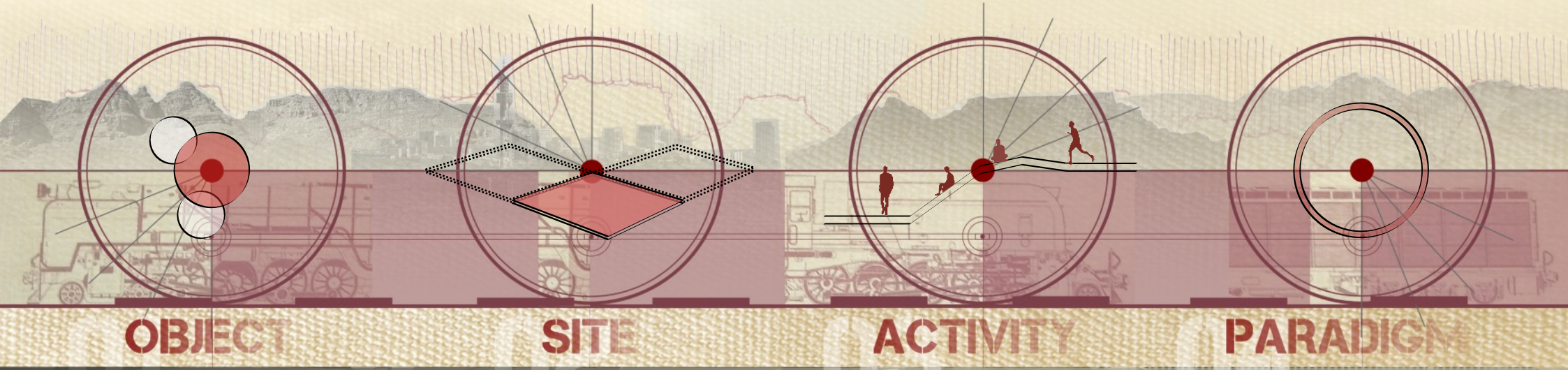
The Capital Park Steam and Railway History Museum

Implementing a Holistic Methodology for Contextual Museum Architectural Design

- The Rovos Rail Estate



Holism is the operative factor in the evolution of wholes and is the ultimate principle of the universe.

- General Jan Christiaan Smuts (1987).

By Tara Du Plessis

Course coordinator: Catherine Karusseit/
Prof Arthur Barker

Study leader: Johan Swart

Editor: Berdine Smit

Study Field: Heritage and Cultural Landscapes

Submitted in fulfilment of part of the requirements for the degree Master of Architecture (Professional) in the Faculty of Engineering, Built Environment and Information Technology University of Pretoria. November 2020

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

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

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

Project Summary

Dissertation title:	Developing a Holistic Methodology for Contextual Museum Architecture in South Africa.
Programme:	Steam Locomotive and Railway History Museum.
Address:	Transnet Avenue, Eloff Estate 320-Jr, Pretoria, 25 43’10.48’’ S, 28 11’17.04’’ E.
Clients:	Rovos Rail and Transnet.
Keywords:	Museum Architecture, Identity, Contextualism, Holism, Heritage. Industrial Heritage.
Theoretical Premise:	An Investigation into Contextualism through the Lens of Holism.

Special Thanks

"If I have seen further than others, it is by standing upon the shoulders of giants."

- Isaac Newton

My study leader, Johan Swart, for your wisdom and guidance.

My fellow students, Elmar, David and Caylin for your help and humour throughout the year.

Rovos Rail, for consultation, site access and images provided.

Lastly, my parents, Balthi and Sanet du Plessis, for all the love you give me and the sacrifices you have made.

Fig 0.1: Restoration of the old coaches.
Image provided by Rovos Rail.

Abstract

This dissertation focuses on the development of the site in and around Rovos Rail. Rovos Rail is a unique train travel company cut off from the public view. The project context is located in Capital Park adjacent to Transnet Avenue. The primary purpose of the site was to accommodate railway-related workshop facilities that provisioned and maintained the trains and carriages on their way to the industries of Johannesburg.

Rovos Rail has done much in terms of the conservation of railway history in Pretoria. This ambition should be celebrated and built upon. It is necessary to promote the conservation of the rich railway history of South Africa and understand the impact thereof on the contemporary landscape.

In order to understand the significance of contextualism, research based on philosophical, theoretical and practical lenses will be conducted. The argument relies on understanding the context through these different lenses.

The historical significance of the site is celebrated. The dissertation places it within the historical continuum of both the larger context of Pretoria and the smaller context of the surrounding community. Through the design of a Steam Locomotive Museum next to Rovos Rail, a holistic approach, based on contextualism theories and South African case studies is illustrated.

The project proposal establishes a physical connection with the historically significant structures of the site and emphasises the historical layers. Inspiration is drawn from the existing railway lines, the existing platform, ecological features and buildings.

The chosen function, that of the museum, intends to act as the arbitrator for the diversity of narratives of an ever-evolving landscape, be it manmade or natural. The museum represents a prototype for the methodology proposed.

The design aims to facilitate the conservation of railway history, the education of the importance thereof and enticement to develop these sites to represent a prosperous future.

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Fig 0.2: The locomotive arrives.
Image provided by Rovos Rail.

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1.1 Background

Within the contemporary landscape, in a world that is continually growing and transforming, architecture must structure itself within this ever-shifting environment by finding new ways to adapt to change. Architecture as itself, cannot exist without context (Gaines, 1980; Parry, 2015). By looking at context through a holistic view, meaning to see the world as a series of *bonds* within *wholes* and the importance of the connections between things as according to Smuts (Smuts, 1987), the relationship between architecture and context can be understood.

This relationship is symbiotic by nature whereby the context influences the architectural design and the architecture in turn can transform or emphasise the context. However, within the contemporary landscape, there exist architectural responses of arbitrary nature that are insensitive to the identity of the context it occupies. These responses seem to not *fit* in its context either visually, physically or philosophically. This is the result of superficial design applications or depreciation of context (Gaines, 1980).

By approaching contextual design through a holistic view, the architecture can respond to the *bonds* and *wholes* within the context. In the contemporary landscape, architecture must respond to a variety of aspects to be contextual such as relating to people, impact on urbanism, the emphasis of historical identity and preservation of the natural landscape.

This dissertation aims to propose a set of guidelines formulated by research, which leads the project design and aims to create a contextual design that is based on a holistic approach. The area of focus, the site adjacent to Rovos Rail in Capital Park, represents a unique opportunity to test the methodology proposed. Rovos Rail is contained within an environment that is disconnected from its outer context. It is needed to connect Rovos Rail with its context and thereby contextualise Rovos Rail with the greater historical landscape. The larger site around Transnet Avenue contains the various stages of the development of railway historical sites. The site has the potential for development and the opportunity for architecture to emphasise the importance of South Africa's

1.2 Project Context

The site is comprised of mostly railway-related buildings and activities, with the most prominent area being Rovos Rail. Rovos Rail is a private company that is one of the most luxurious vintage train travel companies in the world. The railway sites within South Africa have great historical and cultural significance (Worth, 2017; Jorgensen, 2010). Railway sites symbolise a legacy of ushering industrialisation through exportation (Jorgensen, 2010). The site, therefore, represents connectivity, economic growth and technological advancement (Jorgensen, 2010). By establishing the site's significance as part of the industrial heritage of South Africa and proposing a new way of integrating the site into the contemporary landscape can enhance its presence within the historical narrative.

Fig 1.1: The Context. Image provided by Rovos Rail

1.3 Problem Statement

It is essential for architectural design to be contextual (Gaines, 1980; Parry, 2015). How architecture can be contextual, meaning to not just fit into context but represent it, has varied greatly throughout history (Jellicoe, Jellicoe & Waymark, 1995).

Contemporary architecture is especially required to respond to contextual issues. These issues include environmental issues such as sustainability, social issues such as community needs and conservational issues such as preservation. Within South Africa, there exist architectural designs that are renowned for their contextual responses that respond to some of these issues (The Plan, 2018). These architectural designs often do not respond appropriately to all of the contextual issues. An understanding of contextualism, its relevance and how to apply it adequately into the design process is essential in order to respond to all contextual issues (Gaines 1980).

The uniqueness of the project context is evident in the presence of Rovos Rail - a fully functioning steam locomotive train station. However, no measures have been taken to fully emphasise the station. The station is confined within a controlled and maintained environment. This contrasts the outside areas which are overgrown, polluted and under-maintained. Remnants of buildings associated with the railway activity populate the site. There exists a need to address environmental, social, and conservational issues on site.

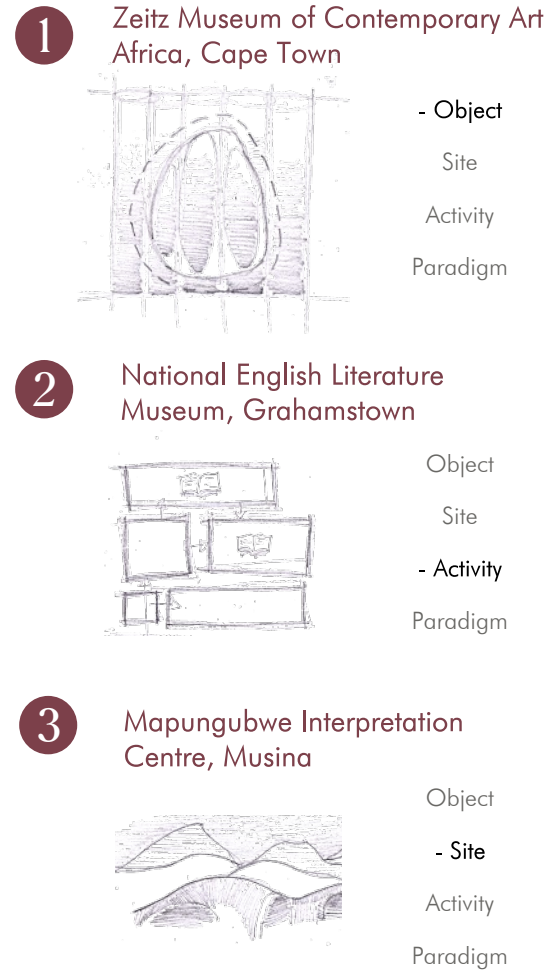

Fig 1.2: The Missing Layers

1.3.1 General Issue

Heritage sites within South Africa often need to justify their existence to be considered worthy of being preserved (Immelman & Quinn, 1968). Left undefended, these sites This results in the loss of unique heritage sites that had the potential to contribute to the understanding of the South African historical landscape (Immelman & Quinn, 1968).

The conservation, appreciation and celebration of these sites are essential in order to understand South African historical identity (Immelman & Quinn, 1968). By celebrating and connecting them to other similar sites of significance, a new approach to heritage can be realized. An approach that is evolutionary in spirit (Immelman & Quinn, 1968).

1.3.2 Urban Issue

Within South Africa cities, there exist many industrial heritage sites left unused and underutilized (Worth, 2017). These sites are connected within a certain historical landscape. This landscape can be called, as proposed by Worth (2017), a *Networked Industrial Landscape*. In the contemporary setting, these sites seem disconnected from the city - industrial sites within a post-industrial city.

The railway sites of Pretoria are important components within the industrial landscape, yet some historical sites are often undermaintained and left to decay (Jorgensen, 2010). The need for architecture to act as arbitrator for the conservation of railway historical sites and their narratives are of exceptional importance.

1.3.3 Architectural Issue

Within the built-environment, there occur architectural responses that are insensitive to the identity of the context it occupies. Architectural designs born from trends, biases or superficial understanding of context often rely on visual aesthetic presence to merely look contextual (Jodidio, 2010). These prevailing factors culminate in the creation of arbitrary objects that alienate themselves within the context, creating a disconnection between architecture and context (Gaines, 1980).

The focus on design relies too greatly on superficial applications to be contextual. This results in designers designing in an a-contextual manner. The complexity of the multi-layering of contextualism theory is often overlooked.

1.4 Research Question

The dissertation question is:

How can a holistic approach lead to a connected and contextually relevant museum within the context of a railway historical site?

The sub-questions that arose from the problem statement are:

1. How can a holistic approach lead to the understanding of historical identity?
2. How can a contextually relevant museum strengthen the pre-existing physical qualities of the landscape?
3. How can contextualism help to link a railway site with railway history and future conservation?

1.5 Intentions

The design would aim to respond to the context of Rovos Rail through a holistic perspective by proposing a new programme meant to facilitate conservation, education and recreation within the undeveloped areas adjacent to the working railway lines. The intention is to emphasise the significance of the site in terms of its role within the historical continuum of the South African landscape.

Theories of holism and contextualism will be consulted in order to inform an architectural response that strengthens the pre-existing historical features of the site and enables a platform for future development and transformation.

1.6 Methodology

The study will be developed from data collected from field research which include site visits and documentation of existing site conditions. This will discern the physical, social and ecological potential of the site.

A series of mapping exercises will follow in order to understand the transformation and development of the site from a time of industrial expansion to the present day. This method will discern the heritage value of certain existing features on the site and the contribution to the historical identity of the site.

Desktop studies will be conducted to further gather information regarding the development and conditions of the site. This will enable the layering of information to fully

1.7 Contribution

frame the site in terms of the historical continuum.

The precedent analysis will enable an understanding of existing relevant designs and programmes within South Africa. The lessons concluded from this analysis will further inform the design approach.

Evaluation of theories collected through research will be conducted in order to root a theoretical departure. Various literature will be consulted to generate a series of theoretical principles. Holism theory based on that of Smuts, Holism and Evolution (1987) will form the basis of the theory and will be carried through the design of the architecture and urban vision.

The dissertation aims to provide a set of guidelines meant to inform the design process to create contextual museum design. This will enable an architectural design that holistically responds to the context.

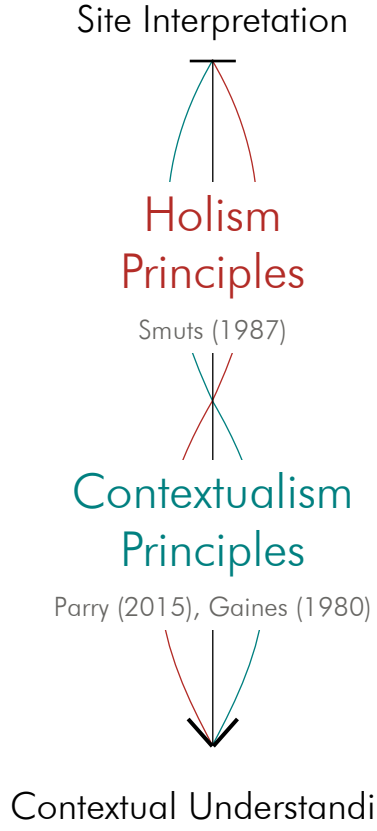

Fig 1.3: The Filtration Process

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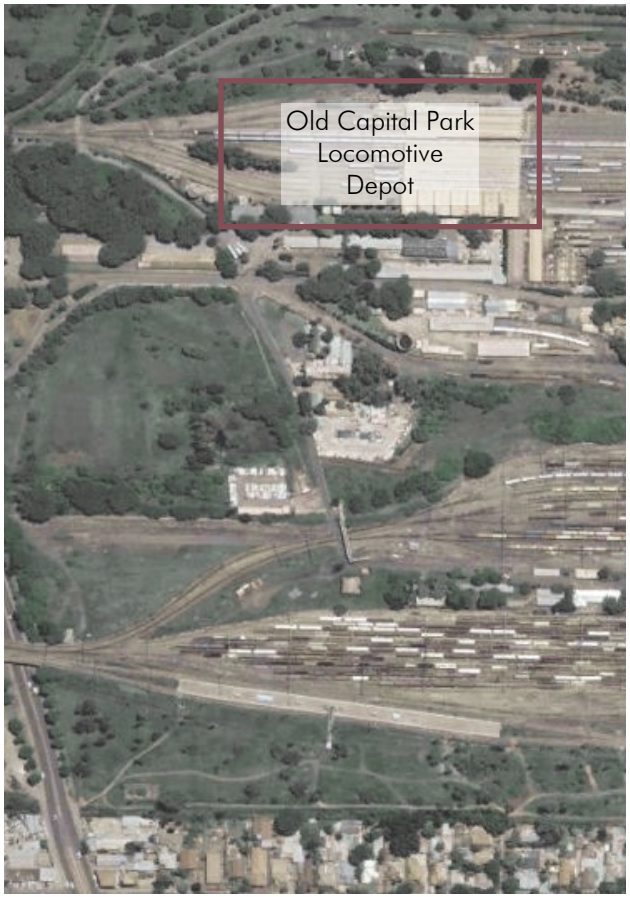
2.1 Introduction

The excitement grows as the impatient commuter waits on the platform, gazing out onto the dust-covered rails. In the distance, the sound of an engine's thunder grows louder and louder. Excitement turns into wonder as the machine glides into view alongside the platform. The journey starts here…

Fig 2.1: The Platform. Image provided by Rovos Rail

The context of this dissertation is located in Eloff Estate 320-Jr, Capital Park and is accessible from Transnet Avenue. The most prominent feature is Rovos Rail, a privately owned vintage train travel company with a world-class reputation.

This chapter provides an analysis of the context. Firstly, the site will be introduced pertaining to its construction and original use to eventually how it stands today. Secondly, an analysis of the characteristics and zoning of the site will be done. Thirdly, historical timeline analysis of the history of Rovos Rail, South African Railways and locomotives will follow. Lastly, a summary of how the site fits into the historical fabric of Pretoria will be concluded.



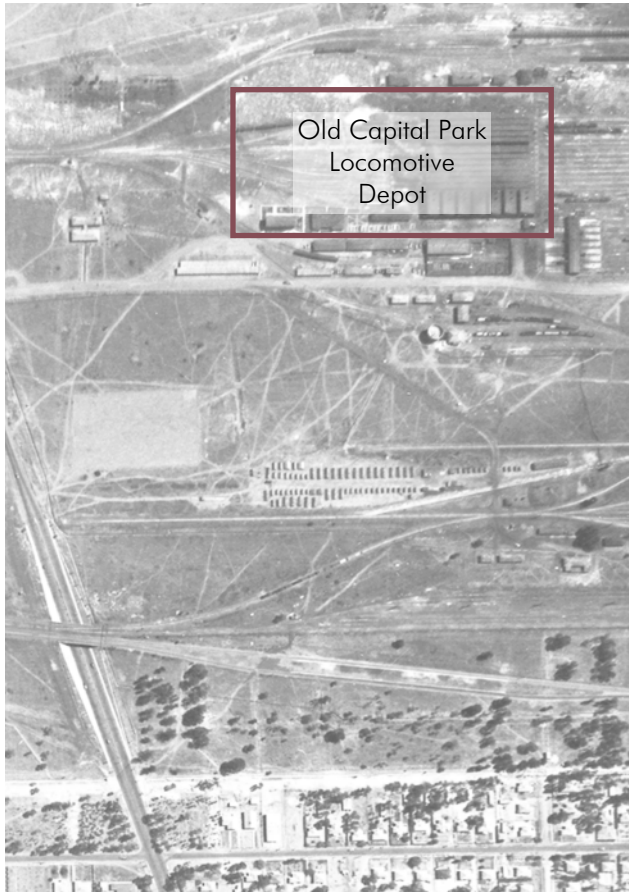


Fig 2.2: 2020 and 1948 Aerial Photographs of site

The Capital Park locomotive depot was constructed in 1939 and completed in 1943 despite the construction difficulties that were the result of the war during that time (Rovos Rail, 2009). The original Pretoria locomotive shed was situated at the main railway station. However, the large amounts of smoke caused most of the air pollution in Pretoria's business district. Because of this, the locomotive depot and other facilities were moved to areas on the city perimeter in order to minimize air pollution. The yard in Capital Park was chosen to house the new locomotive sheds and marshalling yard. The railway lines were laid and linked mainly to Koedoespoort (Rovos Rail, 2009).

After its opening, the yard was bustling with life. Engineers, craftsman and officials all worked around the clock. The entire site and its workforce ran much like the machines they were maintaining. The site became like a *stable for iron horses*, cared for by their masters (Rovos Rail, 2009). This time of industrial productivity would soon come to an end. With diesel and electric trains taking to the tracks, the use of the steam locomotive sheds rapidly declined (Jorgensen, 2010). Over the years, the buildings on site became derelict, left to decay and at the mercy of vandalism (Rovos Rail, 2009).

After Rovos Rail acquired the space, much work was needed to bring the old buildings and sheds back to life. Much time has been spent on restoration, renovation and refurbishment after which new life has been given to the once-abandoned locomotive depot yard. This rejuvenation shed light once more on the importance of South Africa's railway heritage (Rovos Rail, 2009).

Rovos Rail commissioned extensive work on the site before establishing it as their base of operation. The old railway tracks, once buried under dirt and undergrowth, were revealed. The colonial-like station building was repainted and refurbished. The original function of the large shed structure was brought back as a repair and maintenance depot for steam locomotives (Rovos Rail, 2009). Today, the site gleams with life once more. With craftsman and restoration experts on-site, a museum of railway memorabilia, the addition of an authentic signal box, and the introduction of various animals to inhabit the natural areas, the site at last opened in 1999.

2.2 Characteristics and Qualities

AREA OF INTERVENTION

ROVOS RAIL ❶

Rovos Rail, exclusive access

OLD WORKSHOPS ❷

Old railway workshops used by metallurgic businesses

Active railway lines used to transport cargo trains

CAPITAL PARK STATION ❸

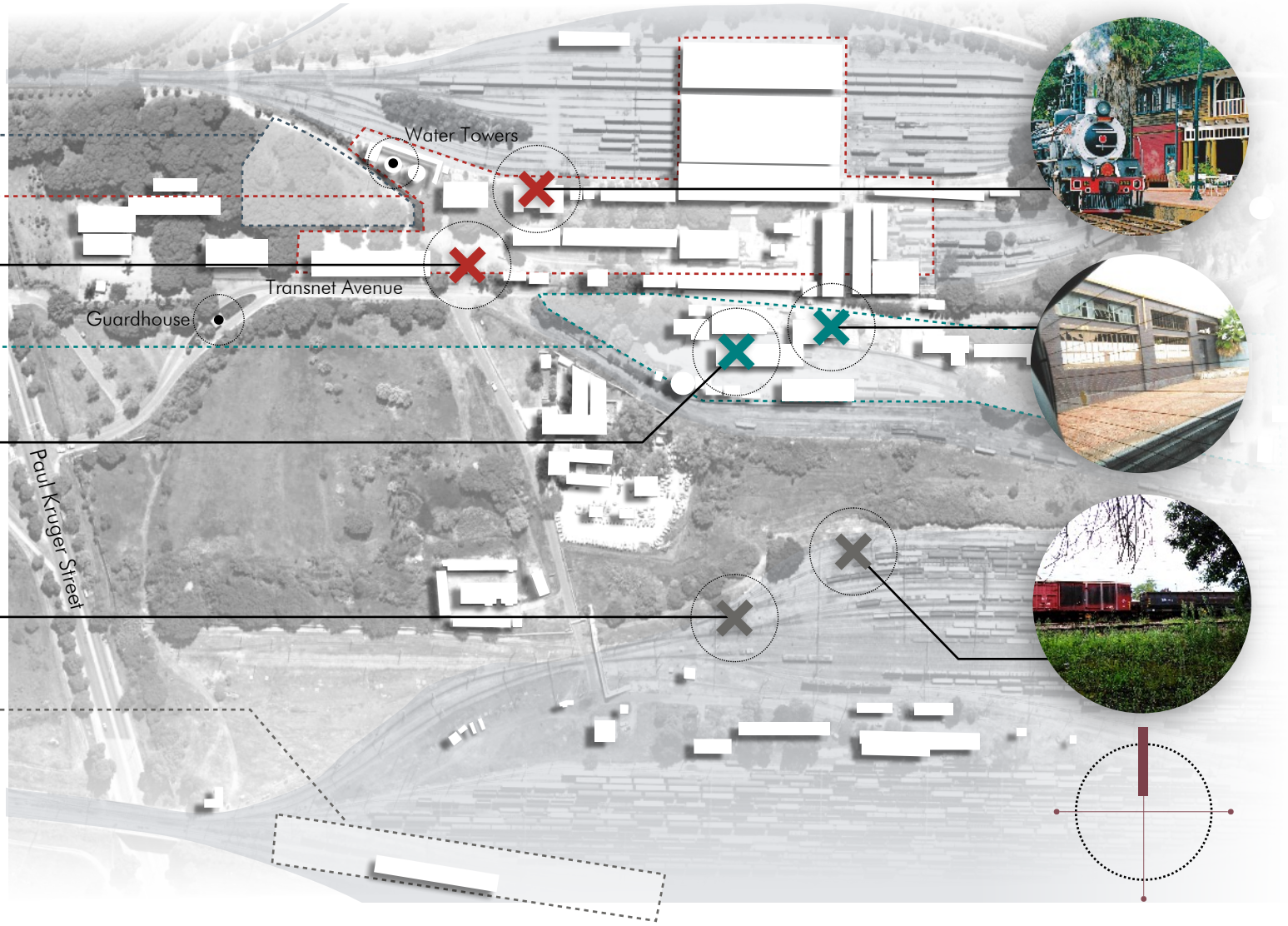


Fig 2.3: Site Zoning

For the purpose of this study, the site was divided into zones to better understand the context in terms of its key features.

2.2.1 The Natural Zone

The Natural Zone refers to the part of the site that remained mostly untouched and is recognized to contain mostly vegetation. This zone represents the opportunity to conserve the existing natural environment and incorporation into the new proposed intervention.

2.2.2 The Platform Zone

This refers to the part of the site that physically connects with the railway lines and represents the romantic essence of the site. This zone provides the opportunity to extend one of the key features of the railway - the platform.

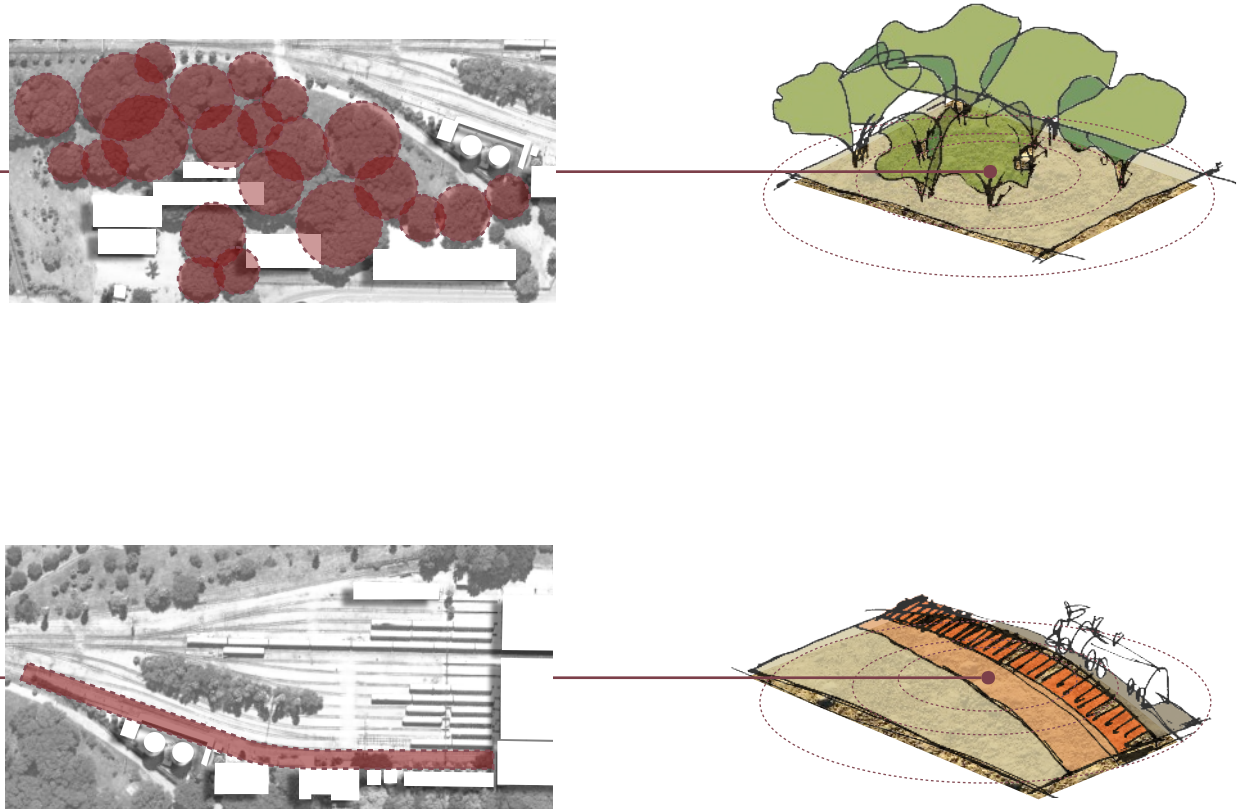


Fig 2.4: Natural Zone, Platform Zone

2.2.3 The Station Zone

The Station Zone partly encompasses Rovos Rail, the waiting and arrival area on the used platform. This zone symbolises the historical connection with the site and allows emphasising the presence of Rovos Rail.

2.2.4 The Transnet Avenue Zone

This refers to the part of the site that is centred around Transnet Avenue and the existing storage buildings adjacent to it. This zone represents the opportunity to enable a direct connection to the public.

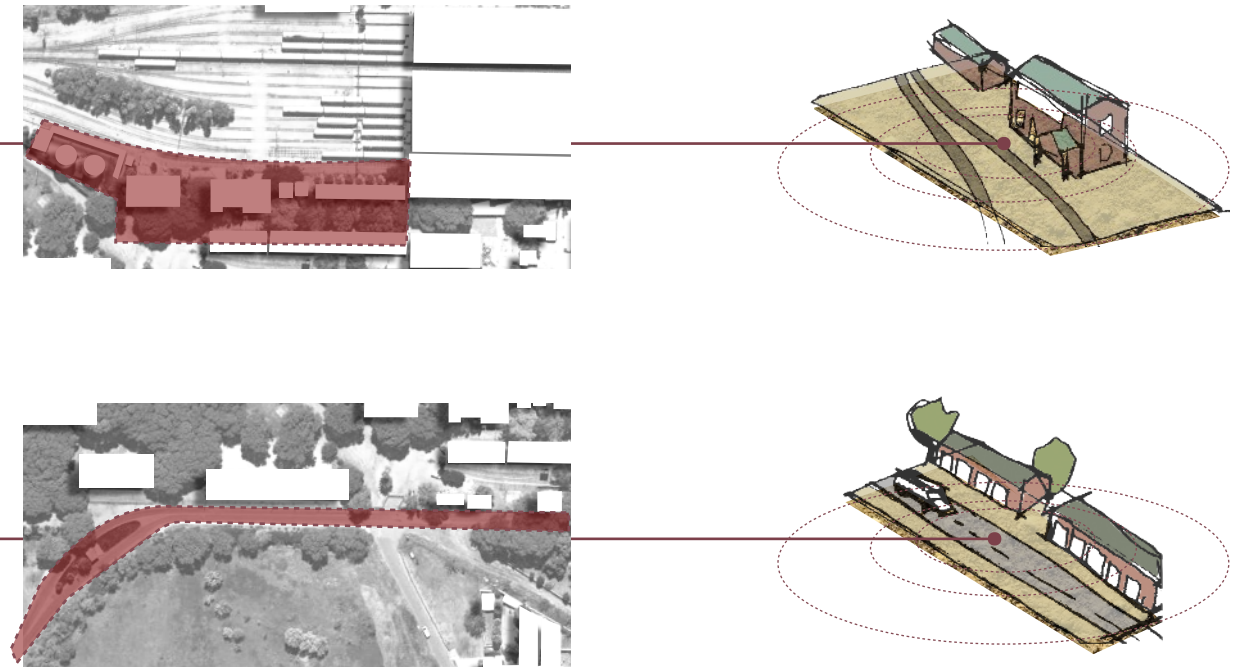
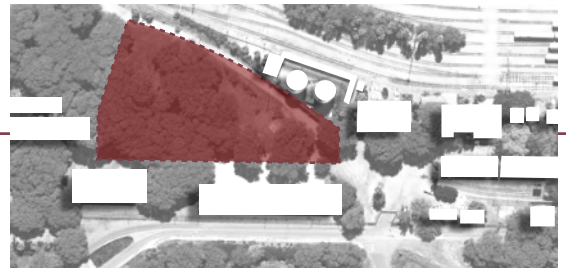


Fig 2.5: Station Zone, Transnet Zone

2.2.5 The Museum Zone

The Museum Zone refers to the part of the site where the proposed intervention will be situated. This 'new' zone aims to connect the other zones of the site and represents the vision of the future of the site.



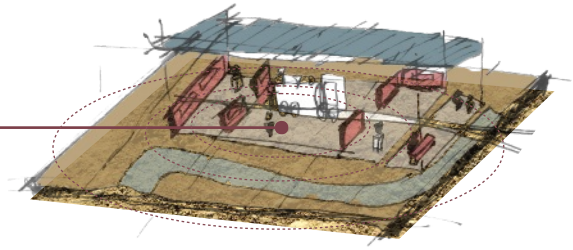


Fig 2.6: Museum Zone

The existing buildings on site represent the contrasting architectural styles. Specifically, that of the tectonic industrial buildings and the stereotomic station buildings. The textures found on the site represent these two contrasting styles. A mix of steel and brick populate the structures of the site. The steel from the locomotives, railway track and workshop buildings represent technological innovation, a sense of creation and wonder. Movement and power are associated with these materials. The solid brick station buildings, platform and gravel surfaces represent stability, solidity and reliability. These stagnant materials are associated with resilience and immobility.

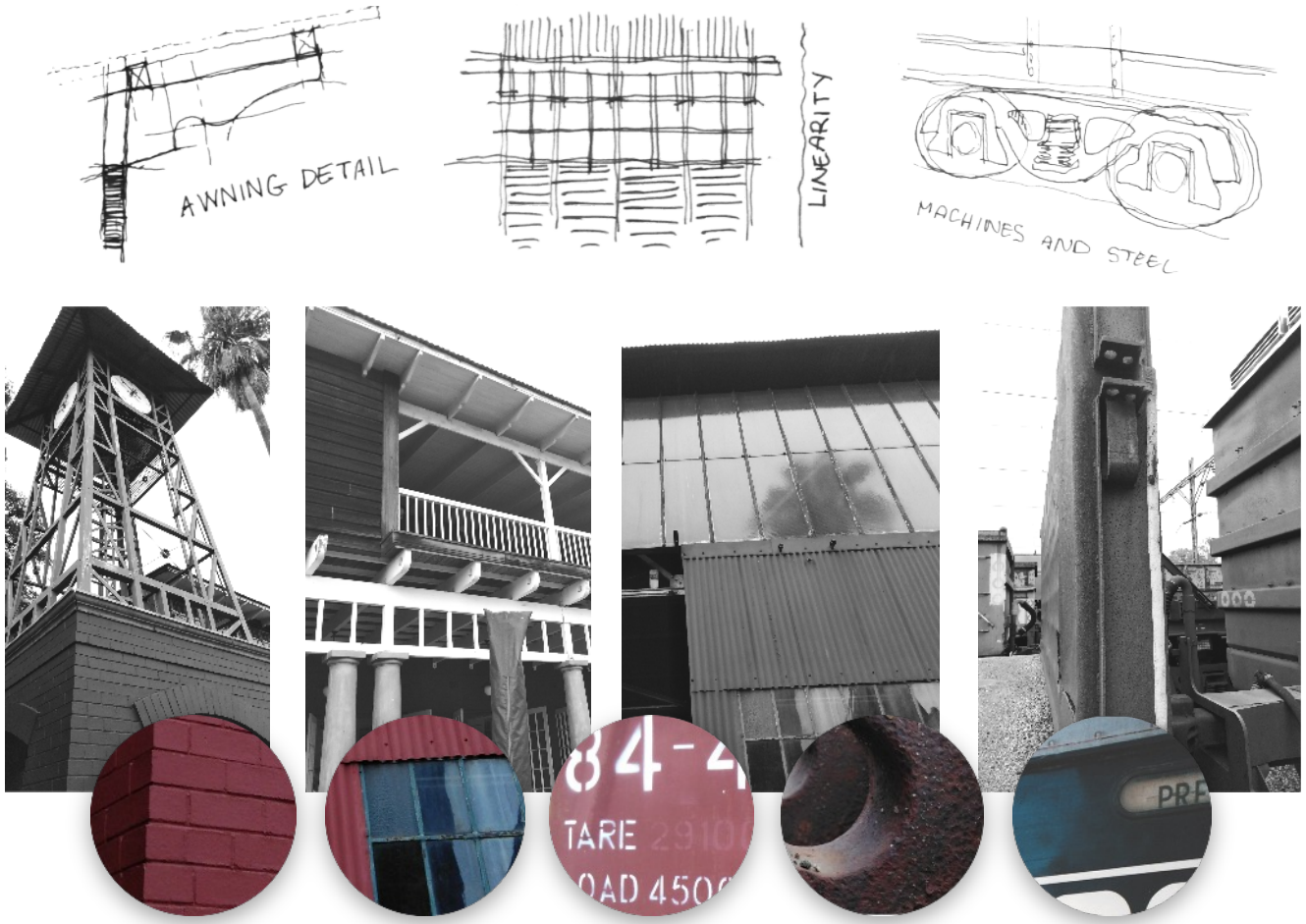


Fig 2.7: Textures and Qualities

2.3 Timeline - Rovos Rail

Rovos Rail was founded and established by Rohan Vos. The original place of work was established in 1986 at the Witbank Colliery. With insufficient workspace and lack of security, Rovos Rail soon relocated to the old SAR Goods Depot and then later, to the yards next to Pretoria Station with the Victoria Hotel as the main premises for offices (Rovos Rail, 2009). This move led to the restoration of the old 1893 railway hotel. The first commercial train was launched in 1989.

In later years, Rovos Rail took over the old locomotive depot in Capital Park. After extensive work on-site to bring it up to standard, the site became their centre of operation. Rovos Rail in Capital Park was eventually opened for business in 1999 (Rovos Rail 2009).

The iconic steam locomotives were bought mostly from scrap yards, rescued before they succumbed to decay and vandalism (Rovos Rail, 2009). Their steam engines were fully restored to working condition. However, they were later updated to hybrid engines of steam and diesel to comply with the railway regulations of today (Jorgensen, 2010). The collection of locomotives bought, restored and used by Rovos Rail was named the *Pride of Africa*. Each locomotive that was part of this collection was named after the family members of the founder, Rohan Vos (Rovos Rail, 2009). The locomotives were not just machines, they became part of a family and a legacy. Three classes of locomotives are operational on site. The smallest being Class 6, the 19 D Class and the larger, newer 25 NC Class. Following is a list of the working

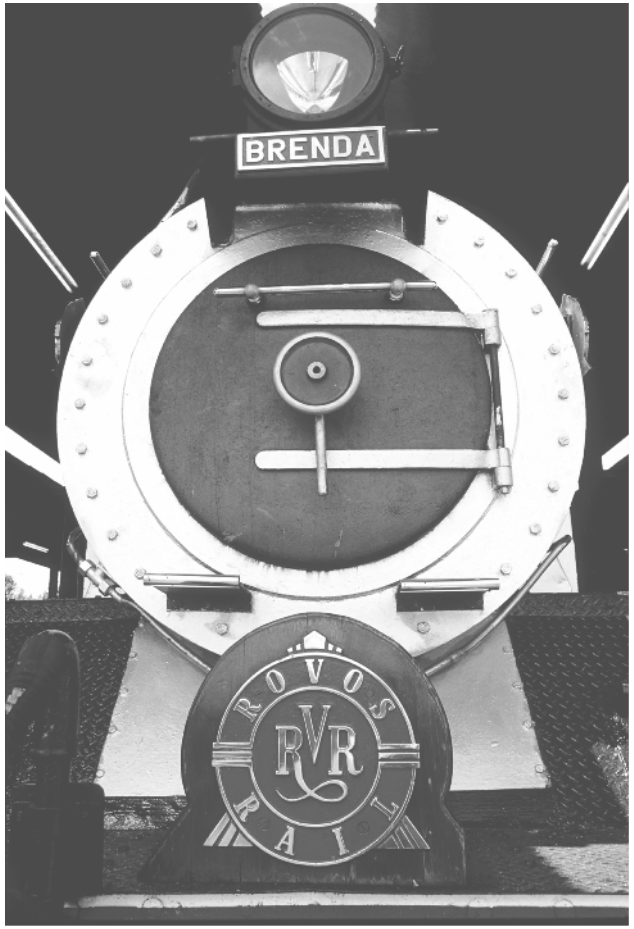


Fig 2.8: The Second Class 19D. Image provided by Rovos Rail

locomotives, their corresponding names, dates they were built and dates they were purchased by Rovos Rail:

Class 6:
439 *Tiffany*. Built-in 1893 and purchased in 1987. This locomotive was used as a monument in Windburg Station before being purchased and restored.

The 19 D class:
2702 *Bianca*. Built-in 1938 and purchased in 1986 from a scrapyard.
2701 *Brenda*. Built-in 1937 and purchased in 1986 from a scrapyard.
3360 *Shaun*. Built-in 1948 and purchased in 1986 from a scrapyard.

The 25 NC class:
3484 *Marjorie*. Built-in 1953.
3442 *Anthea*. Built in 1953.
3533 *King Zog*. Built in 1954. This locomotive was named after the Vos family's dog.
3440. Built in 1953 and not yet restored.
3480. Built in 1953 and not yet restored.

The ambition of Rovos Rail and the passion of its founder is apparent in the way these machines are named and cared for. Throughout the years, many coaches were bought across South Africa and brought back to be restored and refurbished by an expert craftsman (Jorgensen, 2010).

Rovos Rail has to date established many routes and journeys throughout Southern Africa (Jorgensen, 2010). With the drive and ambition of its founder, the extensive restoration work on the old buildings and locomotives, and business success, Rovos Rail symbolises the effectiveness of the privatization of railway historical sites as well as what can be achieved when initiative strikes.

2.4 Timeline - South African Railways

The development of the railway lines of South Africa can be greatly attributed to the Nederlandsche Zuid-Afrikaansche Spoorweg Maatschappij (NZASM). The discovery of gold in 1886 was the tipping point for the development of infrastructure. This resulted in the sudden need for more efficient transport, larger spanning service lines and greater supply routes. A connection between the gold mines inland and the harbours of the coasts was needed (Clarke & Fisher, 2016).

NZASM commissioned the construction of the railway network that started from the docks of the Cape colonies to the various mining towns of the Natal colonies (Jorgensen, Clarke & Fisher, 2016).

In the Transvaal, the first railway lines were laid between Boksburg and Johannesburg and so, the Rand Tram was created in 1980. The Rand Tram was introduced to transport large quantities of coal from the coal mines of Boksburg to fuel the great machines of the newly developed gold mines (Jorgensen, 2010). In the years that followed, the three main lines were completed to establish three entry points into South Africa. These lines were: The Southern line, the Eastern line and the South Eastern line (Clarke & Fisher, 2016).

As the railway lines spread from the coast to the plateau, many tunnels and bridges where constructed (Jorgensen, 2010). This signified the construction and technological achievements that resulted in the process of connecting South Africa via the railway lines. The first train arrived at Pretoria Station in January 1893 (refer to Fig 2.9, bottom image).

Fig 2.9: The arrival of the first train at Pretoria Station

The occupation of Pretoria by the British led to the confiscation of NZASM properties and the deportation of their staff. After years of ceased payments and destruction of shares, NZASM officially dissolved in 1908. Despite this, NZASM has left a great legacy and allowed South Africa to be counted among the industrial giants of the continent (Clarke & Fisher, 2016).

An important aspect of the South African railways is its role within the colonial and Apartheids era. During NZASM's reign, approximately 3700 black South Africans were employed in the railway workforce (Clarke & Fisher, 2016). The contractors employed by NZASM often relied on 'oppressive labour practises' (Clarke & Fisher, 2016). During the Apartheid era, due to segregation laws and Apartheid policy, many black construction workers were enrolled in the construction of railways (Jorgensen, 2010). This was known to be dangerous and many railway workers have lost their lives throughout the years (Jorgensen 2010). Despite their role in the success of the railways, black communities were the least to benefit from the usage of train travel (Giliomee & Mbenga, 2007; Jorgensen 2010).

