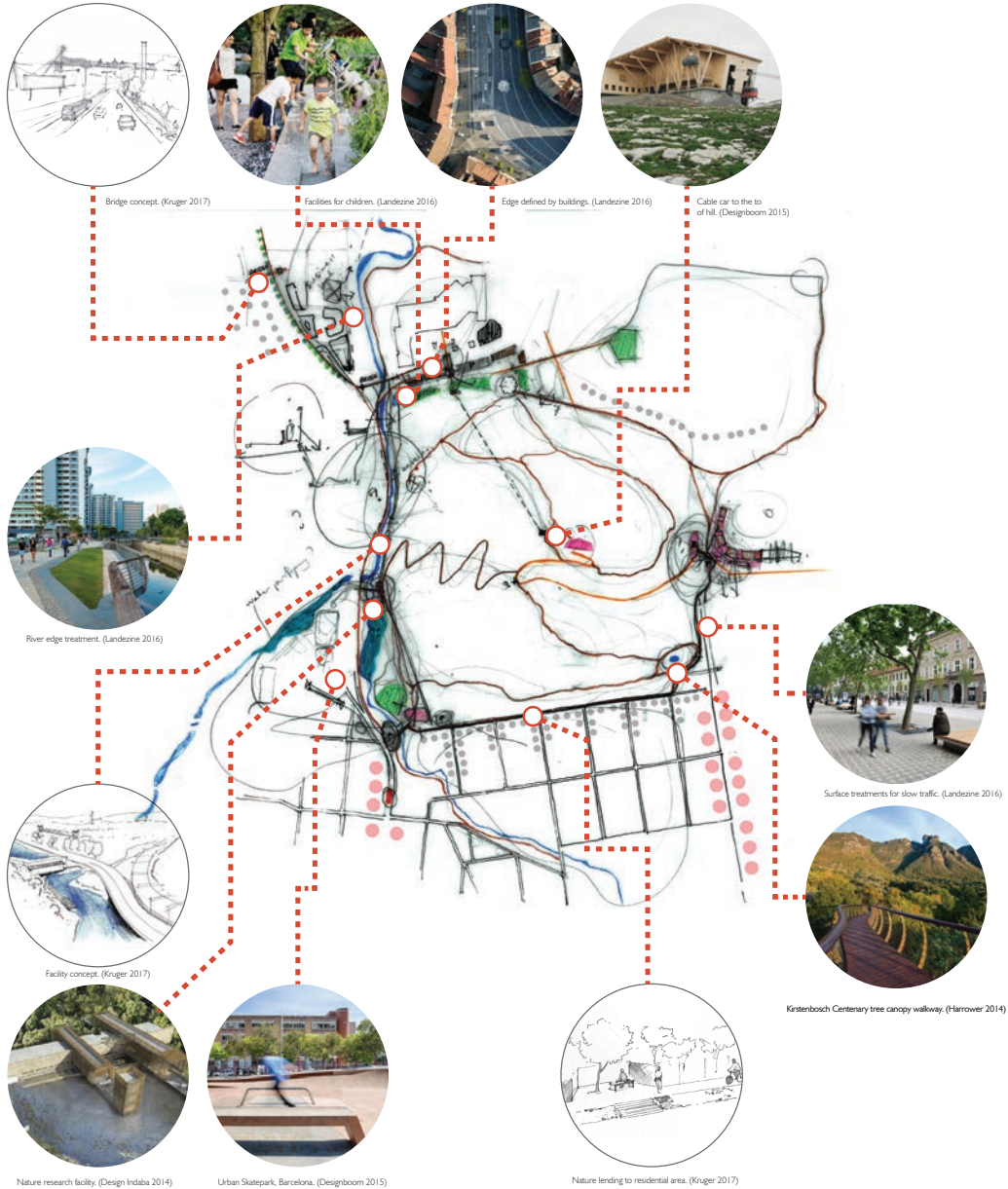
Fig_42,43 & 44 (Left, Top & Bottom): Analysis of current site in terms of Ideal Space Flow diagram (Author 2017).

bered for a longer period. The objective of the reflection space is to keep the memory of place for longer periods in the user's mind, building a greater interest in place. The user is then placed back into the decision-making space to choose if he wants to encounter another experience or exit the space. The model for the WNR is developed with no specific function in mind but rather on the idea that all programs have an experiential element. This model aids in the objective of creating more interaction with the site and memory of place.

The ideal space flow model as proposed under the urban strategic vision for the WNR area is believed to be the first step in creating an architectural response that considers the notion of ideal space flow under an urban vision.

Considering the practical principles and the second layer of sub-consciousness, a conceptual urban framework (fig 45) was developed to showcase possible precedents and the points at which they can be implemented to achieve the main objective of interaction. The urban strategic vision sets the scene for the investigation of the notion of architecture as contextual conservator.

Fig_45 (Right): Conceptual Urban Strategic Vision Implementation (Author, 2017).



02_2.4 Proposed intervention

Considering the urban strategic vision and the precedent proposals at the possible points for intervention as displayed in the conceptual urban strategic vision (fig 45), six possible sites were identified as strategic points to intervene with a proposed function to achieve interaction. Three of the six sites presented the opportunity for the investigation of architecture as contextual conservator (see fig 47).

The first possibility was a research institute on the south-western edge with an alternative entrance on the southern edge, from the residential suburb. After a site-specific analysis of the site, it was not considered viable due to the current endangered ecosystem that was discovered.

The second identified site is situated just below the mountain peak, on the southern slope. This site has spectacular views to the south, framing the city skyline. An additional entrance from the service road to the site was proposed with the function of a nature reserve distillery utilizing marula fruit, possibly to be imported from SA's northern provinces.

The site and function were rejected due to the difficulty to develop a distillery that needed a constant interaction with the road network for access and service purposes.

The third identified site is situated at the foot of the mountain on the northern edge next to the existing entrance on Lavender Road. On this site, the vegetation is disturbed by recreational activities that currently happen in this area. The site holds multiple opportunities to interact with the surrounding urban environment and build connections to nature. The site falls 3 degrees to the West making this part of the reserve the most feasible to construct a large program as the area to slope ratio is low. The proposed program for this site was recreation focused and required to relate to the existing Wonderboom tree to the east and the Apies River to the west. From the three identified sites within the six-conceptual urban vision implementation proposals, the third option showed the most potential to test the notion of architecture as conservator.





Fig_46 (Top): Proposed site in relationship surrounds and Magiesberg mountain range (Author 2017).

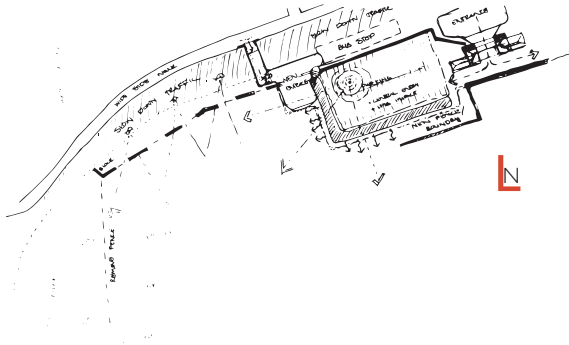
Fig_47 (Left): Proposed site in relationship to surrounding context (Author 2017).

Fig_48 (Right): Proposed site for architectural intervention (Author 2017).

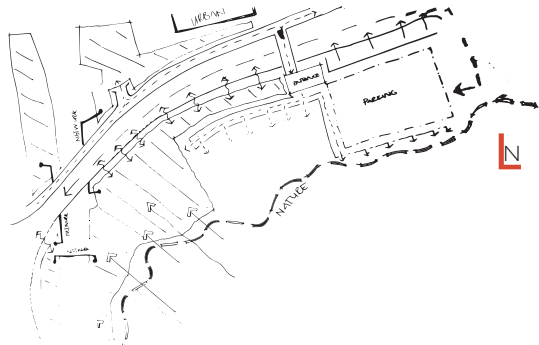


02_2.5 USV Implementation on site

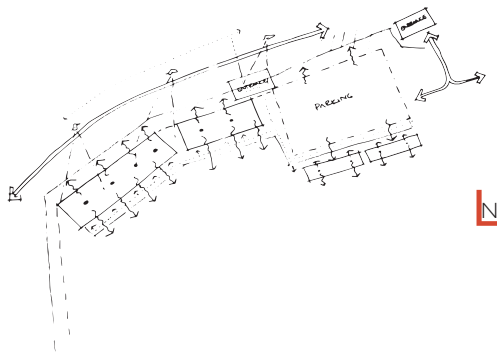
Access



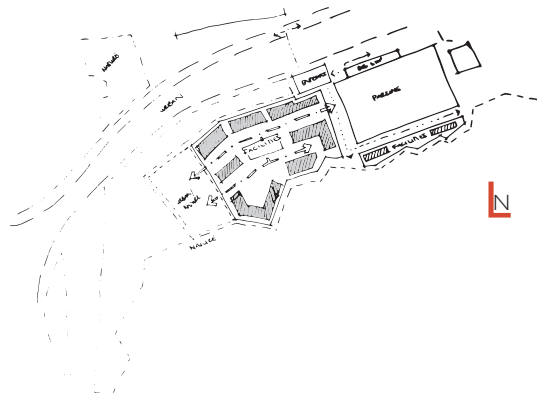
Connections



Edges



Facilities

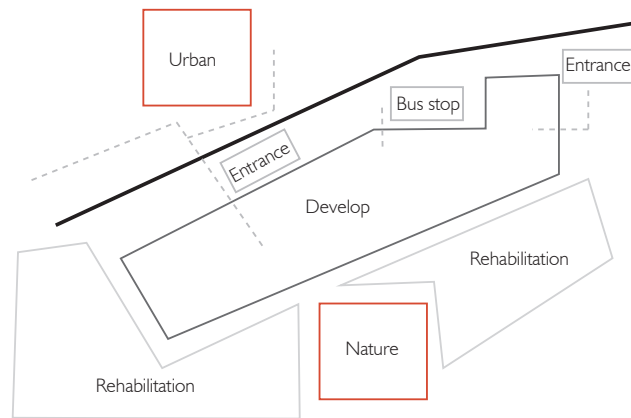
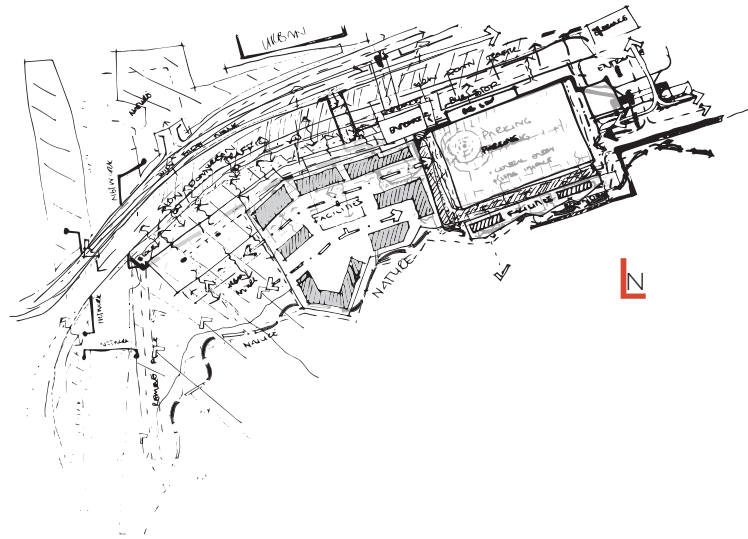


Fig_49 (Top Left): Access conceptually implemented onto selected site (Author 2017).

