

RE-IMAGINING TERRAIN VAGUE

The adaptive re-use of Makwassie's Train Station as an agricultural centre

Eugenie Rheeder 2016006666



Reimagining terrain vague:

The design of an agriculture centre in Makwassie.

Programme:

Agricultural skills development centre.

Research field:

Adaptive re-use.

Site description:

Under-utilized structures owned by Transnet .The site is located at the edge of town with commercial and residential buildings/activities to the north.

Site Address:

Potgieter Street, Makwassie,
North-West ,South Africa

GPS Coordinates:

27°19'16.2"S 25°59'50.5"E

Supervisors

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Submitted in fulfilment of part of the requirements for the degree of Masters in Architecture (Professional)

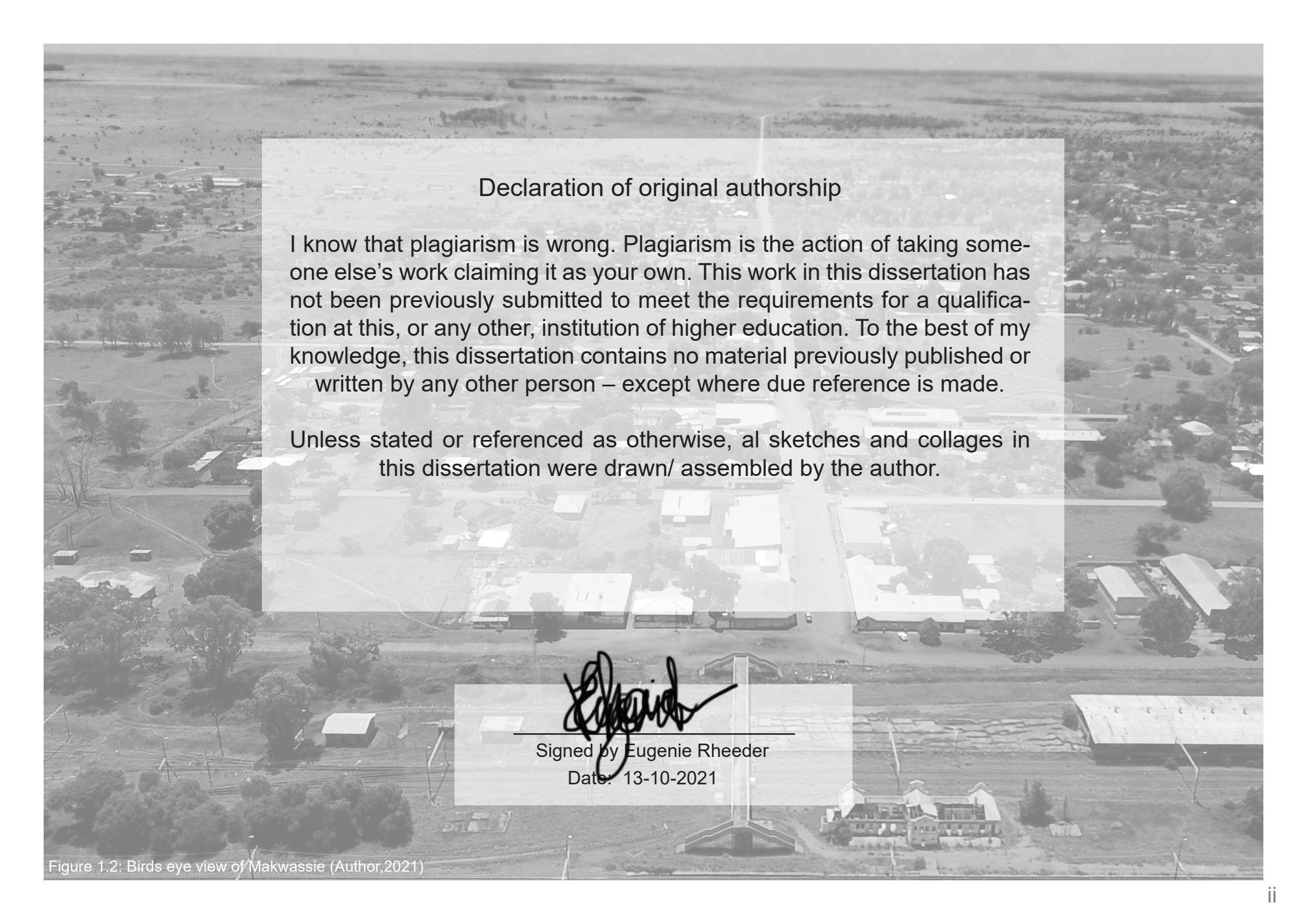
Department of Architecture, Faculty of Natural and Agricultural Science.

University of the Free State

2021



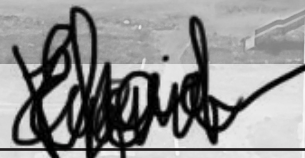
Figure 1.1: Interior photograph of trainstation (Author,2021)

An aerial photograph of Makwassie, South Africa, showing a mix of residential buildings, open fields, and some industrial structures. The town is spread out across a relatively flat area with some trees and roads visible. The background shows a vast, open landscape under a clear sky.

Declaration of original authorship

I know that plagiarism is wrong. Plagiarism is the action of taking someone else's work claiming it as your own. This work in this dissertation has not been previously submitted to meet the requirements for a qualification at this, or any other, institution of higher education. To the best of my knowledge, this dissertation contains no material previously published or written by any other person – except where due reference is made.

Unless stated or referenced as otherwise, all sketches and collages in this dissertation were drawn/ assembled by the author.

A handwritten signature in black ink, appearing to read 'Eugenie Rheeder', written over a horizontal line.

Signed by Eugenie Rheeder

Date: 13-10-2021

Figure 1.2: Birds eye view of Makwassie (Author,2021)

J.C. GREYLING wrote a News24 article *in Diamant in die Stofpad?* He writes the following description of the town ,Makwassie:

“Vroegwinter verfraai opslag-kosmos die toegangspaaie en bring ‘n onverwagse spatsel kleur aan ‘n andersins vaal wintersveld. Reuse bloekom-en kameelbome vorm ‘n erewag weerskante stowwerige strate, en stokou kareebome met krom, skurwe stamme is ‘n algemene gesig.

‘n Klompie kaalvoetkinders kom lawaaiierig in die voetpaadjie van die Lebaleng-nedersetting af om stok-swiets by die Chinees se deurmekaar negosiewinkeltjie te koop.

Makwassie Handelshuis bestaan al jare nie meer nie. ‘n Halfvoltooide winkelkompleks in die hoofstraat staan versteen in tyd.

Naby die stukkende damwal klingel ‘n boerbok se klok.

Laatmiddag skommel ‘n enkele hooflyntrein in stilte verby dié dorpie waar bittermin in 100 jaar verander het. ‘n Tamatierooi son versmelt papperig op die uitgestrekte horison.

Dit gaan ‘n koue winter wees.”

(Greyling, 2018: online)

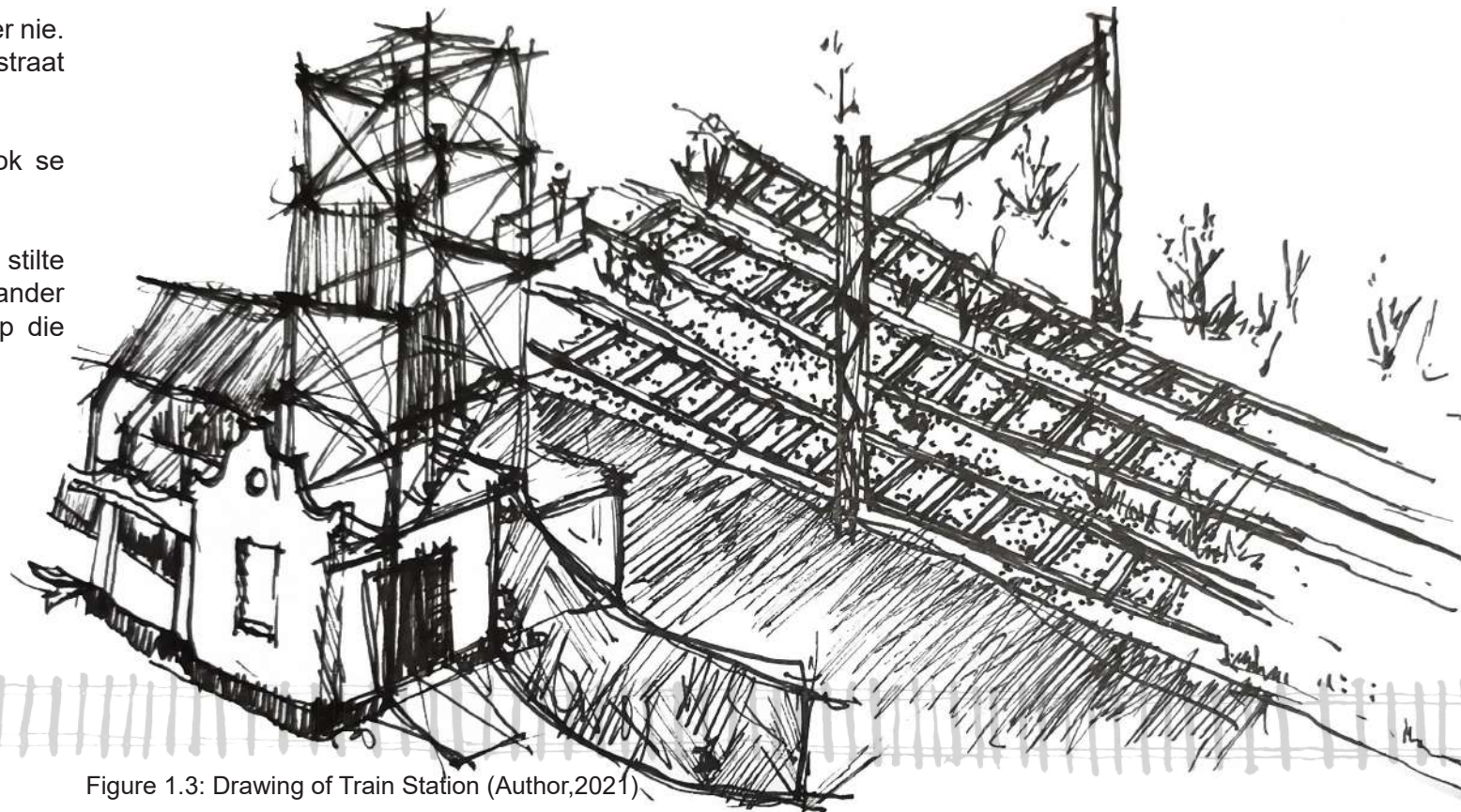


Figure 1.3: Drawing of Train Station (Author,2021).

Abstract

Situated on the periphery of a small town in North-West a decaying train station stands idle. Between open veld and a small town where nothing has changed over the last 50 years lies potential for an architectural intervention.

This dissertation will address the revitalization of a static industrial site. This industrial site has lost its original identity and fallen victim to deterioration. A loss in original identity created a site that is vague. Revitalization of vague sites can be achieved by exploring the latent potentials within the site narrative.

The intervention confronts the transitions between the dynamic environmental transformations of the site and the static structures on site. The study examines the importance of adaptively re-using structures. This intervention will be manifested as an agricultural centre. The aim is to re-activate the terrain through the layering of transitions in the program activating the inherent sense of place.

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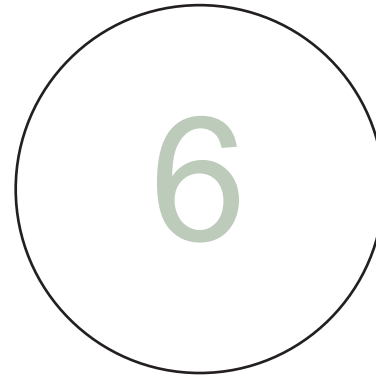
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CHAPTER ONE

Introduction

1.1. Objectives and Significance

1.2. Research Methodology

1.3. Client and Programme





Figure 1.4: Abstract collage of site (Author ;2021)

1.1 Objectives and significance

The thesis aims to redefine the latent potential within the site identified as terrain vague. It intends to change the site into a didactic landscape.

“The TERRAIN VAGUE is an inevitable consequence of the changing patterns of industrial activity in a city” (Watkins, 2013: 1).

Didactic is defined as “Having the character or manner of a teacher or instructor; characterized by giving instruction; having the giving of instruction as its aim or object; instructive, perceptive. A carefully planned structure can teach people an appreciation for space, light, size and scale. Often didacticism occurs in architecture when the architect wants to be blatant in their main concept or intent.

Didactic instances can also occur when the architect wants to make the construction or assembly of the building obvious. Didactic thinking is a respectable response to a post-industrial site, but the success of the design ultimately depends on the honesty and skill with which the design is made and what it offers the context and its user. It is meant to be a collaborative process between features, plans for how it will be maintained, used, and learned from (Lopez, 2011).

The project intends to become a metaphoric bridge taking the un-skilled worker and teaching them new skills. The skills to be developed are specific to the field of agriculture.

South Africa faces a number of problems with regards to agricultural development having an effect on the environment and the livelihoods of the country’s citizens. “South Africa has the third largest biodiversity in the world” (Department of Agriculture, 2002: 8)

However there is a rapid increase in the rate of extinction caused by unsuitable farming practices. Sustainable development in this area is addressed by specific aspects such as environmental, social, and economic ,educational development according to The Department of Agriculture (Department of Agriculture, 2002: 9).

The rural community of Makwassie derives financial income from agricultural practices. This emphasizes the need and importance for a specific space where agriculturalists can gain sustainable knowledge.

The objectives and significance of the project are described in the diagram outlining the research methodology on page 5.



Figure 1.5: Photograph of entrance to site (Author;2021)



Figure 1.6: Cows and their herder walking on site (Author;2021)



Figure 1.7: Image of railway lines (Author;2021)

1.2 Research Methodology

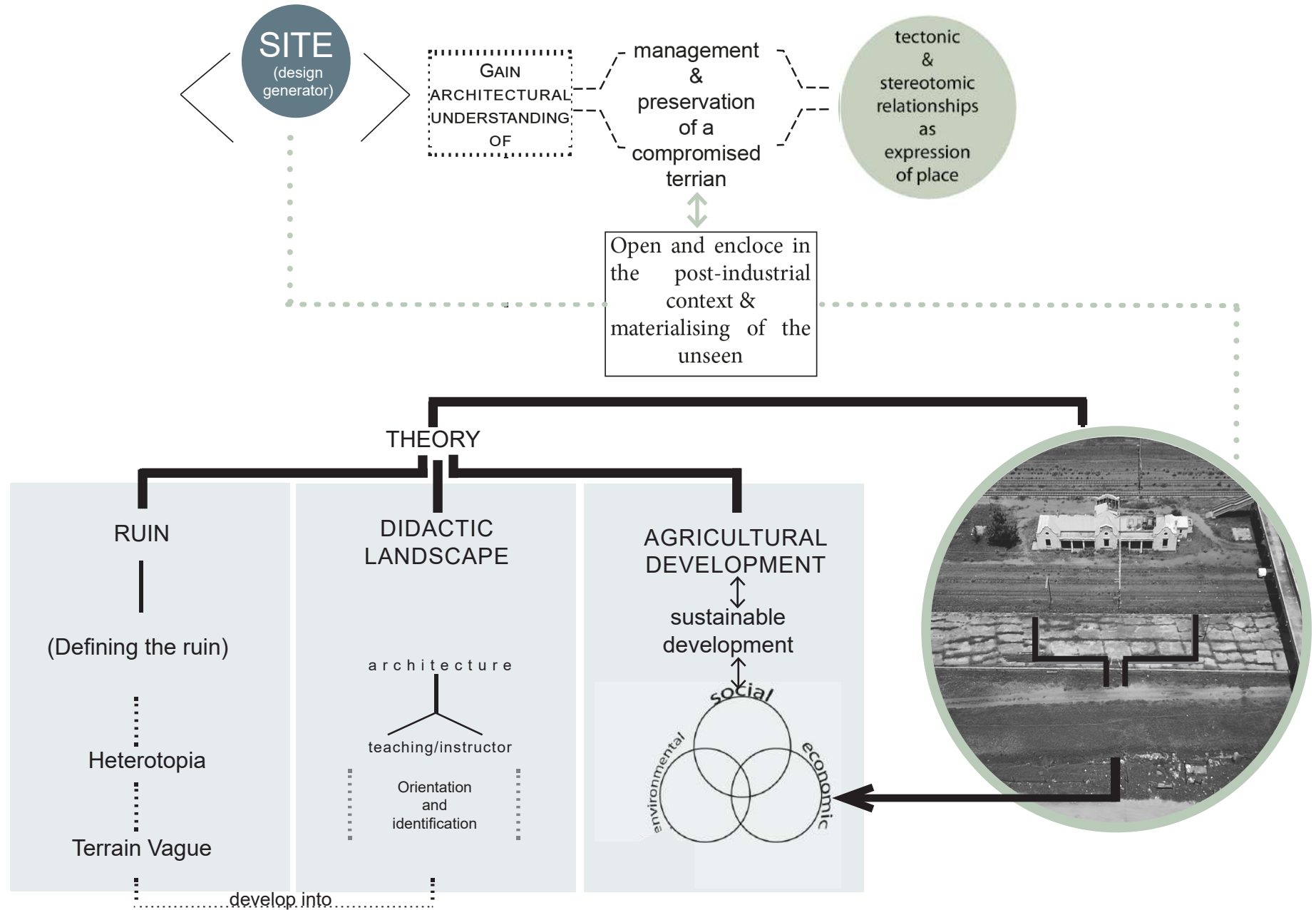


Figure 1.8: Diagram of research methodology

1.3 Client and programme

Agri Skills Transfer is selected as the client for this proposal. Agri Skills Transfer was established in 2004 for training in the Agricultural Sector (Primary and Secondary). Agri Skills Transfer is currently located on Klipfontein farm near Cullinan, Gauteng.

Agri Skills Transfer's training is aligned with the SAQA (South African Qualifications Authority) system. They took a business decision to align with outcome based education and to develop their courses according to the National Qualification Framework (NQF).

Agri Skills Transfer uses theoretical and practical workshops in order to transfer skills.



Figure 1.9: Agri Skills transfer logo (Agri Skills Transfer, 2015: online)

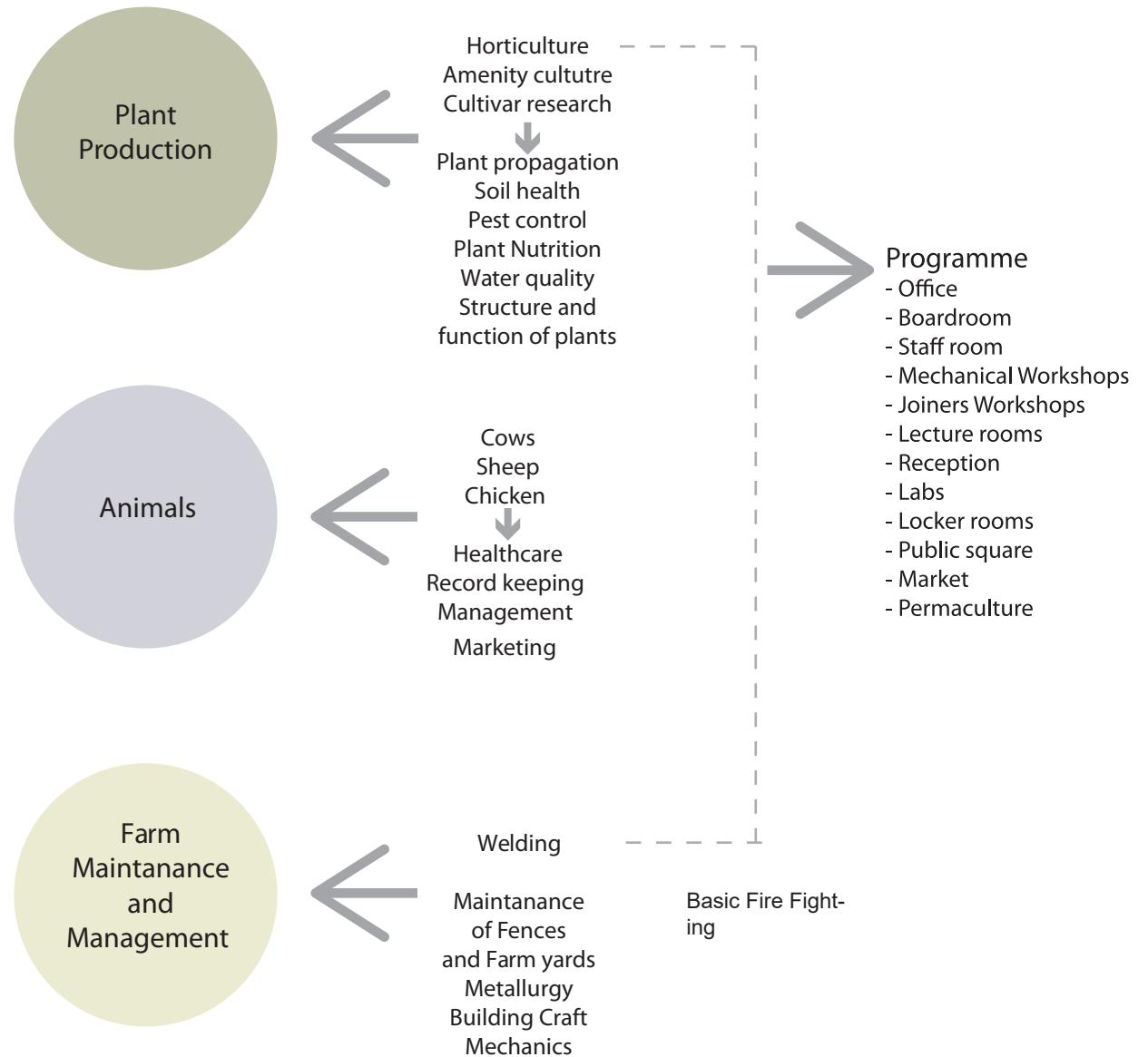


Figure 1.10: Diagram of proposed program

CHAPTER TWO

Theoretical discourse and legal framework

2.1. Terrain Vague

2.2. The Burra Charter

2.3. Heritage Resources Act

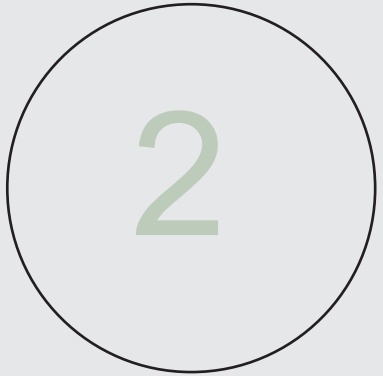
2.4. Listening to the building

2.5. Identifying the industrial archetype

2.6. South African Railway history

2.7. Industrial Achetype

2.8. Glossary of Terms



2.1 Terrain Vague

Post-industrial sites tend to be functionless, vague and meaningless. They do not forge relationships with the context. A similar description is appropriate when the ruin of Makwassie's Train Station is considered.

Industrial sites serve a spatial function only. What once was a node for connection, a transitional platform for travel and central point of coming together has lost its identity. This loss of identity relates to the concept "*Terrain Vague*".

Spanish Architect Ignasi de Sola-Morales researched and wrote about this topic in *Terrain Vague* published in 1995. The concept of terrain vague connects directly to spatial and social concepts of urban environments. The term refers to the uncertainty of space. This uncertainty includes the ambivalence of urban plots of land or terrains (King, 2011: online).

Terrain Vague is described by many terms: "waste land", "ambiguous space", "strange place" etc. Other terms that can be used when describing Terrain Vague include misunderstood and overlooked. Terrain vagues are counter-spaces acting as a keeper or container of fragments of history. The term Terrain Vague is taken apart by the landscape architect Jason King, in his blog post *Landscape and urbanism*, as the two words it consists of (King, 2011: online).

Terrain as a concept is described as expansive and having a relationship that is directly linked to the urban environment. Vague as translated from the German "Woge" or "Vaag" in Afrikaans refers to unstable movement and fluctuation. "Vacuus" which is French, translates to emptiness. Vague according oxford dictionary means "Not clear in a person's mind". The terms describe the current state of the selected site.

With the windows and doors removed the structure seems like a skeleton in the desert with an occasional wind blowing through it as a train passes by.

Ignasi asks the question "What is to be done with these enormous voids, with their imprecise limits and vague definition?" (Sola-Morales, 1995: 110). The challenge lies in transforming the terrain. An appropriate architectural response that is dualistic. The reminisce of the past in poetic harmony with the new.

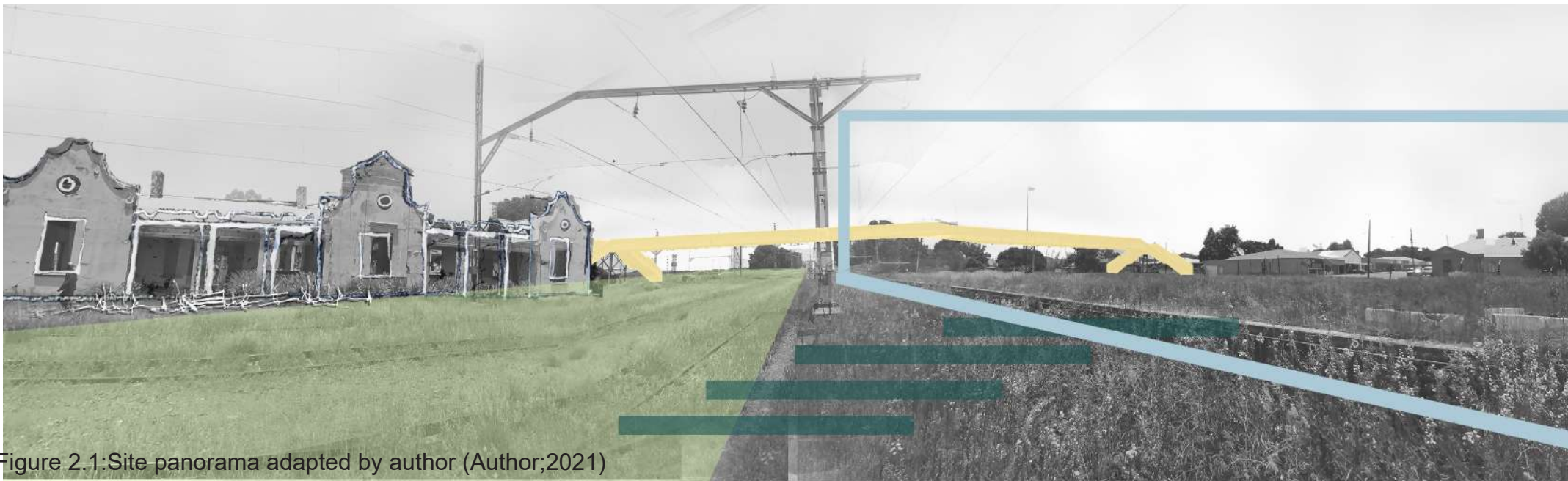


Figure 2.1: Site panorama adapted by author (Author;2021)

The act of transforming terrain vague is summarised by Sola-Morales (1995 :119) as follows :

- Architecture should not become an aggressive instrument of power and abstract reason.
- The previous statement can be achieved by considering the continuity of the energy flow within the site. This energy was established through “the passing of time and the loss of limits”

An understanding of the importance and the reason why the Terrain Vague should be reimagined is important before the reimagining occurs.

A major part on South African history is constituted by the country’s industrial heritage (Läuferts and Mavugandize,2009:1). Neglect of historical industrial structures will lead to their destruction. These buildings are deteriorating as they are open to face natural forces along with looters.

It is necessary to recognise and conserve the importance of industrial structures, to protect the industrial history of South Africa. Post-industrial sites, such as the Train Station form part of the urban landscape ,even though these structures and sites are strange, ambiguous places left to their demise. The station remains a remnant of the past. Using the existing structure in the regeneration of the site, the aim is to bring life to the current Terrain Vague.

The intangible and tangible history and heritage of the site forms the narrative of the town and the hierarchical layering. The importance of the historical narrative is emphasized by retaining the authenticity of the structures on site. Presenting and interpreting the authenticity of the train station is one of the ways in which the character of site is brought forward.

The selection of decaying buildings on ambiguous sites led to the adaption of these buildings. This is necessary as it provides a sustainable manner of enhancing appreciation and understanding of Terrain Vague (industrial sites). Responsive programmatic implementation combined with the potentials embedded along with the memory of the post-industrial terrain emerge as a space that is inhabitable.



Inhabitable space is developed through intervention: According to Sola-Morales (1995: 120) such an intervention should:

- Retain the existing structure and give new purpose,
- Be a non-exhaustive system,
- Aim to reincorporate these places to the productive logic of the city.

A designer is able to work within the complex systems of the intervention by close observation and tending. Tending to the train station requires a strategy. This strategy will be developed through the use of practice guidelines set out by the Australia ICOMOS Charter for places of Cultural Significance (Marquis-Kyle & Walker, 2004: 1).

2.2 The Burra Charter of 1999

The Charter was adopted in 1979 at the Australian town of Burra. The charter was developed with a vision for conservation of culturally significant places.

The charter states that “a deep and inspirational sense of connection” is created where places of cultural significance are concerned (Marquis-Kyle and Walker, 2004: 1).

A cautious approach is suggested by the charter. “It is necessary to care for the place and make it usable, but otherwise change it as little as possible so that its significance is retained” as stated in the charter (Marquis-Kyle and Walker, 2004: 12).

Cultural significance is a concept that aids in establishing the value of places. Places that help in “creating an understanding of the past or enrich the present” are considered as places with cultural significance (Marquis-Kyle and Walker, 2004: 12).

Sensory experience is part of the intrinsic value of place. This includes every sensory aspect of the site including the sounds along with smells associated with the place.

The Burra Charter suggests a sequence of investigations, decisions and actions as seen in Figure 2.2. This sequence will be applied throughout the design process. Applying these steps is helped along by the application of the South African Heritage Resource Act 25 of 1999.

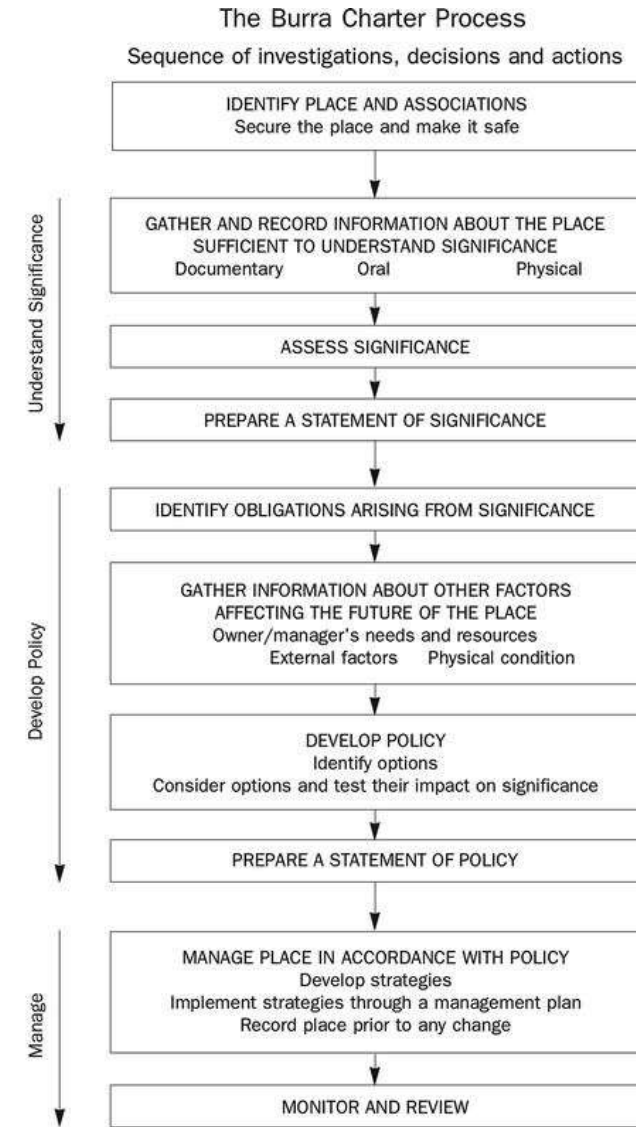


Figure 2.2: Scan of Burra charter Process (Marquis-Kyle and Walker, 2004: 10)

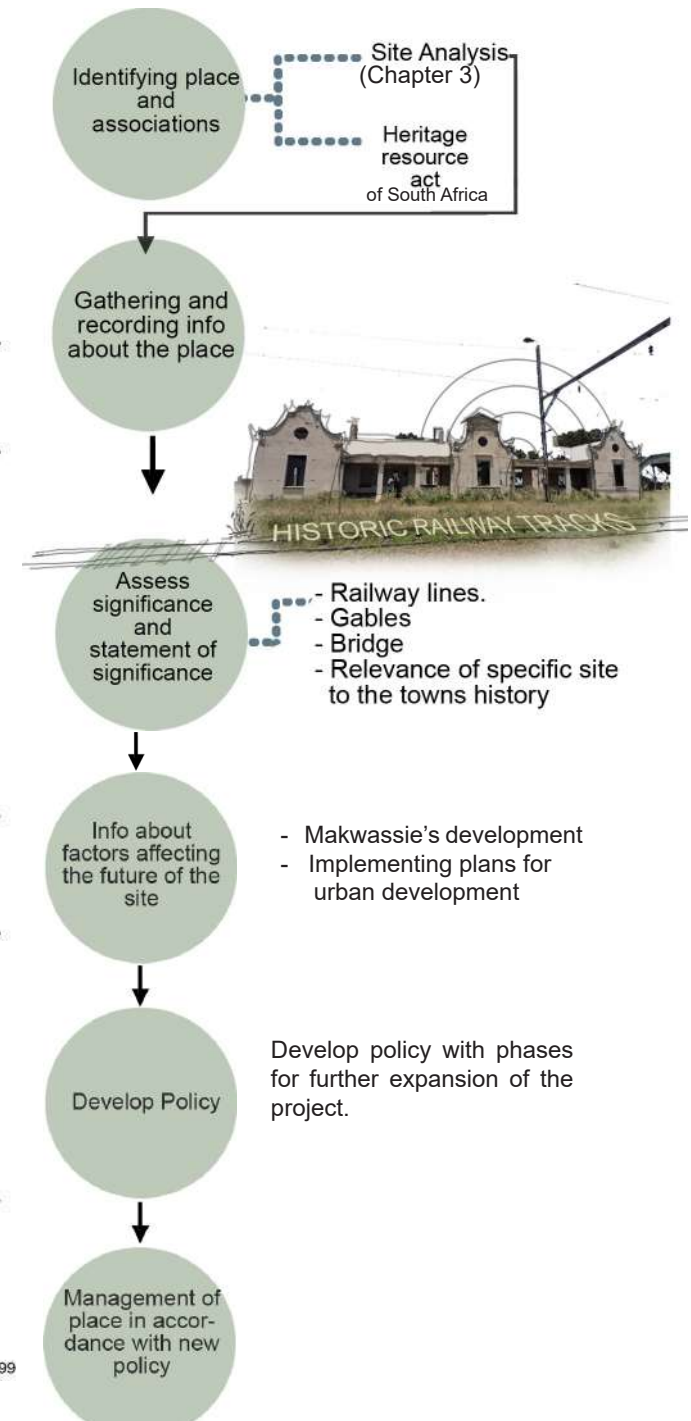


Figure 2.3: Diagram applying Burra Charter Process to project.

2.3 Heritage Resources Act

The protection of heritage resources is implemented by the Heritage Act of South Africa Act 25 of 1999. The general protection rule applies to structures that are older than 60 years. The train station built in 1910 is 111 years old. Careful consideration should be taken and every choice regarding demolition or changes to the station require justification. According to the South African Heritage Resource Authority (SAHRA) the responsibility of the act is “to identify, conserve, protect and promote heritage resources in South Africa.”(SAHRA, 1999: online)

The north and south façade is indicated as the station is identified as the most significant parts of the building. These parts should be protected while the rest of the building requires less consideration.

2.4 Listening to the building

A study of the existing is necessary to ensure the successful merging of the new addition to the existing structures. The language and specific proportions of the existing building provide solutions for the design of the new addition.

Proportions of the train station on floor plan.

The plan (Fig 2.4) is comprised of three main rectangles and two squares. A specific rhythm is prevalent in the floor plan as in figure 2.4. The rhythm is created with the placement of the rectangles and squares.

Proportions of the train station on elevation.

The north elevation is symmetrical echoing the rhythm on floorplan. A second rhythm is introduced in the columns. The train station is placed on a granite plinth that was painted black. This dark line is in contrast with the rest of the white structure emphasizing the horizontality of the design. Large bricks are drawn into the exterior plaster creating the illusion that large bricks were used in the construction. This also emphasizes the horizontality of the structure. The south elevation has a similar black plinth. The vertical rhythm on the southern elevation (Fig 2.5) differs from the north.

The influences on the proposal.

The rhythms and proportions on floor plan and elevation can be echoed in the new design. Relating dimensions as in figure can be utilised in the design of the new extension echoing the geometries of the existing.

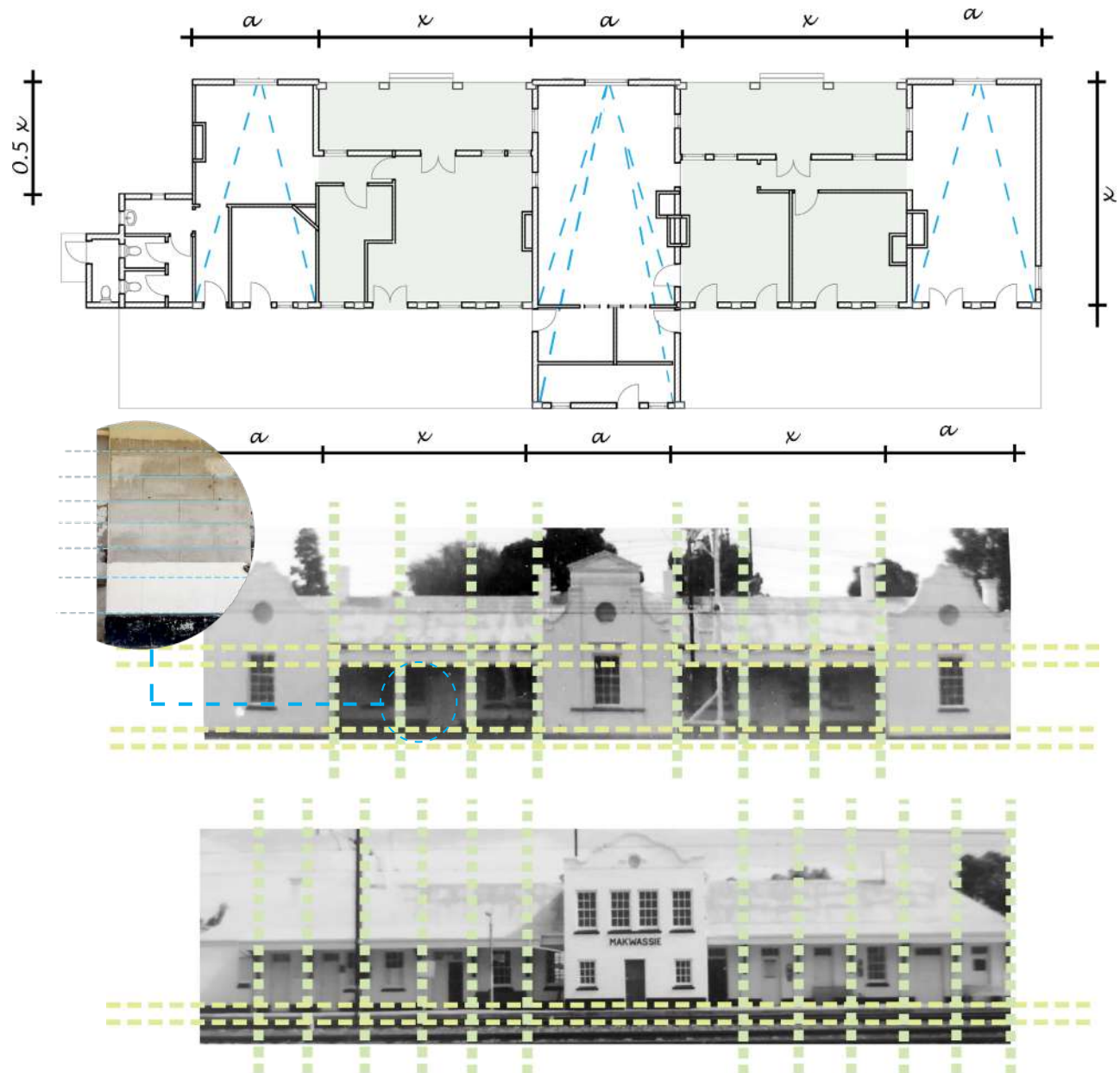


Fig 2.4: Existing Train Station floor plan analysed.