2.5 Timeline - Steam Locomotives of South Africa

In 1859, the first steam locomotive was brought from Britain to Cape Town to start its service on the then still underdeveloped railway systems of South Africa (Jorgensen, 2010). The arrival of this machine ushered in a technological growth that would set South Africa as an industrial giant on the African continent (Clarke & Fisher, 2016). These machines of power became so familiar with the public and railway workers alike that they were often given affectionate names such as 'Blackie' or 'Natal' (Jorgensen, 2010). The locomotives and coaches replaced the use of the popular ox-drawn wagons that dominated the roads of that time. Throughout the years, despite political and construction grievances, the public welcomed railway transport as a means to travel in comfort and in shorter periods of time (Jorgensen, 2010).

Many steam locomotives are today displayed in various railway museums such as the South African National Railway and Steam Museum in Johannesburg. However, restored and fully functioning steam locomotives are exceptionally rare. The significance of Rovos Rail lies within this aspect. Throughout South Africa, many steam locomotives that were decommissioned in the past, have been left to decay (Meyer, 2020). The locomotives were often subjected to vandalism due to the metals, such as brass, that encompass the engine (Jorgensen, 2010).

The presence of steam locomotives onsite, albeit transformed to hybrid locomotives of steam and diesel, provides an opportunity to express the need to conserve these working artefacts of railway history through architectural intervention.

Fig 2.10: The Machine. Image provided by Rovos Rail

2.6 Networked Industrial Landscape

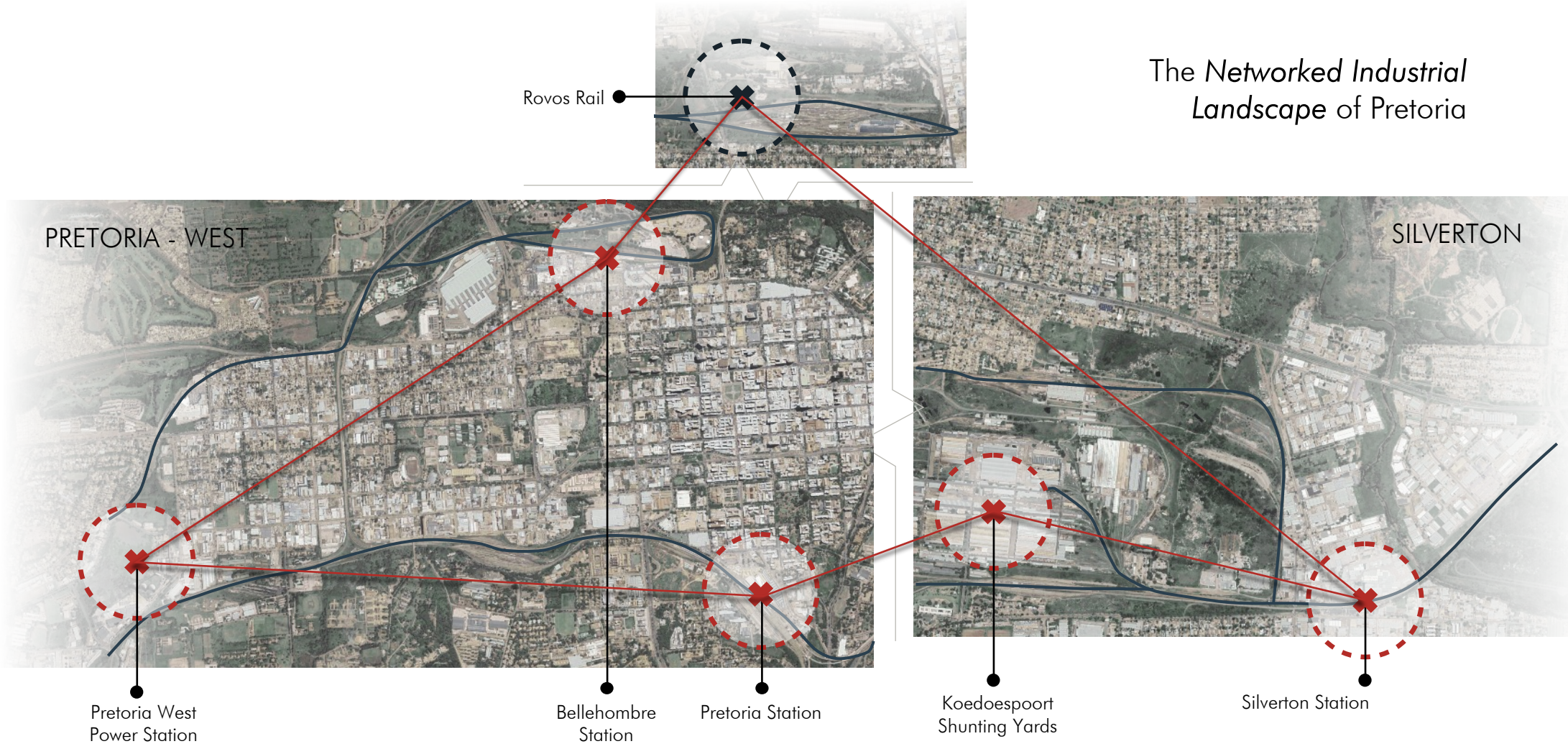
Worth (2017) discusses the term - networked industrial landscape - as relating to certain industrial sites, used or unused, that is depended on a larger collection of similar sites. These sites are intertwined through use and purpose - connecting the different cities of South Africa to further economic development (Worth, 2017).

The railway represents connectivity, economic growth and technological advancement (Jorgensen, 2010). The railway stations within South Africa have great historical and cultural significance (Worth, 2017; Jorgensen, 2010). Worth (2017) states that identifying these sites of significance will lead to a new way of integrating them into the contemporary landscape and enhance their presence within the narratives of South Africa. Industrial sites are remnants of the industrial era (Loures & Panagopoulos, 2007). Railway sites symbolise this legacy by ushering exportation within the country to herald expansion (Jorgensen, 2010).

The site of intervention is physically connected to the railway stations and industrial areas of Pretoria that is situated on the city perimeter (Rovod Rail, 2009). The site itself speaks greatly of technological advancement, as it is the site of the original steam locomotive depot. It is the place where the locomotives were maintained and serviced - a place where feats of engineering made its mark on the landscape (Rovos Rail, 2009). With the passing of steam locomotive use, the site became a remnant of a bygone era (Rovos Rail, 2009).

Another key characteristic is that, unlike most sites near the city centre within Pretoria, it has a large number of open, unused spaces. This is a characteristic shared with many industrial sites (Worth, 2017). Therefore, the uniqueness of the site lies within its value as a networked industrial landscape (Worth, 2017). It is a site that connects to a larger system of networks. It speaks of industry and technology. It is a reminder of a time long past. The site belongs to the system of historical sites in Pretoria, a system called by the term proposed by Worth (2017) - *a networked industrial landscape.*

The *Networked Industrial Landscape* of Pretoria



Based on analysis done on *'Industrial Areas in Relation to Pretoria CBD'* in dissertation by Pauw 2010

Fig 2.11: The Networked Landscape

Based on analysis done on *'Mapping the apparent and non-apparent relationships between natural environment, industry and user in Silverton'* in dissertation by von Geyso 2013, page 32

2.7 Industrial Heritage Site

In order to understand how the site falls under industrial heritage sites, the term industrial heritage will be deconstructed into three categories: definition, purpose and image.

In terms of definition, UNESCO (Falser, 2001) describes industrial heritage sites as: *Guardians of the past, industrial sites testify to the ordeals and exploits of those who worked in them. Industrial sites are important milestones in the history of humanity, marking humanity's dual power of destruction and creation that engenders both nuisances and progress. They embody the hope of a better life and the ever-greater power over matter.* Therefore, the definition of an industrial heritage site is represented by the word ambition.

In terms of purpose, according to Worth (2017) and Loures and Panagopoulos (2007), industrial sites symbolise automation, production and exportation (Loures & Panagopoulos, 2007). These sites are the by-products of industrialisation and globalisation meant to connect countries, cities and peoples (Loures & Panagopoulos, 2007; Worth, 2017). These sites herald technological advancement and growth (Worth, 2017). The purpose of an industrial heritage site is represented by the word connection.

In terms of image, according to Whitehouse (2018), remnants of an industrial site have great aesthetic value and have romantic, expressive qualities. This is because they represent pieces of a bygone time and age (Whitehouse, 2018). Industrial buildings represent function and purpose (Whitehouse, 2018). The image of an industrial heritage site is represented by the word functionality. By analysing the site of intervention through the discussed definitions, the existing functions on-site can be understood in terms of the response to the industrial environment.

The Capital Park Station represents a continual use of the original programmes that were meant for that site. Through restoration and renewal, Rovos Rail portrays the vintage experience of steam train travel. The old workshops are reused and repurposed to suit new businesses. All of these activities connect to the categories of industrial heritage which are ambition, connection and functionality.

Rovos Rail aimed to portray the experience of a time where steam locomotives were used to transport people across the country.

The old storage buildings have become places for businesses and metal workshops.

The train station has had continual use for years and has remained as such with the only expansion being the number of railway lines into the area.

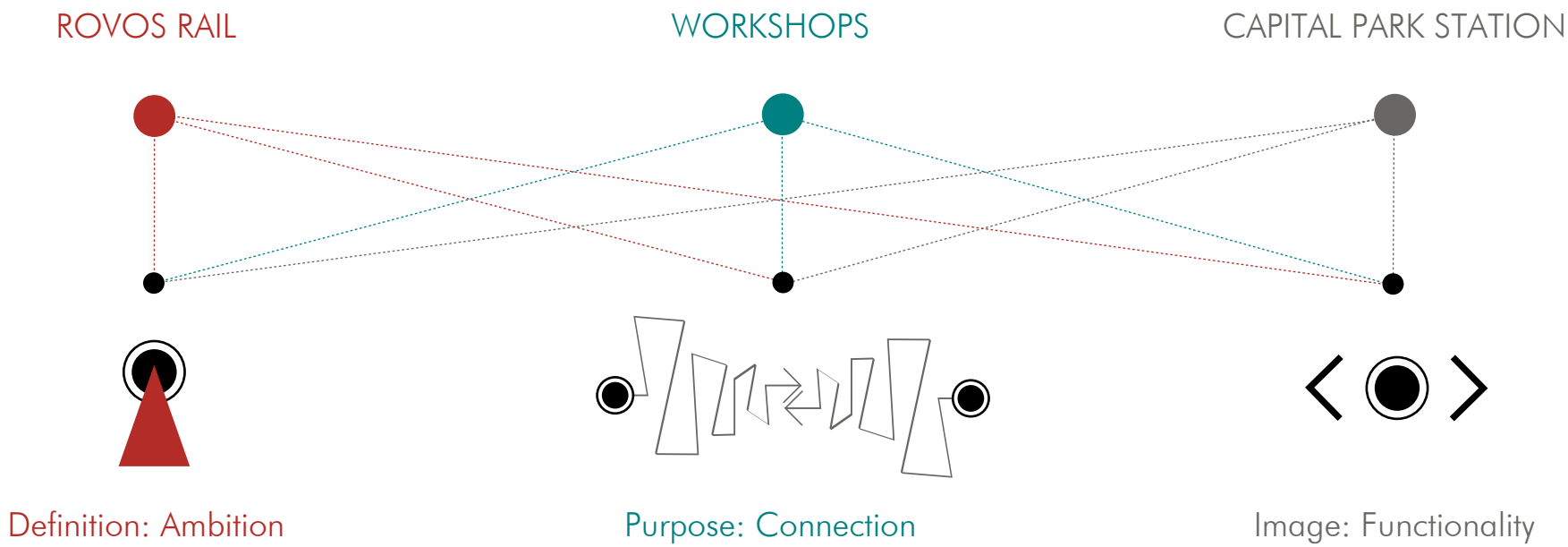


Fig 2.12: What makes it Industrial Heritage

2.8 Statement of Significance

To determine the historical significance of the site, the Burra Charter (1999) will be followed in terms of the guidelines of cultural significance. This will aid in estimating the value of the site.

In terms of historical value, the site has not played any major part of specific renown events that contributed to the historical identity of South Africa (ICOMOS, 1999). However, it did contribute to connecting the industrial sites situated on the city perimeter (Rovos Rail 2009). Because of the survival of the buildings throughout the years, it retains historical value by being remnants of a bygone industrial age. Thereby, the site played its part within the historical development of Pretoria.

In terms of scientific value, the site contains rare and fully functioning steam locomotives, albeit hybrids of steam and diesel. The significance lies within its rarity as many steam locomotives are left to decay and vandalism throughout South Africa. The functioning locomotives within a functioning context give the site its scientific value (ICOMOS, 1999).

In terms of social value, the site is favoured by railway groups and association such as Friends of the Rail. Aside from the favour it gained with small railway groups, the site is occupied by many businesses. The significance lies within its cultural sentiment (ICOMOS, 1999).

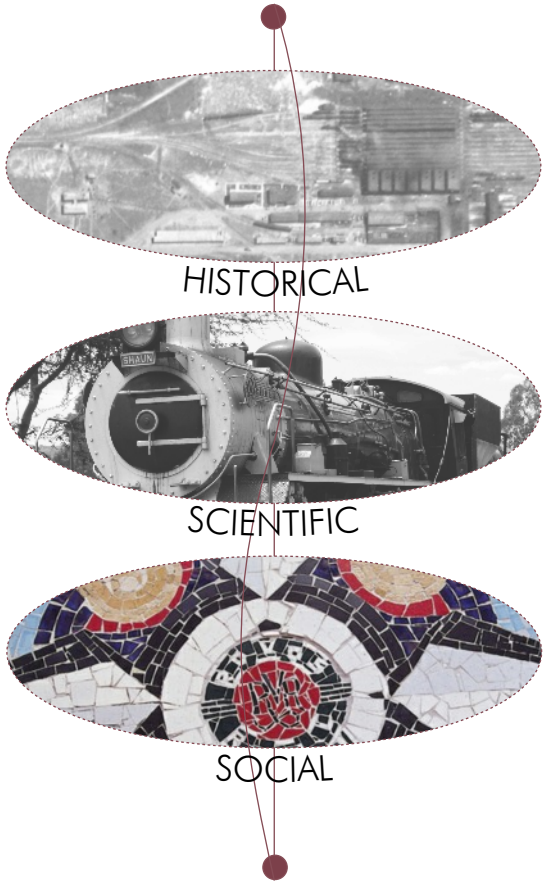


Fig 2.13: Heritage Assessment

03

Theory

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3.1 Introduction

What different perspectives can aid in the understanding and application of contextualism in order to generate contextually relevant museums in South Africa? This research aims to provide a proposed methodology to approach designing contextual museum architecture in South Africa. The approach will be defined by analysing theories on holism, contextualism and South African case studies.

The necessity for architecture to structure itself within the historical continuum, either visually or philosophically through form, function or by any other means of design execution, is critical in order to produce the resolved architectural design (Gaines, 1980). According to Smuts (1987), based on the original publication from 1926, holism is a perspective of the world that was adopted in order to explain the complex systematic functions within it. Through this lens, we perceive a world that is evolutionary in purpose, connective in principle and structured in spirit. Smuts (1987) states that transformation, connectivity and individuality are some of the predominant concepts within this perspective.

To accomplish the fundamental purpose of fitting into the complex systems of the world, the architectural design process involves the implementation of contextualism principles. These principles shape the architectural response to the inhabited historical and cultural landscape.

Museums can represent cultural and historical identity (Jodidio, 2010). It is therefore imperative for museum designs to be contextual. By looking holistically at contextual museum design, it can aid the architecture of museums to be a crucial instrument in expressing cultural and historical identity respectfully and appropriately (Brand, 1994).

Within the contemporary landscape, architectural responses occur that are insensitive to the identity of the context it occupies. This is possibly the result of designers designing in an a-contextual manner (Gaines, 1980) and possibly motivated by current trends and personal bias (Jodidio, 2010). These prevailing factors culminate in the creation of arbitrary objects

that alienate themselves within the context (Gaines, 1980).

Presently, there exists an exceptional need for museums to act as arbitrator between the diverse narratives of an ever-evolving landscape, be it manmade or natural. The discussion on contextuality in museum architecture has been vast, and the methods of contextual approaches are varied (Gaines, 1980; Parry, 2015). Often, the focus on design relies too greatly on superficial applications to be contextual and the complexity of the multi-layering of contextuality is often overlooked.

This study aims to illustrate the link between contextual design approaches and different perspectives. Contextuality will be examined through the lens of holism, contextualism and practical contemporary applications. To understand contextuality, certain principles will be identified, analysed and interpreted. Through literature analysis, the importance of acknowledging the link between these perspectives and contextual design approaches will be explored. Presently, different approaches exist as proposed in various literature that describes the ways in which architecture can be contextual (Gaines, 1980; Parry, 2015; Tabarsa a& Naseri, 2017; Roberts, 2016; The Plan, 2018).

Contextuality will be researched and analysed through three approaches namely philosophy, theory and finally application. A conclusion for each approach will be synthesised in terms of the positive aspects and negative aspects of each approach. The analysis will be primarily based within the architectural field. In order to understand the contextuality of architectural design, it is critical to see it in light of how we see the world in terms of contextuality and what physically exists in the world. The process will therefore progress from a philosophical perspective to what existing architectural responses are considered contextual.

The methodology includes the analysis of the contextuality of museum architectural design. This is because museums will be used as an illustrative typology to show architectural relation to context. The purpose of museums is to represent historical identity, emphasise social behaviour and further future development. Museums are the

arbitrators of representing identity and will therefore be the focus of the case study analysis in terms of contextual application.
For this analysis, it is critical to firstly analyse contextuality from a holistic perspective. Smuts' theory on holism (Smuts, 1987) will form the basis for the philosophical approach. Contextualism theories from Gaines (1980) and Parry (2015) will form the basis for the theoretical approach. Case studies of renowned buildings within the local context will be analysed in terms of their contextuality and this will form the basis of the third approach.

Each perspective will be introduced based on the definition discussed by various applicable sources. A brief description will follow. Each perspective will then be interpreted through an analysis of the appropriateness of the perspective in terms of the possibility to be used in further architectural design applications. The analysis will conclude based on the positive aspects and negative aspects of each perspective. The research will conclude with an overview of all the perspectives proposed and the most successful approach will be chosen.

The first perspective, the philosophical perspective, will analyse Smuts' theory of holism (1987) and discuss it in terms of key principles that are meant to illustrate what primarily encompasses a holistic perspective of the world. An interpretation and synthesis of this philosophical perspective into architectural terms will follow. The second perspective, the theoretical perspective, will analyse two conflicting theories from two authors of contextualism in an architectural application. The pattern approach as proposed by Gaines (1980) and the value approach as proposed by Parry (2015) will be discussed, compared and then synthesised to produce an approach that encompasses positive aspects from both theories. The third perspective, the practical design perspective, will analyse the contextuality of existing architectural applications. The analysis will start with how contextual buildings are viewed on an international scale. The case studies have been selected because of their renowned contextuality according to various authors. These case studies will primarily be museums of architectural renown. For the local case studies, the following buildings will

be analysed: the Zeitz Museum of Contemporary Art Africa in Cape Town, the National English Literature Museum in Grahamstown, and the Mapungubwe Interpretation Centre in Musina. Based on the analysis of the case studies, the principles of contextual South African museum architecture will be discussed.

3.2 Holistic Perspective

Holism is the operative factor in the evolution of wholes and is the ultimate principle of the universe - General Jan Christiaan Smuts (1987).

In Holism and Evolution, Smuts (1987) describes holism as a perspective of the universe. One that is composed of a series of *parts* within *wholes* (Smuts, 1987). It looks at a universe that is continually growing and transforming, configuring all old components into new bonds to create new things (Smuts, 1987). Smuts (1987) further expands on this by describing the necessity for these components, that possess their own uniqueness and individuality, to collaborate in order for a system to function accordingly. Every part has a purpose, a relationship with

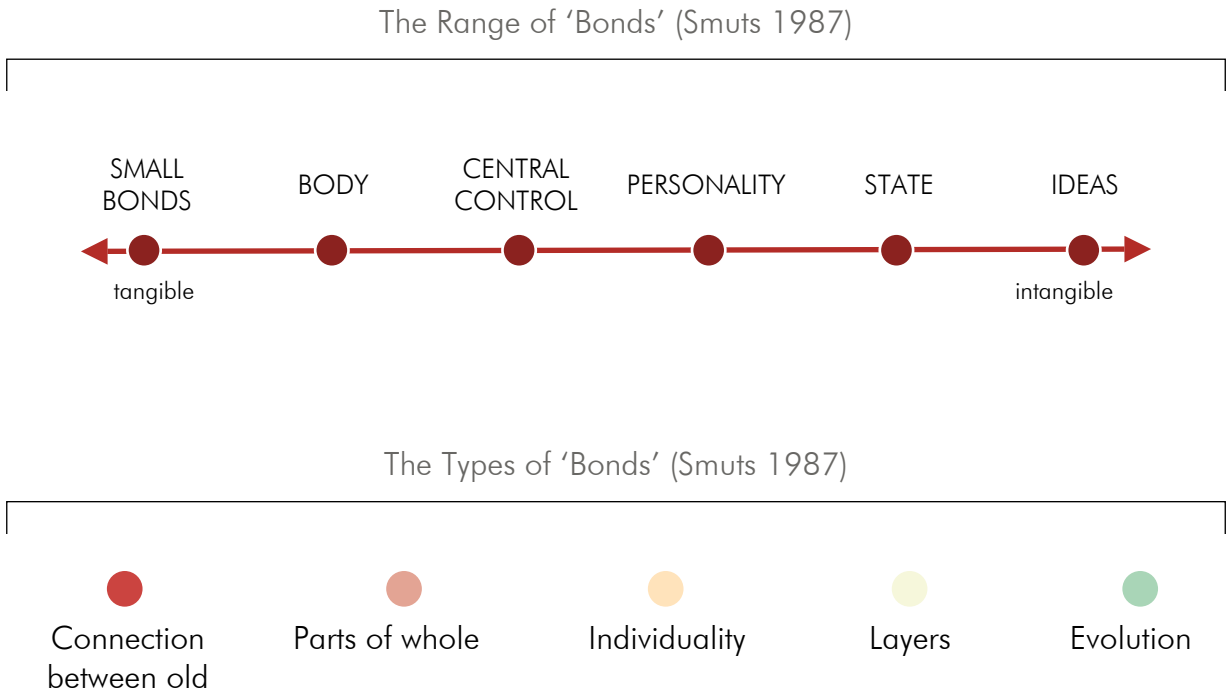

Fig 3.1: Principles of holism as interpreted through Smuts (1987)

other parts and is in its own way, unique (Smuts, 1987).
How can holistic views propose a new way of approaching contextualism? How can a holism be used as a lens to define contextual architecture?

The following principles are selected from the chapter General Concept of Holism in Smuts' Holism and Evolution (1987:85): the connection between old and new, parts of a whole, individuality, layers, evolution. These principles are identified and selected to illustrate what primarily encompasses a holistic perspective. These principles are based on direct terminology used by Smuts (1987) and reinterpreted to simplify the concepts introduced within the chapter. The principles are defined by assembling different aspects that connect to each principle discussed within Smuts' Holism and Evolution (1987). The definitions for the principles are as follows:

3.2.1 The connection between old and new

This refers to the physical and philosophical link between old and new - past and future. All materials in the universe existed at the beginning of time and everything from that point on is a synthesis of old matter and through transformation, new materials are born (Smuts, 1987). Herein lies the connection between old and new - old materials are used as the building blocks for new materials. Therefore, the past (old materials) is used as the core for an established possible the future (new materials). "It creates both new materials and new forms from the synthesis of the new with the old materials" (Smuts, 1987).

3.2.2 Parts of a whole

This refers to the relationship between things and the purpose thereof. The whole is more than the sum of its parts and can take in new parts through a transformation, not addition (Smuts, 1987). "The whole is in the parts and the parts in the whole and this synthesis of the whole and the parts is reflected in the holistic character of the functions of the parts as well as the whole" (Smuts, 1987). All the parts with the whole work towards the main purpose.

3.2.3 Individuality

Every part has character and individuality organised within a whole. Each part is unique. A unique purpose is attributed to each part. Without the part, the whole can't function appropriately (Smuts, 1987).

3.2.4 Layers

An additional characteristic of holism is the relationships or 'bonds' between parts (Smuts, 1987). The types of bonds are arranged in terms of scale, from small to large. Starting from small bonds; bodies, 'central control' or intellect, personality, 'state' or being, ideas and beauty (Smuts, 1987). These bonds appear to be organised from the tangible to the intangible.

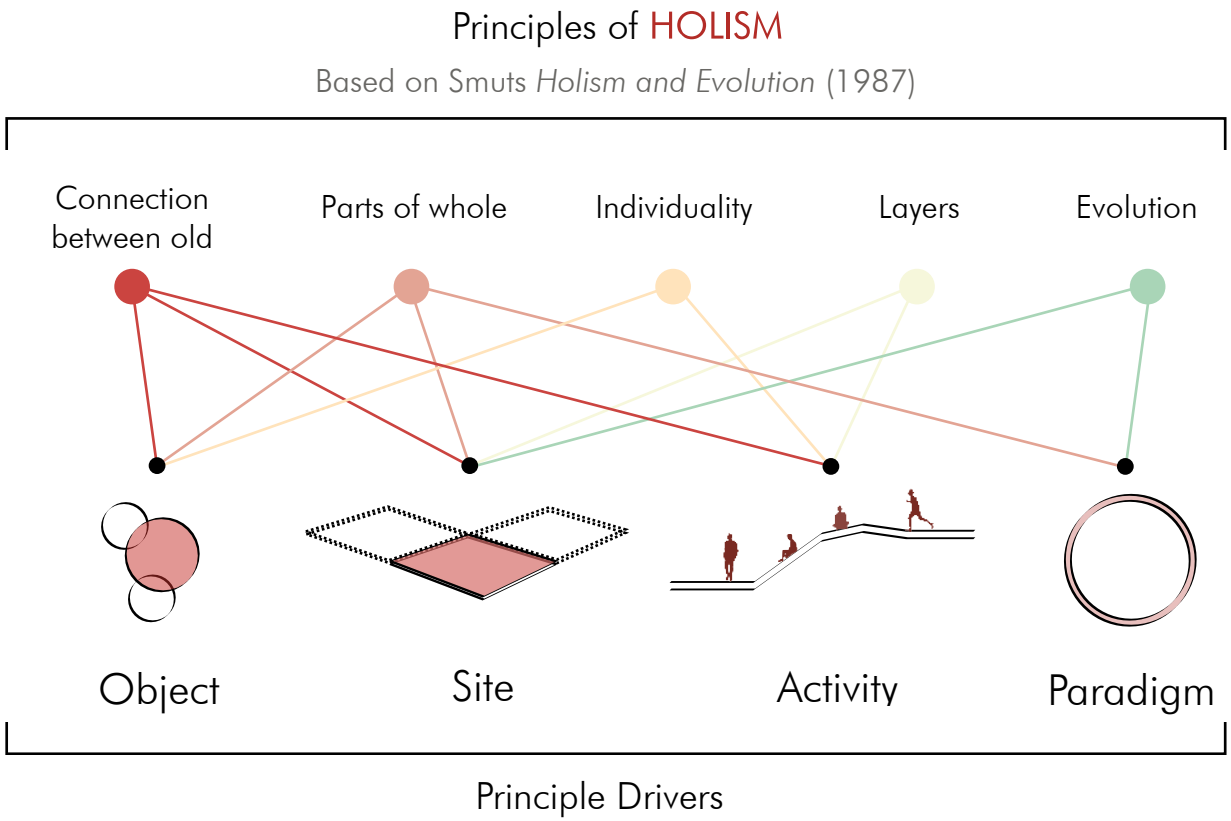

Fig 3.2: Principles of holism and Principle Drivers

3.2.5 Evolution

Evolution refers to view the universe as a progressive one (Smuts, 1987). This means that the world is constantly changing and transforming. By bringing these principles under the light of architecture resulted in the following questions:

1. What would the architecture's purpose be as a part?
2. How does architecture emphasise the relationship between the parts?

By synthesising Smuts' theory of holism (Smuts, 1987) to make it more understandable in terms of architectural responses, the following principles are concluded: Object; Site; Activity; and Paradigm. These principles are arranged from tangible to the intangible, referring to the types of bonds discussed by Smuts (1987). These principles will be the starting point for the solution to contextualist museum architecture.

3.2.6 Object

This refers to the small elements on a site. These 'objects' represent the identity of the site which is tangible. Within the museum, these 'objects' are often represented by the artefacts contained within the building. They represent a story - a piece of history. In order to fully grasp the identity of the site, something must physically represent a piece of the story that is left to interpretation. The 'object' is a physical element that adds meaning and value to the identity of the area. It fits therefor into the patterns of the site as proposed by Gaines (1980) and the value approach as proposed by Parry (2015). The 'object' aids the architecture to be contextual in the sense that it allows the architecture to align and revolve itself around a dominant physical feature of the site that represents historical identity (The Plan, 2017; Tabarsa & Naseri, 2018).

3.2.7 Site

This refers to the locale - the shard of the land. It is the setting or stage on which the architecture materializes (Porter, 2013). 'Site' embodies the narrative of the landscape, be it urban or natural. The identity of the physical realm is encompassed within. Just as 'object' refers to identity by being a particle of that identity, 'site' can be seen as a particle on an immense scale. The 'site' is also a tangible and physical element and

adds meaning and value to the identity of an area. It fits therefor into the patterns of the site as proposed by Gaines (1980) and the value approach as proposed by Parry (2015). The 'site' aids the architecture to be contextual by allowing the architecture to align, protect and care for the natural environment it is situated within (The Plan, 2017; Tabarsa & Naseri, 2018).

3.2.8 Activity

This principle concerns human activity. Examples of human activity are routes or gathering points - existing or the remains thereof (Gaines, 1980). These activities are produced by the people through means of interaction with themselves and their environment. The environment itself has then transformed accordingly. By investigating these activities, the cultural narrative of the site can be revealed. The 'activity' is either tangible or intangible. It adds meaning and value to the identity of an area. It fits therefor into the patterns of the site as proposed by Gaines (1980) and the value approach as proposed by Parry (2015). The 'activity' aids the architectural design to be contextual by putting a focus on people's livelihoods, routines and needs (The Plan, 2017; Tabarsa & Naseri, 2018).

3.2.9 Paradigm

This concerns a perspective that is a collection of the prevailing thoughts and patterns that exist within the current world (Porter, 2013). The stories or patterns that represent an evolving world that enables change and growth result in a cohesive view

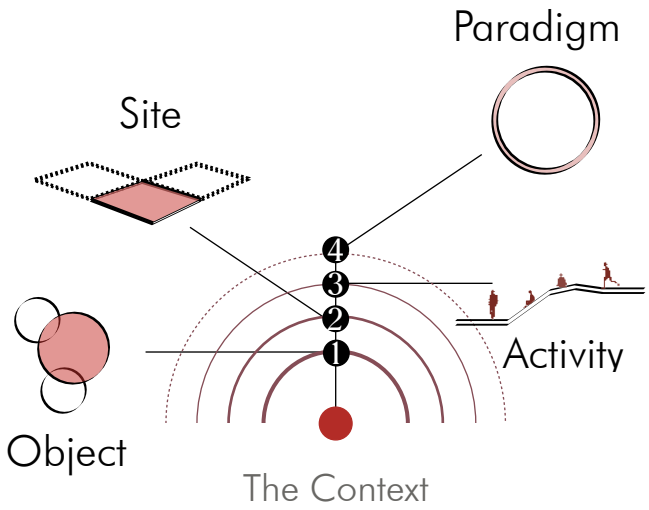

Fig 3.3: The Levels of Context Interpretation interpreted through a holistic perspective

that encompasses all views. 'Paradigm' is an intangible principle and it fits into the value approach according to Parry (2015). The 'paradigm' leads the designer's decision by considering the vision of the site and the design's conformity to existing paradigms (The Plan, 2017; Tabarsa & Naseri, 2018).

3.3 Contextualism Perspective

Architecture is an extension: a modification establishing absolute meanings relative to a place - Steven Holl (Porter, 2013)

To invent contextual architecture is to design a building from which the inspiration stems from a broad range of external patterns be it tangible or intangible (Gaines, 1980; Parry, 2015). Why is a contextual approach necessary? Buildings that appear imposing and unsuited to the context can become objects of isolation (Gaines, 1980; Parry, 2015). Understanding the deep fundamentals of contextualism can lead to an architecture that is more suited to the environment it inhabits, in other words, a building that belongs in a specific place. It is to prevent designs to become arbitrary objects of sculpture that are based on biases, trends

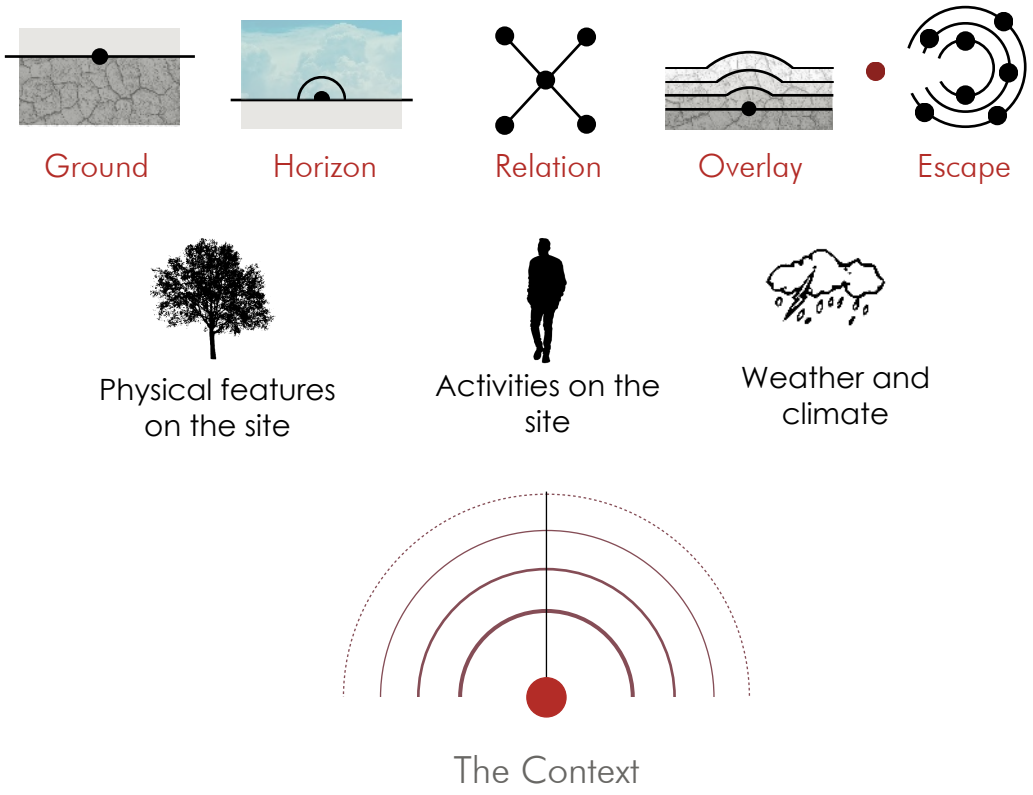

Fig 3.4: The context and contextualism

and superficial principles (Gaines, 1980; Parry, 2015). Lastly, it is to maintain the link between place and time (Gaines, 1980).

A sound comprehension and respect of context are needed to produce resolved architecture (Gaines, 1980; Parry, 2015). The ultimate intent should be to strive to create a building that honours the setting to some extent - it's memory, activity and history (Porter, 2013).

There exists a necessity for architecture to structure itself within the historical continuum of the environment, especially one that has undergone much change in terms of identity within the past century. Architecture is required to embody connectivity, diversity and transformation (Marstine, 2006; Mdanda, 2016). Yet, there remain architectural applications that do not fully personify these characteristics. An approach to contextuality within the context of the South African landscape is necessary.

How can architecture be contextual? The answer, according to Gaines (1980) and Parry (2015) lies with the patterns of the site and the meanings thereof (Tabarsa & Naseri, 2017). These two approaches to contextuality will be analysed respectively and will be titled: The Pattern Approach inspired by Gaines (1980) and The Value Approach inspired by Parry (2015).

Fig 3.5: Pattern approach as proposed by Gaines (1980)

3.3.1 The Pattern Approach

Any context possesses narratives rooted within space that are personified through a variety of patterns that are either tangible or intangible (Gaines, 1980; Parry, 2015). Gaines (1980) states that contextualism is guided by a meticulous appreciation of context and is necessary in order to 'broaden our range of external influences that relate to the architectural context' (Gaines, 1980). This approach realizes the richness that stems from design possibilities when all the elements of a site are contemplated simultaneously in their entirety (Tabarsa & Naseri, 2017).

Gaines (1980) tabulates contextuality under three primary categories. Firstly, formal patterns encompass space, shape, scale, mass, and other visual or physical form expressions (Gaines, 1980). These characteristics can be used as inspiration to create a building that visually unifies itself with the context (Gaines, 1980). Secondly, activity patterns are systems of human behaviour that can include movement, gathering points, actions and reactions (Gaines, 1980). These activities are remnants of socialization (Gaines, 1980). Thirdly, climatic patterns speak of geographical limitations such as solar gain and weather (Gaines, 1980).

The Pattern Approach (Gaines, 1980), although systematic and straightforward in purpose, is superficial and obvious in nature. The problem within this approach to contextuality is twofold. Firstly, it opens up a broad range of possible responses, perhaps too large to fully engage with. This is because there are often numerous varieties of patterns existing on a site (The Plan, 2018). This approach places focus on the meticulous nature of the design process and the desire to use as much of the external patterns as possible to produce contextual architecture. It is possible that this approach, however, would be time-consuming. Therefore, the question arises: To what extent should the architecture respond to the physical patterns for it to be considered contextual?

The second problem to this approach is the absence of a hierarchy of patterns. The second question is, therefore: How do we, as architects, decide which patterns to adhere

to primarily? Within current times, it is impossible to produce designs that are influenced by all external patterns of a site (Gaines, 1980). Gaines (1980) argues that the best course of action would be to ensure the architecture responds to all three categories.

It is essential to define a particular approach or lens to contextualism, comprised of knowledge from international and local literature, to determine a design that will ultimately generate contextually definite architecture. The approach must respond to the following factors: Firstly, the architecture must convey historical and cultural identity. Secondly, the architecture must strengthen the physical qualities of the landscape. Thirdly, the architecture must order itself within the historical fabric by linking past, present and future (Gaines, 1980; Parry, 2015; Tabarsa & Naseri, 2017).

3.3.2 The Value Approach

In another, more philosophical approach, Parry (2015) instead proposes a selective process of which certain prominent meanings are linked to patterns. These meanings are rooted in the methods of portraying historical identity. This approach, although interpretative in purpose, suggests associating a certain meaning to a particular pattern. Through scrutinization of the meaning, the pattern which to respond to can be selected based on the importance of its meaning and influence on the narrative of the site (Parry, 2015). This requires a rigorous historical analysis of the site, possibly by means of historical mapping of all

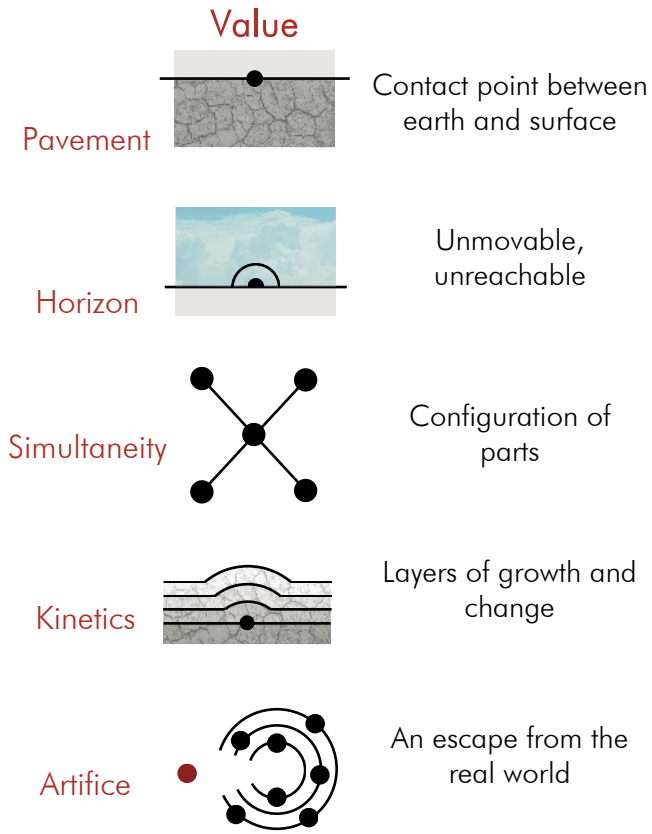

Fig 3.6: Value approach as proposed by Parry (2015)

components of the site thereby revealing the true narrative of the site.

The following five principles of contextualism are discussed by Parry (2015) and will be analysed in terms of their validity:

1. Pavement: Parry discusses this as dependence on the contact point and relationship with the ground or earth plane (Parry, 2015). It is a plane of composition and expression of political and cultural agendas because the pavement has such a profound meaning and influence in everyday life. This meeting point refers to where memories are created and where events of historical or cultural significance take place (Parry, 2015). Parry (2015) calls it the "trace of habitation". The meeting point becomes the floor and the floor can become a symbol of "political and cultural will" (Parry, 2015). The meeting point can also become a route and thereby remnants of historical events, connecting places and plays a role within the historical continuity of the city.
2. Horizon: Parry describes this principle as that which "cannot be removed, yet cannot be reached" (Parry, 2015). It is the physical meeting point between earth and sky and the metaphorical meeting point between objective and discovery (Parry, 2015). It is a point of direction and orientation and presents continuity by being a datum (Parry, 2015).
3. Simultaneity: "The cumulative effect of related parts to a spatial configuration." To understand the "simultaneity of the parts" one must understand the "normative condition of living". The relationship between things must be understood in order to understand their existence. Something exists because of certain other things or events existed.
4. Kinetics: To grow and change. To be resilient. Movement. The "Layering of the city" creates a complex system of interconnectedness. It is through these layers that one can perceive the historical continuity of the city.
5. Artifice: "The idea of making." To play is integral to the idea of living. It is "freedom" and "stepping out of real-life and into a temporary sphere". To understand the creation of devices that

constitute play is to understand life. The artifice or device constitutes an escape from the real world. The artifice imitates nature. To understand life is to understand the space the artifice creates for people to escape to a place of rest and pleasure.

The poetic nature of the above principles introduced by Parry (2015) is evident. However, the abstraction of these principles will prove problematic. Therefore, the above principles, as discussed by Parry (2015), will be changed to be able to fit into the context of architectural discourse. Architectural principles described by Ching (2015) will be consulted. This led to the following terms and definitions:

A. Ground (Pavement): This refers to how the architecture connects to the ground plane through visual or philosophical means. It can be a tangible or intangible connection. It manifests within the physical patterns of everyday life.

B. Horizon (Horizon): This refers to how architecture strives to reach new objectives. As horizon means the datum line that divides sky from earth (Parry, 2015). It is a metaphor to reach new objectives. In other words, that which we strive for but cannot reach. It is a metaphorical and psychological connection. It manifests within new ideas and objectives or the means to reach those objectives.

C. Relation (Simultaneity): This refers to how the architecture act as the arbitrator that connects things seemingly

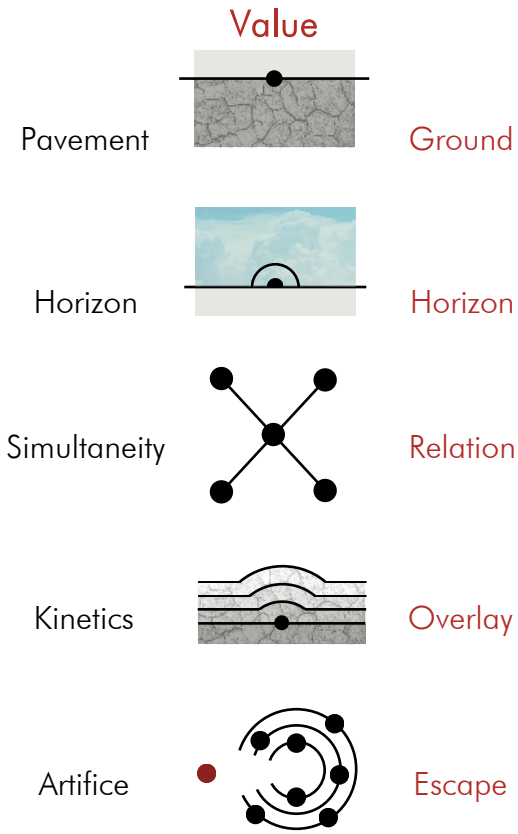

Fig 3.7: Value approach interpreted

unconnected, and allows other things to exist (Gaines, 1980). It can be a physical or psychological connection. It manifests in the living things within the natural or urban landscape.

D. Overlay (Kinetics): This refers to how the architecture respects and represents the layers of history that are embedded within the site (Gaines, 1980). It also refers to the additions of layers and what indent within the layers can be made by the architecture. This is predominantly established on physical connections. It manifests within manmade and natural developments and infrastructural systems (Gaines,1980).

E. Escape (Artifice): This refers to how the architecture allows the freedom for new things to be created (Gaines, 1980). It refers to the architecture being a point in a place where ideas can be born. It is predominantly a psychological connection. It manifests in the act or state of mind in which one can escape the normality of everyday life (Gaines, 1980).

The Pattern Approach and Value Approach differ greatly in terms of how to commence understanding a site and all its features through categorization and deconstruction of either meaning or purpose. The correlation, however, lies within the argument of how the design should respond to the site. Both Gaines (1980) and Parry (2015) state that a true response follows a full comprehension of the site. A true response is one that is "subtle, rather than obvious" (Gaines, 1980) and "abstract, rather than literal" (Gaines, 1980).

After the analysis of both takes on contextualism, a new approach can be realized. By combining Gaines' (1980) pattern approach with Parry's (2015) value approach, an approach that both give a criterion of what patterns to adhere to and how these patterns can be chosen is realized.

Firstly, the feature that represents the physical, activities and climate features on-site can be chosen. Secondly, meaning will be associated with each feature. Through the literature analysis, it is clear that there seems to be a myriad of proposed methods in various academic sources in order for architecture to be considered contextually

appropriate (Gaines, 1980; Parry, 2015; Tabarsa & Naseri, 2017, Roberts, 2016; The Plan, 2018).

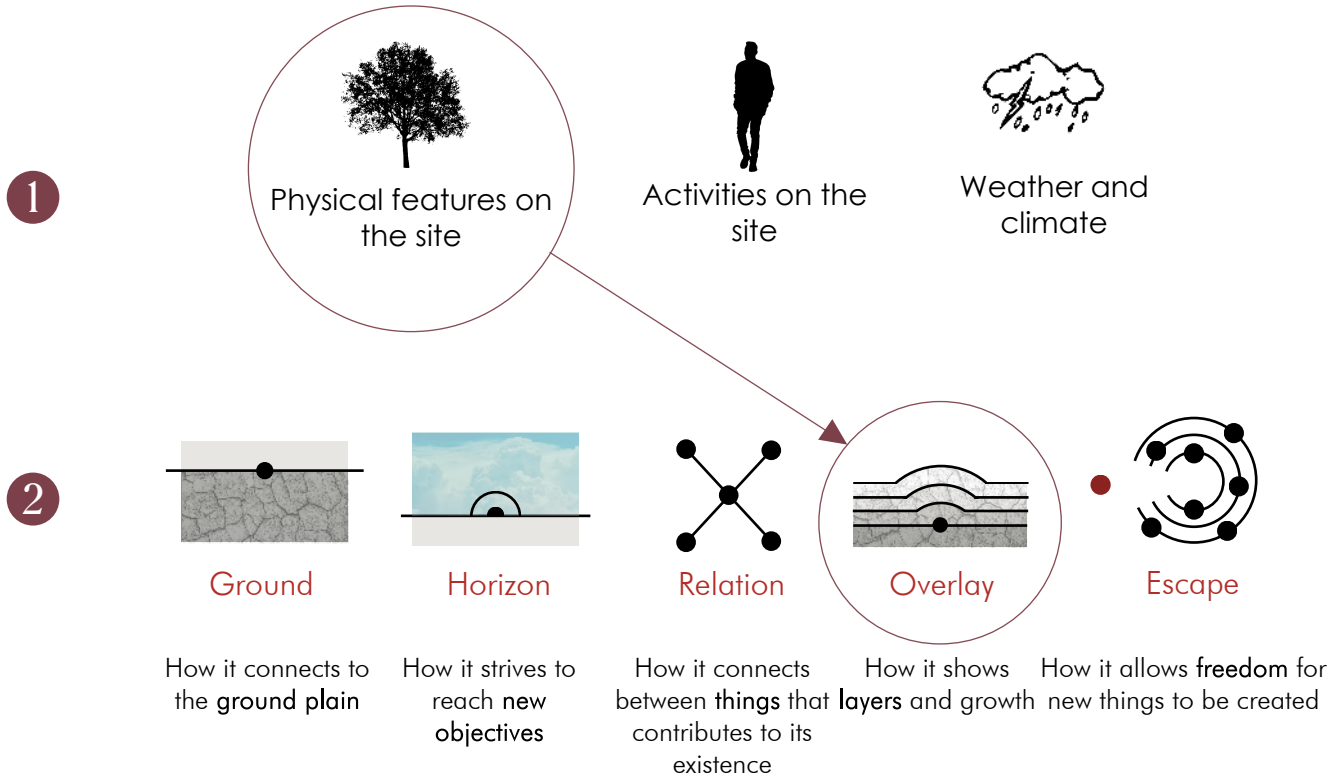

Fig 3.8: Combining Pattern and Value

3.4 Practical Perspective

As architecture must strive to connect buildings and places, it must also strive to connect people and places (The Plan, 2018). Architecture often runs parallel with social behaviour and thereby relies greatly on the appropriation by people of a place (The Plan, 2018). Tabarsa and Naseri (2017) discuss that approach of considering context as a "historical event" born from the actions of people. Contextual architecture can therefore only be contextual if the design accommodates the lives, routines and needs of people - the individual or the collective.

Tabarsa and Naseri (2017) argue that contextualism lays a significant role to bridge architecture and urbanism. Contextualism on an urban scale, as argued by Tabarsa and Naseri (2017), can be accomplished by the following: looking at the physical characteristics of what constitutes the city-scape; looking at the relationship between the old and new context, that which is existing or removed; and looking at the elements of the city as part of a greater system of connections. Contextual design, whether on a small scale or urban scale, should align itself.

Contextual architectural design should not only emphasize what currently exists on the site but must also strive to embrace the potential of what a site can become (The Plan, 2018). The architecture thereby becomes a catalyst for change and connects old with new. To be contextual to the historical identity of a site does not mean to mimic nor neglect the existence of past architectural styles (Tabarsa & Naseri, 2017). It means to rather connect tradition with transformation.

The contextual architectural design aligns itself with the natural environment and all its physical qualities (The Plan, 2018). As context includes all parts of a landscape, it must include the earth itself - its natural resources, systems and life (The Plan, 2018). For architecture to be contextual, it must aim to contribute to the responsibility of caring for and protecting the natural environment. Therefore, contextual architecture is often sustainable architecture (The Plan, 2018).

Contextual architecture can be unobtrusive or monumental (The Plan, 2018). This is because the contextual design does not

merely rely on visual presence and form alone to fit into its context. Therefore, the contextual design should be seen to rely on various degrees of expression that range from the tangible such as form and materiality, to the intangible such as philosophy and meaning (The Plan, 2018; Tabarsa & Naseri, 2017; Parry, 2015).
The following is an analysis of South African case studies.

To understand how museums can be contextual in South Africa, it is crucial to understand the existing roles and responsibilities of the museum within the South African Context and internationally. ICOM (2007) defines the museum within Article 3: Definition of Terms, Section 1 as follows: "A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment."

Three case studies will be analysed to determine the criteria for contextual museums in South Africa. Namely, The Zeitz Museum of Contemporary Art Africa, the National English Literature Museum and the Mapungubwe Interpretation Centre. These case studies are greatly recognised for their architectural design innovation in terms of landscape integration, sustainability principles and heritage preservation (The Plan, 2018). The historical and cultural identity of the South African landscape is also critical for inclusion in this research. This will be discussed based on the design principles discussed under Contextual Museum Design.

3.4.1 Museums and the South African People

Museums must emphasise an understanding of social behaviour and allow people to appropriate the space to their own will. The social-cultural landscape of South Africa is unique in richness and diversity (Mdanda, 2016). There is presently many communities, groups and individuals that live in varying economic and social circumstances (Vollgraaf, 2012-2014). The museum, therefore, needs to embrace the different stories of the South African people and make history as accessible to everyone.

Vollgraaff (2012-2014) argues the need for museums to act as "contact zones" between communities, historical events and views. Museums are meant to exhibit answers to stories, while also allowing room for questions to further research. By facilitating programmes that are based on the needs of the communities, museums can be the bringers of great change (Vollgraaf, 2012-2014). For museums to fulfil their purpose as described by ICOM (2007), they need to become places where different perspectives and people meet to commemorate memories and find ways to develop a new future (Vollgraaf, 2012-2014).

The Zeitz Museum of Contemporary Art Africa by Heatherwick Studio emphasises an understanding of social behaviour (Worth, 2017). The design was meant to tell the story of transforming from a purely industrial area to a public commercial area. Growing from enclosed and restricting to open and inviting (Worth, 2017). The programme was meant to become integrated into the daily lives of the people. This contrasts greatly the western ideals of a western museum as a colonising identity whereby the museum dissociates itself from its surroundings (Marstine, 2006).

3.4.2 Museums: South African Historical Identity and Future visions

Museums must connect the old with the new by emphasizing the existing historical identity and embrace future possibilities. Museums have done much in terms of connecting the city through different approaches to urbanism (Marstine, 2006). Marstine discusses the necessity for the museum to give something back to the city. This means that museums need to embrace a truthful openness of their economic presence and status. Through this, museums can become a revitalising urban centre according to Martsine (2006). By being objects of tourist attraction, the museum plays an important role within a city's renown (Martsine, 2006).

Spalding (1993) discusses the predominant purpose of museums which to not just communicate history, but also to be a place where understanding and interest go hand in hand. As tourist attractions, museums deviate from the monotonous patterns within society, as Spalding discusses (1993), and become a place of difference and escape.

The Zeitz Museum of Contemporary Art Africa has been designed to become a historical urban centre (Worth, 2017). The silo structure, the most prominent feature of the museum, was mean to be the centre point of development. The activities and functions are meant to be situated around it through the manipulation of negative spaces (Worth, 2017). The museum was meant to become the main destination points of the area and to draw locals and tourists into the site (Worth, 2017).

Apart from being tourist attractions, museums are places to learn about history (Spalding, 1993). The contrast between museums and the easily accessible virtual realm of information is that museums contain "the real thing" (Spalding, 1993). In a world of information and possible falsification, museums symbolise authenticity, truth and tangibility (Spalding, 1993). Museums embody celebration and commemoration of the past by relating to people's aspiration to protect and conserve history (Murray, 2013). Spalding discusses museums as machines of communication (Spalding, 1993). This means a continual process understanding between the museum and visitor that can lead to change and growth (Spalding, 1993). Therefore, the museum not only needs to embody historical identity but create a platform for future development. The museum must strive to pay homage to the roots of history but also move towards the horizon of a new future.

The Zeitz Museum of Contemporary Art Africa has been effective in this regard. In terms of fulfilling the role of to conserve and communicate stories, the architectural design places focus on conserving the utilitarian structure of the old silos (Worth, 2017). However, by transforming the silos into usable space, the structure was transformed to become more symbolic than utilitarian (Worth, 2017).

In the case of the Mapungubwe Interpretation Centre by Peter Rich Architects, the design intends to emphasise the historical natural landscape it is situated within (The Plan, 2018). By using local materials in the construction, the surrounding environment is conserved (The Plan, 2018).

3.4.3 Museums and the South African Natural Landscape

Museums must embody the responsibility of preserving the natural environment. One of the most important factors in the contemporary context is the necessity to conserve and protect the world's natural resources (The Plan, 2018). The natural environment is accommodated in two ways: through sustainable design principles or visual aesthetics (Thomas, 2013; The Plan, 2018).

South African architecture often strives to incorporate the natural landscape into the design features (The Plan, 2018). This aspect is clearly evident in the case of the Mapungubwe Interpretation Centre. The museum's design puts great emphasis on the natural landscape around the archaeological site at Mapungubwe Hill (The Plan, 2018). The design is centred around emphasizing the surrounding environment through physical and visual means. Locally-sourced materials are used to represent the existing colours of the earth. Construction is based on contemporary takes on traditional construction methods. The building's forms and footprints blend physically into the landscape (The Plan, 2018). The Mapungubwe Interpretation Centre embodies a strong presence of the natural landscape within the museum's form and materiality.

It is often necessary for the contemporary museum to accommodate a variety of spaces that require different environments to function adequately (Thomas, 2013). As the museum programme aims to facilitate the conservation and protection of the artefacts within, perhaps the museum form, materials and footprint should facilitate the conservation of the environment around it (Thomas, 2013).

The National English Literary Museum, located in Grahamstown, is the first sustainable museum in South Africa and was certified by the Green Building Council of South Africa (Thomas, 2013). It is therefore on the forefront of sustainable museum design. Principles of sustainability have been carried through from building management to construction emissions (Thomas, 2013). In terms of the programme, the museum is meant to emphasise the conservation of

3.5 Conclusion

In order to produce contextually relevant architectural museum designs in South Africa, three perspectives have been proposed and analysed. The three lenses - philosophical, theoretical and practical - can be used to approach contextualism in ways that have the potential to produce contextually relevant architectural museum designs.

By looking through the philosophical lens of holism, an approach can be drawn to produce four categories to influence the design process. The categories are object, site, activity and paradigm. These categories are organised from the tangible to the intangible, much like holism theory as discussed by Smuts (1987). The categories represent the different layers of *bonds* within the *system* that is within the context. By approaching an architectural design that draws inspiration from the context according to these categories, a holistic approach to contextualism can be realised.

By looking through the theoretical lens of contextualism theory, an approach can be drawn to produce a method of context analysis. This analysis can aid the designer to decide what primary features of the context the architectural design must adhere to. This method is rooted in two theories. One is the pattern approach as proposed by Gaines (1980). The second is the value approach as proposed by Parry (2015). A synthesis of these two theories is proposed as a method to emphasise the most prominent contextual features of the site. Through this, a theoretical approach to contextualism can be realised.

By looking through the practical lens of case study analysis, an approach can be drawn based on methods used by existing contextually relevant museum architecture. These case studies, located in South Africa, have been assessed in three categories. These categories are based on the similarities between the case studies. Firstly, how they emphasise social understanding. Secondly, how emphasise historical identity and future possibilities. Lastly, how they preserve the natural environment. By understanding what has already been done and by learning from what has already been built, a practical approach to contextualism can be realised.

All three lenses have conveyed a method of producing potentially contextual architectural designs. The philosophical lens enables the designer to respond to the context holistically. The theoretical lens enables the designer to analyse context according to its patterns and values. The practical lens enables the designer to learn from existing contextual architectural designs.

Within a universe that is continually growing and transforming, configuring, changing and creating (Smuts, 1987) it is necessary now more than ever to understand the purpose of the unique purpose of all components within the universe. If every part has a purpose, as Smuts states (1987), and every part connects with other parts in its own way, perhaps architecture is also the *parts* within this system of *wholes*. Perhaps the part that the architecture of the contemporary museum is to emphasise, engage and enhance the connectedness between the things that constitutes the context.

By using the different methods proposed, the intention will be to successfully prevent arbitrary objects of architecture. The methods will lead to an architectural design that is not based on biases, trends and superficial principles, but rather based on a deep appreciation and understanding of context (Gaines, 1980; Parry, 2015). As is evident throughout history, and will continue to be so, architecture itself is, was and will forever be a crucial instrument in expressing the identity of the context (Brand, 1994).

04

Precedents

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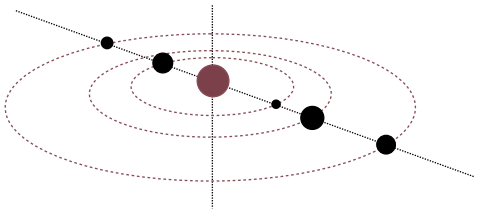
4.1 Introduction

This chapter focuses on analysing precedents that will inform the contextual response, design concept and programme. The analysis will be done on national and international precedents. These precedents include railway-related museums of some renown.

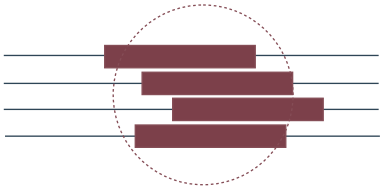
In terms of contextual response, the precedent chosen will be analysed according to how it emphasises the environment it is situated within, how it speaks of the railways and how it *fits* into the site. It is necessary to analyse existing railway museums, both locally and internationally. The South African National Railway and Steam Museum in Krugersdorp will be analysed to determine the existing model for local railway museums.

In terms of the design concept, four precedents will be analysed according to the four categories of holism as proposed in the previous chapter. The categories are object, site, activity and paradigm.

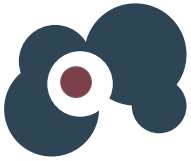
In terms of the programme, the Utrecht Railway museum will be analysed in terms of how it connects the two aspects necessary for a museum programme, the educational aspect and the conservational aspect.



Emphasise Environment



Speaking of Railways



Fitting Into the Site

Fig 4.1: Parameters of precedent analysis

4.2 Contextual Precedent

4.2.1 South African National Railway and Steam Museum

SANRASM was originally based in Randfontein and has since moved to Krugersdorp. The museum contains a variety of railway related artefact that represent the long-gone years of steam travel. Steam train travel routes are operated to and from Magaliesburg (South African History Online, 2020). The site contains a monument to South African history, in the form of an 1879 steam locomotive. This locomotive, called Kitson, was once the oldest running steam locomotive in South Africa (South African History Online, 2020).

One of the prominent failures of SANRASM is the inefficient maintenance of the locomotives and lack of security within the property (South African History Online, 2020). The vast number of locomotives left exposed to the outdoor elements, have been greatly vandalized and left to decay (South African History Online, 2020). Much work is needed to restore the locomotives on site.

Fig 4.2: Krugersdorp railway museum

4.2.2 Bochum Railway Museum, Germany

The museum was designed by Max Dudler and was to be a new addition to the large existing railway museum. The museum is located in a historically rich site that speaks of industry and technological achievement (Max Dudler, 2020). The existing museum was founded in 1977 and consists of various industrial and railway-related buildings that function primarily as exhibition spaces (Max Dudler, 2020).

The new building, however, as illustrated in the figure (see Fig 4.2), contrasts the existing buildings greatly. It is sculptural in nature and monolithic in presence. The materiality of the building resonates the surrounding existing structures. Through the use of various sculptural and geometrical shapes, the building becomes a landmark within the area (Max Dudler, 2020). The buildings sit unobtrusively in its setting. It does not impose on the adjacent railway tracks. The monolithic structure shifts the attention to its context through visual and physical means (Max Dudler, 2020).

Fig 4.3: Bochum Railway Museum

4.3 Conceptual Precedent

4.3.1 Object:

High-Speed Train Station by Santiago Calatrava Valls, Italy

This precedent has been chosen as to how the building conveys the object, which is in this case, the train. The concept of motion has been heavily applied within the structure of the building, by manipulating envelope and structural elements, a geometric modular form is created to represent the *object* or *the train* in motion.

The design relies on the roof element as the primary aesthetic piece. The folding of the roof structure articulates certain openings and routes within the building. The structure manipulates entrances for view and light. (Detail, 2020).

Portal shapes of varying sizes and angles are used to articulate motion within the form which suggest a wave-like geometric shape. Focus is placed on the structure to articulate form whereby the roof overlaps the wall and becomes one continuous wave (Detail, 2020).

Fig 4.4: High speed train station, Italy

4.3.2 Site:

Jewish museum by Daniel Libeskind, Germany

This precedent has been chosen as to how the building conveys the site, which is in this case, a historical and open site. The Jewish Museum in Berlin is based around creating a building that, much like the art it contains, is of sculptural beauty and should be exhibited (Architectural Review, 2020).

Within the footprint of the building, it is evident that the void takes preference over mass. This void, which is linear in shape, cuts a continuous path through the building. Through this, space and circulation are articulated (Architectural Review, 2020). The footprint shows a dynamic combination of linear strips. The inspiration is taken from lines drawn from the city. The footprint shows a self-contained and isolated structure (Architectural Review, 2020). Even though the envelope of the building represents a dynamic movement, the volumes, wall lines and hallways convey the repositioning of linear forms.

Fig 4.5: Jewish Museum, Berlin

4.3.3 Activity:

District Six Museum, Cape Town

This precedent has been chosen as to how the building conveys the activity, which is in this case, that of the museum. The museum programme connects with the site programme. The site is a place of historical significance. The museum is dedicated to the people who suffered from the forced removals under Apartheid's policies (Beyer, 2008). The museum's location on this site signifies the connection between history and present-day, between community and locality, between the real and the educational (Beyer, 2008).

The exhibition is meant to be more than just a place where artefacts are showcased. The museum is meant to be a place of learning where stories from the people who were forcibly removed from their homes can tell their stories to the younger generation (District Six, 2020)

Fig 4.6: District Six Museum

4.3.4 Paradigm:

Neue Staatsgalerie, Germany

This precedent has been chosen because of how the building conveys the paradigm, which is in this case, that of the museum as an urban centre. The museum was designed by James Stirling in 1984 and is located in Germany. The design focuses on articulating public space through the relationship between solids and voids. The museum facilitates a central courtyard and from this, the lines from the street and other walk routes are connected (Architectural Review, 2020).

The paradigm of the museum as an urban centre is based on connecting public space with seemingly isolated space. The museum becomes the centre of urban development (Architectural Review, 2020). Instead of directing the spaces inward, the spaces are articulated outwards towards the city.

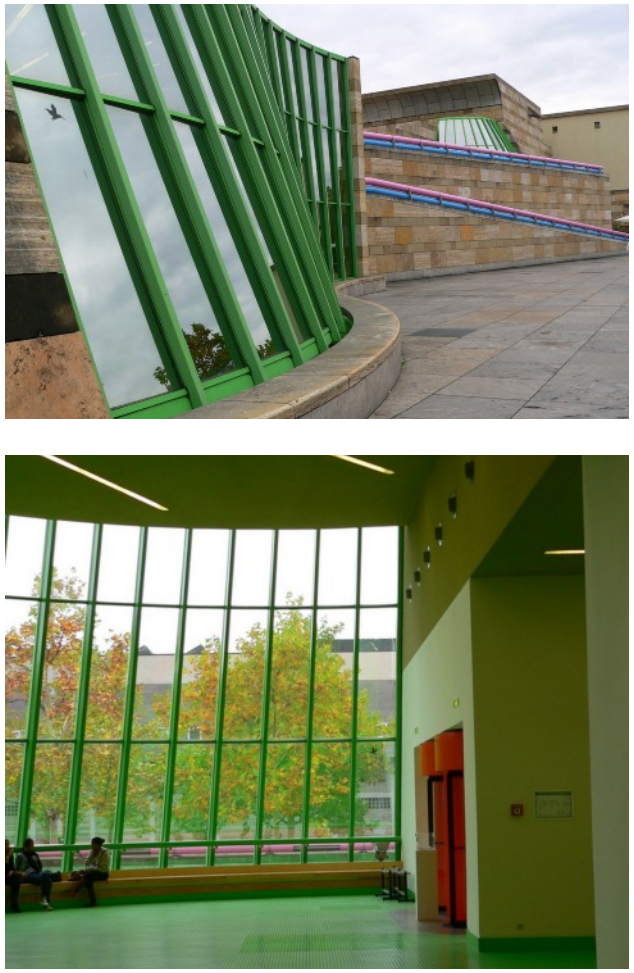


Fig 4.7: Neue Staatsgalerie, Germany

4.4 Programmatic Precedent

4.4.1 Utrecht Railway Museum, Netherlands

The museum has moved premises over the course of many years. Much effort has been put into preserving the collection despite the difficulties that arose during the second world war (Asselberghs, 1956). The Maliebaan Station in Utrecht was to be used as the final premises for the artefacts. So, the old station was converted into the new museum (Asselberghs, 1956).

The museum exhibits a vast collection of artefacts. Modern works and models were displayed alongside the older artefacts to enable the visitor a visual representation of railway history (Asselberghs, 1956). In 2005, a new structure has been added to the station-museum (Archello 2020). The design intends for the visitor to experience the exhibition along a walkway. This walkway is littered with railway carriages, locomotives machines and tools. The design intends to communicate the history of the railway in all its different forms (Asselberghs, 1956).

Fig 4.8: Utrecht Railway Museum, Netherlands

05

Programme

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5.1 Introduction

This chapter focuses on the integration of the programme based on the urban, site, and building strategies. The role of the museum will be discussed throughout these strategies. The main programme is that of the museum. The standard functions within this programme include exhibition spaces, research facilities, manage-ment facilities, event spaces, and other spaces.

The urban strategy is based on the museum as a new cultural centre for the suburb of Capital Park. Firstly, the relevance of the museum within a *learning society* (Falk & Dierking, 2006), fixated within the virtual realm of information, will be discussed. The museum as a tool to connect the local with the global context will be discussed. The Capital Meander Art Route will be discussed and how the museum can contribute to this annual event. Secondly, a description of the expected visitor profile will be discussed.

The site strategy is based on the role the museum can play to connect the existing programmes on site. Firstly, the future of the existing museum on site will be discussed. This museum is located within the main building of Rovos Rail and consists of mainly railway memorabilia. Secondly, the museum as a *part* of the systems of the site will be discussed.

The building strategy is based on the connection of the different functions within the museum and how they engage with the users. Firstly, the primary exhibition principles will be discussed. Secondly, the story conveyed in the exhibition will be discussed.

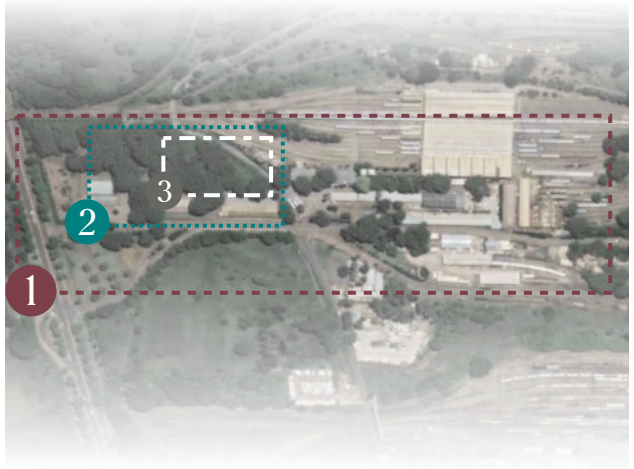


Fig 5.1: Overall Strategy

5.2 Urban Scale Strategy

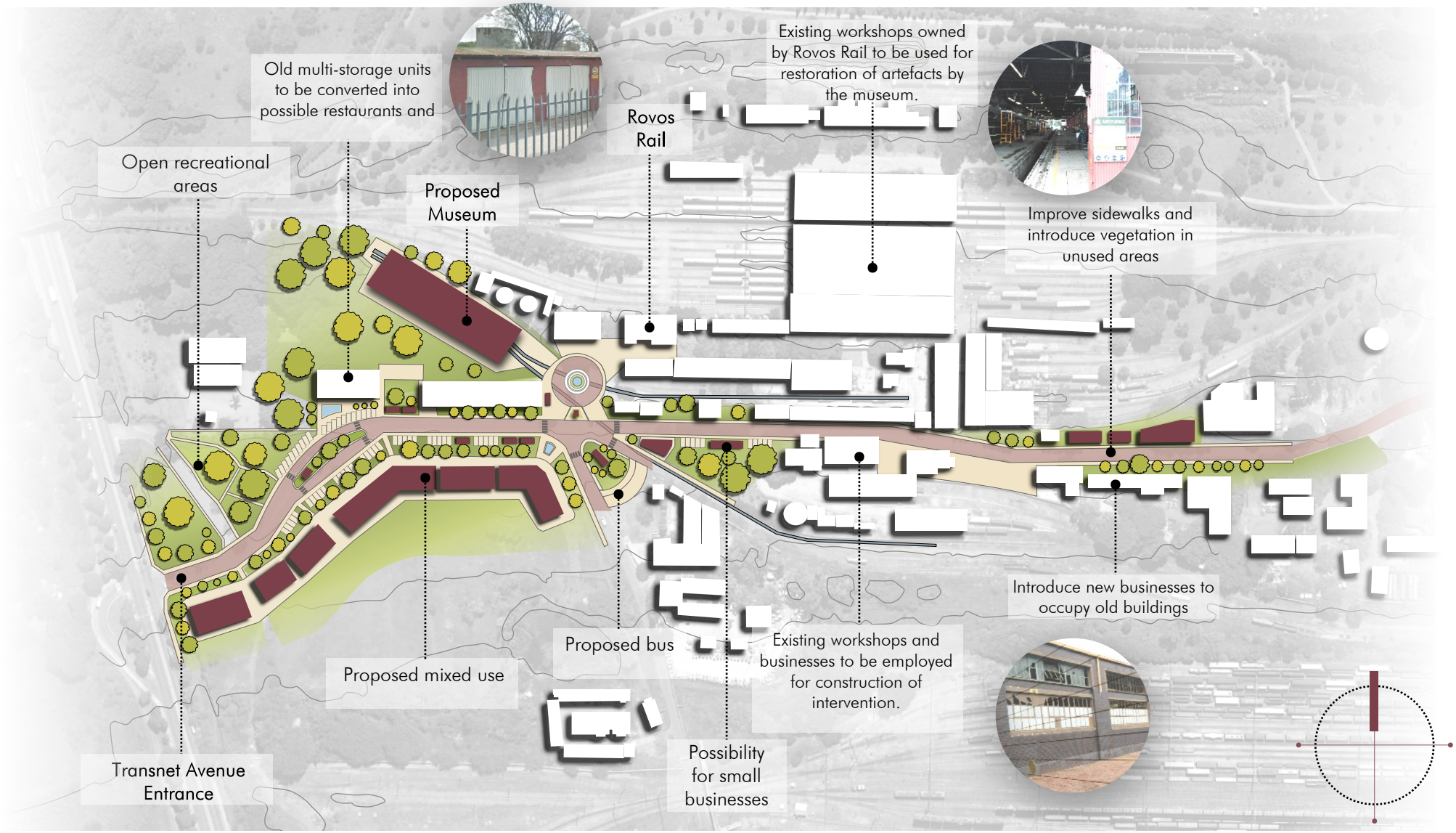


Fig 5.2: Urban Strategy

5.2.1 Museum as a Cultural Centre

5.2.1.1 The Museum within a Learning Society

Learning is critical to our survival especially within the contemporary setting (Falk & Dierking, 2006). In a world were access to information becomes more and more effortless, people want to learn more. Humans are by nature social creatures, therefore the museum should be concerned with socio-cultural factors while harbouring information (Falk & Dierking, 2006).

Museums are primarily places of learning (Spalding, 1993). As the volume of information available grows, so too does the possibility for falsification (Spalding, 1993). Museums contrast the virtual realm that people are so used to. The museum provides the *real thing* and symbolises authentication and trust (Spalding, 1993).

5.2.1.2 Connecting Local and Global Context

Museums can represent the different identities and histories of an ever-changing and chaotic world. To do this, the purpose of the museum is to represent these identities and histories within a more structured and ordered one. The museum itself is intended to be a *world* with a world (Rectanus, 2006). Therefore, the museum represents the factors of the world or in other words, the context.

Museums often facilitate a connection between the economic, political and social realms through the specificity of the

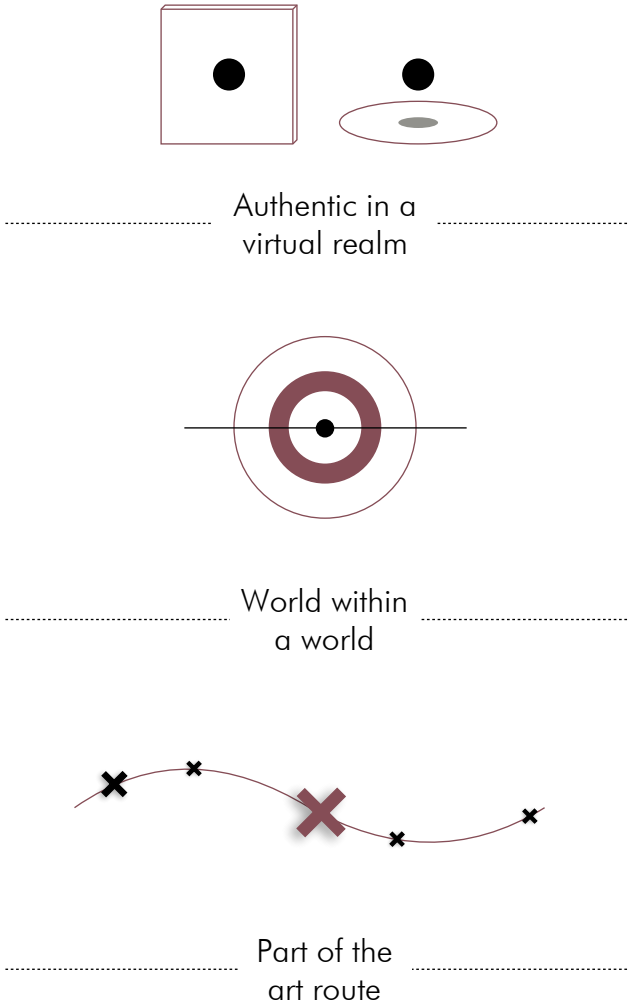


Fig 5.3: The cultural centre

collections they house (Rectanus, 2006). The exhibition speaks of what happens in the outside world. It is through these exhibitions, that a relationship can be established between the local and the global context. This is because the exhibitions, which speak of local or global historical events, are conveyed to the viewer, who might be local or international (Rectanus, 2006).

The presence of the museum within either an urban, suburban or rural setting creates the possibility to establish a socio-cultural environment. It contributes to the sense of the local and the identity of the community (Rectanus, 2006). Through this, the museum can establish a sense of pride of the local people. By creating a variety of spaces, the museum can become an integral part of public engagement (Rectanus, 2006).

Museums bring with them artists and audiences from different places. Through the visitation and contribution by diverse people from around the world, museums can bring in new life into the area it occupies.

Through the development of the museum, the development of the existing urban conditions can be brought about. Development heralds a need for quality public environments. It signals the change and growth of the local area (Rectanus, 2006). Rectanus (2006) argues that the museum's responsibility stretches far beyond just serving the artefacts. By establishing the museum as a cultural centre, it merges education, tourist attraction, community engagement and entertainment (Rectanus, 2006).

5.2.1.3 The Capital Meander Art Route

This is an annual event that steams from the mission of CAPRRA to establish Capital Park as *Tshwane's art village* (Capital Park, 2020). Capital Park is currently populated with a wide range of art galleries and studios (Capital Park, 2020). By establishing event and art exhibition spaces in and around the museum, the museum can become a main stop within the Capital Park art route.

5.2.2 Visitor Profiles

The clients chosen for the project are Rovos Rail and Transnet. The intervention aims to bring great change to the site by enhancing the existing heritage features, establish a cultural centre and bring in more foot traffic. Rovos Rail is therefore an important client. The museum also intends to use artefacts stored currently at the Transnet Archive in Johannesburg.

Clients:

1. Rovos Rail
2. Transnet

Visitors:

3. Capital park Residents
4. School learners
5. National tourists
6. International Tourists
7. Special Interest Groups

	Geographic	Psychographics	Behavioural	Narrative
1	Restoration experts, engineers, management	Site to become part of historical sites.	Safety & Security, Car Parking	Spend most of the day on site
2	Archivists, researches, restoration experts, historians	Need adequate working facilities and storage spaces	Safety & Security, Car Parking, Research Equipment	Spend most of the day in research facilities
3	Capital Park, Pretoria CBD	Site competes with other commercial sites (Menlyn etc.), curios shop	Safety & Security, Car Parking, Restaurants.	Spend whole day in museum
4	80% learners from poor communities, 20% rich communities	Play areas, curios shop	Quick foods and beverages, fits into learning curriculum	Spend whole day in museum
5	South Africa	Site competes with other historical sites (Voorttrekker etc.), curios shop	Safety & Security, Bus Stops	Want to see most sites in one day, spend less time in museum
6	Chinese, British, German, American, Australia	Site competes with other historical sites (Voorttrekker etc.)	Safety & Security, Bus Stops, language signage	Want to see most sites in one day, spend less time in museum
7	Friends of the Rail, museumologists	Curios shop, learning facilities	Safety & Security, Bus Stops	Spend whole day in museum

Fig 5.4: Profiles and Needs, according to interview by Du Plessis 2020

5.3 Urban Vision

The urban vision proposes a transformation of the entirety of the estate starting from the entrance from Paul Kruger street. Transnet avenue is established as the main public route. Walkways for pedestrians are included, with seating and shading areas along the road. This route is intended to become part of the *Capital Meander Art Route*. The route does not physically connect to the existing route but becomes a branch of that route, the second *Capital Meander Art Route*. Along the route, the existing open and unused spaces are intended to be populated with various shops, cafes, event and performance spaces.

The main event and gathering space are intended to be located at the entrance to Rovos Rail and the new museum.

Fig 5.5: Urban master plan

5.3 Urban Vision

The site of the intervention is transformed through a series of routes, public plazas, view platforms and shading areas. By placing the museum in the manner shown in the image (see Fig 5.6 and 5.10, a direct connection between the railway platform and Transnet Avenue is created.

Open public spaces are located between the existing historical structures. This allows for a physical engagement between the visitor and the historical fabric. A series of paved walkways connect the new Platform Plaza with the new Transnet Plaza and act as viewing platforms to create a visual connection between the visitor and the site.

Fig 5.6: Urban master plan

5.3.1 Transnet Boulevard Route

Transnet Avenue is established as the primary public space by placing focus on pedestrian walkways green strips and seating adjacent to the road. The existing storage buildings are proposed to be converted into shops, cafes and restaurants that open up to the walkways. Vehicular parking is made available on the southern side of the road.

5.3.2 The Platform Route

The existing platform is made open to the public via the museum route. The platform is populated with various seating areas with shading structures for people to view the passing trains.

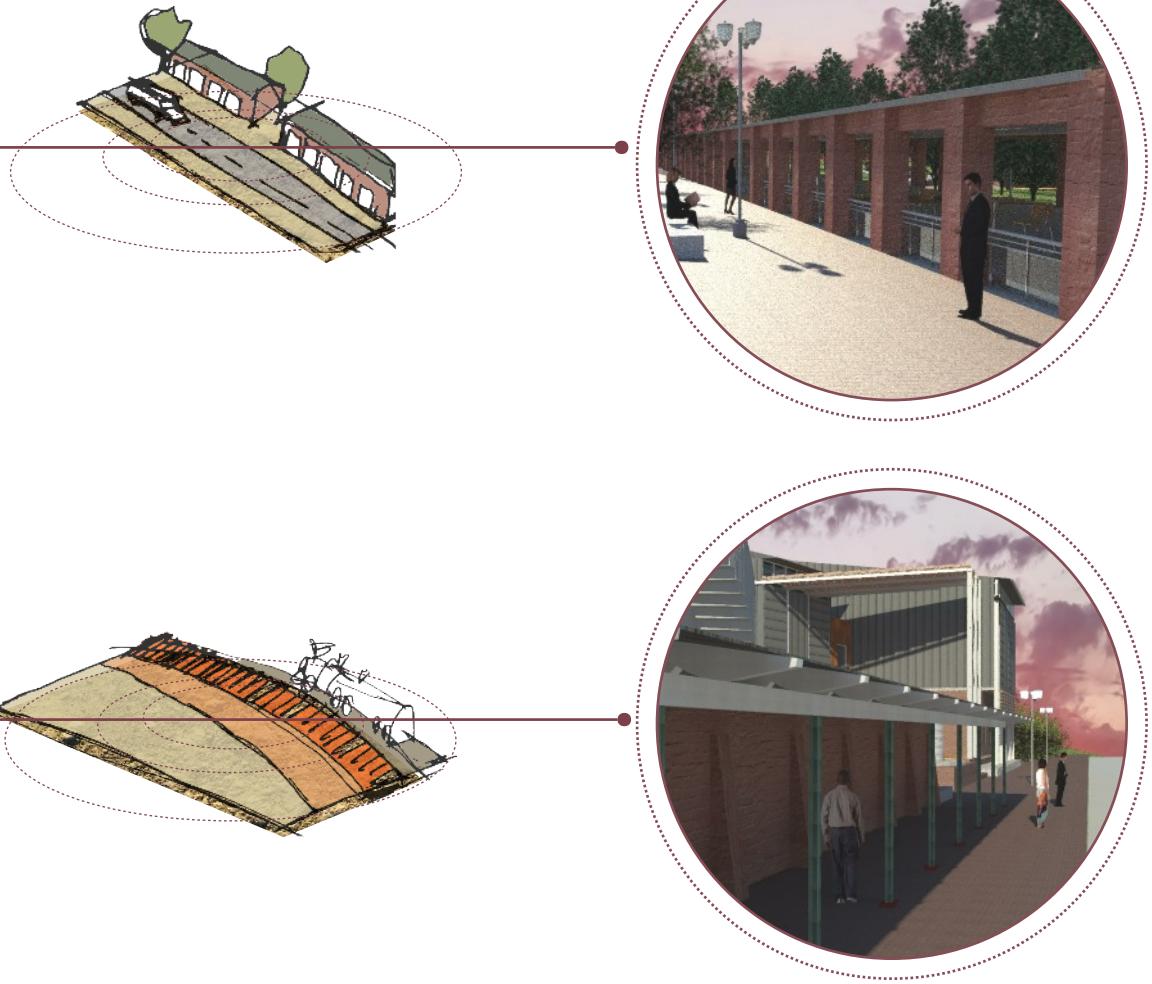
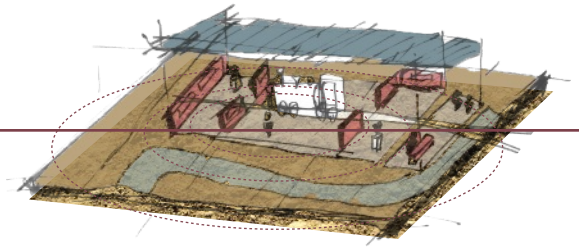


Fig 5.7: Routes 01

5.3.3 The Museum Route

The new museum establishes routes adjacent to its footprint that connect to the Platform Route and the Park Route. These routes connect Transnet Plaza with the Platform Plaza.



5.3.4 The Park Route

A new route is established in the natural zone of the site. It consists of a series of flower gardens, children's play areas, park benches, running routes and spaces for outdoor events. The route stems primarily from Transnet Plaza and ends in the natural area.

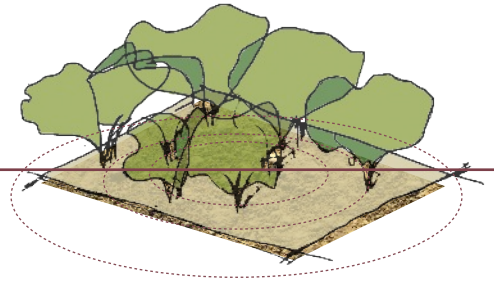


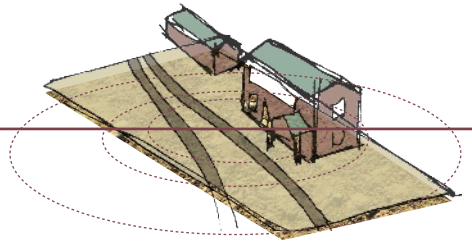
Fig 5.8: Routes 02

5.3.5 Transnet Plaza

The plaza is located at the entrance to Rovos Rail. Where this space was once enclosed and unpopulated, it is now open to the public. The plaza acts as a gathering and orientation space which contains an amphitheatre for large groups, information desk, green areas and a central water feature articulated by a rainwater harvesting tank.