Fig_50 (Bottom Left): Edges conceptually implemented onto selected site (Author 2017).

Fig_51 (Top Right): Connections conceptually implemented onto selected site (Author 2017).

Fig_52 (Bottom Right): Facilities conceptually implemented onto selected site (Author 2017).



Fig_53 (Top): Synthesis of Urban Stetegic Vision onto site (Author 2017).

Fig_54 (Bottom): Proposed zoning of site from Urban Stretegic Vision (Author 2017).



02_3

INFORMANT - THEORY

"If you think you can't make the world a better place with your work, at least make sure you don't make it worse."

Herman Hertzberger

02_3.1 Theoretical Approach

The proposed intervention to test architecture as conservator considers two theories and one research study approach as bases to structure an architecture in function and form. These theories are used to structure the detail function⁵ and the architectural language⁶ of the design. Form and function are two of the three fundamental foundations that all architecture is built on. Technology is the third and will be investigated at a later stage in the project. Theory towards function, considers the general notion of ecosystem services theory. This idea looks at the existing ecosystem and the resources it provides to the context in which it functions. Theory towards function also considers the initiative study approach done by “the economics of ecosystems and biodiversity” (TEEB 2010) to strengthen the functional consideration.

Theory towards form uses the architectural theorist and architect, Herman Hertzberger’s 1973 theory of Homework for more hospitable form (Hertzberger 1973) to write an architectural language that relates to the existing layers on site. These two approaches are then combined to form the architecture that contextually conserves.

The theoretical approach as explained in this chapter considers two theories to formulate function and form. This section showcases the additional information gathered and the process followed to structure the expanded program and the architectural language.

The first part explains the extended function and the considerations used to formulate the program. It sets out the detail program and process of the project and showcases possible precedents for each function. The second part takes the historical layers of the site and analyses them into an architectural language of diagram.

02_3.2 Theory into function

Theory into function focusses on the functional aspects of the proposed intervention project, and the process to formulate a detail program that informs the design and achieve the project objectives. For the proposed project, the main functional objective is to conserve the ecological significance of the site. To address this objective by means of architecture, the first theoretical part considers ecosystem services theory to structure a program that informs the use of space.

The notion of ecosystem services is not new as traces of this idea can be found from the late 19th century in policy adjustments done by the American government (Thompson 2011: 2). The focus on the socio-economic benefits only gained interest when it was sparked in 2000 with the Millennium Ecosystem Assessment call by the then secretary general of the UN, Kofi Annan (Millennium Ecosystem Assessment 2005: ii). The Millennium Ecosystem Assessment (MEA) was initiated in 2001 with the objective to "assess the consequences of ecosystem change for human well-being and to establish the scientific basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being" (MEA 2005: ii).

The findings in the first part indicate that humans have altered ecosystems in the last 50 years more than any other comparable period and this was due to the rapid growth of demand in for food, fresh water, timber, fibre and fuel (MEA 2005:2). The report further found that action needed to be taken to counter the effects of rapid resource demand on ecosystems being it in policy change or active adaptive management. Part of the study tested possible scenarios to show the estimated effect that certain influences would have on ecosystems and their provisioning of services by the year 2050. The scenarios were used to address certain report related questions, of which one was "What options exist to manage ecosystems sustainably?" (MA 2005:92) The question was answered by proposing interventions and investments in "environmentally sound technology, active adaptive management, [and] proactive actions to address environmental problems

before their full consequences are experienced..." (MEA 2005:92)

The project's functional consideration builds on the found disruption in ecosystems services and the proposed interventions made by the MEA to address these disruptions for sustainable ecosystem development. The functional shaping starts off by identifying elements in the WNR and the Magaliesberg mountain context's ecosystem that can provide in urban resource needs, that in future might influence ecosystem depletion. The resources are divided into the four categories of ecosystem services to identify possible intervention points and contributions that ecosystem services can make towards human wellbeing on a socioeconomic level (fig 56). The focus falls on the ecosystem provisioning services category as the natural environment holds the most potential in terms of architectural intervention and the relationship with the urban.

This identified category's resources are sustainably harvested and placed into an alternative, man-made adaptive and continuously managed ecosystem to produce products that reduces the depletion of ecosystem services and start to achieve the objectives as set out by the project.

The functional formulation goes further, by expanding the theoretical input by means of the consideration of an approach implementation as explained in a study called The economics of ecosystems and biodiversity (TEEB 2010). This study's approach considers the natural environment's ecosystem services as sectors to generate economic value. The study's approach showed that the benefits of ecosystem services as economical funder is just as big as other economic sectors of the same nature. The TEEB study considers a three-step process to showcase the capital ecosystem services will be able to generate (TEEB 2010:11-12). This process firstly captures the value of the ecosystem service, demonstrates it in terms of investment potential to ultimately recognize and show the value of ecosystem service. By using these three steps, the project sets out to determine the amount of revenue that will be able to be generated by considering the

WNR ecosystem service as resource. Aiding the functional consideration in terms of demonstrating the gains that this program, in considering ecosystem services, will be able to contribute to the notion of architecture as contextual conservator.

The projects functional consideration will be a facility that sustainably harvests the natural resources of the WNR and the Magaliesberg mountain's ecosystem services to create an alternative, adaptive, continuously managed ecosystem facility to produce products that can be sold for economic gains (see fig 59). These gains can then be utilised by the nature reserve and nature organizations to fund ecological research and management to keep these enclaves in balance.

"The benefits people obtain from ecosystems: These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services such as nutrient cycling that maintain the conditions for life on Earth (Greenfacts 2017)."

Valuing Nature: Economics, Ecosystem Services, and Decision-Making

by Dr. Stephen Polasky, University of Minnesota

1. Link actions to impacts on the provision of services by improving understanding of:
 - the consequences of human actions on ecosystem.
 - the ultimate impacts on the natural capital that sustains ecosystem services.
2. Value services to:
 - improve understanding of the contribution of ecosystem services to human well-being.
3. Provide incentives to:
 - incorporate an understanding of the value of ecosystem services into policy and management frameworks.
 - provide incentives for the continued provision of valuable ecosystem services.

- From Theory of Ecosystem Services Seminar 2 (2011)

"The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on "making nature's values visible". Its principal objective is to mainstream the values of biodiversity and ecosystem services into decision-making at all levels. It aims to achieve this goal by following a structured approach to valuation that helps decision-makers recognize the wide range of benefits provided by ecosystems and biodiversity, demonstrate their values in economic terms and, where appropriate, suggest how to capture those values in decision-making (TEEB [sa])"

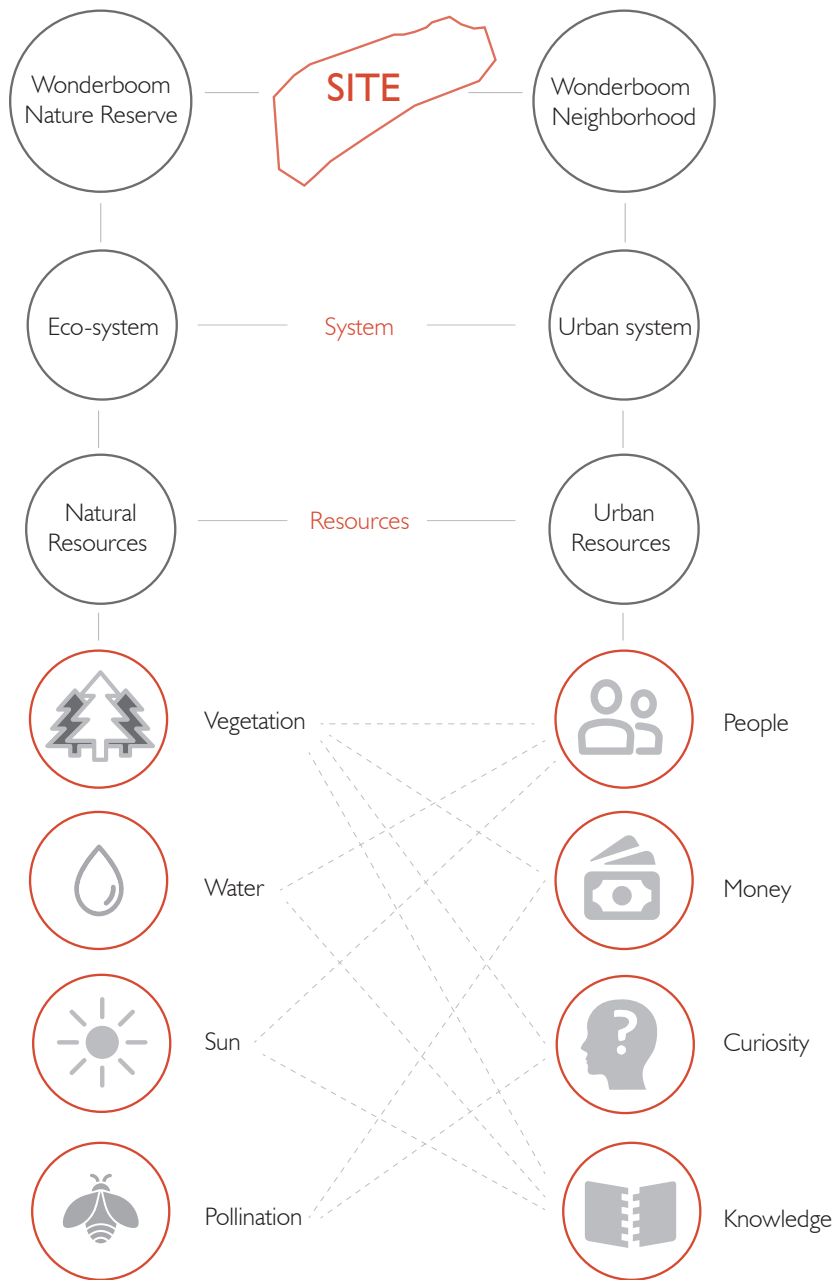
Advantages in Numbers:

Conserving forests avoids greenhouse gas emissions worth US\$ 3.7 trillion (ZAR 35 trillion @ ZAR12.96 to US\$)

Halving deforestation rates by 2030 would reduce global greenhouse gas emissions by 1.5 to 2.7 GT CO₂ per year, thereby avoiding damages from climate change estimated at more than US\$ 3.7 trillion in NPV terms. This figure does not include the many co-benefits of forest ecosystems (Eliasch 2008).