Fig 2.5: Photographs of Train Station elevations analysing rhythm.

Proportions of the shed plan and elevation.

The design of the shed follows a strict grid where x on Figure 2.6 is 5m. The grid is echoed in the elevation of the shed. The horizontality of the shed as in Figure 2.7 is emphasized by the concrete ring beam visible on the exterior along with the cement platform elevating the shed from natural ground level.

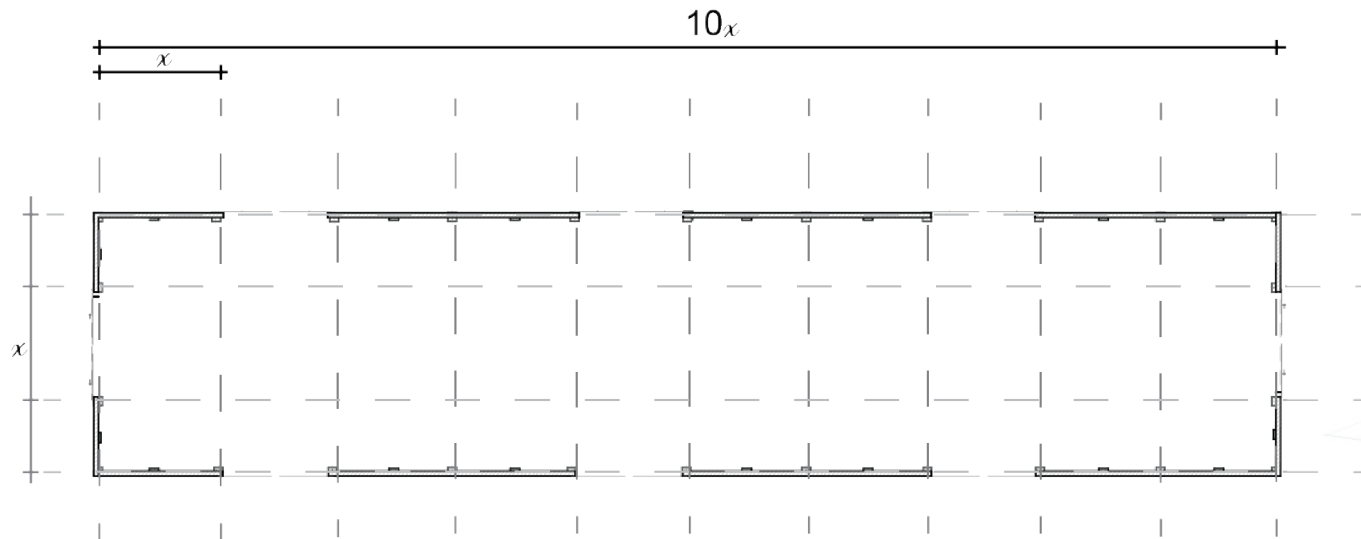


Fig 2.6: Drawing of Goods Shed indicating structural grid.

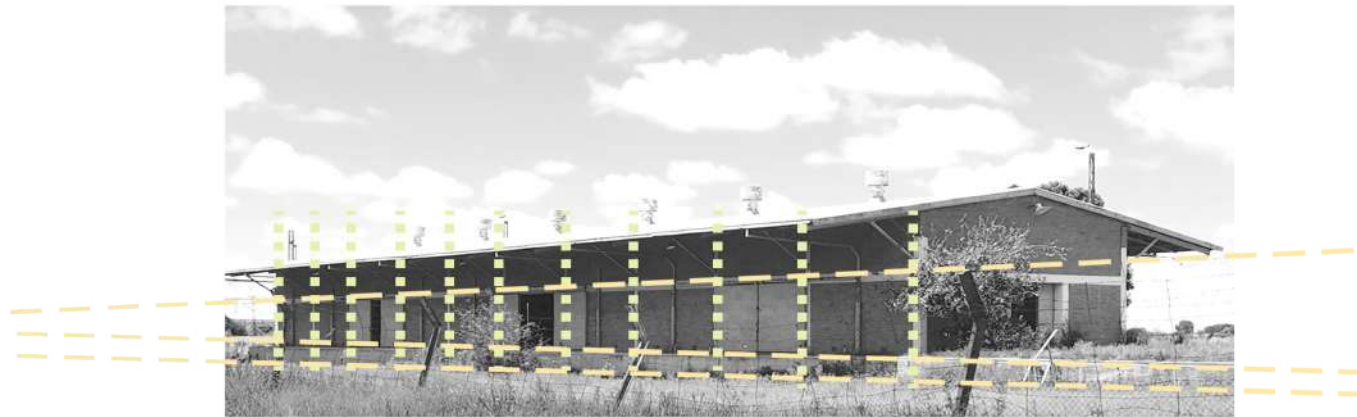


Fig 2.7: Photographs of Goods Shed analysing the rhythm of the shed.

Summary of lessons learned

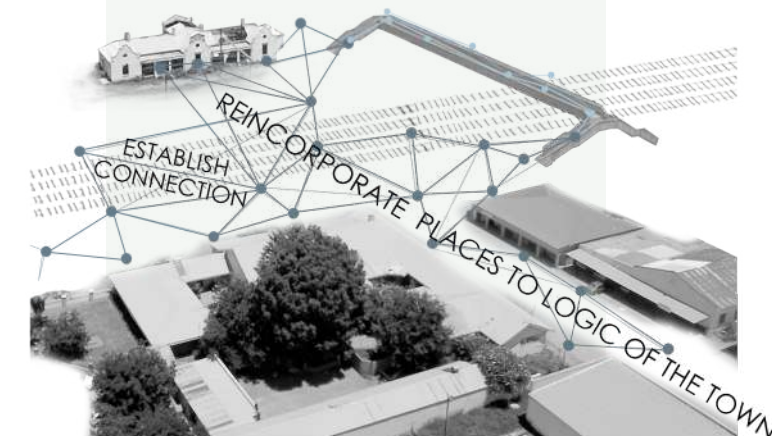
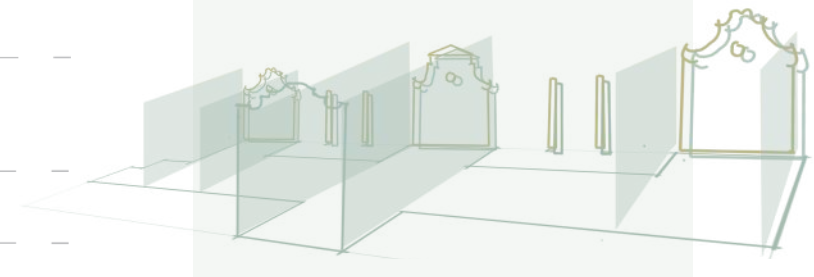


Fig 2.8: Diagrams indicating application of lessons learned.

2.5 Identifying the industrial archetype

The terrain as previously stated is an industrial terrain. Industrial architecture evolved into a combination of functionality and design. These buildings are constructed in exceedingly impressive manners. Both buildings on site form part of the archetype. As seen in the analysis of the two buildings the shed was built for function. Whereas the Train Station is built to a human scale.

Industrial ruins reflect the past. A sense of nostalgia is associated with ruins like the Train Station. These ruins also represent risk and neglect. Cowie and Heathcott (2003: 4) describe derelict landscapes as wasted cultural, social, and economic places. Elements of acceptance and hope are present in decaying industrial sites.

The revitalization of an industrial site requires an understanding of the development and characteristics of the archetype. Identifying the pragmatic relationship between function and form will aid in developing an understanding of industrial buildings and how they may function as other archetypes.

It is necessary to provide a short history of the South African Railway to establish the relevance of the construction of the train station and shed in conjunction with the rest of the timeline.



Fig 2.9: Photograph of Railway sign (Author: 2021)



Fig 2.10: Photograph of Railway track towards Leeudoringstad (Author: 2021)

2.6 South African Railway history.

Before the railway line was built ox and horse traversed through the high-lying interior of South Africa. Rail transport allows efficient transportation of bulk freight over long distances.

The discovery of gold and diamonds catapulted South Africa into economic development. There was a demand for transportation of materials with the rapid expansion of the mining industry.

The Natal Line was the first to be built in 1860 (Mdem, 2018: 8). The discovery of diamonds in Kimberly in 1867 drew people to the geographical center of the country. This created a need for quick transportation of construction material (Mabin, 2021: online). The discovery of gold in the Witwatersrand led to another rush in 1886. In 1905 a railway line from Cape Town to Johannesburg was laid. This railway line is the one that passes by Makwassie.

Train Stations were built, becoming the link with the world. These Train Stations became the hub of connection. The social, cultural, and economic activity took place at train stations. Newspapers, mail, and the distribution of fresh produce were delivered to and from the station. Farmers dispatched their harvest to markets, as is the case in Makwassie. A further description and investigation of the relationship between the Train Station and town are dealt with in Chapter 3.

Now that the relevance of construction of the Train Station and shed in conjunction with the rest of the railway history timeline has been established an investigation of the industrial archetype is required.

2.7 Industrial archetype

Industrial architecture, whether a train station, factory, storage shed, powerplant, etc., was built with two goals in mind: safety and efficiency. From its genesis industrial buildings “encouraged an efficient work process” as stated by Ljiljana Jervremovic (2012: 81) in *Aesthetics of industrial architecture in the context of industrial buildings conversion*. Efficient work processes are encouraged by creating large column-free interior spaces. These early examples included a circulation tower. The circulation tower is the only part of the building where ornamentation was placed (Jervremovic, 2012: 82) as seen in figure 2.11.



Fig 2.14: Farm Shed constructed of locally sourced materials (Jorgense: 2020, online)



Fig 2.15: Photograph of farm shed in Makwassie district (Author: 2021)



Fig 2.16: Photograph of farm shed in Makwassie district (Author: 2021)



Fig 2.11: Trent Mill, Chadderton, Oldham, Greater Manchester, England, 1882 (Jervremovic: 2012, 82)



Fig 2.12: Peter Behrens' AEG Turbine Factory Berlin, 1907 (Jervremovic: 2012, 83)



Fig 2.13: Photograph of Karoo Shed constructed with local materials (Schoeman: 2012, online)

The AEG turbine factory in figure 2.12 by Peter Behrens built in Germany in 1909 refers to an agricultural shed typology (Winter, 1970: 70). The architectural shed as an industrial building is also constructed purely for function. The visible structure indicates the construction method. Agricultural sheds as in figure 2.13 form part of vernacular architecture, are usually constructed out of locally sourced materials as seen in figure 2.14. Figures 2.15 and 2.16 are photographs of sheds in the Makwassie. All of these examples offer design solutions relating to the choice and use of material. The design of the shed simply aids in the identification of proper materials to be used not stipulating guidelines for the design of an architectural solution.



Fig 2.17: Alberts Kahn's Chrysler Half-Ton Truck Plant (Winter: 1970, 95)



Fig 2.18: Inmos Microprocessor Factory by Richard Rogers (Crook: 2019, online)



Fig 2.19: Proud Heritage Clothing Campus by Albert and Partners (2007: online)

“Around the early 1900s, the factory was seen as a building type deserving of architectural treatment in order to enhance the production of goods and dignify the workplace, as well as forge corporate identities.” (Jevremovic, 2012: 83). Later developments included clerestories as in Alberts Kahn's Chrysler Half-Ton Truck Plant building in figure 2.17. This functional cathedral interior is flooded with light.

Industrial architecture evolved into buildings that display the contents. Inmos Microprocessor Factory by Richard Rogers in figure 2.18 is an example of further development in the industrial archetype. The high-tech suspending structure is exposed and placed on the exterior to keep the interior column-free (Crook, 2019: online)

The Proud Heritage Clothing Campus by Albert and Partners (fig 2.19) is a contemporary example of industrial architecture in South Africa. The material choice (fig 2.20) was informed by the production process housed on the interior. This design offers a diverse and sensory experience whilst allowing unhindered, efficient production to take place.

Industrial architecture has come a long way. The archetype is much more integrated in terms of construction and design as with Proud Heritage Clothing Campus by Albert and Partners. The current condition of the post-industrial site is ineffective in encouraging public interaction. An alternative approach to industrial architecture can provide an appropriate solution to redefine the latent potential within the site identified as Terrain Vague. The alternative approach includes lessons learned in the development of the industrial archetype.

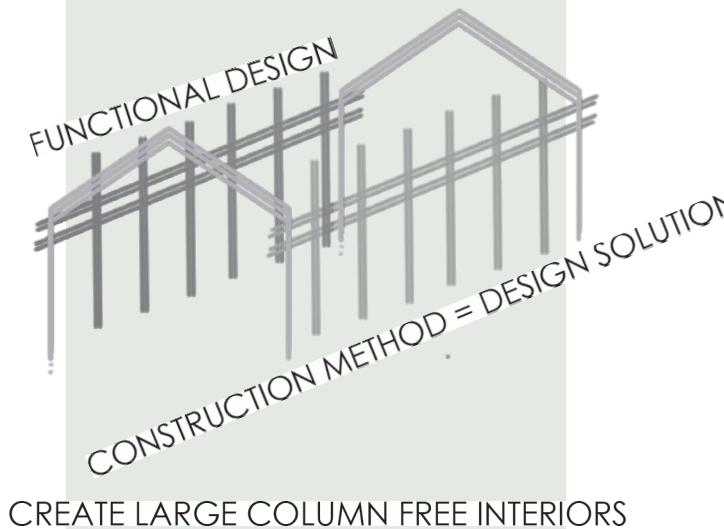


Fig 2.20: Application diagram (Author: 2021)



Fig 2.21: Proud Heritage Clothing Campus in Durban, South Africa by Albert and Partners (2007: online)

2.8 Glossary of terms

According to Adaptive Reuse : Architecture Documentation and Analysis by Dafna Fisher-Gewirtzman adaptive re-use includes different terms. Some of these terms include the following:

Alteration

“Work intended to change the function or appearance of a place.” (Wong, 2016: 13)

Conversion

“Conversions always affect the structure of a building. They extend the concept of refurbishment to interventions in the loadbearing members and/or the interior layout.” (Wong, 2016: 15)

Preservation

“Standards for Preservation:

1. a property will be used as it was historically or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships.” (Wong, 2016: 18)

“Preservation is no longer a retroactive activity but becomes a prospective activity.” (Wong, 2016: 19)

Re- Use

The intervention should consider all experiences of the Station and surrounding structures. The approach should be applied in a sensitive manner. The approach can be identified as adaptive re-use.

Refurbishment

“Modernizing or overhauling a building and bringing it up to current acceptable functional conditions (Watt, 1999). It is usually restricted to major improvements primarily of a non-structural nature to commercial or public buildings. However, some refurbishment schemes may involve an extension.” (Wong, 2016: 21)

“The difference between refurbishment and conversion, however, is that refurbishment does not involve any major changes to the loadbearing structure or interior layout. It therefore lies exactly between maintenance and conversion, but the extent of refurbishment works can vary enormously.” (Wong, 2016: 21)

Rehabilitation

“Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alteration, and additions while preserving those portions or features which convey its historical cultural or architectural values.” (Wong, 2016: 21)

Retrofitting

“The redesign and reconstruction of an existing facility or subsystem to incorporate new technology, to meet new requirements or to otherwise provide performance not foreseen in the original design. In other words, retrofitting is the replacement of building components with new components that were not available at the time of the original construction.” (Wong, 2016: 27)

All the terms stated above describe the way in which the intervention will be approached. Some of them will apply to the project, others are simply used as guide in the development of the design.



Fig 2.22: Collage of traintracks on site



CHAPTER THREE

Analysis

3.1. History and development of Makwassie

3.2. Macro Analysis

3.3. Micro Analysis

3.4. Urban Issue



3.1 History and development of Makwassie

300 v.C. The Koranna and Batswana tribes moved through this area in search of water and grazing for their cattle (Prinsloo, 2014: 35).

1870's

1870 Settlement of White farmers in Makwassie ward.

1876 Thomas Leask opens a shop in Wolmaransstad along the Makwassie spruit (Prinsloo, 2014: 18).



Figure 3.1 Thomas Leask House . Photograph taken by Author 2021

1900's

1905 Railway from Cape Town to Johannesburg via Kimberly is laid forming the southern boundary of present-day Makwassie (Prinsloo, 2014: 85).

The first small train station was built of corrugated iron.

1910's

1910 New Train station is built. The Station handled agricultural products from the old railway silo. Makwassie's first hotel is built and opened



Figure 3.3: Photograph of Train Station ; 1993 S.A.V.F

1800 's Makwassie is a sought after place for tribes to settle

8 April 1832

Weslyen Mission Station established in Witpoort in the Makwassie ridges on Leeuwfontein located 8 km from where the town is (Prinsloo, 2014: 35).

Mr Charles Cherry is appointed to oversee the construction of the railway line.

1800's



Figure 3.2: Drawing of Wesleyan Mission Station located in Maquassi in, *Grepe uit Makwassie se geskiedenis* (2014,52)

Transport and transport services between Kimberly and the Witwatersrand resulted in regular traffic between the two towns. The route ran over the Vaal River and followed the Makwassie-Spruit to where the Dowwespruit flows into the Makwassiespruit (Prinsloo, 2014: 23).

1906 Mr Charles Cherry built a supply store and house to oversee the construction of the railway line at Klipkuil Railway station on the farm Oersonskraal. This led to a settlement of wooden buildings (Prinsloo, 2014: 86).

1909 Makwassie is declared a town .



Figure 3.4: Photograph of First Train Station (2014:87)



Figure 3.6: Photograph of old grain silo; Author 2021

1913 Oldest town hall north of the Vaal River is built.



Figure 3.7: Photograph of Town hall; Author 2021

1920's

1920 New buildings are added to the existing school. The school would accommodate up to 285 students in 1953 (Prinsloo, 2014: 260).

1927 The railway line from Makwassie to Wolmaransstad and all along the Makwassie spruit is laid. The railway line made people return to Wolmaransstad due to the town's location near the N12.

1960's

1969 Dutch Reformed church construction finished. Architect B Hartman



Figure 3.11: Photograph of Dutch Reformed Church; Author 2021

1990's

1993 The Trains station's doors are closed.



Figure 3.8: Photograph of first hotel; 1910 (2014:113)

1911 Makwassie school opens its doors with a two classroom building also functioning as a school hall (Prinsloo, 2014: 255).

1930 Railways supply electricity to certain institutions in the town

1946 English Church is built



Figure 3.10: Photograph of English Church; Author 2021

1974 Ons Eie Retirement village sponsored by S.A.V.F.* is built (Prinsloo, 2014: 280).

1975 Nederduitsch Hervormde Kerk built.



Figure 3.12: Photograph of Nederduitsch Hervormde Kerk ; Author 2021

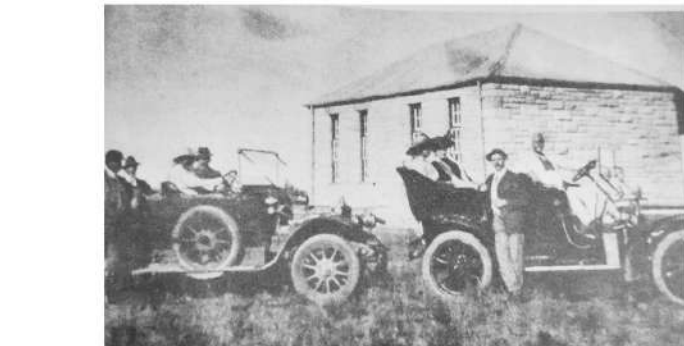


Figure 3.9: Photograph of School 1911 (2014:255)

1930's

1940's

1970's

* S.A.V.F. -Suid-Afrikaanse Vroue Federasie

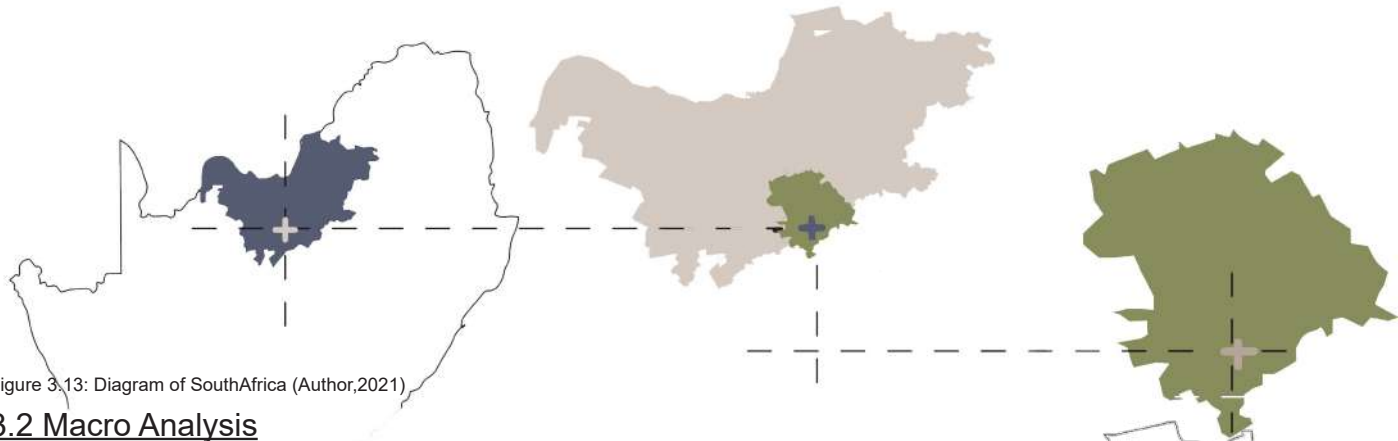


Figure 3.13: Diagram of South Africa (Author,2021)

3.2 Macro Analysis

Makwassie is located in North-West province in South Africa. It was proclaimed as town in 1910 by Charles Lacy Strattin Cherry. The town is located at the convergence of the R505 and R502 next to the Makwassie spruit. The town has a population of 919 individuals, the neighbouring settlement Lebaleng has 12 433 residents (Mabin, 2021: online).



Figure 3.15: Diagram of North West (Author,2021)

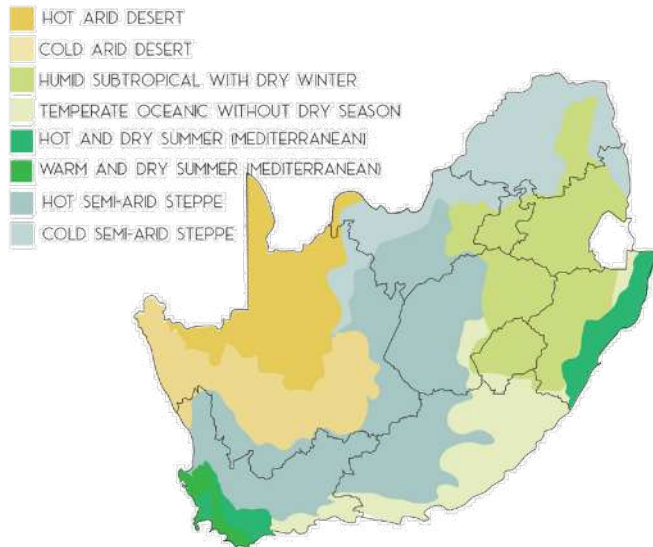


Figure 3.14: Climate diagram of South Africa according to Climate data.org. redrawn by Author.

Reasons why settlement was founded in this location.

In 1905 a railway from Cape Town to Johannesburg via Kimberley is laid forming the Southern boundary of present-day Makwassie. In 1906 Mr Charles Cherry built a supply store and house to oversee the construction of the railway line at Klipkuil (a farm forming part of present day Makwassie). Railway station on the farm Oersonskraal and Klipkuil led to settlements of wooden buildings that lead to permanent settlement and the declaration of the town in 1909.

Makwassie is a small farming and digging community located along the Makwassie-spruit. The region has a semi dry climate and is characterized, and forms part of the hot semi-arid steppe with 530mm rainfall per year. The climate and natural resources allow for a strong agricultural presence.



SITE WITH DISTANCE RADII INDICATED



Figure 3.16: Google Earth image adapted by author

- Business
- Schools
- Memorials/ Monuments
- Silo
- Medical Facilities
- Religious institutions
- Historical sites / buildings

Density + Built form

Makwassie was measured according to the well-known grid pattern without any investigations into soil conditions. This has led to many undeveloped proclaimed plots in the town due to the wide, undevelopable claysoil strip.

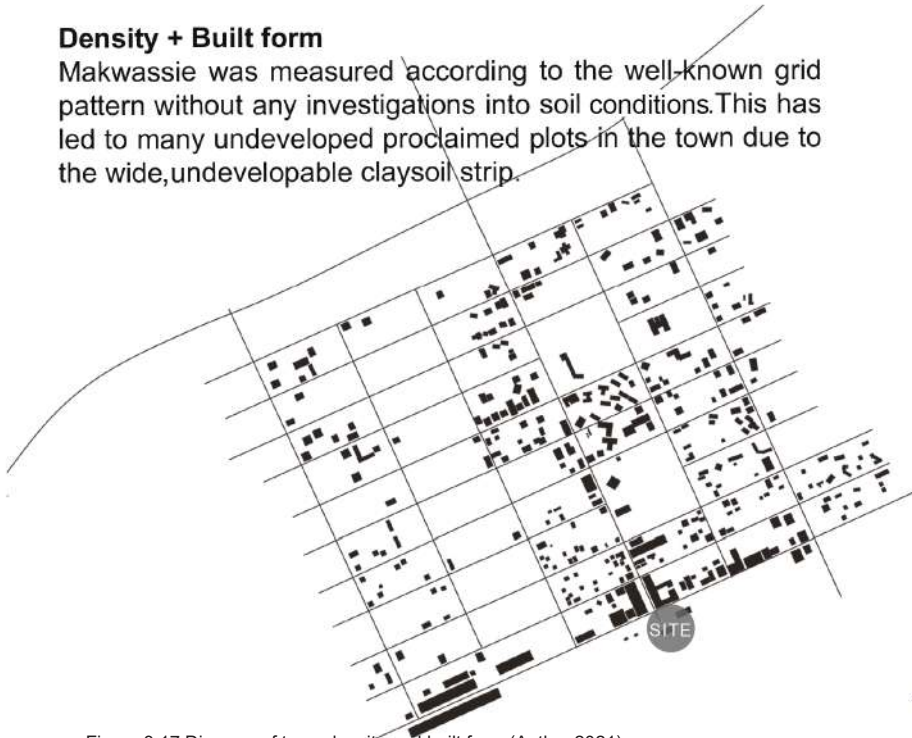
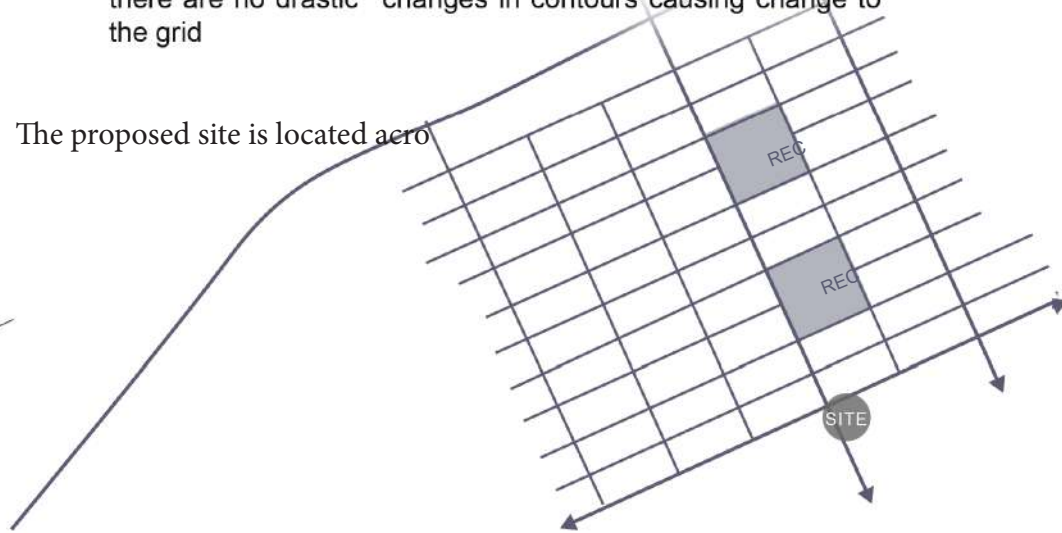


Figure 3.17: Diagram of town density and built form (Author,2021)

Primary grid

The proposed site is located in across the densest area of Makwassie. The primary grid is the well known rectangular grid pattern. This layout works well with the surrounding context as there are no drastic changes in contours causing change to the grid



The proposed site is located across

Figure 3.19: Diagram of town grid (Author,2021)

Town organisation through its main axis

The primary axis of the town grid, created by the R505 changing into Cherry avenue and Potgieter Street, connects at the intersection of the R505 from Wesselsbron and the link with R502.

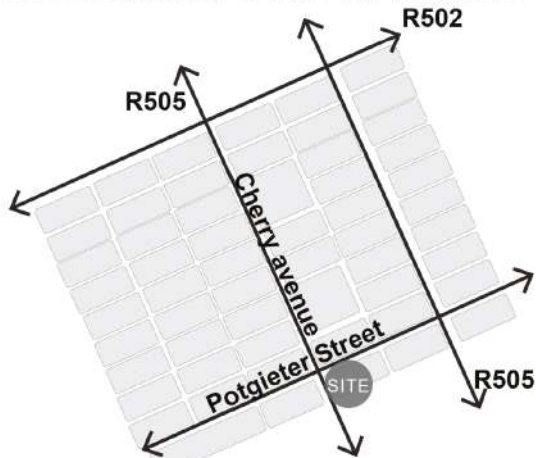


Figure 3.18: Diagram of town organisation (Author,2021)

Landuse

- Landform artificial area (Digging)
- Recreational Areas
- Residential landuse



Figure 3.20: Diagram of landuse in town (Author,2021)

ARIAL VIEW OF SITE WITH IMMEDIATE CONTEXT

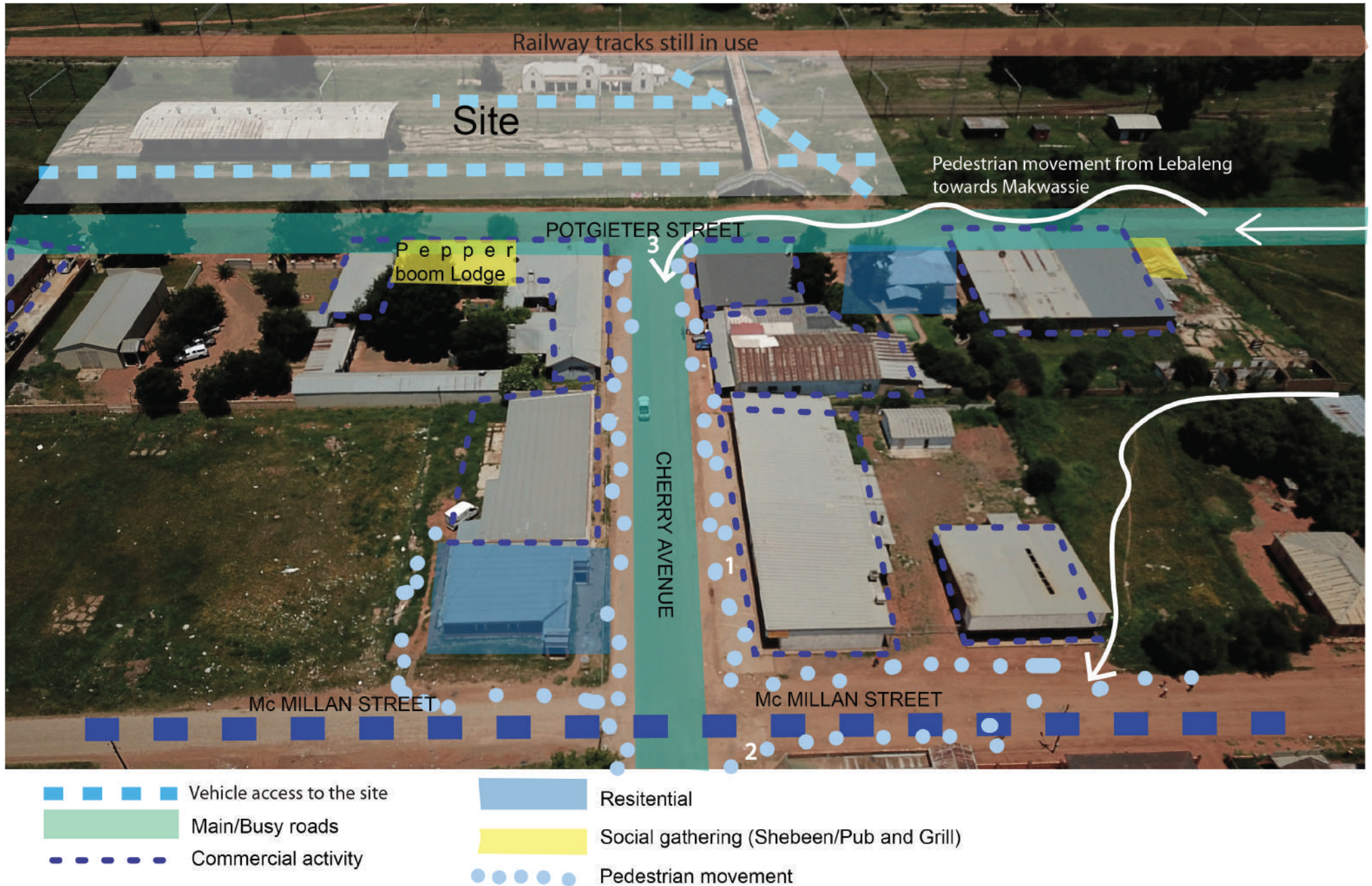


Figure 3.21: Drone image of site, analysing the terrain (Author: 2021)

KEY TO NINE SPECIFIC PLACES IN MAKWASSIE



Fig 3.22 :Birds eye view of Makwassie indicating specific locations (Author: 2021)



1.

Fig 3.23: Image of Potgieter Street (Author: 2021)



2.

Fig 3.24: Photograph of Potgieter Street (Author: 2021)



3.

Fig 3.25: Photograph of context (Author: 2021)



4.

Fig 3.26: Photograph of McMillan Street (Author: 2021)



5.

Fig 3.27: Mack's Petroleum gas station (Author: 2021)



6.

Fig 3.28 : Suidwes Cooperation (Author: 2021)



7.

Fig 3.29: Makwassie Clinic (Author: 2021)



8.

Fig 3.30: Makwassie Post Office (Author: 2021)



9.

Fig 3.31: Plaasmark in Makwassie (Author: 2021)

3.3 Micro Analysis



Fig 3.32: Photoshop collage of railway lines (Author: 2021)

Existing Built Fabric

This part of the site analysis focuses on the existing built fabric. The site currently has three large structures. These three structures include:

1. Train station
2. Goods shed
3. Bridge.

The photo analysis takes an in-depth look at the existing conditions of the isolated structures.

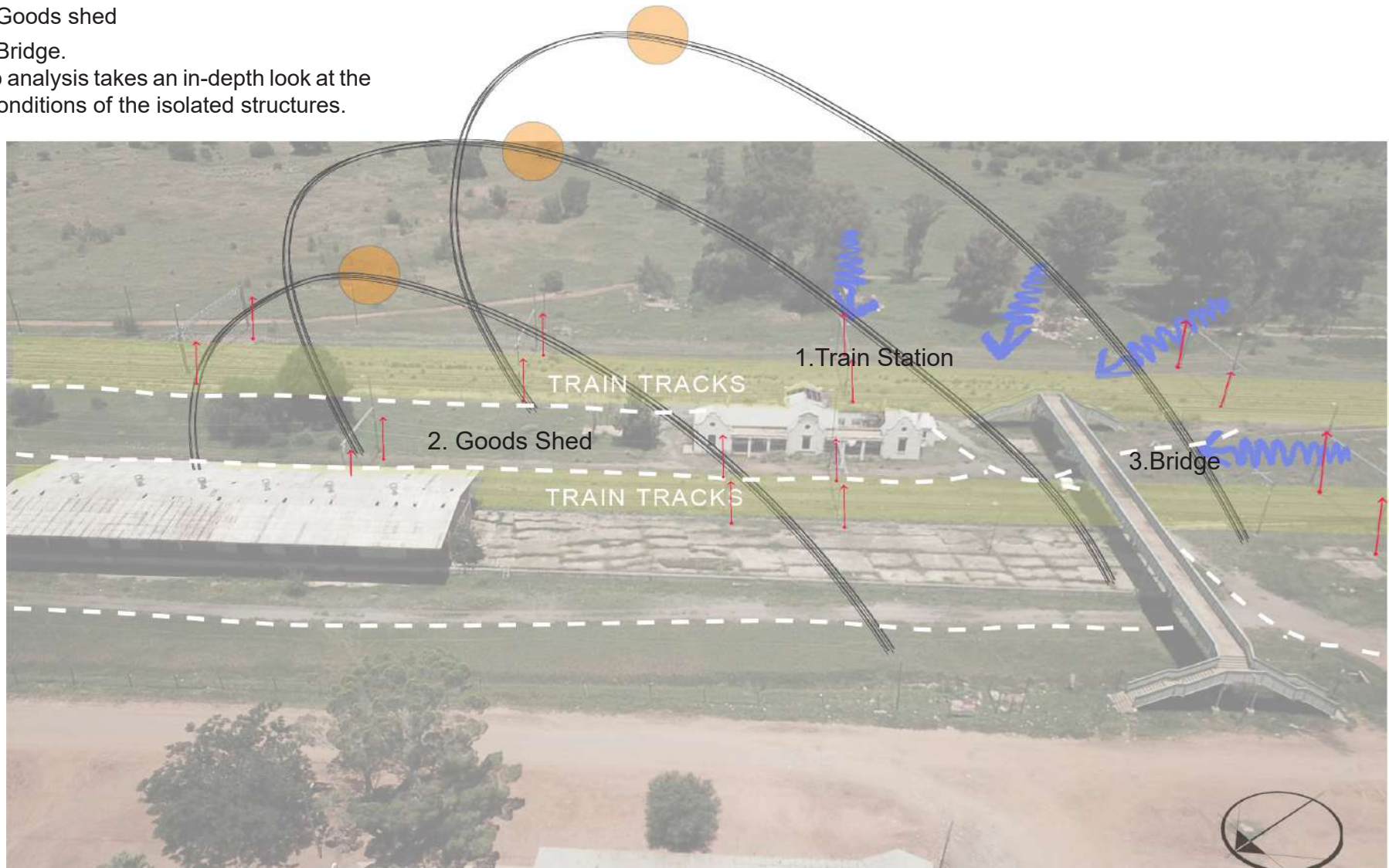


Fig 3.33: Site analysis diagram (Author; 2021)

Materiality of existing structures

Train Station

Roof: Gable, hip and Dutch pitched roofs are present in the construction of the station. Timber trusses are used with corrugated iron roof sheeting as in figure 3.34.