5.3.6 The Platform Plaza

The plaza is located at the end of the platform route to the north. It is meant to repeat the existing recreation spaces outside Rovos Rail. The recreation space is therefore not limited to Rovos Rail and seeps into the outside areas. The plaza contains various seating areas, water features and cafes.



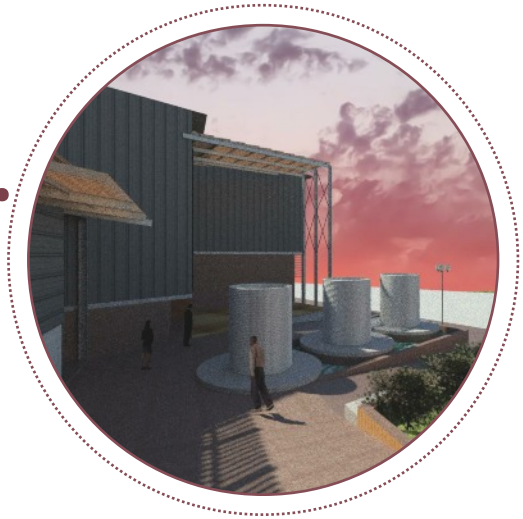


Fig 5.9: Plazas

5.4 Site Strategy

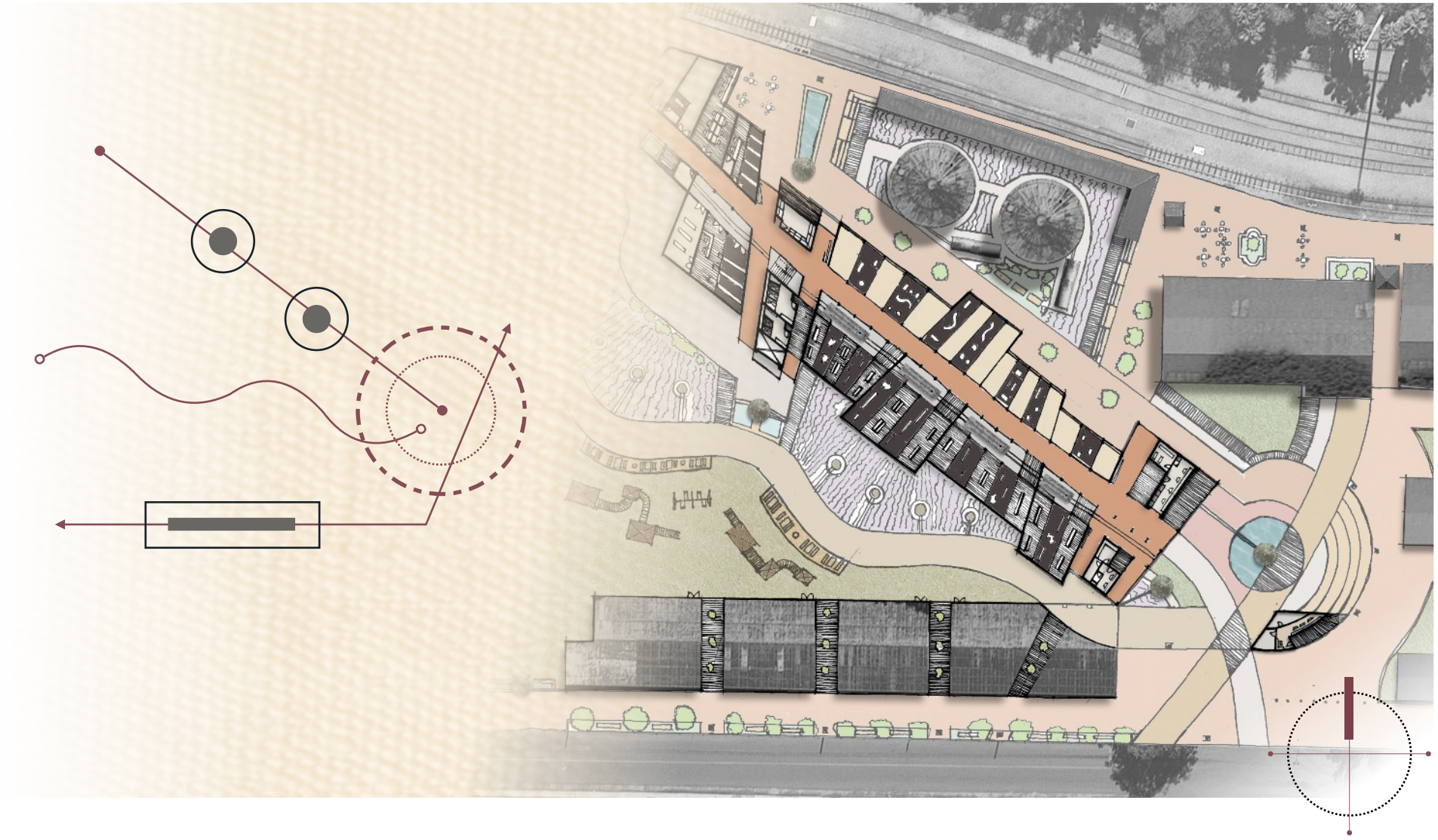


Fig 5.10: Site Strategy

5.4.1 Future of the Existing Museum

Rovos Rail currently hosts an existing museum. The museum is located near the entrance of the site adjacent to Paul Kruger Street. The artefacts contained within a range from artworks such as landscape paintings and photographs, to documents such as awards and purchases (Rovos Rail, 2020). These artefacts speak of the story of Rovos Rail, its founder, establishment and development throughout the years. Included in the collection is a range of railway memorabilia from around the world (Rovos Rail, 2020).

The museum and the artefacts are not properly curated nor documented and can be seen as a collection rather than an exhibition. Access to the museum is limited, as it is only open to people who book in advance. The museum was created after establishing Capital Park as their base of operations. After the opening of the train station, Rovos Rail required space to showcase their artefacts. The museum is, therefore, the sub-function to the train station.

The new museum will focus on facilitating ways for the visitors to engage with the artefacts. Through new exhibition and event spaces, the new museum can educate railway history in ways that the existing museum cannot.

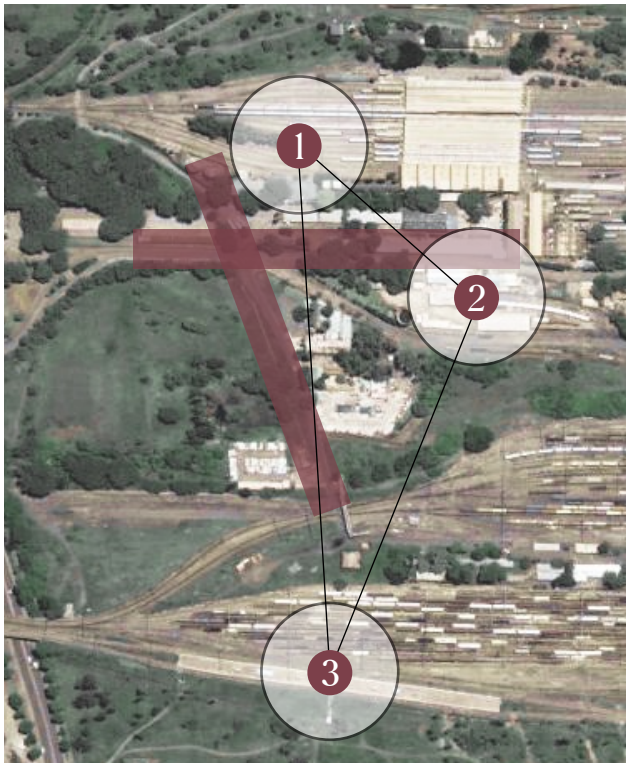
Fig 5.11: The old museum

5.4.2 Connecting the site

The site contains a variety of different functions that fit into different narratives. These narratives depict different responses to the industrial environment. As the context of the site can be classified as an industrial heritage area, the intervention must fit into these responses. The responses are categorised as the following: continued use, restore and renew, reuse and repurpose. The different narratives on the site can be considered as the following: existing narrative, constructed narrative and conventional narrative.

The Capital Park station located to the south is currently used as a train station as it has been throughout the years (Rovos Rail, 2020). This was the intended purpose for the site. The function speaks of continued use and responds to the existing narrative of the site. Rovos Rail recreates a new narrative, the narrative of a long-gone experience. The function introduced by Rovos Rail speaks of restore and renew and responds to the constructed narrative of the site. The site contains various metallurgic workshops and businesses. These businesses make use of the old railway buildings on site. These functions speak of re-use and repurpose and fit into the conventional narrative.

The project intention is to connect these narratives by establishing event spaces to act as *connector* spaces. These spaces will in turn represent an extension of the narratives and connect directly back to the museum.



Public routes and spaces

1 Rovos Rail

2 Metal Workshops

3 Capital Park Station

Fig 5.12: Connecting the narratives

5.5 Building Strategy

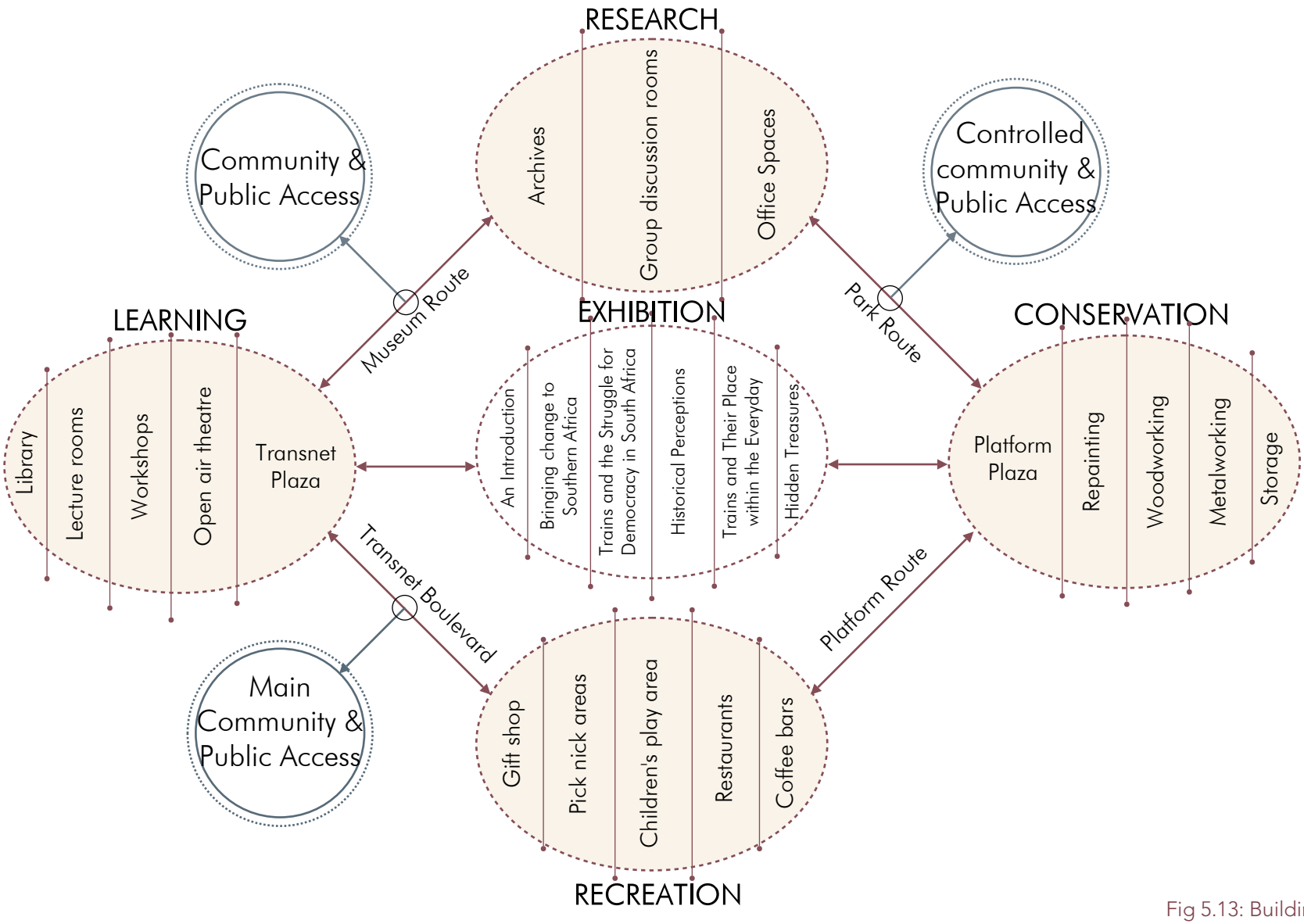


Fig 5.13: Building programme

5.5.1 Exhibition Principles

Exhibition design principles have been consulted based on discussions by Schwartz (2015).

The first principle is based on the communication of the stories of the artefacts. The story is not only about what lies on the surface. To understand a story sometimes requires further and deeper investigation. It is therefore crucial for the arrangement of artefacts to be planned. This principle relies on inherent respect for the artefacts (Schwarz, 2015).

The second principle focuses on the space the artefacts are exhibited in. The interaction between object and room is essential to communicate a deeper story. This principle relies on conveying value to the building within which the object is contained (Schwarz, 2015).

The third principle focuses on the interests of the visitor. The visitor of any age or expertise should not be underestimated. It is the visitor who interprets the story and passes it along to others. This principle relies on respecting the visitor as they are part of the process of communicating the story (Schwarz, 2015).

The exhibition would make use of the above principles. Artefacts provided primarily by Rovos Rail and Transnet Archives will be used in the exhibition. The exhibition space will represent the context within which the artefacts belong. The exhibition space will use a series of neutral backgrounds and storytelling elements to suggest a story to the visitor but also leave room for the visitor to interpret the story in their own way.

5.5.2 The Story

- An Introduction

  A brief history of the steam engine, where it originated and the first steam locomotive.

- Bringing Change to Southern Africa

  A history of railway introduction into the African continent and the changes it brought about.

- Trains and the Struggle for Democracy in South Africa

  A detailed history of the role trains played in the Apartheid's era.

- Historical Perceptions

  Historical accounts of the perceptions of steam trains, their incorporation within society.

- Trains and Their Place within the Everyday

  Detailed and interactive exhibition meant to communicate the aspects of day-to-day train use.

- Lost Treasures

  Space containing a variety of different and unspecified artworks.

The Heart of the
Transforming Landscape

Fig 5.14: Exhibition themes

06

Concept

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6.1 Introduction

The site provides the potential to explore a method of contextual design that recognizes the historical value of the context and allows for future development and growth. The project intentions will be discussed according to the general intentions and heritage intentions. The general intentions will convey a summary of urban, site and programmatic intentions. The heritage intentions will convey an adaptive reuse strategy for the existing historical buildings that are based on the statement of significance.

The theoretical framework will be used to create conceptual generators. According to the theoretical framework, the philosophical lens, rooted in holism theory, will be implemented. The four conceptual generators are based on the four contextualism categories of object, site, activity and paradigm.

The conceptual approach is informed by the theoretical lens as proposed by the theoretical framework. The theoretical lens defines the physical manifestation of the design. This defines how the concepts driven from object, site, activity and paradigm will be applied to the design through example footprint of form.

Conceptual explorations through diagrams will be provided. A final urban vision will conclude this chapter. The urban vision will synthesise the urban and site strategies as discussed in the previous chapter.

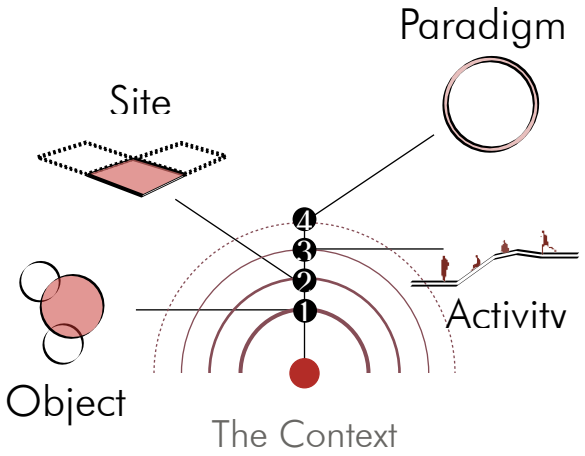

Fig 6.1: Categories of contextualism

6.2 Project Intentions

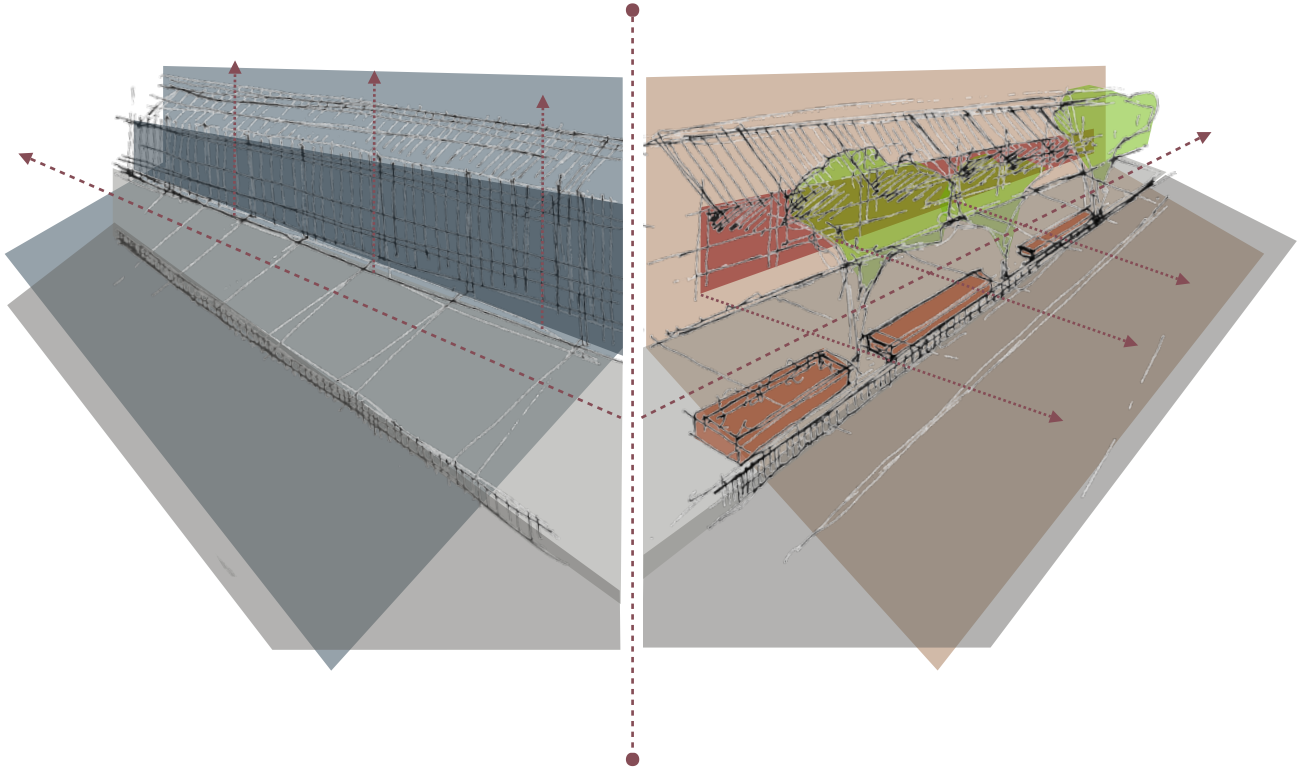

Fig 6.2: Uplifted

6.2.1 General Intentions

The intention aims to establish the museum as a cultural centre within the suburb of Capital Park. The cultural centre intends to merge education and community attraction through the creation of a variety of public spaces.

The intervention aims to enable public access to the site by deconstructing existing visual and physical barriers such as fences, walls and overgrown vegetation. Transnet Avenue will be established as the main public space with secondary spaces adjacent to the road. To establish the public route, it is necessary to populate it with various activities meant to invite foot traffic.

With this development comes the necessity to clean-up the site of existing ground and water pollution to make it appealing to the public eye. Through development, upliftment and rejuvenation, the site can entice daily visitation and thereby become integrated into the daily lives of the surrounding community.

Fig 6.3: Broken Boundaries

6.2.2 Heritage Intentions

With the presence of historically significant buildings on site, the intervention aims to implement adaptive reuse strategies in order to emphasise the historical value of the site.

Inspiration has been taken from works discussed by Roberts (2016), specifically that of the *Templo de Diana* by *José María Sánchez García* (Roberts, 110:2016). The idea of the old structures being *framed* by the new structure will form the base of the adaptive reuse strategy.

The idea of the *frame* is based on respecting the uniqueness and individuality of the historical structures without the need to physically and drastically transform them (Roberts, 2016). The *frame* is articulated by layers of public space. These spaces are placed between the new structure and the old to direct focus towards the old structures (Roberts, 2016). The public spaces are divided according to different ways of interacting with the old structures. The different interaction spaces are open spaces to promote physical interaction, viewing platforms to promote visual interaction, and enclosed spaces to promote psychological interaction (Roberts, 2016).

Roberts (2016) also discusses physical and visual continuity that is associated with the *frame*. The new structure can mimic the form of the old by creating visual continuity of the existing floor and roof lines. The discontinuity can also be achieved through the creation of open spaces between the old and new buildings (Roberts, 2016).

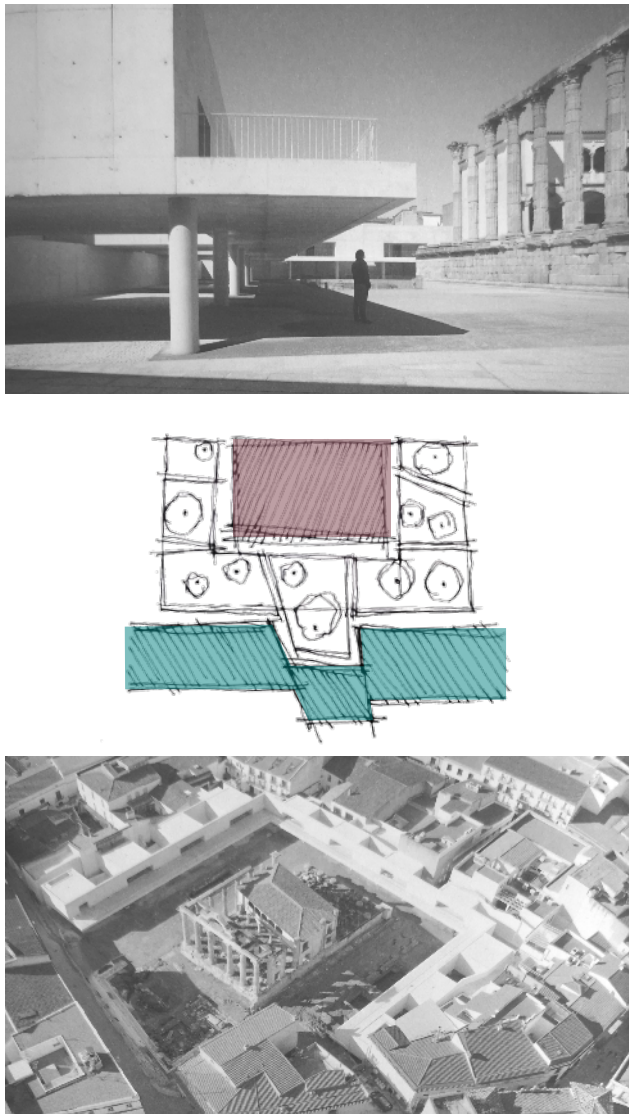

Fig 6.4: Open heritage

6.3. Conceptual Generators

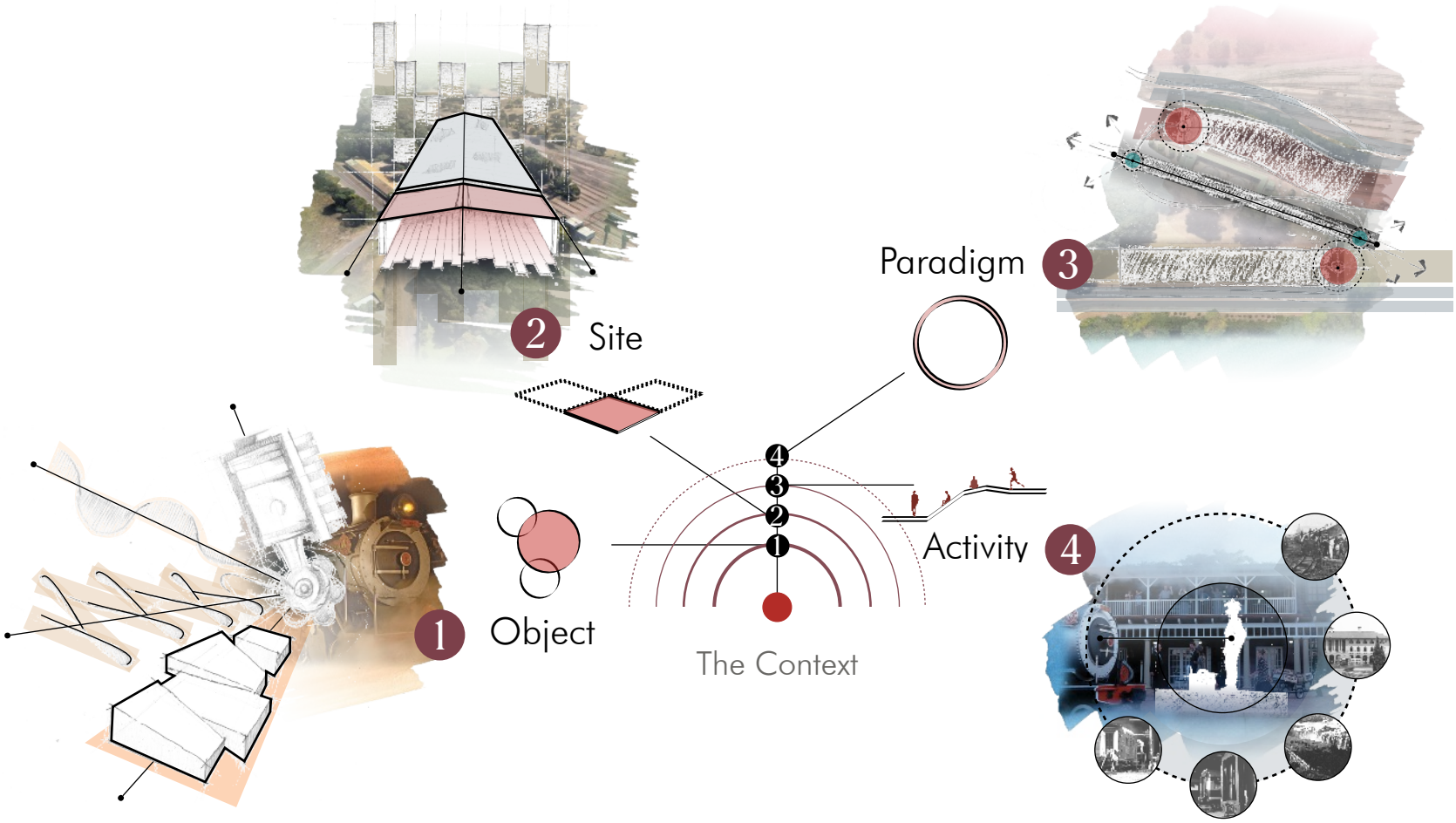

Fig 6.5: Conceptual generators

6.3.1 Object | Motion

The motion and energy of the steam engine are intended to be translated into the form of the building. This creates a living building that visually moves through the site much like that of a locomotive engine. The stagnant landscape comes alive.

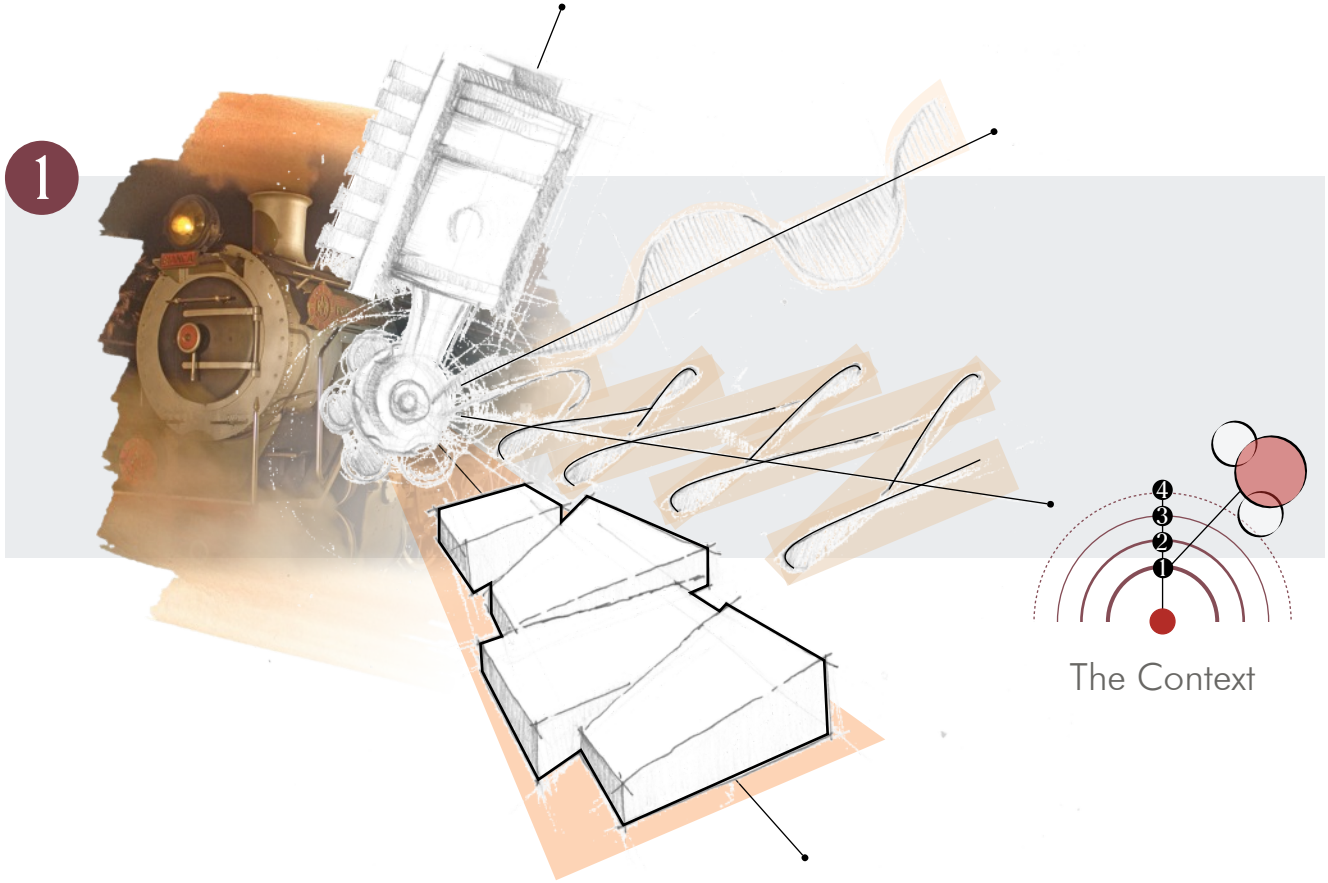

Fig 6.6: Motion

6.3.2 Site | Linearity

The existing linear typology is translated into the building footprint. By repeating the linear typology, the design intends to emphasize the existing features on-site. The design roots itself in the existing narrative of the site. The new forms from the old.

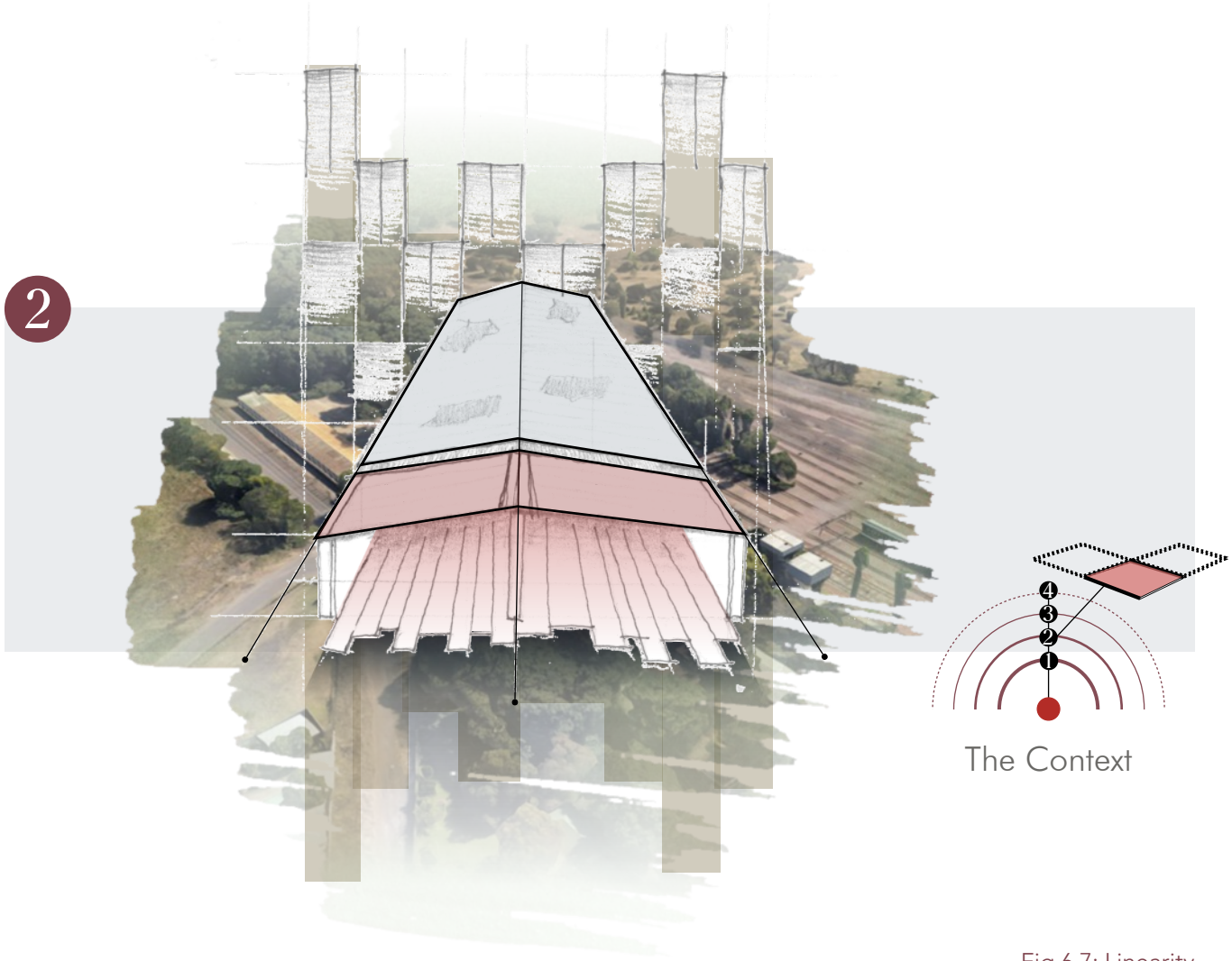

Fig 6.7: Linearity

6.3.3 Activity | Theory vs Real

This is inspired by the aim to enhance the old experience of the train station recreated by Rovos Rail. To enhance this experience, the intervention intends to provide a historical background to railways. The museum will give a theoretical context to the real experience. The programme intends to connect theory with the real.

Fig 6.8: Theory vs Real

6.3.4 Paradigm | Connection

This is inspired by the role of the contemporary museum in South Africa. The role is to communicate historical identity, connect people and places and enable future transformation. This is translated into the urban development proposal. The urban development is meant to establish hidden areas as public spaces. The museum becomes the connector of the landscape.

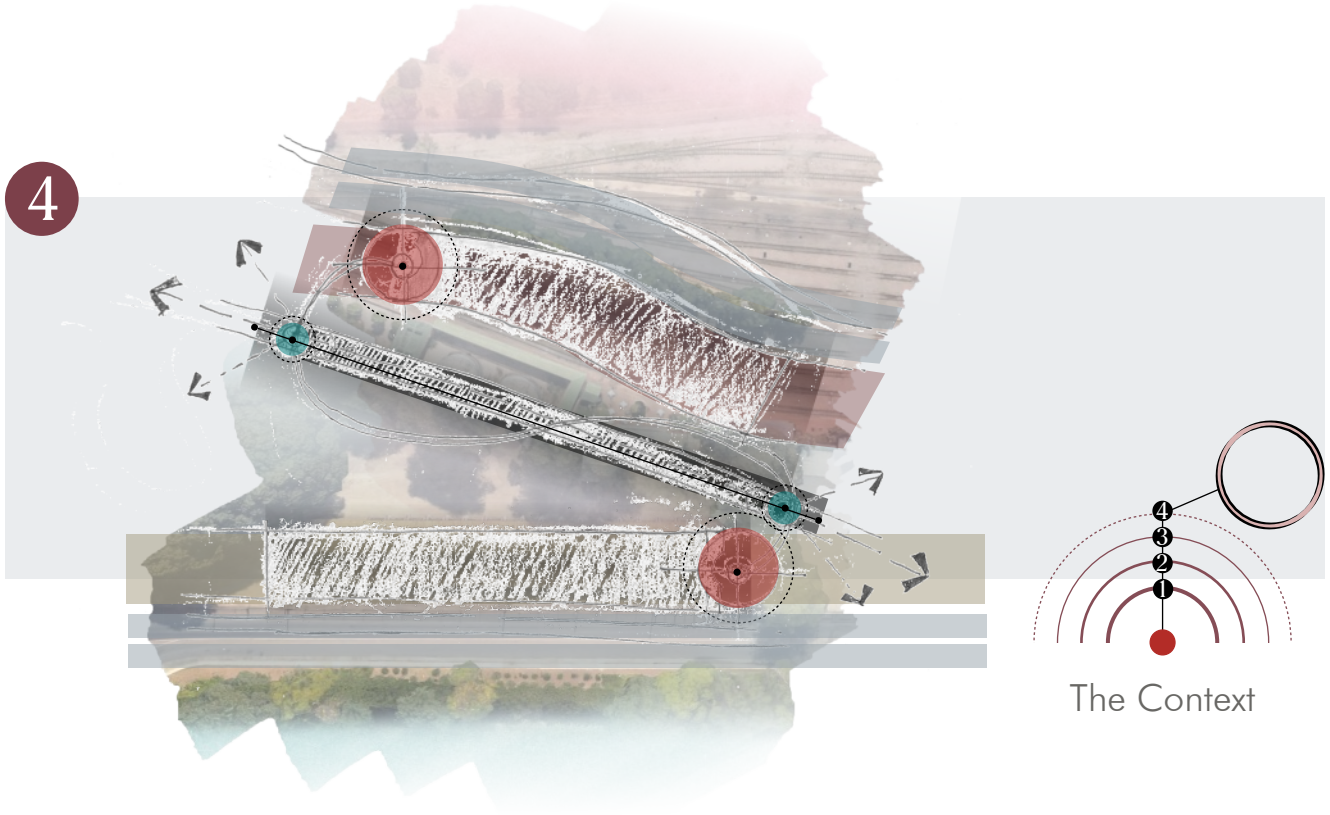

Fig 6.9: Connection

6.4 Conceptual Approach

The conceptual approach is divided into two steps. Firstly, choose what on the site represents object, site, activity and paradigm. This will then be the conceptual generators. Secondly, through an analysis of its meaning based on the theoretical lens of contextuality, the architectural response will be drawn. In terms of the first step, the following have been chosen to represent object, site, activity and paradigm:

- The object will be represented by the locomotive.
- The site will be represented by the site next to the railway.
- Activity will be represented by the programme of the museum and train station.
- Paradigm will be represented by the contemporary role of the museum.

In terms of the second step, the following architectural responses will be informed by the conceptual generators:

- The *motion* of the locomotive and will be applied in the form of the building.
- The *linearity* of the site will be mimicked in the footprint of the building.
- The *theoretical versus the real* will inform the connection between the existing and the new programmes.
- *Connection* and *transformation* will inform the urban plan, the connection between public spaces and the connection between the different zones of the site.

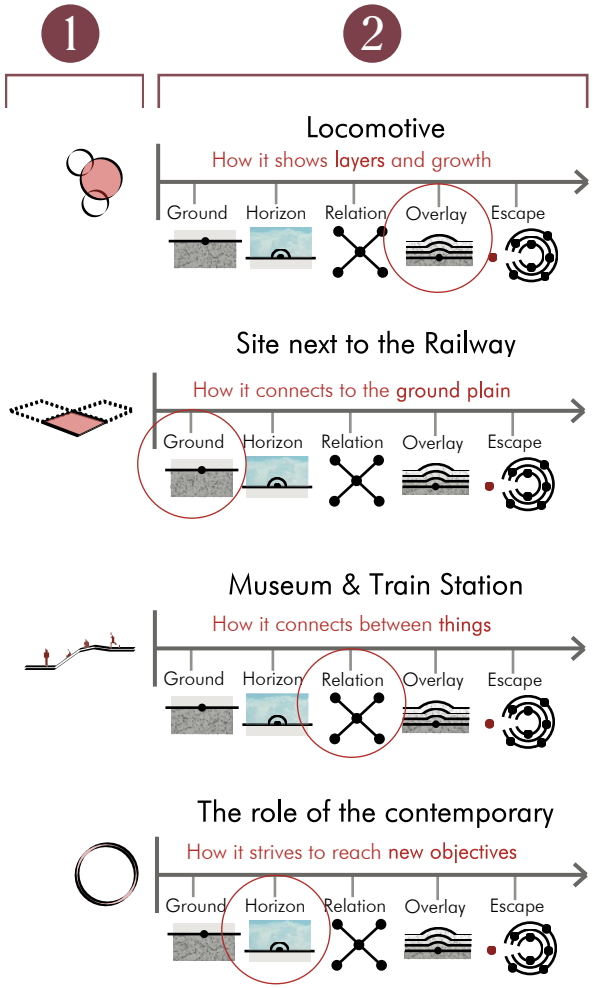

Fig 6.10: The approach

07

Design Development

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7.1 Design Application

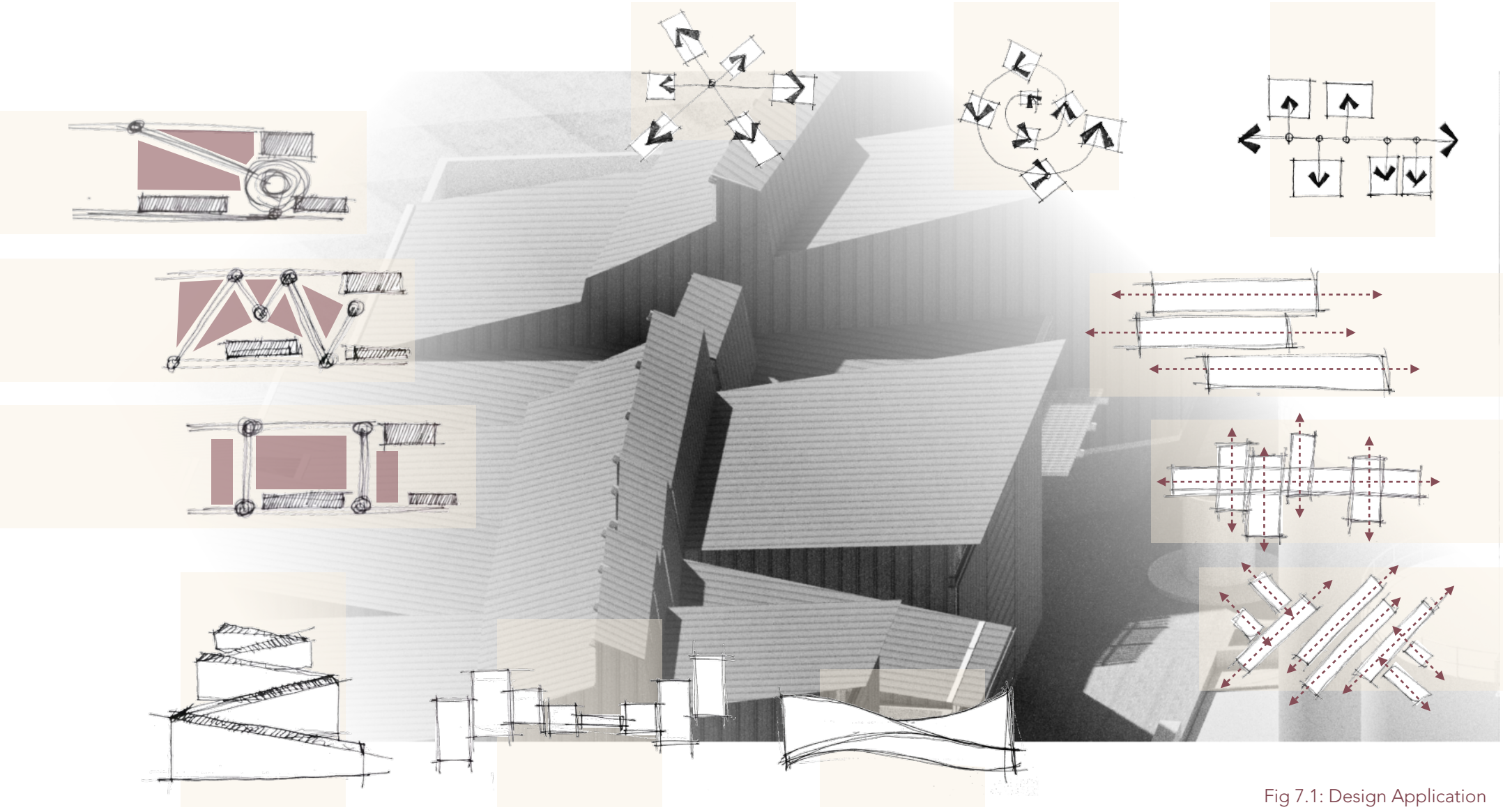


Fig 7.1: Design Application

7.1.1 Form

Iterations on the form have been based on the idea to communicate motion. Inspiration has been taken from looking at the workings of the steam engine within a locomotive.

Three predominant types of movements are apparent within a steam engine. Firstly, the expansion of water transitioning to steam through heat. Secondly, the linear movement of the pistons powered by the expanding steam, Thirdly, the circular movement of the wheels of the locomotive which is caused by the pistons.

This transition of energy, from expansion to linear to circular is translated into building form. It is decided that linear motion is more appropriate to use within the form.

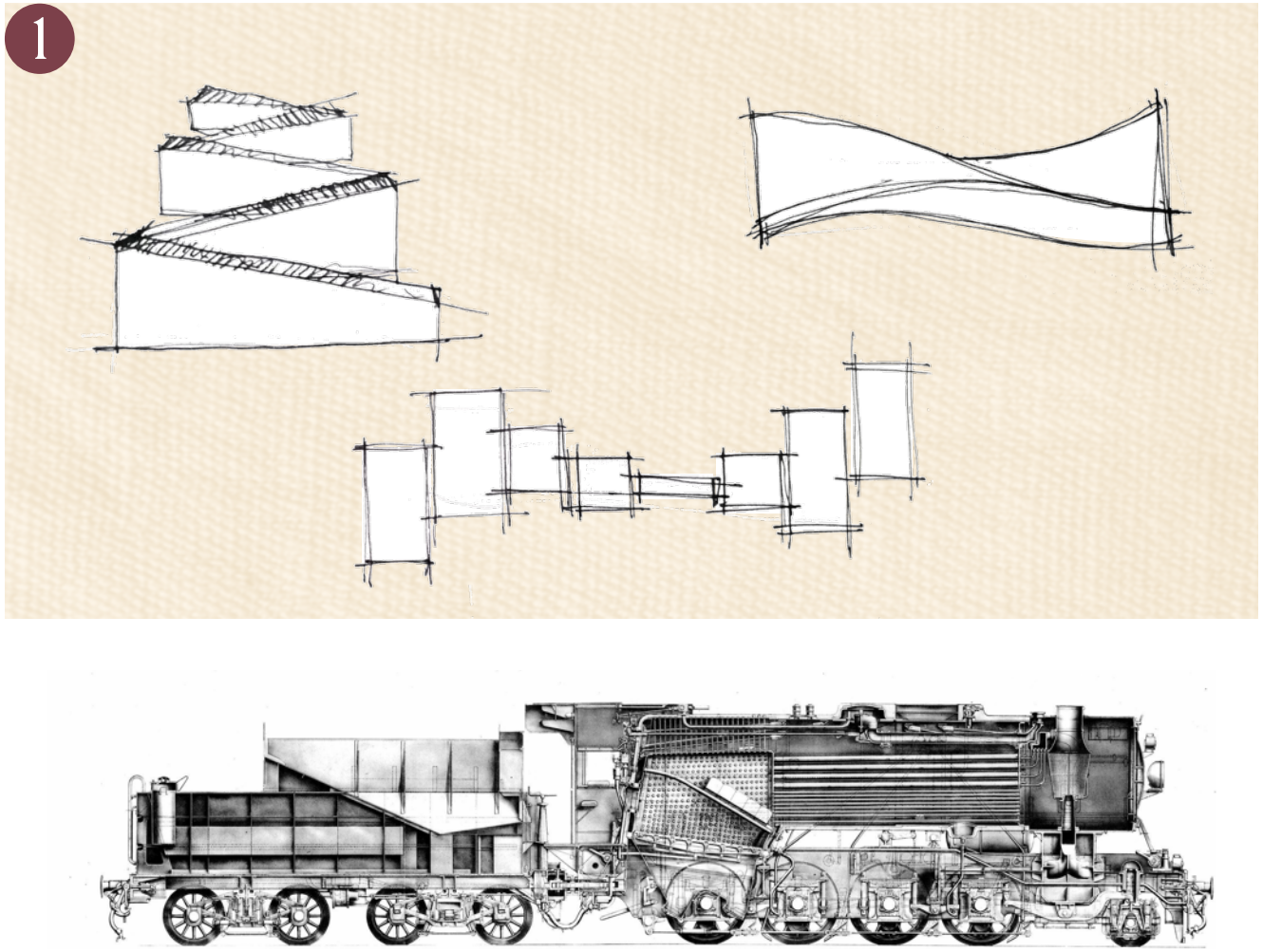


Fig 7.2: Exploring visual motion

7.1.2 Footprint

Iterations on footprint have been based on the idea of incorporating the predominant linear typology of the existing structures on site. The linearity of the existing buildings is interpreted in three ways. Firstly, the rigidity of the footprints. This rigidity speaks of singularity and isolation. Secondly, the footprints can be merge creating crossing grid lines. Thirdly, different footprints can come together to form not only cross-grid but multiple grids. This third footprint still retains its linearity but allows for different connections between different footprints.

The multi-grid footprint is chosen to take further for the design as it represents connection and allows for other elements to be introduced within the footprint of the building.

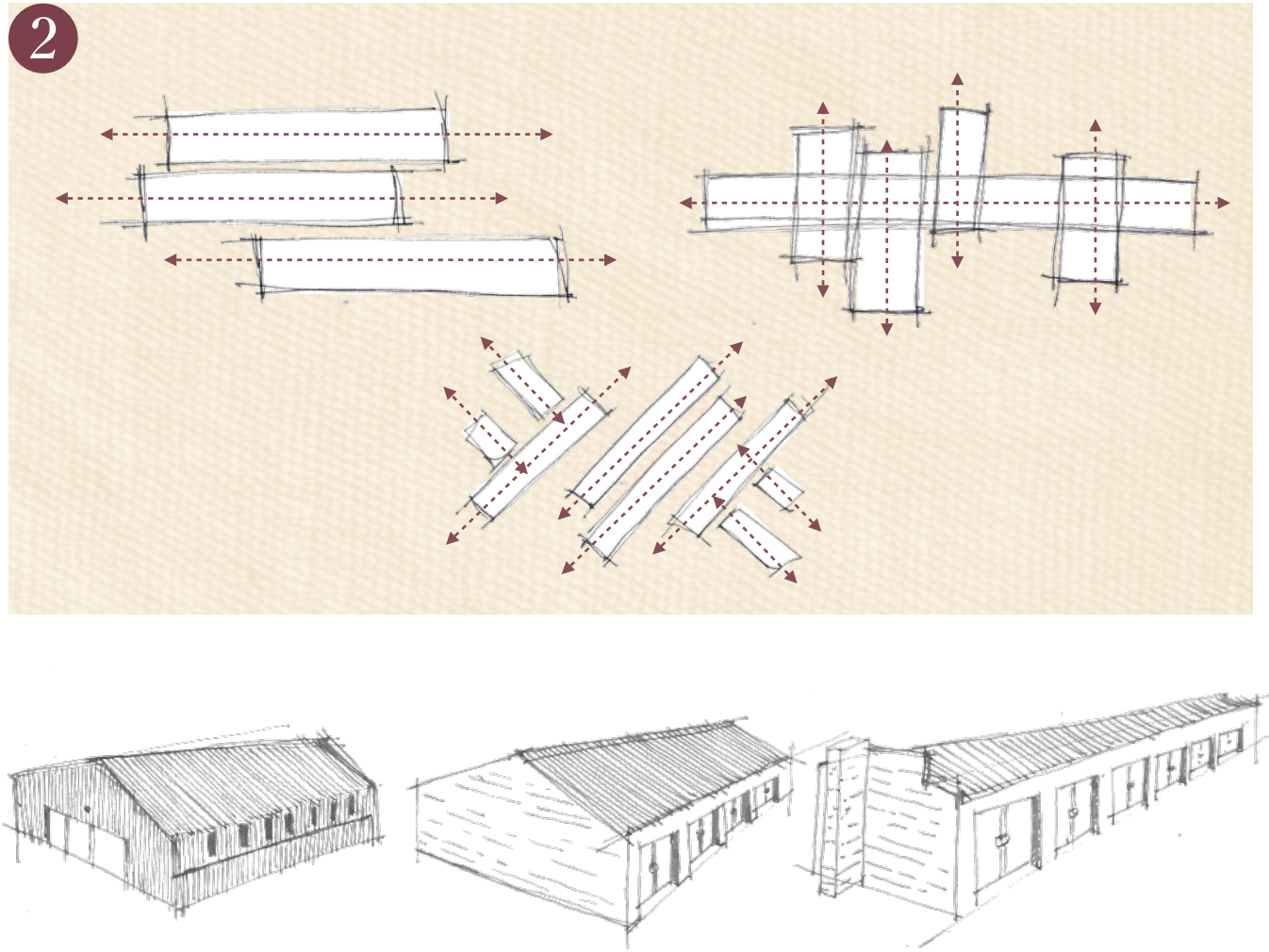


Fig 7.3: Exploring layouts of linearity

7.1.3 Programmatic Layout and Circulation

Iterations of programmatic layout have been based on the intention to connect the public with the heritage by placing certain functions between them. The first iteration is based on a progression of functions starting with learning spaces, to other spaces and finally, the heritage. The second iteration is based on creating a large threshold space that can be transformed into different spaces to accommodate different functions. The third iteration is based on creating a clear distinction between public an heritage. Iterations on circulation have been inspired by the flow of energy within a steam engine. By translating the different forms of motion into movement patterns, the different types of circulations have been identified. The user is meant to become energy molecules within the engine to power the locomotive.

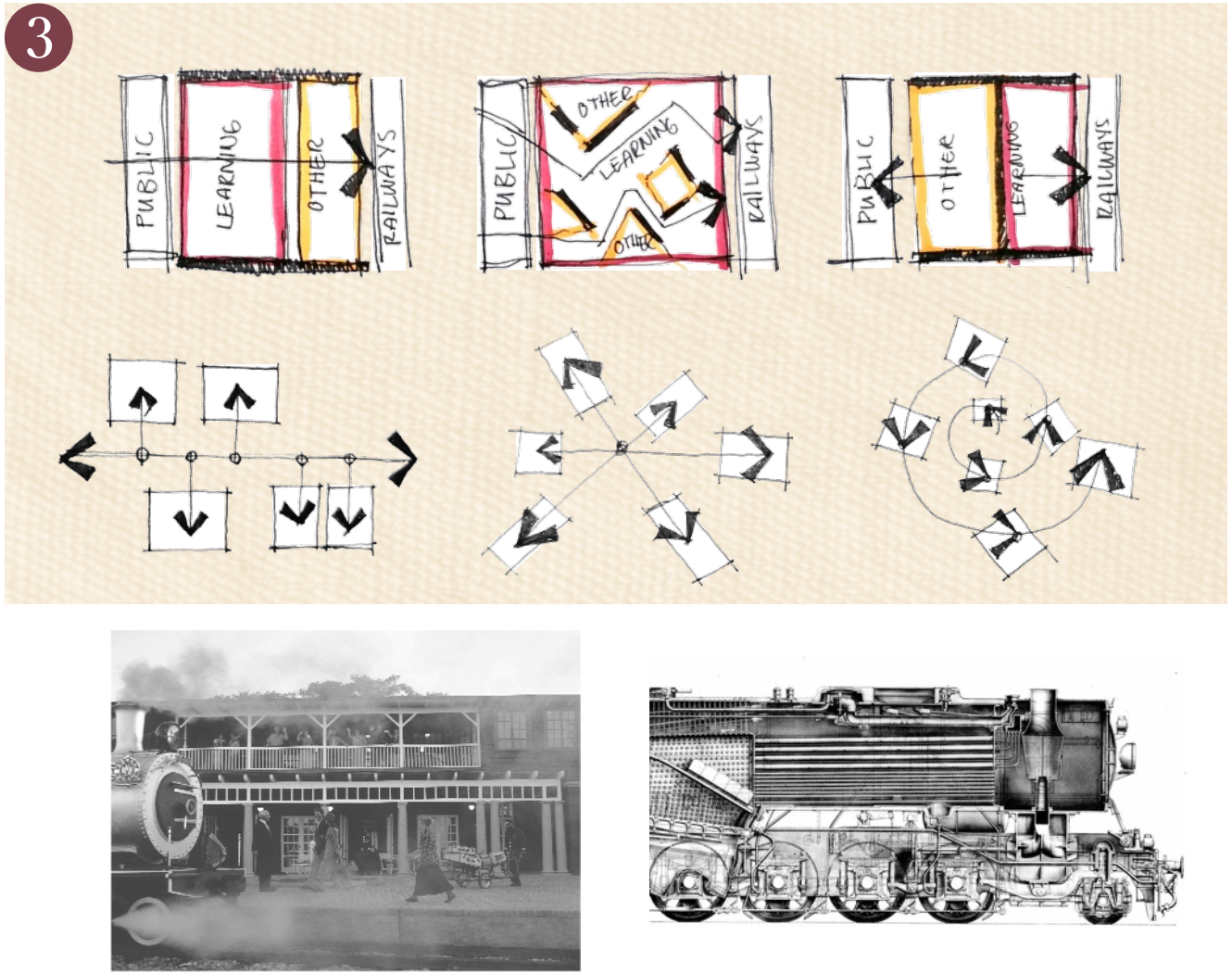
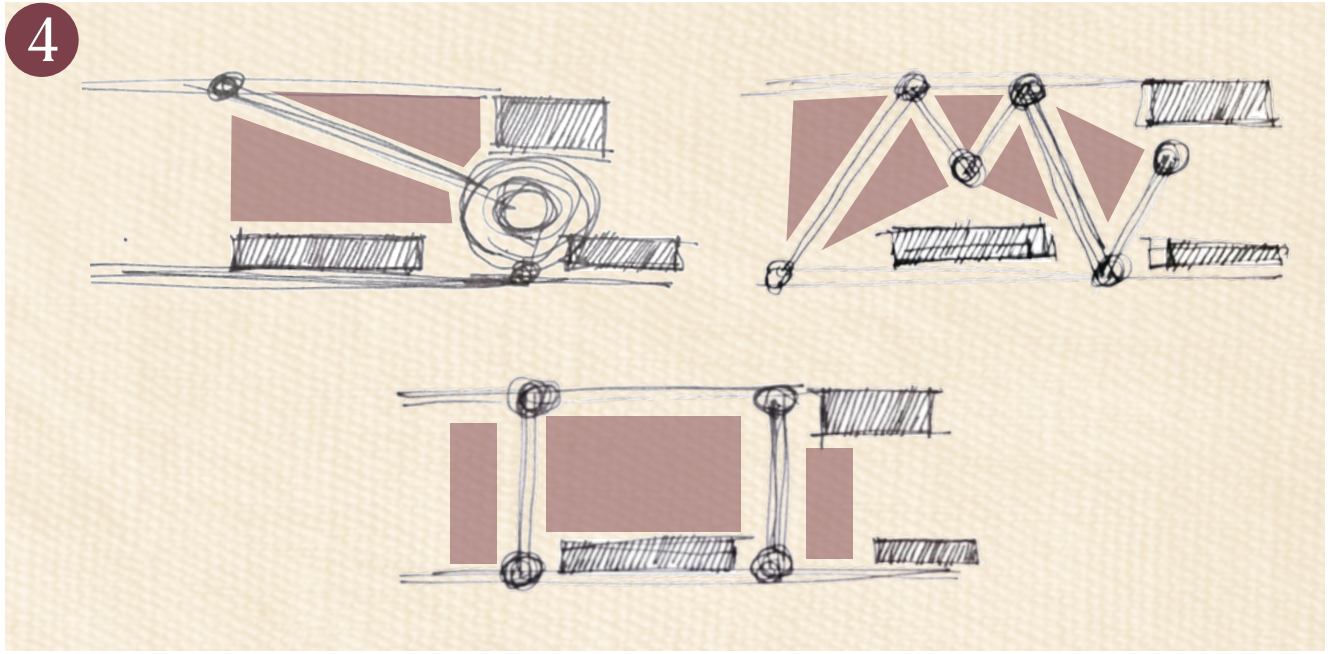


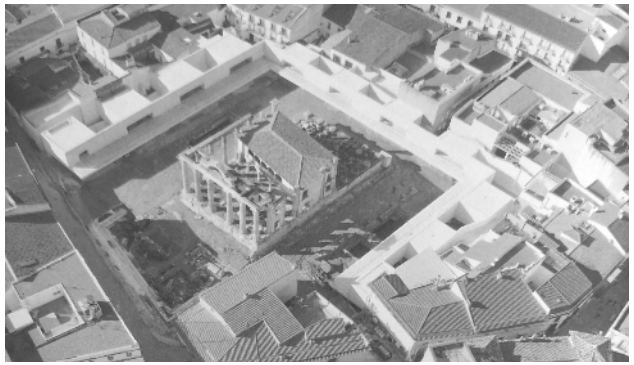
Fig 7.4: Exploring circulation

7.1.4 Old and New within Urban Plan

Inspiration has been taken from adaptive reuse methods from Roberts (2016), *Tabula Plena*.

The method chosen was to frame the existing historical features of the site through connections. These connections are either physical connection through interaction, visual connection through openings and viewpoints, psychological connection through creation of space around the historical structures. The aim is for the intervention to frame the surrounding historical structures as they sit within their context. Unchanged but emphasised. It is proposed that the intervention frames these features by using all three connections.





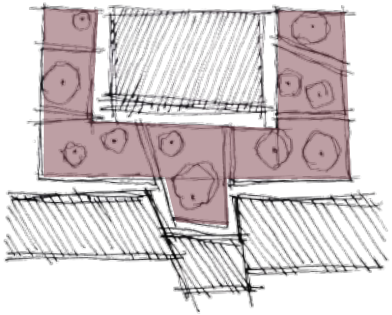


Fig 7.5: Exploring lines of connections

7.1.5 Exhibition Narrative

Exhibition principles based on discussions by Schwartz (2015) are used. The principles are based on respect for the artefacts, the building and the visitor. The exhibition themes discussed in the previous chapters intend to tell the story of the railways as it transformed the landscape and the lives of the people. The exhibition narrative is intended to tell the story of the artefacts through the manipulation of space. Space is manipulated through the inner-envelope of the museum. This inner-envelope, consisting of a series of adjustable ceilings, walls and openings, simulates a landscape through the time - changing, growing and evolving.

The main artefacts displayed are the locomotives. These locomotives are the centrepieces of the exhibition. The tracks on which they rest run through the entire museum. This simulates a *walk-through time.* The exhibition themes are containing within the different segments of the building. As one progresses through the exhibition the inner-envelope evolves and transforms from enclosed and organic to open and structured. This simulates the changing landscape from the beginnings of the railways to the expansion of the railways.

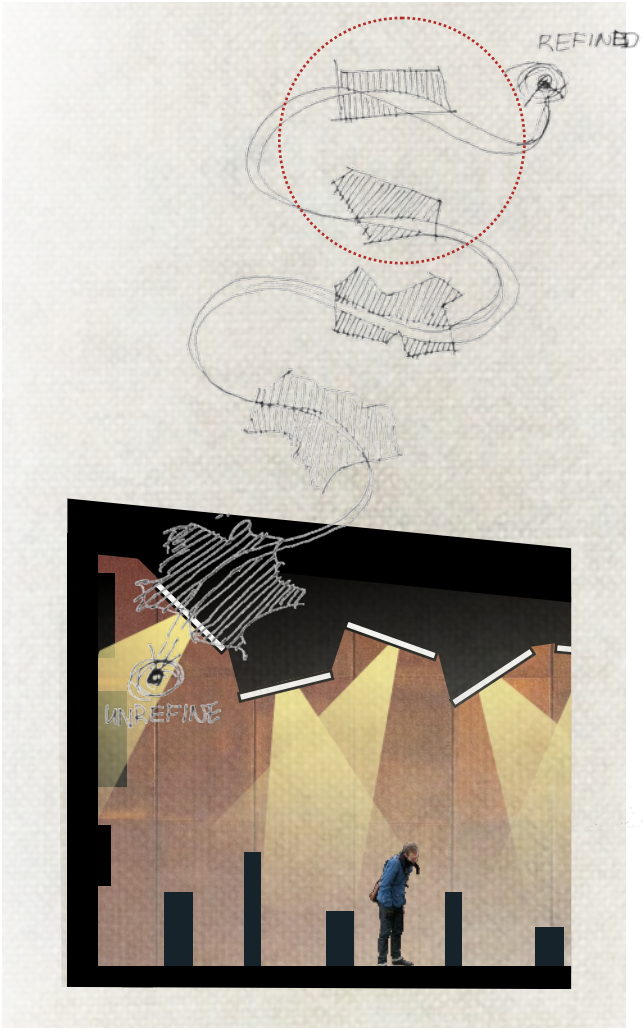


Fig 7.6: Exhibition Narrative

7.2 Design Iterations

The first iteration has focused on physically extending from the existing structures on site. This has led to the site being too densely populated by the intervention. The footprint takes inspiration from the various linear grids of the existing buildings and creates visual continuity with the existing features. However, through the mix of these grids, it directs focus inward to the intervention and not outward towards the historical structures. The roof structure is meant to be monolithic in nature. The slight tilt of the roof towards the railways signifies motion. The surface area of this iteration is too great and leaves no room for public space between the old and the new buildings.

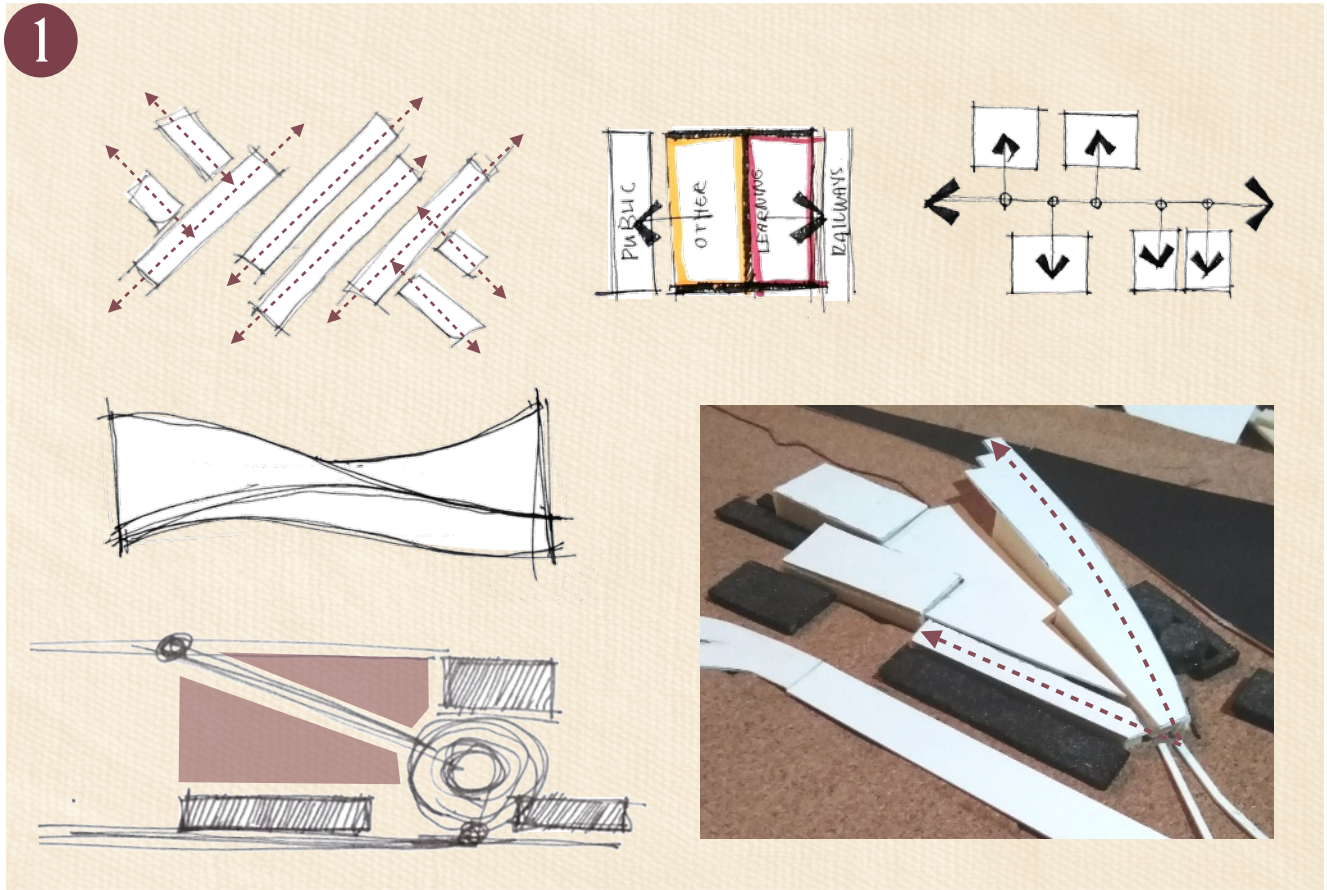


Fig 7.7: Design iterations 01

The second iteration focused on placing the building in such a way that it connects the existing routes on site. This led the design to be able to enhance existing spaces and connecting the main public route with other parts of the site. The footprint is placed directly on top of the existing unused railway lines. The building grid takes inspiration from existing building grids. This establishes a visual continuity between the new structure and the old structures. Motion is heavily implied within the tilting segments of the roof structure. This iteration proposes a building that covers a smaller surface. This allows for the manipulation of public space as well as being less destructive.

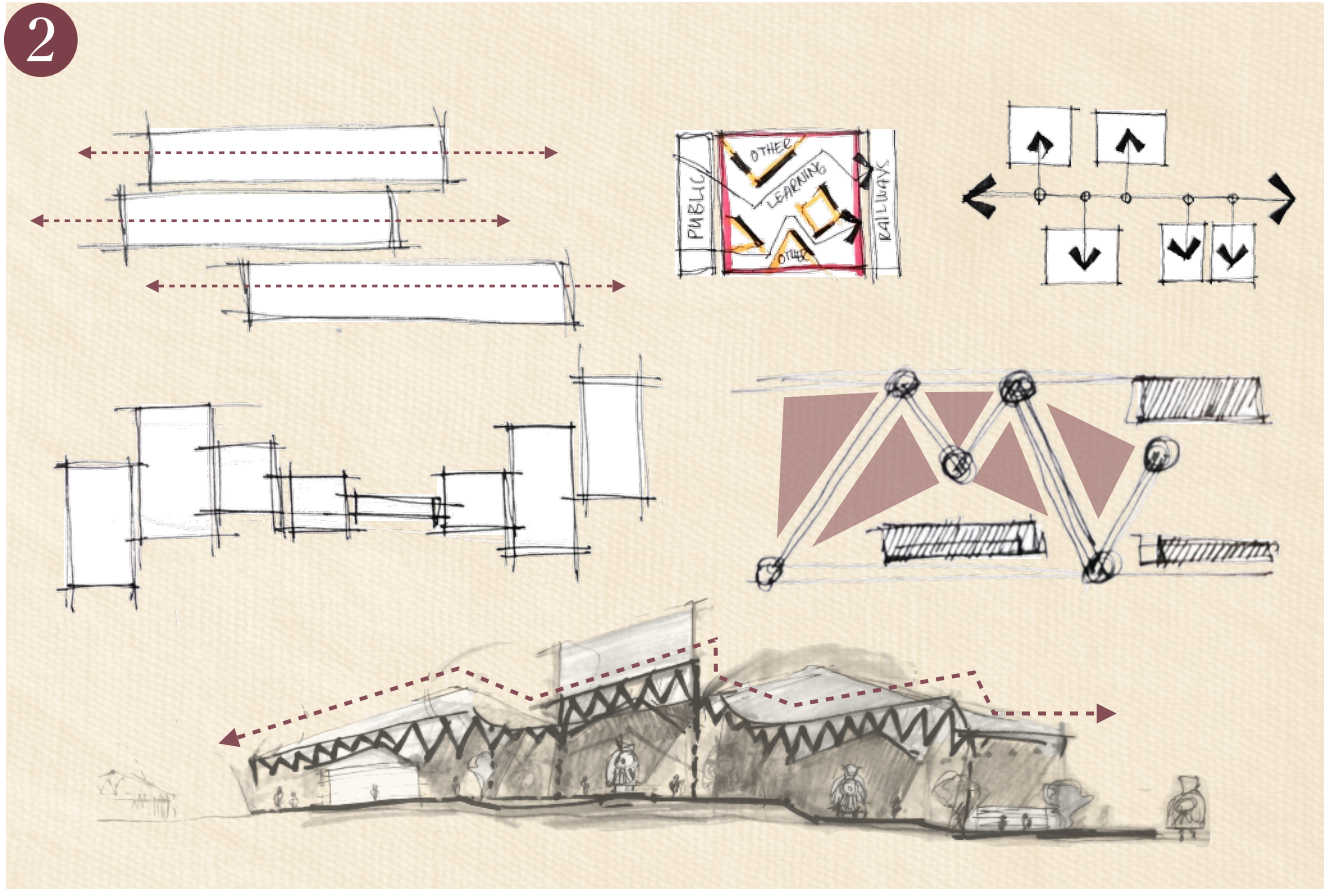


Fig 7.8: Design iterations 02

7.3 Final Design

The final design uses aspects from both iterations. Visual continuity between old and new is created through footprint and form. The design articulates the existing unused railway lines through means of the roof structure. The roof structure itself is meant to become the aesthetic centrepiece as it articulates the spaces around and within the museum. The roof elements signify motion through the various segments and the organic shape of the central structure. The envelope of the building manipulates the spaces within and outside in order to emphasise the narrative of the site while establishing its own narrative.

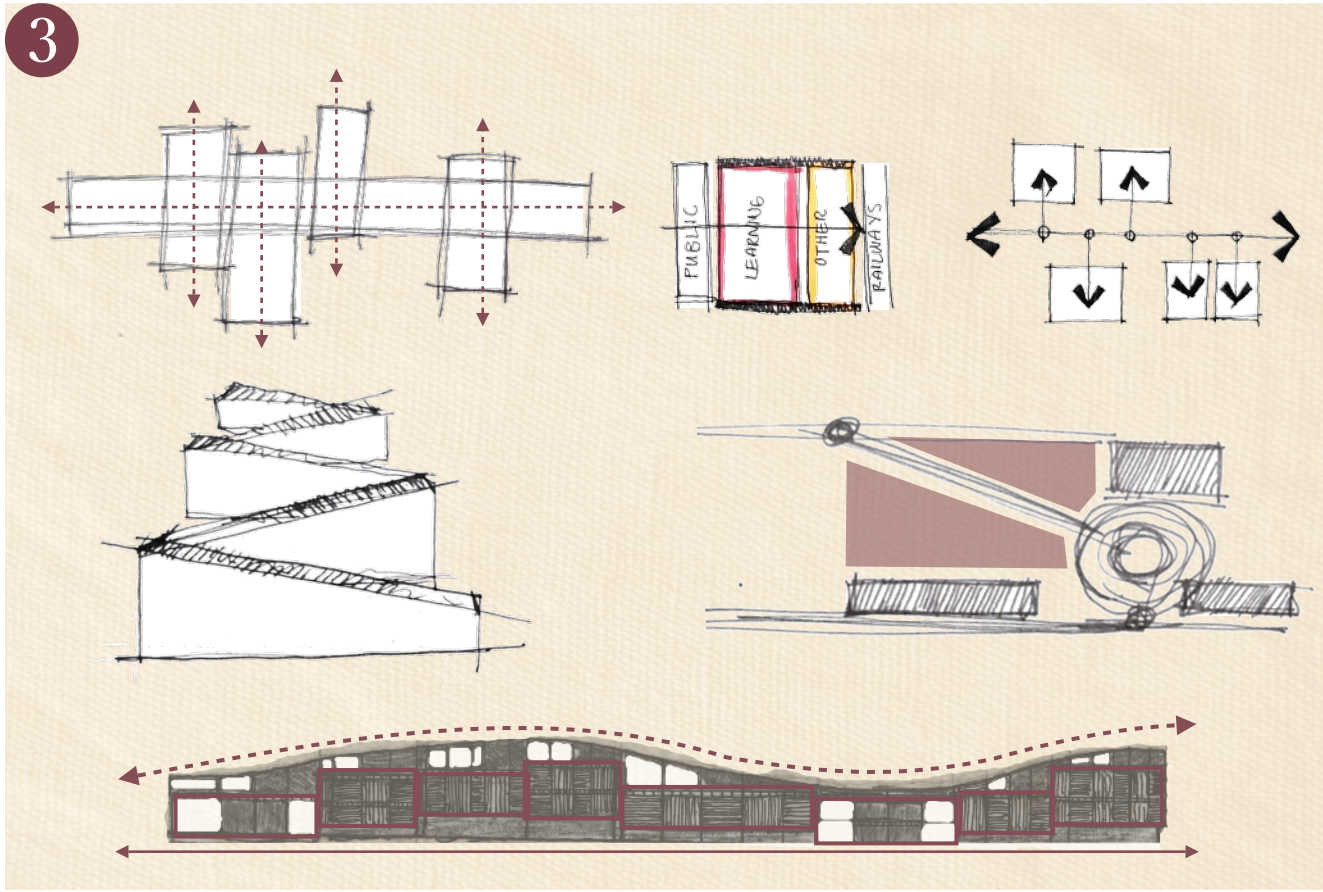


Fig 7.9: Design iterations 03

08

Technology

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8.1 Technical Concept

The site provides the opportunity to explore a method of contextual design that proposes a technological resolve that portrays existing narratives. This will be achieved through the use of the building envelope. The envelope consists of a series of spatial framing devices. These framing devices aim to manipulate space and thereby the experience of the visitor. The inner-envelope manipulates the visitor's experiences within the exhibition space. The outer envelope manipulates the exterior spaces and facilitates engagement with the visitor and the landscape. Through these structural manipulators, the existing narratives and the museum narratives can be conveyed.

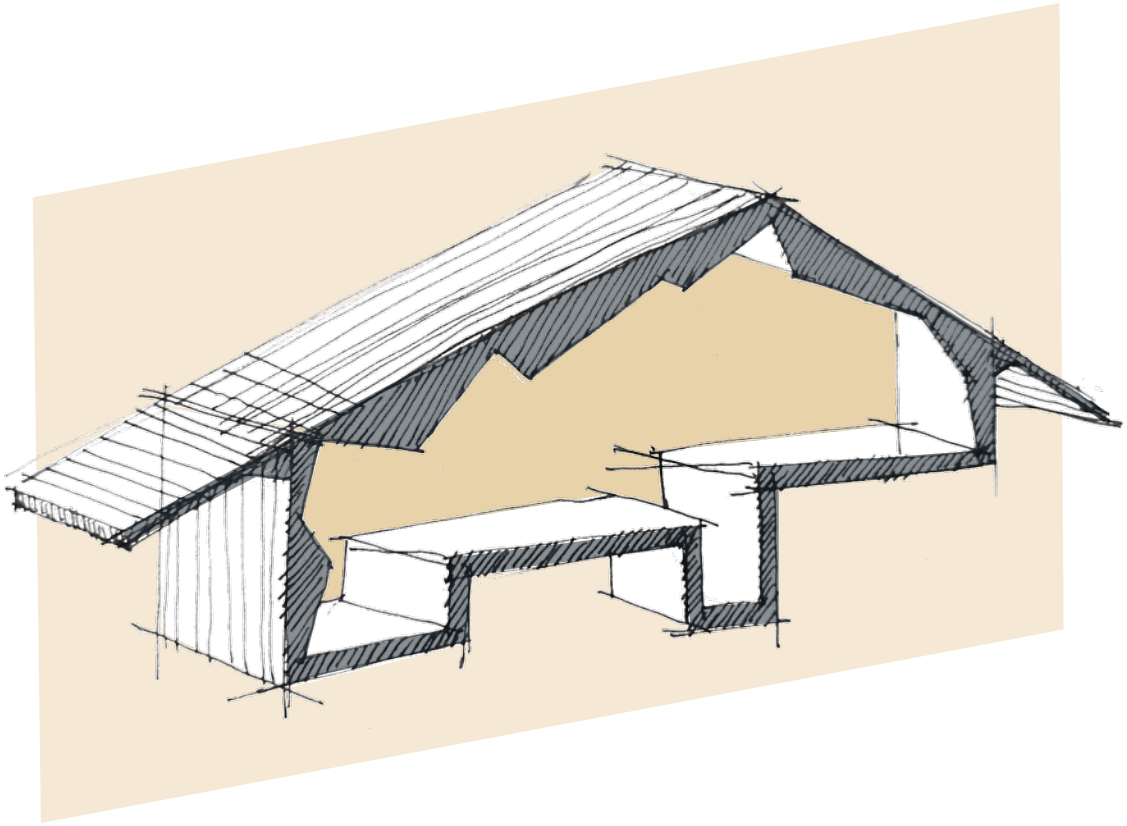


Fig 8.1: The Envelope

8.2 Technical Precedent

8.2.1 Fresnoy Art Centre by Bernard Tschumi

The Fresnoy National Studio for Contemporary Arts is located in Tourcoing, France. The building makes use of the envelope to protect, collate and enhance a variety of existing historical structures (Roberts, 2016). The roof element functions as the primary envelope. The roof spans over great lengths to create and articulate large public spaces. It varies in height to distinguish between public and private spaces. The roof also articulates different paths of circulation through means of contrast in materiality (Roberts, 2016). The envelope consists of a series of steel components, uncovered and exposed in order to facilitate a visual connection between the user and the structure (Roberts, 2016).

Because the roof acts as the primary structural piece, it allows for the inclusion of various mechanical systems and networks (Roberts, 2016). Openings within the envelope are meant to reveal the inner spaces of the building while simultaneously creating a visual connection between interior and exterior (Roberts, 2016).

Fig 8.2: Fresnoy Art Centre - the envelope

8.3 Technical Framework - The Envelope

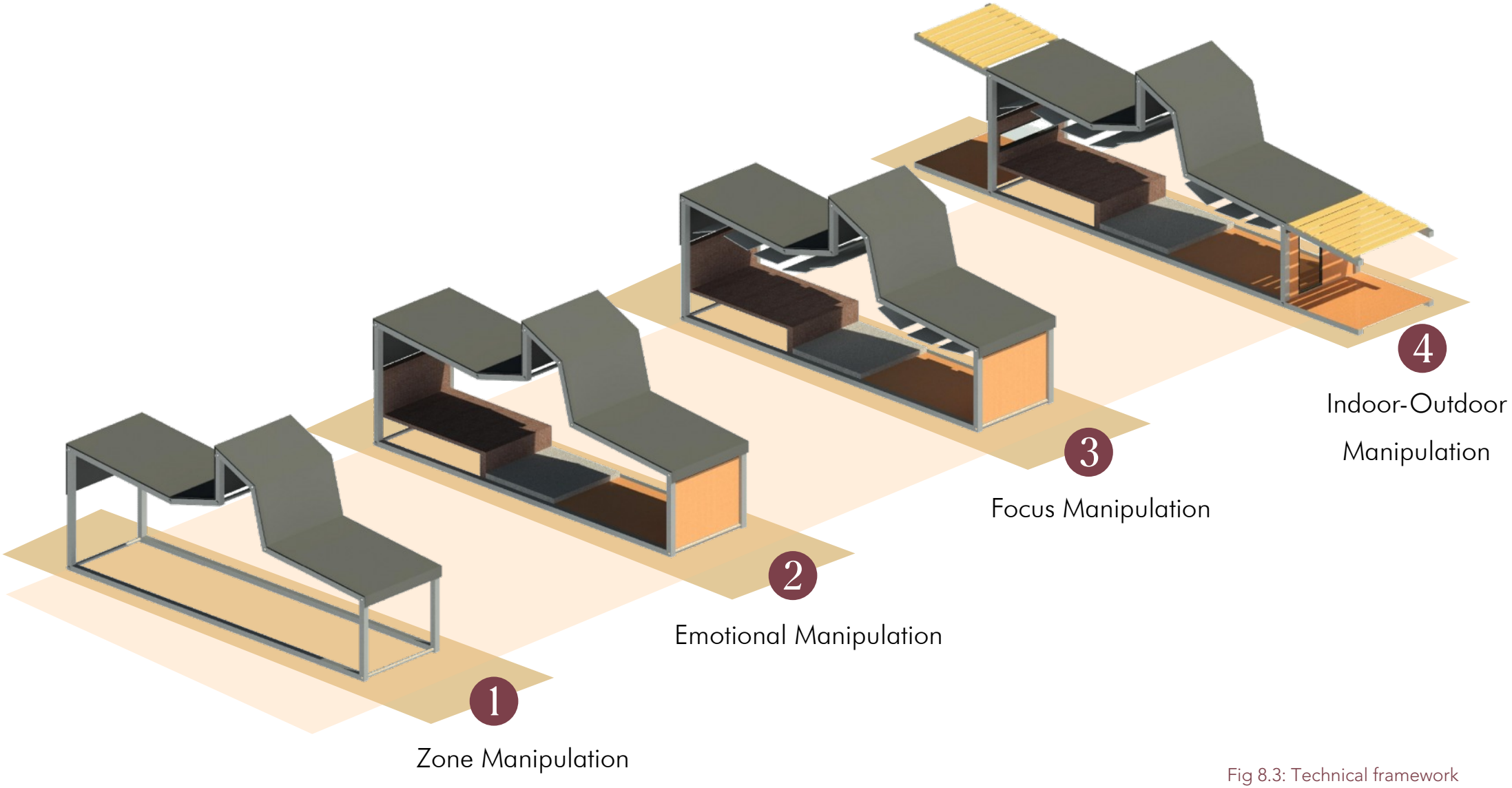


Fig 8.3: Technical framework

8.3.1 Zone Manipulation | Frame

The structure is meant to allocate the zoning of the main spaces within the building - the main route, secondary route and exhibition spaces. The framed structure is meant to expose the components within, celebrating technological advancement. The ribbed structure enables ventilation, openings, and a modular structural system.

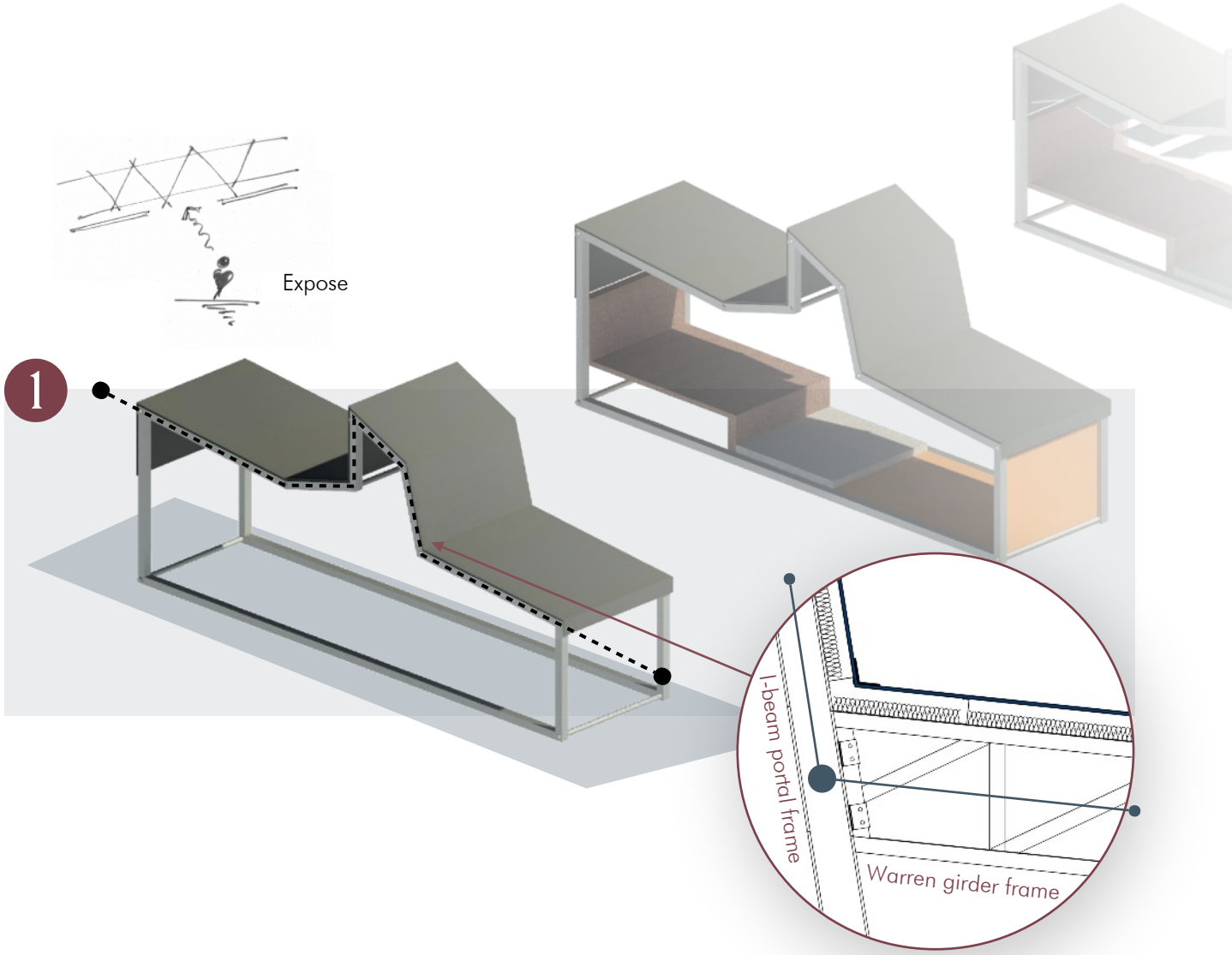


Fig 8.4: Zone manipulation

8.3.2 Emotional Manipulation | Surface

The materiality is meant to create a relationship between lightness and heaviness according to the tectonic and stereotomic materials on site. This relationship is emphasized through use of the surfaces within the envelope, as heavy materials convey a sense of reliability and light materials convey a sense freedom.

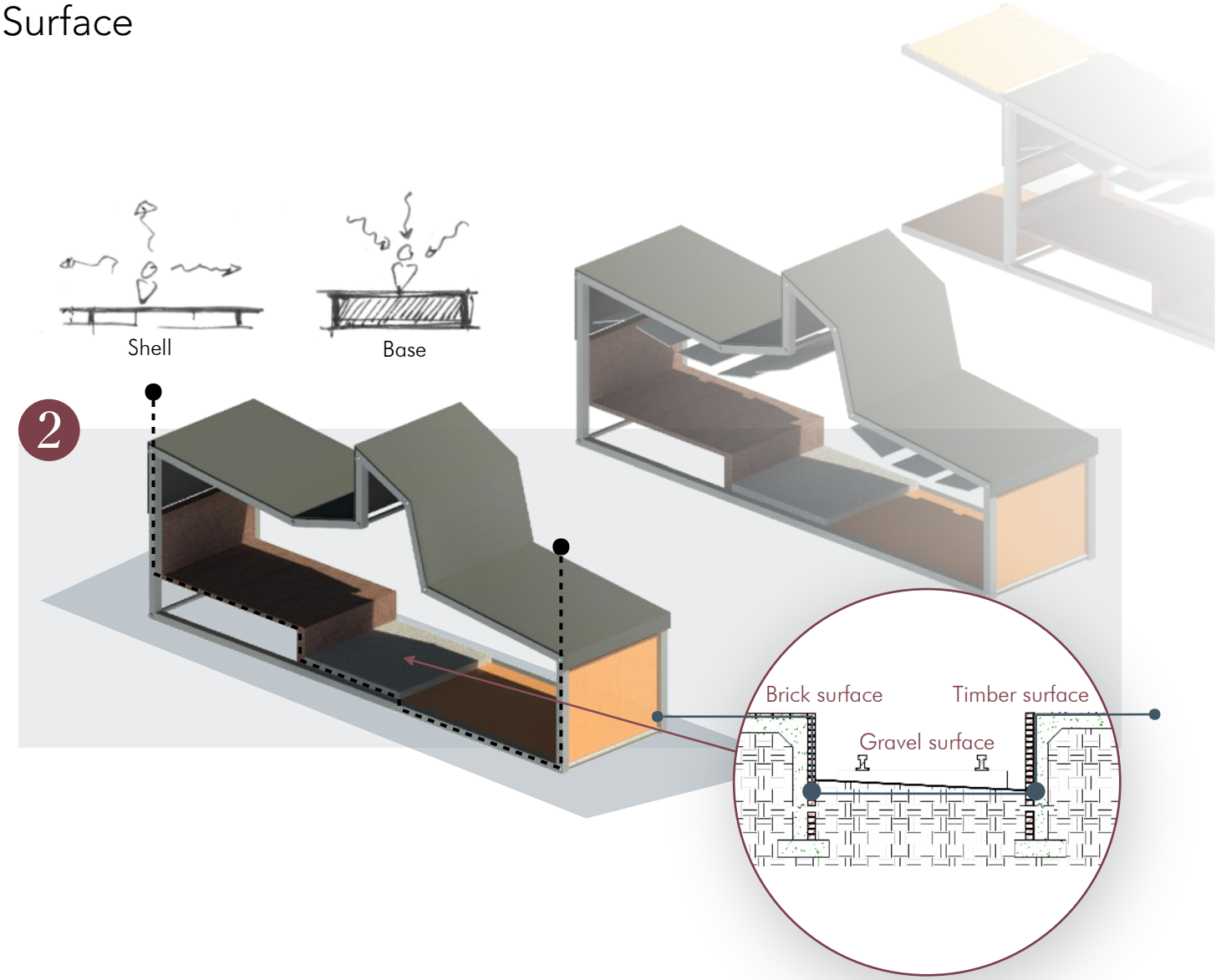


Fig 8.5: Emotional manipulation

8.3.3 Focus Manipulation | Components

The mechanical aspect of the design is meant to use components to emphasise the internal spaces. This is achieved through a system of pulleys that lower and lift ceiling panels. Through this, the user's focus is manipulated by creating smaller spaces within a larger frame.

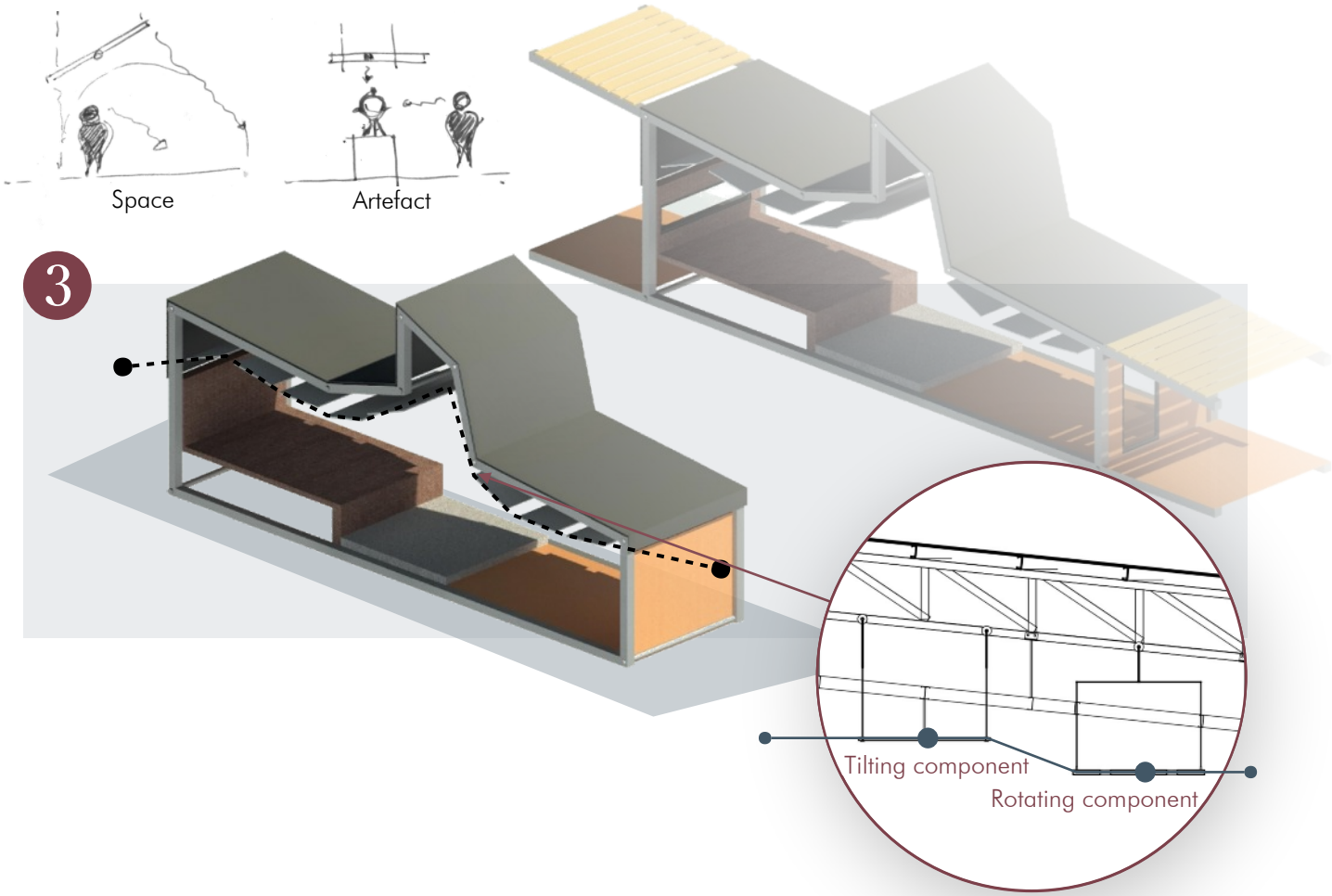


Fig 8.6: Focus manipulation

8.3.4 Indoor - Outdoor Manipulation | Aperture

The large roof intends to allow for rainwater collection while contrasting the destructive nature of industrial buildings. The envelope contains apertures that connect indoor and outdoor through visual connection. The envelope extends into the landscape creating shade, emphasizing openings and activating the space around the building.

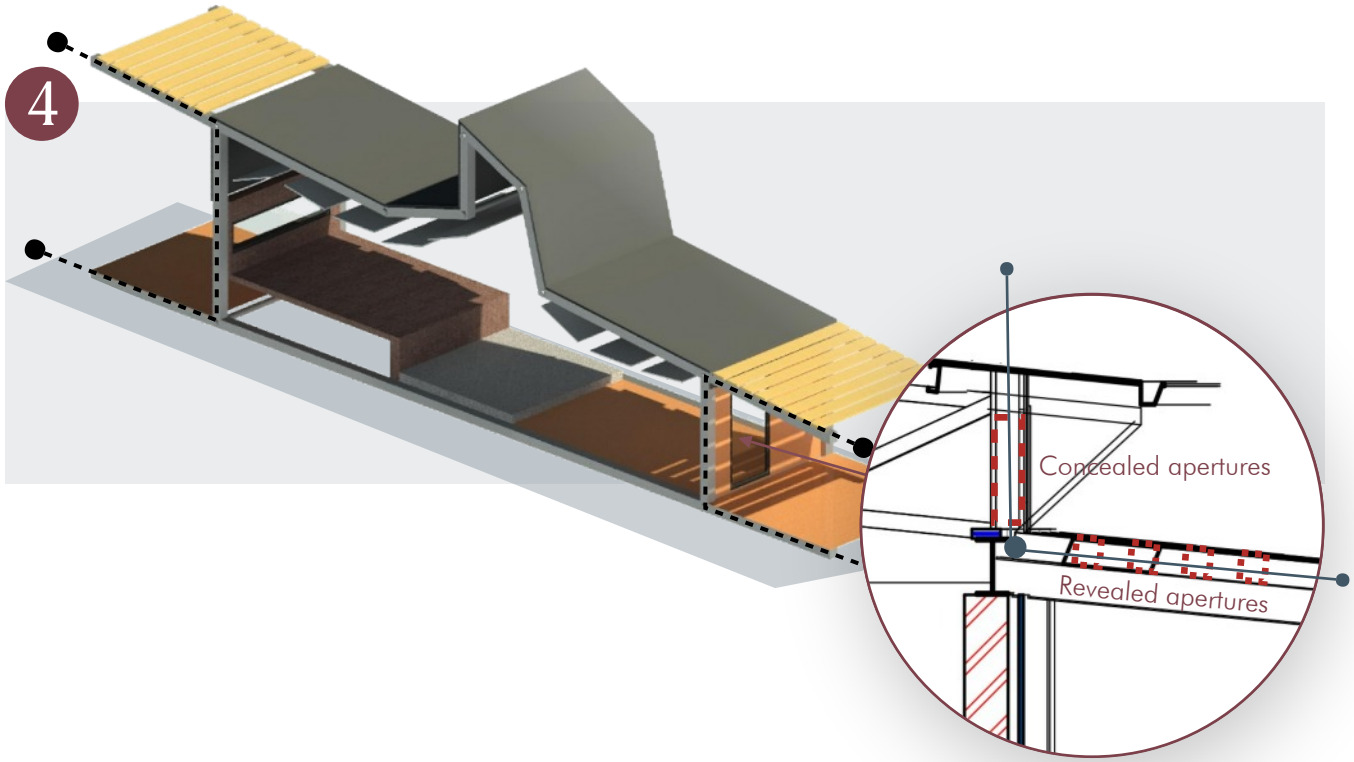


Fig 8.7: Landscape manipulation

8.4 Technical Applications

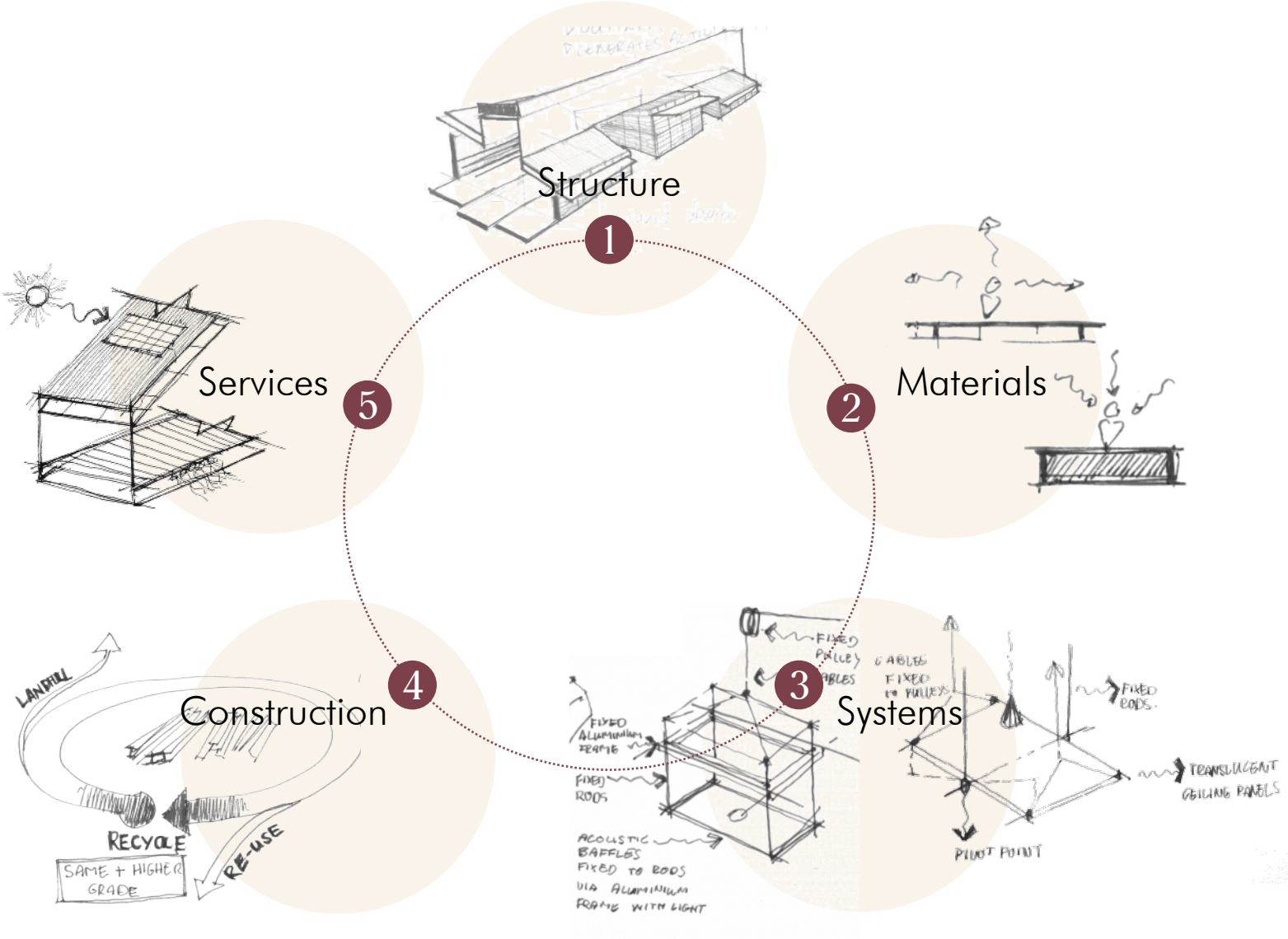


Fig 8.8: Technical Applications

8.4.1 Ribbed and Spinal Structure

The linear structure is articulated by a series of ribbed portal frames. These ribs carry the weight of the exterior envelope and allow for flexibility of the interior envelope. The portal frames manipulate space, both internally and externally. The ribs are spaced differently for each segment of the building. This is to simulate the motion of a machine meandering its way through the landscape. The result is the creation of a movement perpendicular to the central primary circulation. The linear becomes dynamic. Connecting the ribbed frames is the predominant spinal structure. This structure consists of a series of slanted steel columns connect to form a portal. This portal encapsulates the locomotives on display. An opening in this portal opens towards the sky to enable the flow of natural light into the building.

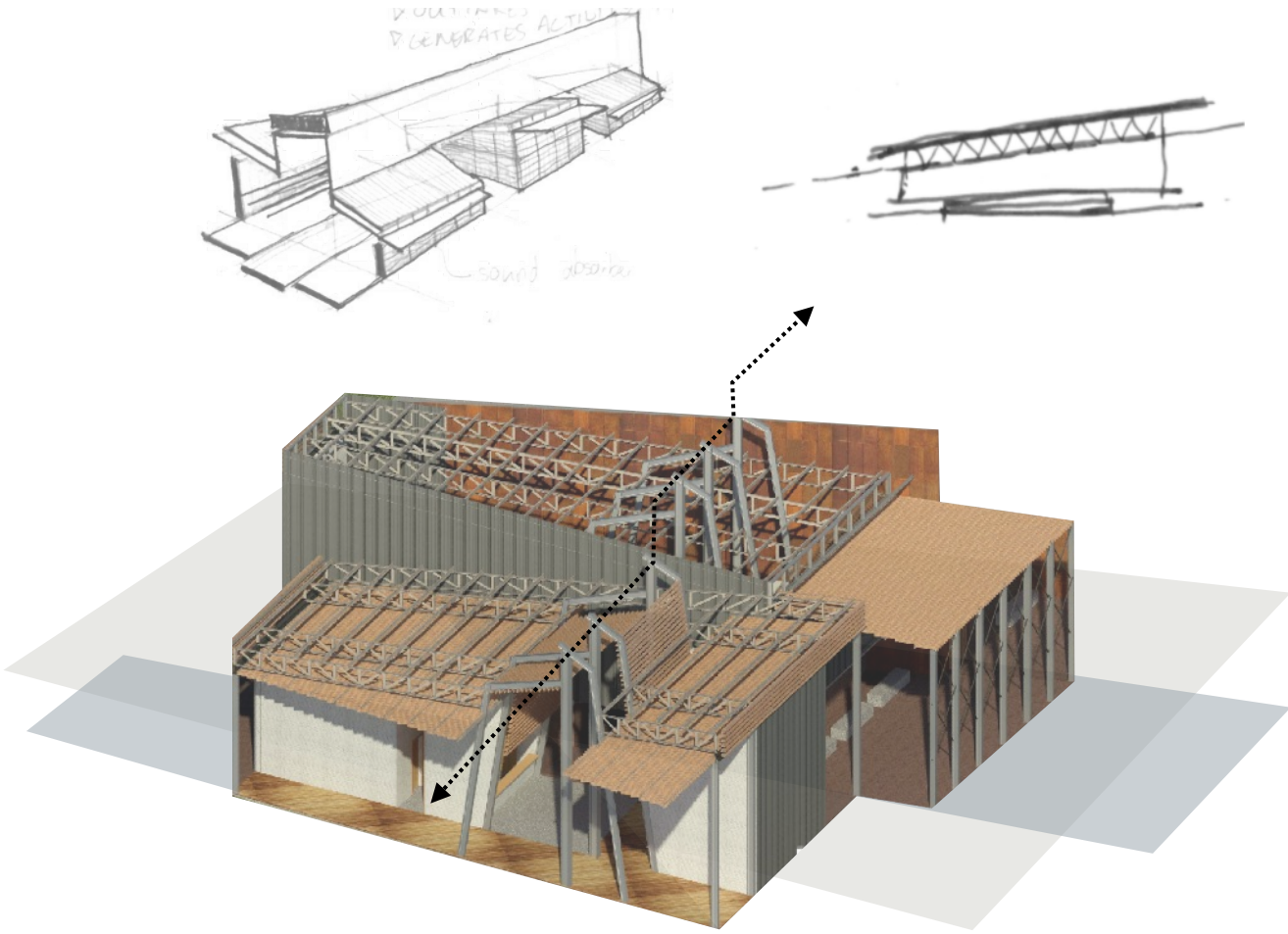


Fig 8.9: Structural spine

8.4.2 Material Layers

The contrast of materials is represented within the layers of the envelope. A brick-paved floor articulates the primary circulation. This is meant to simulate the railway platform - a familiar element to train commuters. The use of masonry as the surface material is to convey a sense of reliability, stability and familiarity. The platform, which represents the start of the train commuter's journey, becomes a heavy and predominant element in the interior space. The steel walls and roof articulate physical and visual direction. The lightness of the shell manipulates openings to create a sense of openness, freedom and connection. The shell provides protection from the elements and allows for engagement between user and space.

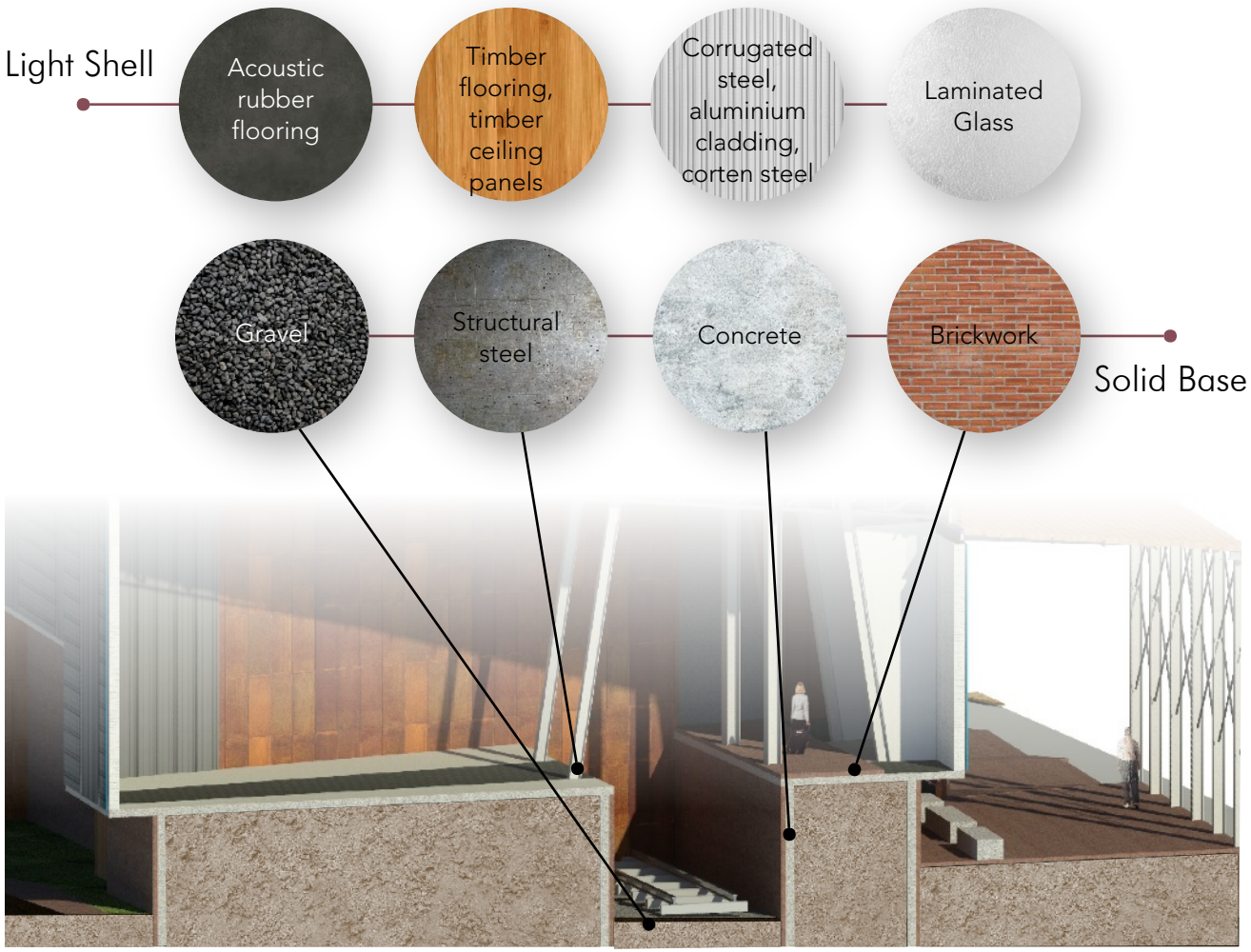


Fig 8.10: Material Layers

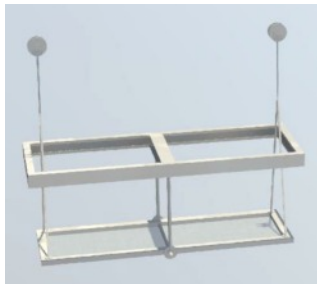
8.4.3 Moving Ceilings

The internal envelope allows for transformation and adaptation of space. As the exhibition themes can change seasonally, the mechanical ceiling allows for this change. The changes are according to the curator's intentions. The ceiling can be transformed to articulate focus points and focus spaces.

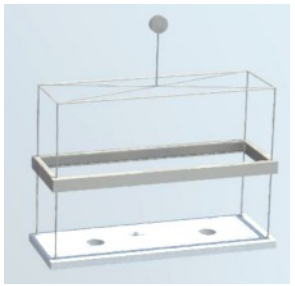
For focus points, the ceiling panels can be lowered or lifted. These panels contain a built-in light and are fixed to a frame to give them weight. The four corners of the panels are connected to rods that run through another steel frame to ensure stability. The rods are pulled up or down via cables connected to a fixed pulley. The cables run through hooks fixed to the trusses that lead to a central point where the system can be operated.

The panels allow for the accommodation of artefacts of various sizes.

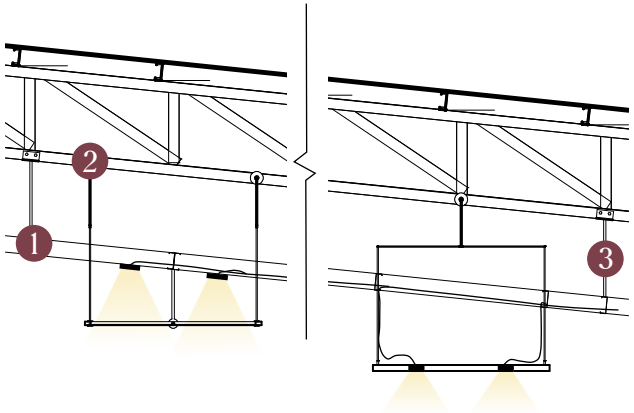
For focus spaces, the ceiling panels are fixed to place via rods that are in turn fixed to a frame underneath the trusses. The rods articulate a swivel point at the centre. This allows the ceiling panels to be adjusted as shown in the illustration. These panels do not contain built-in lights but are rather made up of translucent acoustic material. Cables are fixed to the four corners of the panel, then run through a fixed pulley and finally through hooks fixed to the trusses that lead to a central point. The panels themselves are translucent. This allows for light or projected images to filter through the panels. Through this the ceiling plane becomes part of the exhibition.



Focus points



Focus Spaces



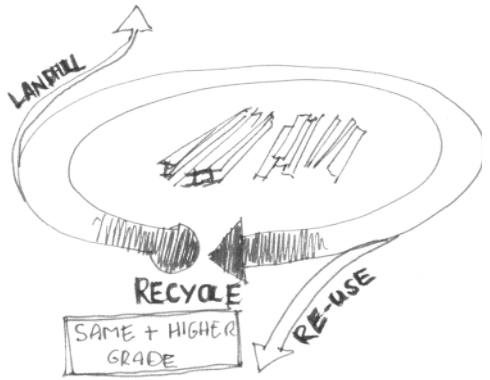
1. Light steel frame
2. Pulleys fixed to warren girder frame
3. Steel rods fixed to warren girder frame

Fig 8.11: Moving ceilings

8.4.4 Ecological Contribution

It is proposed that recycled materials are used as much as possible within the construction of the building. Reclaimed steel and timber that can be used in the main construction systems, such as I-beams and floorboards, should first be assessed by a specialist before use (Addis 2006). Acoustic rubber flooring is specified for the interior spaces. Other reclaimed materials that are deemed unsuitable for construction should be used to articulate outdoor spaces such as seating, decking and simple shading structures.

Collected rainwater will supply the surrounding landscape with water through irrigation systems. In order to conserve the most amount of water, the quantity of irrigation water will be assessed according to the vegetation daily requirements. An automatic system is specified as it is the most effective system in terms of water conservation.



	TYPES	DESCRIPTION	REUSE/ RECYCLE	ENVIRONMENTAL BENEFITS	ASSESSMENT NEEDED
METALS	• SECTIONS • BEAMS • TRUSSES • PIPING • FRAMES • PANELS	Use much energy for extraction. Expensive to buy.	REUSE/ RECYCLE	HIGH	YES
MASONRY	• CLAY • SAND-LIME • CONCRETE • ENGINEERED	Use much energy to produce.	REUSE/ RECYCLE	HIGH	YES
TIMBER	• BEAMS • TRUSSES • JOISTS • BOARDS • PANELS • FRAMES	Quality can be easily assessed.	REUSE	HIGH	YES

Fig 8.12: Recycled materials according to Addis 2006.

8.4.5 Services

8.4.5.1 Solar Energy Supply

The use of renewable energy sources is proposed. Photovoltaic panels are to be mounted on the segments of the roof between the trusses. The solar panels alone will not be sufficient to supply the building. It is also costly to install. Power will therefore be converted to systems and devices with smaller electrical loads. Electrical conduits and ground circuit converters are to be installed within the floor.

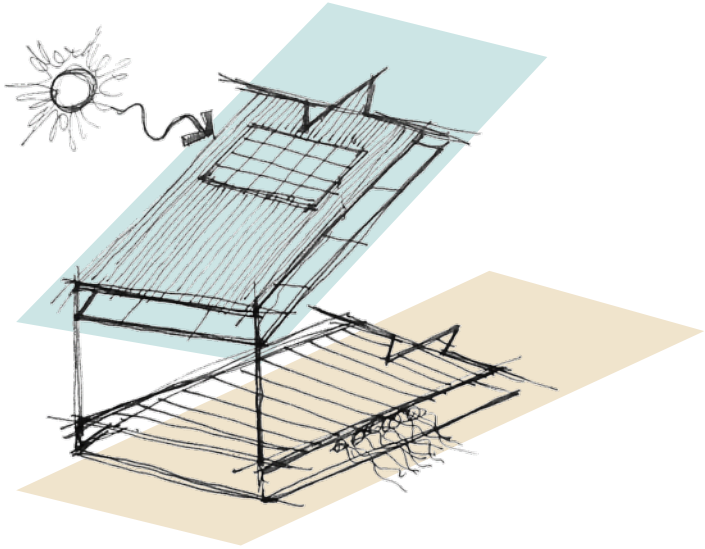


Fig 8.13: Electricity

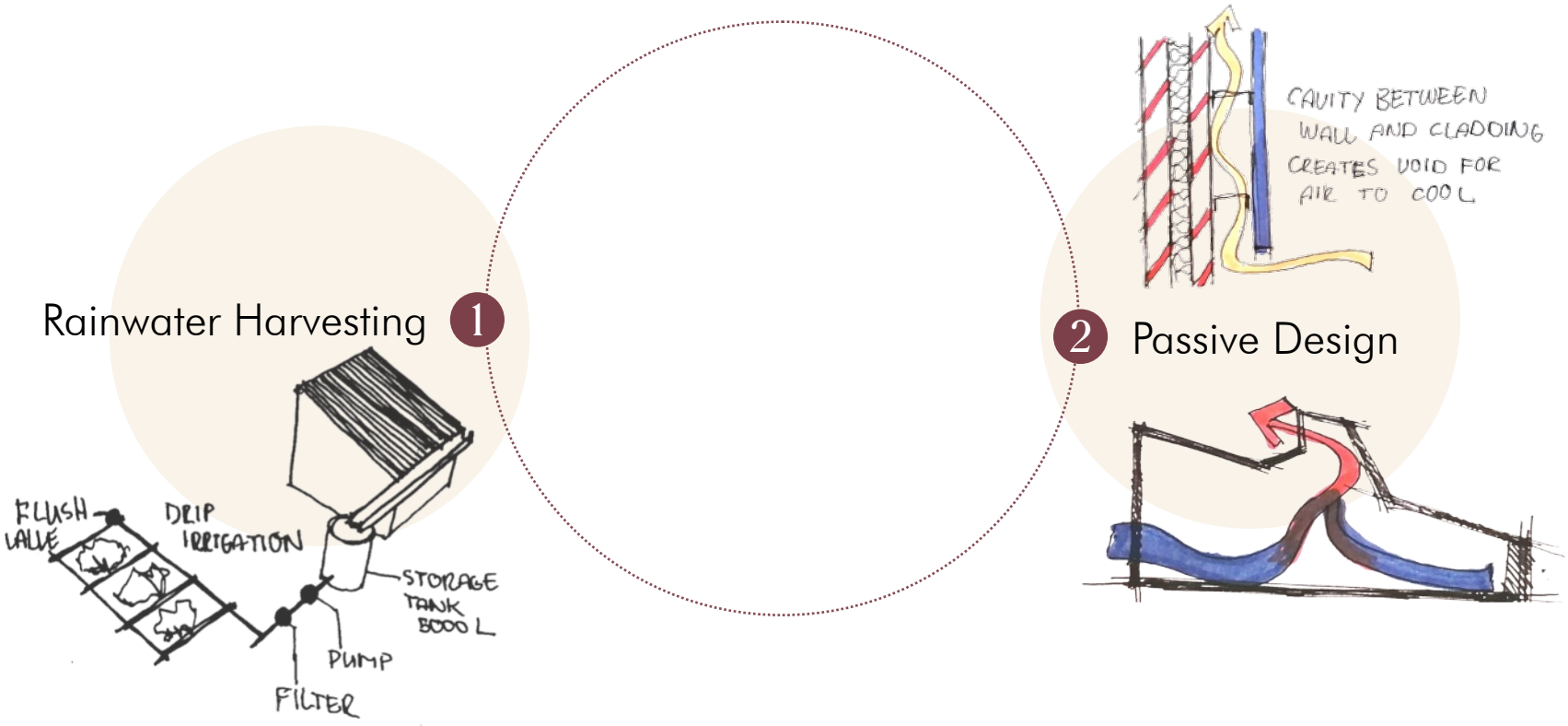


Fig 8.14: Sustainable devices

8.5.1 Rainwater Harvesting

The railway sites, especially the Capital Park locomotive depot, use vast amounts of water that is used to fuel the steam locomotives as well as for restoration and cleaning of old carriages (Rovos Rail, 2009). The two existing water towers on site are used to contain the water required by Rovos Rail. These towers are situated like landmarks within the site.

It is, therefore, necessary to propose alternative ways of water collection. According to rainwater harvesting calculations, the roof surface and surrounding pavement can act as sufficient catchment surfaces for the months of February and November. It is proposed that the water from the municipal pipeline be used within the months were rainwater collection is not sufficient to supply the museum.

The final tank capacity required to contain the harvested rainwater is 716 m^3 or 716 000 litres (See rainwater calculations on page 135). The number of tanks required to hold the water would occupy unnecessary large space. It is proposed that seven 10 000 litres above-ground water tanks are used and the rest of the water be diverted to the existing large water towers on site through underground pipes.

An above-ground galvanised steel round tank with liner is proposed, manufactured by RainQueen (RainQueen, 2020). The above-ground tanks are easily accessible and can use gravity for pressure. The water tanks also become landmarks, that signify different routes and outdoor spaces.

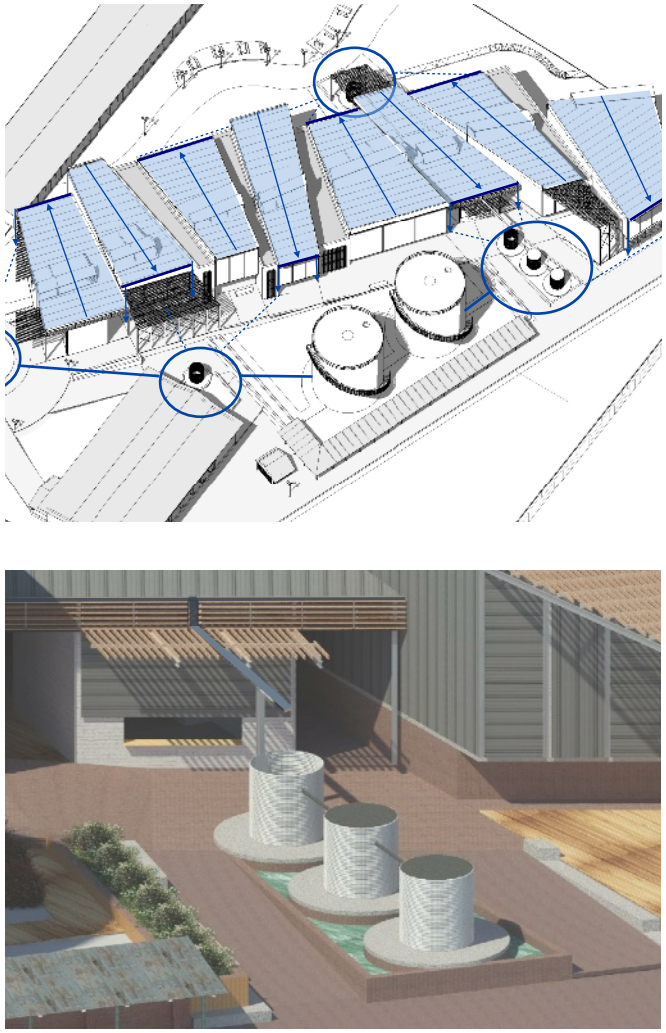


Fig 8.15: Rainwater harvesting

8.5.2 Passive Design Strategy

The building is intended to make use of passive solar heating methods. The building is orientated to the northeast and the corresponding walls are maximized to benefit the most from solar heat gain. Operable external louvres are placed along the curtain walls to allow for light and disallow unwanted heat gain. External shading is required outside the research and management facilities of the building as the window to wall ration to the northeast is greater. Clear-story windows with external louvres are placed between the roof and the walls to bring in natural light.

Passive ventilation is needed in the main public spaces of the building - the threshold spaces, office spaces and gathering spaces. The frame of the building is meant to allow the circulation of air within the building.

Mechanical ventilation systems are needed within the exhibition spaces as great amounts of natural unfiltered air risk damaging the artefacts. These systems consist mainly of 'sock' ventilation ducks which are primarily made of fabric, easily installed and placed between the warren girders of the roof (FabricAir 2020). The use of this mechanical system articulates the roof element and internal envelope.

The aluminium cladding on the exterior walls creates a void that reduces sound transmission and reduces heat gain. This in turn reduces energy consumption for mechanical cooling and heating.

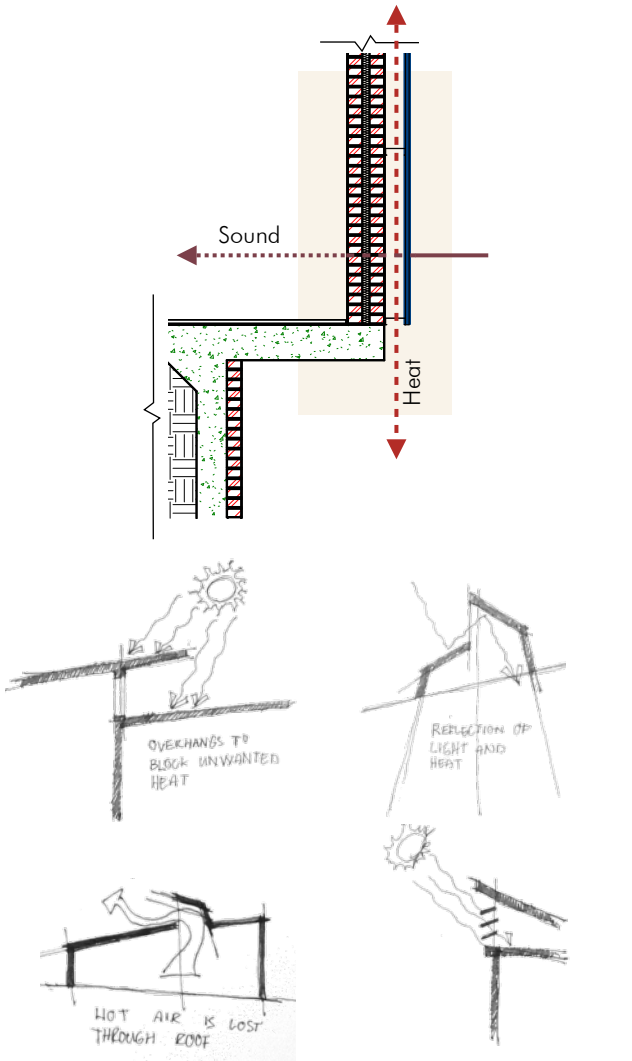


Fig 8.16: Ventilation

8.6 SANS Requirements

8.6.1 Occupancy and building classification

The total occupancy is according to SANS 10400 regulations.

- Entertainment and public assembly (A1): 1 person per m²
- Exhibition hall (C1): 1 person per 10 m²
- Library (C2): 1 person per 20 m²
- Offices (G1): 1 person per 15 m²
- Shops (F2): 1 person per 10 m²
- High Risk Storage (J1): 1 person per 50 m²
- Low Risk Storage (J3): 1 person per 50 m²

8.6.2 Number of sanitary fixtures needed

- Museum (A1, C1):

Males = 1 WC, 1 Washbasin

Females = 1 WC, 1 Washbasin

- Research facilities (G1):

Males = 1 WC, 1 Washbasin

Females = 1 WC, 1 Washbasin

- Archives and storage (C2, J1, J3):

Males = 1 WC, 1 Washbasin

Females = 1 WC, 1 Washbasin

- Shops and recreation (F2):

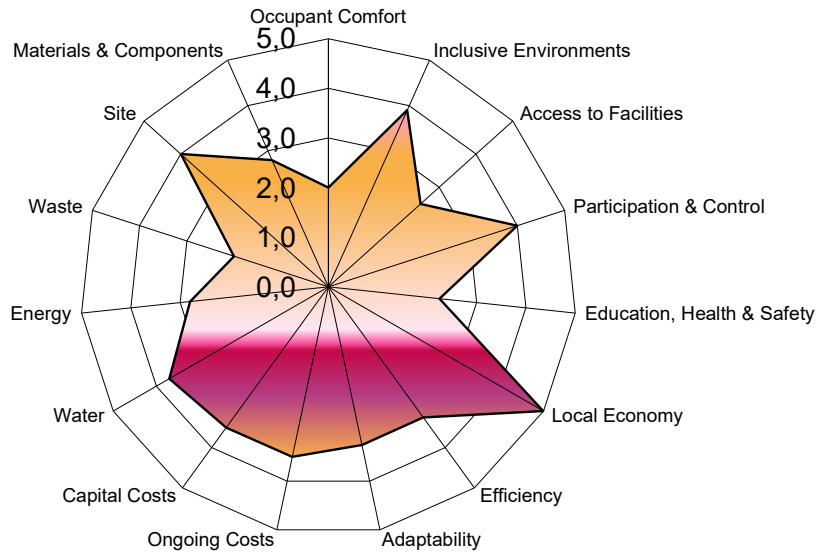
1 WC, 1 Washbasin

8.6.3 Ventilation

- Public Halls: 3.5 L/s per person
- Educational Buildings: 7.5 L/s per person
- Food and Eating Facilities: 5 L/s per person
- Bathrooms: 25 L/s per person
- Shops: 7.5 L/s per person
- Libraries: 6.5 L/s per person
- Offices: 5 L/s per person

SUSTAINABLE BUILDING ASSESSMENT TOOL (SBAT- P) V1

PROJECT		ASSESSMENT	
Project title:	Steam and Railway History Museum	Date:	2021/01/05
Location:	Transnet Avenue, Capital Park	Undertaken by:	
Building type:	A1, C1, C2, G1, F2, J1, J3	Company / organisation:	
Internal area (m2):	3055,26	Telephone:	Fax:
Number of users:	197	Email:	



Social	2,9	Economic	3,7	Environmental	3,1
Overall	3,2	Classification			

Fig 8.17: Green rating

09

Conclusion

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9.1 Summary

The dissertation attempted to understand contextualism from a holistic perspective. This resulted in the generation of categories of contextualism namely that of object, site, activity and paradigm. These categories aided the design in order to facilitate the contextually relevant architectural design. This approach led to an architectural design that not only responds to the different context's *bonds* and *systems*, as stated by Smuts (1987) but also transforms the context as much as the context transforms the architecture. Through the design iteration process, the transformation and appreciation of context have been made possible by emphasising context as a *bond* within a *whole.*

9.2 Synthesis

How can a holistic approach lead to connected and cohesive contextualism in order to generate contextually relevant museums in South Africa?

A holistic approach has led to the use of three lenses: a philosophical lens, a theoretical lens and a practical lens. All three have enabled a deeper understanding of context. From these lenses, the categories of contextualism were generated. These categories, in turn, have led the design process and informed the conceptual development. As the categories are rooted within holism theory, they have aided the design to understand and respond holistically to context. This resulted in an architectural design that approached contextualism through the philosophical, theoretical and practical lenses.

9.3 Issues

Rovos Rail has done much in terms of conserving the old locomotive depot. The efforts of Rovos Rail have given the site new life and allow people to get a glimpse of what it was like when steam locomotives ruled the industrial landscapes (Rovos Rail, 2020). These efforts have been emphasised by the new museum through connecting Rovos Rail with the public view. The new museum was intended to act as the arbitrator for the conservation of railway historical sites. By connecting community with history, the museum has achieved this goal. The architectural response was rooted within the different lenses proposed by the theoretical framework. Although the approach could have been interpreted in other ways, it is one based on a holistic view of the context.

9.4 Contribution

Through philosophical, theoretical and practical lenses, the research generated a set of guidelines that can be used to inform the design process to create a contextual design. A method of architectural design approach was generated - one that looks through a holistic lens to reveal the qualities of the context. This method can not only be limited to museum architecture but other forms of architectural design.

10

Appendices

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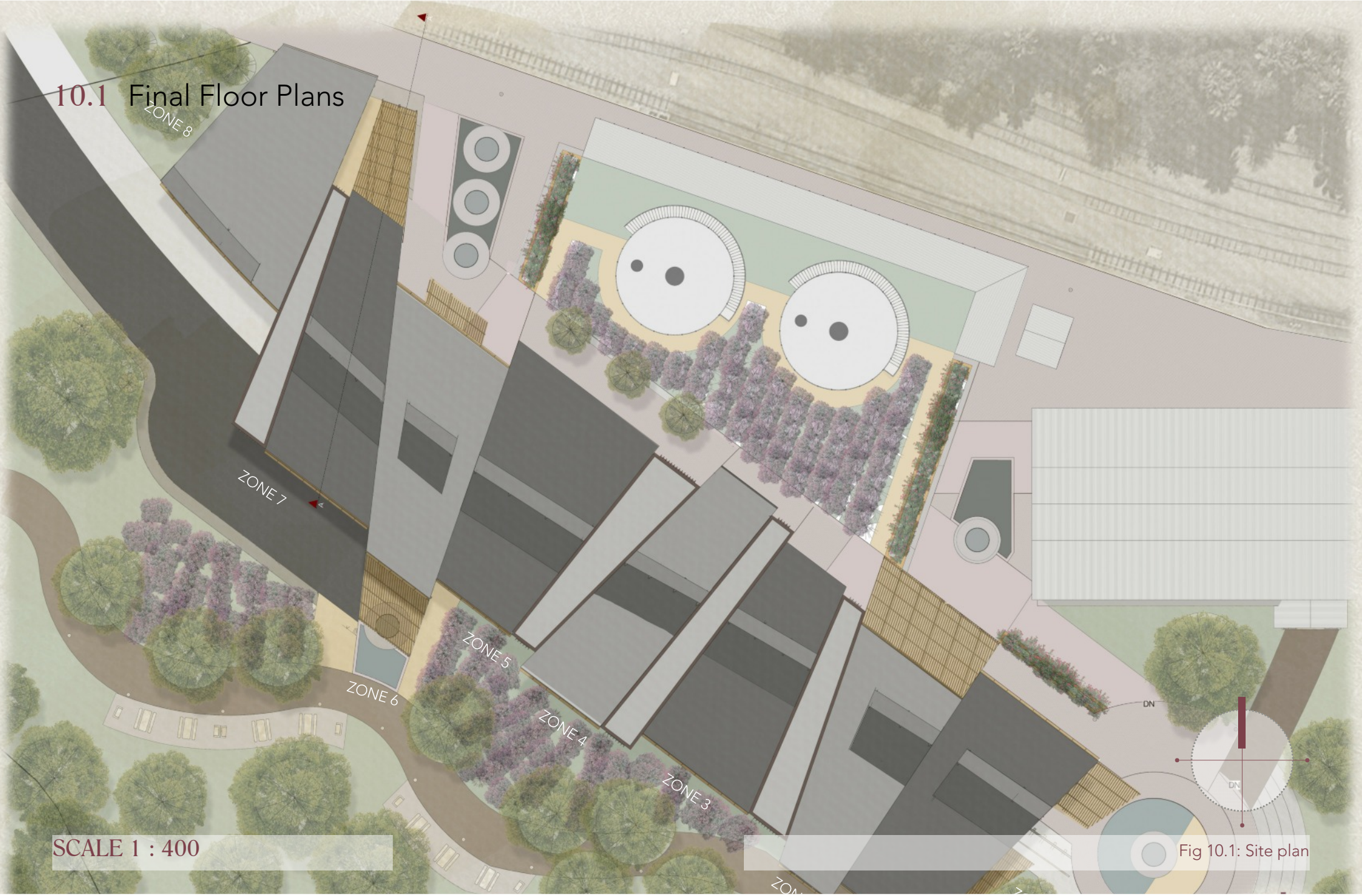
10.1 Final Floor Plans



SCALE 1 : 400

Fig 10.1: Site plan

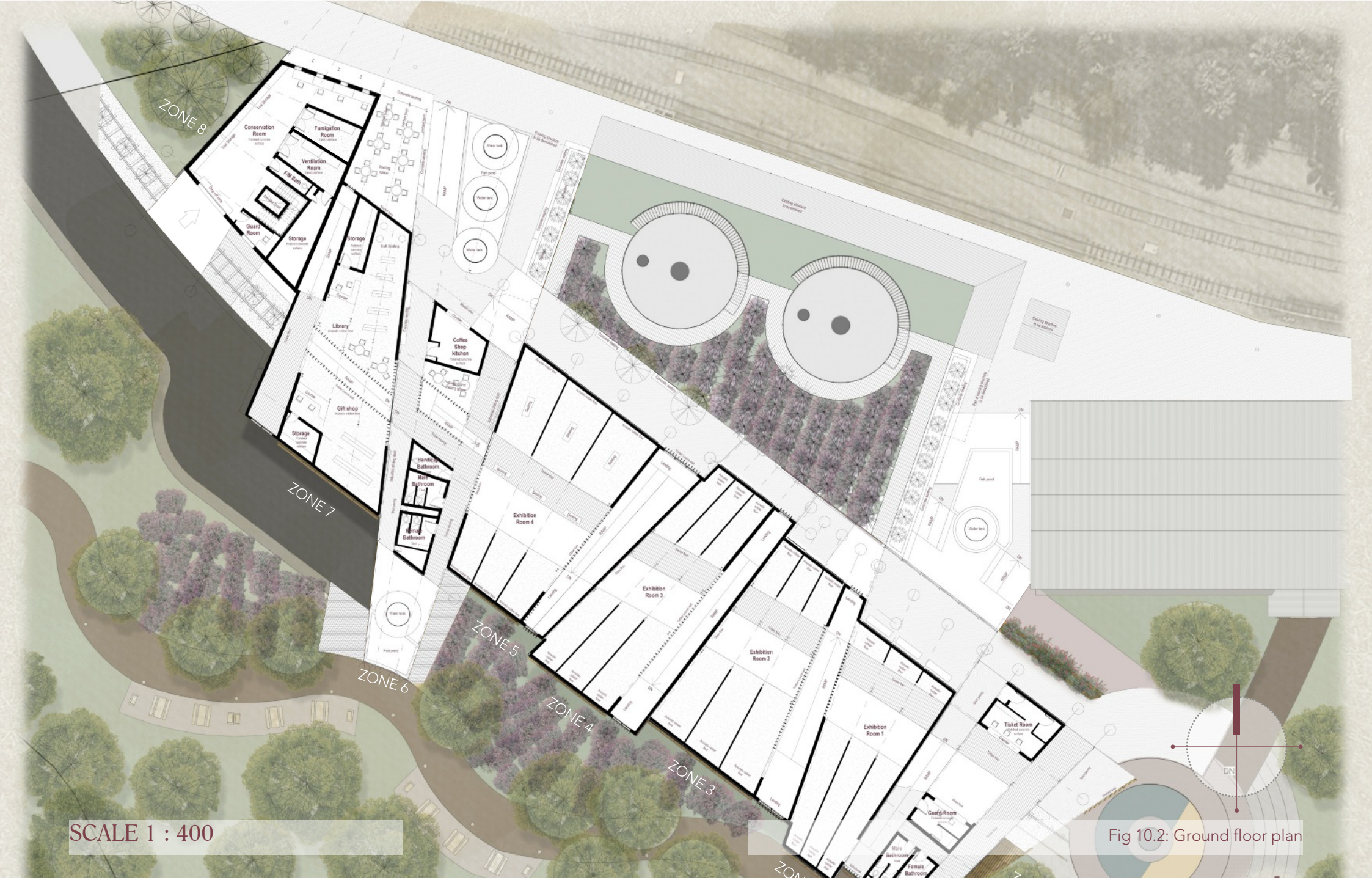


Fig 10.2: Ground floor plan

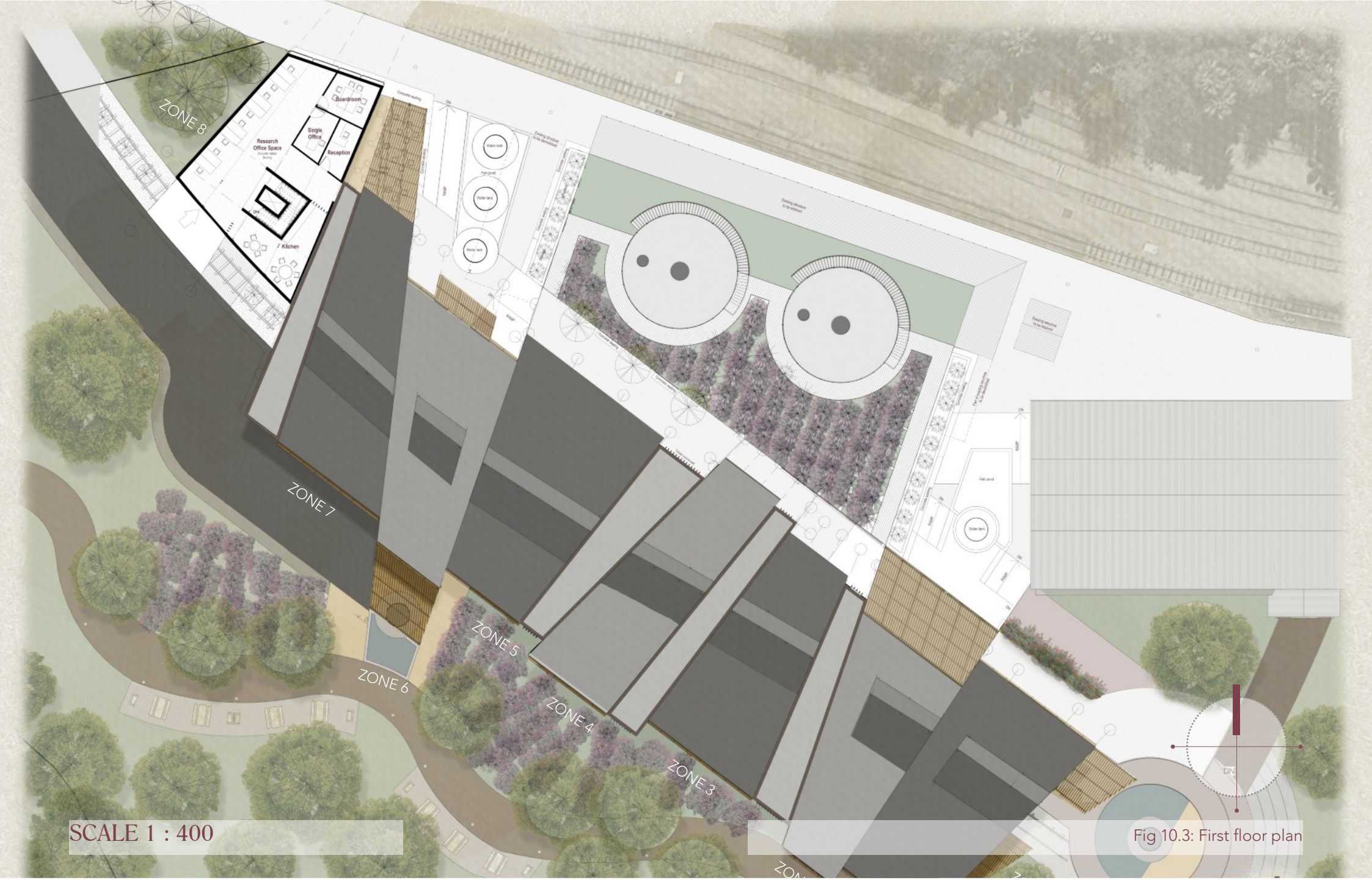
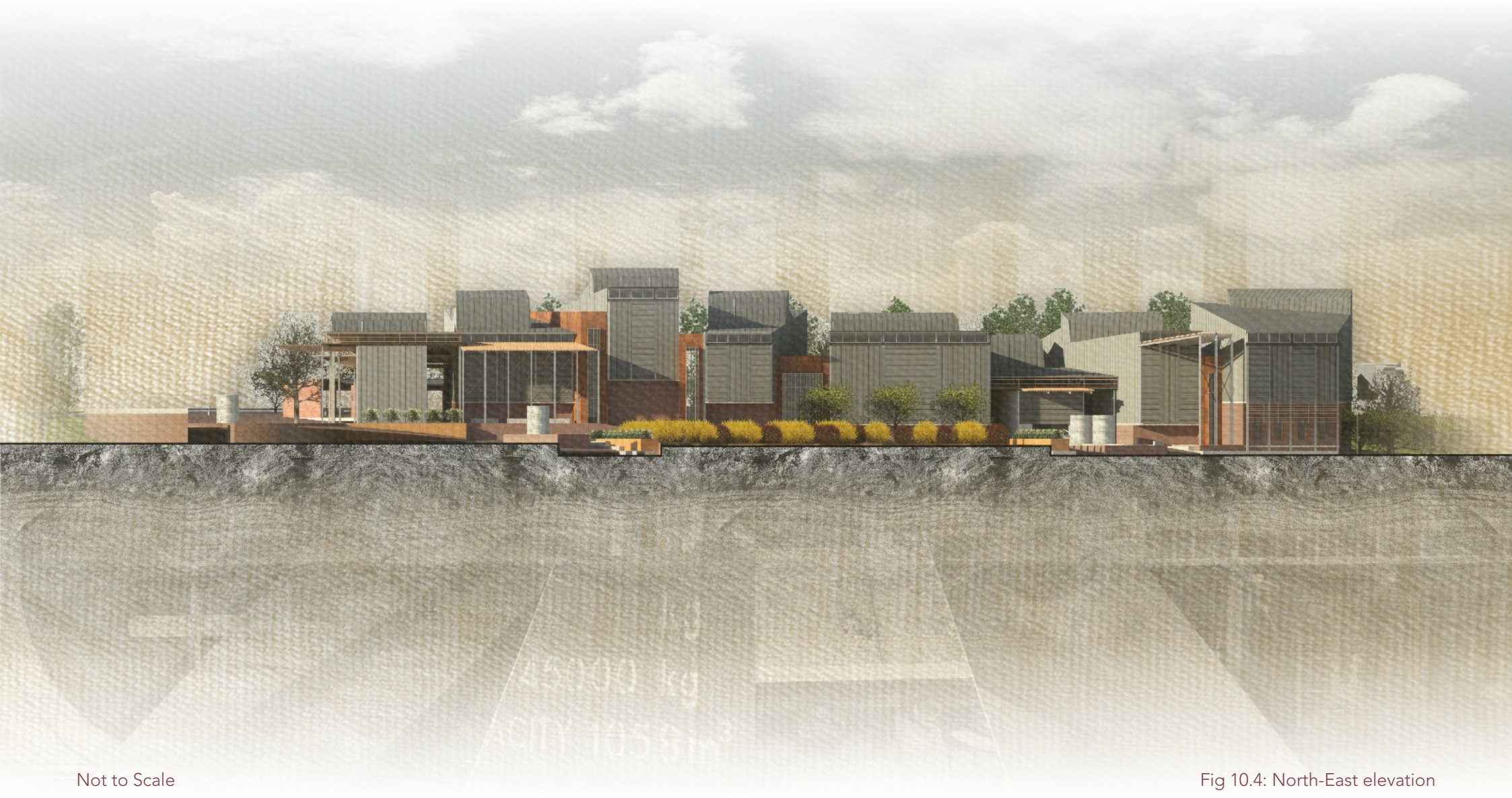


Fig 10.3: First floor plan

10.2 Final Elevations



Not to Scale

Fig 10.4: North-East elevation

Not to Scale

Fig 10.5: South-West elevation

Not to Scale

Fig 10.6: South-East elevation

Not to Scale

Fig 10.7: North-West elevation

10.3 Final Section

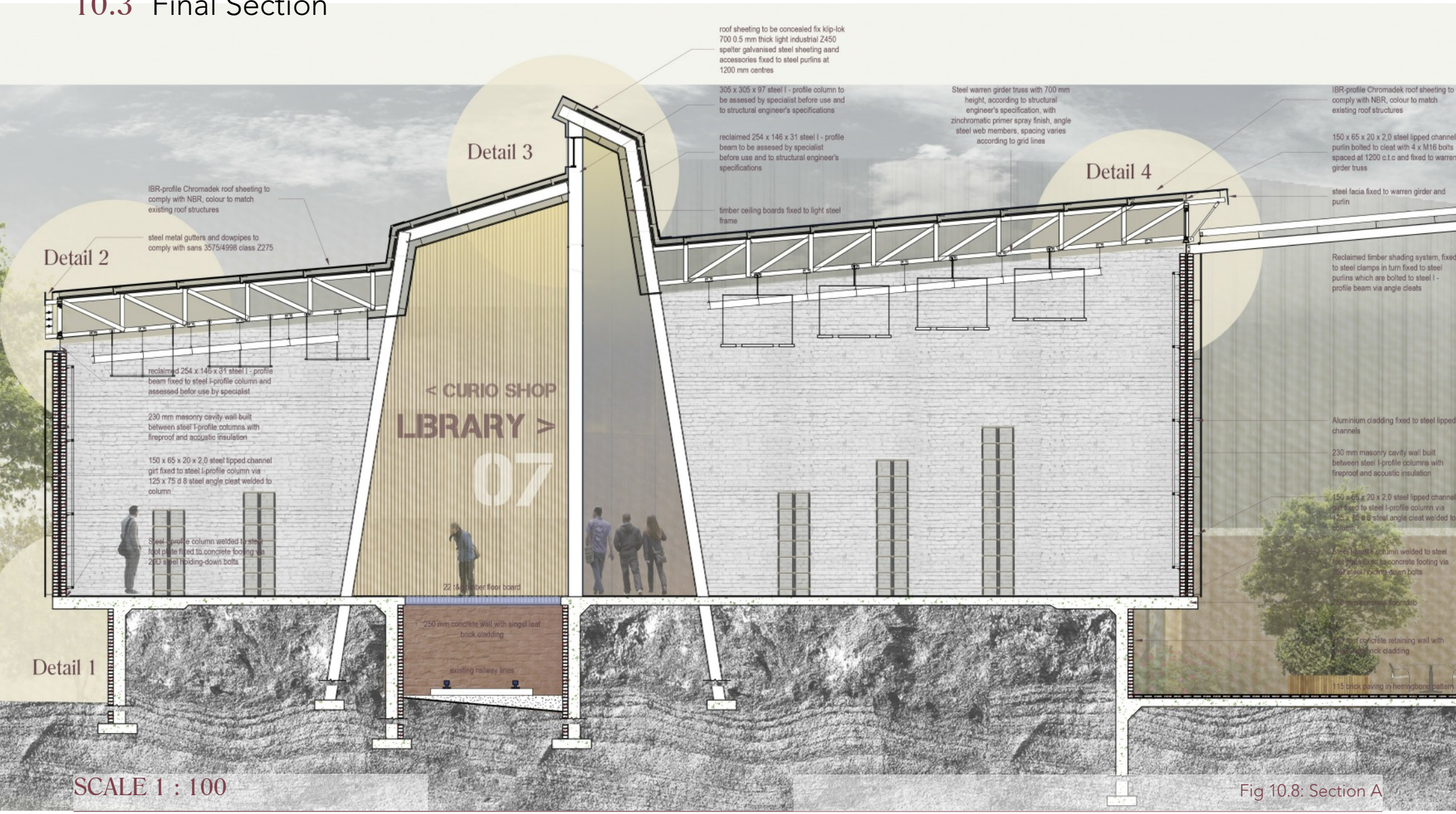


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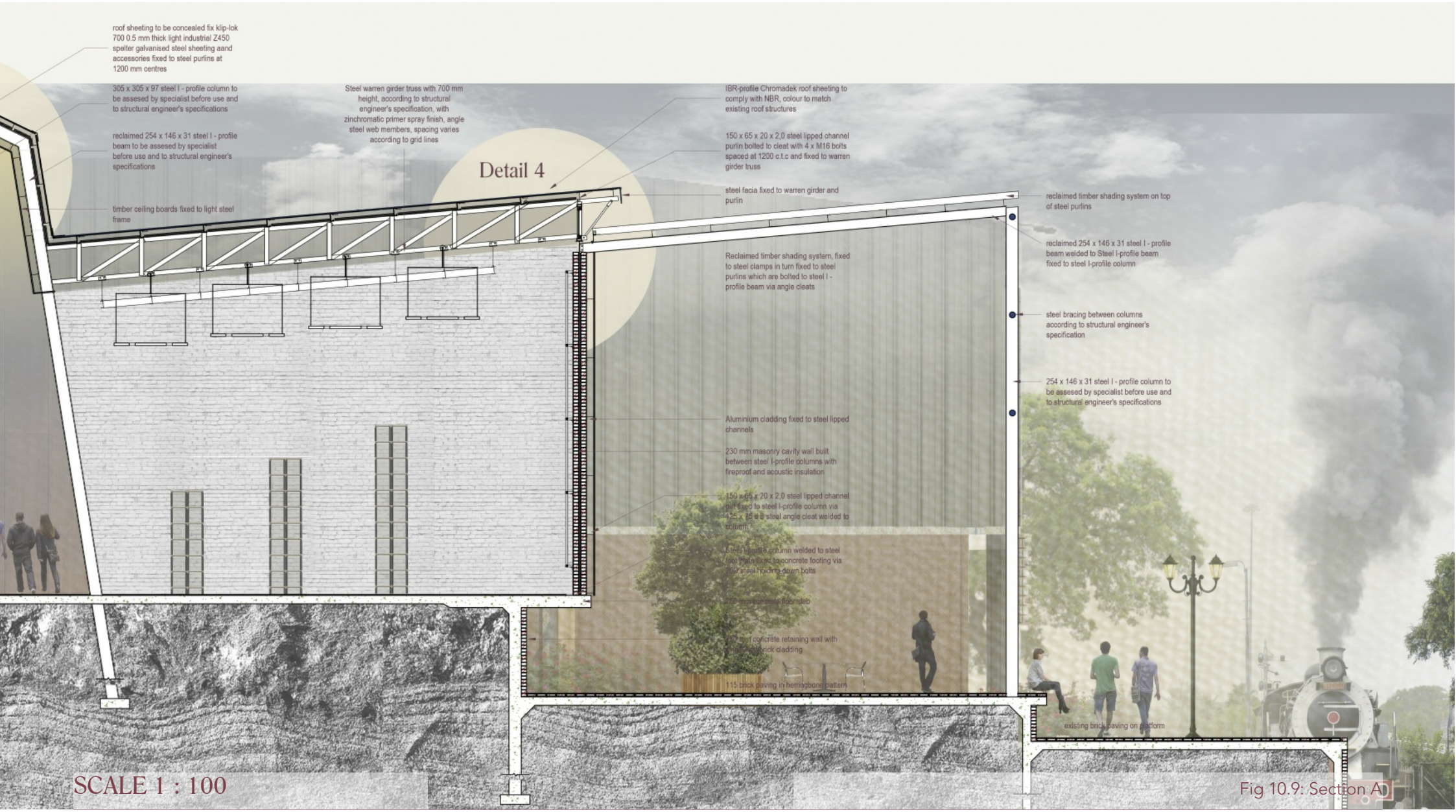
Fig 10.8: Section A



SCALE 1 : 100

Fig 10.9: Section A

10.4 Final Details

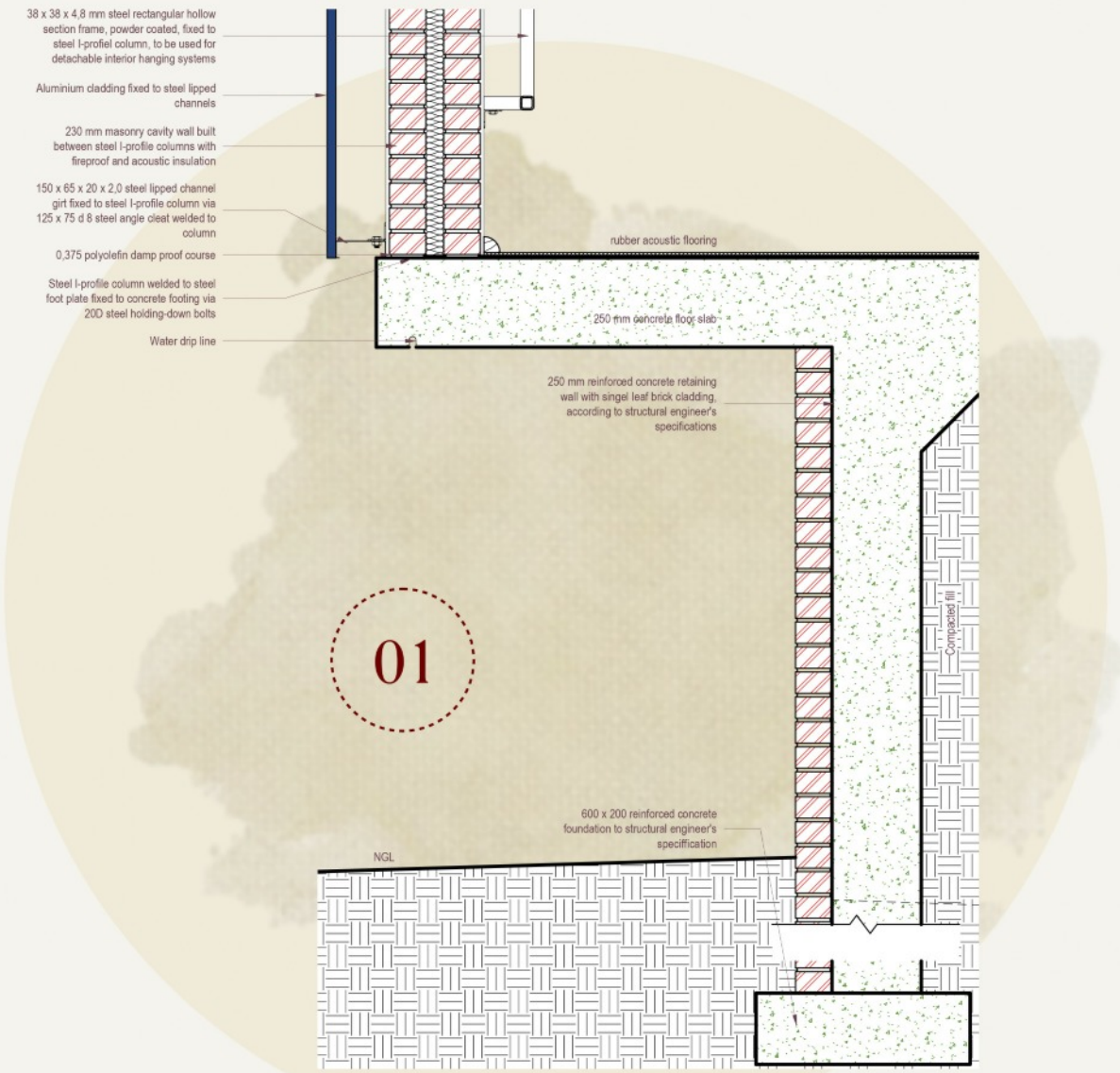


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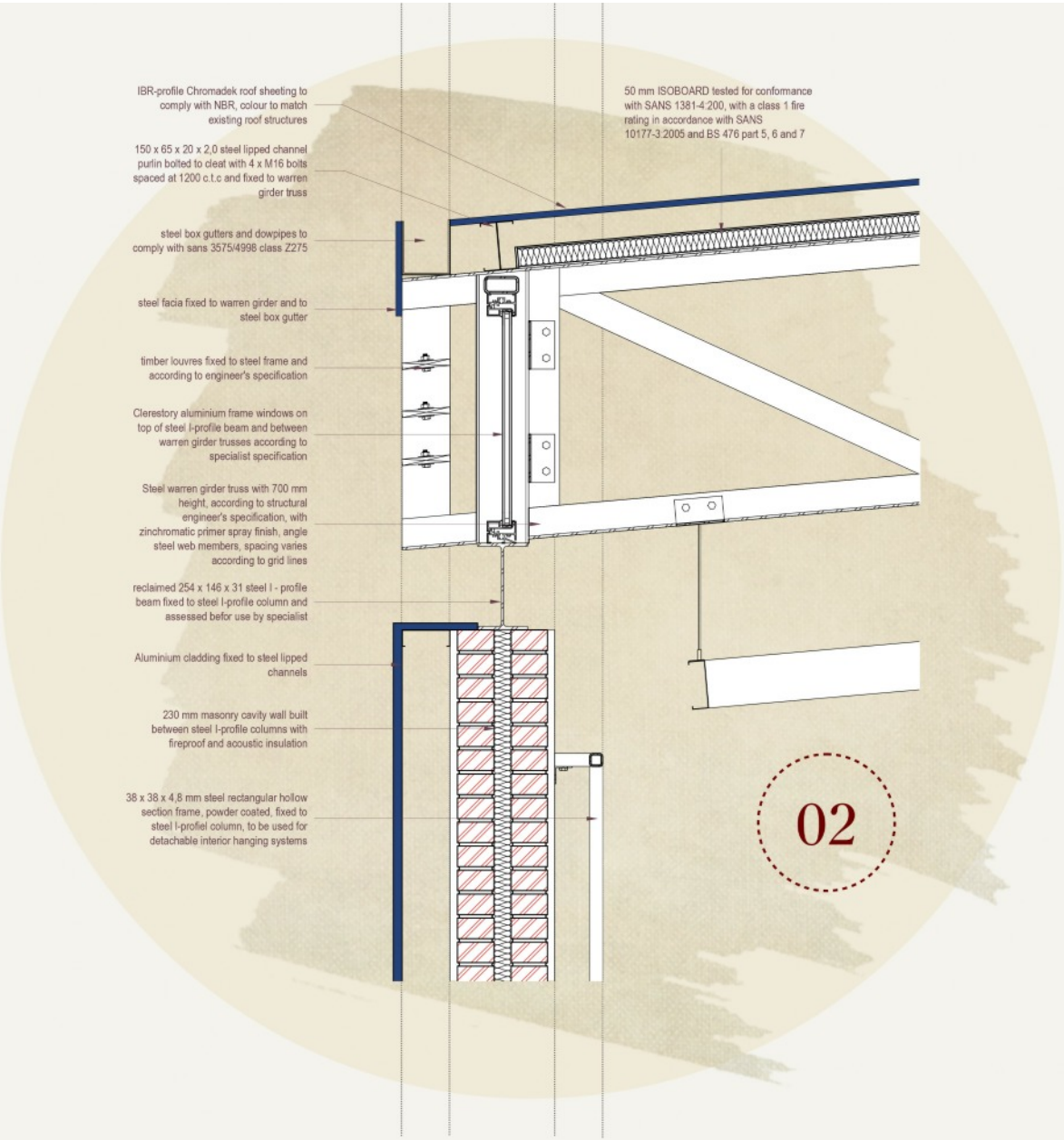
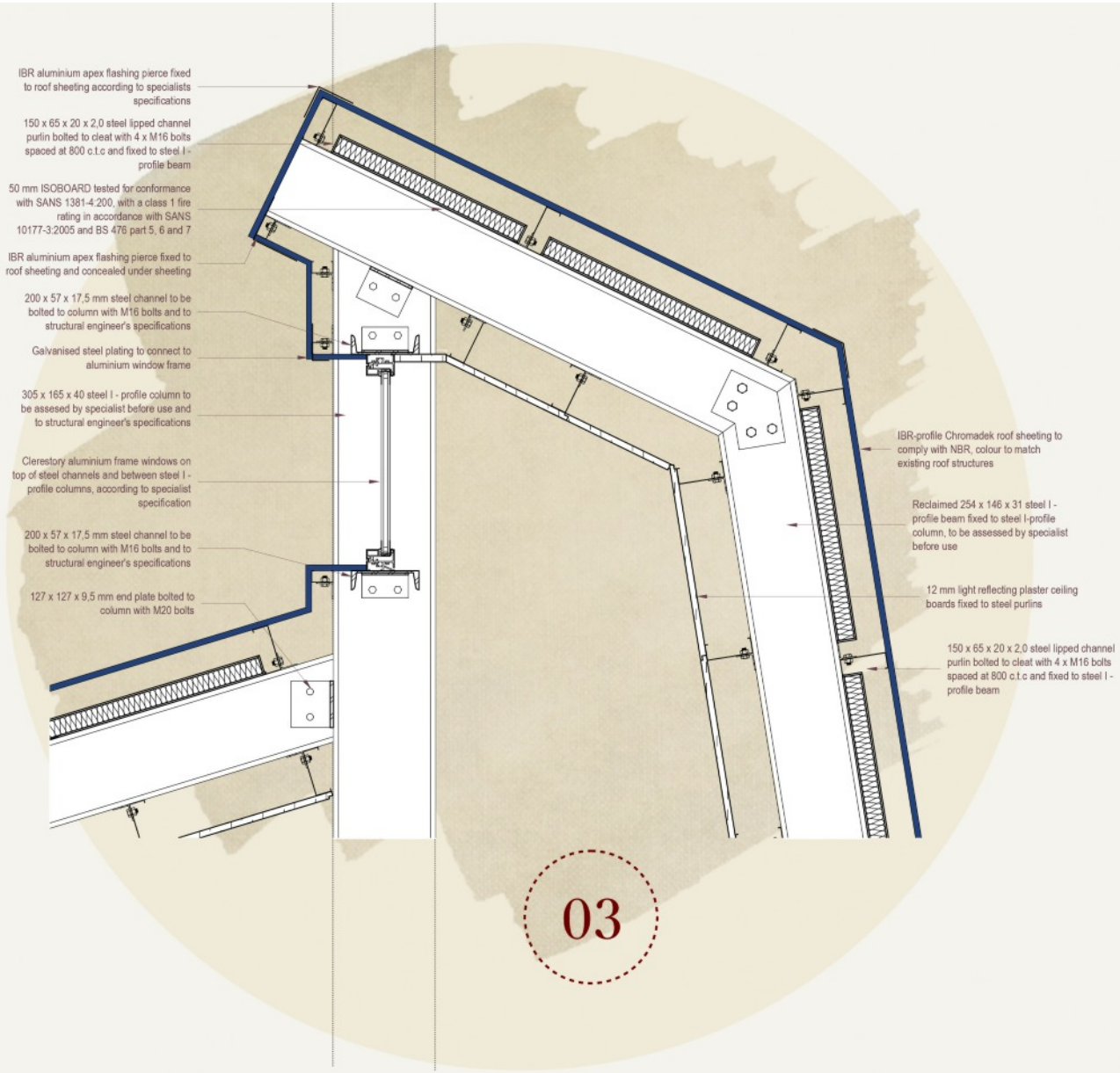
Fig 10.10: Final details 01



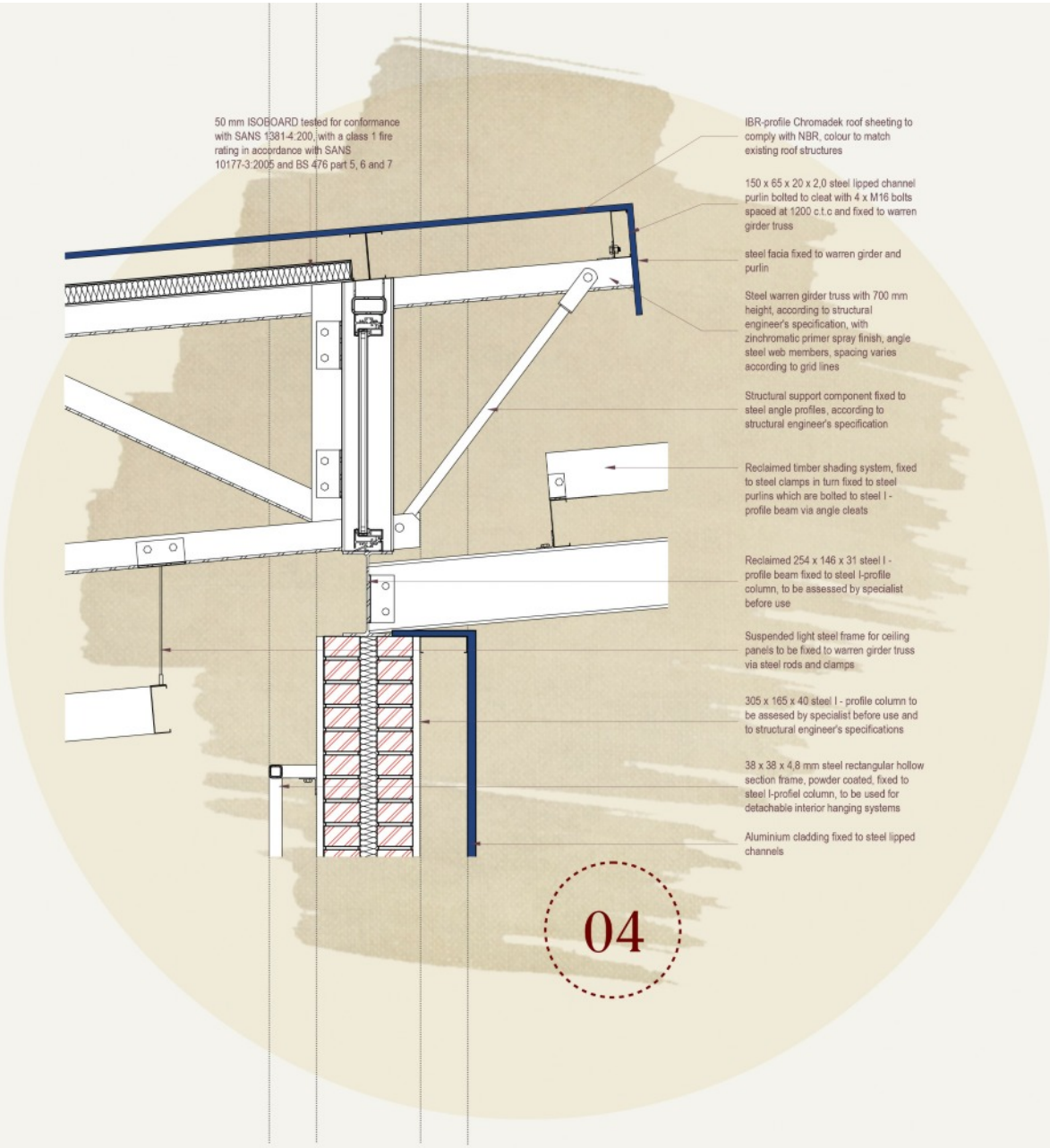
SCALE 1 : 20

Fig 10.11: Final details 02



SCALE 1 : 20

Fig 10.12: Final details 03



SCALE 1 : 20

Fig 10.13: Final details 04

10.5 Rainwater Calculations

1

Average Monthly Precipitation in Pretoria		
Month	Precipitation	
	Average monthly (mm)	Average number of days with >=1mm
January	154	14
February	75	11
March	82	10
April	51	7
May	13	3
June	7	1
July	3	1
August	6	2
September	22	3
October	71	9
November	98	12
December	150	15
Year	732	88

2

Rainwater Yield Calculation		
Month	Average monthly precipitation (m)	Yield (m^3) (Yield = P x A x C)
January	0.154	669
February	0.075	326
March	0.082	356
April	0.051	221
May	0.013	56
June	0.007	30
July	0.003	13
August	0.006	26
September	0.022	95
October	0.071	308
November	0.098	426
December	0.150	652
Annual average	0.732	3178

Catchment and Coefficient		
Catchment	Area, A (m^2)	Runoff Coefficient, C
Roof	3055.26	0.9
Paving	2000	0.8
Total	5055.26	0.86

3

Irrigation Demand				
Month	Planting area (m^2)	Irrigation depth / week (m)	Irrigation depth / month (m)	Irrigation demand (m^3)
January	3000	0.04	0.16	480
February	3000	0.04	0.16	480
March	3000	0.04	0.16	480
April	3000	0.03	0.12	360
May	3000	0.02	0.08	240
June	3000	0.02	0.08	240
July	3000	0.02	0.08	240
August	3000	0.02	0.08	240
September	3000	0.03	0.12	360
October	3000	0.04	0.16	480
November	3000	0.04	0.16	480
December	3000	0.04	0.16	480

Commercial Demand (Museum, Offices, Shops, Storage)			
Month	Persons	Water / capita / day (L) as a visitor	Commercial Demand (m^3)
January	197	50	10
February	197	50	10
March	197	50	10
April	197	50	10
May	197	50	10
June	197	50	10
July	197	50	10
August	197	50	10
September	197	50	10
October	197	50	10
November	197	50	10
December	197	50	10

Water Demand Calculation			
Month	Irrigation demand (m^3)	Commercial Demand (m^3)	Total Water Demand (m^3)
January	480	10	490
February	480	10	490
March	480	10	490
April	360	10	370
May	240	10	250
June	240	10	250
July	240	10	250
August	240	10	250
September	360	10	370
October	480	10	490
November	480	10	490
December	480	10	490
Annual Ave.	4560	120	4680

4

Water Demand Calculation				
Month	Yield (m^3) (Yield = P x A x C)	Total Water Demand (m^3)	Monthly Balance	Volume of Water in Reservoir (m^3)
January	669	490	179	358
February	326	490	-164	194
March	356	490	-134	60
April	221	370	-149	-
May	56	250	-194	-
June	30	250	-220	-
July	13	250	-237	-
August	26	250	-224	-
September	95	370	-275	-
October	308	490	-182	-
November	426	490	-64	-
December	652	490	162	162
Annual Ave.	3178	4680		

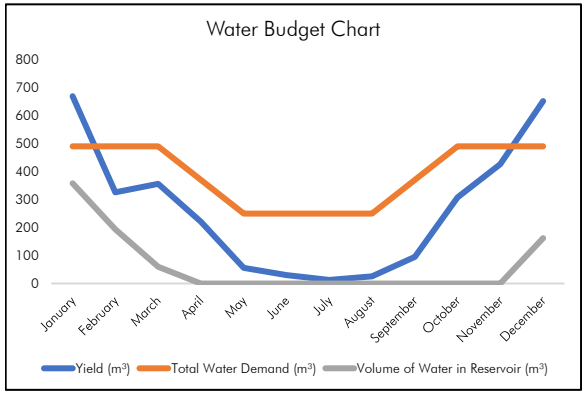


Fig 10.14: Rainwater calculations according to presentation by Fourie Pieterse, 2015

10.6 Views and Perspectives

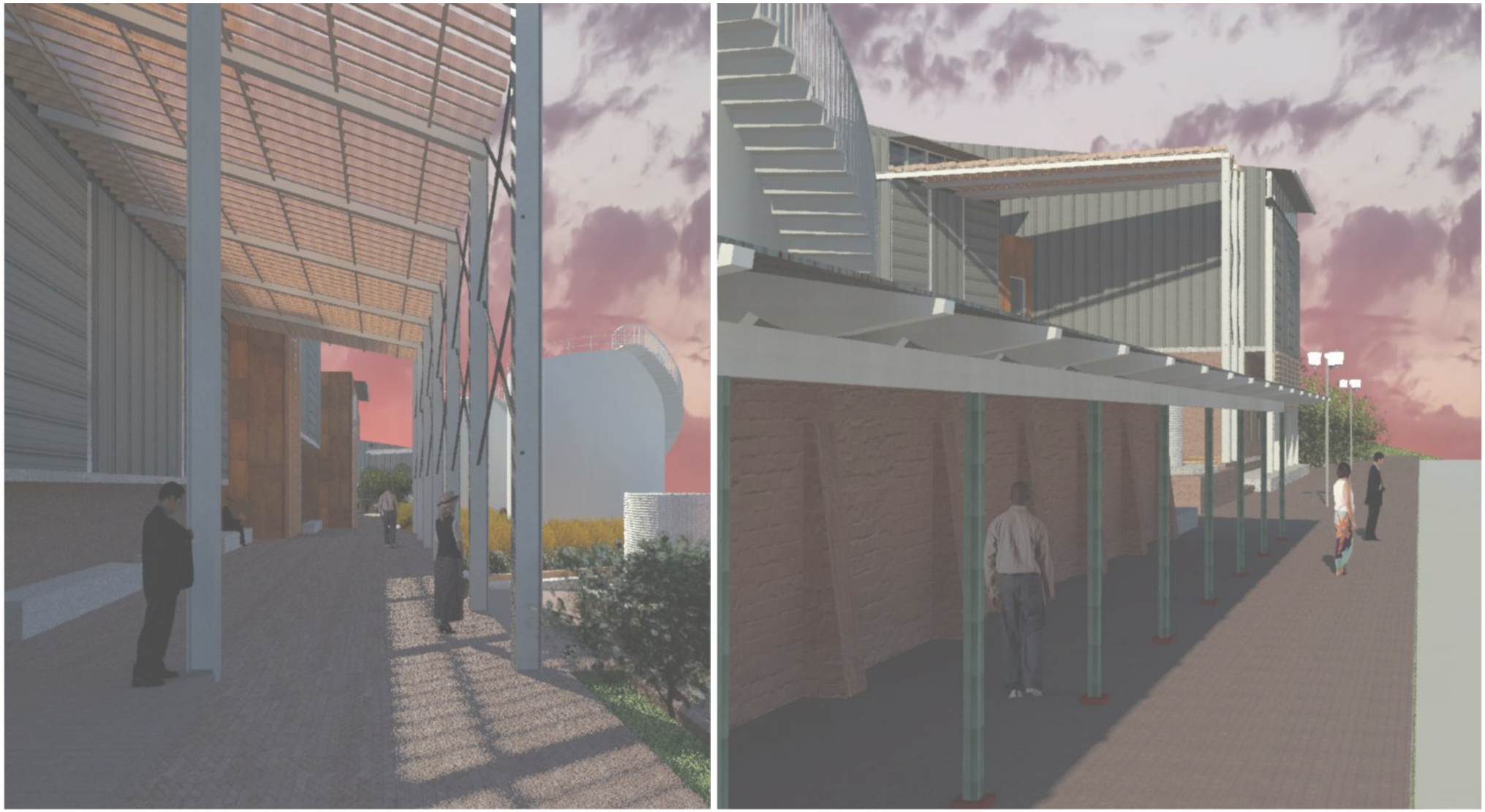


Fig 10.15: Perspectives 01

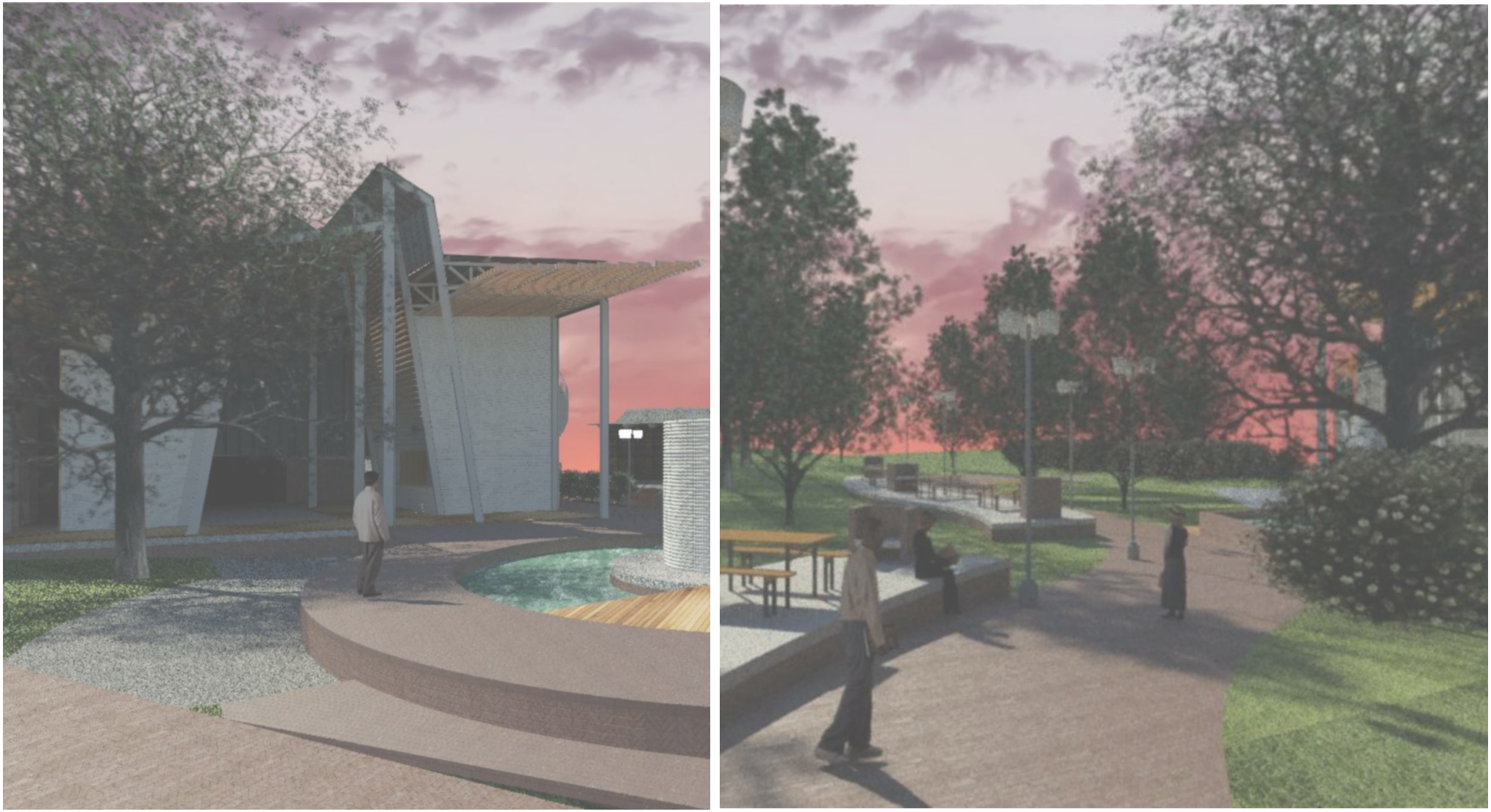


Fig 10.16: Perspectives 02

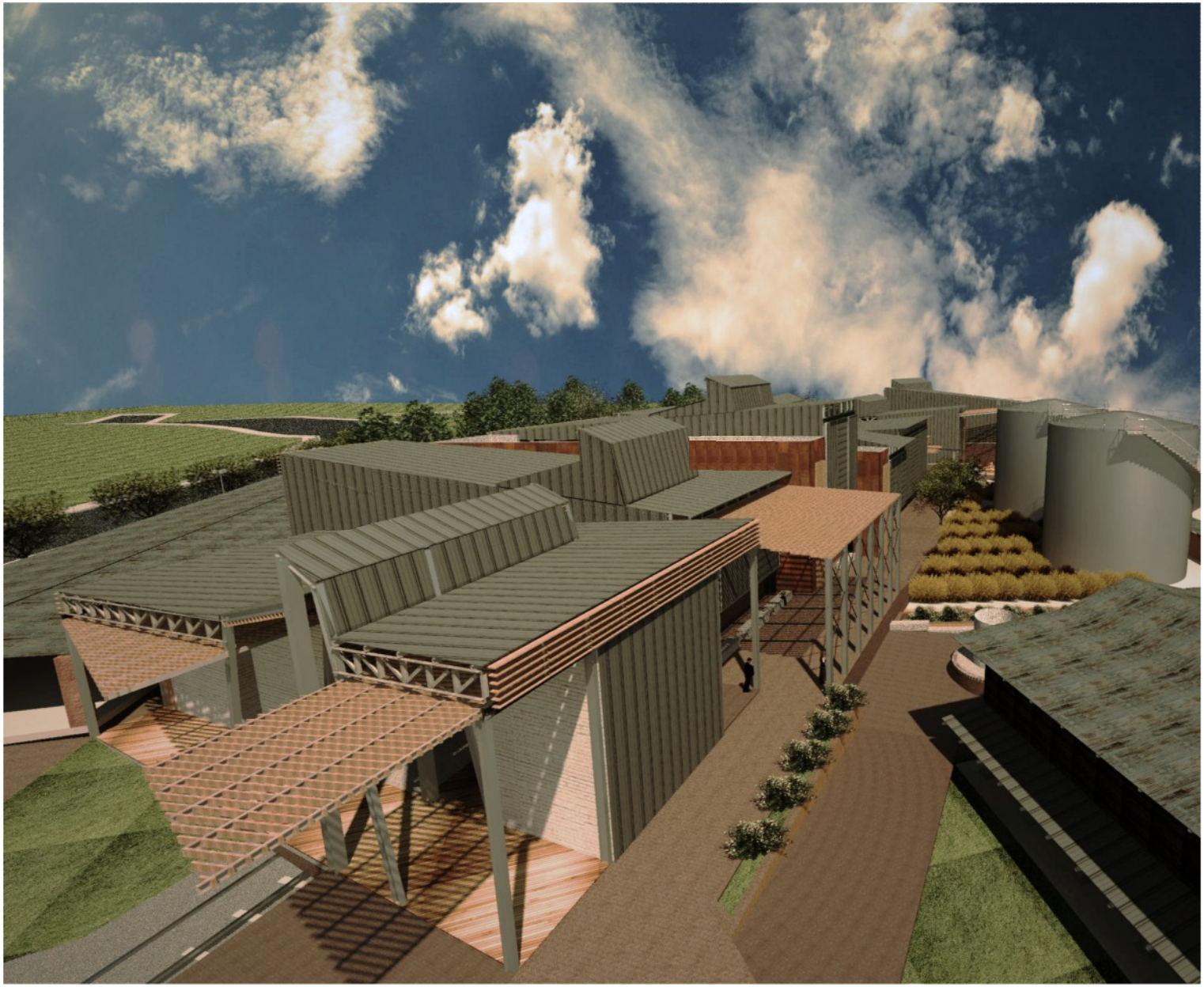


Fig 10.17: Perspectives 03

Article

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1. Introduction

What different perspectives can aid in the understanding and application of contextualism in order to generate contextually relevant museums in South Africa? This research aims to provide a proposed methodology to approach designing contextual museum architecture in South Africa. The approach will be defined by analysing theories on holism, contextualism and South African case studies.

The necessity for architecture to structure itself within the historical continuum, either visually or philosophically through form, function or by any other means of design execution, is critical in order to produce the resolved architectural design (Gaines, 1980). According to Smuts (1987), based on the original publication from 1926, holism is a perspective of the world that was adopted in order to explain the complex systematic functions within it. Through this lens, we perceive a world that is evolutionary in purpose, connective in principle and structured in spirit. Smuts (1987) states that transformation, connectivity and individuality are some of the predominant concepts within this perspective.

To accomplish the fundamental purpose of fitting into the complex systems of the world, the architectural design process involves the implementation of contextualism principles. These principles shape the architectural response to the inhabited historical and cultural landscape.

Museums can represent cultural and historical identity (Jodidio, 2010). It is therefore imperative for museum designs to be contextual. By looking holistically at contextual museum design, it can aid the architecture of museums to be a crucial instrument in expressing cultural and historical identity respectfully and appropriately (Brand, 1994).

Within the contemporary landscape, architectural responses occur that are insensitive to the identity of the context it occupies. This is possibly the result of designers designing in an a-contextual manner (Gaines, 1980) and possibly motivated by current trends and personal bias (Jodidio, 2010). These prevailing factors culminate in the creation of arbitrary objects

that alienate themselves within the context (Gaines, 1980).

Presently, there exists an exceptional need for museums to act as arbitrator between the diverse narratives of an ever-evolving landscape, be it manmade or natural. The discussion on contextuality in museum architecture has been vast, and the methods of contextual approaches are varied (Gaines, 1980; Parry, 2015). Often, the focus on design relies too greatly on superficial applications to be contextual and the complexity of the multi-layering of contextuality is often overlooked.

This study aims to illustrate the link between contextual design approaches and different perspectives. Contextuality will be examined through the lens of holism, contextualism and practical contemporary applications. To understand contextuality, certain principles will be identified, analysed and interpreted. Through literature analysis, the importance of acknowledging the link between these perspectives and contextual design approaches will be explored. Presently, different approaches exist as proposed in various literature that describes the ways in which architecture can be contextual (Gaines, 1980; Parry, 2015; Tabarsa a& Naseri, 2017; Roberts, 2016; The Plan, 2018).

Contextuality will be researched and analysed through three approaches namely philosophy, theory and finally application. A conclusion for each approach will be synthesised in terms of the positive aspects and negative aspects of each approach. The analysis will be primarily based within the architectural field. In order to understand the contextuality of architectural design, it is critical to see it in light of how we see the world in terms of contextuality and what physically exists in the world. The process will therefore progress from a philosophical perspective to what existing architectural responses are considered contextual.

The methodology includes the analysis of the contextuality of museum architectural design. This is because museums will be used as an illustrative typology to show architectural relation to context. The purpose of museums is to represent historical identity, emphasise social behaviour and further future development. Museums are the

arbitrators of representing identity and will therefore be the focus of the case study analysis in terms of contextual application.
For this analysis, it is critical to firstly analyse contextuality from a holistic perspective. Smuts' theory on holism (Smuts, 1987) will form the basis for the philosophical approach. Contextualism theories from Gaines (1980) and Parry (2015) will form the basis for the theoretical approach. Case studies of renowned buildings within the local context will be analysed in terms of their contextuality and this will form the basis of the third approach.

Each perspective will be introduced based on the definition discussed by various applicable sources. A brief description will follow. Each perspective will then be interpreted through an analysis of the appropriateness of the perspective in terms of the possibility to be used in further architectural design applications. The analysis will conclude based on the positive aspects and negative aspects of each perspective. The research will conclude with an overview of all the perspectives proposed and the most successful approach will be chosen.

The first perspective, the philosophical perspective, will analyse Smuts' theory of holism (1987) and discuss it in terms of key principles that are meant to illustrate what primarily encompasses a holistic perspective of the world. An interpretation and synthesis of this philosophical perspective into architectural terms will follow. The second perspective, the theoretical perspective, will analyse two conflicting theories from two authors of contextualism in an architectural application. The pattern approach as proposed by Gaines (1980) and the value approach as proposed by Parry (2015) will be discussed, compared and then synthesised to produce an approach that encompasses positive aspects from both theories. The third perspective, the practical design perspective, will analyse the contextuality of existing architectural applications. The analysis will start with how contextual buildings are viewed on an international scale. The case studies have been selected because of their renowned contextuality according to various authors. These case studies will primarily be museums of architectural renown. For the local case studies, the following buildings will

be analysed: the Zeitz Museum of Contemporary Art Africa in Cape Town, the National English Literature Museum in Grahamstown, and the Mapungubwe Interpretation Centre in Musina. Based on the analysis of the case studies, the principles of contextual South African museum architecture will be discussed.

2. Holistic Perspective

Holism is the operative factor in the evolution of wholes and is the ultimate principle of the universe - General Jan Christiaan Smuts (1987).

In Holism and Evolution, Smuts (1987) describes holism as a perspective of the universe. One that is composed of a series of *parts* within *wholes* (Smuts, 1987). It looks at a universe that is continually growing and transforming, configuring all old components into new bonds to create new things (Smuts, 1987). Smuts (1987) further expands on this by describing the necessity for these components, that possess their own uniqueness and individuality, to collaborate in order for a system to function accordingly. Every part has a purpose, a relationship with other parts and is in its own way, unique (Smuts, 1987).
How can holistic views propose a new way of approaching contextualism? How can a holism be used as a lens to define contextual architecture?

The following principles are selected from the chapter General Concept of Holism in Smuts' Holism and Evolution (1987:85): the connection between old and new, parts of a whole, individuality, layers, evolution. These principles are identified and selected to illustrate what primarily encompasses a holistic perspective. These principles are based on direct terminology used by Smuts (1987) and reinterpreted to simplify the concepts introduced within the chapter. The principles are defined by assembling different aspects that connect to each principle discussed within Smuts' Holism and Evolution (1987). The definitions for the principles are as follows:

3.2.1 The connection between old and new

This refers to the physical and philosophical link between old and new - past and future. All materials in the universe existed at the beginning of time and everything from that point on is a synthesis of old matter and through transformation, new materials are born (Smuts, 1987). Herein lies the connection between old and new - old materials are used as the building blocks for new materials. Therefore, the past (old materials) is used as the core for an established possible the future (new

materials). “It creates both new materials and new forms from the synthesis of the new with the old materials” (Smuts, 1987).

3.2.2 Parts of a whole

This refers to the relationship between things and the purpose thereof. The whole is more than the sum of its parts and can take in new parts through a transformation, not addition (Smuts, 1987). “The whole is in the parts and the parts in the whole and this synthesis of the whole and the parts is reflected in the holistic character of the functions of the parts as well as the whole” (Smuts, 1987). All the parts with the whole work towards the main purpose.

3.2.3 Individuality

Every part has character and individuality organised within a whole. Each part is unique. A unique purpose is attributed to each part. Without the part, the whole can't function appropriately (Smuts, 1987).

3.2.4 Layers

An additional characteristic of holism is the relationships or 'bonds' between parts (Smuts, 1987). The types of bonds are arranged in terms of scale, from small to large. Starting from small bonds; bodies, 'central control' or intellect, personality, 'state' or being, ideas and beauty (Smuts, 1987). These bonds appear to be organised from the tangible to the intangible.

3.2.5 Evolution

Evolution refers to view the universe as a progressive one (Smuts, 1987). This means that the world is constantly changing and transforming. By bringing these principles under the light of architecture resulted in the following questions:

1. What would the architecture's purpose be as a part?
2. How does architecture emphasise the relationship between the parts?

By synthesising Smuts' theory of holism (Smuts, 1987) to make it more understandable in terms of architectural responses, the following principles are concluded: Object; Site; Activity; and Paradigm. These principles are arranged from tangible to the intangible, referring to

the types of bonds discussed by Smuts (1987). These principles will be the starting point for the solution to contextualist museum architecture.

3.2.6 Object

This refers to the small elements on a site. These 'objects' represent the identity of the site which is tangible. Within the museum, these 'objects' are often represented by the artefacts contained within the building. They represent a story - a piece of history. In order to fully grasp the identity of the site, something must physically represent a piece of the story that is left to interpretation. The 'object' is a physical element that adds meaning and value to the identity of the area. It fits therefor into the patterns of the site as proposed by Gaines (1980) and the value approach as proposed by Parry (2015). The 'object' aids the architecture to be contextual in the sense that it allows the architecture to align and revolve itself around a dominant physical feature of the site that represents historical identity (The Plan, 2017; Tabarsa & Naseri, 2018).

3.2.7 Site

This refers to the locale - the shard of the land. It is the setting or stage on which the architecture materializes (Porter, 2013). 'Site' embodies the narrative of the landscape, be it urban or natural. The identity of the physical realm is encompassed within. Just as 'object' refers to identity by being a particle of that identity, 'site' can be seen as a particle on an immense scale. The 'site' is also a tangible and physical element and adds meaning and value to the identity of an area. It fits therefor into the patterns of the site as proposed by Gaines (1980) and the value approach as proposed by Parry (2015). The 'site' aids the architecture to be contextual by allowing the architecture to align, protect and care for the natural environment it is situated within (The Plan, 2017; Tabarsa & Naseri, 2018).

3.2.8 Activity

This principle concerns human activity. Examples of human activity are routes or gathering points - existing or the remains thereof (Gaines, 1980). These activities are produced by the people through means of interaction with themselves and their environment. The environment itself has then transformed accordingly. By investigating

these activities, the cultural narrative of the site can be revealed. The 'activity' is either tangible or intangible. It adds meaning and value to the identity of an area. It fits therefor into the patterns of the site as proposed by Gaines (1980) and the value approach as proposed by Parry (2015). The 'activity' aids the architectural design to be contextual by putting a focus on people's livelihoods, routines and needs (The Plan, 2017; Tabarsa & Naseri, 2018).

3.2.9 Paradigm

This concerns a perspective that is a collection of the prevailing thoughts and patterns that exist within the current world (Porter, 2013). The stories or patterns that represent an evolving world that enables change and growth result in a cohesive view that encompasses all views. 'Paradigm' is an intangible principle and it fits into the value approach according to Parry (2015). The 'paradigm' leads the designer's decision by considering the vision of the site and the design's conformity to existing paradigms (The Plan, 2017; Tabarsa & Naseri, 2018).

3. Contextualism Perspective

Architecture is an extension: a modification establishing absolute meanings relative to a place - Steven Holl (Porter, 2013)

To invent contextual architecture is to design a building from which the inspiration stems from a broad range of external patterns be it tangible or intangible (Gaines, 1980; Parry, 2015). Why is a contextual approach necessary? Buildings that appear imposing and unsuited to the context can become objects of isolation (Gaines, 1980; Parry, 2015). Understanding the deep fundamentals of contextualism can lead to an architecture that is more suited to the environment it inhabits, in other words, a building that belongs in a specific place. It is to prevent designs to become arbitrary objects of sculpture that are based on biases, trends and superficial principles (Gaines, 1980; Parry, 2015). Lastly, it is to maintain the link between place and time (Gaines, 1980).

A sound comprehension and respect of context are needed to produce resolved architecture (Gaines, 1980; Parry, 2015). The ultimate intent should be to strive to create a building that honours the setting to some extent - it's memory, activity and history (Porter, 2013).

There exists a necessity for architecture to structure itself within the historical continuum of the environment, especially one that has undergone much change in terms of identity within the past century. Architecture is required to embody connectivity, diversity and transformation (Marstine, 2006; Mdanda, 2016). Yet, there remain architectural applications that do not fully personify these characteristics. An approach to contextuality within the context of the South African landscape is necessary.

How can architecture be contextual? The answer, according to Gaines (1980) and Parry (2015) lies with the patterns of the site and the meanings thereof (Tabarsa & Naseri, 2017). These two approaches to contextuality will be analysed respectively and will be titled: The Pattern Approach inspired by Gaines (1980) and The Value Approach inspired by Parry (2015).

3.3.1 The Pattern Approach

Any context possesses narratives rooted within space that are personified through a variety of patterns that are either tangible or intangible (Gaines, 1980; Parry, 2015). Gaines (1980) states that contextualism is guided by a meticulous appreciation of context and is necessary in order to 'broaden our range of external influences that relate to the architectural context' (Gaines, 1980). This approach realizes the richness that stems from design possibilities when all the elements of a site are contemplated simultaneously in their entirety (Tabarsa & Naseri, 2017).

Gaines (1980) tabulates contextuality under three primary categories. Firstly, formal patterns encompass space, shape, scale, mass, and other visual or physical form expressions (Gaines, 1980). These characteristics can be used as inspiration to create a building that visually unifies itself with the context (Gaines, 1980). Secondly, activity patterns are systems of human behaviour that can include movement, gathering points, actions and reactions (Gaines, 1980). These activities are remnants of socialization (Gaines, 1980). Thirdly, climatic patterns speak of geographical limitations such as solar gain and weather (Gaines, 1980).

The Pattern Approach (Gaines, 1980), although systematic and straightforward in purpose, is superficial and obvious in nature. The problem within this approach to contextuality is twofold. Firstly, it opens up a broad range of possible responses, perhaps too large to fully engage with. This is because there are often numerous varieties of patterns existing on a site (The Plan, 2018). This approach places focus on the meticulous nature of the design process and the desire to use as much of the external patterns as possible to produce contextual architecture. It is possible that this approach, however, would be time-consuming. Therefore, the question arises: To what extent should the architecture respond to the physical patterns for it to be considered contextual?

The second problem to this approach is the absence of a hierarchy of patterns. The second question is, therefore: How do we, as architects, decide which patterns to adhere

to primarily? Within current times, it is impossible to produce designs that are influenced by all external patterns of a site (Gaines, 1980). Gaines (1980) argues that the best course of action would be to ensure the architecture responds to all three categories.

It is essential to define a particular approach or lens to contextualism, comprised of knowledge from international and local literature, to determine a design that will ultimately generate contextually definite architecture. The approach must respond to the following factors: Firstly, the architecture must convey historical and cultural identity. Secondly, the architecture must strengthen the physical qualities of the landscape. Thirdly, the architecture must order itself within the historical fabric by linking past, present and future (Gaines, 1980; Parry, 2015; Tabarsa & Naseri, 2017).

3.3.2 The Value Approach

In another, more philosophical approach, Parry (2015) instead proposes a selective process of which certain prominent meanings are linked to patterns. These meanings are rooted in the methods of portraying historical identity. This approach, although interpretative in purpose, suggests associating a certain meaning to a particular pattern. Through scrutinization of the meaning, the pattern which to respond to can be selected based on the importance of its meaning and influence on the narrative of the site (Parry, 2015). This requires a rigorous historical analysis of the site, possibly by means of historical mapping of all components of the site thereby revealing the true narrative of the site.

The following five principles of contextualism are discussed by Parry (2015) and will be analysed in terms of their validity:

1. Pavement: Parry discusses this as dependence on the contact point and relationship with the ground or earth plane (Parry, 2015). It is a plane of composition and expression of political and cultural agendas because the pavement has such a profound meaning and influence in everyday life. This meeting point refers to where memories are created and where events of historical or cultural significance take place (Parry, 2015). Parry (2015) calls it the “trace of habitation”. The meeting point

becomes the floor and the floor can become a symbol of "political and cultural will" (Parry, 2015). The meeting point can also become a route and thereby remnants of historical events, connecting places and plays a role within the historical continuity of the city.

2. Horizon: Parry describes this principle as that which "cannot be removed, yet cannot be reached" (Parry, 2015). It is the physical meeting point between earth and sky and the metaphorical meeting point between objective and discovery (Parry, 2015). It is a point of direction and orientation and presents continuity by being a datum (Parry, 2015).
3. Simultaneity: "The cumulative effect of related parts to a spatial configuration." To understand the "simultaneity of the parts" one must understand the "normative condition of living". The relationship between things must be understood in order to understand their existence. Something exists because of certain other things or events existed.
4. Kinetics: To grow and change. To be resilient. Movement. The "Layering of the city" creates a complex system of interconnectedness. It is through these layers that one can perceive the historical continuity of the city.
5. Artifice: "The idea of making." To play is integral to the idea of living. It is "freedom" and "stepping out of real-life and into a temporary sphere". To understand the creation of devices that constitute play is to understand life. The artifice or device constitutes an escape from the real world. The artifice imitates nature. To understand life is to understand the space the artifice creates for people to escape to a place of rest and pleasure.

The poetic nature of the above principles introduced by Parry (2015) is evident. However, the abstraction of these principles will prove problematic. Therefore, the above principles, as discussed by Parry (2015), will be changed to be able to fit into the context of architectural discourse. Architectural principles described by Ching (2015) will be consulted. This led to the following terms and definitions:

A. Ground (Pavement): This refers to how the architecture connects to the ground plane through visual or philosophical means. It can be a tangible or intangible connection. It manifests within the physical patterns of everyday life.

B. Horizon (Horizon): This refers to how architecture strives to reach new objectives. As horizon means the datum line that divides sky from earth (Parry, 2015). It is a metaphor to reach new objectives. In other words, that which we strive for but cannot reach. It is a metaphorical and psychological connection. It manifests within new ideas and objectives or the means to reach those objectives.

C. Relation (Simultaneity): This refers to how the architecture act as the arbitrator that connects things seemingly unconnected, and allows other things to exist (Gaines, 1980). It can be a physical or psychological connection. It manifests in the living things within the natural or urban landscape.

D. Overlay (Kinetics): This refers to how the architecture respects and represents the layers of history that are embedded within the site (Gaines, 1980). It also refers to the additions of layers and what indent within the layers can be made by the architecture. This is predominantly established on physical connections. It manifests within manmade and natural developments and infrastructural systems (Gaines,1980).

E. Escape (Artifice): This refers to how the architecture allows the freedom for new things to be created (Gaines, 1980). It refers to the architecture being a point in a place where ideas can be born. It is predominantly a psychological connection. It manifests in the act or state of mind in which one can escape the normality of everyday life (Gaines, 1980).

The Pattern Approach and Value Approach differ greatly in terms of how to commence understanding a site and all its features through categorization and deconstruction of either meaning or purpose. The correlation, however, lies within the argument of how the design should respond to the site. Both Gaines (1980) and Parry (2015) state that a true response follows a full

comprehension of the site. A true response is one that is "subtle, rather than obvious" (Gaines, 1980) and "abstract, rather than literal" (Gaines, 1980).

After the analysis of both takes on contextualism, a new approach can be realized. By combining Gaines' (1980) pattern approach with Parry's (2015) value approach, an approach that both give a criterion of what patterns to adhere to and how these patterns can be chosen is realized.

Firstly, the feature that represents the physical, activities and climate features on-site can be chosen. Secondly, meaning will be associated with each feature. Through the literature analysis, it is clear that there seems to be a myriad of proposed methods in various academic sources in order for architecture to be considered contextually appropriate (Gaines, 1980; Parry, 2015; Tabarsa & Naseri, 2017, Roberts, 2016; The Plan, 2018).

4. Practical Perspective

As architecture must strive to connect buildings and places, it must also strive to connect people and places (The Plan, 2018). Architecture often runs parallel with social behaviour and thereby relies greatly on the appropriation by people of a place (The Plan, 2018). Tabarsa and Naseri (2017) discuss that approach of considering context as a "historical event" born from the actions of people. Contextual architecture can therefore only be contextual if the design accommodates the lives, routines and needs of people - the individual or the collective.

Tabarsa and Naseri (2017) argue that contextualism lays a significant role to bridge architecture and urbanism. Contextualism on an urban scale, as argued by Tabarsa and Naseri (2017), can be accomplished by the following: looking at the physical characteristics of what constitutes the city-scape; looking at the relationship between the old and new context, that which is existing or removed; and looking at the elements of the city as part of a greater system of connections. Contextual design, whether on a small scale or urban scale, should align itself.

Contextual architectural design should not only emphasize what currently exists on the site but must also strive to embrace the potential of what a site can become (The Plan, 2018). The architecture thereby becomes a catalyst for change and connects old with new. To be contextual to the historical identity of a site does not mean to mimic nor neglect the existence of past architectural styles (Tabarsa & Naseri, 2017). It means to rather connect tradition with transformation.

The contextual architectural design aligns itself with the natural environment and all its physical qualities (The Plan, 2018). As context includes all parts of a landscape, it must include the earth itself - its natural resources, systems and life (The Plan, 2018). For architecture to be contextual, it must aim to contribute to the responsibility of caring for and protecting the natural environment. Therefore, contextual architecture is often sustainable architecture (The Plan, 2018).

Contextual architecture can be unobtrusive or monumental (The Plan, 2018). This is because the contextual design does not

merely rely on visual presence and form alone to fit into its context. Therefore, the contextual design should be seen to rely on various degrees of expression that range from the tangible such as form and materiality, to the intangible such as philosophy and meaning (The Plan, 2018; Tabarsa & Naseri, 2017; Parry, 2015).
The following is an analysis of South African case studies.

To understand how museums can be contextual in South Africa, it is crucial to understand the existing roles and responsibilities of the museum within the South African Context and internationally. ICOM (2007) defines the museum within Article 3: Definition of Terms, Section 1 as follows: "A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment."

Three case studies will be analysed to determine the criteria for contextual museums in South Africa. Namely, The Zeitz Museum of Contemporary Art Africa, the National English Literature Museum and the Mapungubwe Interpretation Centre. These case studies are greatly recognised for their architectural design innovation in terms of landscape integration, sustainability principles and heritage preservation (The Plan, 2018). The historical and cultural identity of the South African landscape is also critical for inclusion in this research. This will be discussed based on the design principles discussed under Contextual Museum Design.

3.4.1 Museums and the South African People

Museums must emphasise an understanding of social behaviour and allow people to appropriate the space to their own will. The social-cultural landscape of South Africa is unique in richness and diversity (Mdanda, 2016). There is presently many communities, groups and individuals that live in varying economic and social circumstances (Vollgraaf, 2012-2014). The museum, therefore, needs to embrace the different stories of the South African people and make history as accessible to everyone.

Vollgraaff (2012-2014) argues the need for museums to act as "contact zones" between communities, historical events and views. Museums are meant to exhibit answers to stories, while also allowing room for questions to further research. By facilitating programmes that are based on the needs of the communities, museums can be the bringers of great change (Vollgraaf, 2012-2014). For museums to fulfil their purpose as described by ICOM (2007), they need to become places where different perspectives and people meet to commemorate memories and find ways to develop a new future (Vollgraaf, 2012-2014).

The Zeitz Museum of Contemporary Art Africa by Heatherwick Studio emphasises an understanding of social behaviour (Worth, 2017). The design was meant to tell the story of transforming from a purely industrial area to a public commercial area. Growing from enclosed and restricting to open and inviting (Worth, 2017). The programme was meant to become integrated into the daily lives of the people. This contrasts greatly the western ideals of a western museum as a colonising identity whereby the museum dissociates itself from its surroundings (Marstine, 2006).

3.4.2 Museums: South African Historical Identity and Future visions

Museums must connect the old with the new by emphasizing the existing historical identity and embrace future possibilities. Museums have done much in terms of connecting the city through different approaches to urbanism (Marstine, 2006). Marstine discusses the necessity for the museum to give something back to the city. This means that museums need to embrace a truthful openness of their economic presence and status. Through this, museums can become a revitalising urban centre according to Martsine (2006). By being objects of tourist attraction, the museum plays an important role within a city's renown (Martsine, 2006).

Spalding (1993) discusses the predominant purpose of museums which to not just communicate history, but also to be a place where understanding and interest go hand in hand. As tourist attractions, museums deviate from the monotonous patterns within society, as Spalding discusses (1993), and become a place of difference and escape.

The Zeitz Museum of Contemporary Art Africa has been designed to become a historical urban centre (Worth, 2017). The silo structure, the most prominent feature of the museum, was mean to be the centre point of development. The activities and functions are meant to be situated around it through the manipulation of negative spaces (Worth, 2017). The museum was meant to become the main destination points of the area and to draw locals and tourists into the site (Worth, 2017).

Apart from being tourist attractions, museums are places to learn about history (Spalding, 1993). The contrast between museums and the easily accessible virtual realm of information is that museums contain "the real thing" (Spalding, 1993). In a world of information and possible falsification, museums symbolise authenticity, truth and tangibility (Spalding, 1993). Museums embody celebration and commemoration of the past by relating to people's aspiration to protect and conserve history (Murray, 2013). Spalding discusses museums as machines of communication (Spalding, 1993). This means a continual process understanding between the museum and visitor that can lead to change and growth (Spalding, 1993). Therefore, the museum not only needs to embody historical identity but create a platform for future development. The museum must strive to pay homage to the roots of history but also move towards the horizon of a new future.

The Zeitz Museum of Contemporary Art Africa has been effective in this regard. In terms of fulfilling the role of to conserve and communicate stories, the architectural design places focus on conserving the utilitarian structure of the old silos (Worth, 2017). However, by transforming the silos into usable space, the structure was transformed to become more symbolic than utilitarian (Worth, 2017).

In the case of the Mapungubwe Interpretation Centre by Peter Rich Architects, the design intends to emphasise the historical natural landscape it is situated within (The Plan, 2018). By using local materials in the construction, the surrounding environment is conserved (The Plan, 2018).

3.4.3 Museums and the South African Natural Landscape

Museums must embody the responsibility of preserving the natural environment. One of the most important factors in the contemporary context is the necessity to conserve and protect the world's natural resources (The Plan, 2018). The natural environment is accommodated in two ways: through sustainable design principles or visual aesthetics (Thomas, 2013; The Plan, 2018).

South African architecture often strives to incorporate the natural landscape into the design features (The Plan, 2018). This aspect is clearly evident in the case of the Mapungubwe Interpretation Centre. The museum's design puts great emphasis on the natural landscape around the archaeological site at Mapungubwe Hill (The Plan, 2018). The design is centred around emphasizing the surrounding environment through physical and visual means. Locally-sourced materials are used to represent the existing colours of the earth. Construction is based on contemporary takes on traditional construction methods. The building's forms and footprints blend physically into the landscape (The Plan, 2018). The Mapungubwe Interpretation Centre embodies a strong presence of the natural landscape within the museum's form and materiality.

It is often necessary for the contemporary museum to accommodate a variety of spaces that require different environments to function adequately (Thomas, 2013). As the museum programme aims to facilitate the conservation and protection of the artefacts within, perhaps the museum form, materials and footprint should facilitate the conservation of the environment around it (Thomas, 2013).

The National English Literary Museum, located in Grahamstown, is the first sustainable museum in South Africa and was certified by the Green Building Council of South Africa (Thomas, 2013). It is therefore on the forefront of sustainable museum design. Principles of sustainability have been carried through from building management to construction emissions (Thomas, 2013). In terms of the programme, the museum is meant to emphasise the conservation of

various writings of authors from across the African continent (Thomas, 2013). The design of the museum has a balanced programme and construction to embody conservation and preservation of history and the natural environment.

5. Conclusion

In order to produce contextually relevant architectural museum designs in South Africa, three perspectives have been proposed and analysed. The three lenses - philosophical, theoretical and practical - can be used to approach contextualism in ways that have the potential to produce contextually relevant architectural museum designs.

By looking through the philosophical lens of holism, an approach can be drawn to produce four categories to influence the design process. The categories are object, site, activity and paradigm. These categories are organised from the tangible to the intangible, much like holism theory as discussed by Smuts (1987). The categories represent the different layers of *bonds* within the *system* that is within the context. By approaching an architectural design that draws inspiration from the context according to these categories, a holistic approach to contextualism can be realised.

By looking through the theoretical lens of contextualism theory, an approach can be drawn to produce a method of context analysis. This analysis can aid the designer to decide what primary features of the context the architectural design must adhere to. This method is rooted in two theories. One is the pattern approach as proposed by Gaines (1980). The second is the value approach as proposed by Parry (2015). A synthesis of these two theories is proposed as a method to emphasise the most prominent contextual features of the site. Through this, a theoretical approach to contextualism can be realised.

By looking through the practical lens of case study analysis, an approach can be drawn based on methods used by existing contextually relevant museum architecture. These case studies, located in South Africa, have been assessed in three categories. These categories are based on the similarities between the case studies. Firstly, how they emphasise social understanding. Secondly, how emphasise historical identity and future possibilities. Lastly, how they preserve the natural environment. By understanding what has already been done and by learning from what has already been built, a practical approach to contextualism can be realised.

All three lenses have conveyed a method of producing potentially contextual architectural designs. The philosophical lens enables the designer to respond to the context holistically. The theoretical lens enables the designer to analyse context according to its patterns and values. The practical lens enables the designer to learn from existing contextual architectural designs.

Within a universe that is continually growing and transforming, configuring, changing and creating (Smuts, 1987) it is necessary now more than ever to understand the purpose of the unique purpose of all components within the universe. If every part has a purpose, as Smuts states (1987), and every part connects with other parts in its own way, perhaps architecture is also the *parts* within this system of *wholes*. Perhaps the part that the architecture of the contemporary museum is to emphasise, engage and enhance the connectedness between the things that constitutes the context.

By using the different methods proposed, the intention will be to successfully prevent arbitrary objects of architecture. The methods will lead to an architectural design that is not based on biases, trends and superficial principles, but rather based on a deep appreciation and understanding of context (Gaines, 1980; Parry, 2015). As is evident throughout history, and will continue to be so, architecture itself is, was and will forever be a crucial instrument in expressing the identity of the context (Brand, 1994).

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