Bee keeping generates US\$ 213 million annually in Switzerland (ZAR 2.7 trillion @ ZAR12.96 to US\$)

A single bee colony ensured a yearly agricultural production worth (US\$ 1,050) in pollinated fruits and berries in the year 2002, compared to just US\$ 215 for direct products from beekeeping (e.g. honey, beeswax, pollen) (Fluri and Fricke 2005). On average, Swiss bee colonies ensured a yearly agricultural production worth about US\$ 213 million by providing pollination, about five times value of the production of honey (TEEBcase: Valuation of pollination spurs support for bee keepers, Switzerland). The total economic value of insect pollination worldwide is estimated at €153 billion, representing 9.5% of world agricultural output in 2005 (Gallai et al. 2009).



Fig_56 (Top): Ecosystem Services Conception (Author 2017).



Recognizing Value

Magalies Berg:

- Stretch 120 km from Bronkhorstspruit dam to Rustenburg.
- Of the oldest mountain ranges in the world.
- Quartzite cliffs.
- Sanctuary for escape from city life.
- Diverse Ecology.

Demonstrating Value

- Educating.
- Studying (Research).
- Utilizing materials.
- Tourism.
- Experiencing.

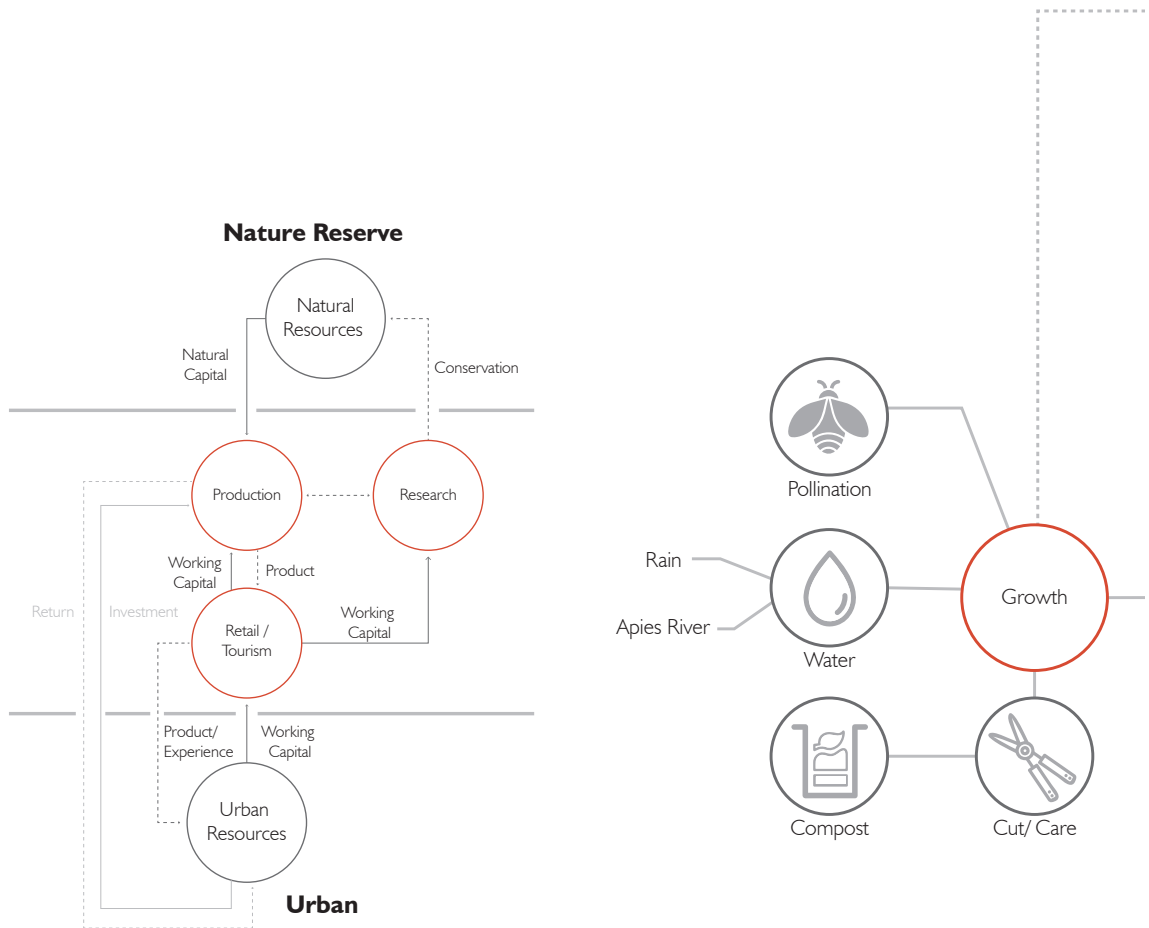


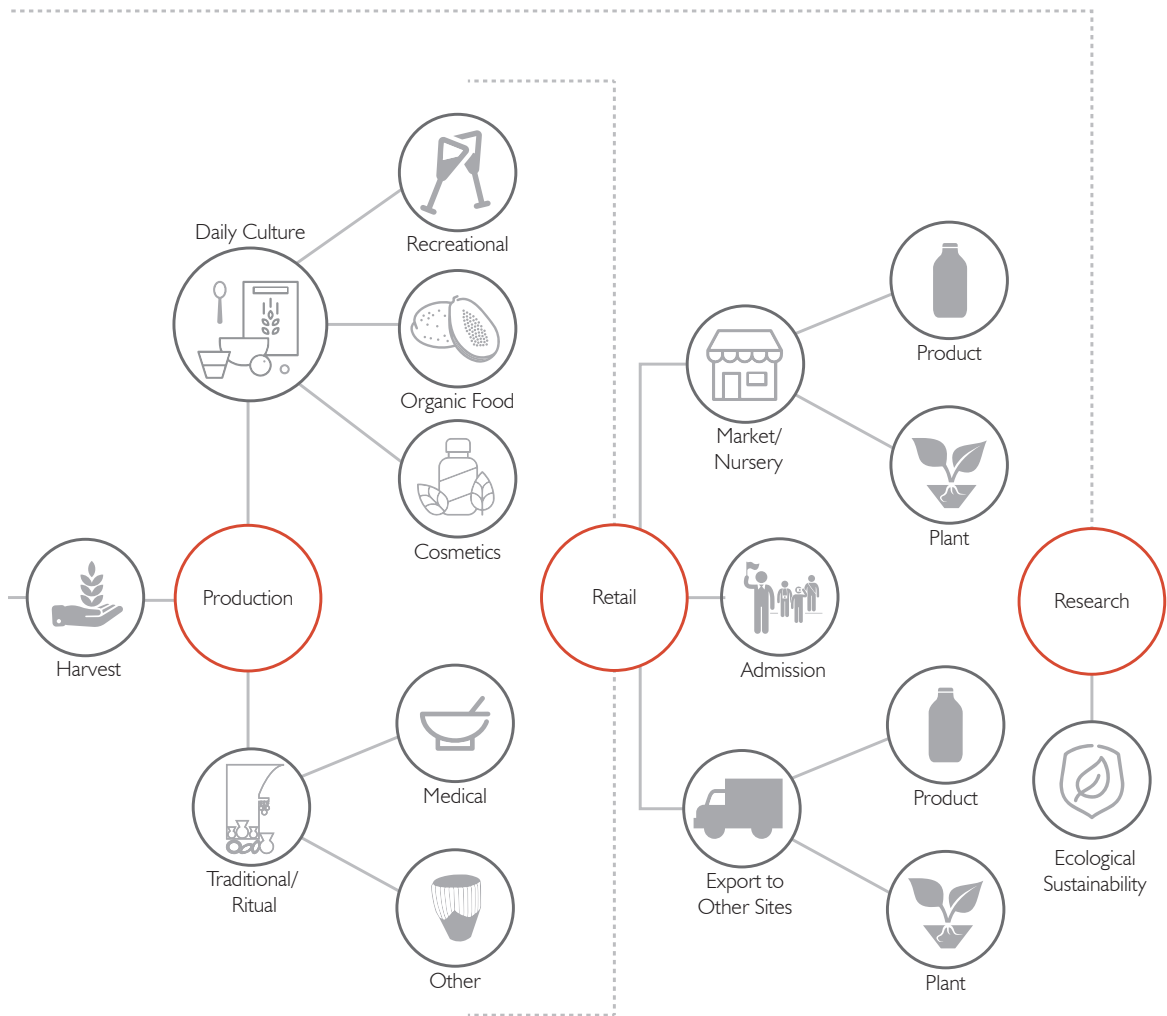
Capturing Value

- Funds for produce.
- Funds for experience.
- Conservation.
- Documentation.
- Recording.



Fig_57 (Top): The Economics of Ecosystems and Biodiversity Conception (Author 2017).





Fig_58 (Far Left): General function diagram (Author 2017).

Fig_59 (Top): Detail function diagram (Author 2017).