Wall: The walls of the station are 220 mm thick load-bearing walls with a granite plinth (Fig 3.44) forming part of exterior walls. Concrete columns (250 x 380 mm) with brick infill are used on the north and south facades.

Floor: The station is constructed with dolerite /ironstone foundations (Fig 3.36). The western section had hardwood floors, where the eastern section has a cement screed as floor. There are granite thresholds at the external entrances as in figure 3.44. The building is elevated with two steps up to finished floor level.



Fig 3.34: Image of interior of train station.



Fig 3.35: Image of interior of train station.



Fig 3.36: Photograph of ironstone foundation.



Fig 3.37: Timber window frame still visible in current structure



Fig 3.38: Photograph of stone mantelpiece



Fig 3.39: Image of interior of train station.

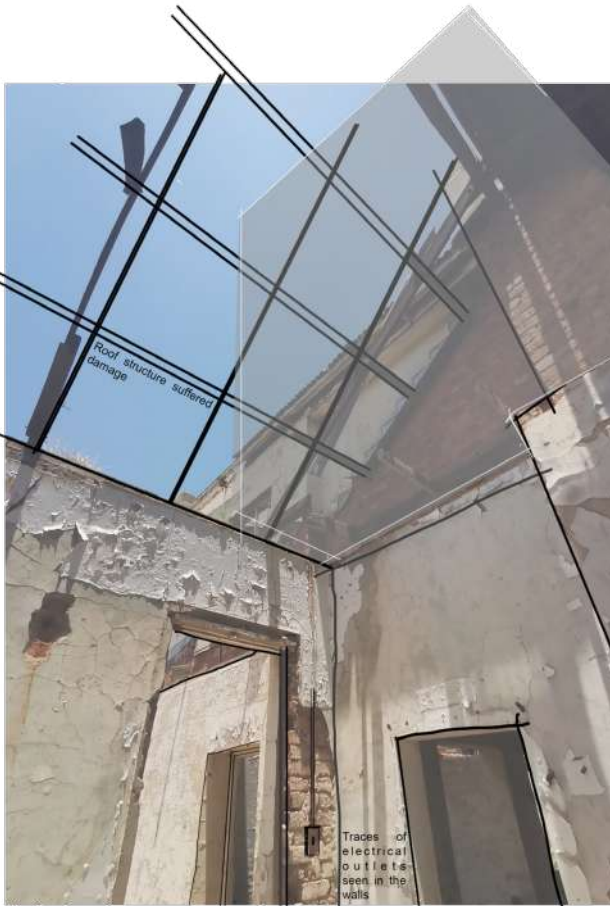


Fig 3.40: Image of interior of train station.



Fig 3.41: Image of hallway of train station.



Fig 3.42: Exterior of train station.



Fig 3.43: Photograph of the roof.



Fig 3.44: Photograph of threshold indicating granite threshold and plinth.

The Goods Shed

Floor: The ground floor level of the Goods Shed is 1000 mm from natural ground level.

Wall: Concrete columns with a concrete ring beam form the loadbearing structure with brick infill. Additional brick buttresses are on the interior of the building.

Roof: A gable pitched roof with steel trusses and corrugated iron roof sheeting.



Fig 3.45: West Elevation of shed.



Fig 3.46: Interior of the shed.



Fig 3.47: Interior of shed with close up image of sliding door.

The Bridge

The bridge is a utilitarian structure used by pedestrians in the event of a train passing. Cross braced steel beams are supported with concrete bases. Pre-cast concrete elements are used to create the stairs and floor of the bridge. Steel plates bolted together form the balustrade of the bridge



Fig 3.49: Image of the bridge walkway.



Fig 3.50: View from the top of the bridge towards train-station.



Fig 3.51: Image of the bridge.



Fig 3.52: Image indicating power box underneath the bridge.

3.4 Urban Issue

The site analysis identified strengths, weaknesses, opportunities, and threats of the site. Detachment from the town is one of the most substantial issues regarding the site. The disassociation between the town and site (specifically the Train Station) as urban issue takes place on five levels.

1. The first level is the relationship of the site within the larger agricultural context of the region. The design question at this level is: How is the architecture specific to the agricultural region it is located in?
2. The second level is the urban link with the town. Design questions include: What is the relationship between the site and the larger town? Where is the central business district in relation to the site?
3. The third level is the physical urban link between the Train Station and the town.
4. The design exchange between the existing infrastructure and new additions is the fourth level. How does the Train Station, Goods Shed, Bridge, and the new addition form an architectural relationship?
5. The fifth level is the new landscaping to be designed. How will the physical landscaping weave through the site redefining the latent potential of the site?

The solution to most of the questions stated can be resolved through the creation of public spaces. Spaces for exchange placed throughout the town will extend the site into the town.

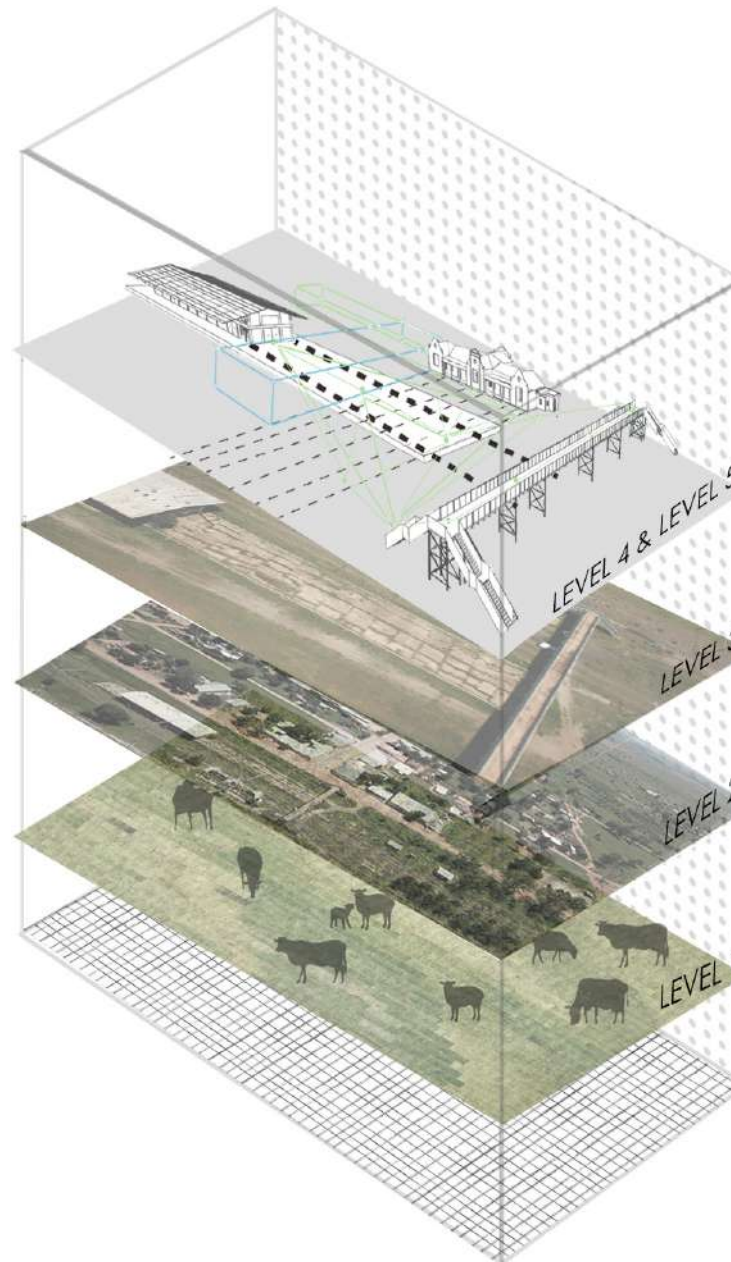


Fig 3.52: Levels of interaction (Author: 2021)

Public infrastructure is an opportunity for urban intervention. Neighborhoods according to Steyn should be walkable, self-sufficient regarding the economy and mixed-use streets (2005: online).

The concept for a design solution regarding urban issues is to provide a framework and allow the community to develop their neighborhoods. The development of urban vitality will be approached through the application of urban principles.

Urban vitality can be created by creating urban magnets. "Urban magnets are spaces, activities or objects that attract people" (White, 2020: online).

The authors of Urban Magnets (Haden, 2020: 12) identified six urban magnets which attract people:

1. Activity Subcultures: Activities that attract cultural groups within larger cultures.
2. Specialty Retail: These form part of activity subcultures. Galleries, bookstores, etc. that attract subcultures.
3. Visible Production: Workshops or studios displaying creative and creation processes.
4. Educational/Learning: Art schools, drama schools, etc.
5. Programming Events: Weekly or daily events. Farmers markets, daily vendors.
6. Unique Urban Form: Public art, performing arts centres, galleries.

These urban magnets can be placed throughout the town forming the important urban link required to establish a relationship between the site and the larger town. The numbers on figure 3.35 indicate historic sites along with churches.

The urban vision for Makwassie will be developed by connecting these sites. The railway bridge over the spruit at number 8 was built during the same time as the Goods Shed therefore it has a significant connection to the Train Station.

The walkway over the bridge offers views over the spruit and Makwassie landscape. The bridge is 1,2 km away from the site. A cycling/hiking route is introduced moving through the town visiting significant sites starting at the Train Station. The route moves through town along the spruit and Makwassie dam, moving over the bridge.



Fig 3.53: Routes indicated through town with specific locations identified as places to visit along the cycling route.



Infrastructure, such as public buildings which are already in town, can be incorporated into the final design of the skills centre. This creates opportunities where students from the skills development center can utilize existing infrastructure. For example, the town library can form part of an extended program for the centre.

Small urban community gardens can be placed throughout the town especially moving towards Lebaleng extending the program into the town. The students of the skills development centre can teach the permaculture skills, they were taught at the centre, to the community.

The Old Town Hall can form part of the development in a later phase becoming a gallery or other specialty retail magnet. The strengthening of existing networks and upgrade of existing infrastructure is important to urban intervention.

The images in figure 3.55 show collages of proposals for the urban vision. The objective is to create spaces which the community can utilize.

Fig 3.54: Important Locations indicated in relation to the site.



Fig 3.55: Urban intervention proposals.

CHAPTER FOUR

Techné

4.1. Techné concept and Intentions

4.2. Techné precedents



4. Technical chapter

This chapter investigates the technical concept and intentions of the design. Precedents relating to site, program and restoration are investigated and related to the structural concepts and intentions.

4.1. Techne concept and intention

Construction Touchstone

The construction touchstone describes the manner in which the construction of floor, wall and roof will be approached. The development of the touchstone started with the combination of the two strongest design concepts, Interpose and Ruin.

The concept of Interpose provides suggestions relevant to the manner in which the new addition reacts and attaches to the ruin. Interpose means to place in-between, the intervention is placed in-between the ruin.

The concept of bridge informs the selection of materials by revering to the silo. The silo offers architectural inspiration with its industrial characteristics along with good shed. Other inspiration in the choice of materiality is taken from materials used in the construction of the Train Station.

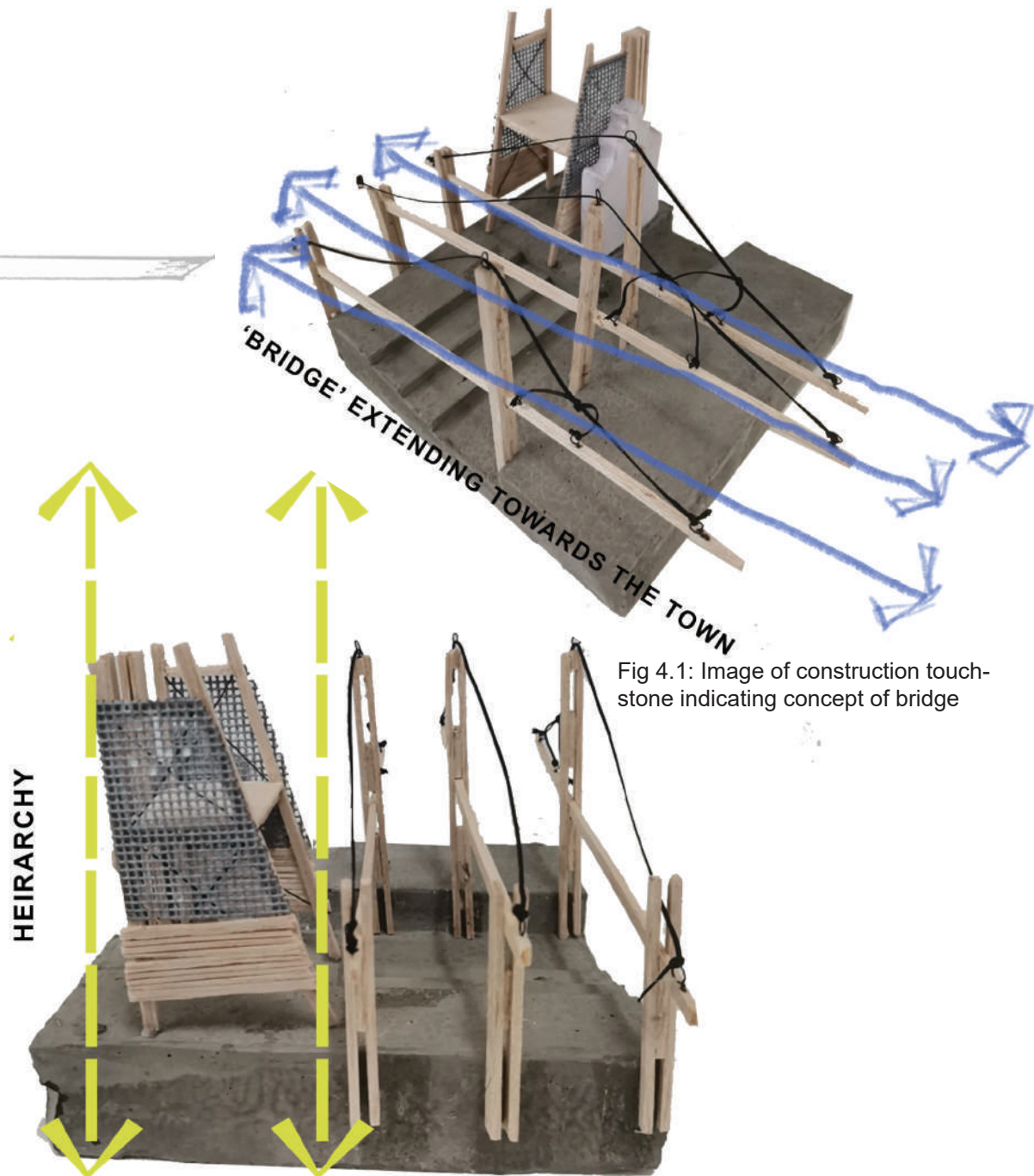
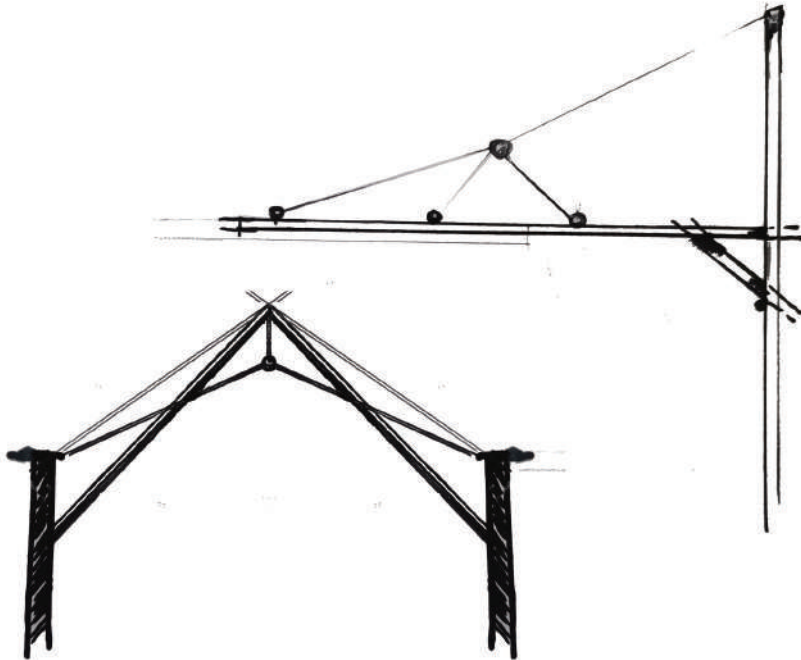


Fig 4.1: Image of construction touchstone indicating concept of bridge

Fig 4.2: Image of construction touchstone indicating heirarchy.

Inspiration is derived from the train infrastructure. By examining the structure one can identify different ways in which the structural systems can be approached. The deconstruction of the structure led to investigations for the design of the new trusses.

The model indicates the manner in which the concept of bridge is applied by extending the existing by attaching the new to the old from the train station towards the goods shed.



The development of the tower behind the gable started by re-appropriating the pitched roof of the train station. Light can enter into the building by splitting the pitched roof. The tower rises above the gable, extending towards the sky, becoming a beacon in the town.

The concept of bridge is applied in the model by changing the western gable into a tower, creating a new form of hierarchy in the design.

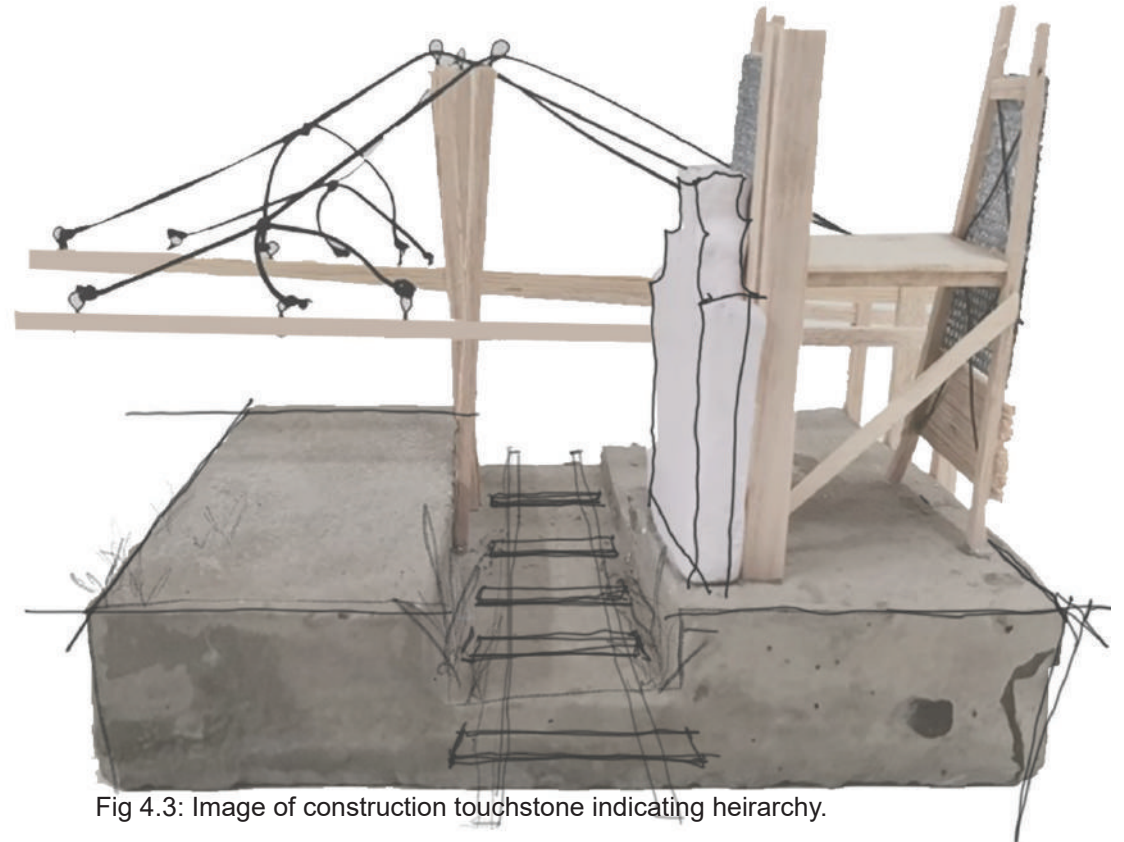
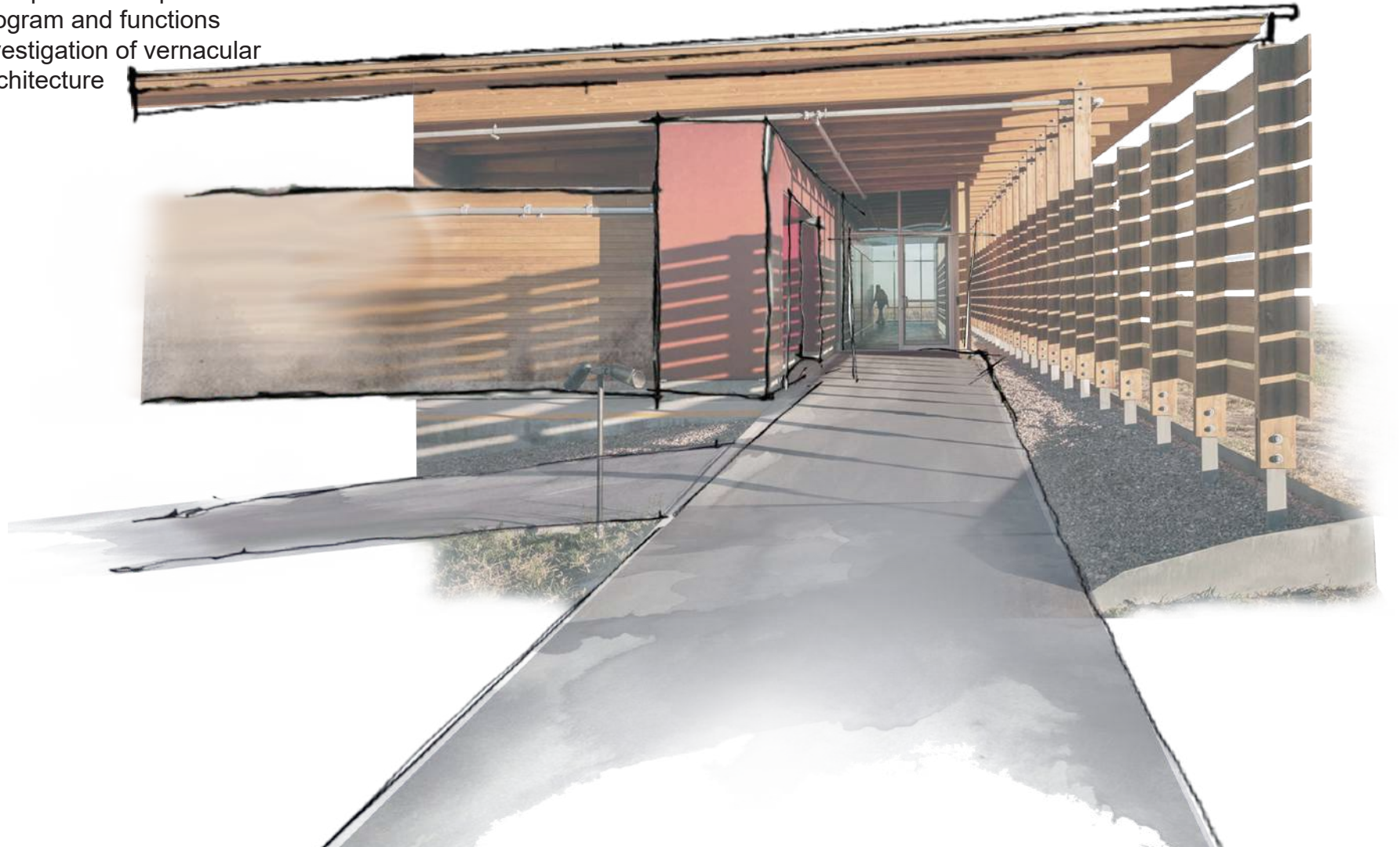


Fig 4.3: Image of construction touchstone indicating heirarchy.

4.2. Techne Precedents

4.2.1 Rangeland Laboratory Facility

Client: Chadron State College
Architect: BVH Architects
Location: Chadron, United States
Year: 2015
Contribution: -Floor plan development
-Program and functions
-Investigation of vernacular
architecture



Introduction

The Rangeland Laboratory is located in the south-east of Chadron, United States. The building functions as a laboratory, instructional and office facilities for the Rangeland Agricultural Wildlife Program. The investigation of this precedent will inform the design development along with the theoretical approach to the tectonic resolution of the proposed design.

Structure

Type and System details

A loadbearing box forms the structure of the lower level and south wing of the design. These loadbearing structures consist of in-situ cast walls (Fig 4.4). The rest of the design consists of timber frames stretching from the lower level through the upper level to the roof. Curtain walls along with freestanding walls form the envelope of the building. (Fig 4.6)

Finishes

Some of the walls are clad with metal taking inspiration from the corrugated metal used in the construction of existing barns. The wood and corn-crib siding also relates to the vernacular materials and ways of construction.

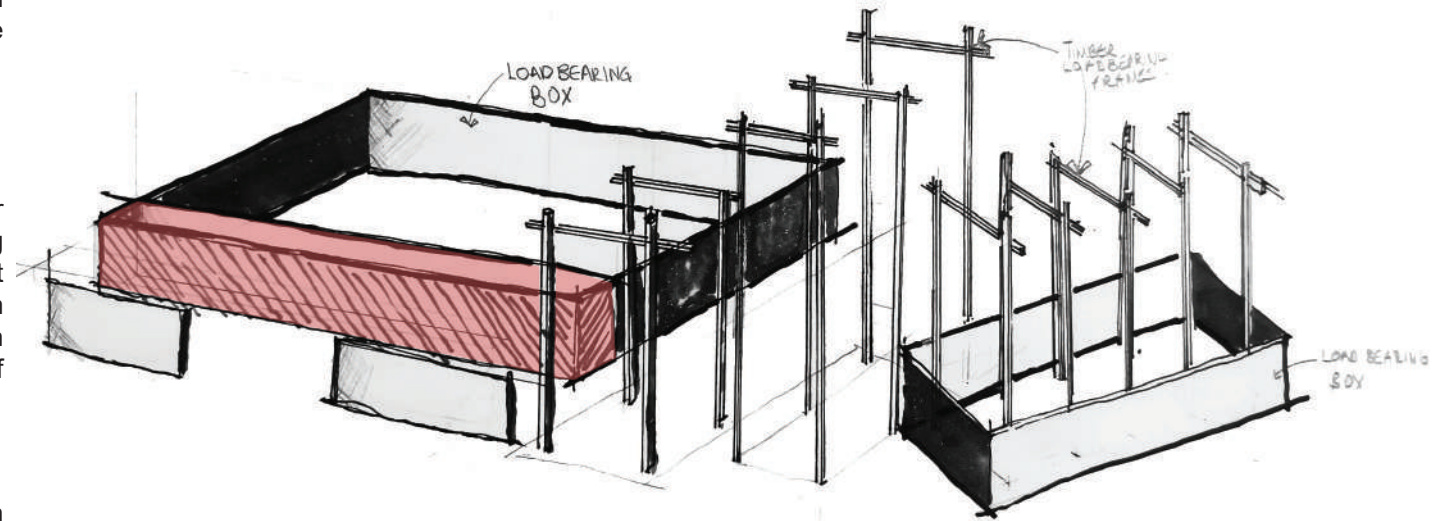


Fig 4.4: Diagram of Rangeland lab structure.



Fig 4.5: East facade showing curtain walls (Crosby, 2021: online)

The architect explains that:” Board-formed concrete and the rhythm of the exposed wood structure lend life and cultural context to the facility’s roots in the ranching and agricultural tradition.” (Crosby, 2015: online).

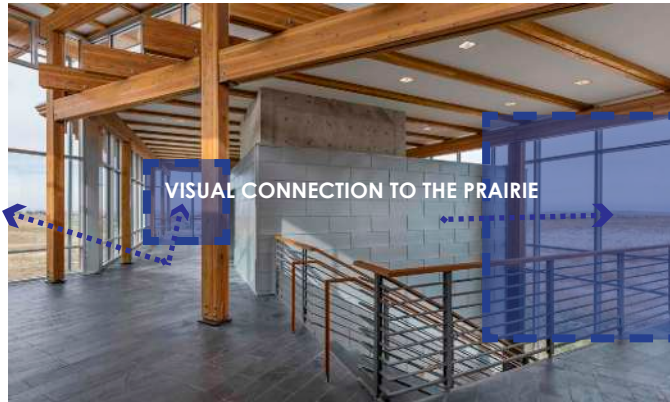


Fig 4.7: Upper level lobby (Crosby, 2021: online)

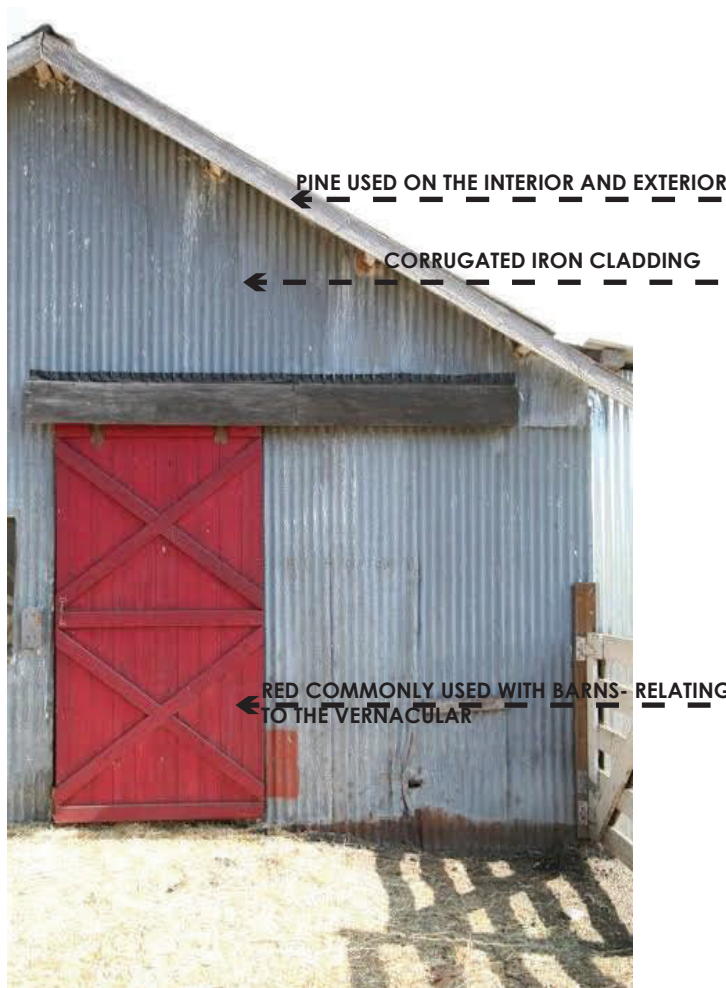


Fig 4.6: Barn exterior cladding (Crosby, 2015: online)

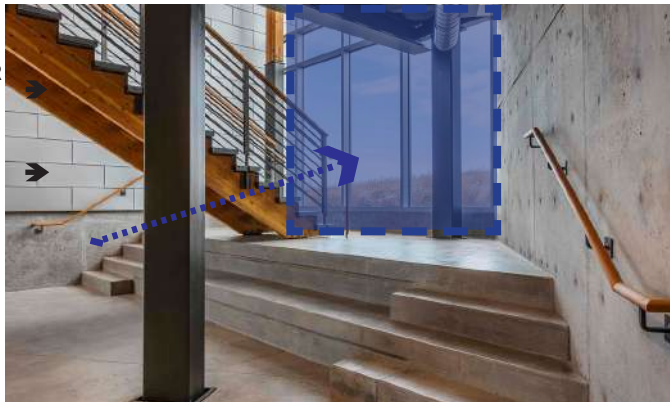


Fig 4.8: Downstairs lobby (Crosby, 2015: online)

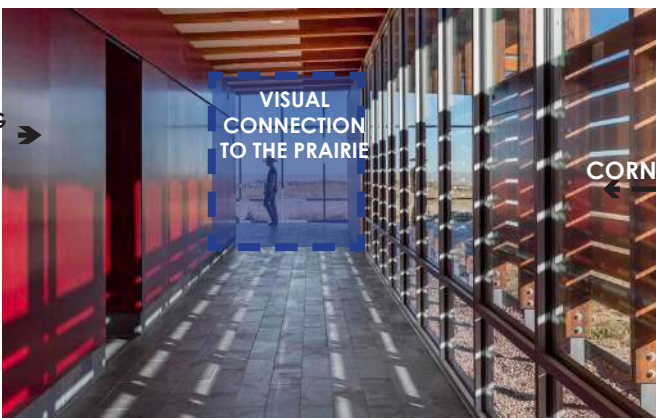


Fig 4.9: Entrance hall (Crosby, 2015: online)

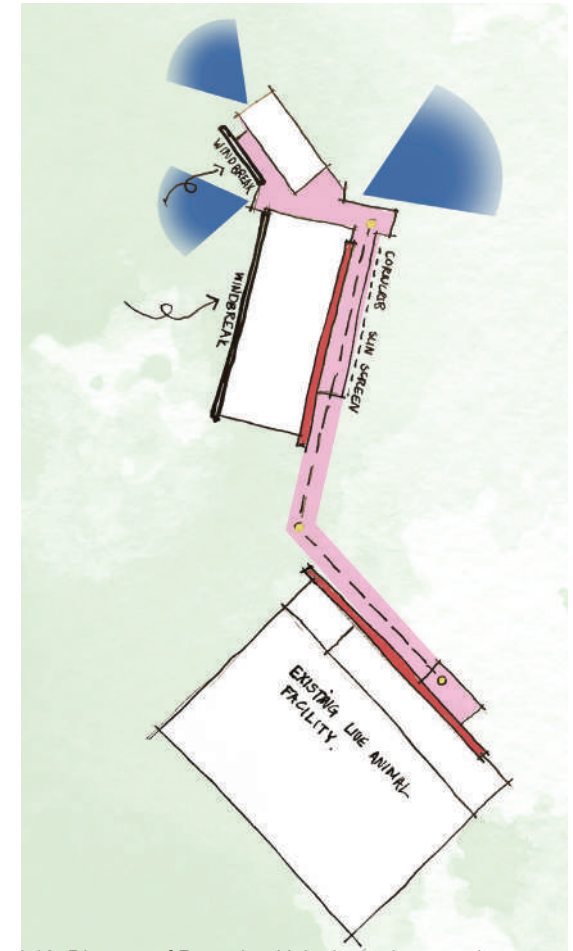


Fig 4.10: Diagram of Rangeland lab site and connection



Fig 4.11: Barn exterior indicating materials (Crosby, 2015: online)

Site accessibility & material availability

The building is an addition to an already existing agricultural learning facility. This means that access to the site has already been established. Material availability will not be a problem as they are ordinary construction materials. The pine frames and siding is often used in the construction of buildings in this region, making the material readily available.

Climate and service requirement

The structure is aligned along two axes forming a natural windbreak (Archdaily, 2015: online) as in figure 4.13. The curtain walls are placed in positions to take advantage of the seasonal sun. The corncrib siding filters some of the harsher sunlight into the building.

The building services are placed in zones where they proficiently serve the served spaces. The freezer, cooler and laundry room is placed in-between the soils lab and animals lab with access from both. The mechanical room is located on the lower level of the design containing the building services such as the HVAC System. An elongated red box structure hides the service pipes of the labs along with other building services systems. Other services such as restrooms are placed on the upper floor and lower floor.

Circulation

Vertical circulation is located in the centre of the design at the intersection of the two wings and the northern most point of the design leading into the prairie. The vertical circulation consists of stairwells that could function as fire escapes.

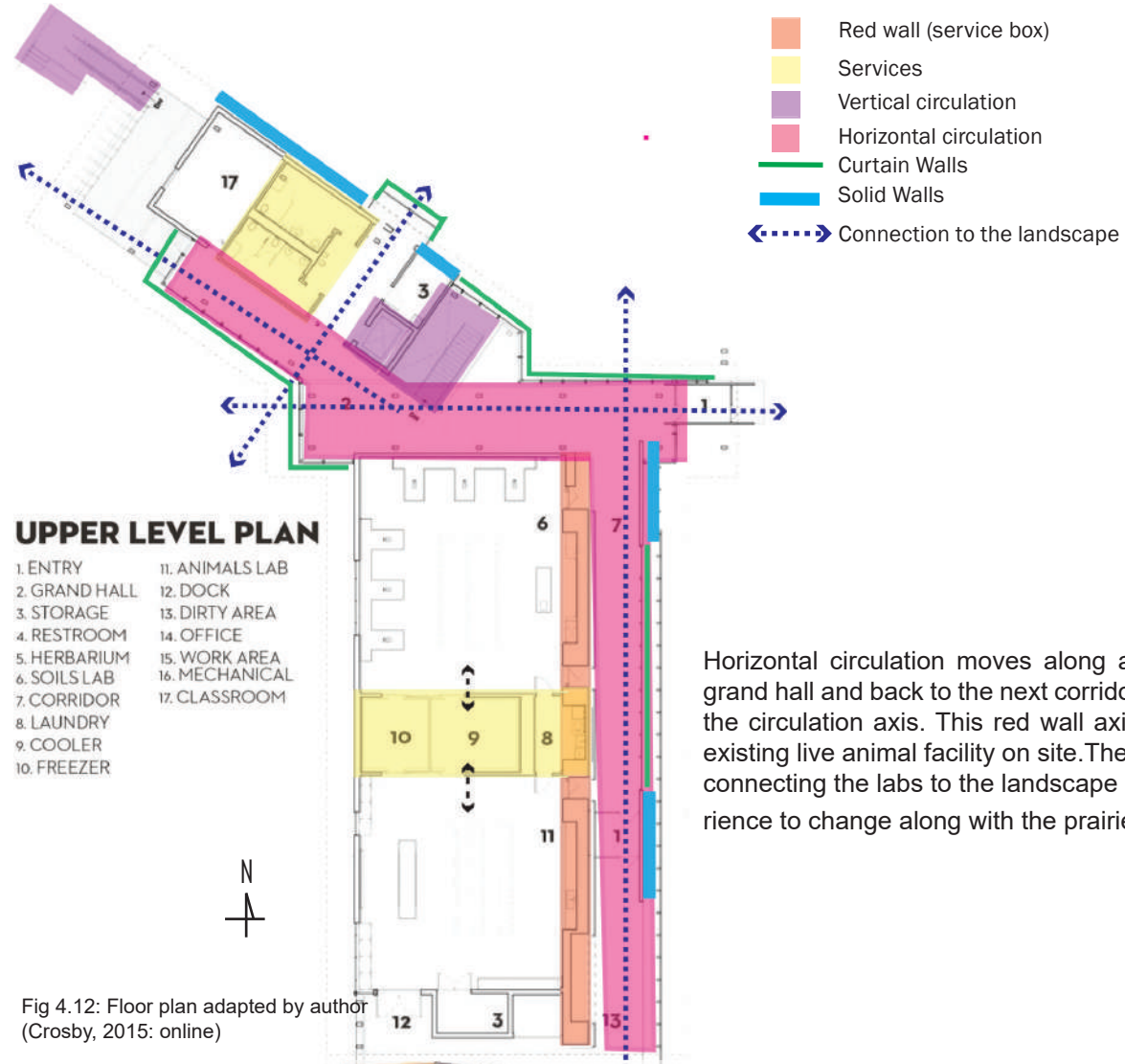


Fig 4.12: Floor plan adapted by author (Crosby, 2015: online)

Horizontal circulation moves along a corridor into the grand hall and back to the next corridor. A red wall forms the circulation axis. This red wall axis moves from the existing live animal facility on site. The circulation aids in connecting the labs to the landscape allowing the experience to change along with the prairie.