02_3.3 Theory into form

Theory into form sets out to address the formulation of the architectural language for the conservation facility. Its objective is to create an architectural language that retains the historical significance of the site by capturing it in a new form to manifest the historical importance of the site in the visitor's mind. To address this objective, the project considers the architectural theorist, Herman Hertzberger's theory of "Homework for more hospitable form" (in Mallgrave & Contandriopoulos 2008:440-442).

Hertzberger argues that modern forms in architecture evoke animosity and a sense of alienation. He proposes the notion of Hospitable Form. With this notion, he calls for forms with a richer capacity to absorb, carry and convey meanings, forms that people can take possession of through mental associations, archetypal forms with respect to human imagination (Mallgrave & Contandriopoulos 2008:440). The notion of Hospitable Form is built on the identification of the museum of images.

Hertzberger's museum of images is a collection of images that all human minds hold after an encounter with the specific space. They are different from person to person but hold a collective thread. Hertzberger states that if designers relate to the collection of images in addition to the usual considerations, they can create spaces that are not unfamiliar and distanced to the user. He further claims that the more distant the images from one another and separated over time, the more in-depth our collection of these images will become. "By referring each one back to its fundamentally unchangeable ingredients, we then try to discover what the images have in common, and find thus the "cross section of the collection", the unchangeable underlying element of all of the examples, which in its plurality can be an evocative form-starting-point" (cited in Mallgrave & Contandriopoulos 2008:441). The idea of the cross section of the collection of images that relate the user to a place⁹ as form starting point comes across as a strong idea to aid the notion of contextual conservation (fig 60).

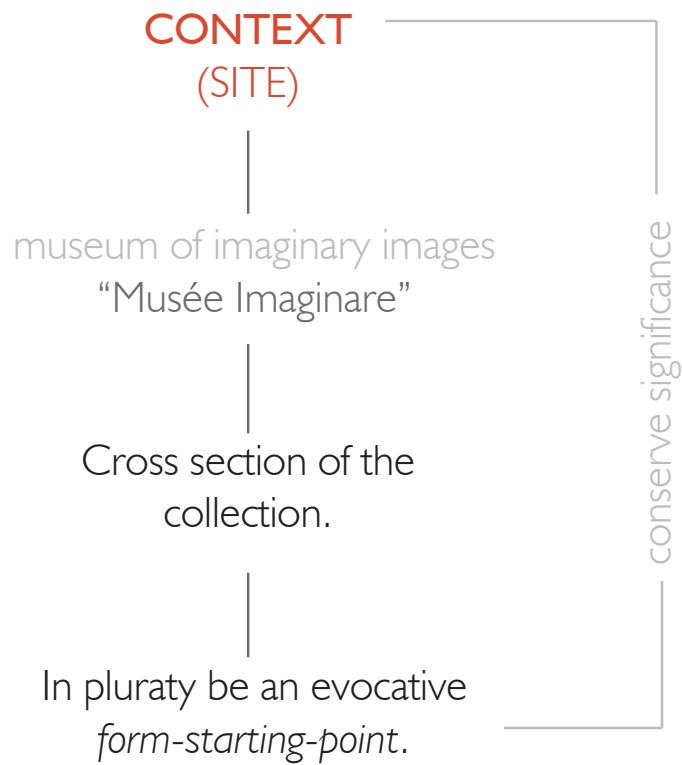
The project considers this theory in terms of the cross-section of the collection of images of the

WNR. It sees the museum of images as the historical artefacts and physical images gained of these artefacts on site. These images are then analysed to form a cross-section of the collection. This cross-section is themed and used as the form stating point to inform the design on a psychological level. Through the analytical and historical investigation of the WNR's images¹⁰, it was found that the site holds a strong protective cross-section collection. This collection spans over hundreds of years from the stone age to the current canopy of the Wonderboom tree. The protection theme was used as starting point to analyse the images and create an architectural language that portrays a sense of protection. This architectural language informs the design's form and aids in creating a conservation facility. It is proposed that if this theoretical approach is implemented, the users that visit the site will be reminded of the history of the site and the connection between nature and urban. It is intended that the architectural form will remind the user of the new protective layer the site is taking into the future, one of conservation and protection of nature rather than more protection of the urban as was the case until now.

9. Noun - 1. a particular portion of space, whether of definite or indefinite extent. 2. space in general: time and place. (Dictionary.com 2017)

10. The Wonderboom fort; the stone age cave; the stone formations & the tree canopy as found in the WNR.

Fig_60 (Right): Conception of theory - Site to form (Author 2017).





SITE

Wonderboom Fort

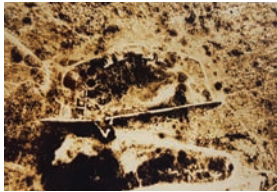


Fig. a. Fort Wonderboom (Van Vollenhoven 1999).

Block House



Fig. b. Typical blockhouse (Van Vollenhoven 1999).

Stone Age Cave



Fig. c. Wonderboom Nature Reserve Cave - Interior floor (Author 2017).

Iron Age Rock Walls



Fig. d. Stone formations on northern hill - Iron Age Artifacts (Author 2017).

Natural Trees



Fig. e. Wonderboom - Enclosed Tree (Author 2017).

conserve historical significance

cross - section - "Musée Imaginaire"

Protection

evocative *form-starting-point*
Images of:

Protection

Fig. 61 (Left): General example explanation of theory argument (Author 2017).

Fig. 62 (Top): Theory argument in terms of site and historical layers (Author 2017).

Wonderboom Fort

Images

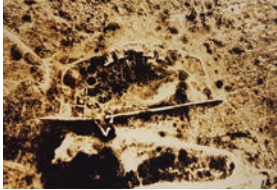


Fig. 63a. Fort Wonderboom (Van Vollenhoven 1999).

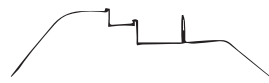
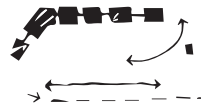
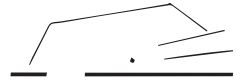


Fig. 63b. Fort entrance from interior (Author 2017).

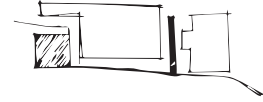


Fig. 63c. Fort rooms detreated walls (Author 2017).

Primary Elements



Geometry / Form / Shape



Block House

Images

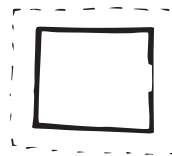


Fig. 63d. Typical blockhouse (Van Vollenhoven 1999).

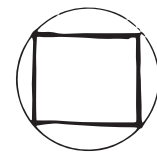


Fig. 63e. Blockhouse on Magalesberg Ridge (Van Vollenhoven 1999).

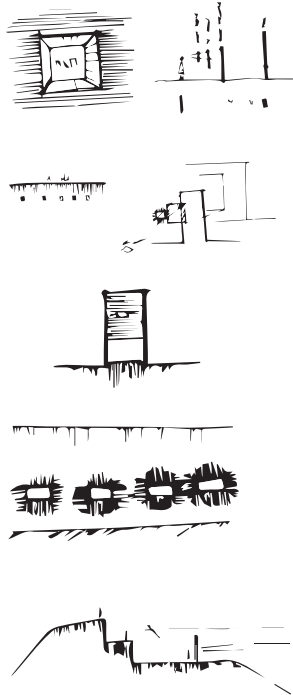
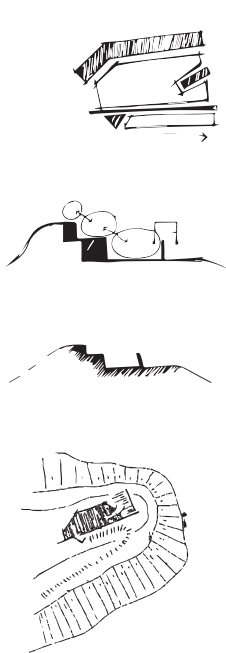
Primary Elements



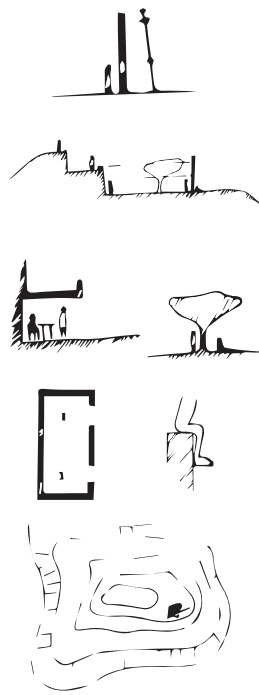
Geometry / Form / Shape



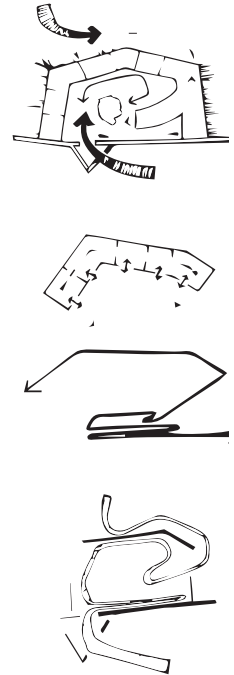
Mass / Void / Tention / Harmony Views / Frames



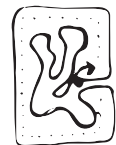
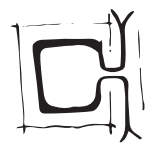
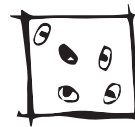
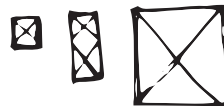
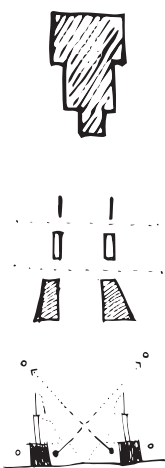
Scale / Porpotion



Circulation



Mass / Void / Tention / Harmony Views / Frames



Fig_63 (Spread): Architectural diagram langues of historical layers I (Author 2017).

Stone Age Cave

Images

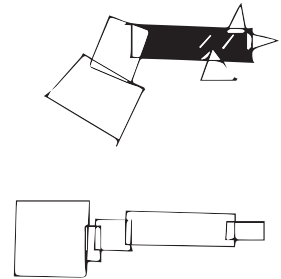


Fig_64a. Wonderboom Nature Reserve Cave - Interior floor (Author 2017).

Primary Elements



Geometry / Form / Shape



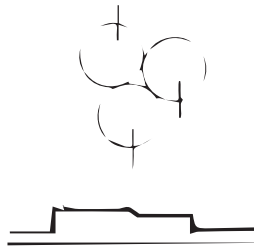
Iron Age Rock Walls

Images

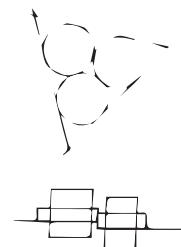


Fig_64b. Stone formations on mother hill - Iron Age Artifacts (Author 2017).

Primary Elements



Geometry / Form / Shape



Natural - Trees

Images

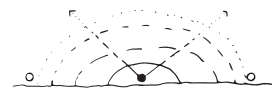


Fig_64c. Wonderboom - Enclosed Tree (Author 2017).

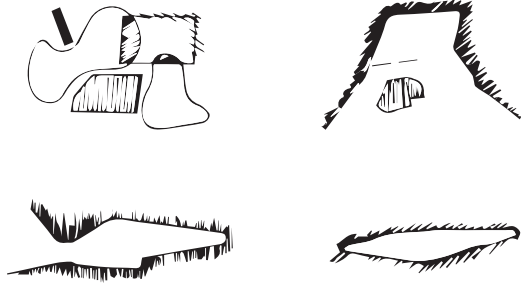
Primary Elements



Geometry / Form / Shape



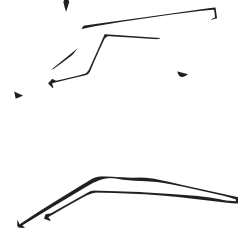
Mass / Void / Tention / Harmony Views / Frames



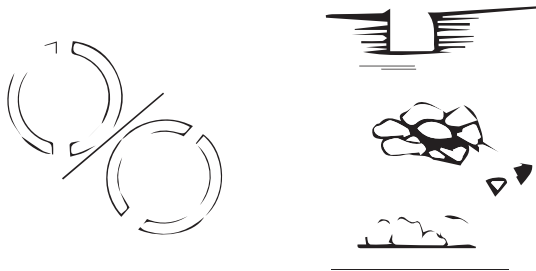
Scale / Porpotion



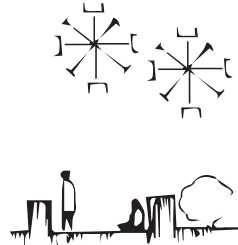
Circulation



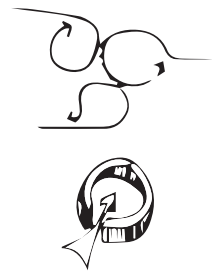
Mass / Void / Tention / Harmony Views / Frames



Scale / Porpotion



Circulation



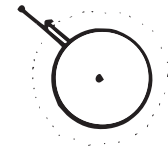
Mass / Void / Tention / Harmony Views / Frames



Scale / Porpotion



Circulation



Fig_64 (Spread): Architectural diagram languages of historical layers 2 (Author 2017).

Theory to form - Additional Information

Homework for more Hospitable form - Herman Hertzberger

Theorist Background:
Herman Hertzberger



Born: 1932

Theory: Structuralist philosophy of a building's users influencing its design via a 'spatial framework'.

Major Buildings:

- Centraal Beheer – Office building, Apeldoorn, The Netherlands, 1972

- Montessori School, Delft, The Netherlands, 1966

Short Biography:

1932 born in Amsterdam

1958 graduated in architectural engineering from Delft Polytechnic (today Delft University of Technology)

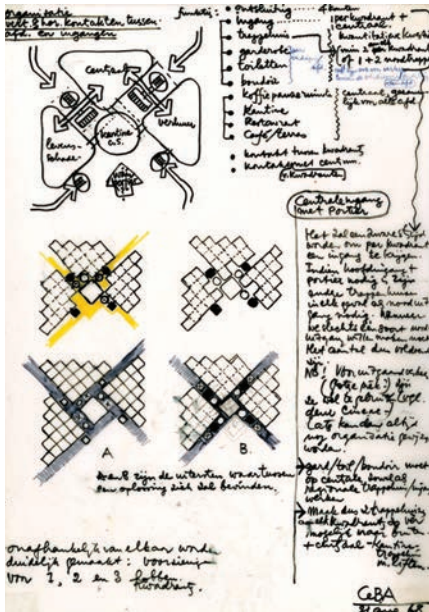
1965-69 lectured at the Academy of Architecture, Amsterdam

1970-99 extraordinary professor at Delft University of Technology

1982-93 guest lecturer at the University of Geneva, Switzerland

1990-95 dean of the post-doctoral course of architecture, Berlage Institute, Amsterdam; guest lecturer at universities and on architecture courses in Argentina, Australia, Austria, Belgium, Brazil, Croatia, Cyprus, Denmark, France, Germany, Greece, Ireland, Israel, Italy, Japan, Mexico, the Netherlands, Norway, Slovenia, South Korea, Spain, Switzerland, Taiwan, the United Kingdom and the United States.

(Lomholt, 2011)



Fig_65 (Left Top): Herman Hertzberger (E-Architect 2011).

Fig_66 (Left Bottom): Diagram by Hertzberger from notes (BMIAA 2015).

Homework for more Hospitable form as published in Forum 24:3 (1973)

“9.2 The only escape from the fundamental limitations of our imaginative faculty lies in directing our attention more to the experiences we all have in common, the collective memory, some of it innate (!) some of it transmitted and acquired, which in one way or another must be at the base of our common experimental world. We don’t have knowledge of everybody’s personal images and associations with forms, but we assume that they can be seen as individual interpretations of a collective pattern. The relationship between collective pattern and individual interpretations can perhaps be linked with the relationship between language and speech. (We each use language in our own way; both individuals and groups can express themselves with, and as long as they keep more or less within the framework of recognize declensions and rules, and use recognizable words then the message comes across.) Indeed we assume the underlying “objective” structure of forms – which we can arch-forms - a derivative of which is what we get to see in a given situation. The whole “musée imaginaire” of forms in situations whatever their time and place can be conceived of as an infinite variety out of which people help themselves, in constantly changing variety, to forms which in the end refer back to the fundamentally unchangeable and underlying reservoir of arch-forms.

9.3 In designing, apart from the usual information, by association we can try to dig up from our memory as many images as possible of situations relating to our problem, and gather these around it. The farther the images are separated from each other in time and place, and the more characteristic they are for the situation at hand, the more our collection of images will gain in depth. By referring each one back to its fundamentally unchangeable ingredients, we then try to discover what the images have in common, and find thus the “cross section of the collection”, the unchangeable underlying element of all of the examples, which in its plurality can be an evocative form–starting-point. The richer our collection of images, the more precise we can be in indicating the most plural and most evocative solution, and the more objective our solution becomes, in the sense that it will hold a meaningful, and be given a meaning by, a greater variety of people.

9.4 We cannot make anything new but only reevaluate already existing images, in order to make them more suitable for our circumstances. What we need to draw on is the great ‘Musée Imaginaire’ of images wherein the process of change of signification is displayed as an effort of human imagination, always finding a way to break through the established order, so as to find a more appropriate solution for his situation. It is only when we view things from the prospective of the enormous collage, that, with the aid of analogies, we can resolve the unknown and, by the process of extrapolation arrive at solutions which can improve our circumstances. Design cannot do other than converting the underlying and the idea of ever being able to start off with a clean slate is absurd, and moreover, disastrous when, under the pretext of its being necessary to start completely from the beginning, what already exists is destroyed so the naked space can be filled up with impracticable and sterile constructions. When we do away with what has gone before us, and pay no attention to what more stable groups of people next to us, elsewhere, still possess, and thus make no use of the accumulation of images at our disposal, we nip the possibility of renewal in the bud.”

(Mallgrave & Contandriopoulos, 2008:441-443)



02_4

INFORMANT - PROGRAM

"Our opportunity, as designers, is to learn how to handle the complexity, rather than shy away from it, and to realize that the big art of design is to make complicated things simple."