Fig 4.13: West facade indicating windbreakung walls (Crosby, 2015: online)

User requirements

The clients required an instructional facility which is classified as A3 in the SANS 10400. Thus it can be said that there should be 5m² per person according to the NBR (in table 2 in the NBR).

This instructional facility has very specific requirements as it forms part of the Agriculture and Wildlife program facilities. Laboratories, classrooms and office spaces where required in the program. The user requirements are much more than this practical statement. The user required a space where they can be taught or tested whilst observing the natural landscape in which the information learnt will be applied.

Application of observations

This precedent is applicable to the design as it has the same program. However the difference is that the intended design will include more classrooms and practical workshops. The precedent has a constant connection with the landscape framing multiple views as one moves through the building. This is another useful lesson learnt. Circulation axis moving through the intervention should have constant references back to the town or open veld behind the train station.

This application of the precedent informs the theoretical concept of creating a didactic landscape. It informs the dweller of the place, teaching them.

This provides the observer of an awareness of place by being blatant in the execution of the concept. Look! Witness the cows grazing in the veld, or see how the church bell tolls and the children in front of the corner shop.

The combination of loadbearing boxes (applied to the design in the train station) and frames (applied to the design as new intervention) forms a dialogue between the structures. The intervention should be in constant connection with the town. This removes the station from its far away pedestal reintroducing it to the town's fabric.

The precedent prompts the investigation in to vernacular agricultural structures as to select materials for the construction of the new skills centre. Concrete, Brick and corrugated iron are some of the materials. The farmstead is usually constructed with loadbearing brick walls, some are steel braced frames with corrugated iron.



Fig 4.16: Image of first floor windows in existing train station indicating the current connection with the veld.

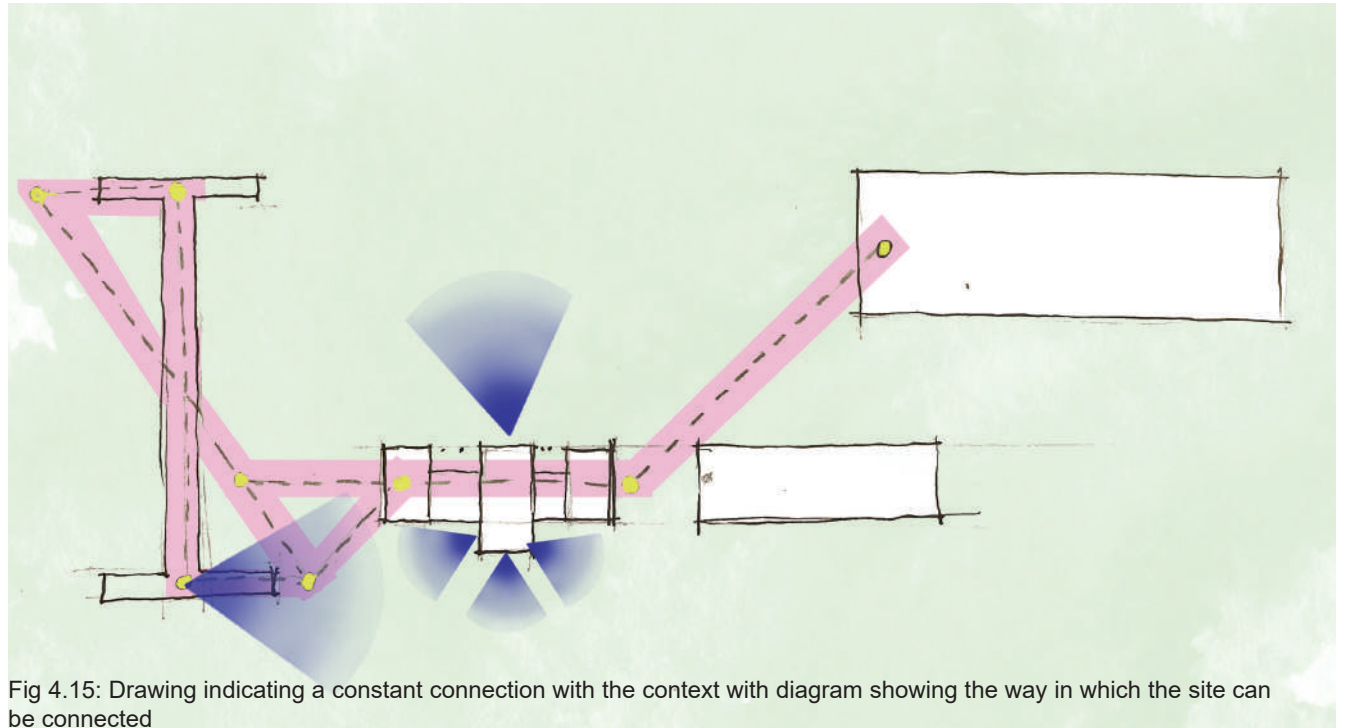


Fig 4.15: Drawing indicating a constant connection with the context with diagram showing the way in which the site can be connected

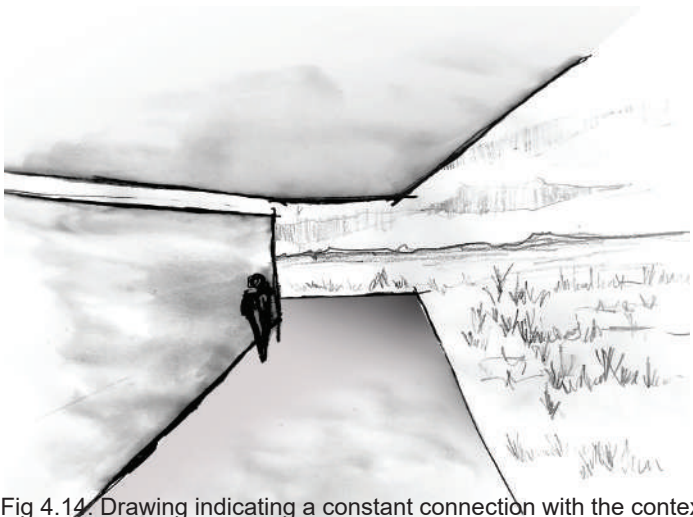


Fig 4.14: Drawing indicating a constant connection with the context

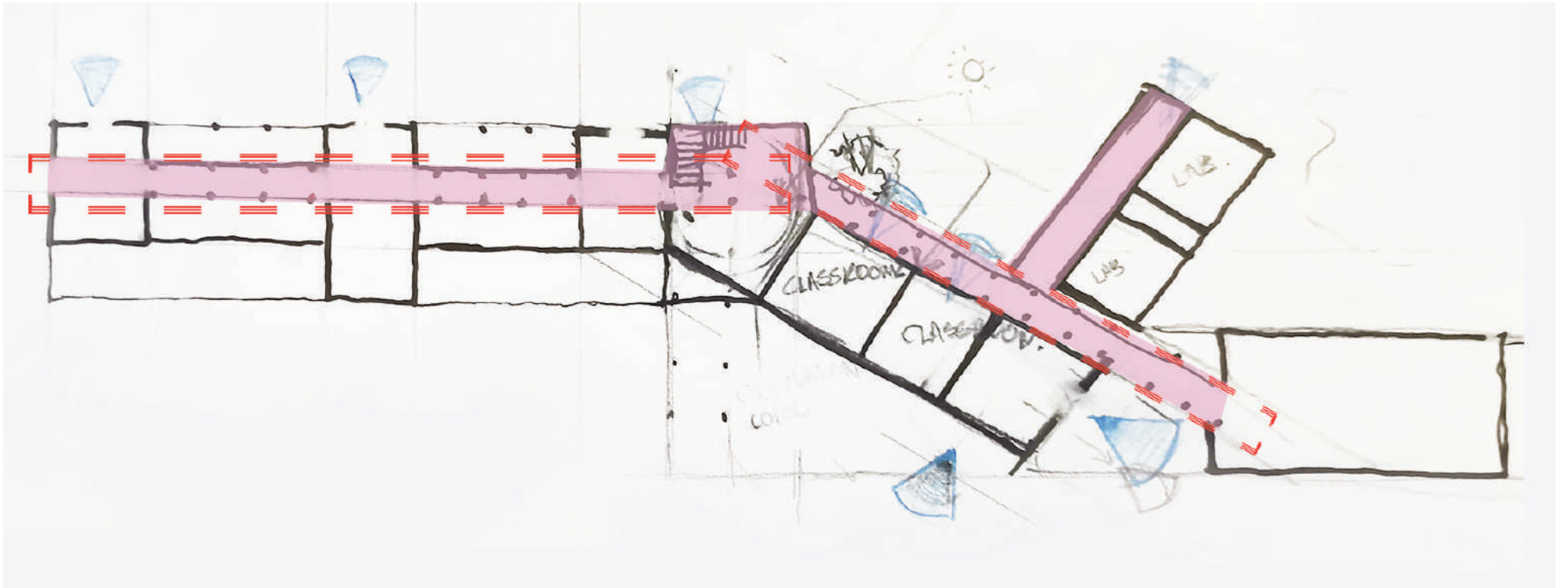


Fig 4.17 : Diagrammatic plan.

4.2.2 Main Building , University of the Free State

Client: University of the Free State
Architect: Bannie Brits Architects
Location: University of the Free State,
Bloemfontein, South-Africa
Contribution: - Restoration
- Relationship between existing
and new



Fig 4.20: Image of UFS main building towers (Herholdt, 2014: 274)

This precedent is located on the University of the Free State Campus in South Africa. The Main Building was constructed in 1905 and was designed by architect P. Taylor (Herholdt, 2014: 274). The nature of the intervention done is identified as rehabilitation or adaptive re-use.

The conceptual approach was to let light into the building whilst opening up the interior. All of this had to be done without causing changes to the exterior of the building. The new plan resulted in “large open spaces” with “individual offices with glass frontages” as stated by Roodt, in Herholdt (2014: 274).

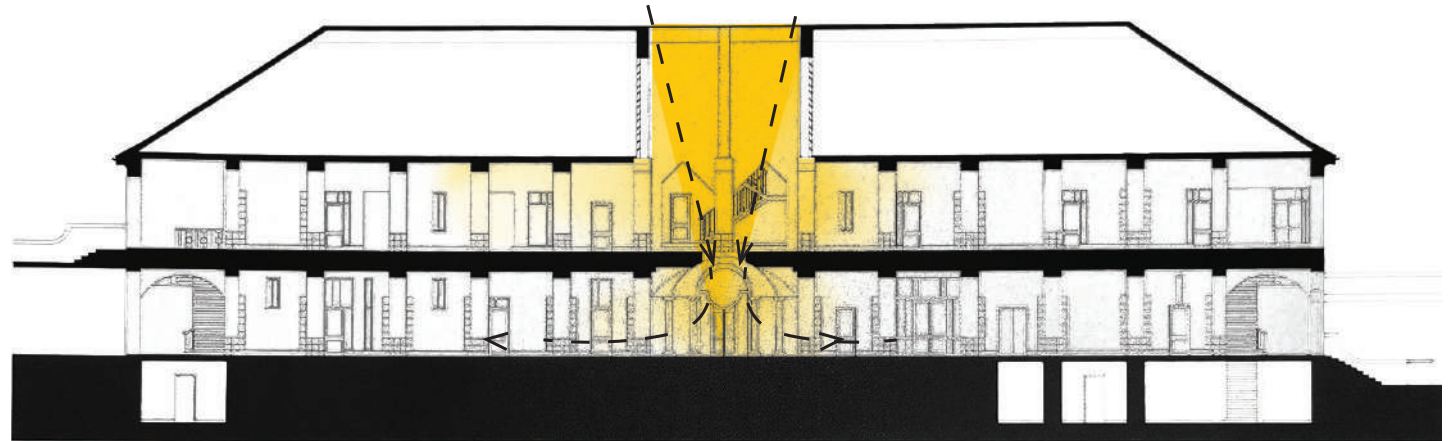


Fig 4.22: Section of UFS main building adapted by Author (Herholdt, 2014: 274)



Fig 4.21: UFS main building ground floor corridor (Herholdt, 2014: 274)

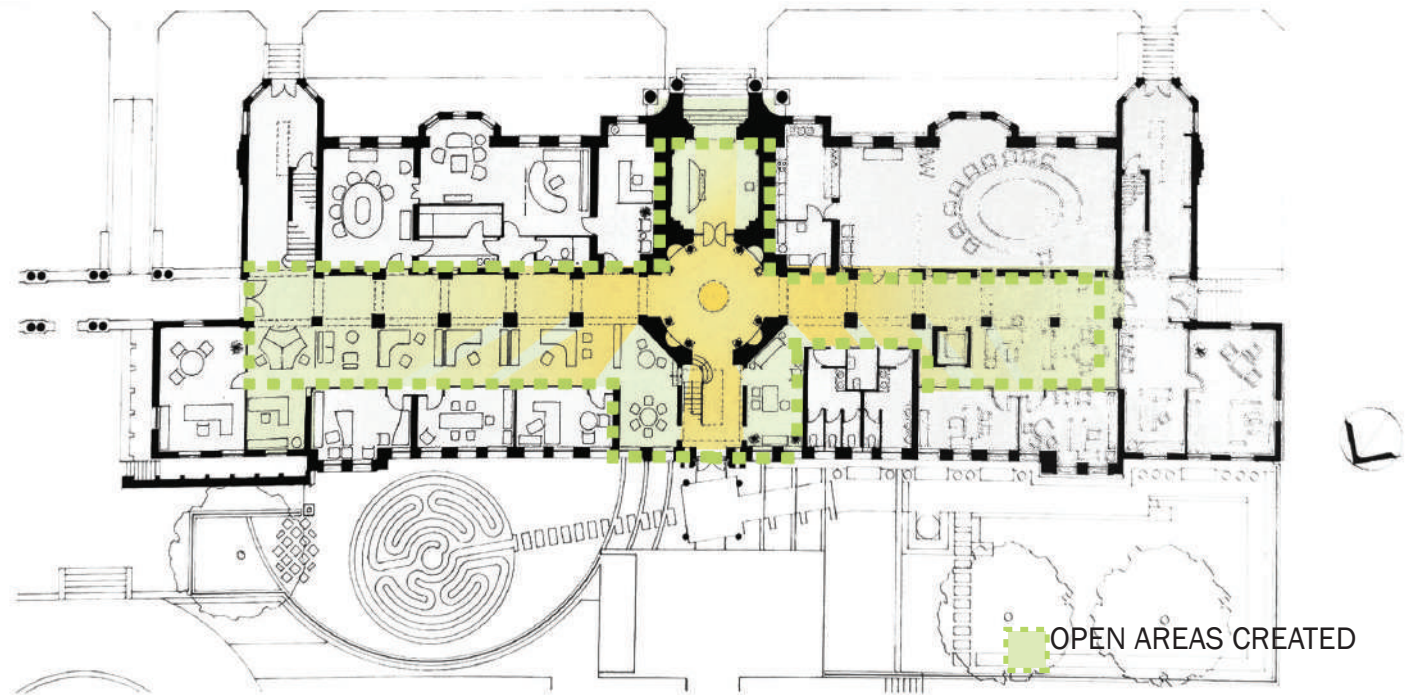


Fig 4.23: Ground floor plan adapted by Author (Herholdt, 2014: 274)

Light is drawn into the building to the ground floor by an oculus covered in safety glass located on first floor. The preservation of the original building adds to the success of this project. The architect identified the historical essence of the building by keeping the granite and plaster facades, along with the tower at the centre and corner trusses.

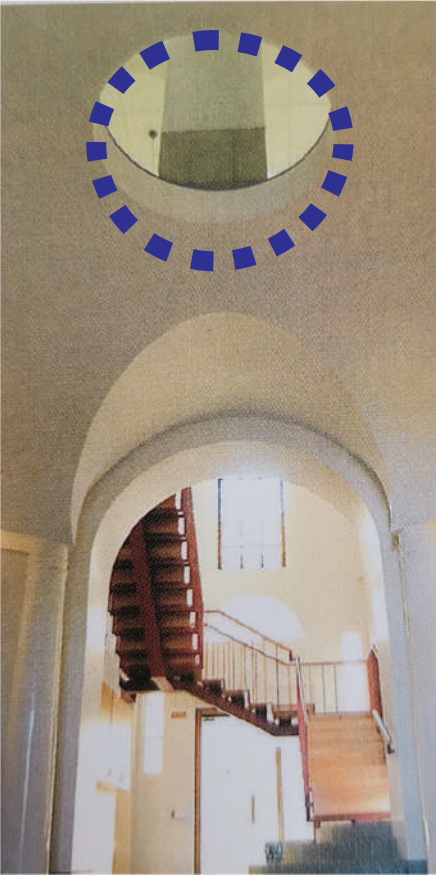


Fig 4.24: Image of skylight and staircase edited by author (Herholdt, 2014: 275)



Fig 4.25: Photograph of entrance with light flooding into the interior, adapted by author (Herholdt, 2014: 275).



Fig 4.26: Image of skylight from first floor adapted by author (Herholdt, 2014: 275)



Fig 4.27: Image of Skylight flooding interior with light adapted by author (Herholdt, 2014: 275)

4.2.3 The Steel Yard

Client: Providence Steel
Architect: Klopfer Martin Design Group
Location: Providence, Rhode Island, U.S.A.
Year: 2009
Contribution: - Site organisation/layout
- Industrial design

The Steel Yard is a regenerative design of an industrial complex. The project entails the adaptive re-use of a disused steel fabricating facility. The facility is located near the centre of the town. The Steel yard houses a non-profit focusing on the fabrication of the arts. The design houses “artist studio space, facilitating instruction in metal, ceramic, and glass arts, and providing job training to young people in welding in addition to a robust set of public-welcome programs and events throughout the year” according to Phillips (2010: online).

The design and over all layout embraces the industrial structures on site by incorporating them in the landscape design.



SITE PLAN

Fig 4.33: Site plan by KDMG architects (Phillips, 2010: online)



Fig 4.34: Drone image of steel yard complex (Phillips, 2010: online)

The site is organised around a paved square with various accommodations leading from the central square.

The application of this precedent will be in the organisation of the site of the proposed design. Separate elements on site can be linked by identifying and designing a central square. The Train Station, bridge and shed are large separate elements on site that need to be connected in order to create a coherent design.



Fig 4.35: Image of steel yard landscaping (Phillips, 2010: online)

4.2.4 Saxum Vineyard Equipment Barn

Client: SAXUM VINEYARD
Architect: Clayton Korte
Location: Paso Robles, California
Year: 2018
Contribution: - Construction
- Designing for animals
-Construction detailing
-Designing for sustainability

Designed as a modern barn, the reclaimed oil field drill stem pipe structure's primary objectives are to provide an armature for a photovoltaic roof system that offsets more than 100% of power demands on the winery and to provide covered open-air storage for farming vehicles and their implements, workshop and maintenance space, and storage for livestock supplies.

It was designed to harness the local climate to maximize cross ventilation, daylight and solar energy. Laminated glass solar modules, serving as both the solar system and the roofing, are supported on wood and WT steel flitch purlins welded to the pipe trusses.

This precedent serves as an example of how to design seemingly ordinary structures in ways that celebrate the construction.

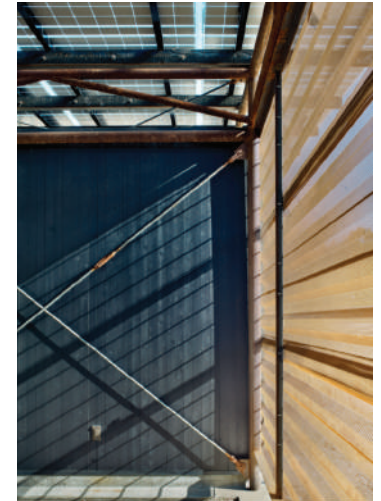


Fig 4.36: Photograph indicating perforated screen (Dunn, 2018: online)

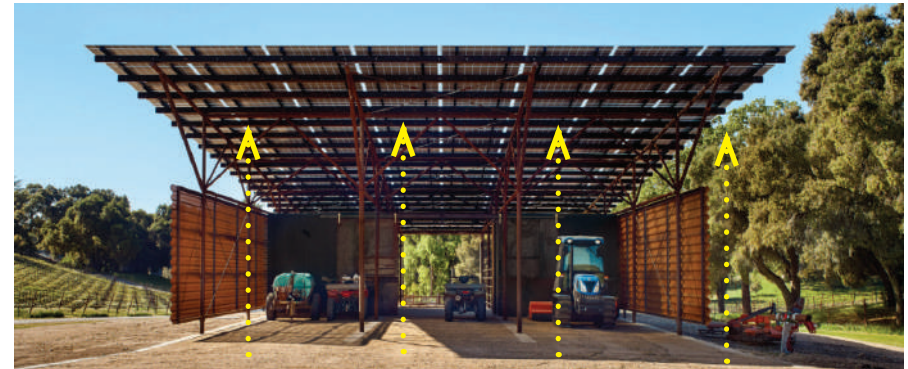


Fig 4.37: North entrance to barn , image adapted by Author (Dunn, 2018:online)

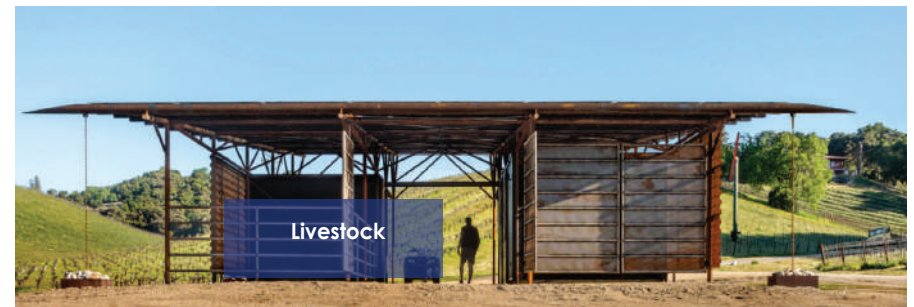


Fig 4.38:South entrance to the barn, image adapted by author (Dunn, 2018:online)

4.2.5 Duduza Resource Centre

Client: Duduza Resource Trust

Architect: Noero Wolff Architects

Location: Duduza ,Gauteng

Year: 1990


Contribution: -Construction.

-Structure and material use.

The centre was designed to provide services and aid for the people who live in townships. The construction was funded by NGO's. Organisation of activities, including educational and community services, were placed along a linear route reflecting the linearity of a street.

An open courtyard becomes the spatial focus of the scheme, providing opportunity for expansion. The covered walkway is a response to the South African climate. This design layout articulates the main access route and circulation.

 Courtyard

 Walkway and circulation

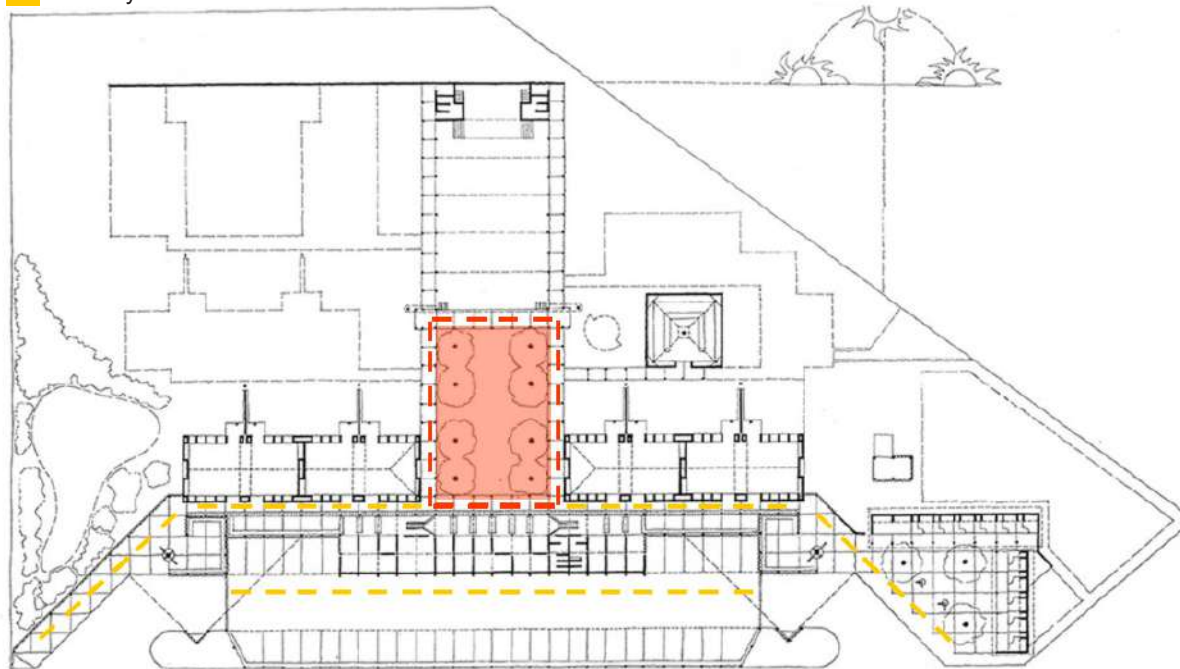


Fig 4.39: Floorplan of Duduza Resource Centre, indicating courtyard and articulated routes.



Fig 4.40: Photograph of trading stall (Laura,1990: online)



Fig 4.41: Photograph of trading stall (Laura,1990: online)



Fig 4.42: Photograph of Duduza Resource centre (Laura,1990: online)

CHAPTER FIVE

Design development

5.1. Design vision, Intent and Touchstone

5.2. Concepts

5.3. Application of Concepts

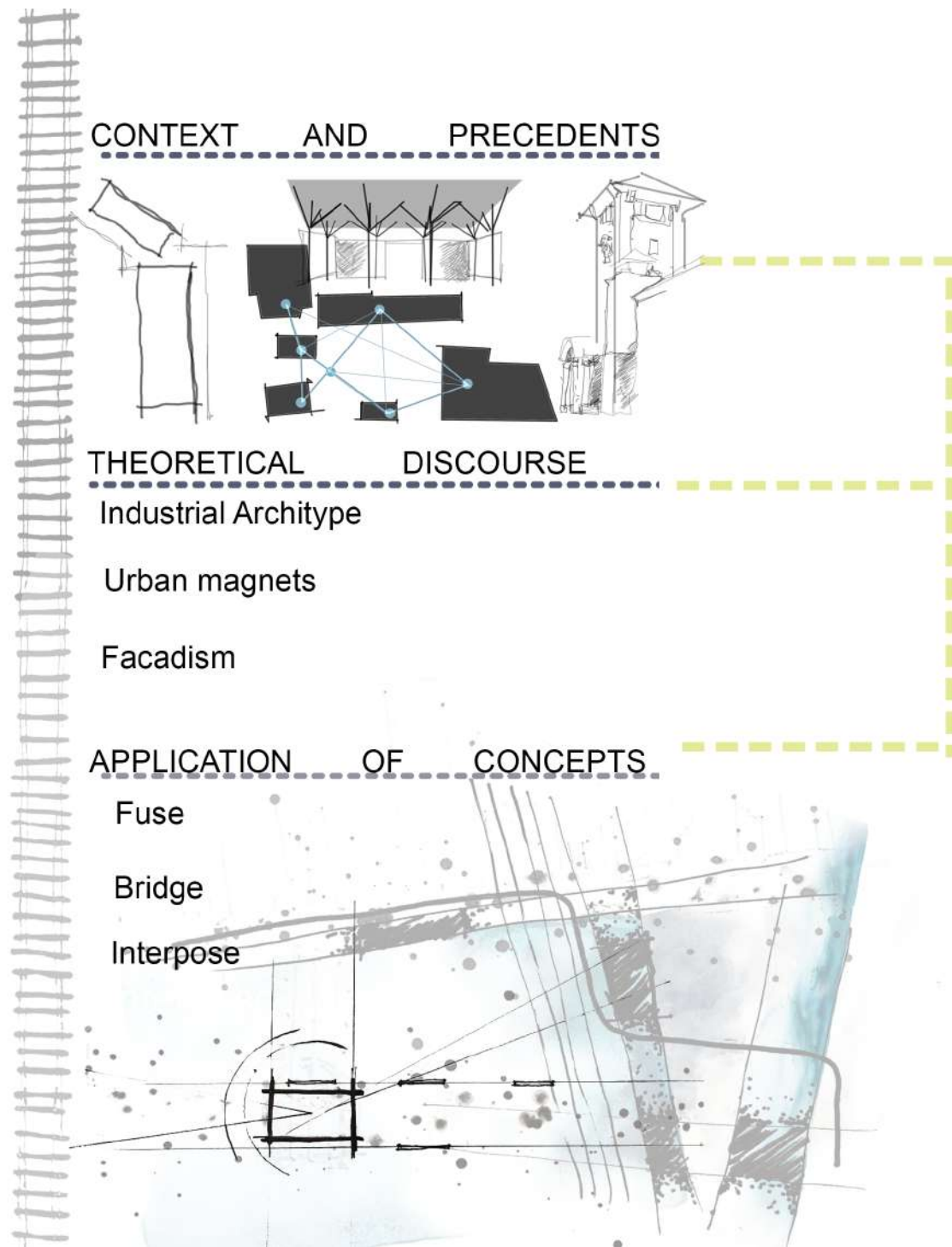
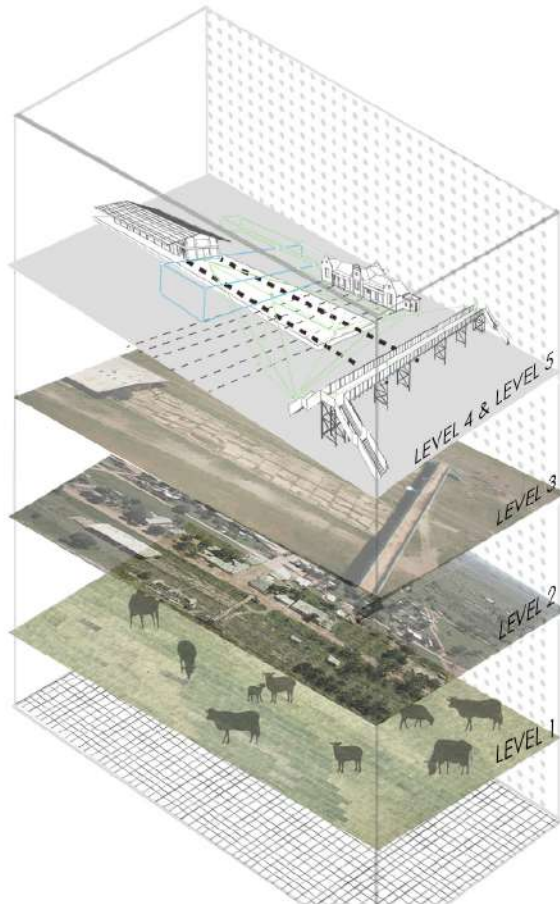
5.5. Insertion of New Structure

5.6 Design Development



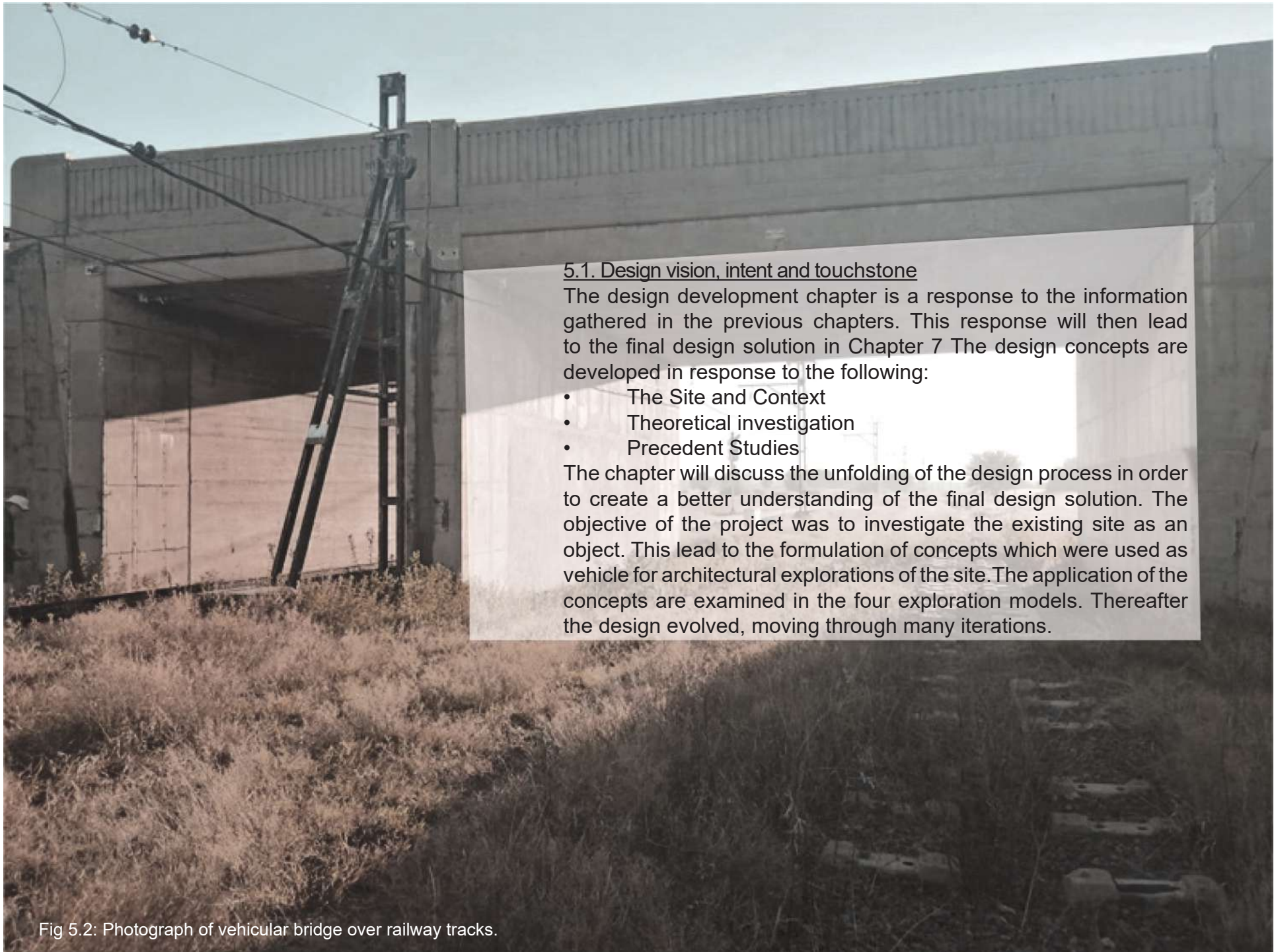
DESIGN INFORMANTS

THEORY
&
CONSTRUCTION



DESIGN SOLUTION

57 Fig 5.1: Design informants diagram illustrating the process followed to develop the final solution



5.1. Design vision, intent and touchstone

The design development chapter is a response to the information gathered in the previous chapters. This response will then lead to the final design solution in Chapter 7. The design concepts are developed in response to the following:

- The Site and Context
- Theoretical investigation
- Precedent Studies

The chapter will discuss the unfolding of the design process in order to create a better understanding of the final design solution. The objective of the project was to investigate the existing site as an object. This led to the formulation of concepts which were used as a vehicle for architectural explorations of the site. The application of the concepts are examined in the four exploration models. Thereafter the design evolved, moving through many iterations.

Fig 5.2: Photograph of vehicular bridge over railway tracks.

Touchstone

The abandoned and overgrown site is left to its own devices at the edge of town. This counter-space is identified as Terrain Vague containing fragmented and shared history. The cement cylinder represents the site, the Train Station to be specific. The site is static, eroding and becoming detached from society.

The essence is to create a space as catalyst for connection through the development of skills in different trades. The intervention should be extended and reach back towards the town, re-activating the site, by utilising the transition between the vacant site and the town which may bring back the character of place.



Fig 5.3: Photograph of design touchstone

5.2 Concepts

FUSE

INSTALLATION, COMBINATION, LAYER, SEQUENCE, MODULATE, ADJUST

The site contains a multitude of systems, mostly process driven. The train along, with a big part of the program contains mechanical characteristics. This concept visualizes the idea of taking existing built elements, history and any other influencing factor related to the site and identifying each as an individual element. These elements combined create the understanding of the site. The model indicates how the process of education and skill training on site will take the unskilled worker and bring them out of the process driven system to a place where they can use their talents to acquire a job. In the drawing (Fig 5.4) the designer tries to illustrate how this can be translated in architectural terms. The working systems are identified and the connected. The idea would be to move up and down with these working systems.

The user would move through the building using various routes set out through the design, creating, various intermediate spaces proposing a means of spatial development.