Tim Parsey

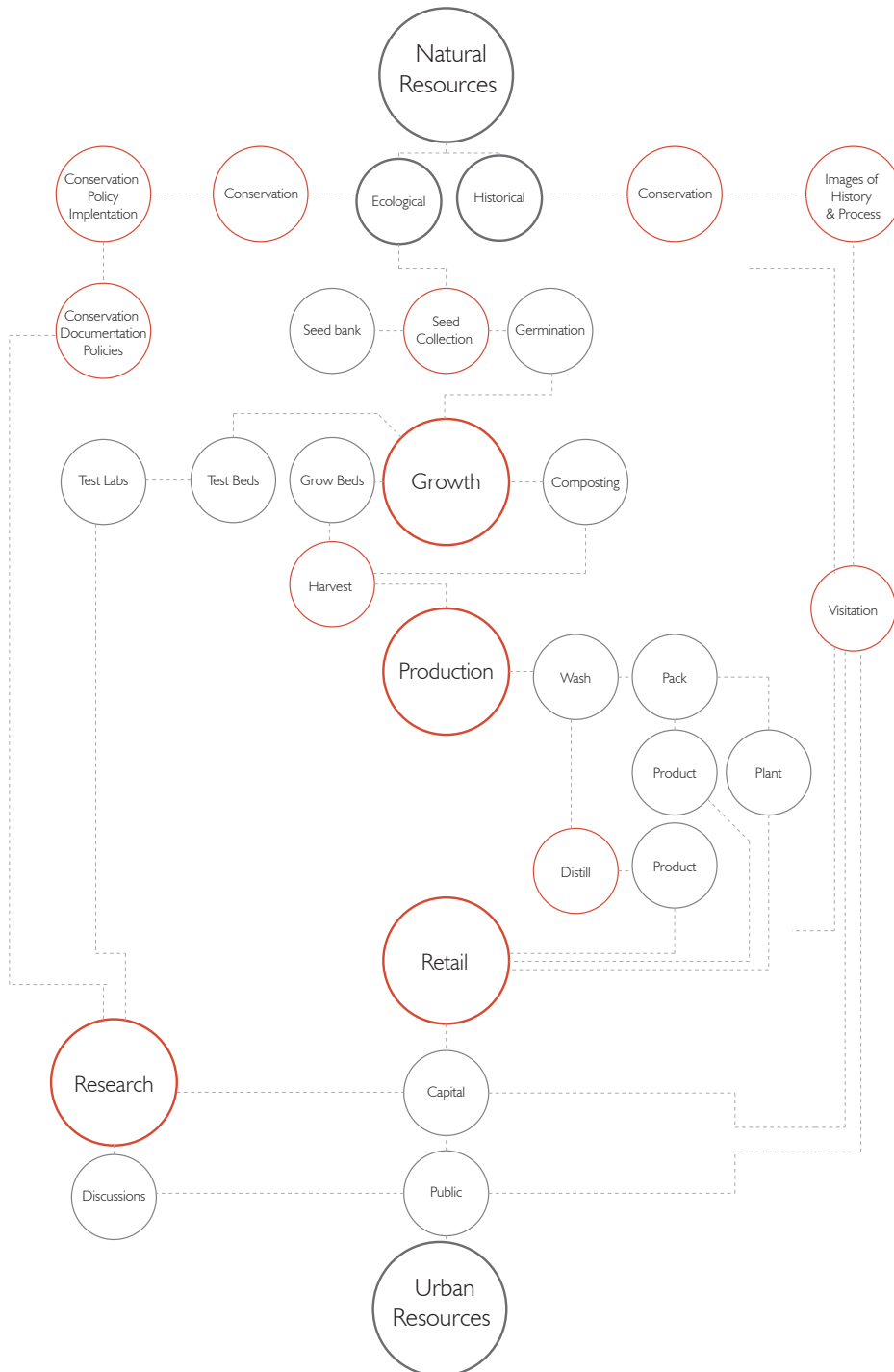
02_4.1 Eleborated Program

This section picks up on the figure as showcased in the theory to function section (see fig 59). It explains the flow of spaces and relationship between functional requirements. The holistic approach towards function is represented as an in-between fill of natural resources and urban resources.

It furthermore showcases the size requirements of the functions presented and precedents that hold similarities in function.

This section aids the reader in understanding the processes of the conservation facility by means of breaking the program up into smaller considerations.

Fig_68 (Right): Diagram of the program structured in the in-between of nature and urban (Author 2017).

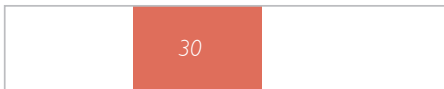




Sourcing of seeds from nature reserve in a sustainable manner. Germanizing of new seeds and monitoring of growth in grow beds. Aiding services for optimal growth.



Sourcing of natural capital (physical raw materials) that Ecosystem services present. Producing products from raw natural materials for market.



Selling product to urban communities.



Utilizing working capital gained from retail and tourism to fund sustainable growth and conservation of nature reserve.



Pollination:
Housing beez.
Collecting honey.



Palynopolis - Eriksen Skajaa Architects + Christina Charlotte Tolfsen



Fig. 69a. Palynopolis. (AchDaily 2010)

Recreational:
Distilling.



Distillery Terrace - I540 Arquitectura



Fig. 69e. Distillery Terrace (AchDaily 2017)

Admission:
Entry.
Exit.
Admin.

Wasit Natural Reserve Visitor Centre
- X Architects



Fig. 69i. Wasit Natural Reserve Visitor Centre (AchDaily 20)

Office:
Admin.

Design Strategy & Research Center
- THE_SYSTEM LAB



Fig. 69m. Design Strategy & Research Center (AchDaily 20)

Water:
Pump room.

(150 sqm)

Stortemelk Hydroelectric Plant - Earth World Architects

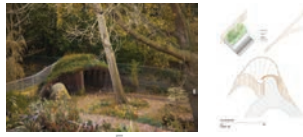


Fig_69b. Stortemelk Hydroelectric Plant (EWA 2016).

Compost:
Collection point.
Storing.
Distribution.

(150 sqm)

The Composting Shed at Inverleith Terrace - Groves-Raines Architects



Fig_69c. The Composting Shed (ArchDaily 2010).

Cut and care:
Storage for tools.

(150 sqm)

Gardening center - Architekti DRNH



Fig_69d. Gardening centre (ArchDaily 2013).

Food:
Wash.
Pack.

(150 sqm)

Carozzi Production and Research Food Center - GH+A | Guillermo Hevia



Fig_69e. Carozzi Production and Research Food Center (AchDaily 2014).

Cosmetics:
Mix/Make.
Pack/Bottle.

(150 sqm)

Tea Seed Oil Plant - Imagine Architects



Fig_69f. Tea Seed Oil Plant (AchDaily 2015).

Medical:
Mix/Make.
Pack/Bottle.

(150 sqm)

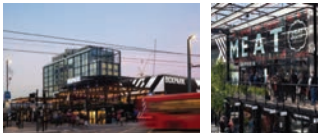
Lozy's Pharmaceuticals Factory - GVG Estudio + Vaillo-Ingaray



Fig_69h. Lozy's Pharmaceuticals Factory (AchDaily 2017).

Market:
Shops.

Boxpark Croydon - BDP



6). Fig_69g. Boxpark Croydon (AchDaily 2016).

Nursery:
Shop.
Admin.
Display.

"Nursery Fields Forever" Reconnects Early Childhood Education with Nature



Fig_69k. "Nursery Fields Forever" (AchDaily 2016).

Export:
Distribution.

Cox Communications Distribution Center - el dorado



Fig_69l. Cox Communications Distribution Center (AchDaily 2016).

Other

Additional programs to aid the sustainability of the conservation facility and aid in the relationship with the urban.

Restaurant.
Interior.
Exterior.

Boos Beach Club Restaurant - Metaform architects



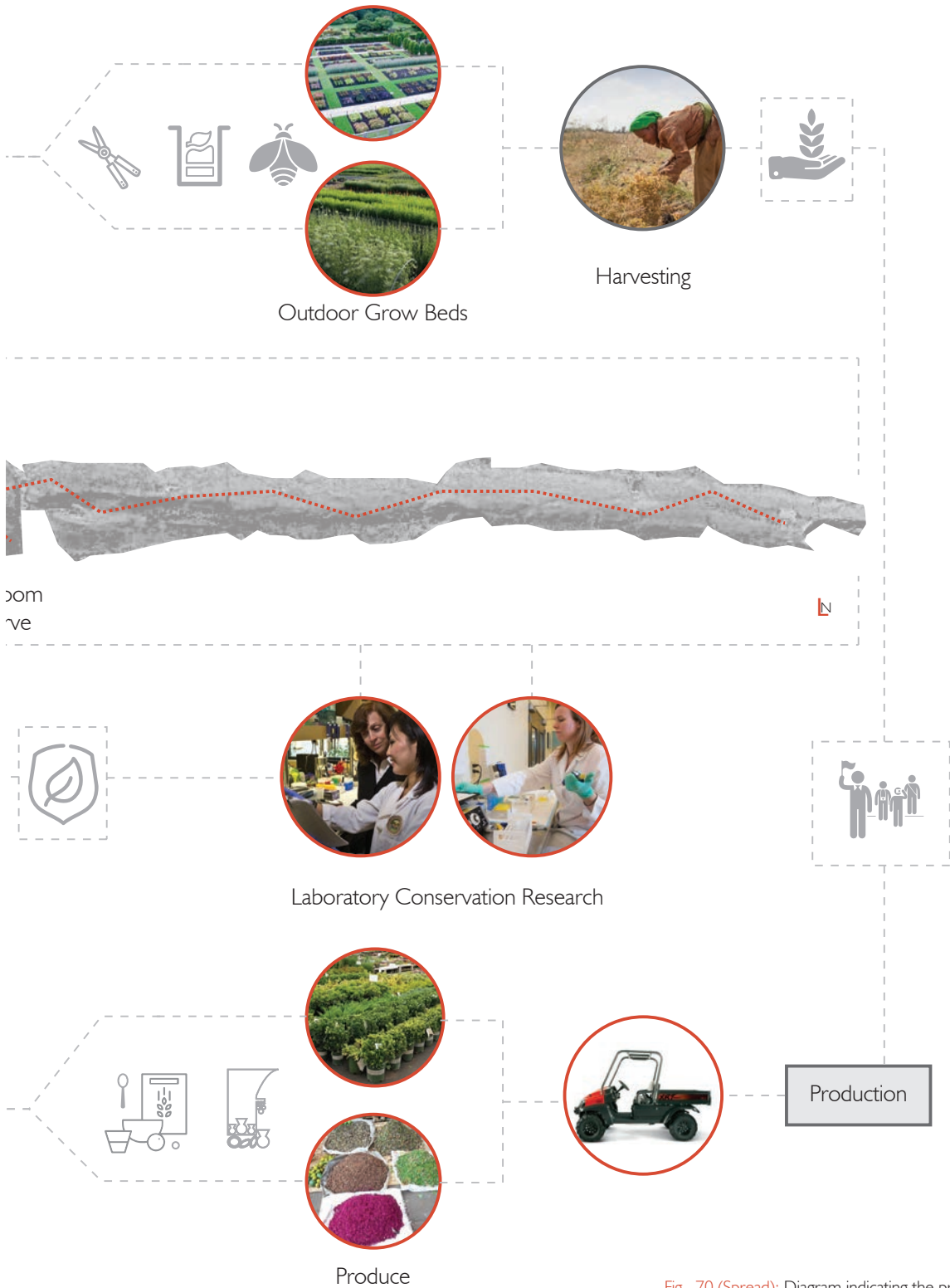
Fig_69n. Boos Beach Club Restaurant (AchDaily 2017).



7).

Fig_69 (Spread): Precedent considerations for functional spaces (Author 2017).





Fig_70 (Spread): Diagram indicating the process of the facility's program (Author 2017).



02_5

INFORMANT - PRECEDENT

"People ignore design that ignores people."

Frank Chimero

02_5.1 Precedents

Precedents as informant consider existing architectural responses in term of related functional, formal or other interventions. The section elaborates on the precedents mentioned in the contribution article and gives the reader a visual interaction between what was explained and the visual architectural intervention.

02_5.2a Investigative Precedent

After a thorough analysis of the informants to develop the architecture, an understanding of possible functional and contextual precedent studies was achieved. The investigation focused on examples, local and international, that relate to the functional and contextual typological requirements and to grasp an idea of possible implementation of the argument onto site. These specific typologies mentioned are only a few of a larger number of examples that were investigated to formulate this general explanation of the functional and contextual typologies.

The basis for identifying functional typological precedents related to the similarities in the program's proposed detail. They only consider one or two of the programs that are presented for the project but constitute key considerations to inform the development of the argument into architecture.

The first precedent investigated is Cape Town's well-known V&A Waterfront and forms ties to functionality (fig 74). Watershed, designed by Wolff Architects, takes the retail typology into a different direction. Developing a retail market that caters for many smaller retailers in reaction to the V&A Waterfront mall. The architecture reacts to the ever-changing retail space model and develops the design into a multi-functional retail model that not only sells clothing, accessories or food on small scale, but also workspace. This retail typology, as developed at Watershed co-exists in an environment that is dominated by a large scale commercial retail environment. The precedent is relevant in terms of the surrounding site influences at the WNR that is also dominated by a commercial retail environment and the consideration of this precedents retail typology will be beneficial to the project.

Another precedent is similarity in program is the Wasit Natural Reserve Visitor Centre by X Architects in Sharjah, UAE (fig 73). The visitor centre was completed in 2016 and showcases a way to present nature reserves to the public without harming the sensitive environment. This precedent considers the idea that nature reserves can be utilised for educational purposes while they experience nature in

the reserve from behind glass walls. The precedent fails in the interaction between nature and the visitor due to the glass walls but succeeds in presenting the importance of nature to the visiting public.

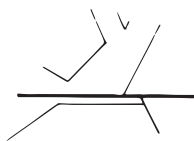
The Royal Academy for Nature Conservation by Khammash Architects in Jordan frames and captures the natural context it sits in very well (fig 75). The building was completed in 2013 and directly reacts to the natural environment that surrounds it. Built on the edge of an old quarry, the architecture reacts in form and material. The architecture considers the edge of the quarry as the guiding factor in plan and the materiality of the quarry as the informant in section.

Other precedents investigated were: MARIOerMURO, a first place winning proposal for a park in Rome, Italy and B.R.E.A.K., a third-place proposal for Turkey's Bandirma Park, both by TA.R.I. Architects (fig 72). These precedents consider the relationship between urban and nature in terms of architectural intervention; the MARIOerMURO proposal re-evaluates the wall and proposes architecture as the division between the urban city and the inner park, creating a calm environment for city residents to break away to. The third-place proposal, B.R.E.A.K links the history of the site with a new programmatic consideration.

Third-Place Proposal for Turkey's Bandirma Park [Bandirma Regeneration As Knowledge]

Project: B.R.E.A.K.
Architect: TARI Architects
Location: Bandirma, Turkey.
Program: Educational
Year of Proposal: 2017

Information: "It is a SPATIAL EXPERIENCE, to promote culture and knowledge, where to stay together enforcing the sense of community. The system obtained is that of a landscape carved, inclusive and introverted, which retains its essence, sculpted by sharp cuts that make it accessible and permeable to light and visitors. [] On the other side, the protected trees form an enchanting woods, with a deep connection to the uncontaminated nature of the site."
T.A.R.I Architects. 2017. B.RE.A.K. BANDIRMA REGENERATION AS KNOWLEDGE. <http://www.tari-architects.com/portfolio-item/b-re-k/> (Accessed 24.06.2017)



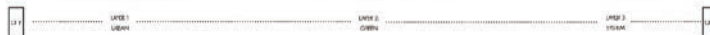
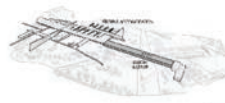
Primary Elements



Mass / Void



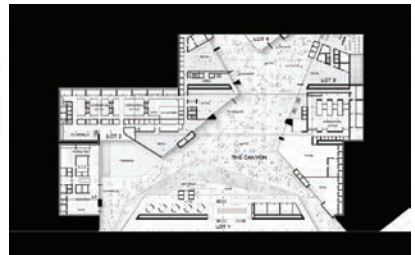
Views / Frames



ARCHITECTURE



LANDSCAPE SYSTEM
(OUR PROPOSAL)



Fig_72 (Poster): Third place proposal for Turkey's Barima Park visuals (T.A.R.I. Architects 2017) and analysis (Author 2017).

Wasit Natural Reserve Visitor Centre

Project: Wasit Nature Reserve Visitors Centre
Architect: X Architects
Location: Sharjah - UAE
Program: Visitors Centre
Year of Completion: 2016

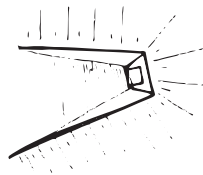


Information: "A wetland visitor center is established on site to continue protecting the natural environment, educate people on the richness of the wetland ecosystem and provides information about the birds that frequent the area and other wetlands areas of the emirate. The facility became heaven for bird watchers and researchers."

X Architects. 2015. WASIT VISITORS CENTRE. <http://www.x-architects.com/x-architects/wasit-visitor-centre/100> (Accessed 24.06.2017)



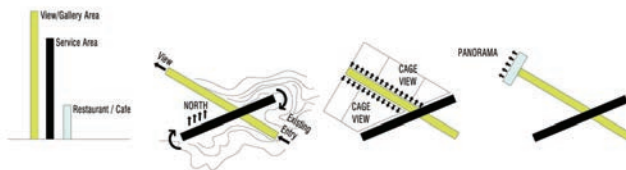
Views / Frames



Approach



Circulation

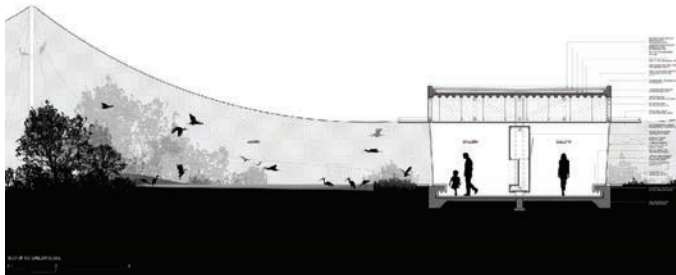


Programme

To tilt the service block against the existing topography, providing a north oriented wall for the ibis birds

To maximize the view between birds cages and gallery path

To maximize the view to the natural area from the cafe



Fig_73 (Poster): Wasit Nature Reserve Visitors Centre visuals (X Architects 2015) and analysis (Author 2017).

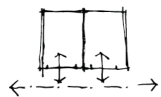
Watershed

Project: Watershed
Architect: Wolff Architects
Location: Cape Town
Program: Retail/ Market
Year of Completion: 2011

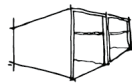


Information: "This design demonstrates how an educational institution can show leadership in the formation of the city that would serve interests beyond those of the proposed business incubator alone. Instead of locating the business incubator in a portion of the existing industrial shed (as required in the brief), we proposed a new street throughout the entire shed that sets up an urban pedestrian network which connects several popular areas around the shed."

Wolff Architects. 2011. Watershed. <http://www.wolff-architects.co.za/projects/all/watershed/#top> (Accessed 23.06.2017)



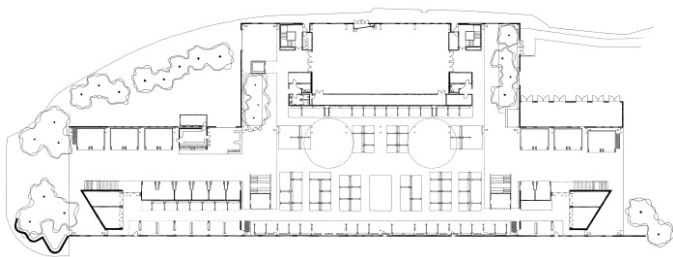
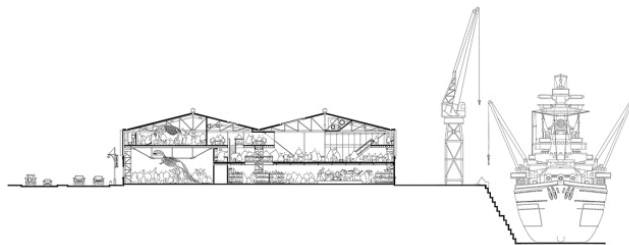
Circulation / Order



Retail Spaces



Skin and Fill



Fig_74 (Poster): Watershed visuals (Wolff Architects) and analysis (Author 2017).

The Royal Academy of Conservation

Project: The Royal Academy of Conservation
Architect: Khammash Architects
Location: Jabal `Ajlun' Jordan
Program: Educational
Year of Completion: 2013

Information: "The building design was based on the quarry cliff cut-line that a bulldozer driver once drew in the land some twenty years ago, never knowing that this line will be the base of a building elevation. The building follows the quarry line very accurately creating a linear addition of constructed stone to the bedrock."

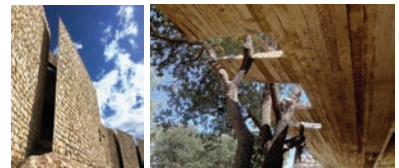
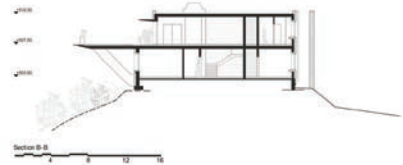
Khammash Architects. 2011. ROYAL ACADEMY FOR NATURE CONSERVATION. <http://www.khammash.com/projects/royal-academy-nature-conservation> (Accessed 24.06.2017)



Mass / Void



Edge / Frame



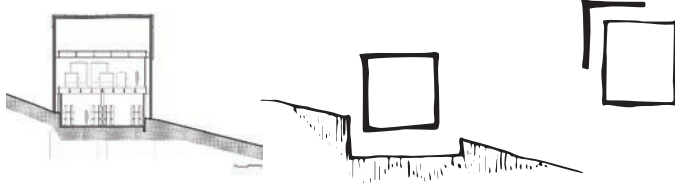
Fig_75 (Poster): The Royal Academy of Conservation visuals (Khammash Architects 2011) and analysis (Author 2017).