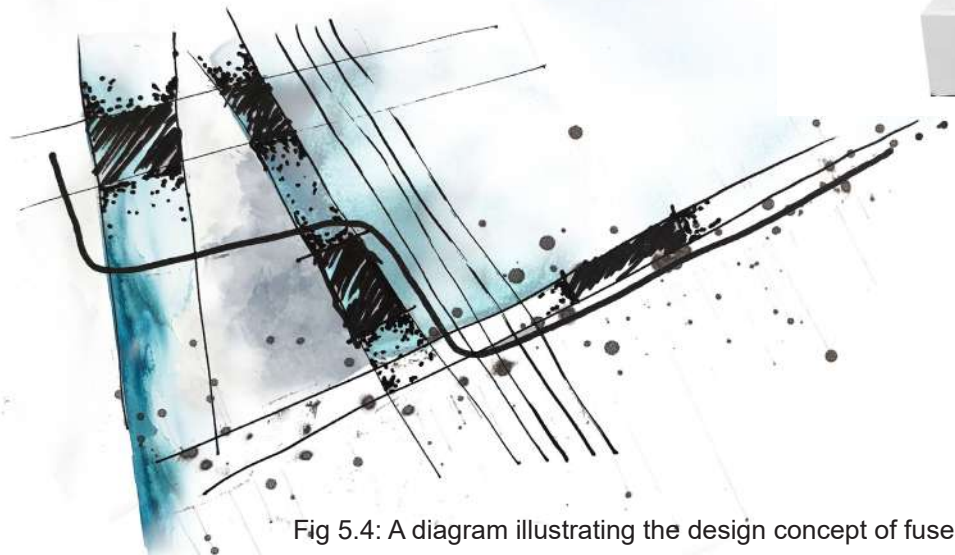


Fig 5.4: A diagram illustrating the design concept of fuse

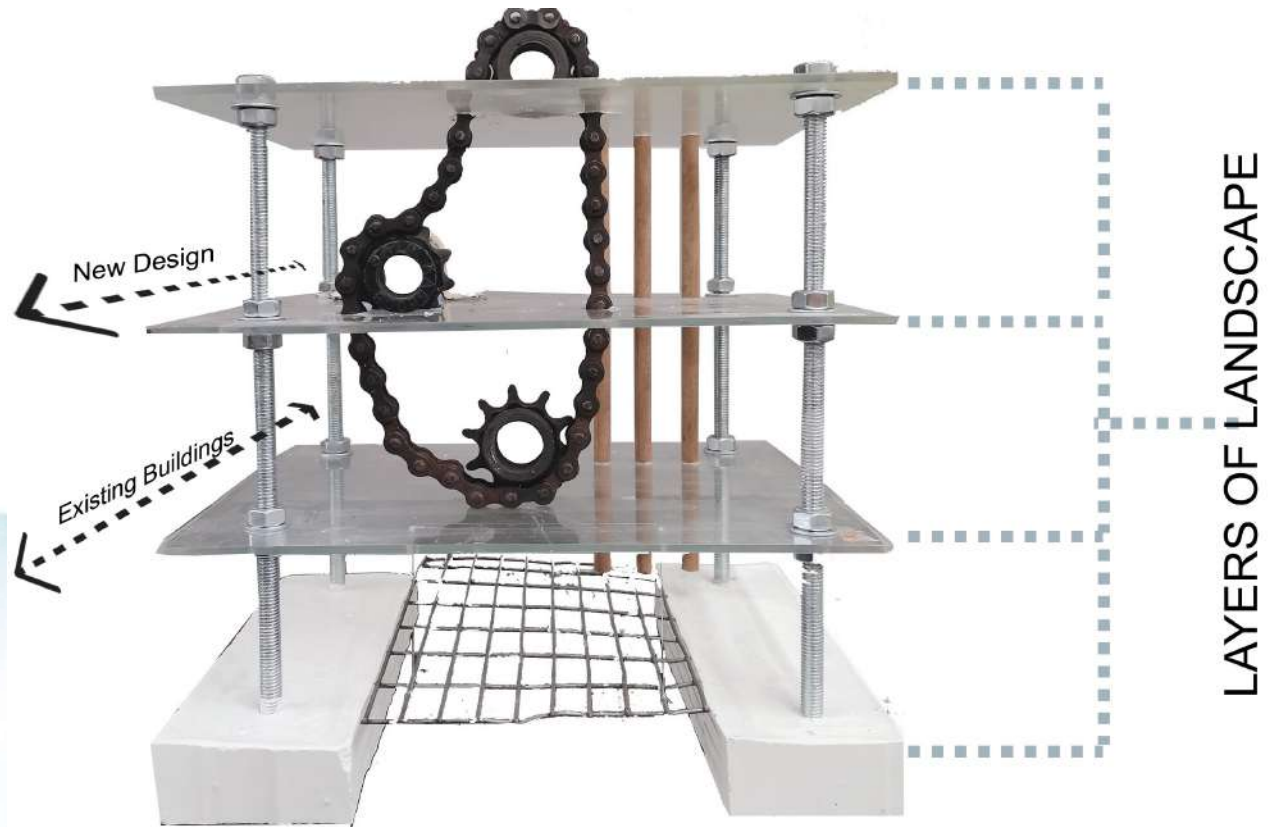


Fig 5.5: Three dimensional expression of the concept fuse

INTERPOSE

IN-BETWEEN, CONTRAST, INTERVENTION

To interpose means to insert or place between one thing and another. This concept takes the existing structure on site and starts creating a dialogue with the ruin. The railway lines, Station and Goods Shed create horizontal lines which are parallel to the town. The bridge connecting the town with the station are perpendicular to the horizontal lines. The sketch and model illustrate how the grid is broken by inserting elements in between. This breaking of the grid draws attention back to the existing structures.

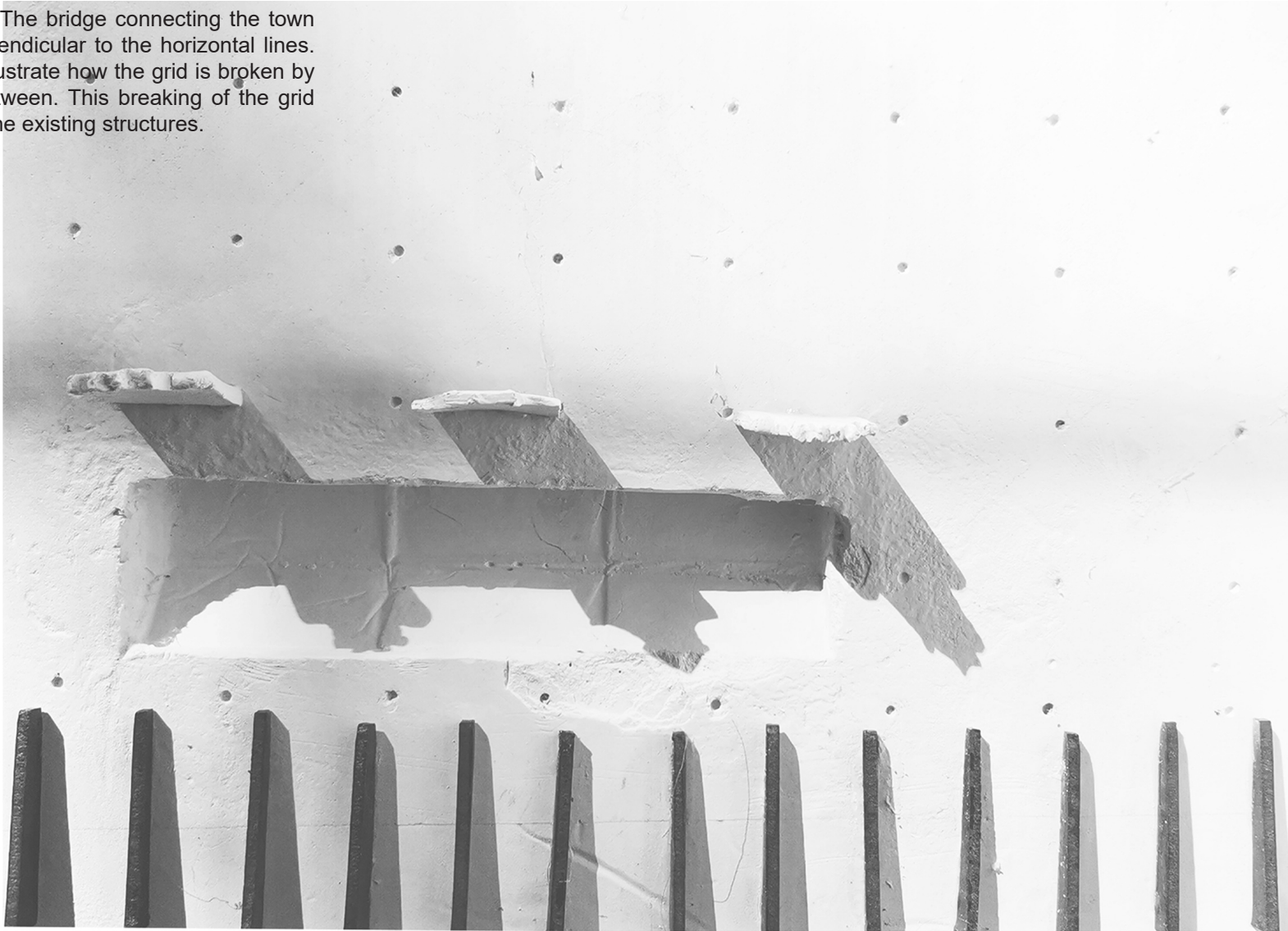
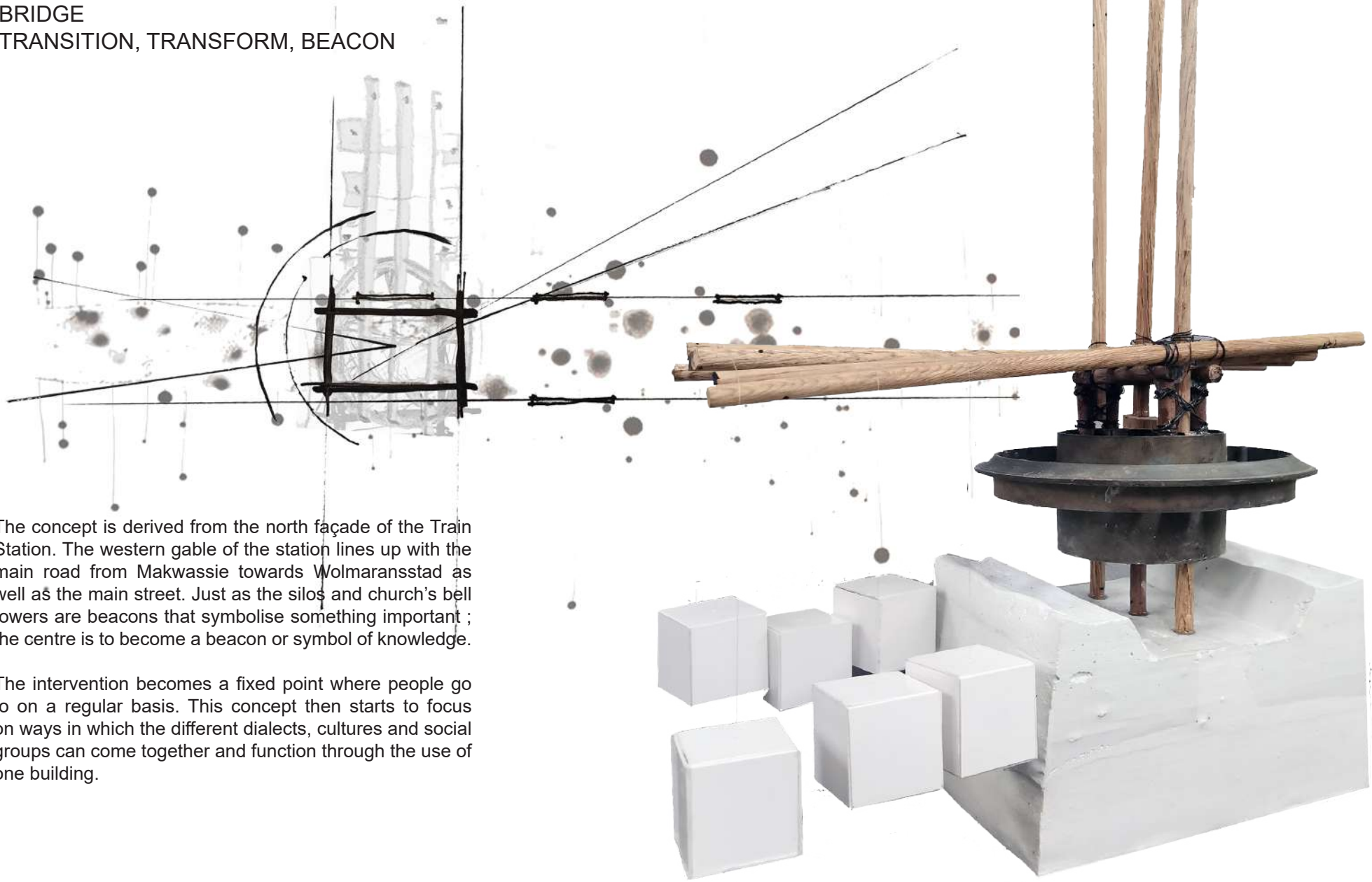


Fig 5.6: Three dimensional expression of the concept interpose

BRIDGE
TRANSITION, TRANSFORM, BEACON



The concept is derived from the north façade of the Train Station. The western gable of the station lines up with the main road from Makwassie towards Wolmaransstad as well as the main street. Just as the silos and church's bell towers are beacons that symbolise something important ; the centre is to become a beacon or symbol of knowledge.

The intervention becomes a fixed point where people go to on a regular basis. This concept then starts to focus on ways in which the different dialects, cultures and social groups can come together and function through the use of one building.

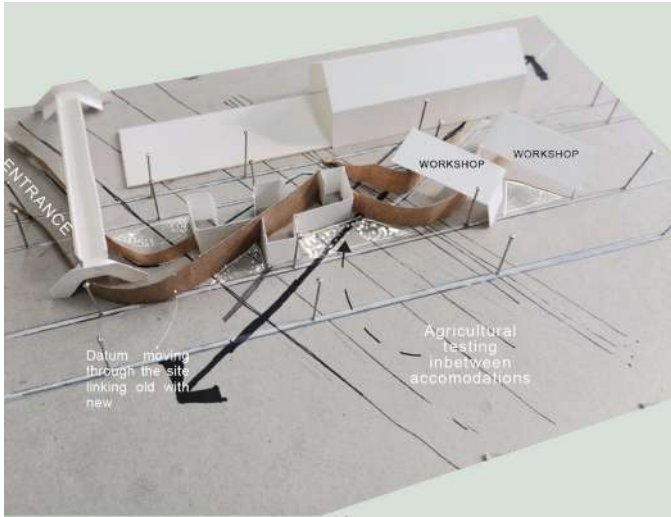
Fig 5.6: Three dimensional expression of the concept bridge.

5.3. Application of concepts

This part of the document follows the design process starting off with explorations on a small scale. These explorations indicate how the concepts will be applied to the site. Throughout this chapter the specific response to context, site, heritage, function, programme, and material/technology will be discussed. All these responses are related and make reference to the specific theory stated in Chapter 2 as well as the application of the concepts. The chapter will conclude with the final design solution that is discussed in chapter 6.



Fig 5.7: North elevation of Train Station

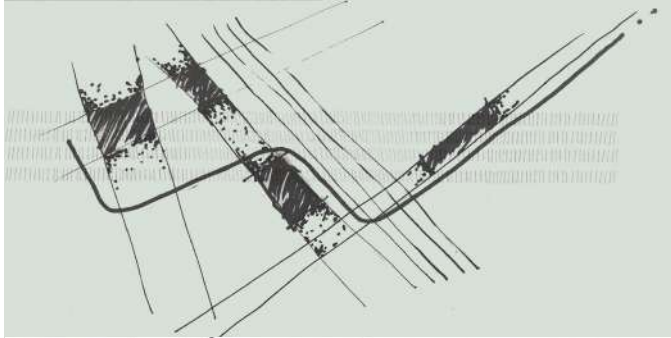


Exploration 1

This exploration offers an experience relating to the concept of interpose. The datum moving through the site binds and stitches everything together. Strict grids created by existing elements on site is broken by the intervention creating a dialect between the intervention and the existing.

The agricultural crop testing in-between the building offers links with the outside throughout the design as access has to be provided to these small fields.

The datum created moves over the train tracks that are still in use. The design excludes the Goods Shed.



Exploration 2

Exploration 2 introduces changes in patterns and volumes by reinterpreting the rhythms on site this brings variation to the site. The main entrance is moved to the transition between the station and the shed. This strengthens the connection between the two and extends the design back towards the town.

The implications of moving the entrance away from the existing approach to the site hold negative and positive implications. Moving away from the existing underutilizes that which is already there, however the rest of the street is activated by moving the entrance towards the east. The rhythm of the shed is enhanced by extracting it upward and re-interpreting it on the new addition



Fig 5.8: Images and diagrams of exploration 1

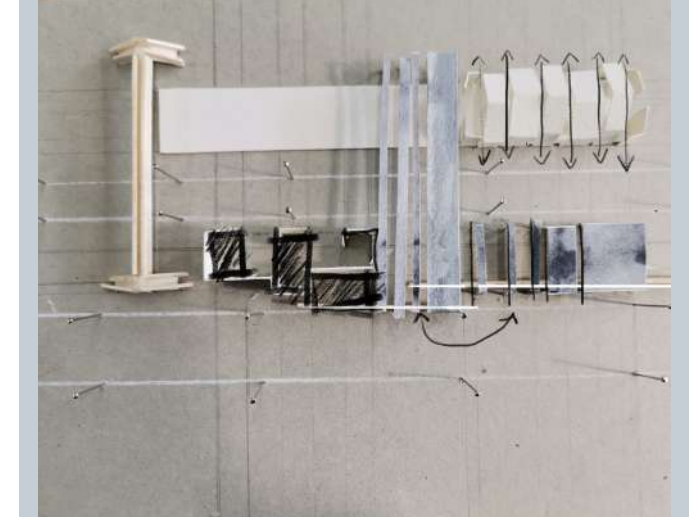
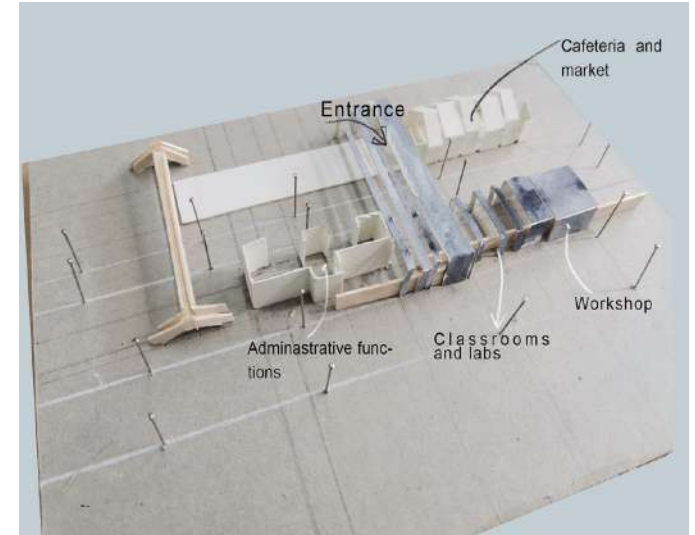
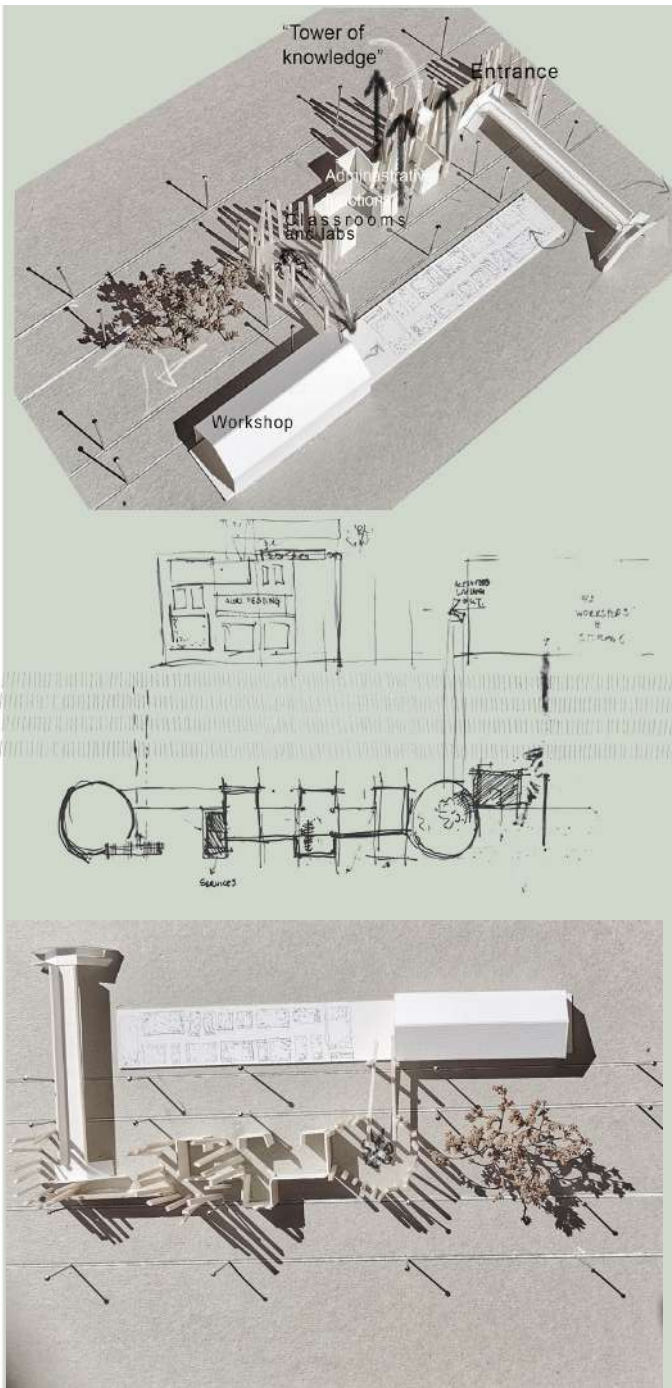


Fig 5.9: Images and diagrams of exploration 2



Exploration 3

Exploration 3 places platforms for agricultural testing on the unused concrete slab in front of the Train Station. The circular elements in this model mimic the silo drawing on the concept of bridge.

This exploration also uses the bridge as the way to enter the building relating to the concept of bridge by using the physical one on site as part of the design. Another bridge extends over the railroad track towards the Goods Shed connecting it with the train station. This exploration uses the way in which the silo connects with the corrugated iron shed structure. The combination of geometries create challenging connections.

Exploration 4

Exploration 4 offers a combination of the other explorations. The intervention emphasizes the tower relating to the concept of bridge. The bridge becomes more than a form of circulation with food stalls along it. Livestock is kept in a kraal across the goods shed.

The circular shape mimics the shape of a silo. The idea is derived from exploration 3. The circulation cuts through the station relating to the concept of interpose.

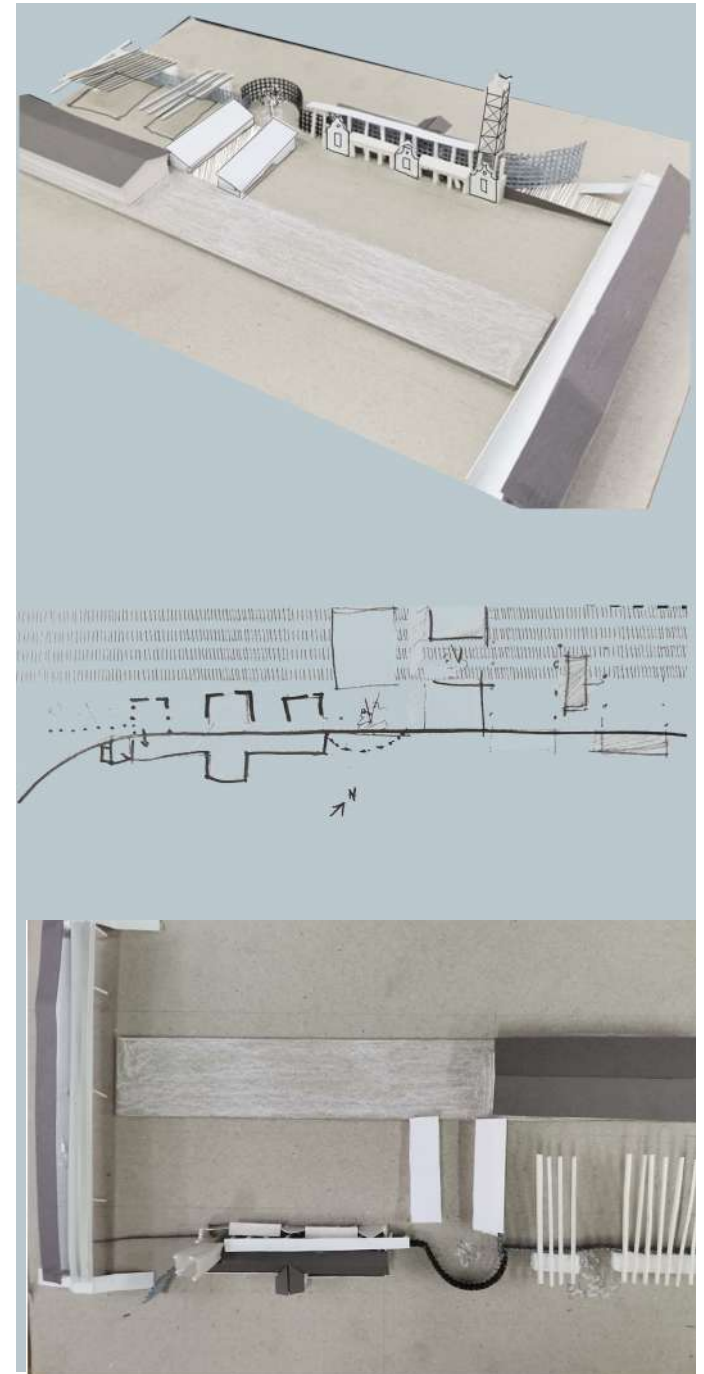


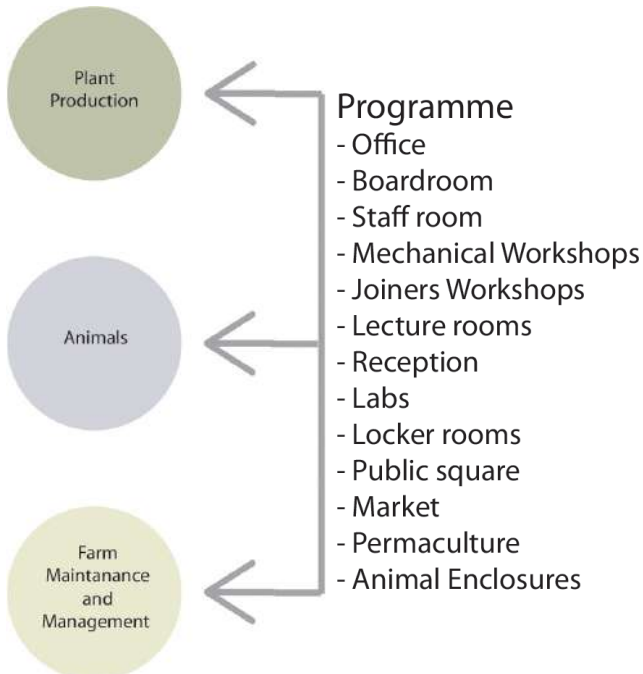
Fig 5.11: Images and diagrams of exploration 4

Fig 5.10: Images and diagrams of exploration 3

5.4 Insertion of new structure

Interpose as concept is applied to the construction of the new addition to the Train Station. A new structure is placed in between the north and south façade. Therefore a discussion of facadism is necessary in the explanation of the design development.

Facadism according to Evangelia Kyriazi (2019 :185) in her article Facadism, Building Renovation and the Boundaries of Authenticity says “facadism lies in the grey area building conservation and development”. Facadism is a source of conflict as the retention of only a façade creates an irrational design. In extreme cases of facadism the elevation has no relation to the interior.



The authenticity of buildings are questioned when they are preserved as “historical-looking masks” according to Robert Bargery (2005: online) in his article The Ethics of Facadism.

Facadism enables the protection of historic elements of familiarity whilst changing the interior of the building to fit its new program. Facadism forms a type of compromise. It is however important to maintain the integrity of the building.

The facades of buildings (along with their interiors) narrate the story of the town. “Cities are living organisms, in which communities, values, and ways of living change constantly” (Kyriazi, 2019: 188).

It is important to promote a high standard of preservation staying true to the historical value of the building. Facadism when approached incorrectly can become inauthentic. The Train Station in its current condition serves no purpose to the town. The intervention should allow for creative use along with respecting the heritage and authenticity of the site. Therefore, the challenge is to understand the existing and apply the new insertion with the lessons learned in the analysis.

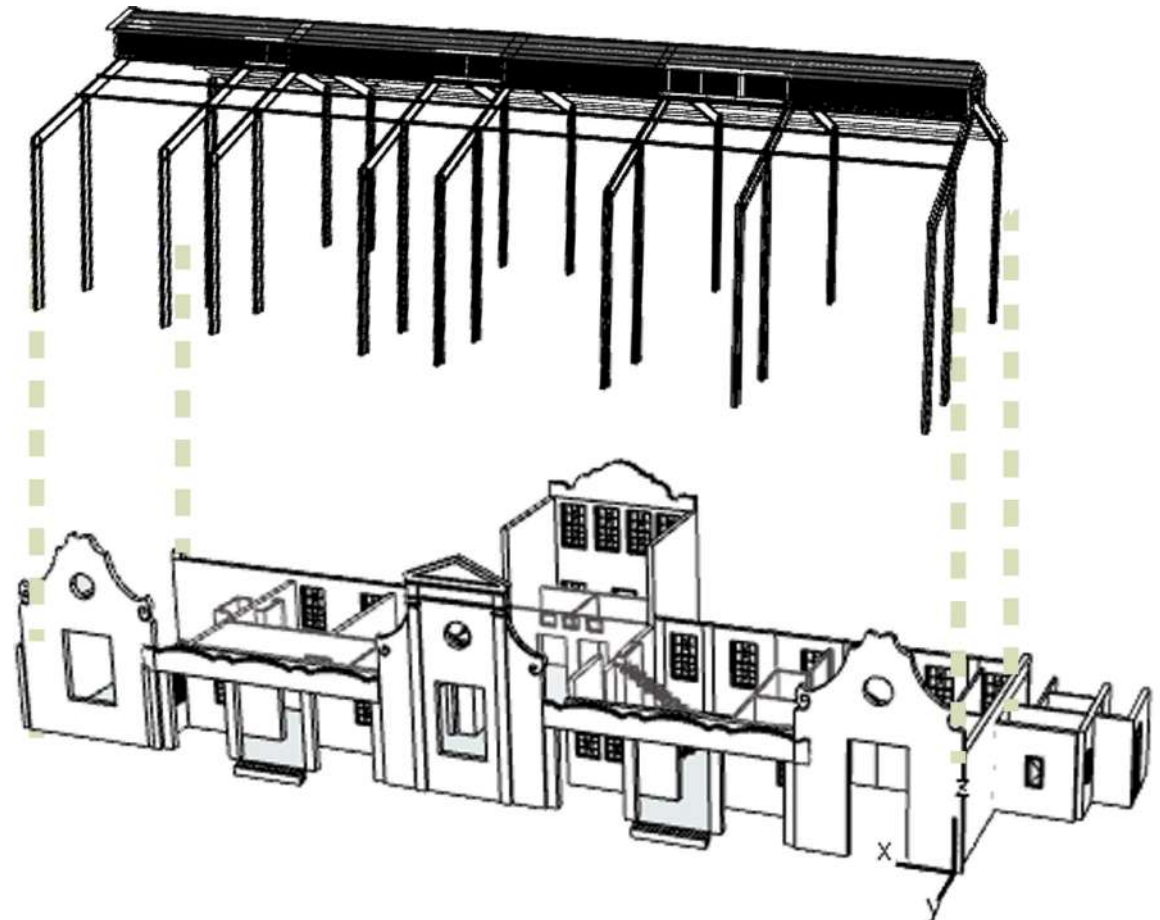


Fig 5.12: Inserting new structure inbetween two facades

5.5 Design Development

Tower development

The design of the tower is an important part of the design as this will act as a beacon in the town, becoming a fixed point where people go to on a regular basis. This design of the tower stands separate from the gable placing a walkway on first floor level between the gables and the rest of the building. This walkway becomes a public viewing platform linked to the tower offering views towards the town which is north of the design. Adding a first story offers the opportunity to design a new roof over the train station.

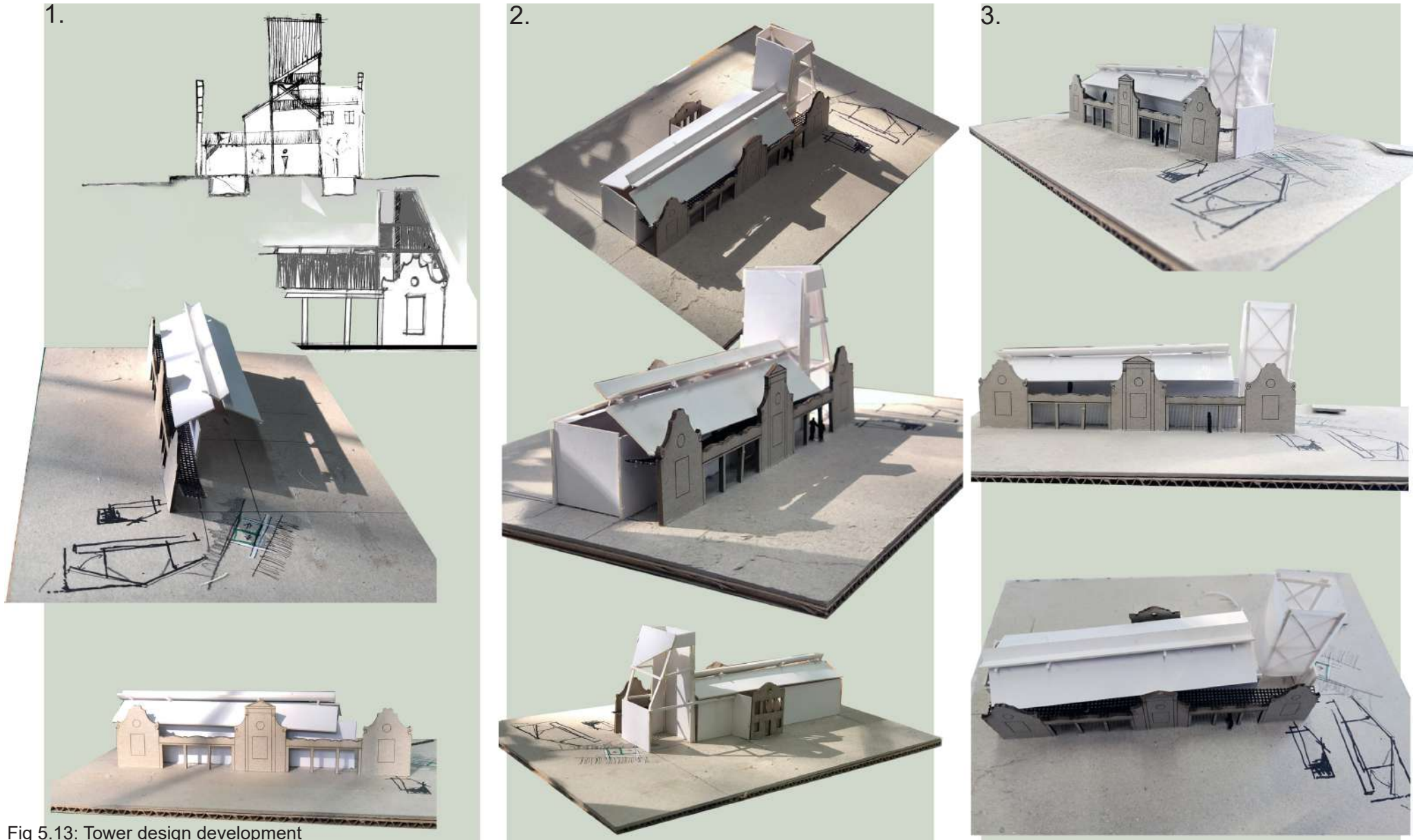


Fig 5.13: Tower design development

Bridge development

The design went through many design options. The first option was to design shops on the bridge. The second option was to replace the shops with classrooms for the centre. The structure of the classrooms will be attached to the bridge with the bridge forming the circulation to and through the structures. In the end the dimensions of the bridge made it difficult to design on top of the bridge as the 3m wide bridge stretches 70m. The final decision is to leave the bridge as is. The decision to design a market square beneath it was made at a later stage in the design process.

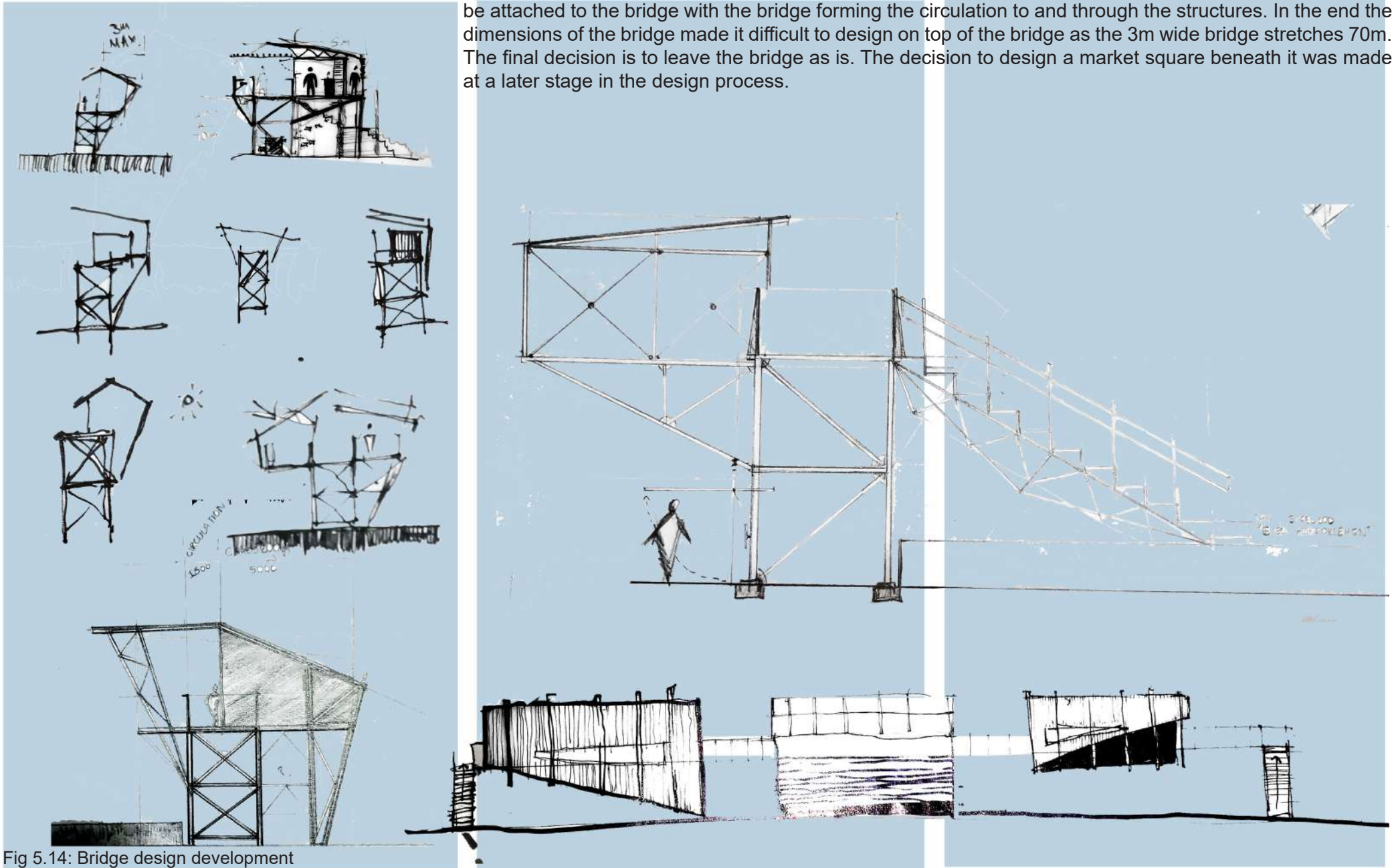
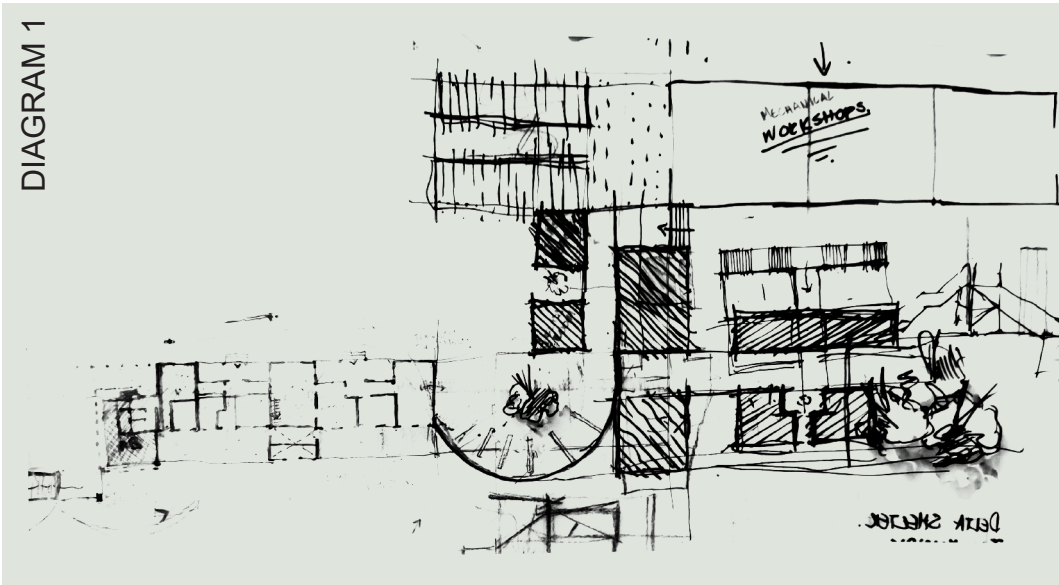


Fig 5.14: Bridge design development



The design diagram started with the allocation of the program to the site, merging the three concepts. The first diagram focused on design spaces that connect the existing structures on site. The placement of greenhouses in between the labs (Fig. 5.16) mimics the rhythm of the Train Station. At this stage the list of accommodations was still developing. Walkways toward the Goods Shed formed a connection to the Train Station and new addition. The design was still isolated from the town not achieving the objective of reaching back towards the town.

Fig 5.15: Design development diagram

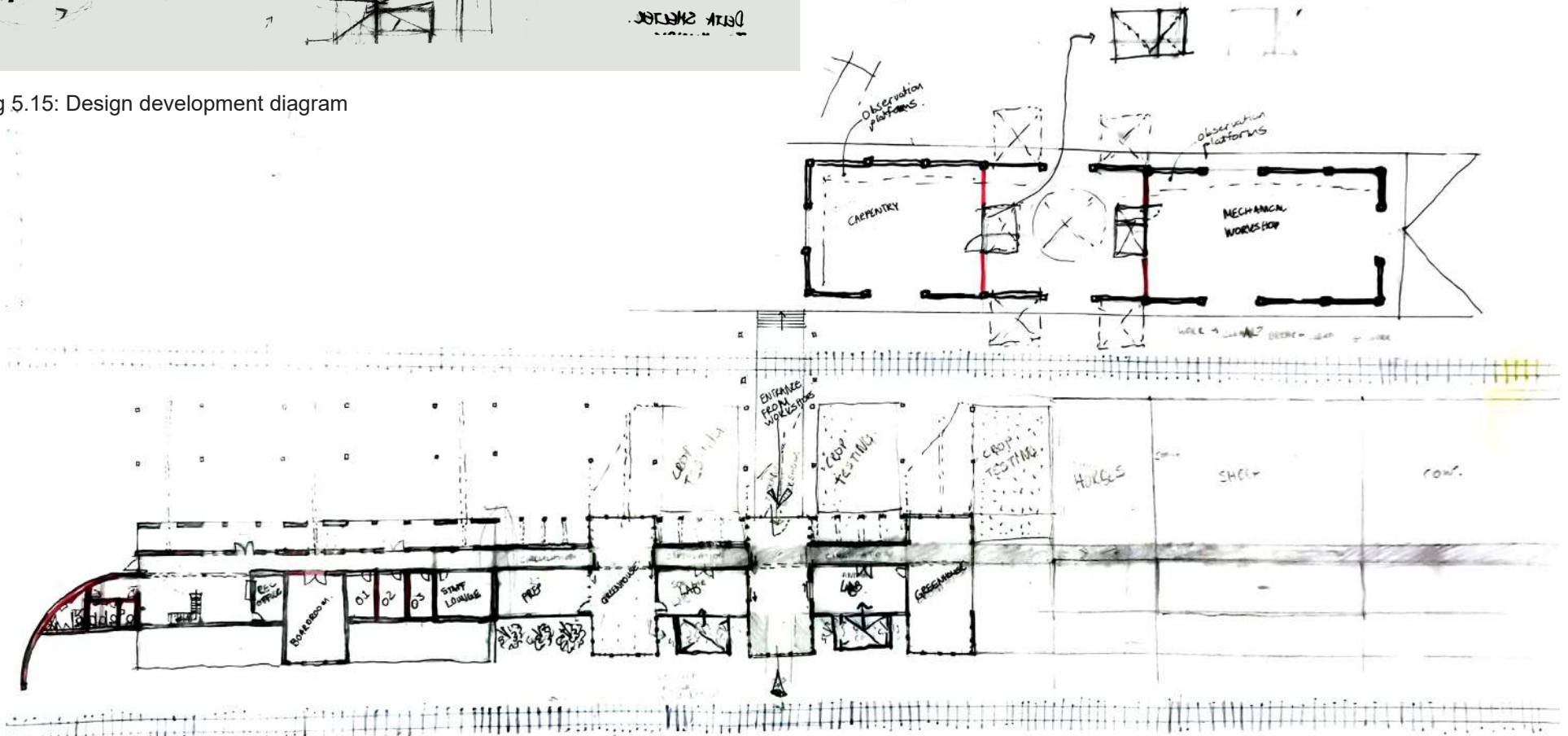


Fig 5.16: Proposed Floor Plan

External 1

Exploration 4 determined the model built for external 1. The design of shops on the bridge is used as a magnet to connect the Train Station with the town. The Goods Shed is connected to the Train Station by designing structures over the railway track. The expansion of the list of accommodations as strategy for connecting the existing structure is implemented in this development.

External review 1 model

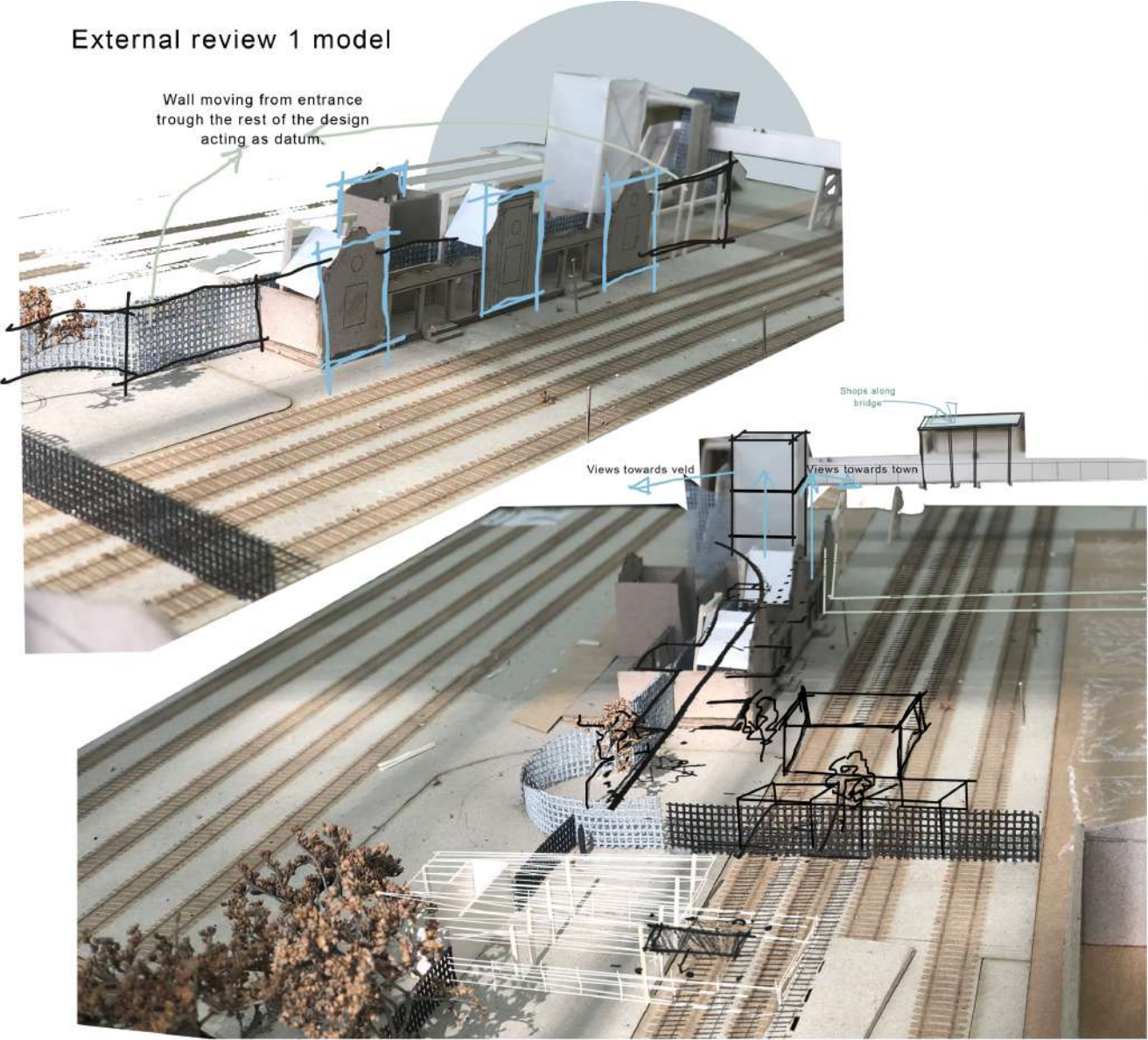
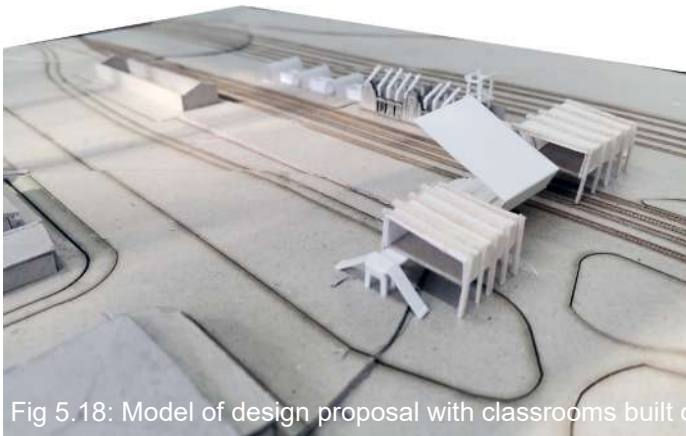


Fig 5.17: Model of design proposal

External review 2



The following stage in the development of the design was an exploration in ways of creating urban magnets. The design of a tower behind the gable as “unique urban form” (White, 2020: online) creates a visual “bridge” linking with the town. The classrooms are magnets of education and learning, drawing people up and over the bridge.

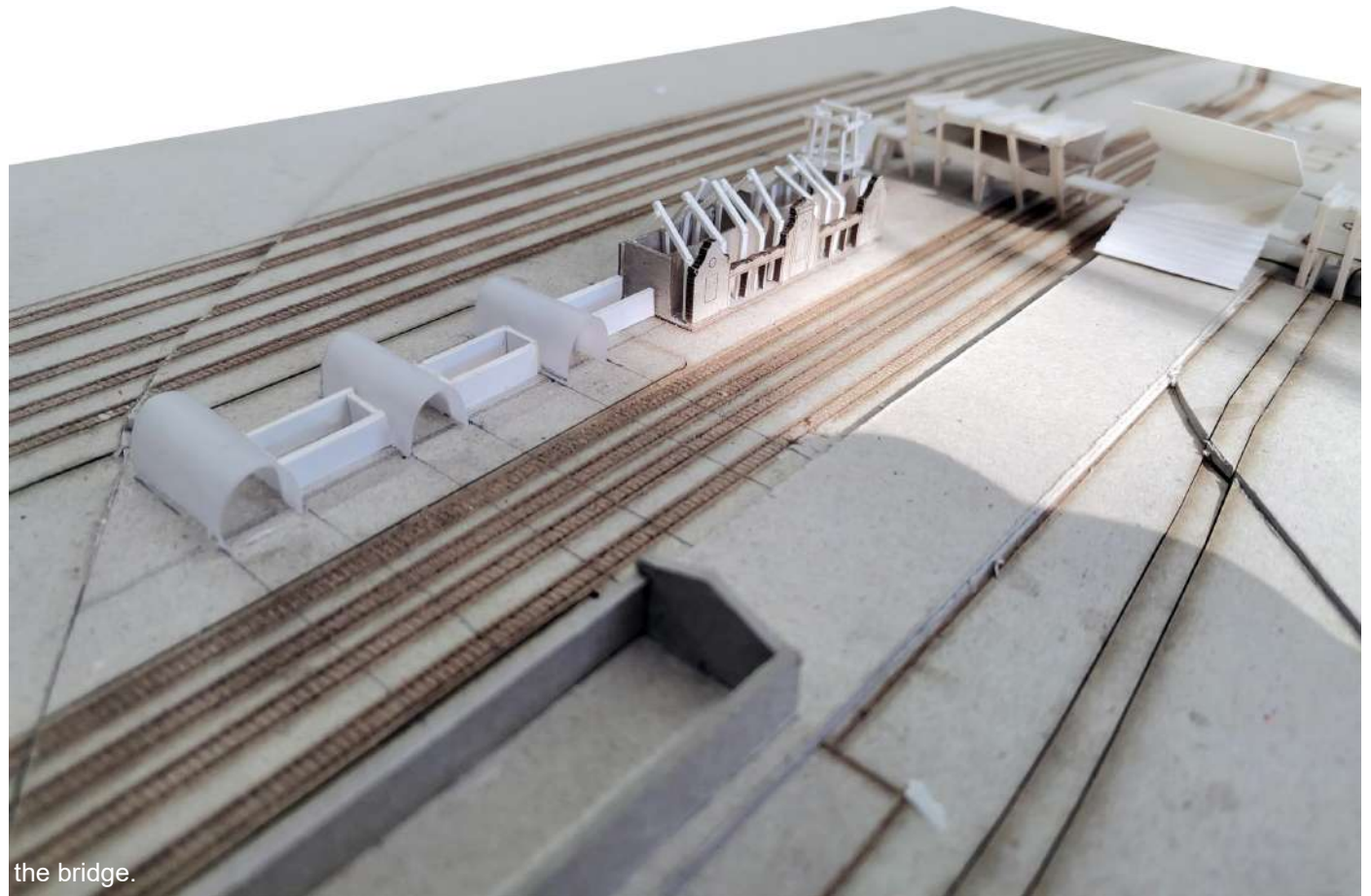


Fig 5.18: Model of design proposal with classrooms built on the bridge.

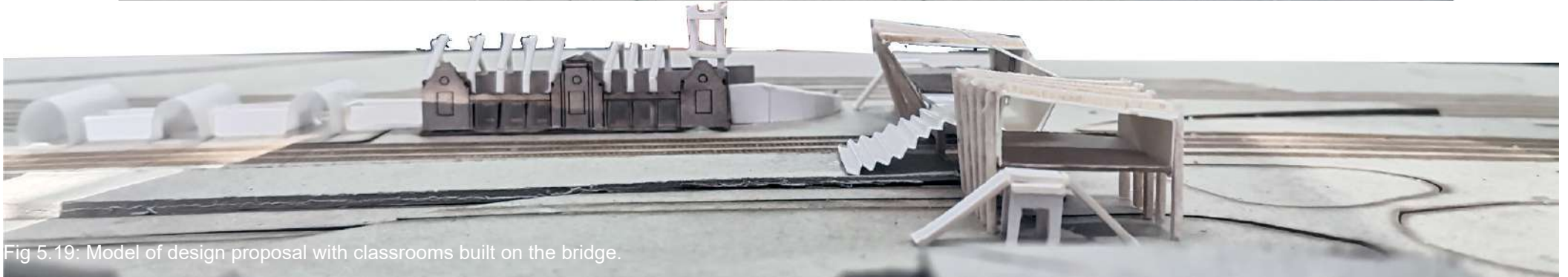
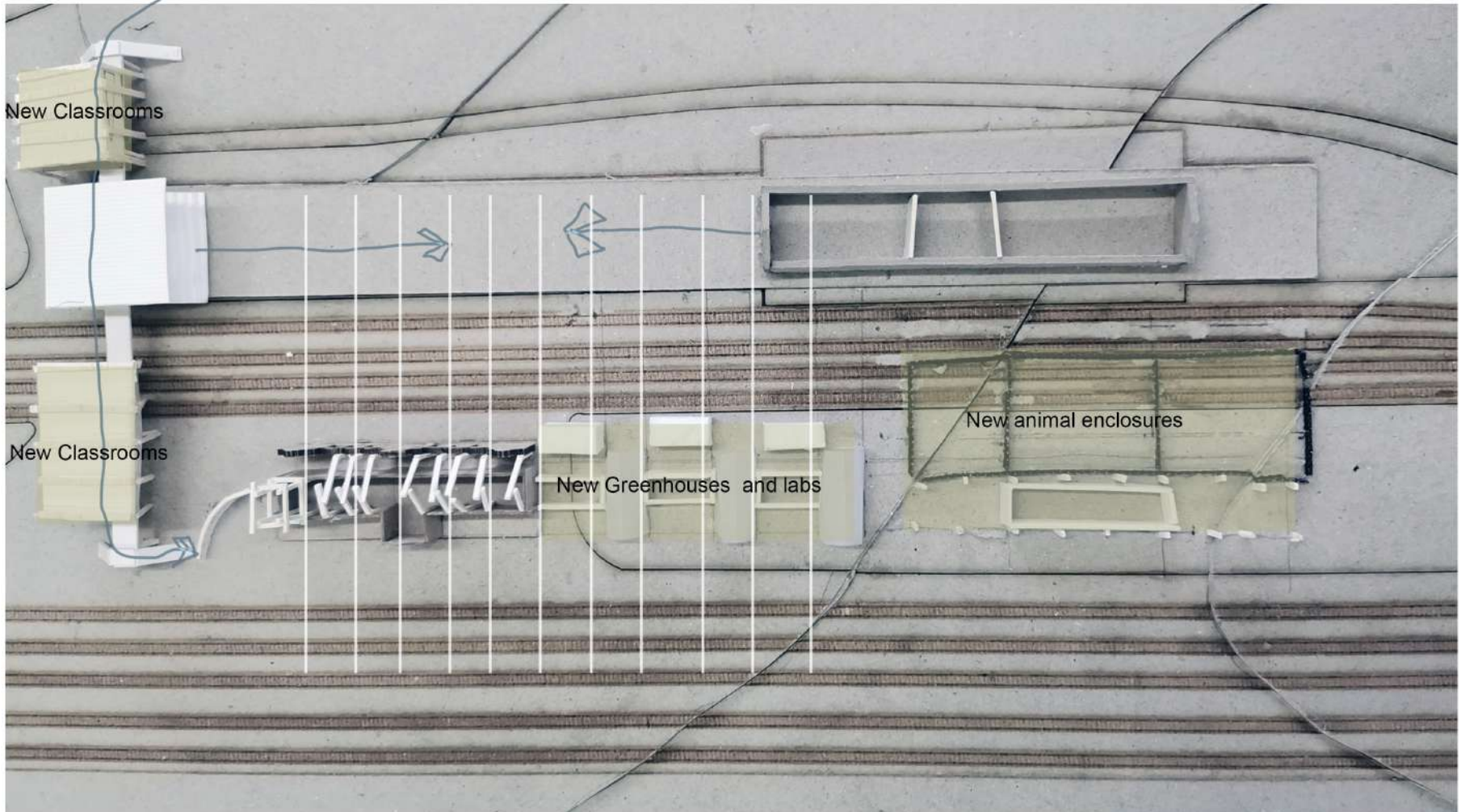
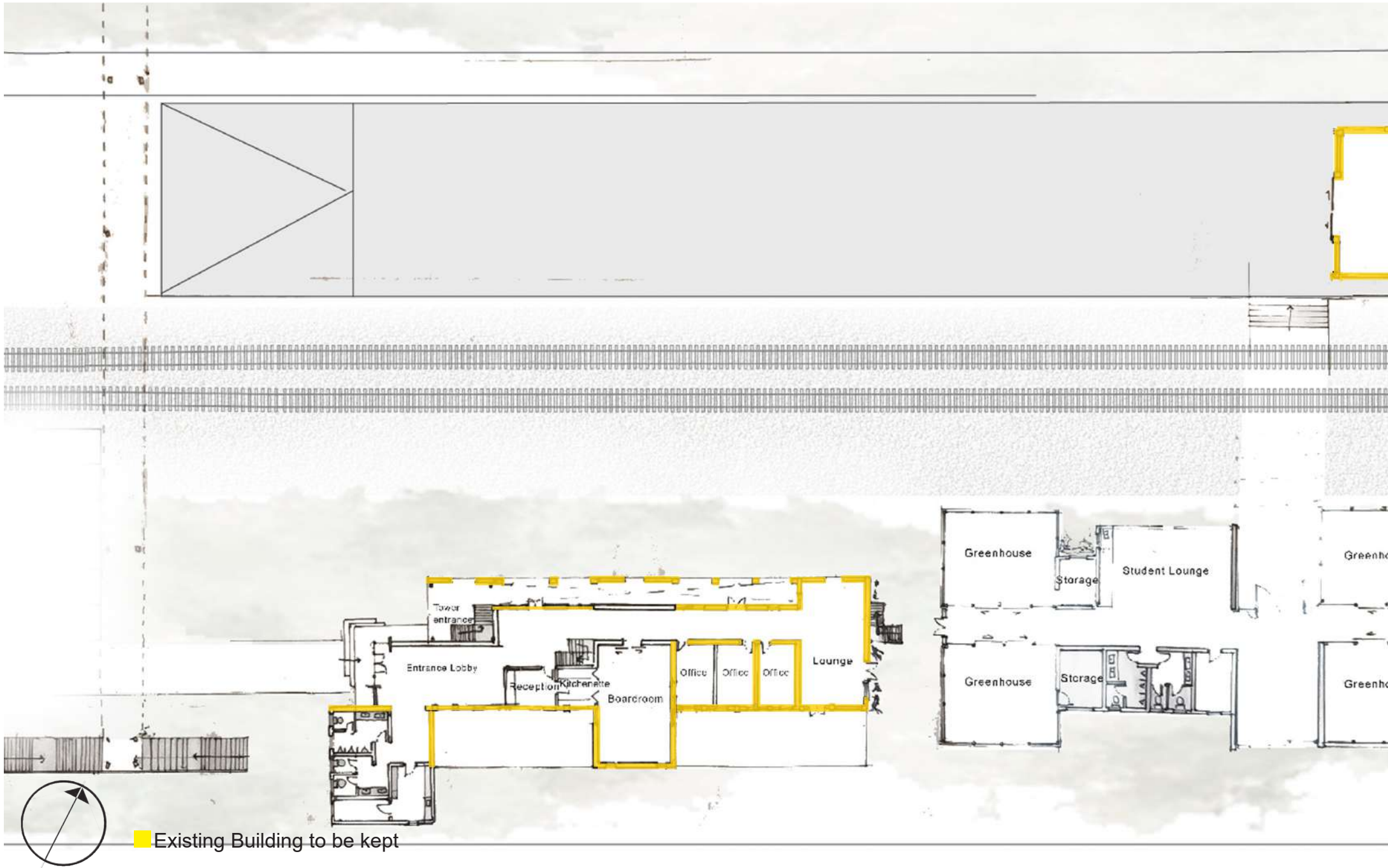
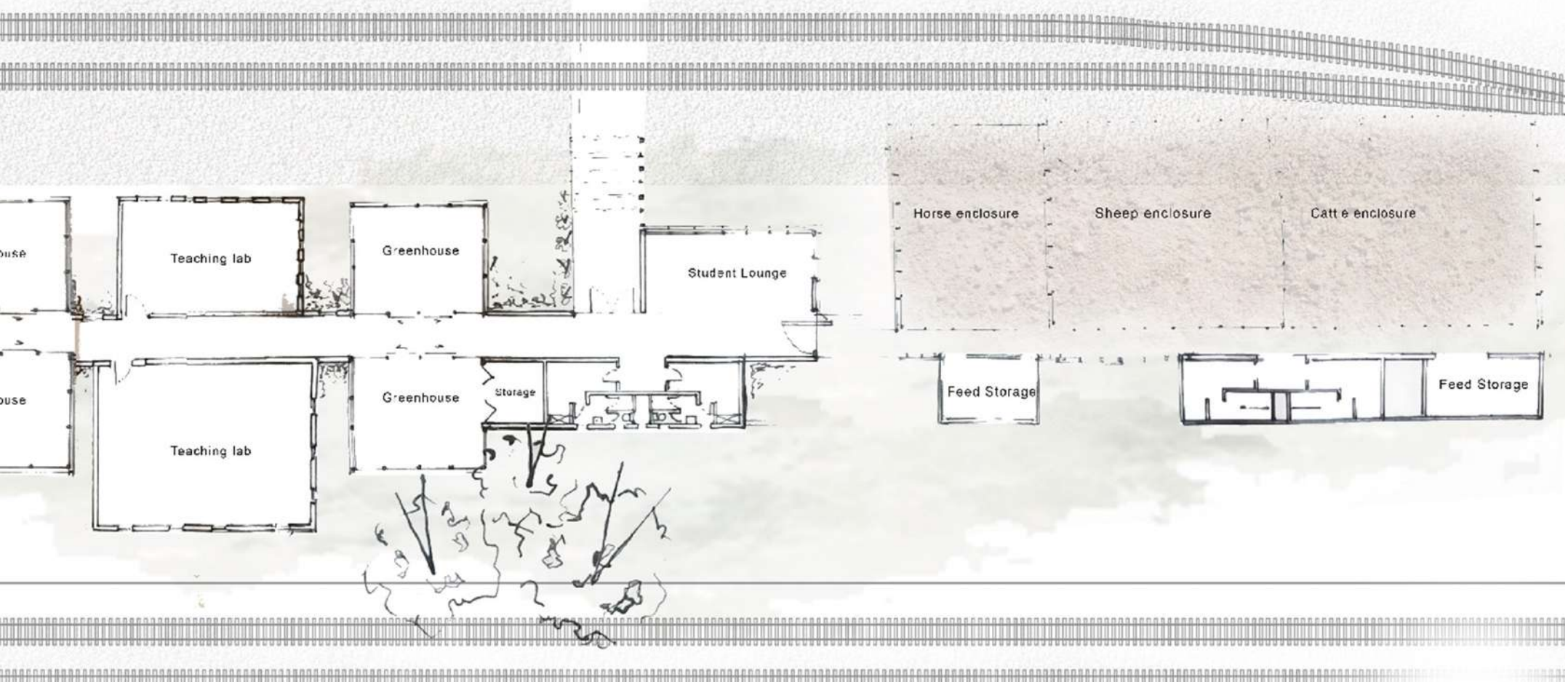
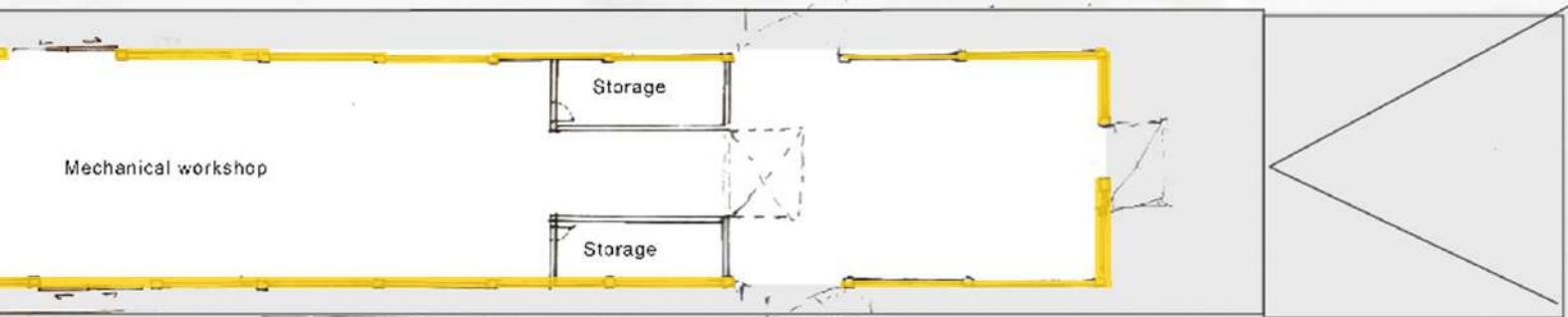


Fig 5.19: Model of design proposal with classrooms built on the bridge.



GROUND FLOOR PLAN DURING EXTERNAL REVIEW 2



In this phase the design was adapted to form a courtyard or square in front of the Train Station. New workshops are placed parallel to the Train Station and classroom building. These new workshops mimic the rhythm of the Train Station. The rhythm is present on floor plan and elevation. The design of an open market square next to the bridge allows for social and economic opportunities. The design is built on a larger scale in figure 5.20. This stage of the design is developing towards the final design.

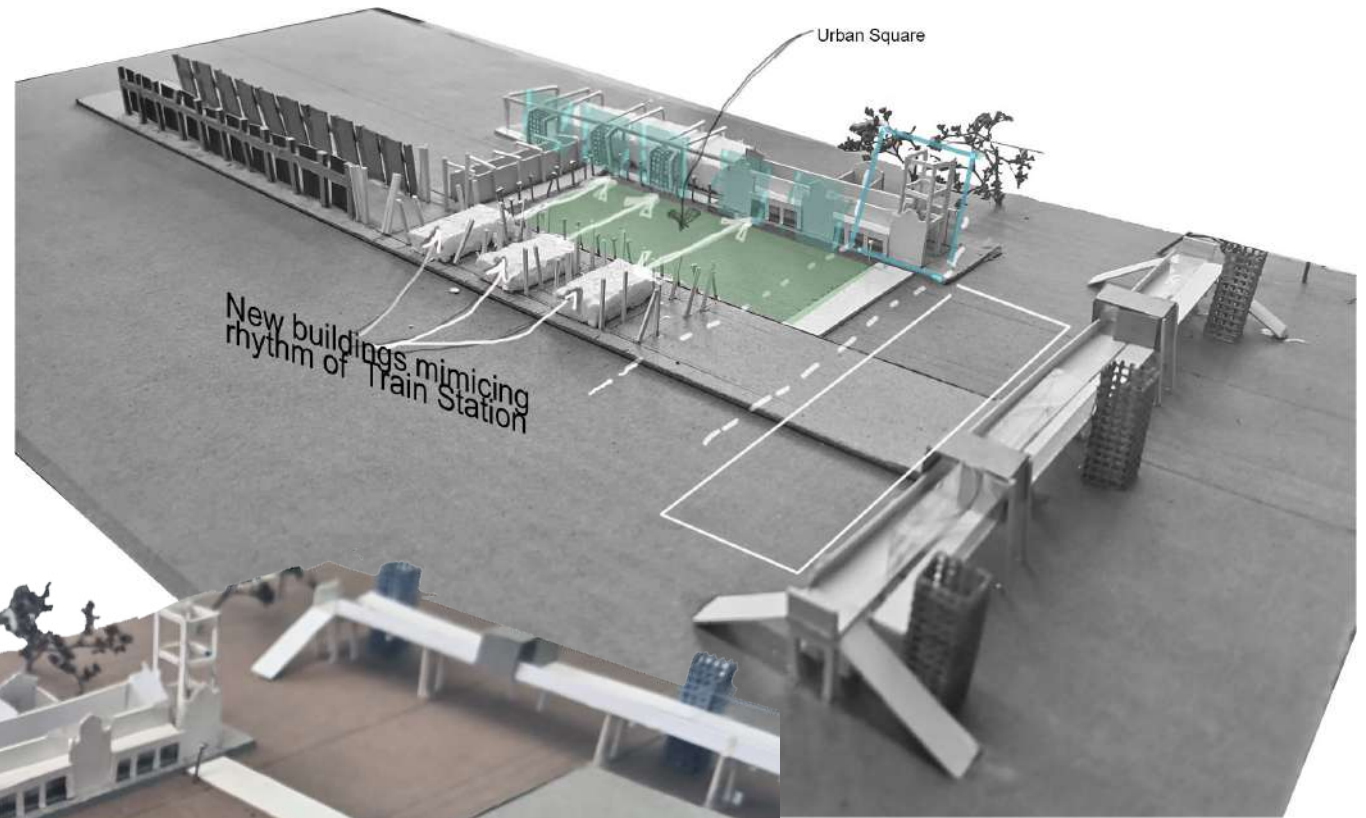


Fig 5.20: Design development models

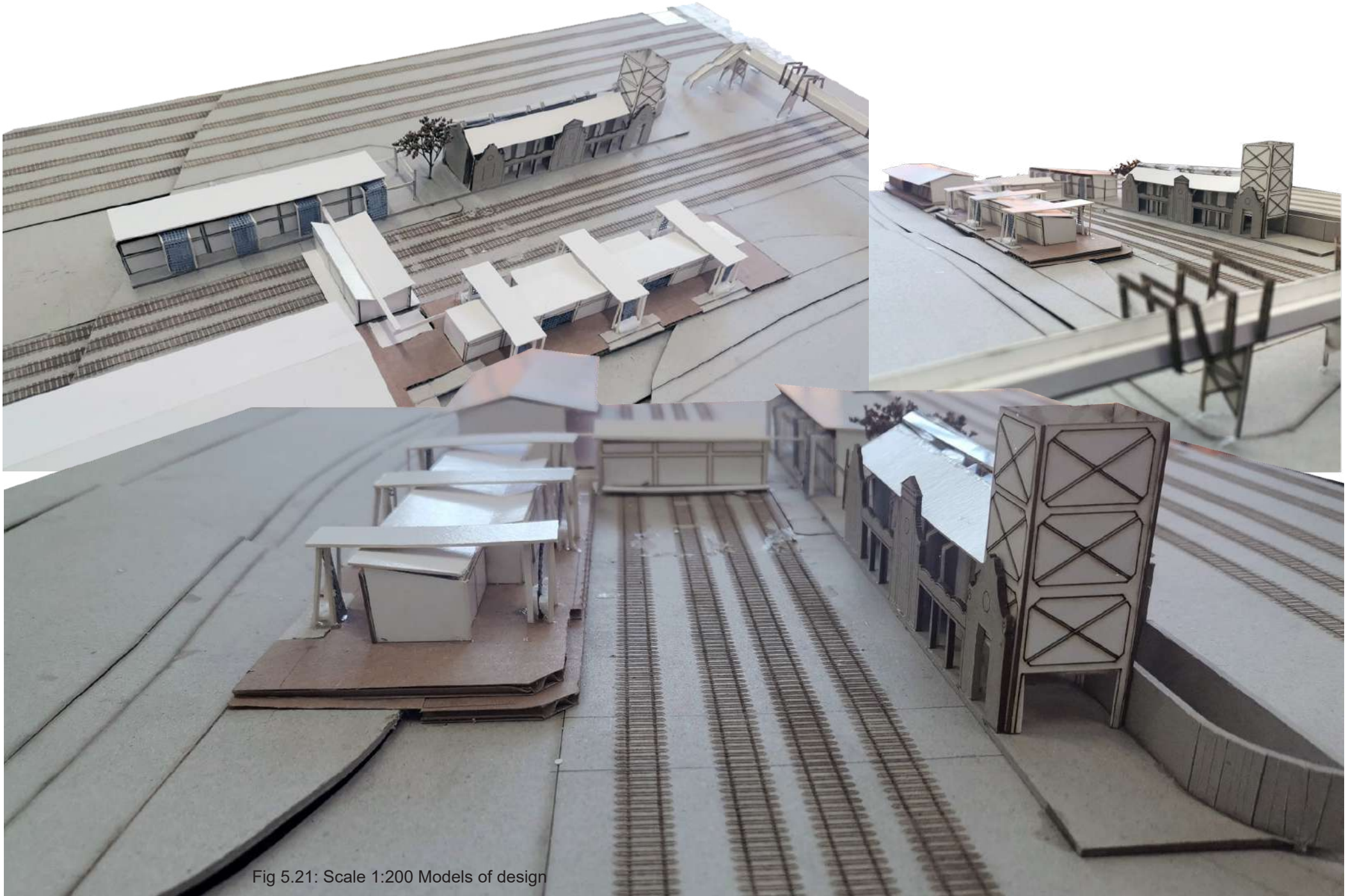


Fig 5.21: Scale 1:200 Models of design

CHAPTER SIX

Final Design iteration

6.1. Final Design iteration



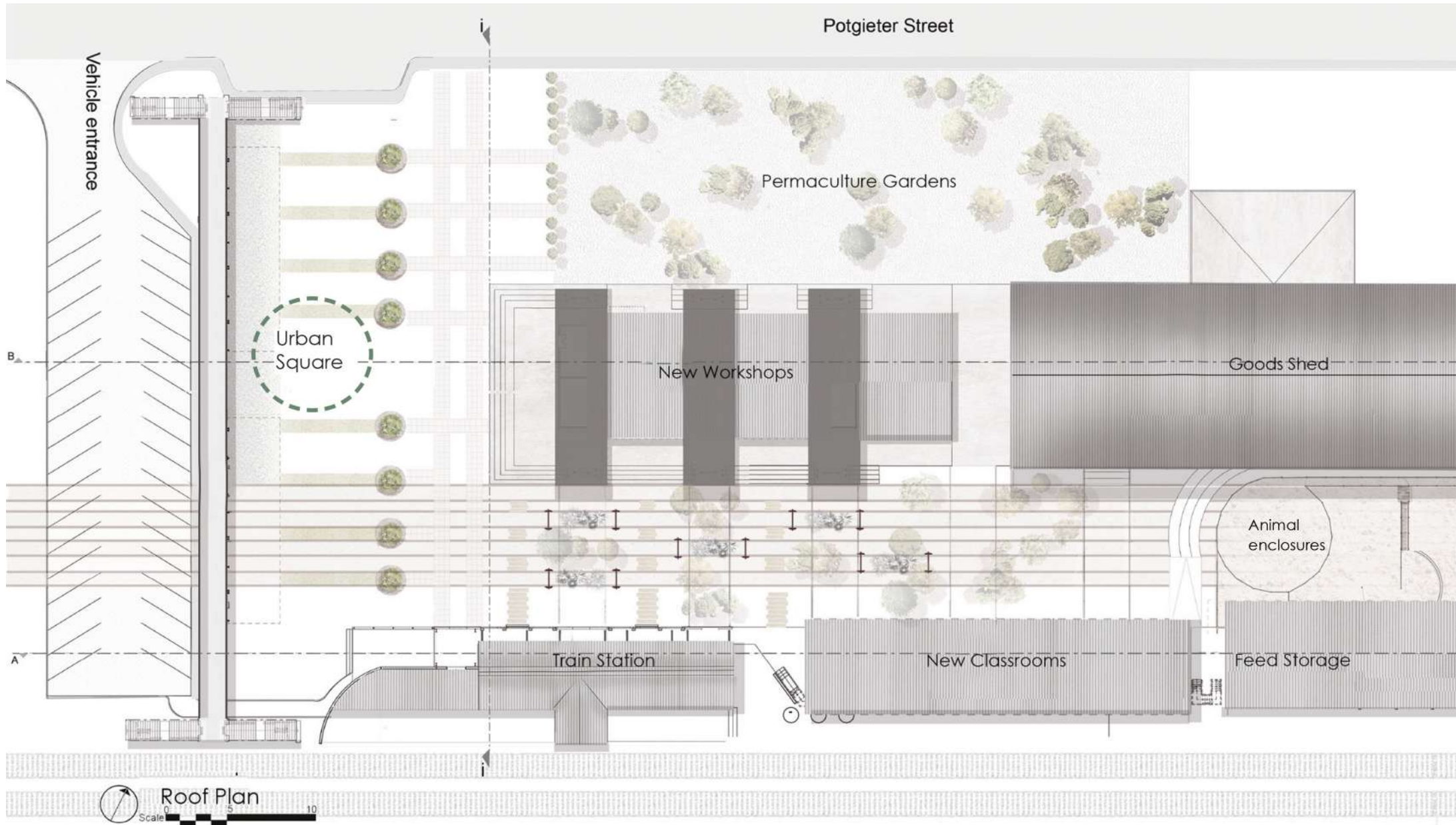
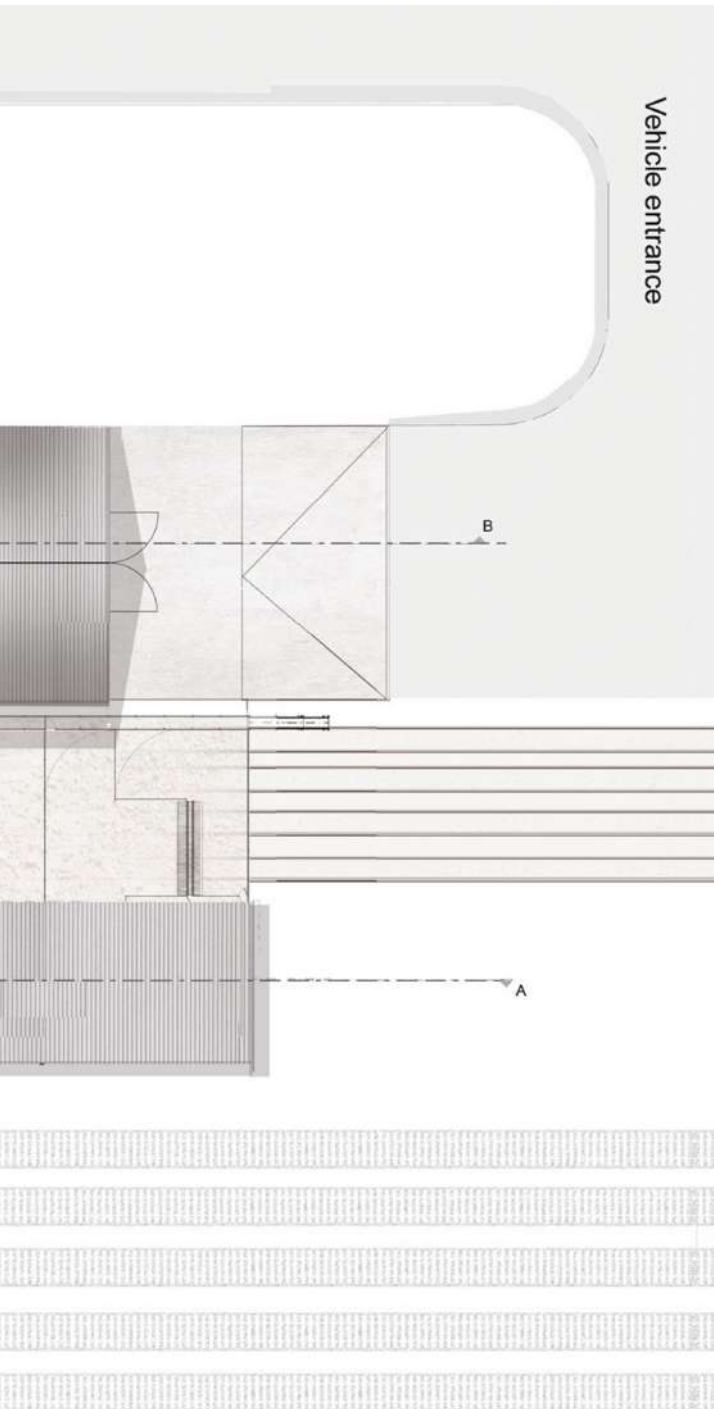


Fig 6.1: Site and Roof Plan

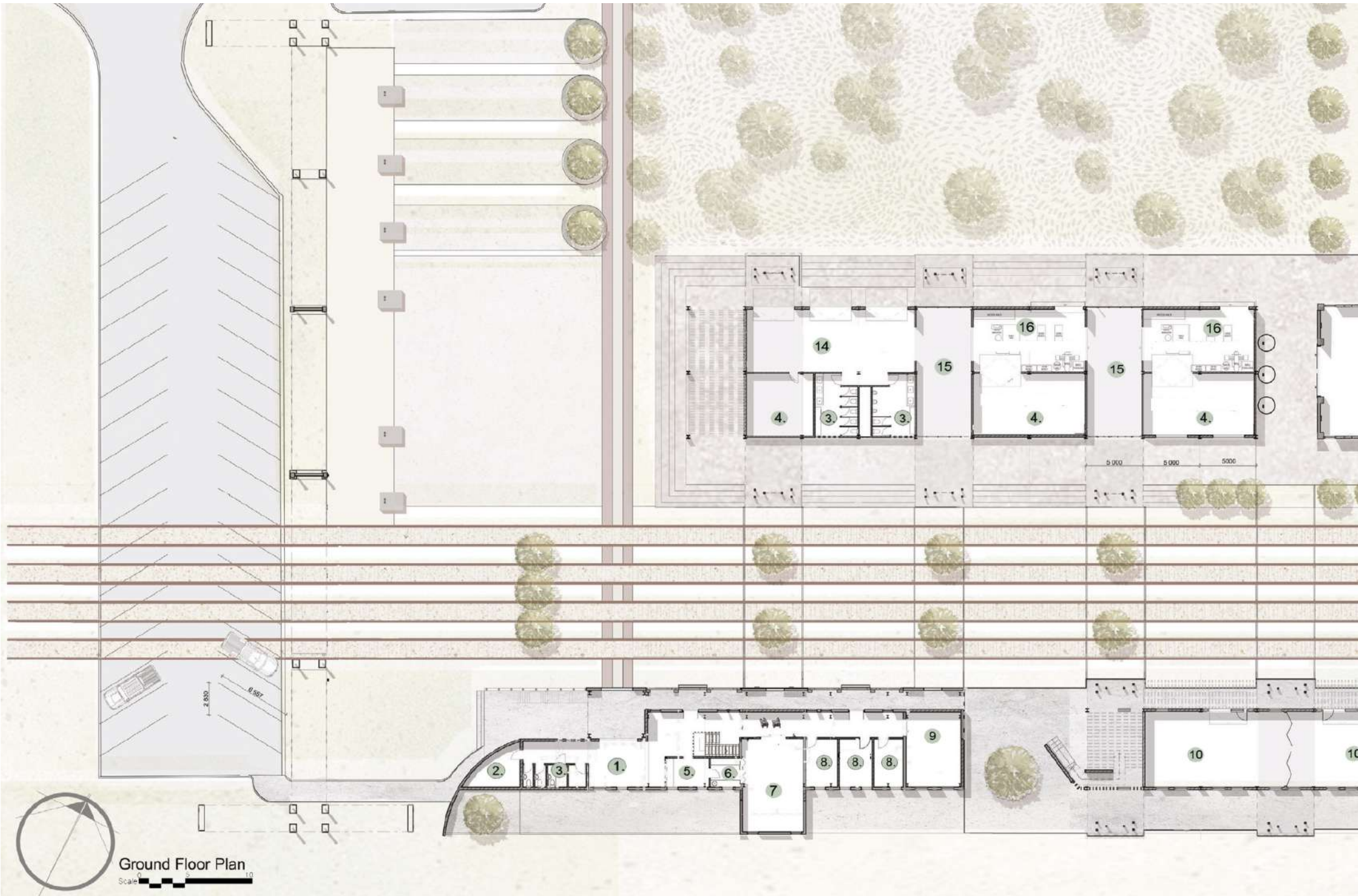


6.1 Final Design Resolution

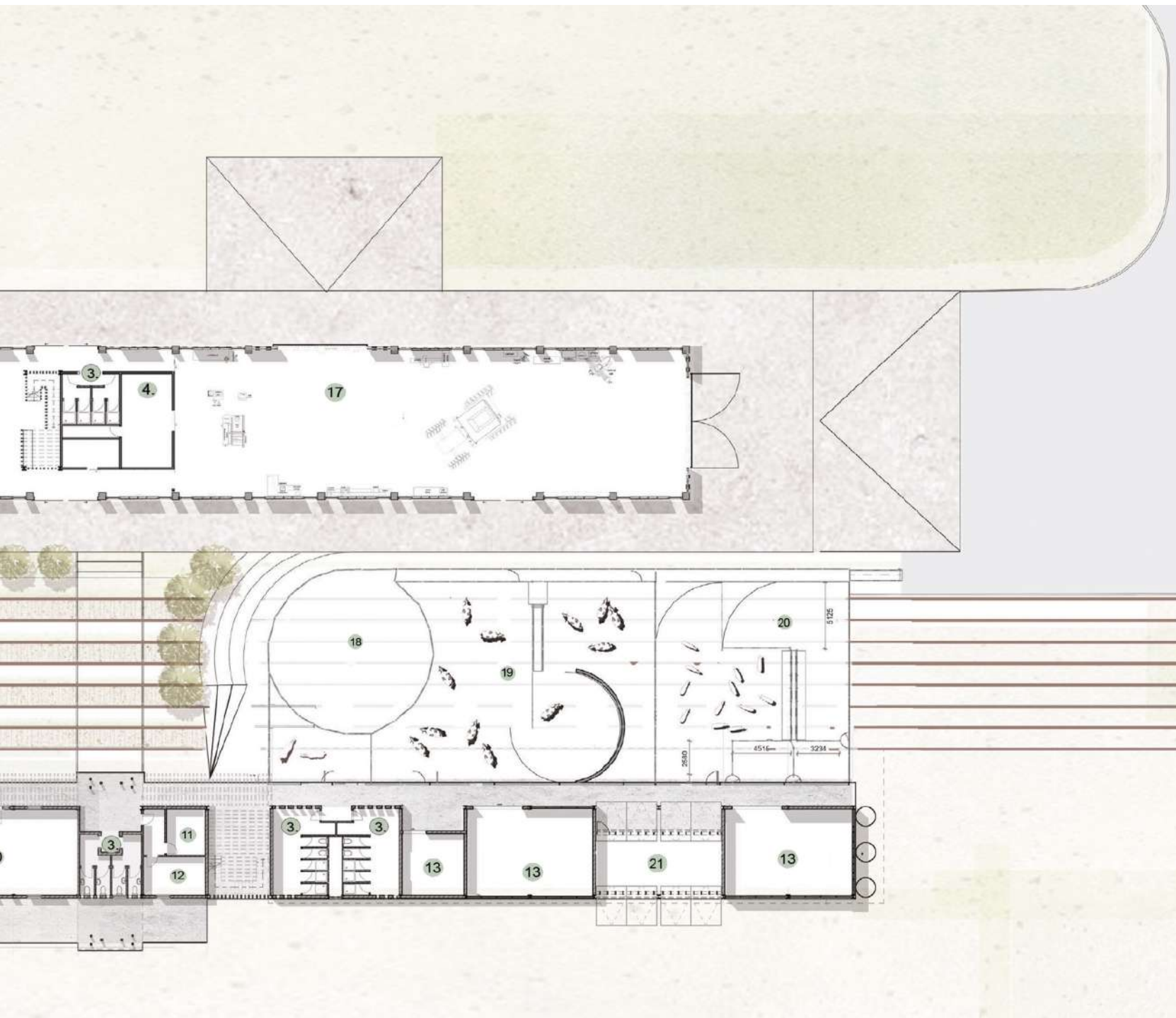
Pedestrians enter the site from Potgieter Street. A market square stretches towards the gable of the Train Station. A tower rises above the gable, beckoning the observer towards the station. The Train Station now functions as the admin building. Classes are attended in the building next to the Train Station. A library and computer labs are situated on first floor level. Mechanical workshops are placed in the Goods Shed. Joinery workshops are placed parallel to the Train Station across the Goods Shed. The joinery workshops become urban magnets of visible production. The market square and permaculture gardens are placed as activities creating urban magnets.



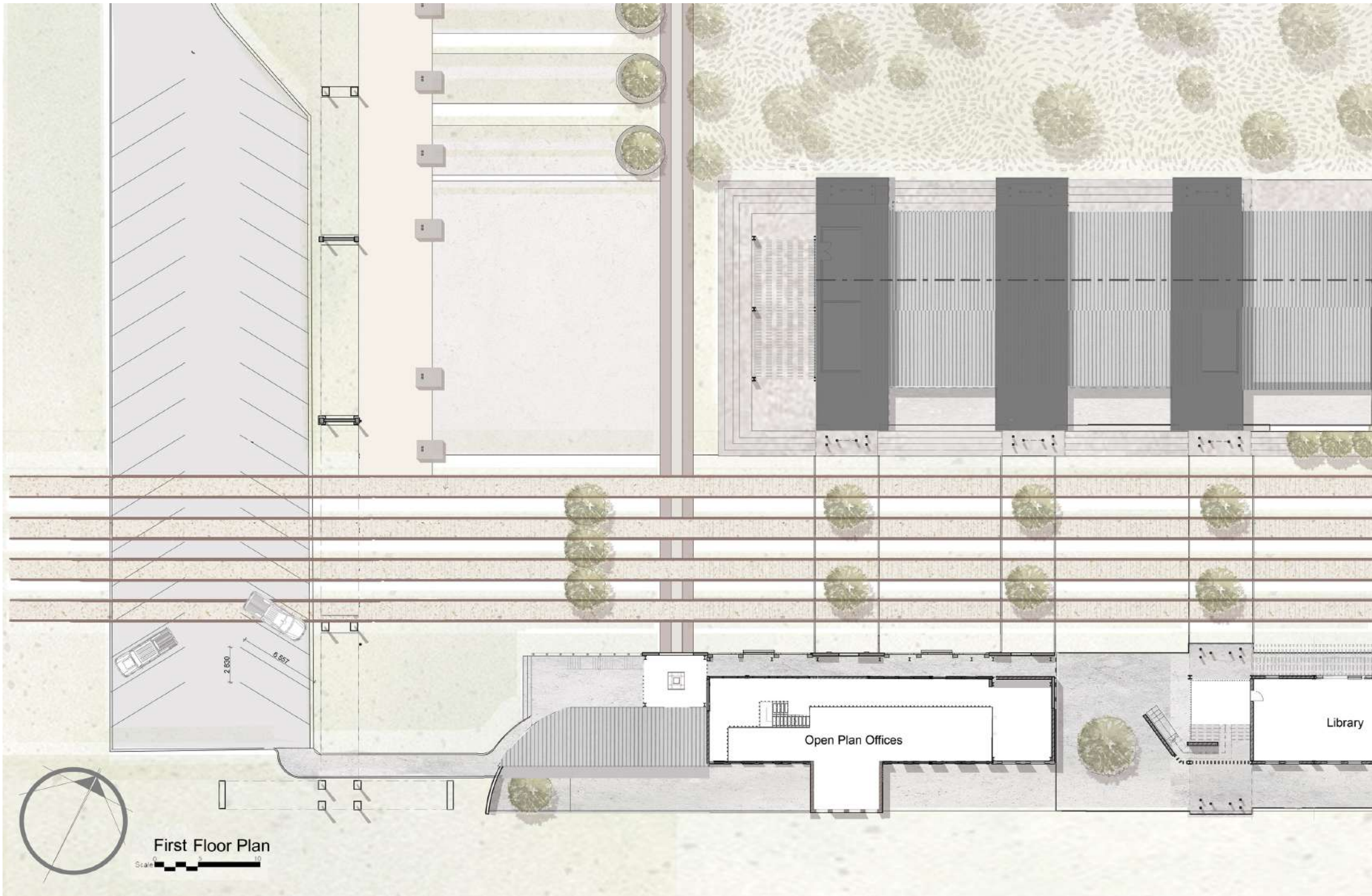
Fig 6.2: Perspective of design ,view from town



Ground Floor Plan
Scale 10

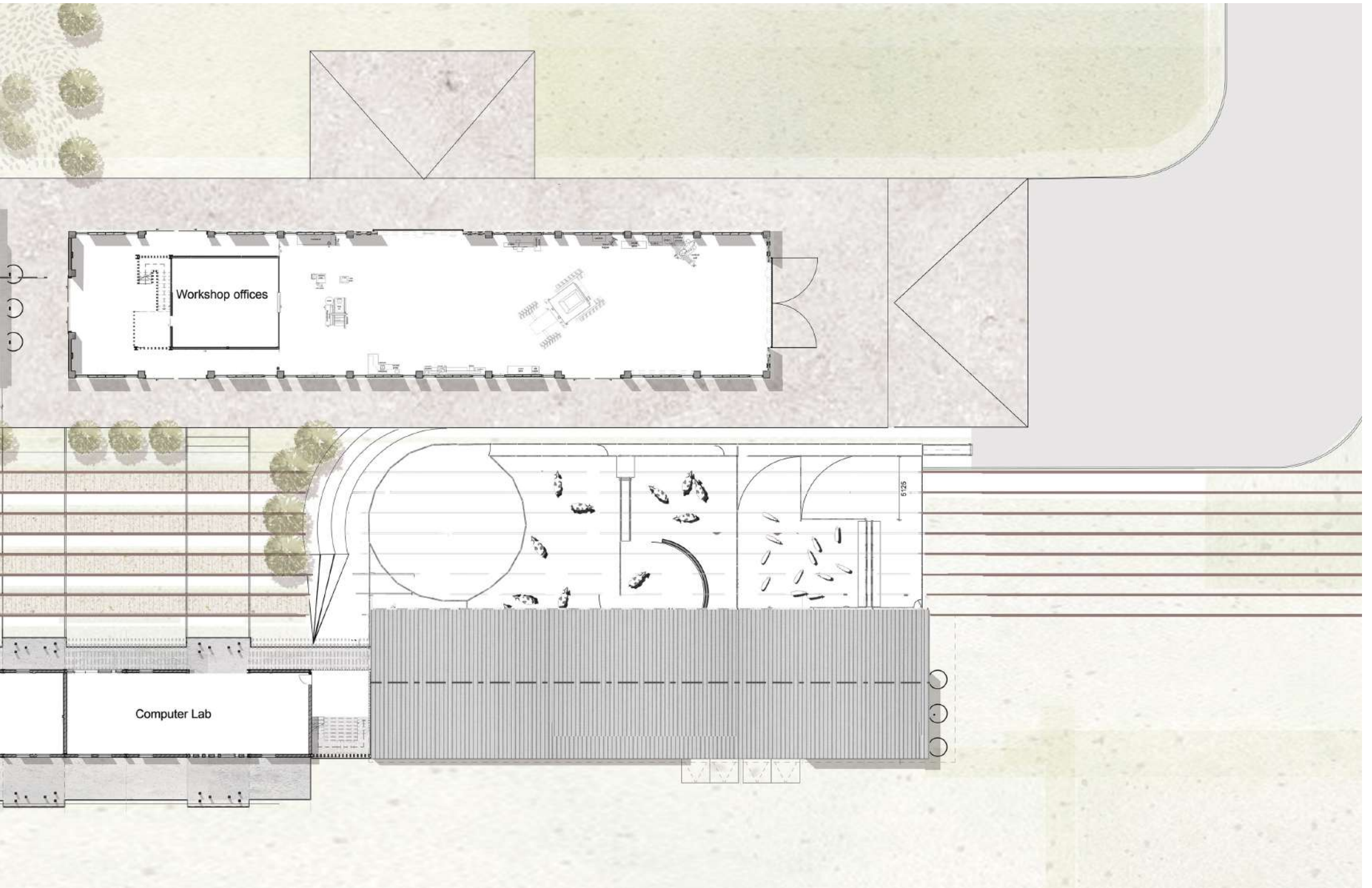


- ① Lobby
- ② Staff Locker Room
- ③ Bathroom
- ④ Storage
- ⑤ Reception
- ⑥ Kitchenette
- ⑦ Boardroom
- ⑧ Office
- ⑨ Staff Lounge
- ⑩ Classroom
- ⑪ Locker Room
- ⑫ Laundry
- ⑬ Feed Storage
- ⑭ Permaculture Workshop
- ⑮ Work Yard
- ⑯ Joiners Workshop
- ⑰ Mechanical Workshop
- ⑱ Horse enclosure
- ⑲ Cattle Enclosure
- ⑳ Sheep Enclosure
- ㉑ Chicken Coop



First Floor Plan

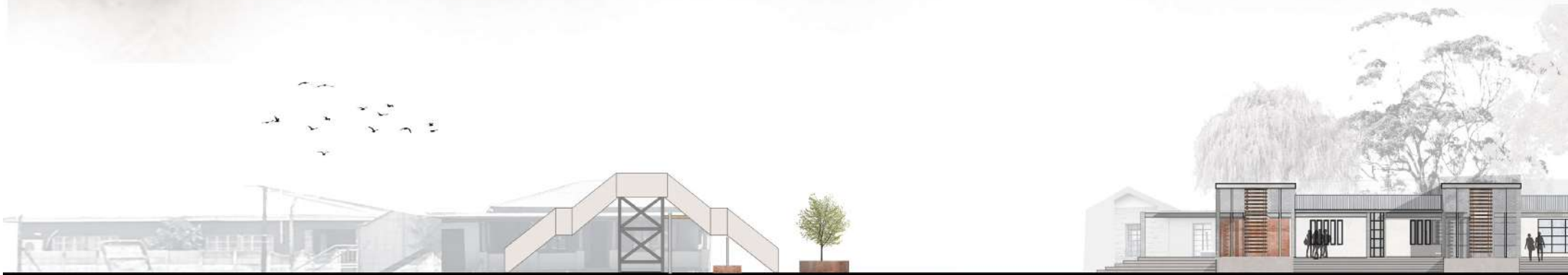
Scale 0 5 10





NORTH ELEVATION OF GOODS SHED

Scale 0 5 10



SOUTH ELEVATION OF GOODS SHED

Scale 0 5 10



Fig 6.4.1:Elevations



NORTH ELEVATION OF TRAIN STATION

Scale 0 5 10



SOUTH ELEVATION OF TRAIN STATION

Scale 0 5 10





- 1. Lobby
- 2. Open Plan Offices
- 3. Classroom
- 4. Locker Room
- 5. Bathroom
- 6. Feed Storage
- 7. Laboratory
- 8. Library

Section A-A

Scale 0 5 10



- 1. Market Square
- 2. Permaculture Workshop
- 3. Joiners Workshop
- 4. Work Yard
- 5. Tool Storage
- 6. Mechanical Workshops
- 7. Workshop Office

Section B-B

Scale 0 5 10

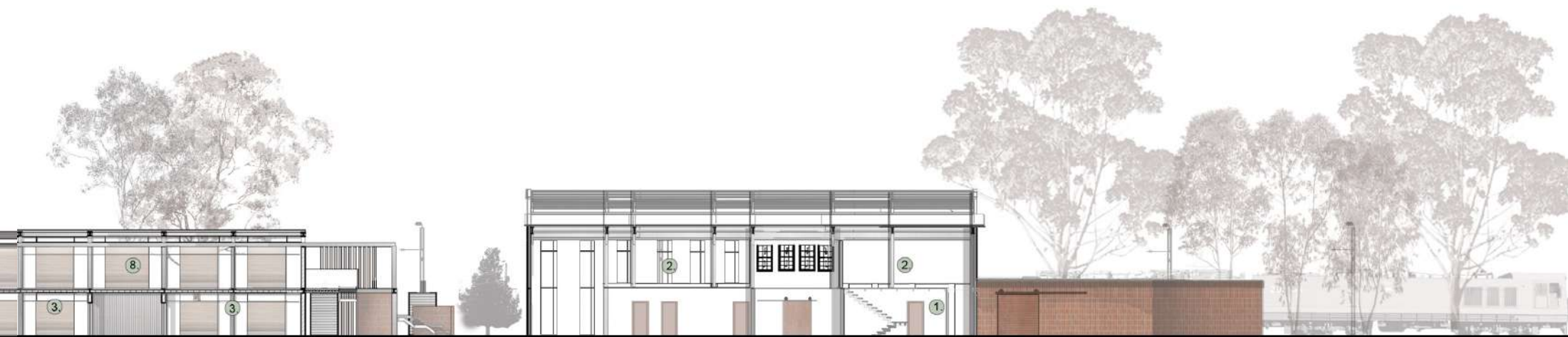


Fig 6.5: Sections(Author,2021)



Scale

Section i-i



Fig 6.6: Sections



Fig 6.7 : Interior of Train Station (Author , 2021)



Fig 6.8 : Interior of Train Station (Author , 2021)



Fig 6.9 : Interior of Goods Shed (Author , 2021)



Fig 6.10 : Perspective from bridge towards the town (Author , 2021)

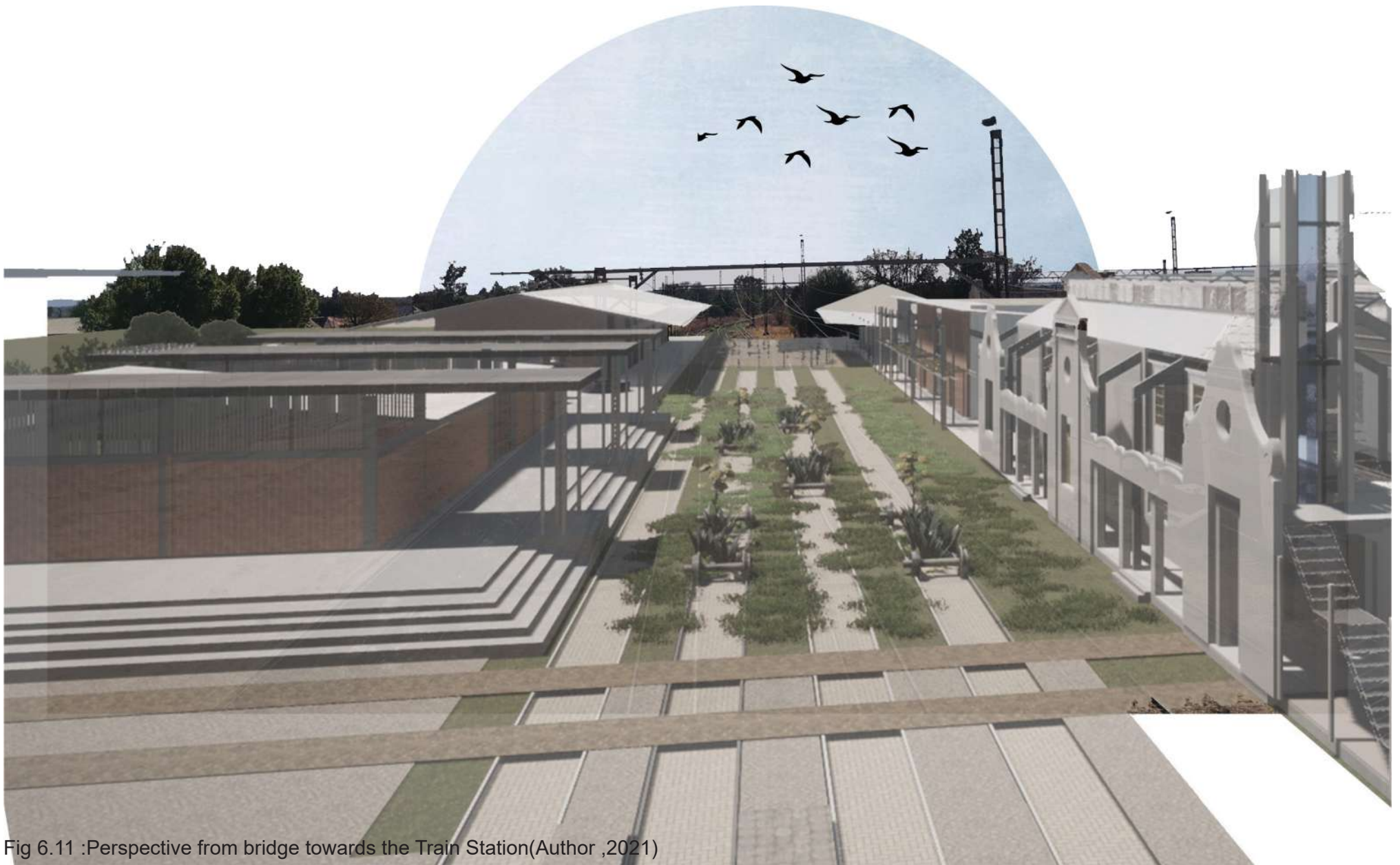


Fig 6.11 :Perspective from bridge towards the Train Station(Author ,2021)



Fig 6.12 :Perspective from Train Station towards the bridge (Author ,2021)



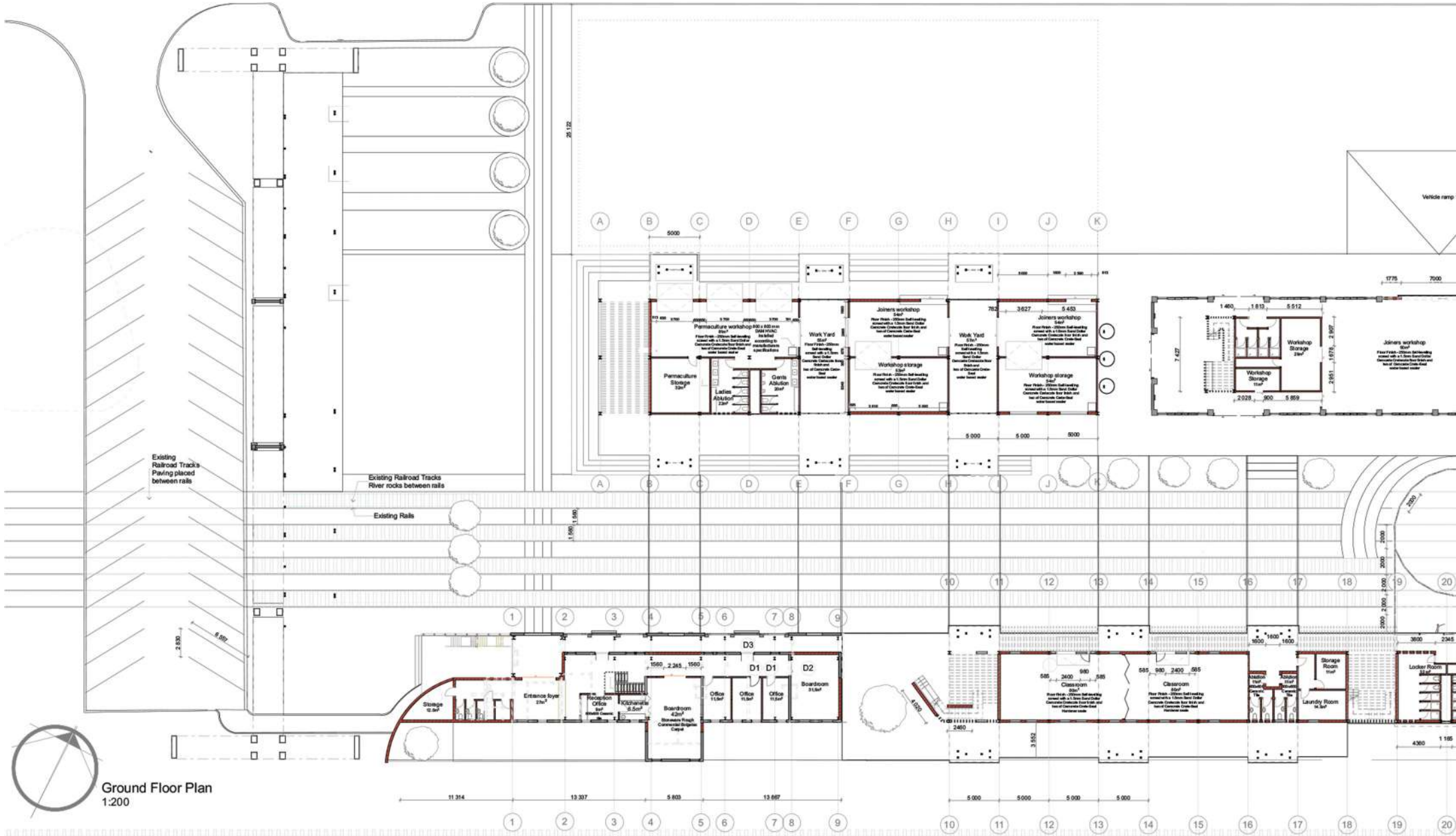
Fig 6.13 :Towards the Train Station from the animal enclosures (Author ,2021)



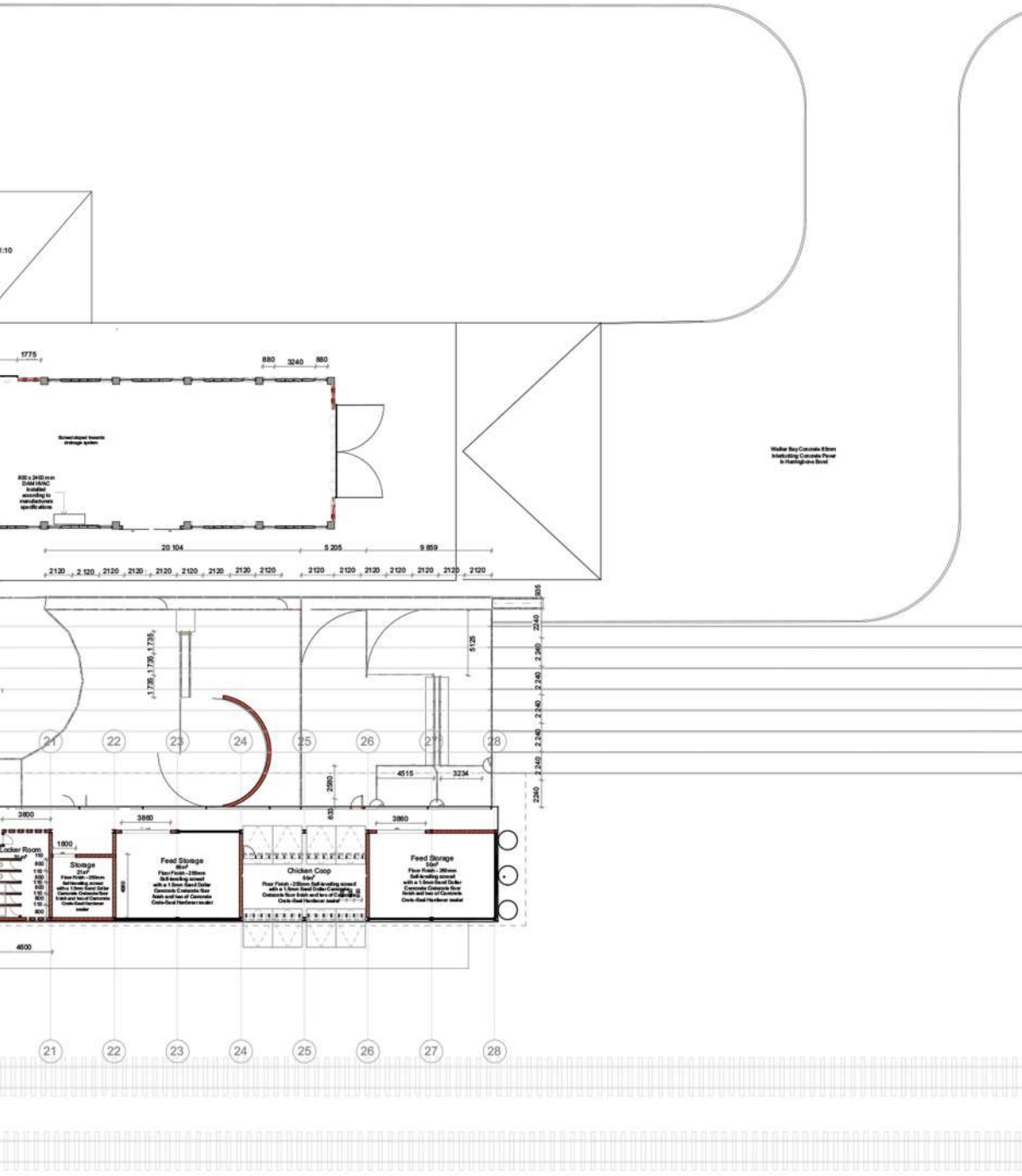
Fig 6.14 :Amphitheatre seating next to the animal enclosures (Author ,2021)



Fig 6.15: Perspective of new Joiner Workshops (Author ,2021)



Ground Floor Plan
1:200




IMPORTANT BUILDING INFORMATION:

ERF NUMBER	
BUILDING OCCUPANCY	
PROPOSED ROOF AREA	
NEIGHBOURING ERFEN /PLOTS	

NO.	DATE	AMENDMENT / NOTES

approved by _____ signature _____
 date approved _____



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Eugenie Rheeder
2016006666
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 Department of Architecture
 Architecture Building
 Dean Street
 205 Nelson Mandela Avenue
 Park West
 BLOEMFONTEIN
 9301

Agri Skills Training Centre
 New development at Potgieter Street,
 Makwassie North West ,2660

drawing title

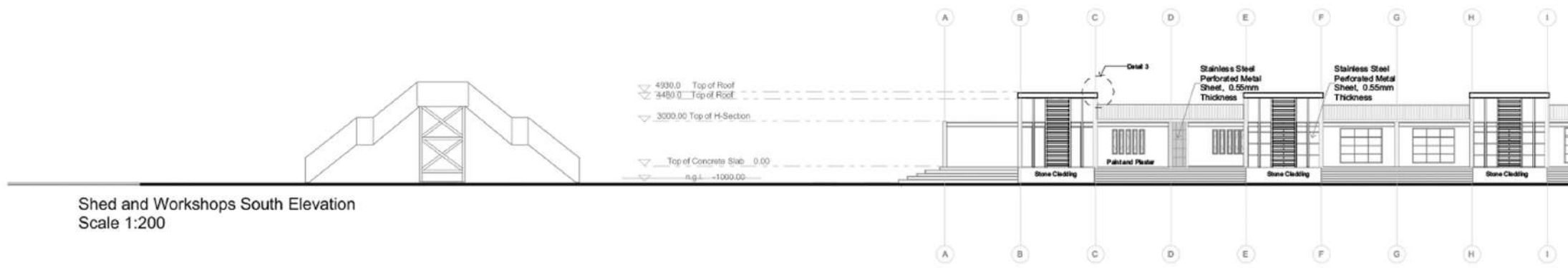
Ground Floor Plan

designed **E.RHEEDER** drawn **E.RHEEDER**
 scale **1:200** various checked

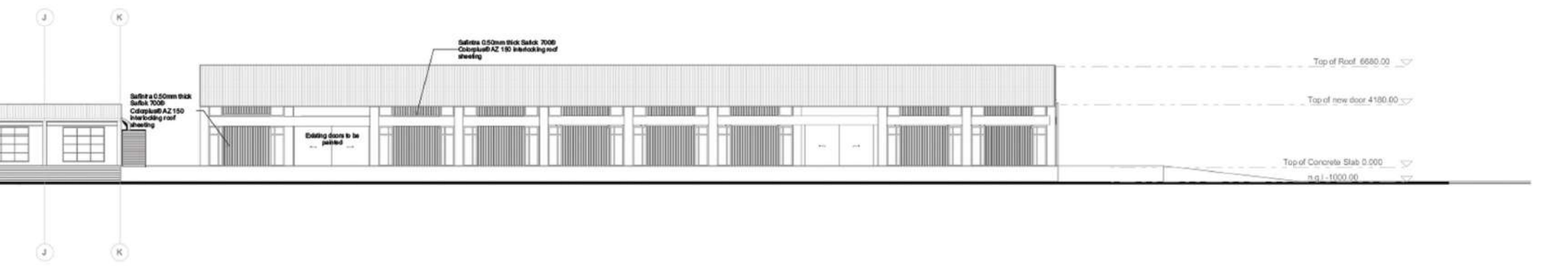
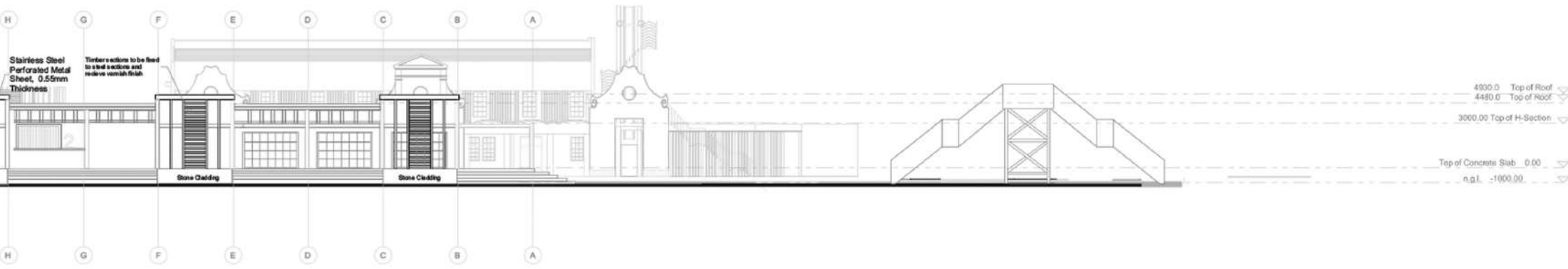
discipline	date
stage	APRIL 2020
file no.	revision no.
NX 01	N 01

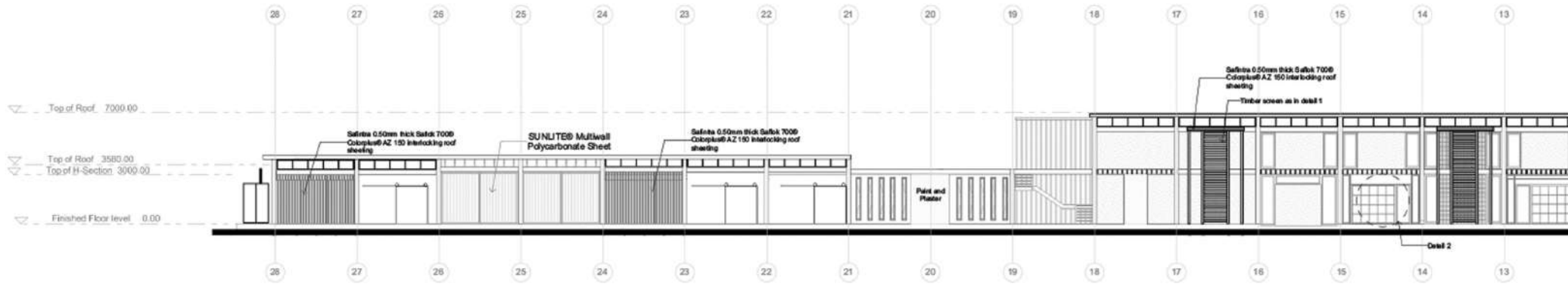


Shed and Workshops North Elevation
Scale 1:200

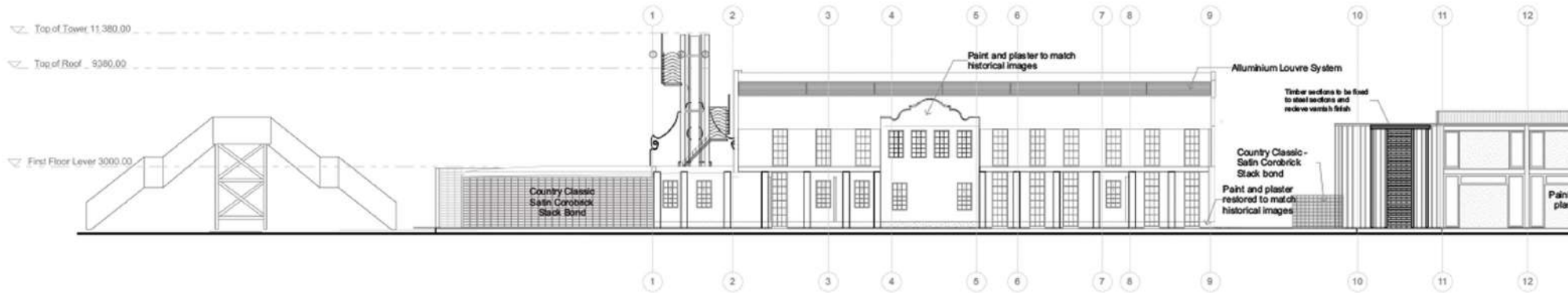


Shed and Workshops South Elevation
Scale 1:200

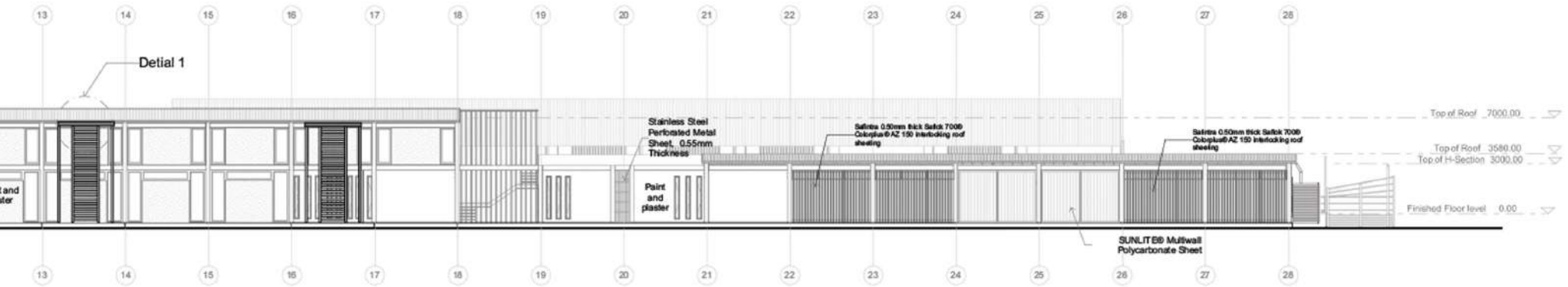
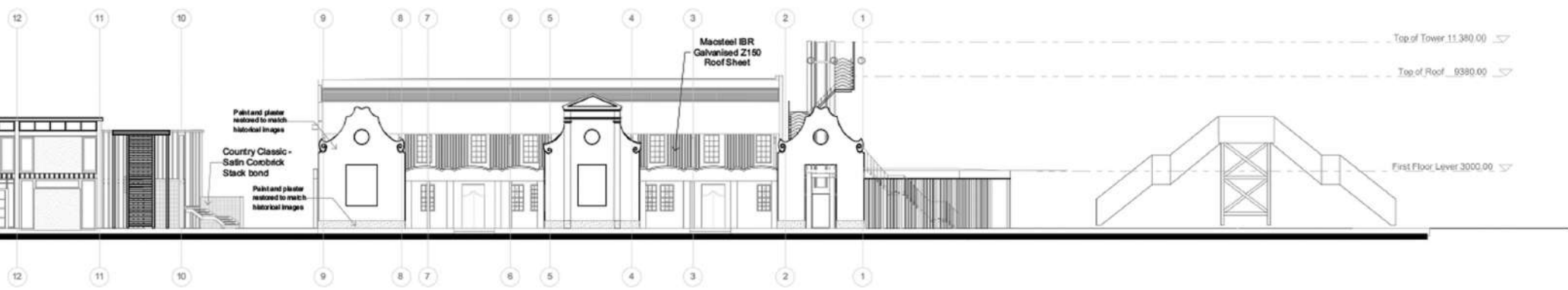


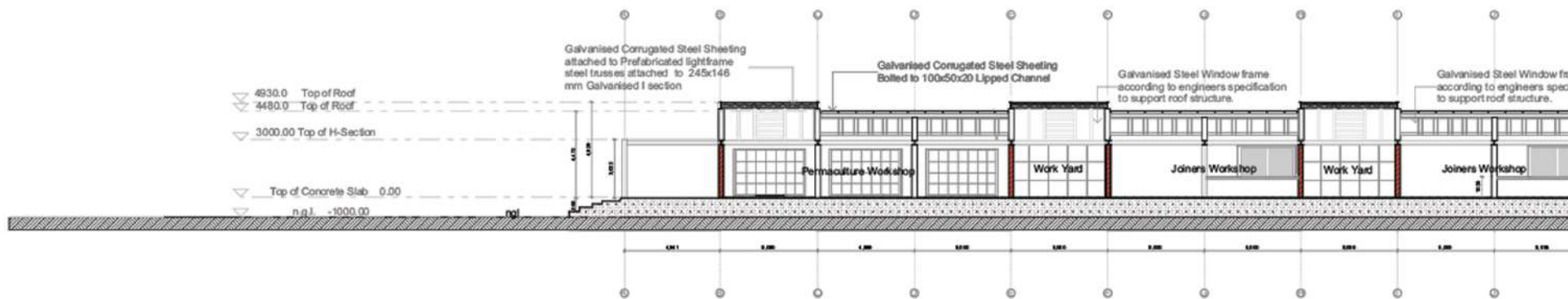
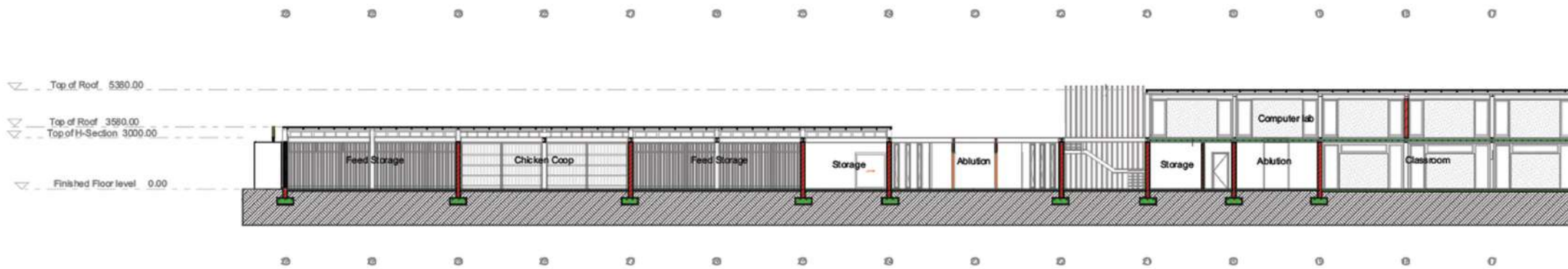


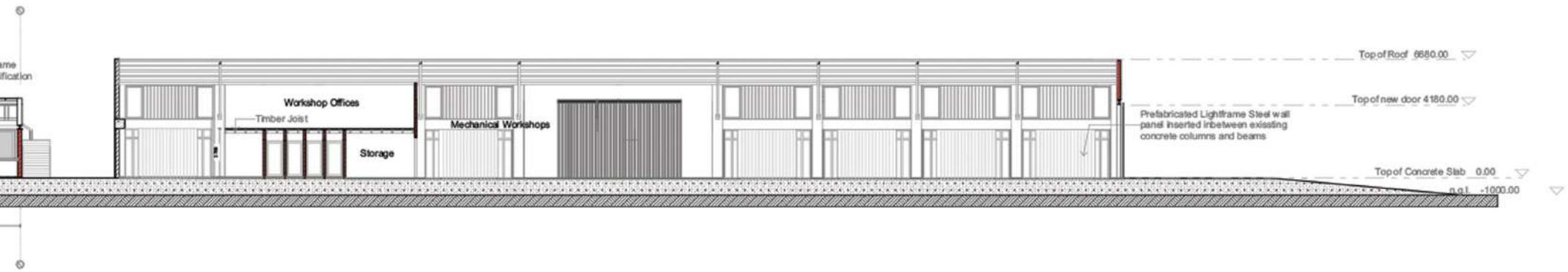
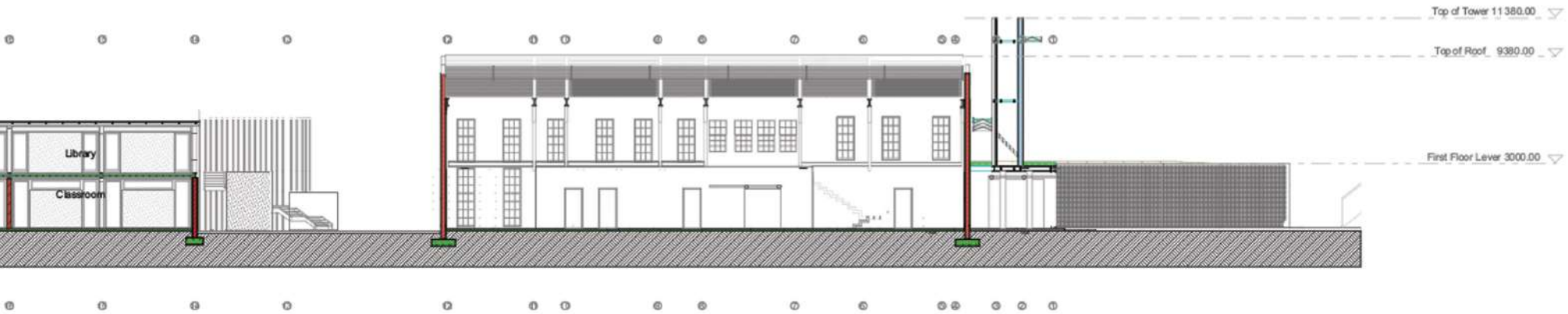
Train Station North Elevation

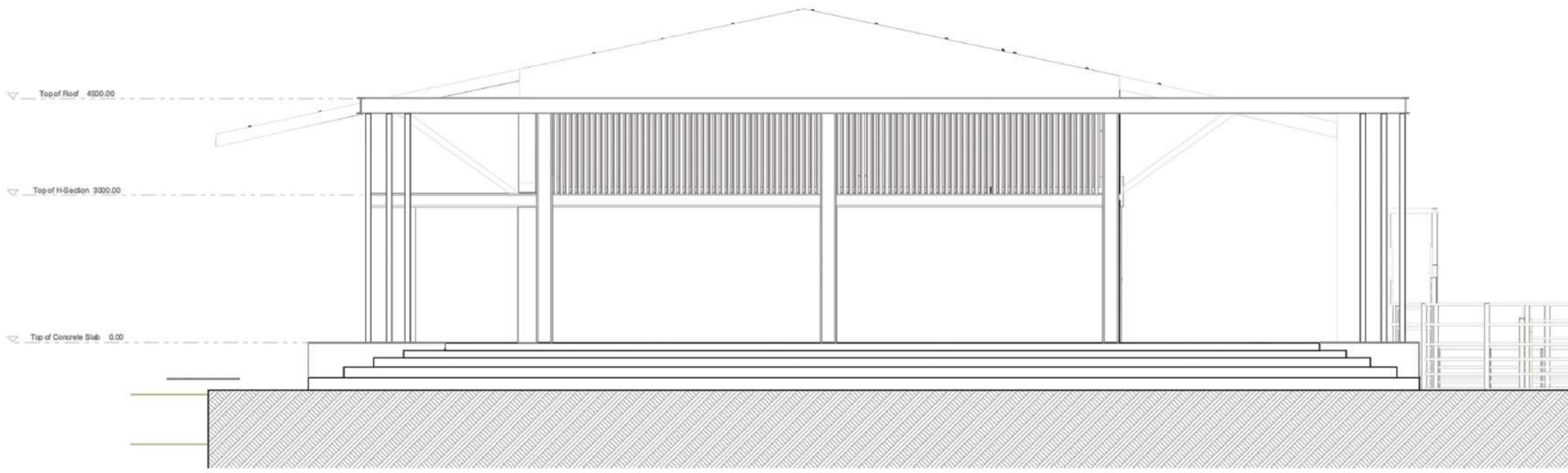


Train Station South Elevation
Scale 1:200

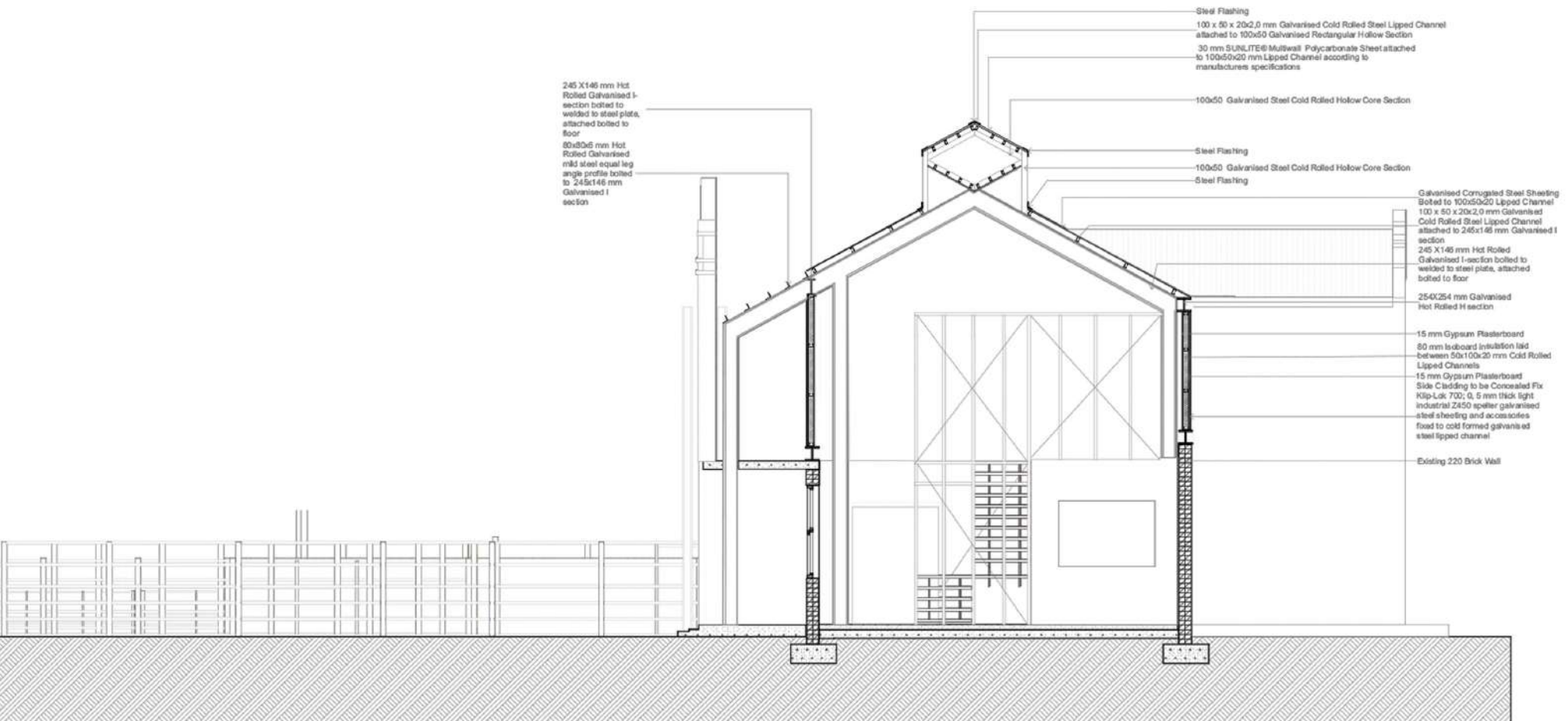




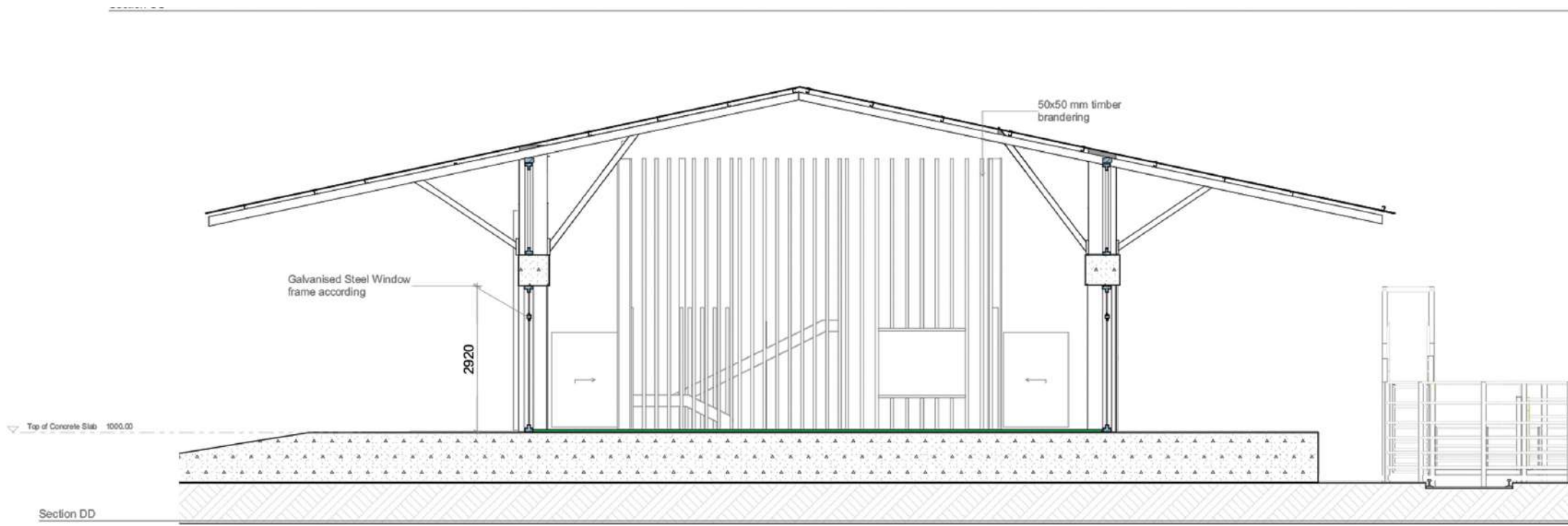


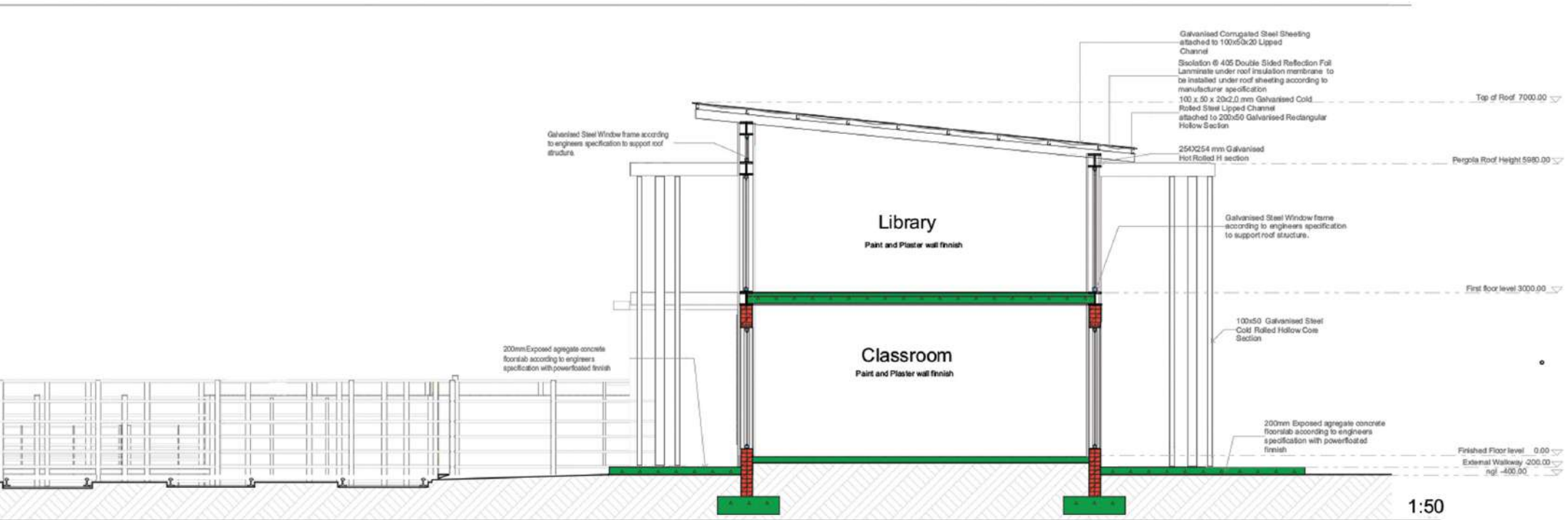


Section CC



1:50





1:50

254 x 254 mm Hot Rolled galvanized steel I-section

48.4 x 4 mm hot formed mild steel circular hollow section shop slotted into and tack welded to 90 x90 x 6 hot rolled mild steel equal leg angle

Galvanized chickenwire attached to 228 x 38 mm S.A. pine structural timber

38 x 38 mm S.A Pine Timber Batten Frame

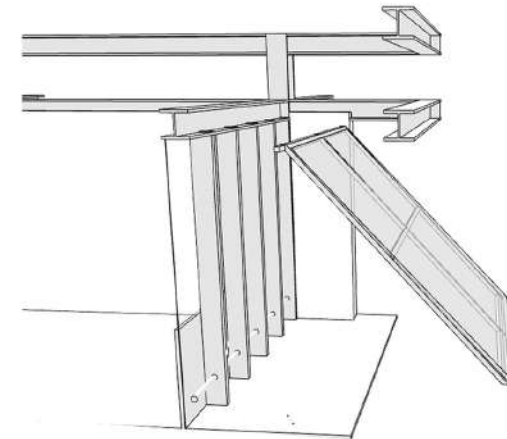
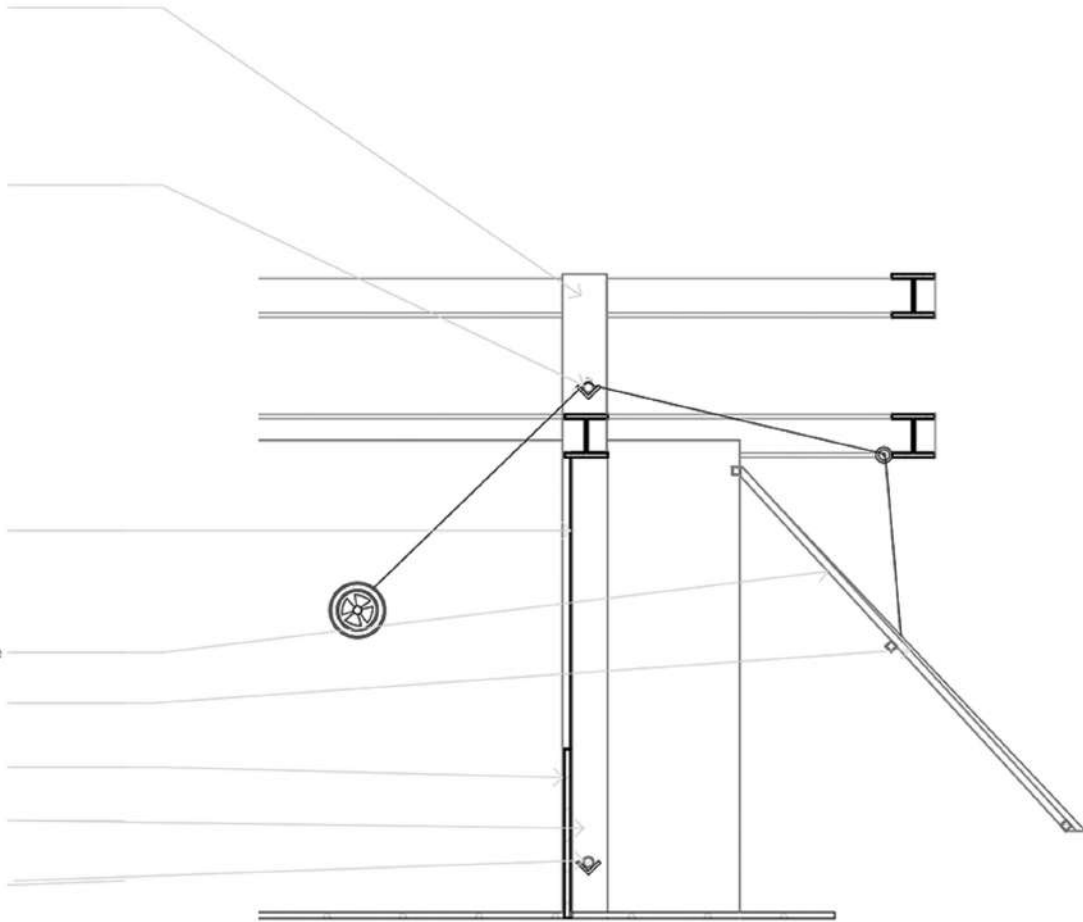
30 mm SUNLITE® Multiwall Polycarbonate Sheet attached to 228 x 38 mm S.A Pine Column

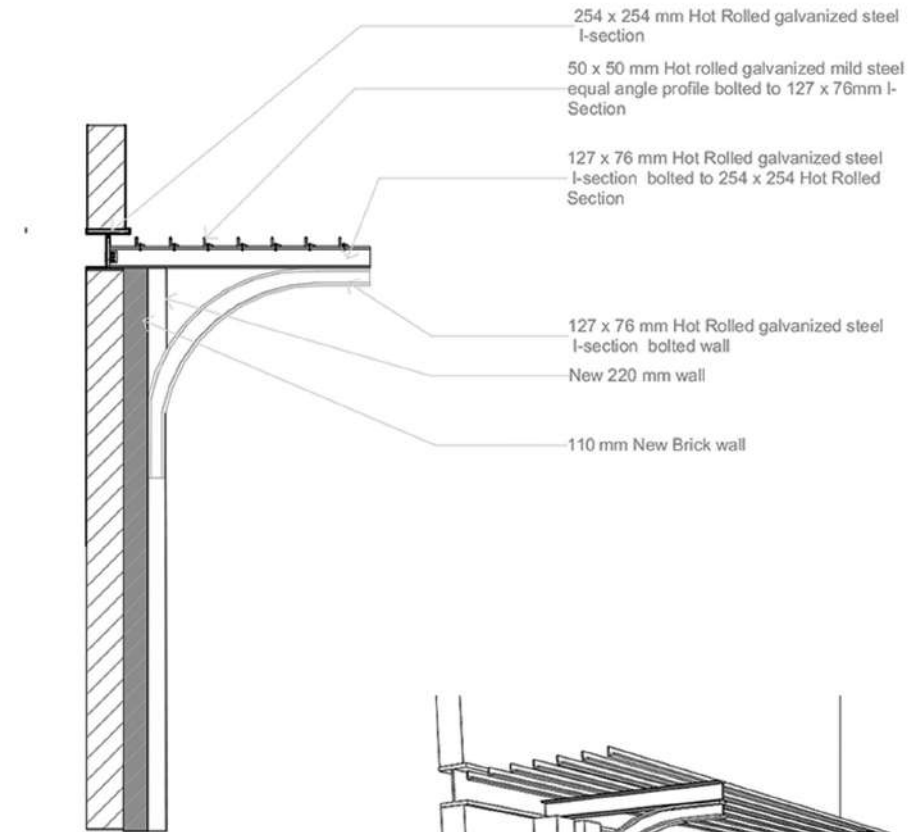
30 mm SUNLITE® Multiwall Polycarbonate Sheet attached to 228 x 38 mm S.A Pine Column

228 x 38 mm S.A. Pine Structural Timber Column

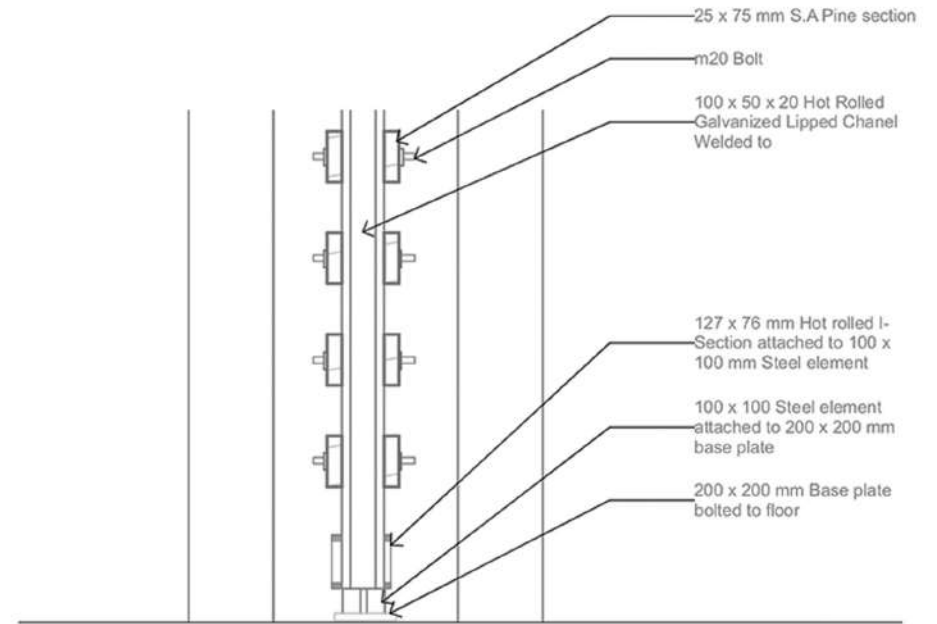
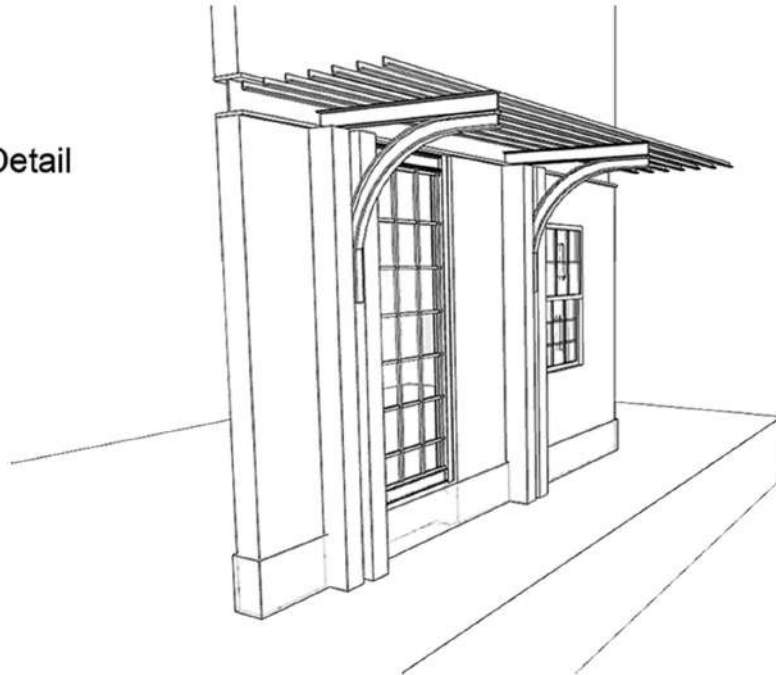
48.4 x 4 mm hot formed mild steel circular hollow section shop slotted into and tack welded to 90 x90 x 6 hot rolled mild steel equal leg angle

Chicken Coop Detail

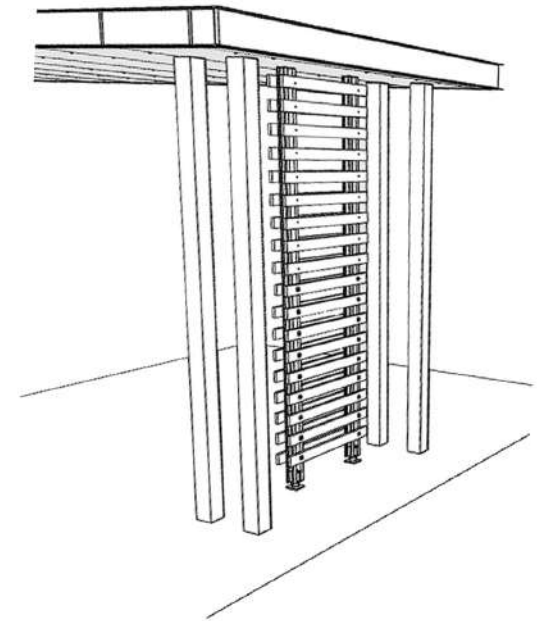




Train Station Detail



Timber Screen Detail



CHAPTER SEVEN

Conclusion

7.1. Conclusion

7.2. Reflection

7.3. References



7.1. Conclusion

Conclusion

“The industrial landscape is an outstanding historical resource to be re-used, regenerating communities, offering real richness and opportunity, reinforcing cultural identity and creating new commercial prospect” (Cossons, 2012: 14).

The revitalization of Terrain Vague can be achieved by exploring the latent potential within the site. Further design solutions are enabled through an investigation of the industrial archetype of the site. The objective of extending the intervention towards the town is achieved by the urban connection with the town. The design reaches back towards Makwassie by utilising the transitions between the vacant site and the town.

Terrain Vague is reimagined as a space acting as catalyst for connection through the development of skills in different trades.

7.2. Reflection

Reflection

Reflecting on the design and research of this project forms an integral part in concluding the design process. Makwassie is my hometown, we used to drive past the Train Station each morning. I remember watching the building decay over time and asking the question: Why is no-one doing anything to utilize the existing infrastructure? The selection of a site was made without hesitation.

The realisation that the problem to be solved is at an urban level came too late in the design process. My personal reluctance to make a decision and stay with it caused a lot of confusion. Every decision made in the process affects the end result.

The design will serve its purpose and the objective is achieved. There will always be room for improvement. The building will aid in empowering the unskilled worker and uplifting the community by providing a space acting as catalyst for connection and the exchange of knowledge.

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