Encuentro Guadalupe Winery

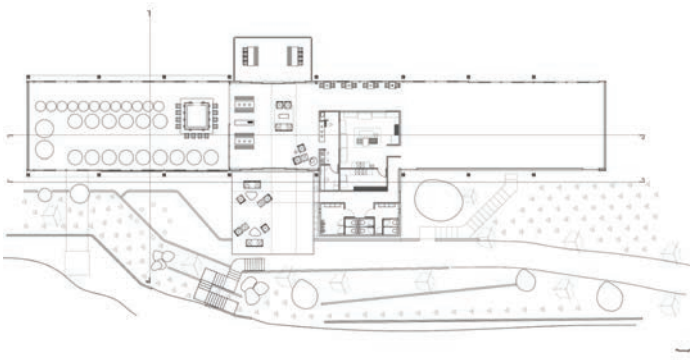
Project: Encuentro Guadalupe Winery
Architect: graciastudio
Location: Jorge Gracia
Program: Winery
Year of Completion: 2011



Information: "One of the main premises was not to directly intervene in the field, as part of the project's philosophy is to respect nature as much as possible. The availability of steel leads to a clean design form of the structure of the material, which rises from the ground to the skeleton of the room, to avoid contact with the environment."
ArchDaily, 2015. Encuentro Guadalupe Winery / graciastudio. <http://www.archdaily.com/775176/encuentro-guadalupe-winery-graciastudio> (Accessed 24.06.2017)



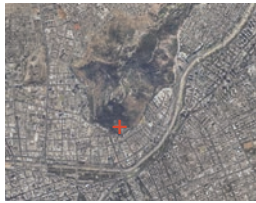
Form / Landscape



Fig_76 (Poster): Encuentro Guadalupe Winery visuals (ArchDaily 2015) and analysis (Author 2017).

Zoo Nursery

Project: Zoo Nursery
Architect: Carreño Sartori
Arquitectos
Location: Camino Carlos
Reed, Providencia, Chile.
Program: Nursery
Year of Completion: 2009

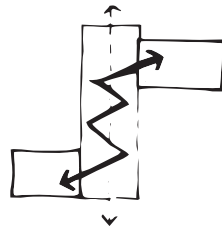


Information: "One of the main premises was not to directly intervene in the field, as part of the project's philosophy is to respect nature as much as possible. The availability of steel leads to a clean design form of the structure of the material, which rises from the ground to the skeleton of the room, to avoid contact with the environment."

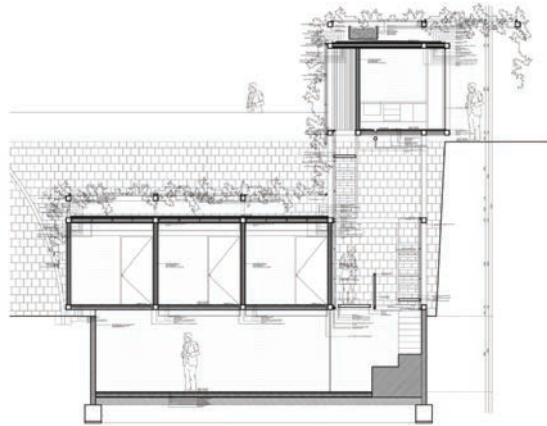
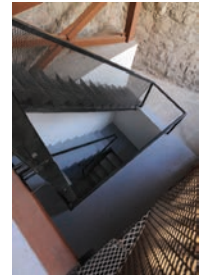
ArchDaily. 2015. Encuentro Guadalupe Winery / graciastudio. <http://www.archdaily.com/775176/encuentro-guadalupe-winery-graciastudio> (Accessed 24.06.2017)



Views



Circulation



Fig_77 (Poster): Zoo Nursery visuals (ArchDaily 2015) and analysis (Author 2017).

02_5.2b Visual Precedent

The visual precedents section considers images of the architectural interventions that show similarities in terms of the functional, aesthetical or contextual influence of the projects. No analysis of these precedents was done as they were only used as visual inspiration to understand the responses of similar contextual reaction in architecture. Some of the visual precedents considered were the Cape Point Nature Reserve (fig 78), the Klipbokkop Mountain Reserve (fig 79), the Bokong Nature Reserve (fig 80) and the Mapungubwe Interpretation Centre (fig 81).

Fig_78 (Poster): Cape Nature Reserve photos (Cape Point [sa]), poster (Author 2017).

Cape Point Nature Reserve

Project: Cape Point
 Visitors Centre
 Architect: [sn]
 Location: Cape Point,
 Cape Town.
 Program: Visitors Centre



Information: "Cape Point is in the Cape of Good Hope nature reserve within Table Mountain National Park, which forms part of the Cape Floral Region, a World Heritage Site. It includes the majestic Table Mountain chain, which stretches from Signal Hill to Cape Point, and the coastlines of the Cape Peninsula. This narrow stretch of land, dotted with beautiful valleys, bays and beaches, contains a mix of extraordinarily diverse and unique fauna and flora."

Cape Point. [sn]. About. <https://capepoint.co.za/about/> (Accessed 27.06.2017)



Klipbokkop Mountain Reserve

Project: Klipbokkop Mountain Reserve Conference Facility
Location: Worcester
Program: Conference Centre

Information: "Situated in the pristine Fynbos Mountains near Cape Town, Klipbokkop Mountain Reserve welcomes you to a unique nature experience. The ambience is enhanced by our commitment to service and quality."
Cape Point. [sn]. About. <https://capepoint.co.za/about/> (Accessed 27.06.2017)

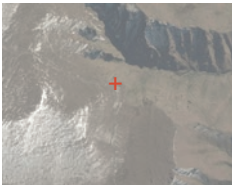


Bokong Nature Reserve

Project: Bokong Nature Reserve Visitors Centre
Architect: [sn]
Location: Lesoto
Program: Visitors Centre

Information: "At more than 3000 meters above sea level, the reserve is one of the highest nature reserves in Africa. An impressive visitors' centre has been developed on the edge of a 100m cliff. [] You may see cattle posts (metebo) which are the ruins of interconnected cattle shelters and kraals for stock that were built from stone."

Visit Lesotho [sn]. What to see, Bokong Nature Reserve. <http://visitlesotho.travel/what-to-see/24-tourist-attractions/180-bokong-nature-reserve> (Accessed 27.06.2017)



Fig_79 (Poster): Klipbokkop Mountain Reserve photos (Klipbokkop [sa]), poster (Author 2017).

Fig_80 (Poster): Bokong Nature Reserve photos (Visit Lesotho [sa]), poster (Author 2017).

Mapungubwe Interpretation Centre

Project: Mapungubwe Interpretation Centre
Location: Mapungubwe National Park
Program: Information Centre

Information: *"In this surreal setting Peter Rich has designed a 1,500 sqm visitor's center which includes spaces to tell the stories of the place and house artifacts, along with tourist facilities and SANParks offices. The complex is a collection of stone clad vaults balancing on the sloped site, against the backdrop of Sandstone formations and mopane woodlands."*

ArchDaily: 2010. Mapungubwe Interpretation Centre. <http://www.archdaily.com/57106/mapungubwe-interpretation-centre-peter-rich-architects> (Accessed 27.06.2017)



Fig_81 (Poster): Mapungubwe Interpretation Centre photos (ArchDaily 2010), poster (Author 2017).



02_6

ARGUMENT - STRUCTURE

"Architecture starts when you carefully put two bricks together. There it begins."
Ludwig Mies van der Rohe

02_6.1 Approach

Architecture can be developed in the in-between space between nature and the urban to act as conservator for nature reserves. Utilising the natural resources of the site to produce products, retailing these products to urban dwellers for revenue to fund environmental organizations to conserve nature reserves and natural balance. The architecture can further capture the historical protective layers of site in a new form to preserve the significance and echo to the visitor the historical significance of the site. The space of interaction between nature and the urban will become the site for intervention (see fig 84), acting as active protector in terms of sustainable harvesting, production, education of conservation and in building a continuous interaction between urban and nature.

The project addresses the physical, in function and psychological experience of form as two continuous informing agents in creating a synergy to test the notion of architecture as conservator. Combining the interaction between these two spheres conceptually and relating them to the relationship between nature and urban. This consideration fills the current void between urban and nature, giving new definition to the fence in terms of the architecture aiding the natural migration and interacting with the urban environment.

In replacing a segment of the fence in the most probable interaction point between urban and nature, the architecture will not only increase interactive activity between urban and nature but also aid the natural environment in conservation, protecting the ecosystems from over-exploitation of influence from the urban environment and a chance to stop biodiversity deterioration.

By combining the functional considerations that aid conservation in using ecosystems services and TEEB's approach, and the architectural form informants from the adapted use of Hertzberger's theory to create form, it is deemed that the architecture will achieve its objective of contextual conservation. The intervention of man in nature can ultimately conserve, define and capture the elements that

make nature reserves protectable and transform these forgotten, yet rich historical sites into places that keep our environments in balance. A balance that is not only important for the healthy continuous existence of nature but also for the existence of man, be it urban or not.

Architecture can be developed in the *in-between* of wilderness and urban to *act as conservator* for nature reserves.

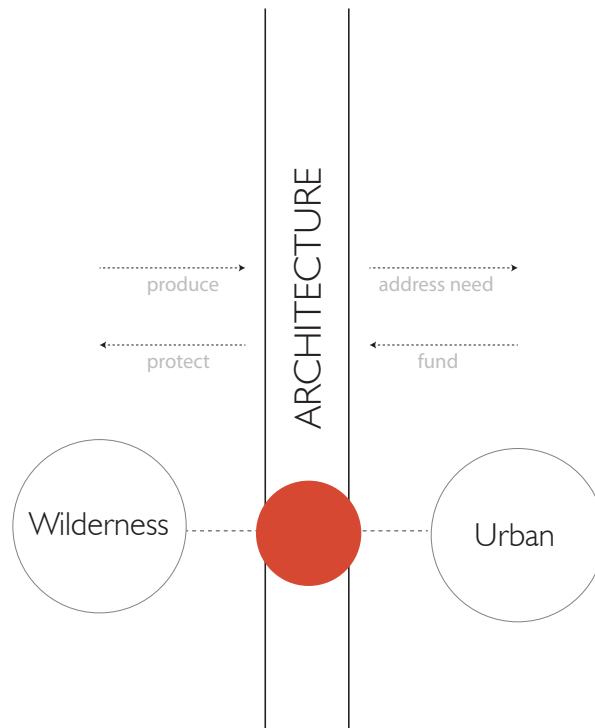


Fig. 83 (Above): Argument hypothesis diagram (Author 2017).

Fig_84 (Right): Argument approach structure diagram
(Author 2017).

Argument Approach Structure:

