



## **Reframing the Ruin:** *Reinterpreting a Bakoni Site Through Experimental Preservation*

Design Project Discourse DPD 801 |  
Design Document  
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*“As people move about the environment, they acquire knowledge about patterns of their own movement and about spatial relations among places in the world. This knowledge is encoded and stored in memory, allowing people to find the places again...”*

Human Spatial Memory: Remembering Where, Gary L. Allen, 2004

–

*“Architecture is exposed to life. If its body is sensitive enough, it can assume a quality that bears witness to the reality of past life.”*

Thinking Architecture, Peter Zumthor, 1999

# LIST OF FIGURES

Figure 1: Cover page (Author, 2024)

Figure 2: Extent of the stone settlements belonging to the Koni group with an overview of ruin concentration, main land uses and main tourism nodes in Mpumalanga (Author, 2024)

Figure 3 (middle): photograph of Verlorenkloof ruins (Delius, 2020)

Figure 4 (top): Photograph of Verlorenkloof terraces (Delius, 2020)

Figure 5 (bottom): photograph of Machadodorp ruins (Wolter, 2021)

Figure 6: Timeline of Bakoni related artefacts, roleplayers and building materials (Author, 2024)

Figure 7: drawing of interpretation of a Bakoni homestead adapted from (Maggs, 2014)

Figure 8: Notable features of a Bakoni complex (Author, 2024)

Figure 9: Summary of project issues and project inquiry (Author, 2024)

Figure 10: Heritage approaches (Author, 2024)

Figure 11: Locality of the project with notable heritage nodes (Author, 2024)

Figure 12: main road cutting right through the heart of a Bokoni settlement adapted (Author, 2024) from (Google Earth, 2024)

Figure 13: Locality of the project with notable heritage nodes (Author, 2024)

Figure 14: Current site condition with an overlay of past use (Author, 2024)

Figure 15: Diagram of conceptual approach aligning with ruin condition (Author, 2024)

Figure 16: Overall programmatic intentions and user profiles (Author, 2024)

Figure 17: Conceptual explorations of program nodes (Author, 2024)

Figure 18: Different spatial attitudes deriving from the ruin (Author, 2024)

Figure 19: Initial concept iteration maquettes and sketches (Author, 2024)

Figure 20: Iteration 1 sketches and 1:200 maquette (Author, 2024)

Figure 21: Iteration 2 sketches and 1:200 maquette (Author, 2024)

Figure 22: Iteration 3 1:2000 scaled site plan and axonometric exploration (Author, 2024)

Figure 23: Iteration 4 1:1000 scaled site model with plan and axonometric exploration (Author, 2024)

Figure 24: Reversibility framework (Author, 2024) adapted from Design Strategies for Reversible Buildings Durmisevic(2019:52-71)

Figure 25: Degrees of reversibility required for each ruin condition (Author, 2024)

Figure 26: Values of prototyping in circular design processes of participatory/collaborative design, digital fabrication and craft-mode (Author, 2024)

Figure 27: Iterative digital fabrication prototyping process (Author, 2024)

Figure 28: Prototyping process of timber structural system (Author, 2024)

Figure 29: Iteration 5 overall scheme and perspective exploration considering the conceptual drivers and relationship to ruin (Author, 2024)

Figure 30: Ruin as in-between space (Author, 2024)

Figure 31: Initial sectional exploration of the active archive (Author, 2024)

Figure 32: Initial technification of the active archive with improved more reversible foundations (Author, 2024)

Figure 33: Initial assembly process of the active archive before the foundations were improved (Author, 2024)

Figure 34: Final floor plan arrangement and associated programs (Author, 2024)

Figure 35: Active archive pottery workshop section highlighting lightweight fabrication (Author, 2024)

Figure 36: Exploded axonometric diagram of the active archive pottery workshop structure (Author, 2024)

Figure 37: Exploded axonometric diagram of the artefact drop-off structure (Author, 2024)

Figure 38: Artefact drop-off section highlighting earthen construction and modularity (Author, 2024)

Figure 39: Parti diagram sketch of project (Author, 2024)

Figure 40: Aerial perspective drawing of artefact and knowledge sources accumulating and becoming embedded in the site (Author, 2024)

## DECLARATION OF ORIGINALITY

I declare that the assignment, *Reframing the Ruin: Reinterpreting a Bakoni Site through Experimental Preservation*, which has been submitted in fulfilment of part of the requirements for the module of DPD 801 at the University of Pretoria, is my own work and has not previously been submitted by me for any degree at the University of Pretoria or any other tertiary institution.

I declare that I have observed the ethical standards required in terms of the University of Pretoria's ethical code for researchers and have followed the policy guidelines for responsible research.

Signature:



.....

Date:

08 November 2024

.....

## ACKNOWLEDGMENTS

I wish to express my heartfelt gratitude to all who have supported me throughout this journey. To my supervisor, Cobus Bothma, thank you for your guidance and encouragement. To my partner, Mishau Azar, and my parents, your unwavering support has been invaluable. I also extend my appreciation to my colleagues – you know who you are – for your camaraderie and collaboration.

A special thank you to York Timbers and Christo van der Hoven for recognizing my passion for working with renewable materials and for sponsoring my studies. Your support, along with the opportunities you provided to present and engage in colloquiums and conferences, has been instrumental in shaping this journey.

This year has been more than an academic endeavor; it has been a deeply personal and meaningful chapter in my life. I have reflected on life and loss and the importance of spending time with loved ones, as you never know when their time on this earth will end. Life is short - and this is only one simple story that will hopefully encourage others to embark on their own journey of navigating the pursuit of giving life back to what is lost.

# ABSTRACT

Located just south of Mashishing (Lydenburg), this project centres around a cluster of Late Iron Age ruins left by the Koni, who are a pre-colonial agro-pastoral society that shaped the Mpumalanga escarpment with extensive terraced landscapes and circular stone-walled settlements. Positioned on a site with varying degrees of stone ruin condition, this project aims to transform these remains into a productive interpretation centre and archive, narrating a story of harmonious interaction between people, landscape, and livestock.

Currently, the general public remains unaware of the origins of these ruins, making this project a platform for public archaeology through collaboration between Mashishing community members, other locals, tourists and archaeologists to reframe their understanding and explore the significance of this heritage. Through its focus on the considered reactivation of these ruins, the project enhances Mashishing's cultural identity while supporting sustainable ecotourism, responding to the disruption caused by a road that fragments one of the ruin homesteads, and subsequently aiding in the future protection of these historic sites. With an integrated program that includes an artefact archive, a small-scale dairy with traditional sour milk processing (amasi/mafi), an eatery, and a communal pottery workshop, the site embodies circularity as dairy products are created and fermented in locally crafted clay pots, connecting service and production in a closed loop, reflective of past site use. Importantly, this workshop provides members of the Mashishing community—some of whom are active potters—a dedicated space to share and showcase their craft with others, creating a cultural exchange that benefits heritage preservation.

This space is designed to attract tourists, students, archaeologists, museum curators, farmers and members of the Mashishing community, creating a strong tourism node between major attractions like Dullstroom and the Kruger National Park.

The architectural approach embraces three core concepts: memorialisation, re-signification, and reframing. Memorialisation subtly reinforces lower-significance ruins using earthen berms, paying homage to their historical context. Re-signification emphasises high-significance ruins with minimalist boundary markers, while reframing uses framed views and programmatic prompts to offer intimate, reflective engagement with selected ruins. By blending contemporary and traditional construction techniques with a focus on reversible construction, the project facilitates sensitive re-inhabitation, positioning Bakoni heritage as a driver of cultural and ecological development.

**Keywords:** *ruin potential, sensitive re-inhabitation, re-integration, reversible construction, archive*

# PROJECT DETAILS

- **Title:** Reframing the Ruin: Reinterpreting a Bakoni Site Through Experimental Preservation
- **Type of building/program:** Productive archive/interpretation centre (small-scale dairy, active archive pottery workshop & eatery)
- **Address:** Lydenburg, Mpumalanga
- **Context & GPS coordinates:** 25°07'24"S 30°26'35"E
- **Departmental research field:** Memory, Legacy & Identity
- **Clients:** Mpumalanga Department of Tourism, The Museums and Heritage Services of the Mpumalanga Department of Culture Sport and Recreation & SANParks
- **Theoretical premise:** The project centres on reinterpreting pre-colonial Bakoni ruins in Lydenburg, Mpumalanga, by employing experimental preservation methods that transform dormant heritage into active heritage production. It emphasises community participation, heritage tourism, and the use of adaptive reuse principles to design a sustainable archive, dairy, and visitors' centre. Guided by the Burra Charter (1979) and ICOMOS heritage principles (2003), the project explores reversible interventions that respect the historical context while allowing for re-inhabitation and modern functionality. The design integrates natural and local materials, reflecting Bakoni space-making practices and prioritises off-grid systems to support ecological and cultural sustainability. Through concepts like memorialisation, reframing, and resignification, the project aims to preserve the past while making it relevant to contemporary needs.

# GLOSSARY

**Koni & Ba/Bokoni:** In line with the referenced academic literature, this project uses "Koni" to denote the ancient people and "Ba/Bokoni" to describe their broader culture and settlement region (Delius et al., 2016:10).

**Experimental preservation:** Experimental preservation is an interventionist approach in heritage practice that actively questions and tests our relationship to an object or site. Rather than aiming solely to preserve or maintain, experimental preservation explores the interpretive boundaries of an object, sometimes pushing these boundaries to the extent that conventional meanings may collapse (Otero-Pailos et al., 2016: 20).

**Active Archive:** The term is used as a focus beyond static preservation. It actively includes cultural artefacts, oral histories, and ritual practices, preserving them not only as static records but as evolving expressions of community identity, resilience, and memory, shaping knowledge production.

**Ruin-potential:** The inherent capacity of architectural ruins to inspire reinterpretation and adaptation within a contemporary context. It acknowledges the emotional, historical, and spatial qualities of ruins, seeing them not as static remnants but as dynamic frameworks that invite new uses and meanings.

**Reversible construction:** Reversibility, a key aspect of Design for Disassembly, ensures that building components can be removed or modified with minimal damage (Durmisevic, 2006). Using modular, standardised components with reversible connections enables physical adaptation while reducing material waste (Sparandara et al., 2019; Finch et al., 2020; Askar, Bragança & Gervásio, 2021).

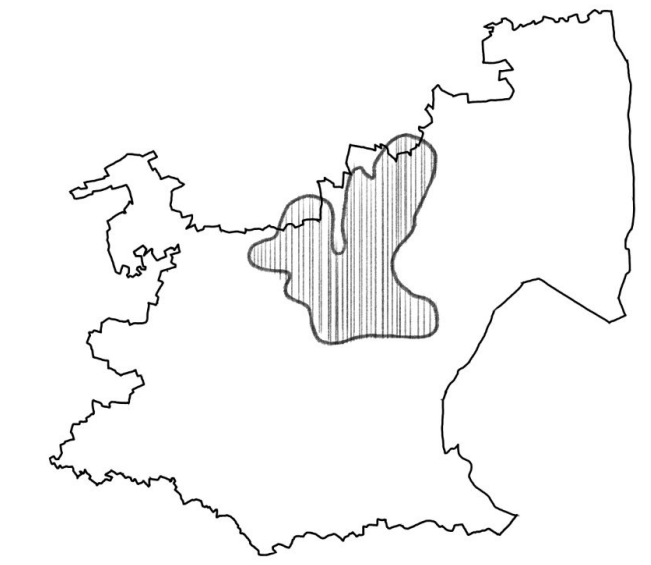
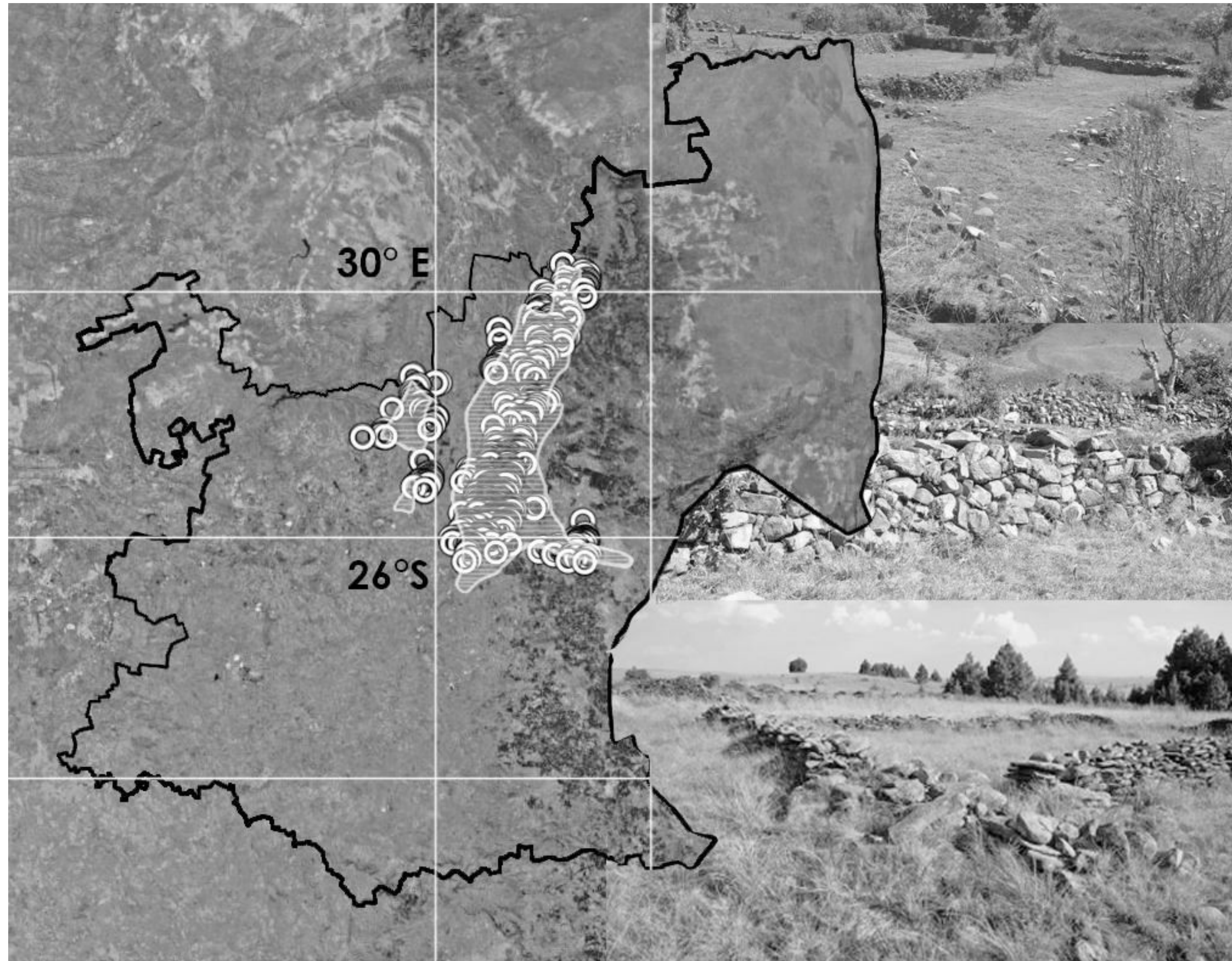
# TABLE OF CONTENTS

<b>01</b> BACKGROUND	7
<hr/>	
<b>02</b> INTRODUCTION   PROJECT FOCUS	10
CONTEXT	12
SITE ANALYSIS	13
CONCEPT	15
PROGRAMME & USERS	16
<hr/>	
<b>03</b> DESIGN DEVELOPMENT & TECHNOLOGICAL INTEGRATION	17
ITERATIONS	18
BUILDING TECHNOLOGY & PERFORMANCE	23
DIT DPD INTEGRATION & INTERPRETATION	24
ACTIVE ARCHIVE ITERATIONS	26
<hr/>	
<b>04</b> FINAL WORK	27
<hr/>	
<b>05</b> CRITICAL REFLECTION	29
<hr/>	
<b>06</b> CONCLUSION	29
<hr/>	
<b>07</b> REFERENCES	30

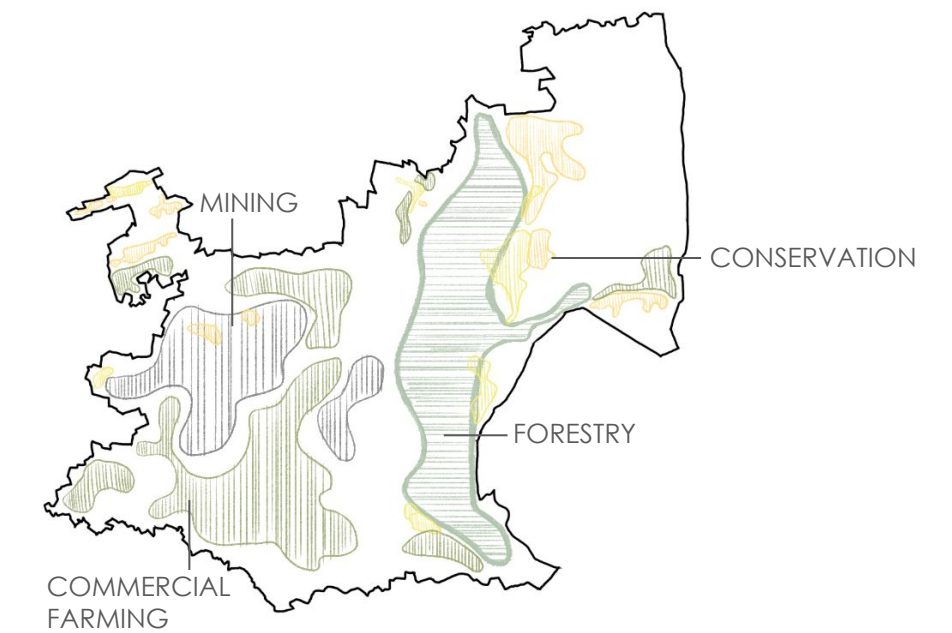
# BACKGROUND

The Bakoni ruins, spanning over 10,000 square kilometres across Mpumalanga and parts of Limpopo, represent an exceptional legacy of the pre-colonial Koni people, who established a sophisticated agricultural system between 1500 and the 1830s. Known for their extensive stonewalled terraces, cattle enclosures, and homesteads, the Koni created a "boundless pre-colonial landscape of migratory farming functions along the escarpment of Mpumalanga". These settlements hold significant historical value as "the remnants of a forgotten world," symbolising a high level of ingenuity and resilience in adapting to the challenging terrain of the highveld (Delius & Schoeman, 2008: 135).

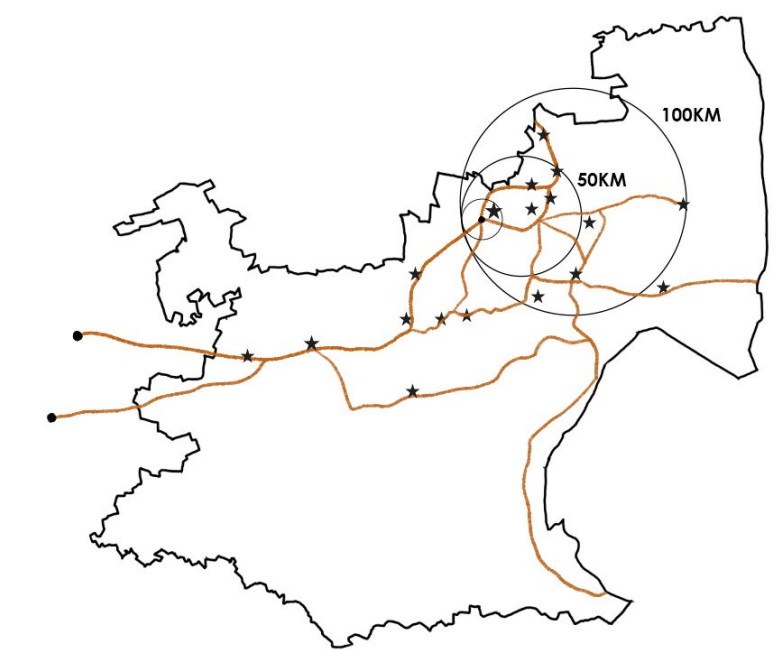
The Bakoni landscape is largely forgotten today, overshadowed by misconceptions and a lack of public awareness, weakening ties between the land and the local community (Delius, Maggs & Schoeman, 2016). Much of this heritage remains hidden and fragmented due to privatised land use and limited access, putting many structures at risk of damage or neglect (Delius & Schoeman, 2008: 135-167; Delius et al., 2016: 12). The stone-walled ruins, with their intricate designs, lack adequate protection to preserve their cultural value. Without intervention, they risk further degradation, emphasising the need to integrate heritage conservation with community engagement.



AREA OF RUIN CONCENTRATION



MAIN LAND USES



MAIN TOURISM AREA & PROXIMITY TO SITE

*Photographs*  
 Figure 3 (middle): photograph of Verlorenkloof ruins (Delius, 2020)  
 Figure 4 (top): Photograph of Verlorenkloof terraces (Delius, 2020)  
 Figure 5 (bottom): photograph of Machadodorp ruins (Wolter, 2021)

Figure 2: Extent of the stone settlements belonging to the Koni group with an overview of ruin concentration, main land uses and main tourism nodes in Mpumalanga (Author, 2024)

Renowned for their advanced agricultural practices, the Koni constructed terraced fields and enclosures, demonstrating a sophisticated approach to land management and environmental adaptation. This heritage contributes to South Africa's historical narrative by highlighting Indigenous innovation and sustainable practices that challenge the view of pre-colonial life as rudimentary. In early 2024, a discovery at the Lydenburg Heads site prompted organic residue analysis on clay artefacts, led by archaeologists worldwide, including Prof. Alex Schoeman. This analysis revealed dairy, animal, and plant processing evidence, suggesting the production of sour milk and curds, as well as ricinoleic acid plants indicating medicinal use and traces of vanilla (Becher, Schoeman, Whitelaw, et al., 2024:12). These findings underscore the Bakoni's advanced, closed-loop systems of organisation and their deep connection to the land and community, representing a significant chapter in our history.

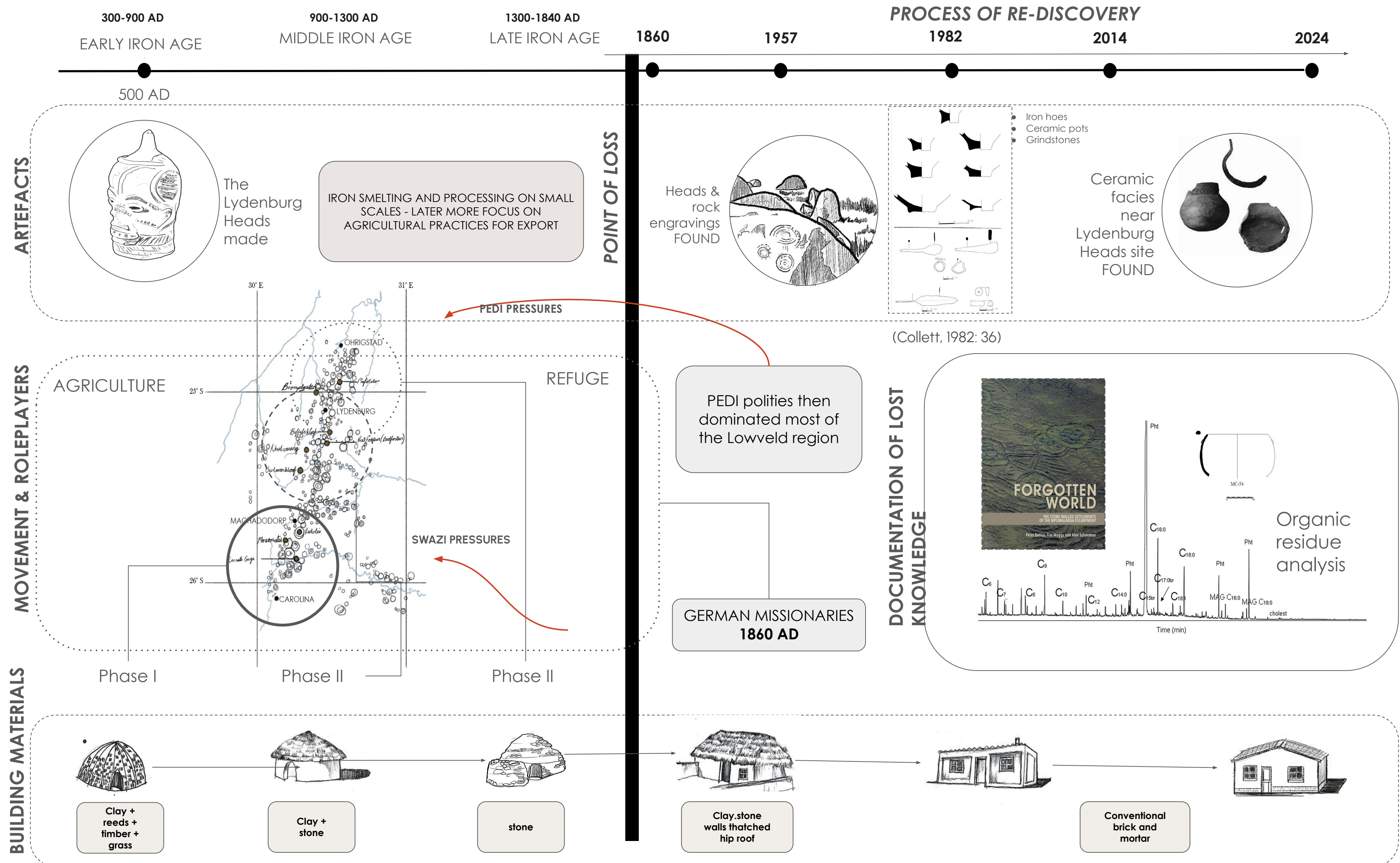


Figure 6: Timeline of Bakoni related artefacts, roleplayers and building materials (Author, 2024)

The stone structures, characterised by dry-stacking techniques and intricate landscape modification, served as animal enclosures, farming terraces, and settlements. The central kraal, constructed from dry-stacked stone, was multifunctional: it housed livestock, collected manure as fertiliser for crop terraces, and symbolised wealth through its size. It also served as a burial site for iron hoes used in bridewealth and for ceramics after ritual use, symbolising transformation. The homes were characterised by reed and timber beehive structures with daga earthen floors, while activities like cooking, pottery making, and dairy fermenting typically took place outside the homes but within the homestead's boundary (Collett, 1982).

Pathways made from dry-stacked stone, often only one row high, were constructed for both cattle and people, with pedestrian paths approximately 500 mm wide and larger paths around 1200 mm wide for cattle and people together. The terracing techniques aligned closely with the landscape, systematically building walls to adapt to land movement from rainfall. Crops cultivated on these terraced landscapes included sorghum, bulrush millet, finger millet, gourds, squash, melons, beans, and groundnuts.

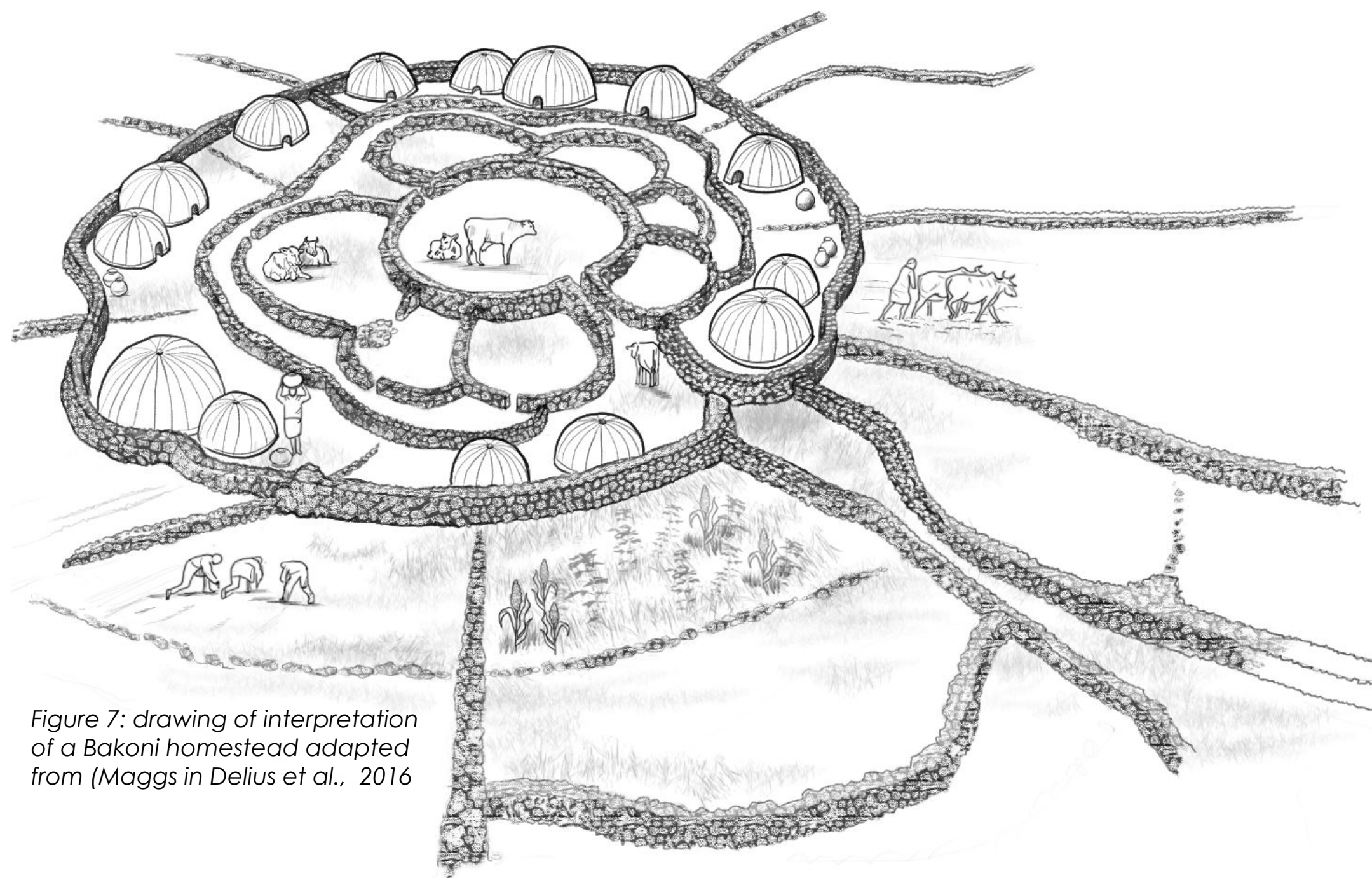
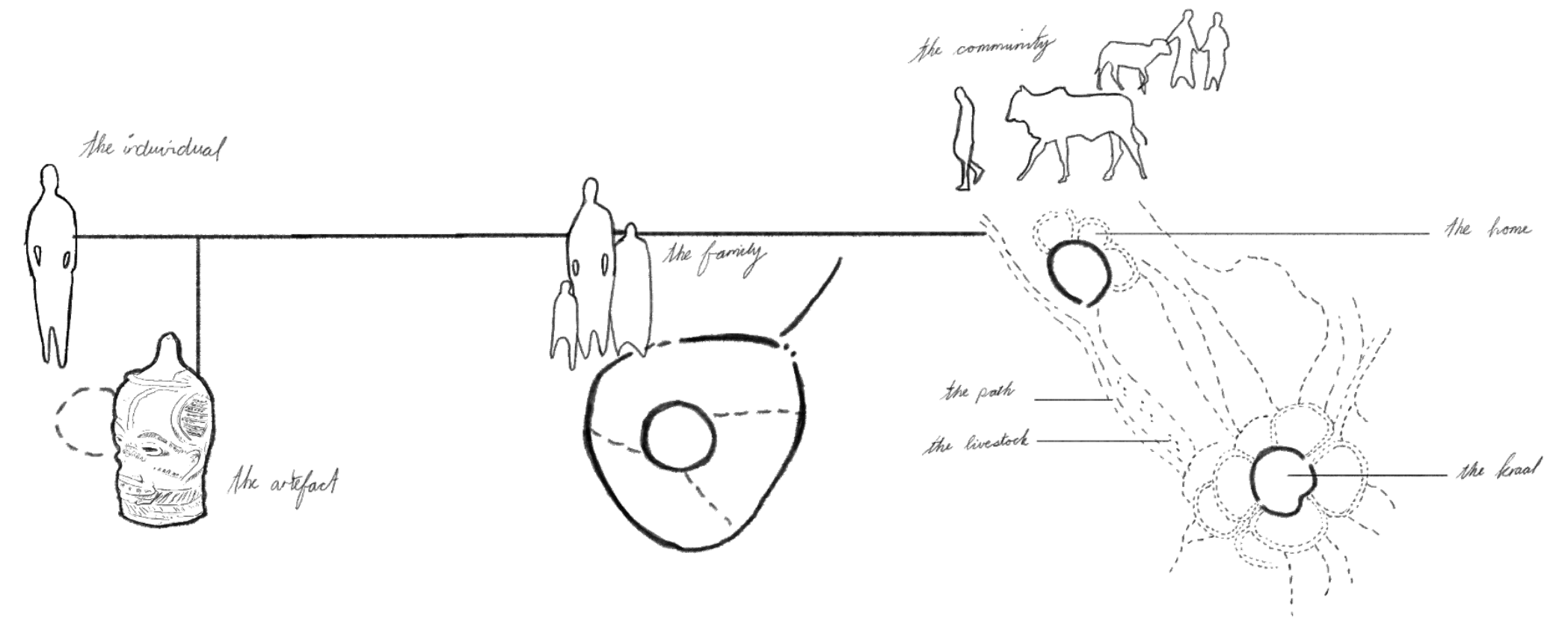


Figure 7: drawing of interpretation of a Bakoni homestead adapted from (Maggs in Delius et al., 2016)



**THE HOME**

IMPERMANENT

**BEEHIVE DWELLING**

TIMBER REED FRAME

**THE KRAAL**

PERMANENT

**DRY-PACKED STONE**

**THE PRODUCTION**

millet  
(Panicum miliaceum)

sorghum  
(Sorghum vulgare)

maize  
(Zea mays)

**CERAMICS (food + ritual)**

**THE TERRACE & PATH**

SLOPE UP

**TERRACING WITH LANDSCAPE OVER TIME**

Figure 8: Notable features of a Bakoni complex (Author, 2024)

# INTRODUCTION | PROJECT FOCUS

The project is driven by the need for preservation strategies for Bokoni artefacts, as only the Blaauboschkraal ruins and Boomplaats engravings hold heritage status, despite numerous artefacts dispersed across the landscape. The focus lies on how to engage with these ancient structures in ways that respect both spatial development and ongoing heritage production for future generations. Preserving these delicate pre-colonial ruins while introducing contemporary use requires balancing historical authenticity with new functionality.

The project addresses the tension between preservation and adaptation, incorporating locally sourced materials and prioritising environmental sustainability, given Mpumalanga's unique conditions. Situated in a region with a prominent tourism industry, it considers the impact of heritage portrayal, responding to critiques of tourism's commodification of culture (De Bernardi, 2019: 440). Rather than aiming for a rigid authenticity, the approach embraces performative authenticity, recognising the ruins' evocative power as elements that resonate with memory and the passage of time (Pallasmaa in Amundsen, 2018:2).

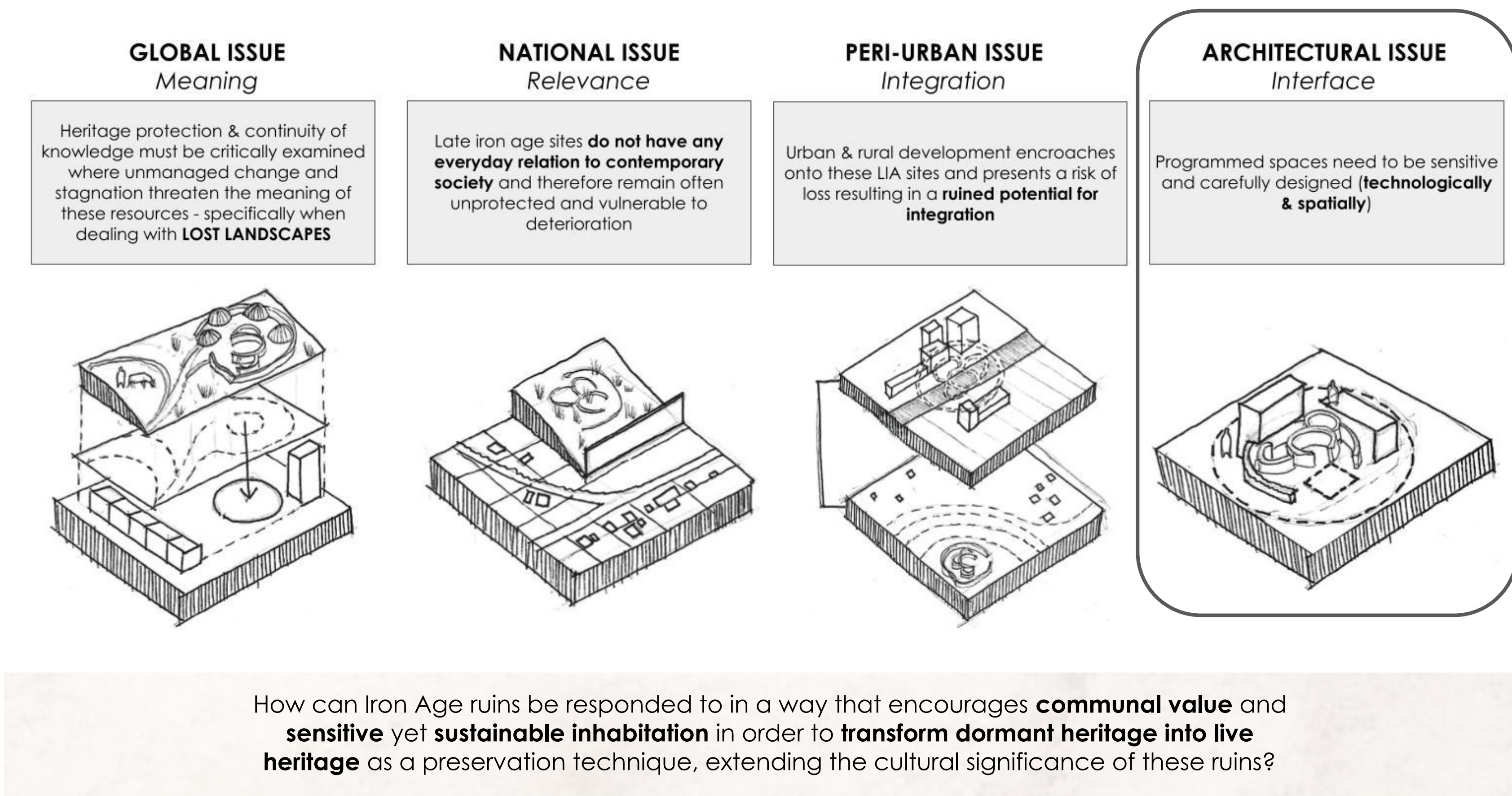


Figure 9: Summary of project issues and project inquiry (Author, 2024)

Guided by the Burra Charter (1979) and ICOMOS heritage principles, this project prioritises reversible interventions to ensure future adaptability. Constructions are designed for assembly, disassembly, and reuse, preserving the historical integrity of the site while enabling new functions and respecting the ruins as dynamic, integral parts of both heritage and contemporary life. Aligning with the Paris Declaration of 2011, which views heritage as a driver of development rather than a static identity marker (ICOMOS, 2011), the goal of the proposal is to, "reconnect these isolated heritage sites with current community life through a 'living heritage' approach" (Wijesuriya, 2018).

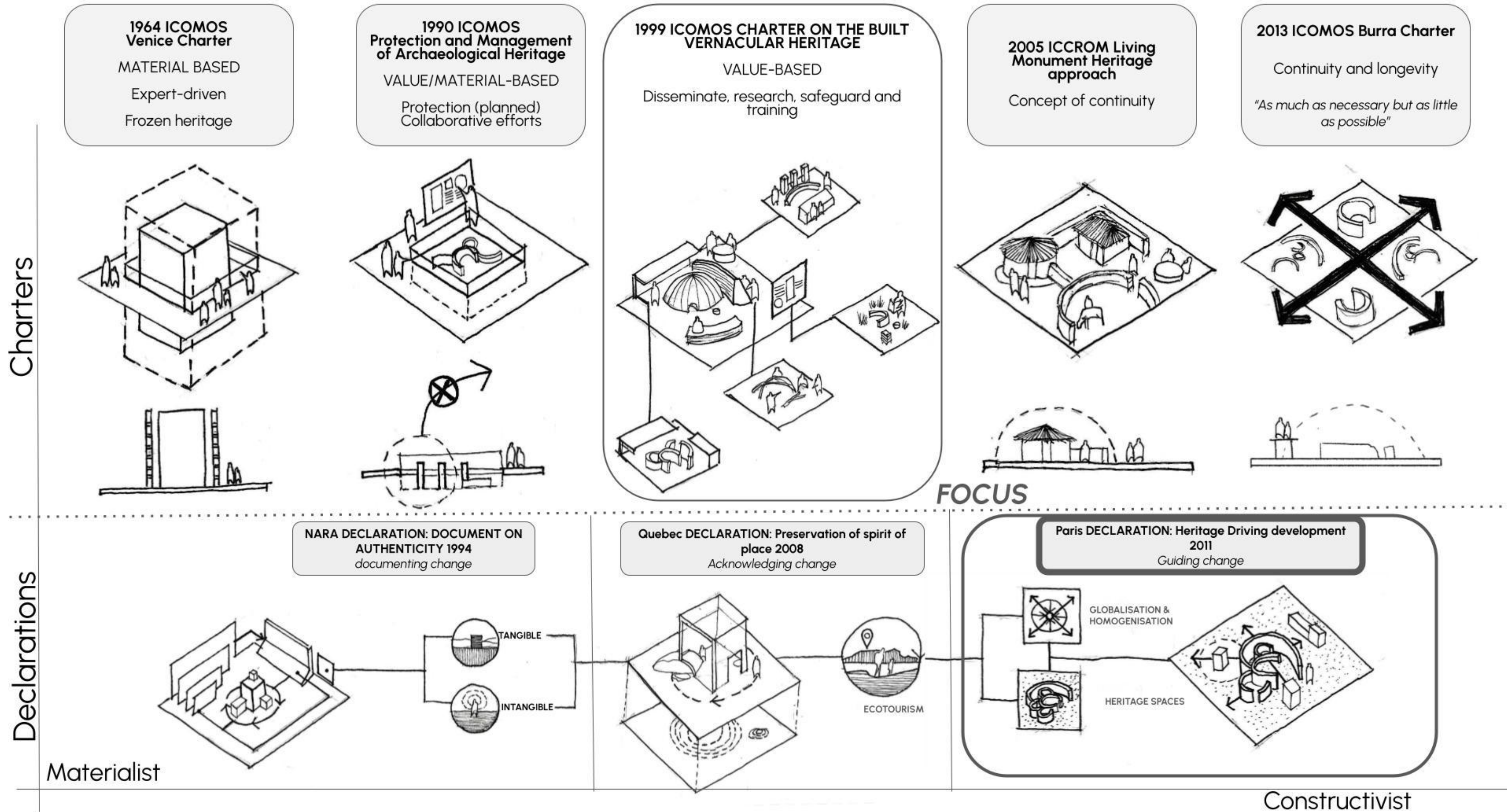
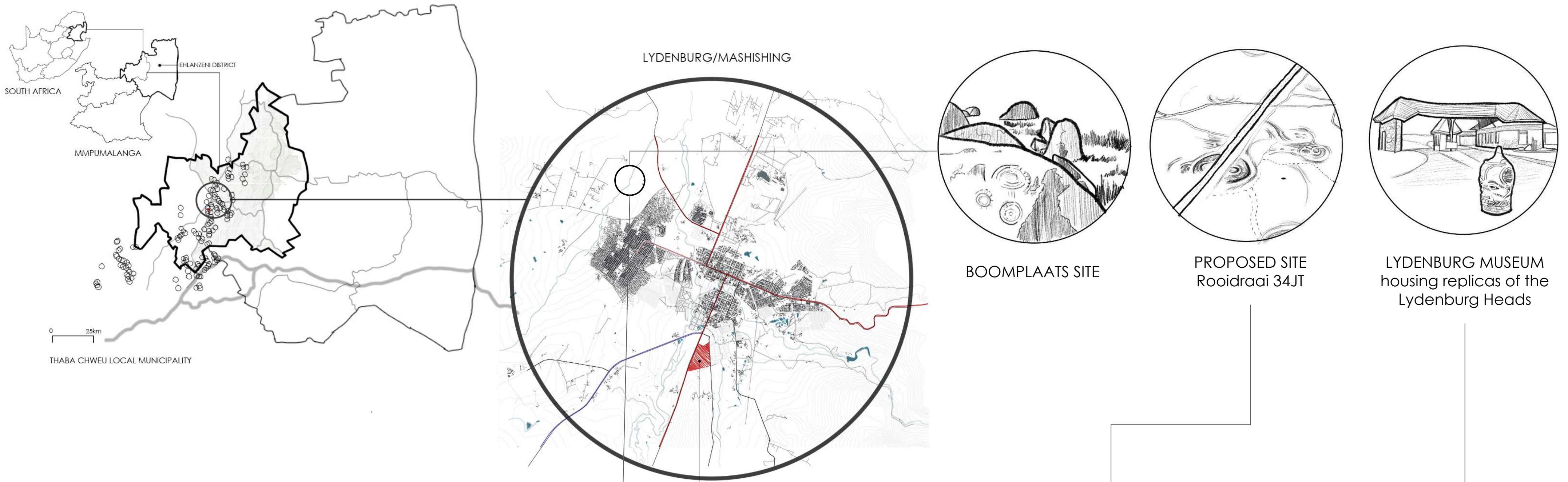


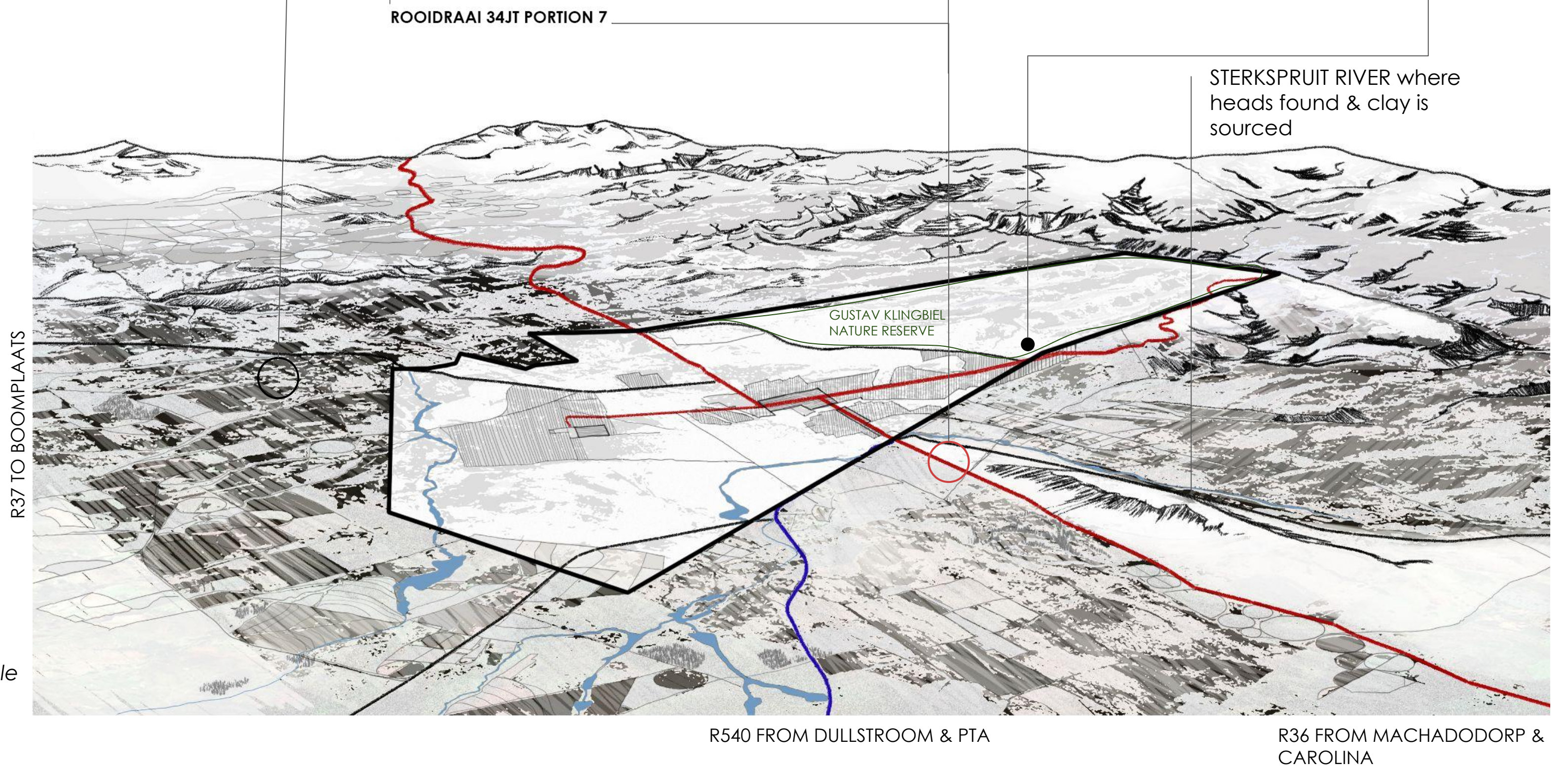
Figure 10: Heritage approaches (Author, 2024)



# CONTEXT

The Bokoni region stretches from Carolina to Ohrigstad in Mpumalanga, with this project focusing on the Roodraai 34JT portion in Mashishing (Lydenburg) within the Thaba Chweu Local Municipality in the Ehlanzeni District. Lydenburg, Mpumalanga's oldest town, was chosen for its historical richness, which was marked by a series of cultural occupations spanning pre-colonial to post-colonial times. It is also home to notable heritage sites, including the Boomplaas Rock Engraving Complex (a Grade 1 Heritage site) and the Lydenburg Museum.

Figure 11: Locality of the project with notable heritage nodes (Author, 2024)



# SITE ANALYSIS

Although the ruins are scattered along the escarpment, many remain close to main roads and rivers, enhancing accessibility. Rooidraai is especially unique, as the R36 road cuts directly through one of its settlements. This prominent feature, often overlooked by travellers, becomes evident through a detailed analysis, revealing how the main road from Machadodorp bisects a historic ruin homestead at the proposed project site.

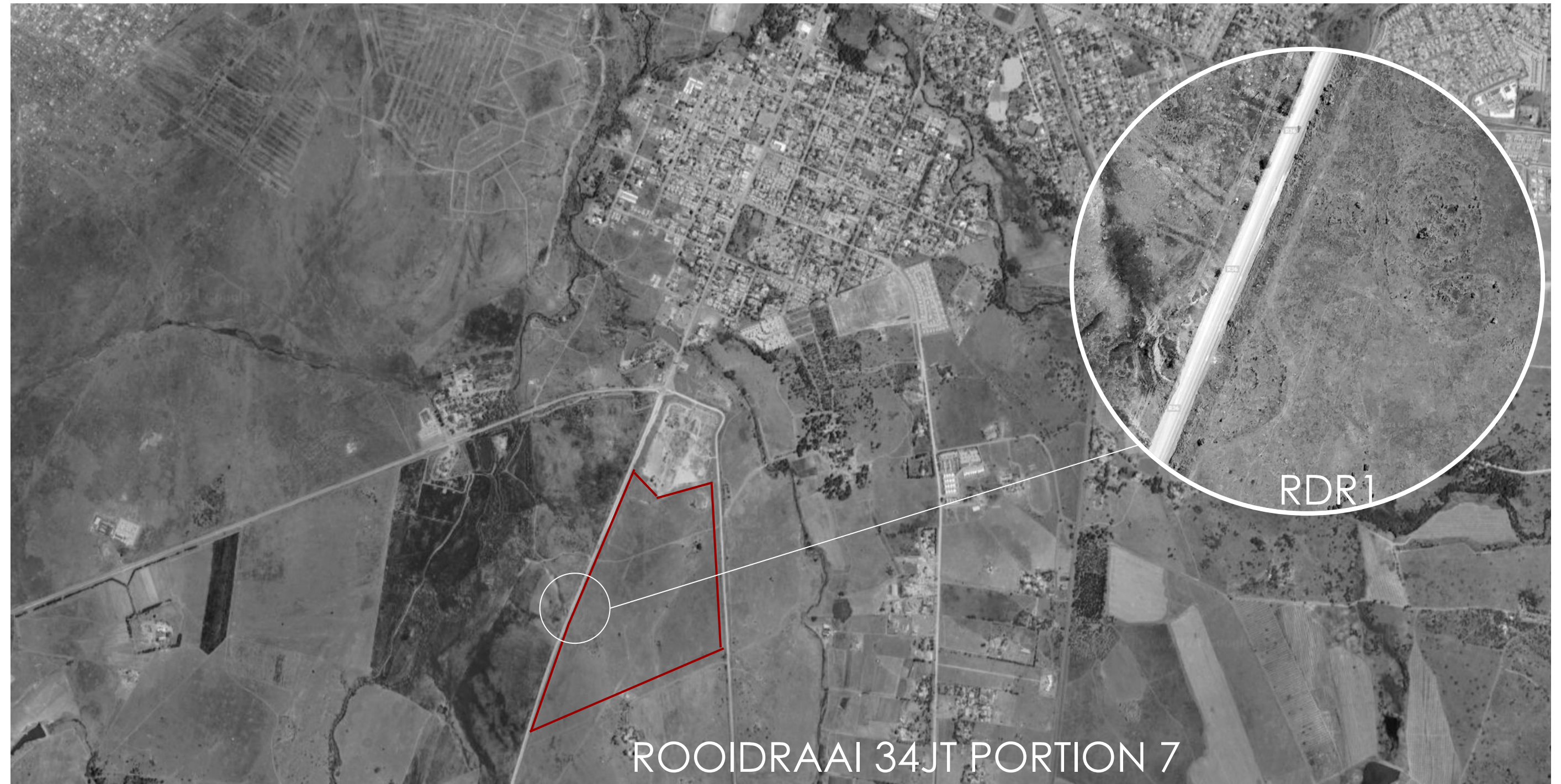
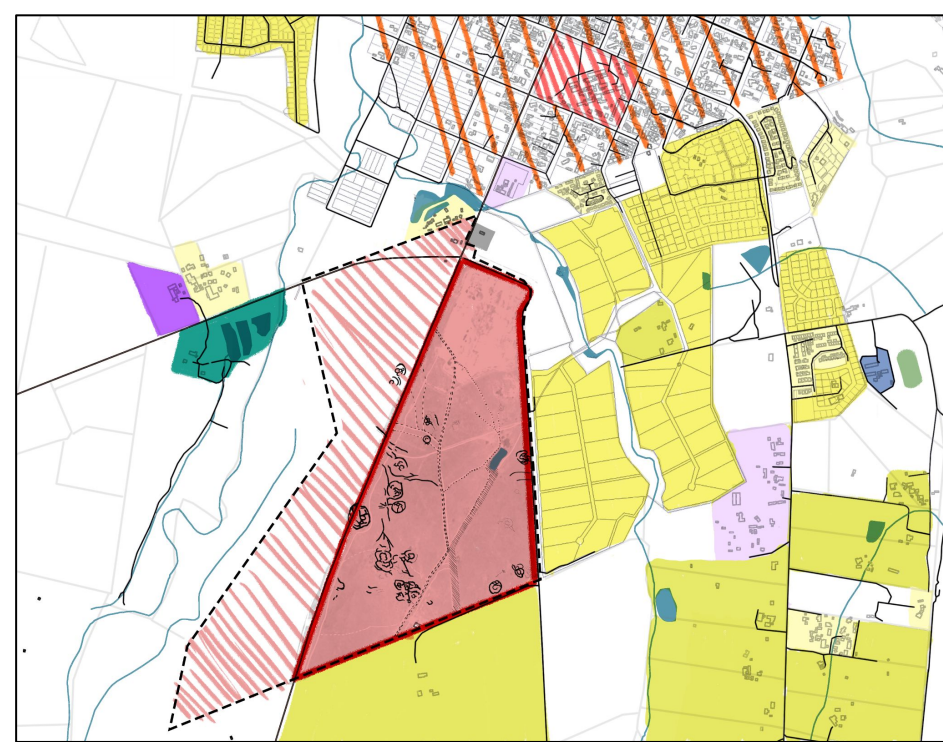
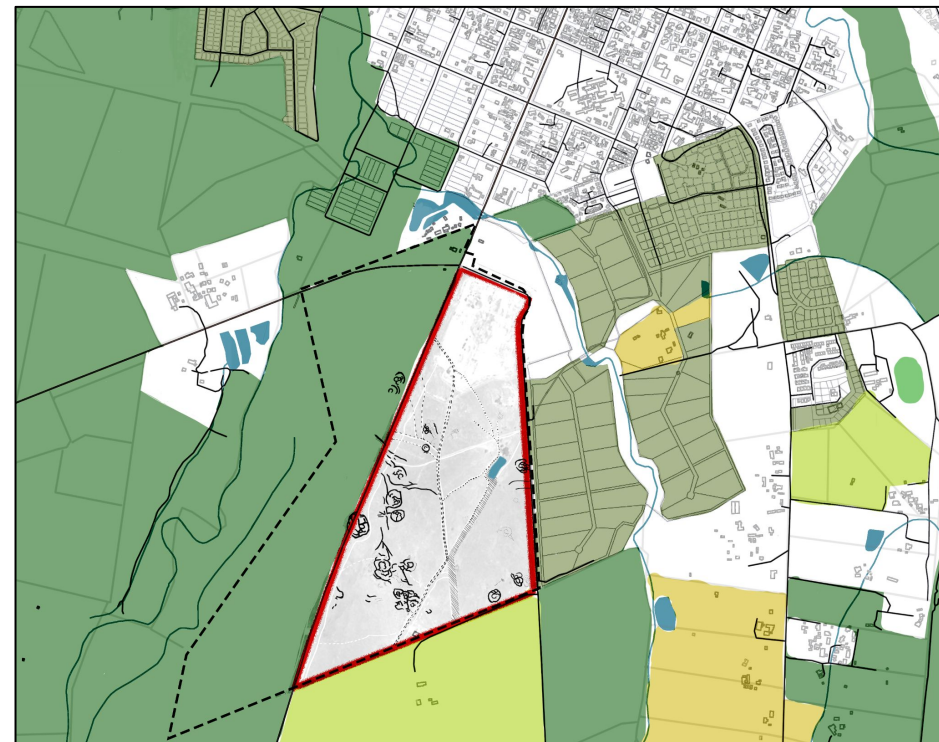


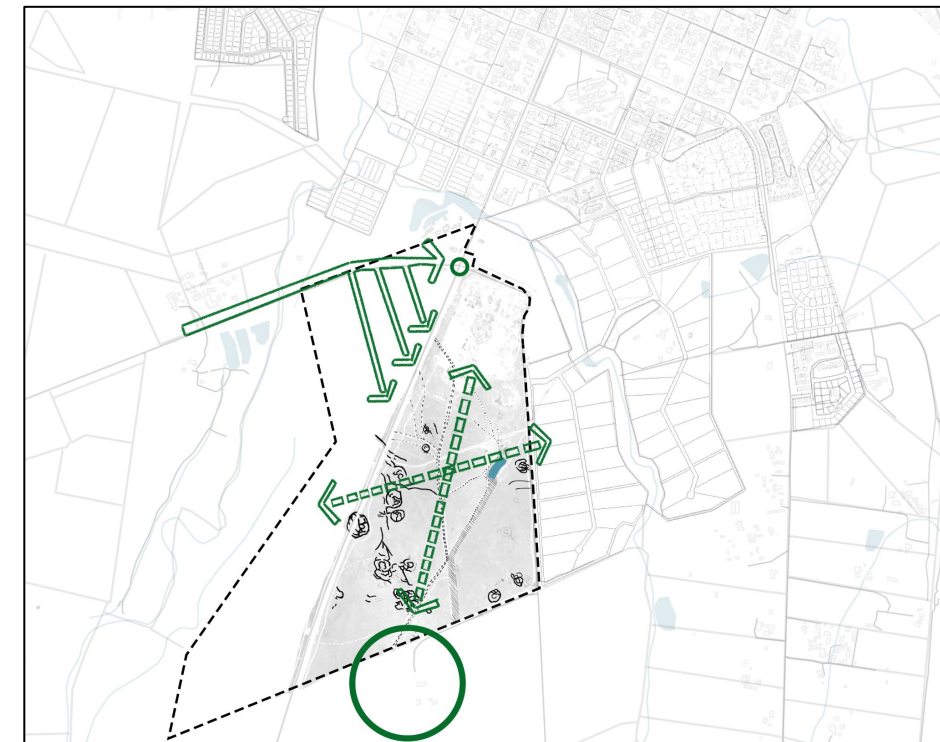
Figure 12: main road cutting right through the heart of a Bokoni settlement adapted (Author, 2024) from (Google Earth, 2024)



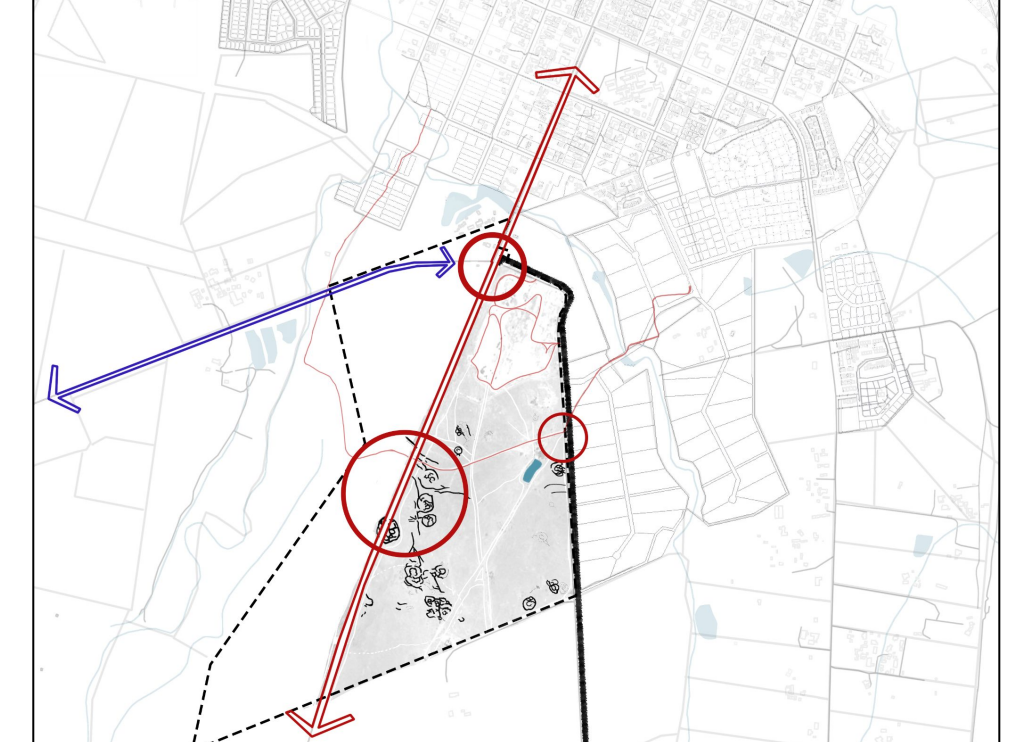
ZONING



OPEN SPACES



DESIRE LINES



INTERFACE FOCUS NODES



Figure 13: Locality of the project with notable heritage nodes (Author, 2024)

The condition and historical significance of the ruins vary, and a low to high scale is applied to categorise them. Low-significance ruins are highly disturbed and under 400mm in height; medium-significance ruins show less disturbance and are around 600mm high; high-significance ruins are generally 800mm or taller. By examining the layout of these ruins, we can infer the probable uses of different areas and identify the likely locations of houses, terracing, and kraals.

### CURRENT ATTITUDES & NEEDS

the Bakoni ruins in the Mashishing area reflect a complex blend of heritage pride and neglect. While the local Pedi and Northern Sotho communities are seen as Bakoni descendants (Musinguzi and Kibirige, 2009: 152), their perspectives are often excluded from mainstream narratives about Bakoni heritage (Mbili, 2024: 4). In his Photovoice Study, Mbili (2024) captured community perspectives that emphasised a desire for respectful commemoration, including proposals for fencing, reconstruction, and potential re-inhabitation. The stone itself emerged as a powerful symbol of identity (Irandu and Shah, 2016: 155), highlighting the cultural value tied to material heritage. There was also a strong wish to respect the ruins as spiritual sites and to increase their visibility through artistic expression. Furthermore, upon the authors visit to the Lydenburg museum, it became clear that the community was seeking access to better job opportunities and public gathering spaces, and these ruins hold potential for addressing this issue to a certain extent.

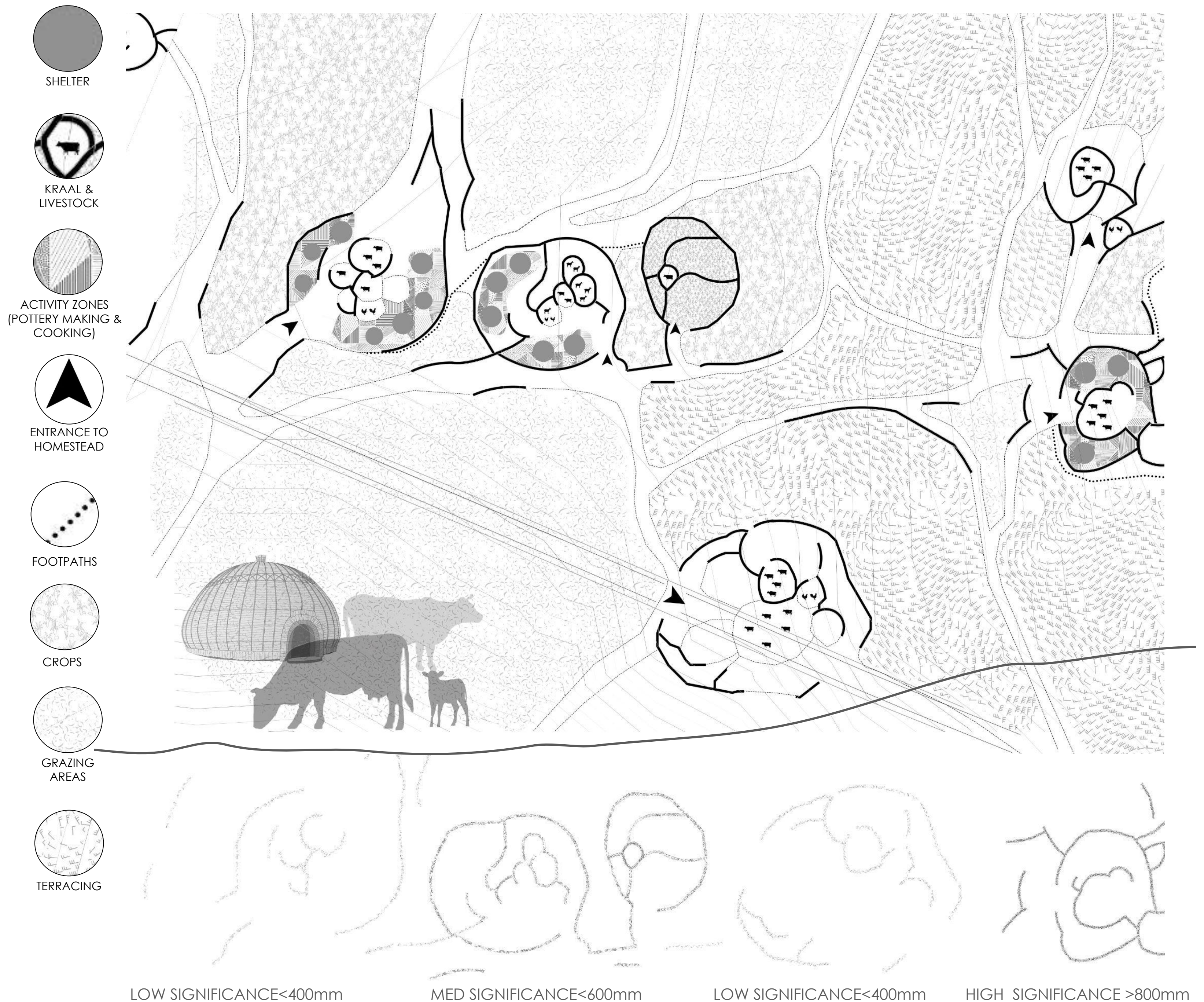


Figure 14: Current site condition with an overlay of past use (Author, 2024)

# CONCEPT

The aim of the project is to transform these ruins, which have been long abandoned and dormant, into living heritage through active re-engagement with ruin as a performative element due to the inherent potential of a ruin. The ruin is seen as an incomplete physical object that triggers creativity and memory (Woodward, 2001). Thus, the aim is to open the conversation to alternative conservation and preservation methods as ruins represent transience instead of “monuments” that talk about the integration of the ruin into the everyday.

The design concept is rooted in the principles of circular design, heritage preservation, and the Bakoni spatial logic. Key drivers for the project are **memorialisation**, **reframing**, and **re-signification**, ensuring that the ruins remain relevant in the present. The design offers a contemporary reinterpretation of Koni's harmonious relationship with the environment, incorporating off-grid systems such as water filtration and treatment through the use of the landscape, passive ventilation and adequate daylighting.

Memorialise involves direct interaction with the ruin, specifically those who are extremely disturbed and of low significance, to memorialise what was once there through creating more of a visual presence in the landscape as well as a program that more strongly relates to what would have happened in the past, both directly or indirectly. Re-framing involves dealing with medium-significant ruins, where the architecture will be next to the ruin, often reflecting a direct or indirect interpretation of past activity, these constructions will be mostly reversible. In the case of re-signify, when dealing with high-significance ruins, the architecture will be completely reversible, not impacting the already well-preserved stone walls. This also allows for complete open-minded interpretation and story-telling.

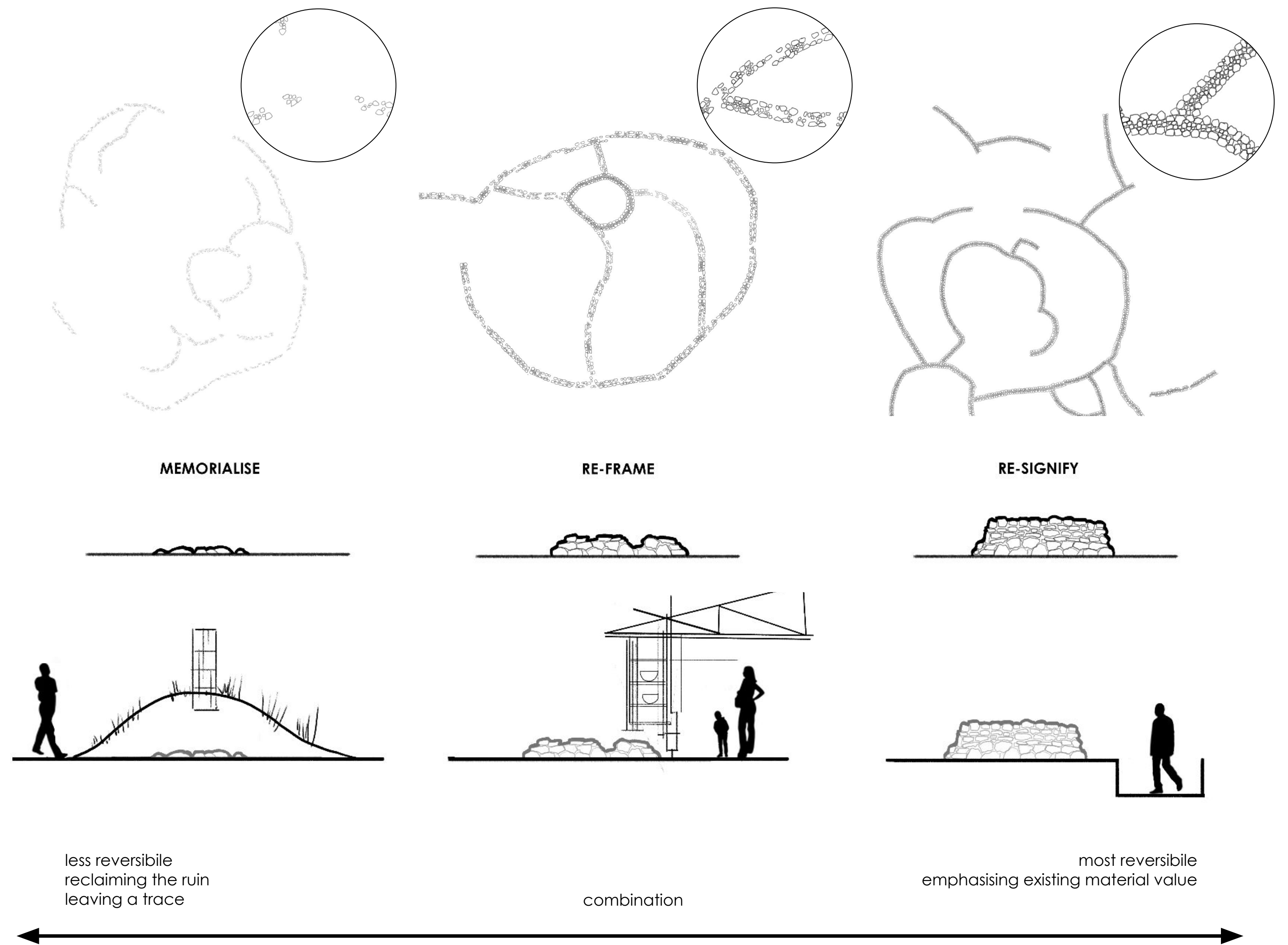


Figure 15: Diagram of conceptual approach aligning with ruin condition (Author, 2024)

Central to the project is the idea of reversibility, where all interventions respect the past while being designed for easy disassembly and future adaptation. Construction materials are chosen for their potential for reuse, and mechanical connections are prioritised over permanent bonding. Modular components allow for parallel assembly and disassembly, ensuring minimal impact on the site and long-term adaptability. This approach aligns with the heritage preservation principles of ICOMOS, ensuring the site remains a dynamic space that can be reinterpreted by future generations.

# PROGRAMME & USERS

The new structures echo the materiality and spatial arrangements of the Bakoni ruins, using dry-stacked stone and low-impact construction methods alongside modern technologies. This heritage site requires sustainable financial support and a product-service model to facilitate heritage production and knowledge exchange, rather than relying solely on museum-like preservation.

Introducing service-based activities, such as workshops, guided tours, or artisanal products, enables revenue generation tied to the site's heritage value. This approach not only covers operational costs but also fosters meaningful visitor engagement, connecting them to the cultural landscape and practices of the Bakoni people.

The site's programmes create an immersive link to the past, blending historical practices with contemporary experiences. The **Arrival Pavilion** introduces the theme of memorialisation, grounding visitors in the site's history, while the **Artefact Drop-off Zone** encourages active participation, allowing visitors to contribute to the evolving narrative through found objects. The **Active Archive** and pottery workshops reframe traditional craftsmanship, as visitors engage in or witness pottery-making, a practice tied directly to Bakoni material culture. The **Artefact Lab** incorporate a more modern public archaeological testing program to test and discuss artefacts found on site and surrounding sites. The **Dairy Processing Area** and **Eatery** incorporate ancient food production methods, like milk fermentation in traditional vessels, creating a sensory connection to history. Finally, the **Barn Viewing Area** and **High Significance Ruins** honour pastoral traditions and preserve the ruins' integrity.

Figure 16: Overall programmatic intentions and user profiles (Author, 2024)

**TOUR GUIDES**  
INITIAL VISITOR ORIENTATION  
EDUCATION OF PAST & CURRENT  
SITE PROCESSES  
GREATER HERITAGE ROUTE TOURS



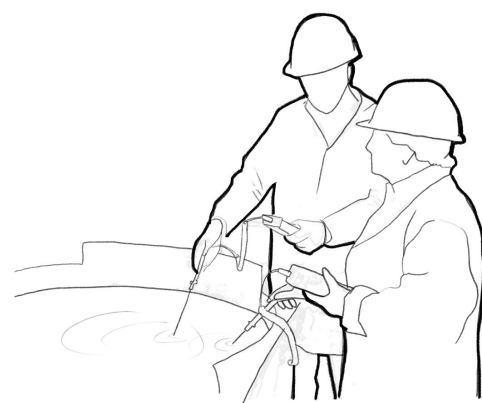
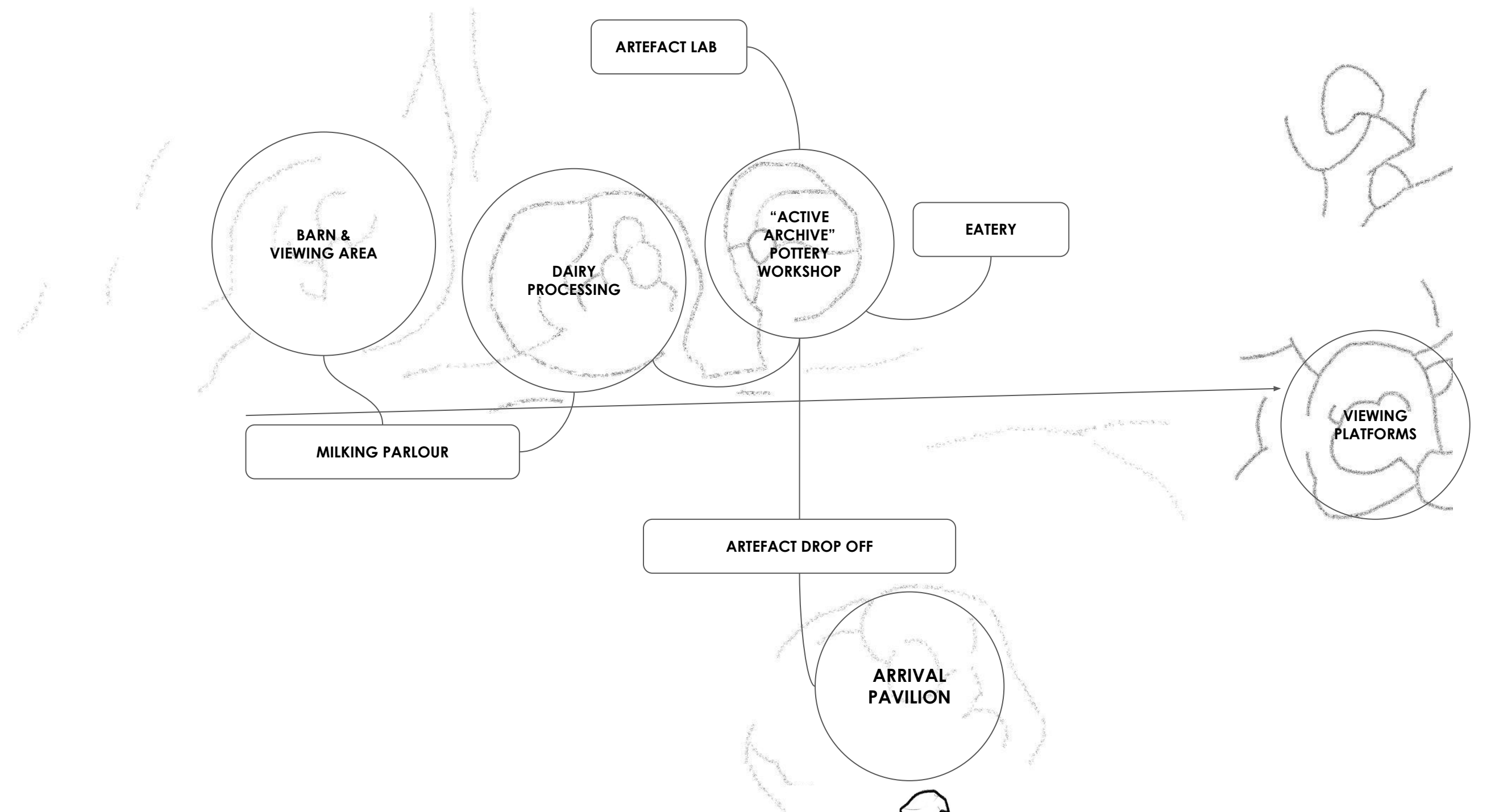
**CURATORS (COLLABORATIVE)**  
CURATION OF ARCHIVES ON  
EXHIBIT  
DEPENDS ON PUBLIC  
ENGAGEMENT



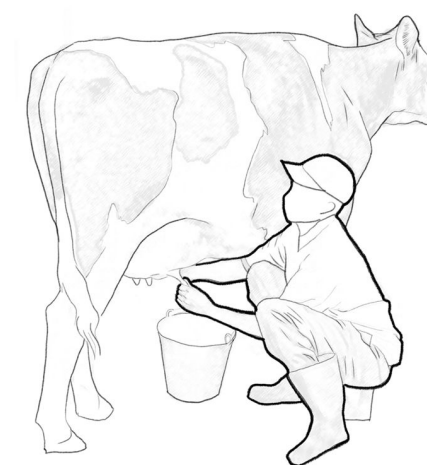
**ARCHIVISTS**  
MANAGEMENT OF PRESERVATION  
OF ARTEFACTS



**THE COMMUNITY, STUDENTS & TOURISTS**  
PARTICIPATE IN ACTIVE  
PRESERVATION ACTIVITIES,  
REFLECT, DISCUSS AND RELAX



**FOOD SCIENTISTS/TRADITIONAL COOKS**  
ASSIST IN NATURAL FERMENTATION  
PROCESSES & NEW DAIRY  
INFUSIONS  
ASSIST IN PUBLIC EDUCATION



**LOCAL FARMERS**  
ASSIST IN DAIRY PRODUCTION,  
CONTROLLED GRAZING OF THE  
SITE & CROP MAINTENANCE  
ASSIST IN PUBLIC EDUCATION



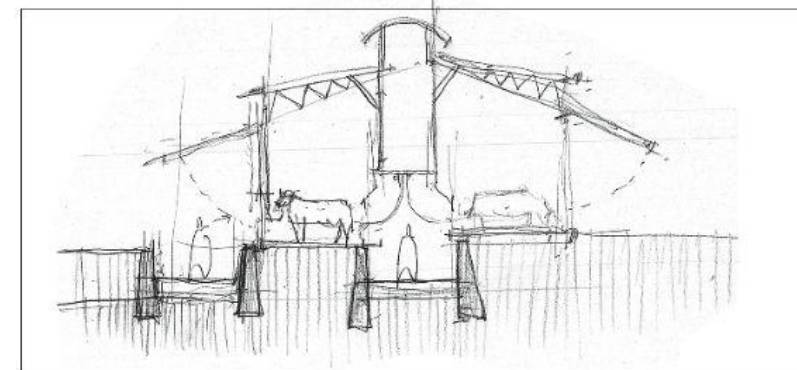
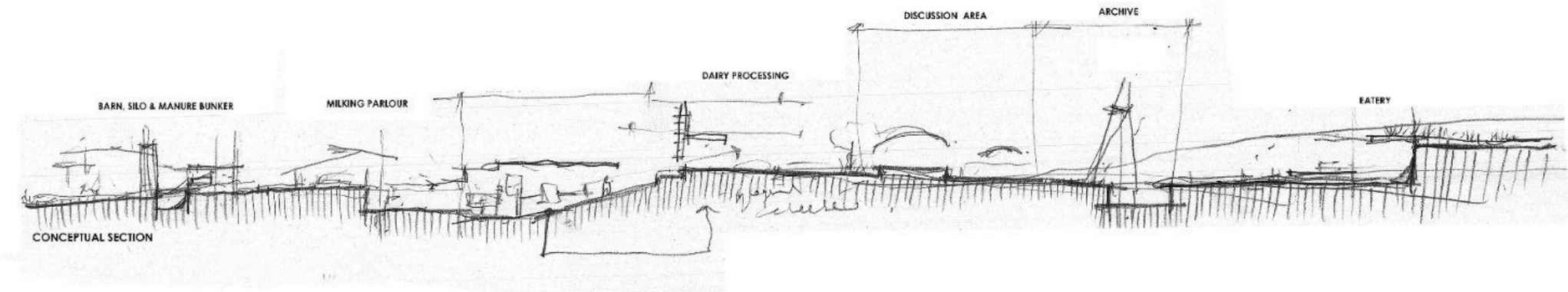
**COMMUNITY ARTISANS**  
CONTINUED PRACTICE OF  
RELATIVELY HIDDEN CRAFT  
CREATING ACTIVE PRESERVATION



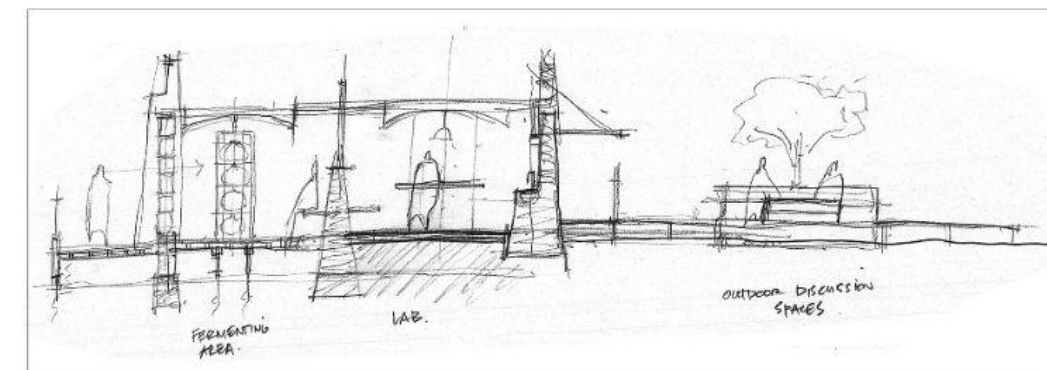
**ARCHAEOLOGISTS**  
ARTEFACT ANALYSIS, DISCUSSION  
& INTERPRETATIONS, IN  
COLLABORATION WITH THE PUBLIC

# DESIGN DEVELOPMENT & TECHNOLOGICAL INTEGRATION | ITERATIONS, PERFORMANCE & DIT INTEGRATION

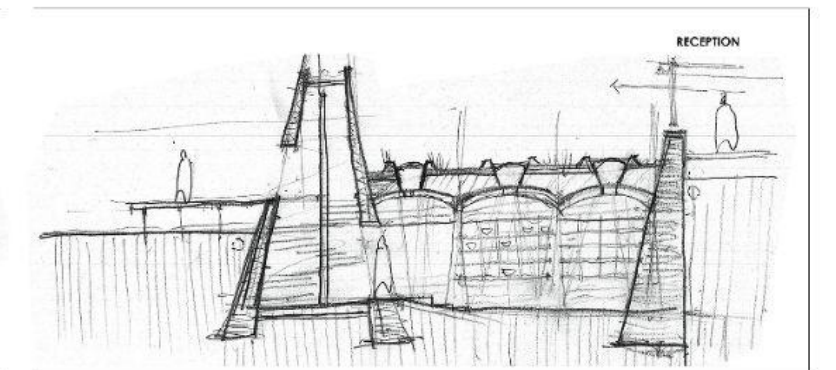
Materialisation, consequently the link between design and construction of the design, was important from the onset due to the sensitivity of the site. However, it was important to first start with conceptual models that evoked a sense of interacting with and responding to the ruin. The iterations involved looking at the design with a multi-scalar lens, allowing for reflexive design to ensure appropriate solutions. Throughout each iteration, a combination of spatial attitudes was adopted, informed by archaeological excavation processes, the existing spatial logic of the ruins and the concept of activity along paths.



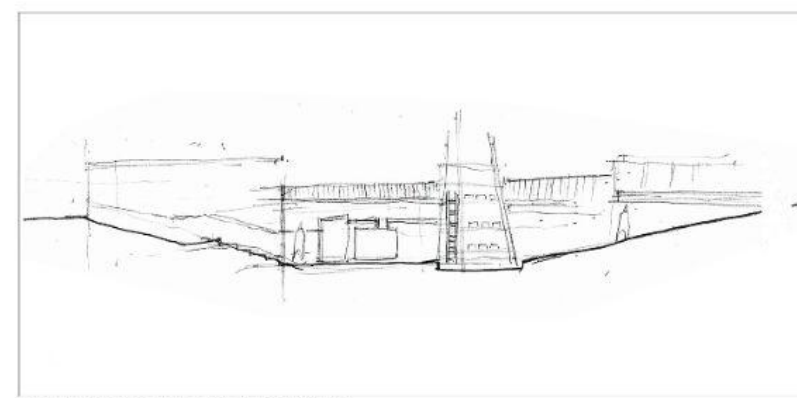
MILKING PARLOUR



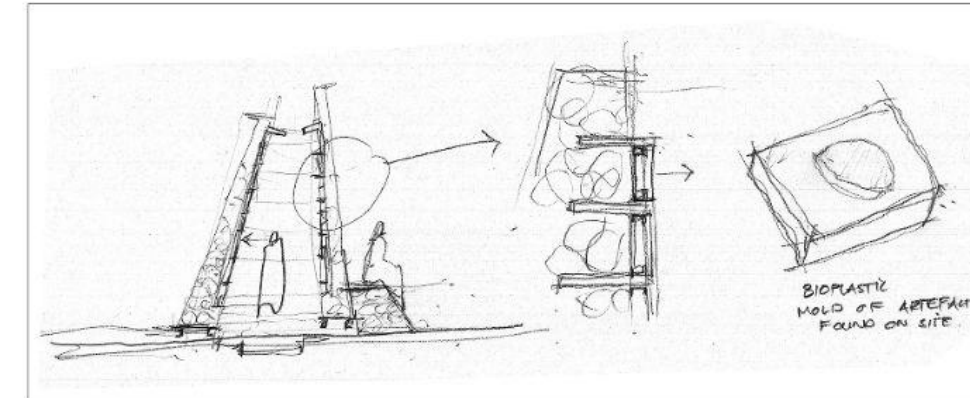
DAIRY PROCESSING AREA WITH DISCUSSION SPACES



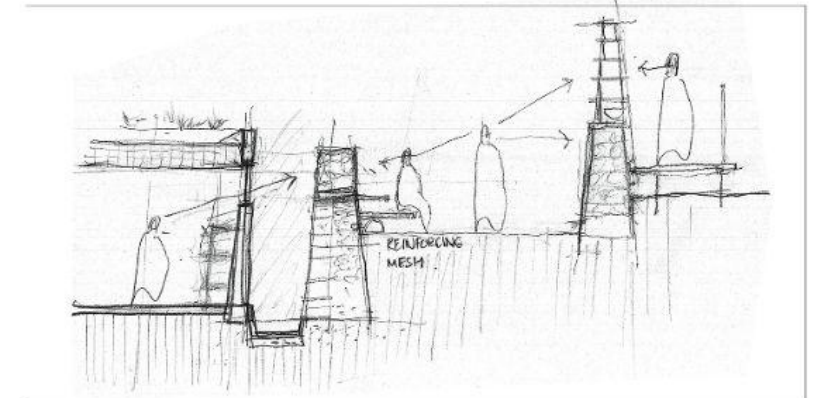
UNDERGROUND ARCHIVE AREA



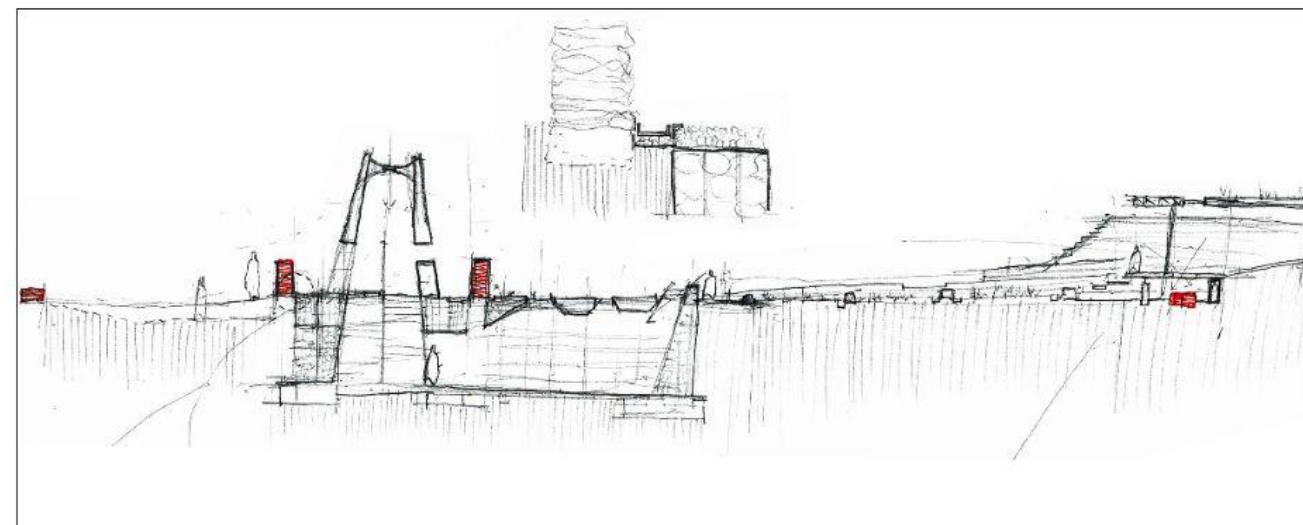
UNDERGROUND COLD STORE



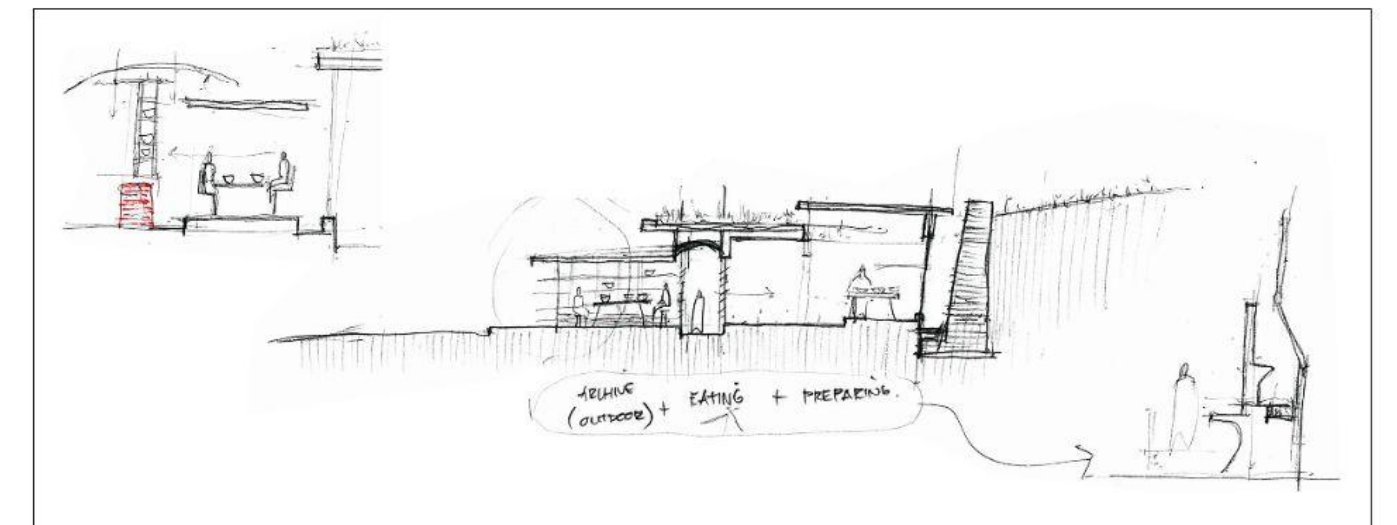
ARRIVAL PAVILION



CROSS SECTION OF ARCHIVE AREA

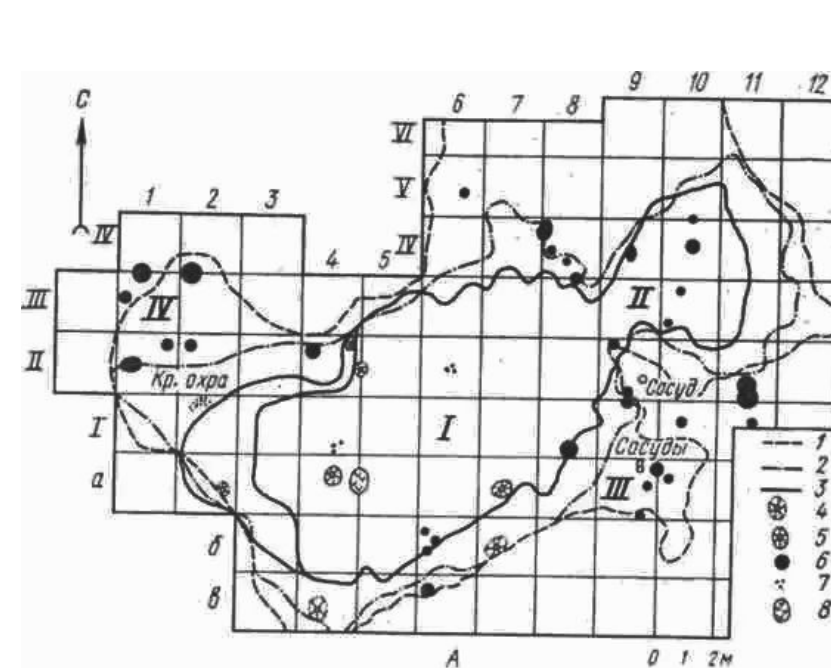


ARCHIVE AND EATERY WITH WALL DETAIL

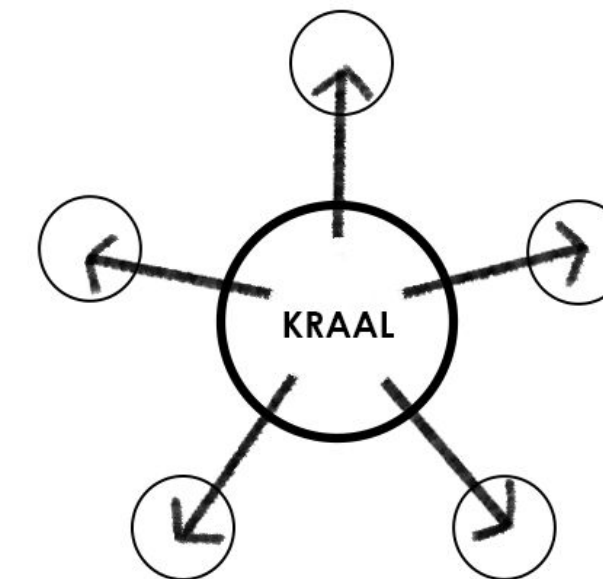


EATERY WITH ARCHIVE ELEMENT

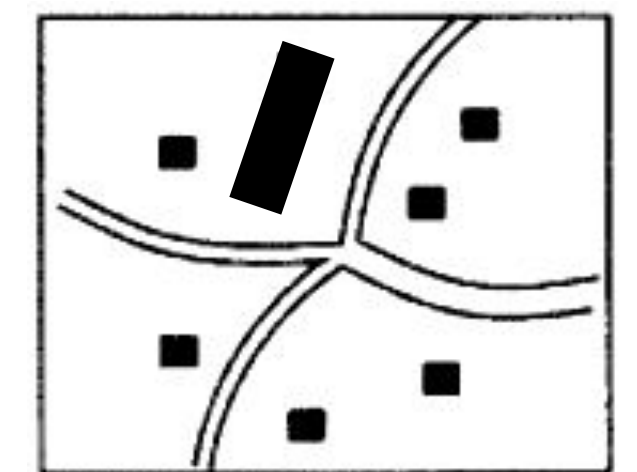
Figure 17: Conceptual explorations of program nodes (Author, 2024)



**GRID ORGANISATION**  
AS IF I WAS AN ARCHEOLOGIST ABOUT  
TO EXCAVATE EACH CLUSTER



**RADIAL ORGANISATION**  
CENTRALISATION AROUND EACH  
KRAAL WITH DIFFERENT PROGRAMMED  
ZONES



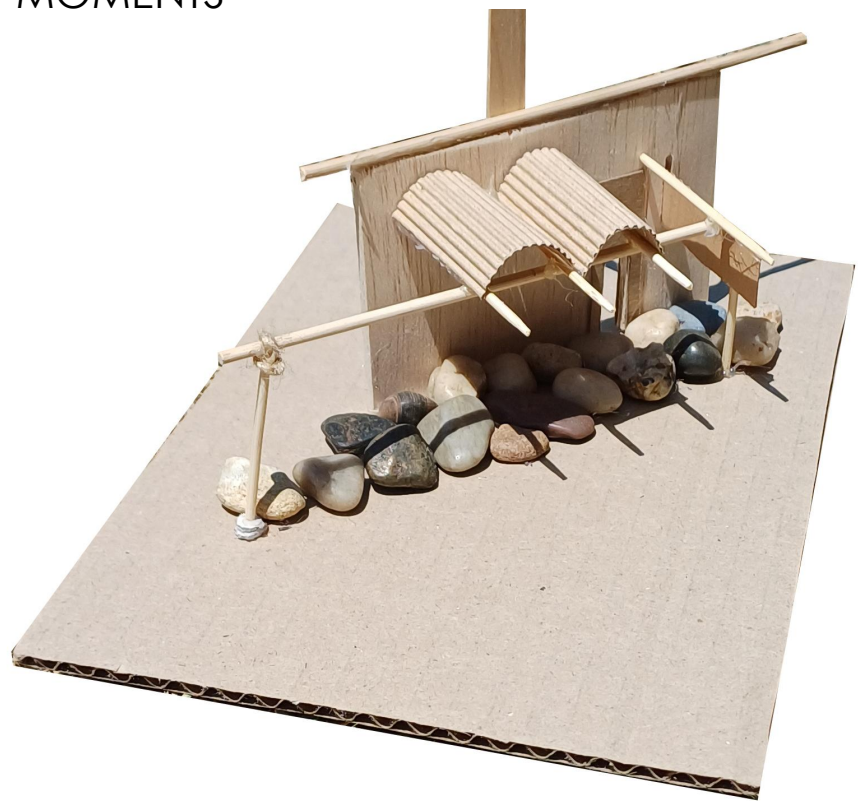
**SCATTERED ORGANISATION**  
LOCATED ALONG TERRACES &  
PATHWAYS

Figure 18: Different spatial attitudes deriving from the ruin (Author, 2024)

# INITIAL CONCEPT ITERATIONS



COVERING AND REVEALING IN MOMENTS



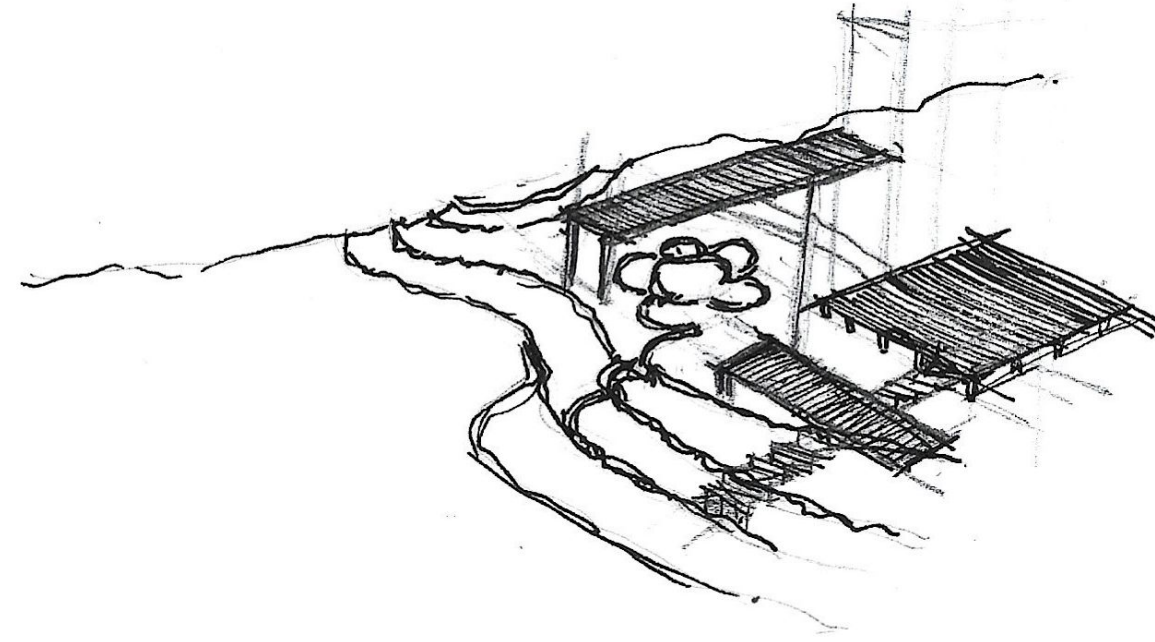
PROTECTING AND FORMING A HARDER BARRIER



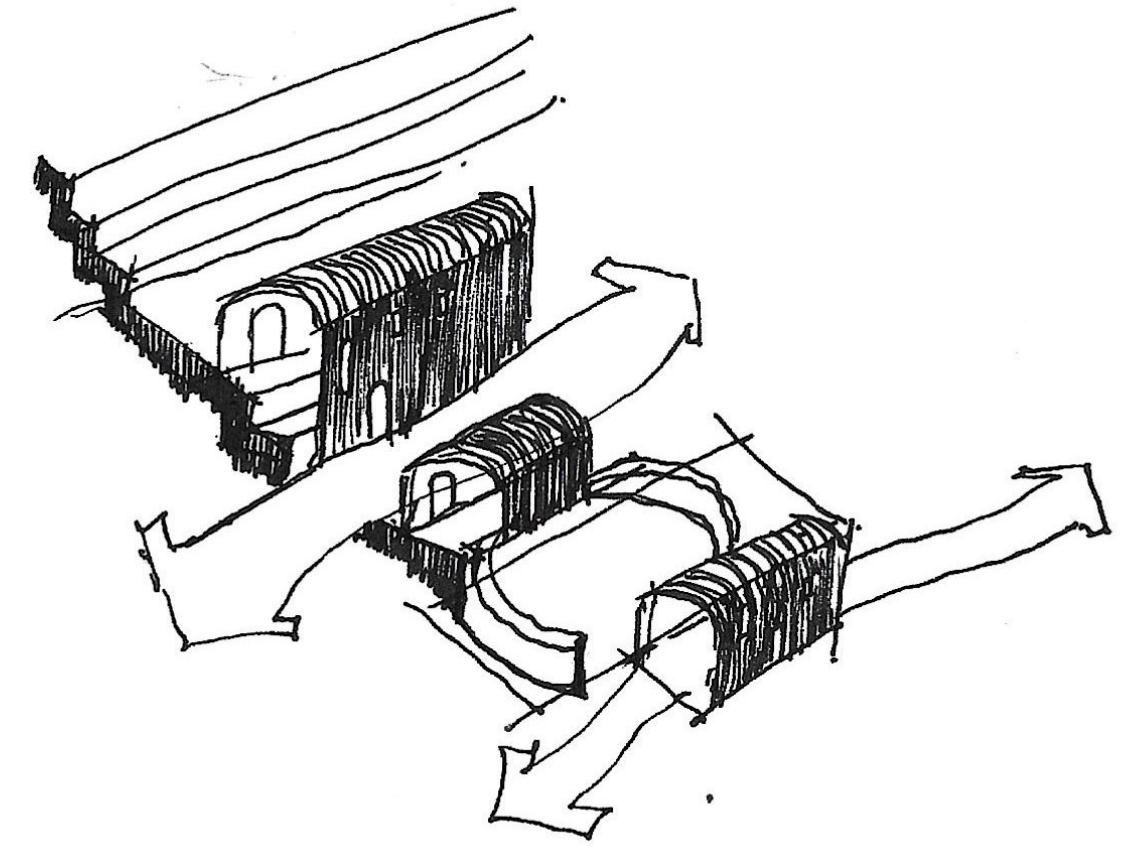
GUIDING VIEWS & SIGNIFYING POINTS

**MORE INTERVENTION**

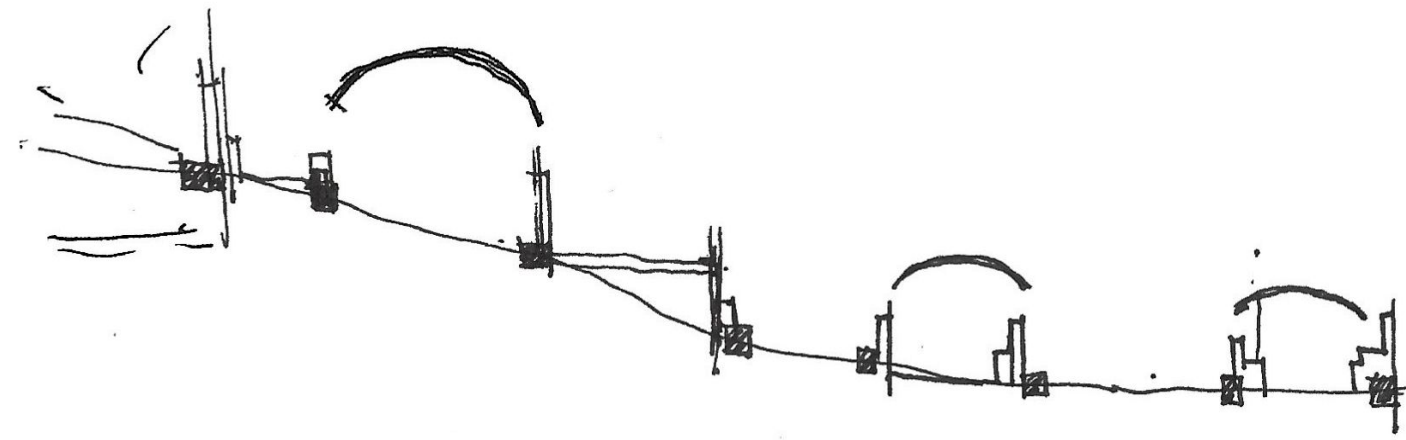
**LESS INTERVENTION**



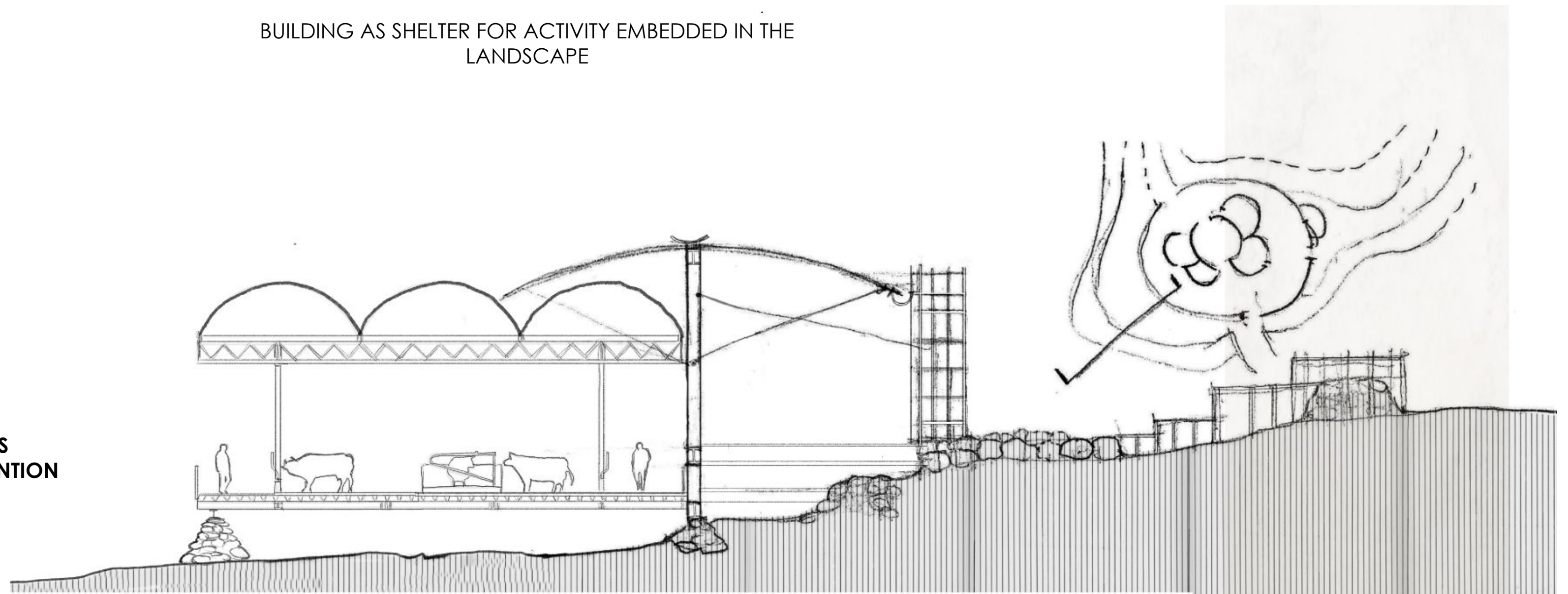
BUILDING AS PLATFORM FOR ACTIVITY



BUILDING AS BOUNDARY AND THOROUGHFARE

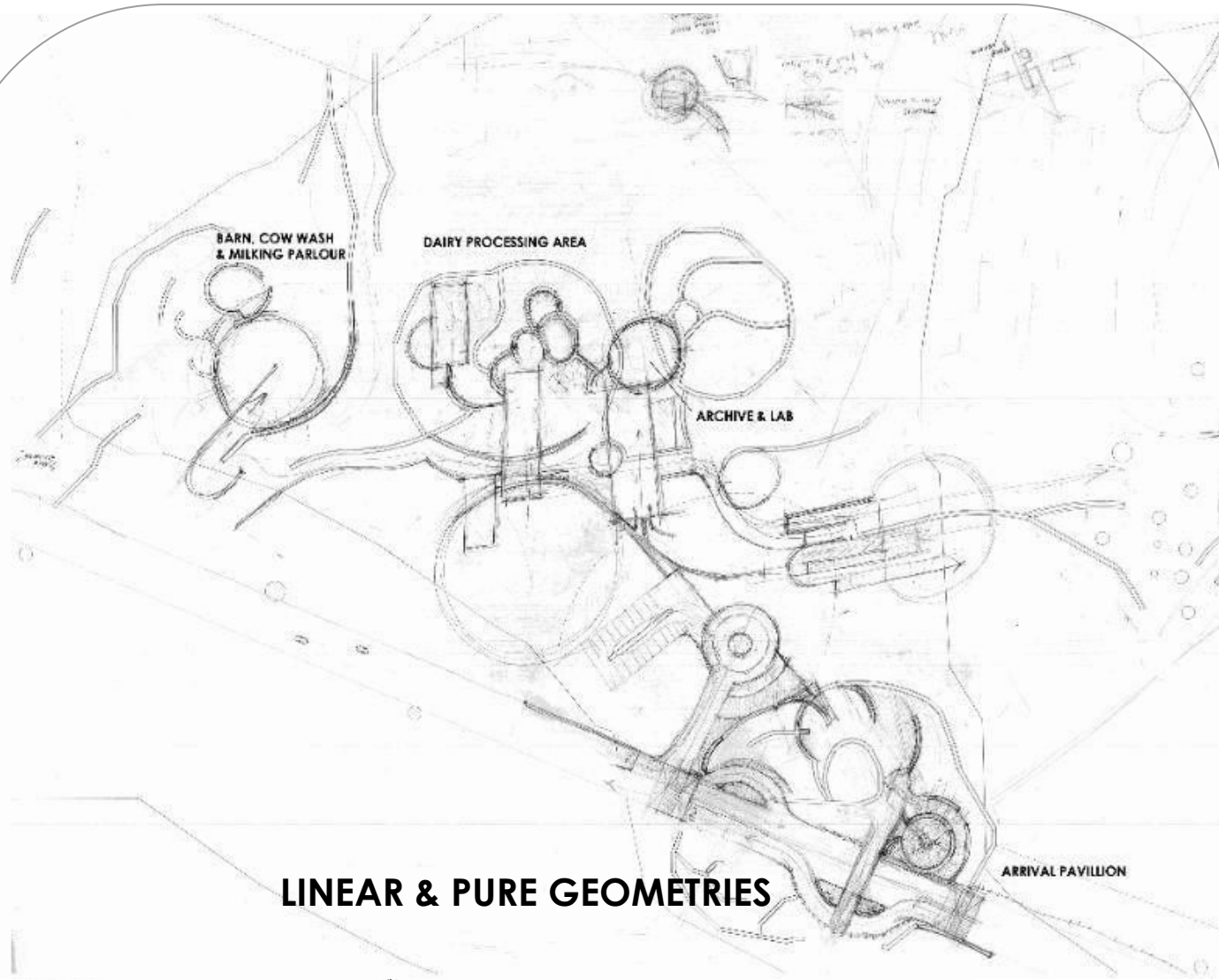


BUILDING AS SHELTER FOR ACTIVITY EMBEDDED IN THE LANDSCAPE

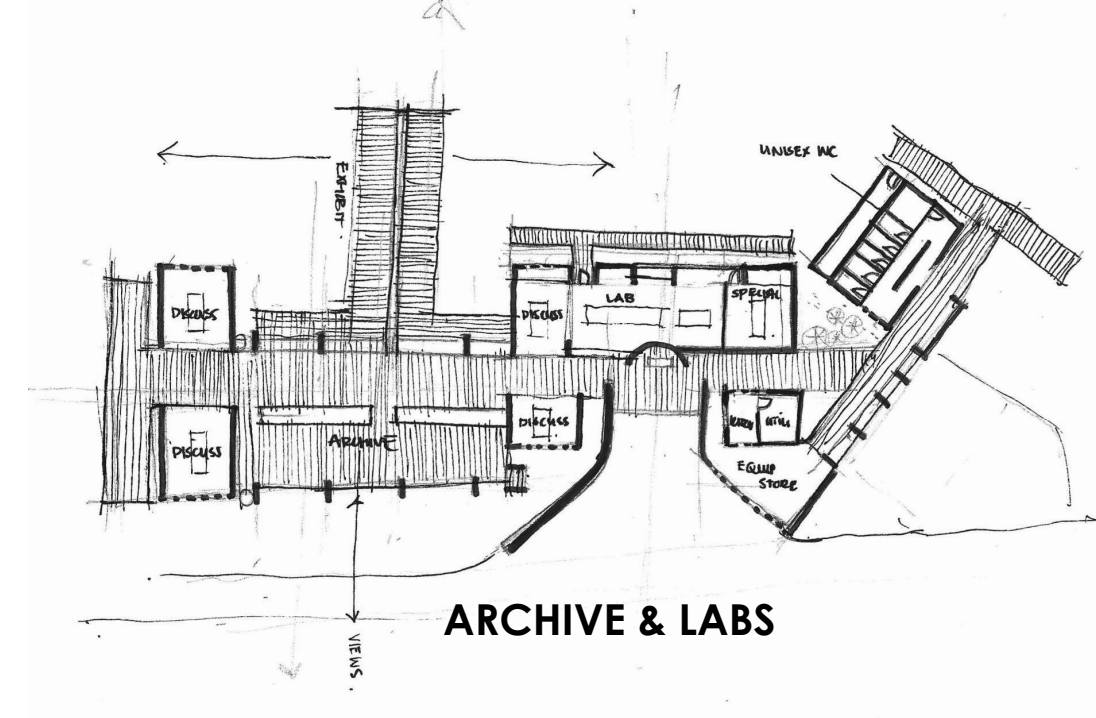


LANDSCAPE ANIMAL HUSBANDRY ACTIVITIES SUSPENDED ABOVE THE RUIN

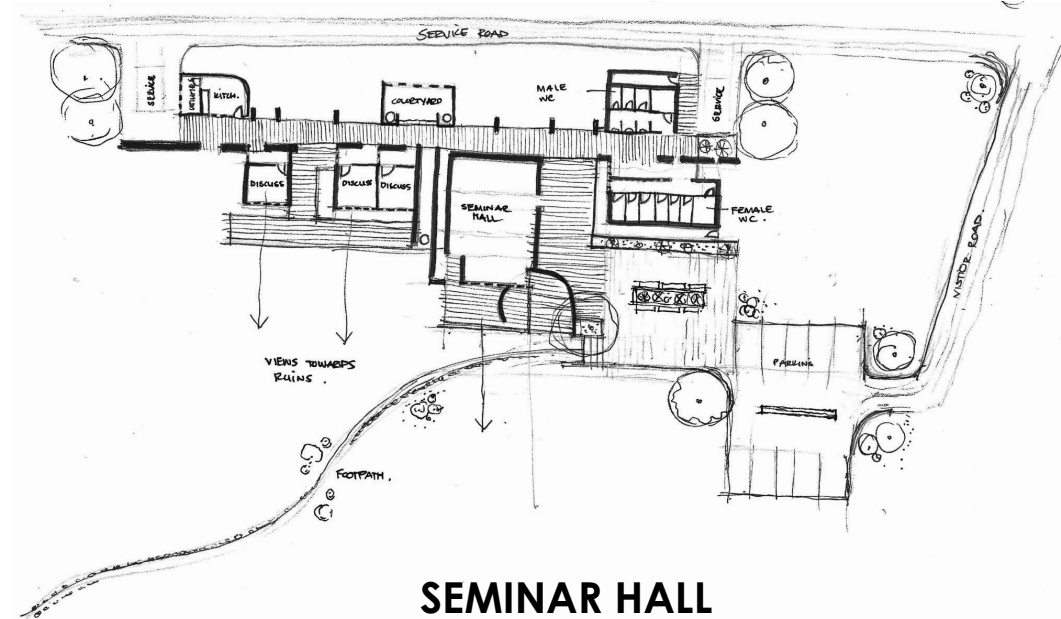
# ITERATION 1



LINEAR & PURE GEOMETRIES



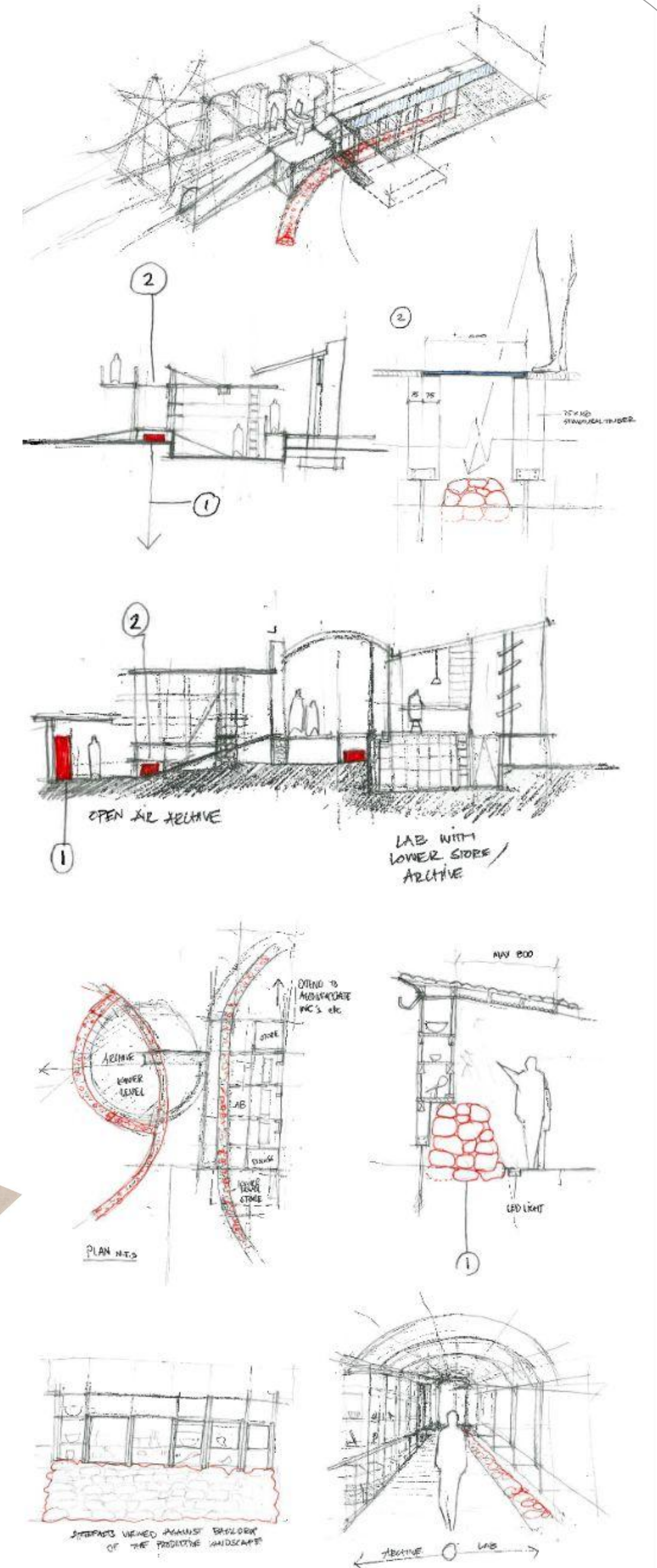
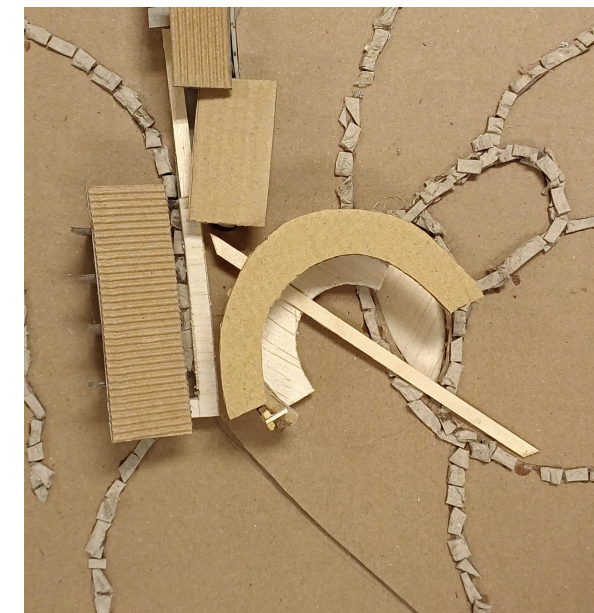
ARCHIVE & LABS



SEMINAR HALL

The initial iteration involved exploring linear and pure geometries as a means of contrasting the existing irregular forms on site. 1:200 sketch plans were developed and then subsequent 1:200 maquettes were made to envision the build form and its interaction with the ruin. Sketches of potential interfaces were then drawn from these models.

Both the archive and reception areas were combined in this iteration, however, their clustered nature overwhelmed the existing, informing the next iteration to be more spread out.

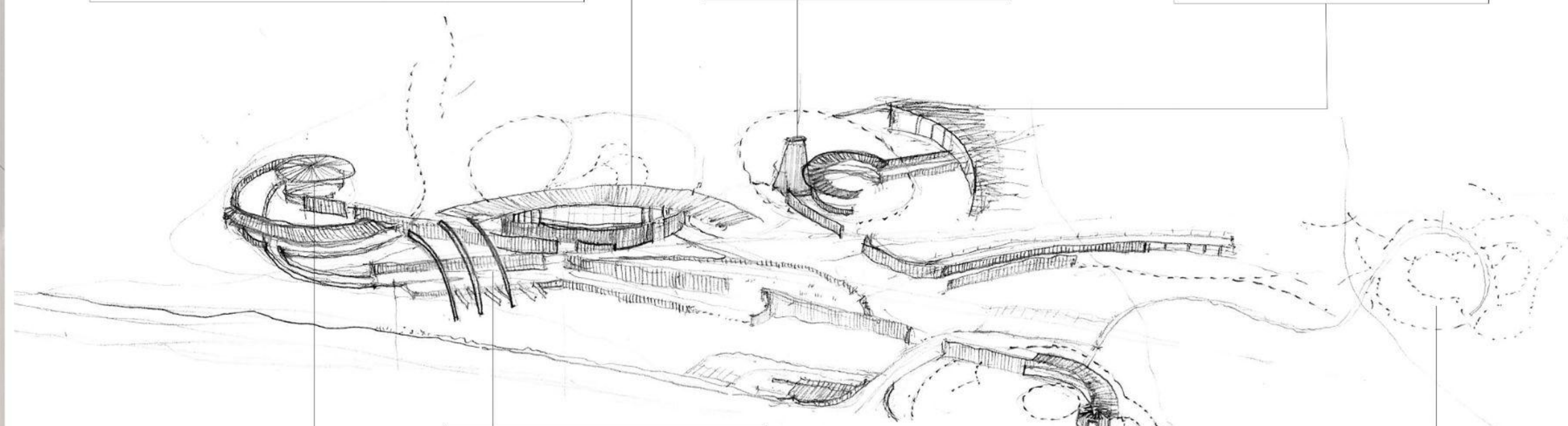
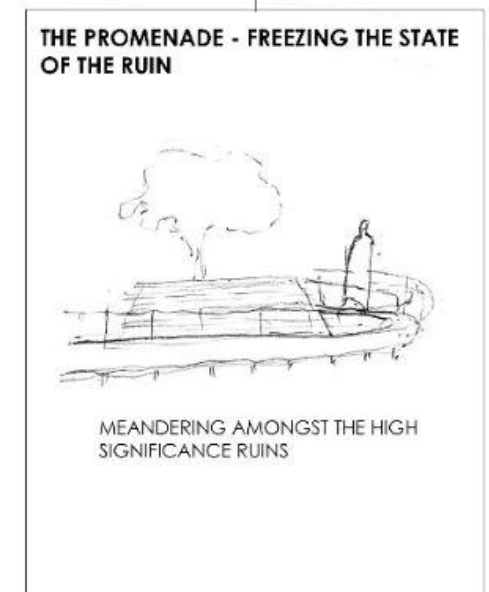
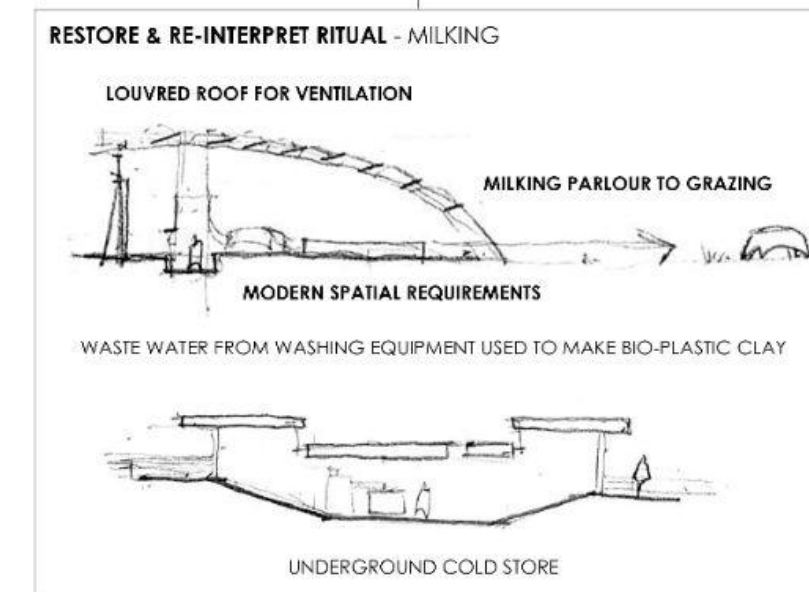
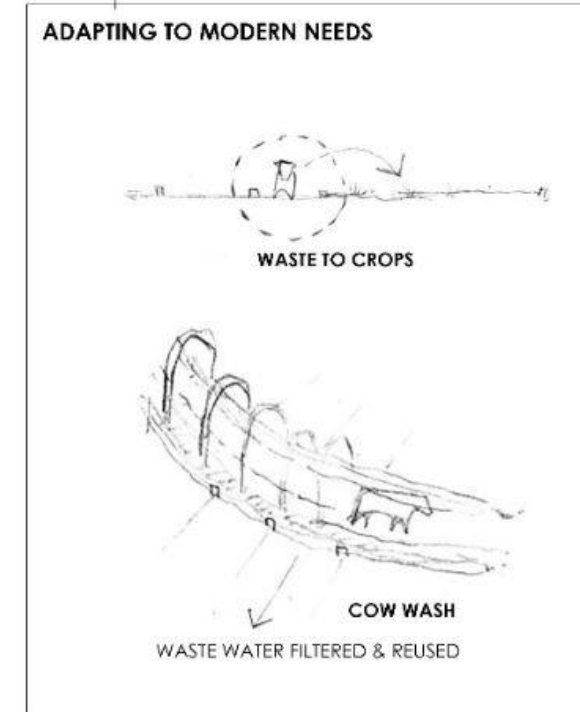
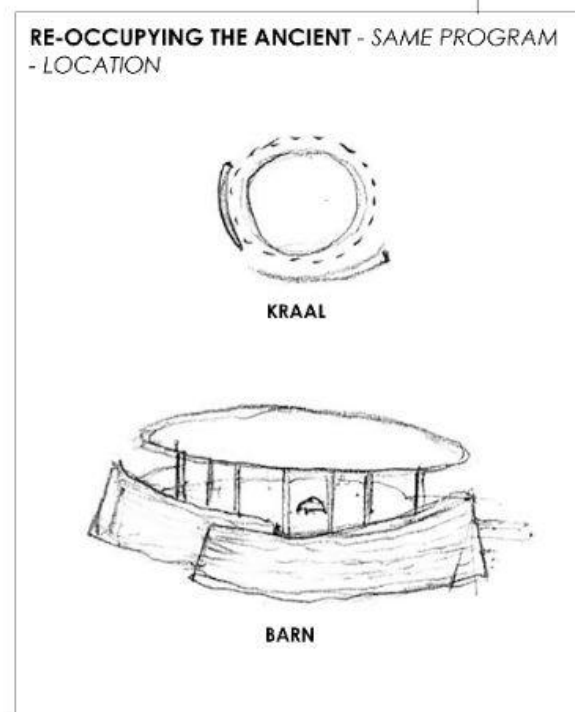
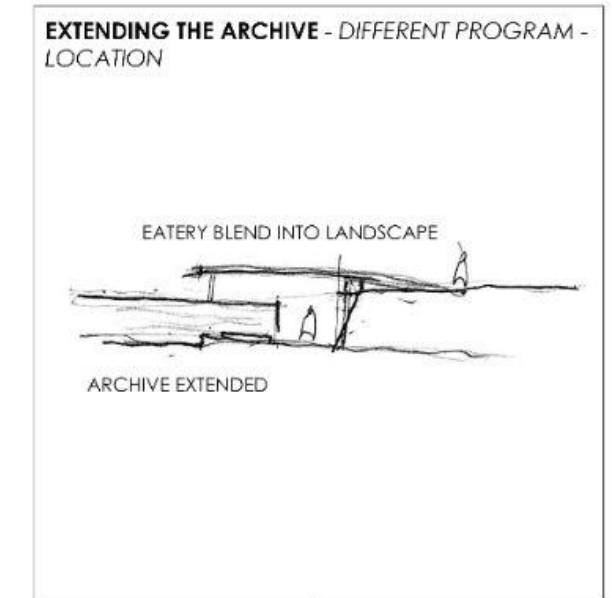
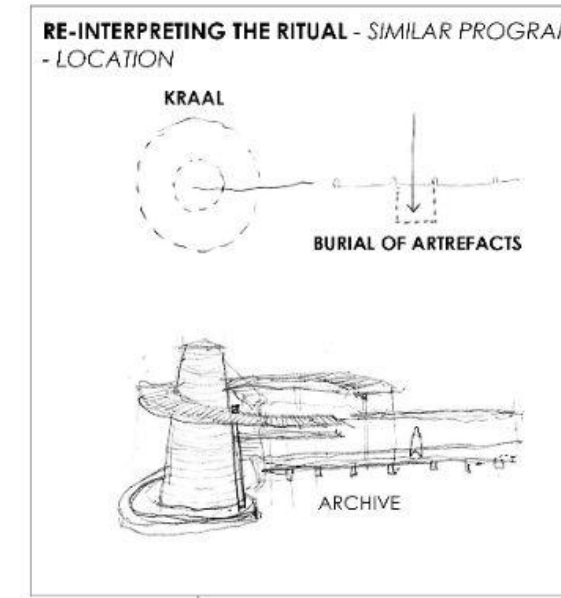
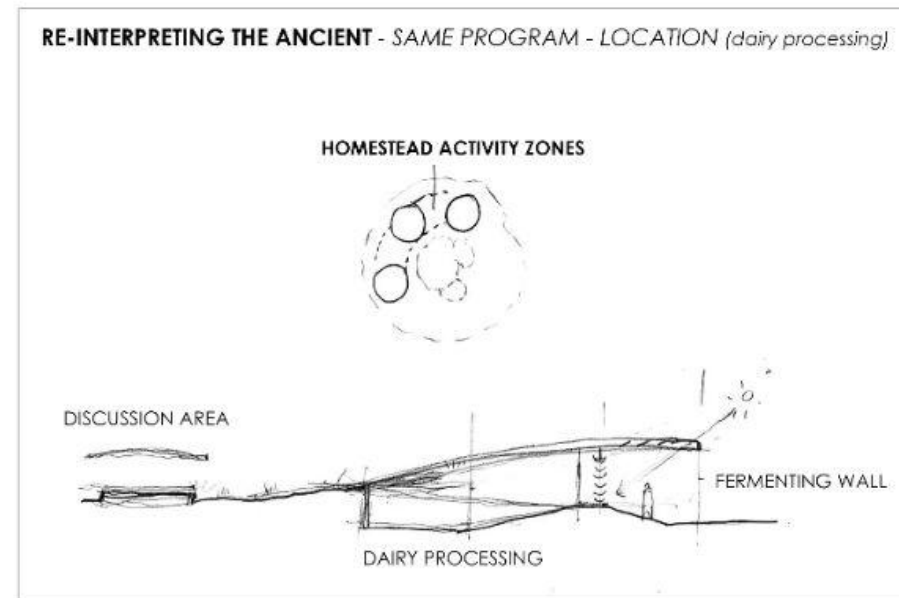




# ITERATION 3

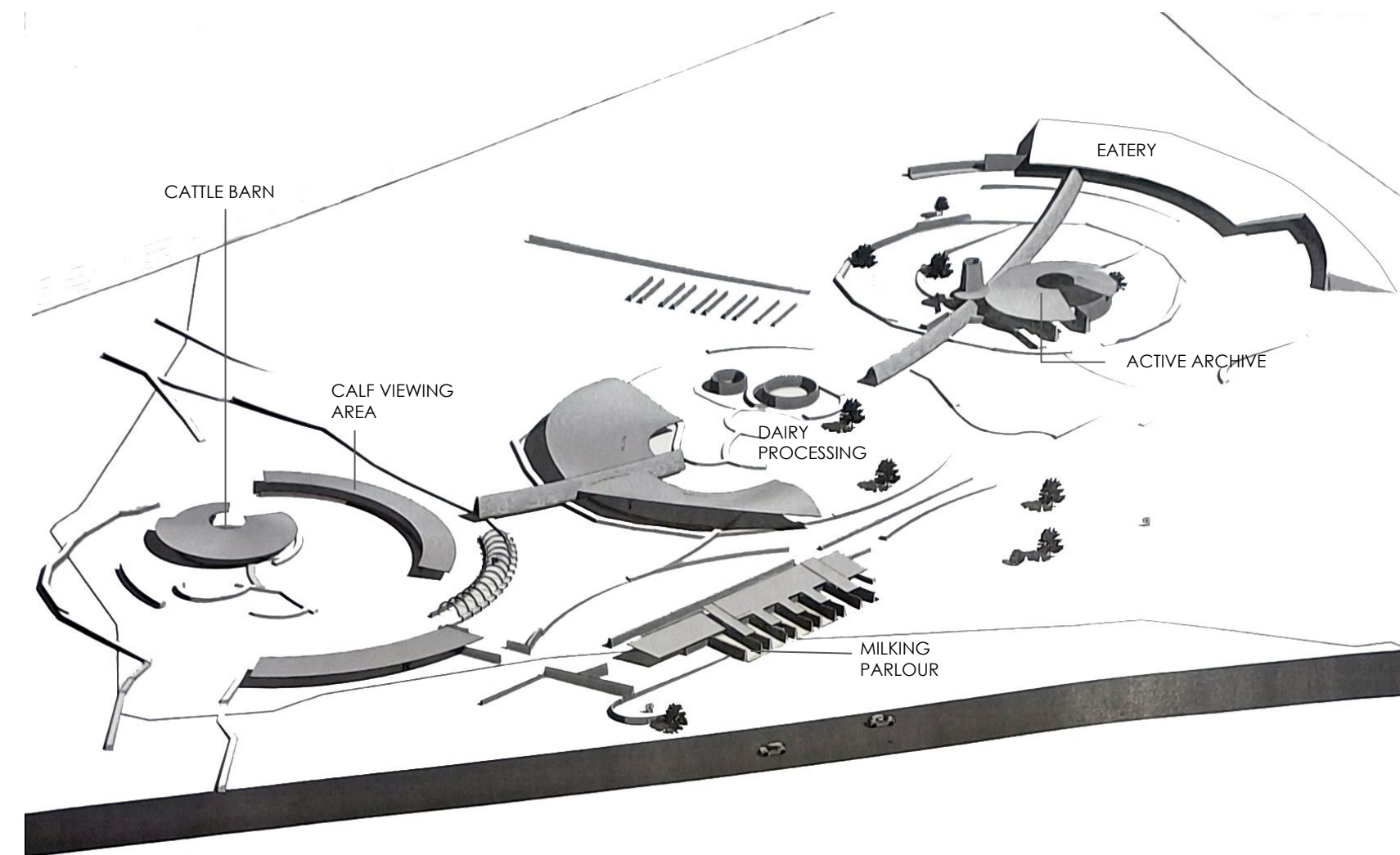
This iteration aimed to have more tectonic interventions in the landscape, marked by buildings that were positioned in areas that are complementary to both contemporary and past programmatic use as seen in the axonometric interpretation of the model. A main axis was defined moving north to south, as the ruins indicate that this was a main pathway. A secondary axis was developed to link the arrival pavilion to the barn, which are both areas characterised by low significance ruins - following a memorialisation approach. It was decided that this axis was too insensitive in the landscape and more organic pathways were needed to link programs.

SCALE 1:2000

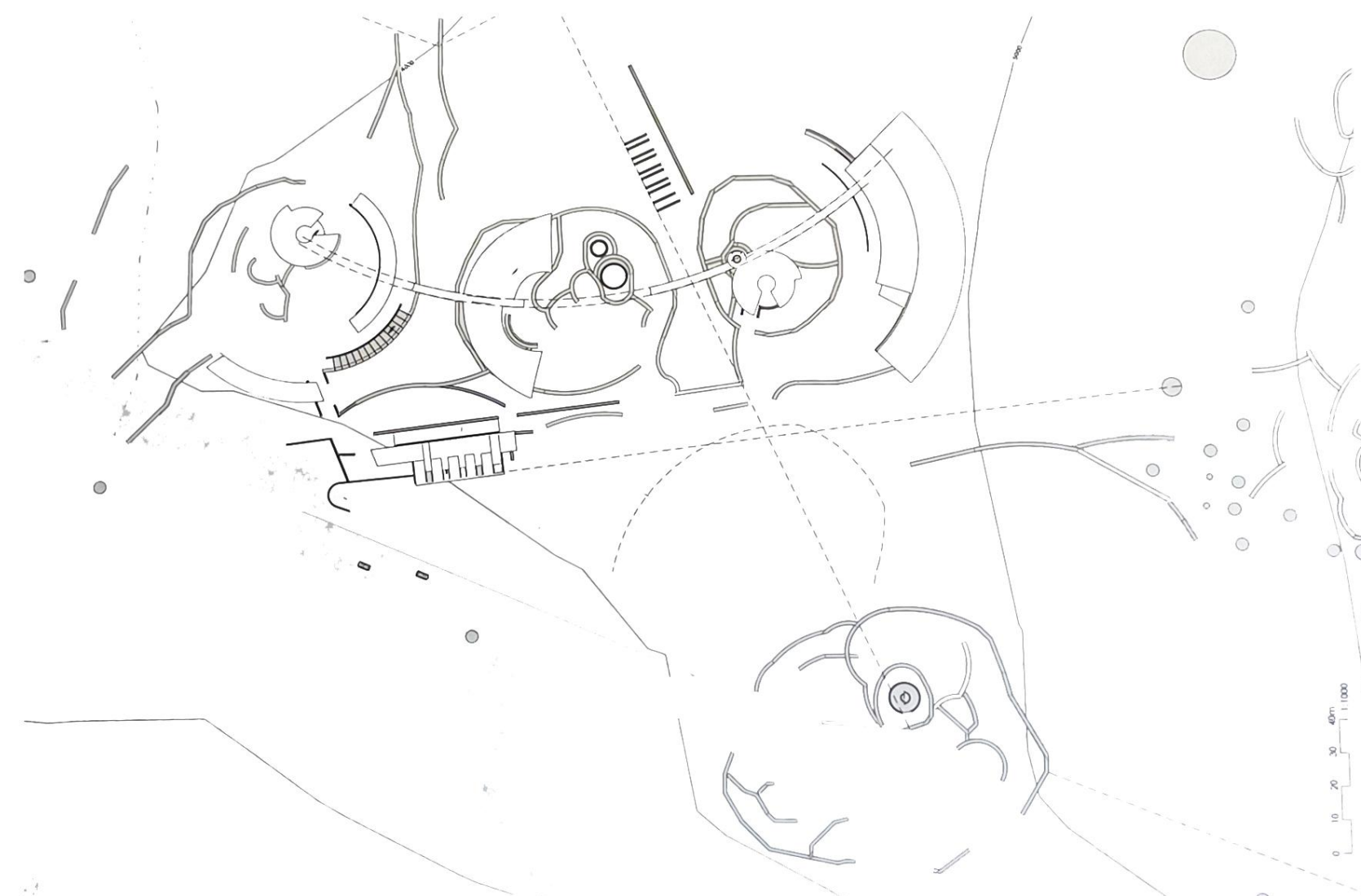


# ITERATION 4

The concept and importance of terracing and working with the landscape became very important in this iteration, where an emphasis on simple forms combined with landscape interventions were prioritised. The arrival pavilion was developed further on the 1:100 scaled model to mark the entrance and reclaiming of the highly damaged ruins. When translating the physical model into a digital model, certain elements were lost and it became clear that the building footprints themselves were disproportionate. It then became important to zoom into each programme and define how much building there would need to be in order to complement the ruin without overpowering it.



A connective walkway was envisioned between the programmes, however, it didn't follow the logic of natural pathways on-site and would interfere with the ruins too much. The next iteration therefore needed to respond more sensitively to past movement routes.



# BUILDING TECHNOLOGY & PERFORMANCE

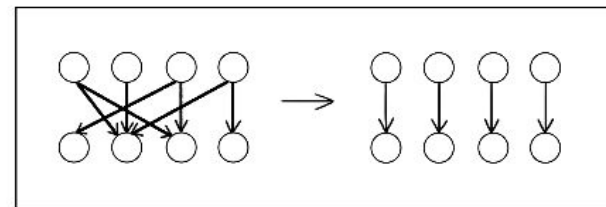
## REVERSIBILITY

### ASSESSMENT INDICATORS AND RECOMMENDED PRINCIPLES

Focusing on the “active archive” space, the report explores strategies such as functional independence, systematisation, and relational dependency to develop a detailed section of the facade, aligning it with design for assembly and disassembly principles to ensure reversibility and respect for the historical context. The project thus aims to assess how technological interventions can be appropriately implemented by considering their impact on the ruins through their assembly.

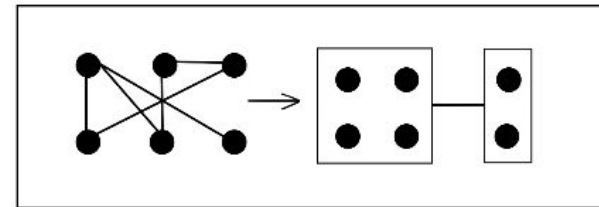
Each component (foundation, floor-to-wall connection, and wall-to-roof connection) will be assessed using a scale of 1 (minimal compliance) to 5 (perfect compliance) of each indicator.

**1 Functional Independence:** Opt for a higher degree of separation of components and function.



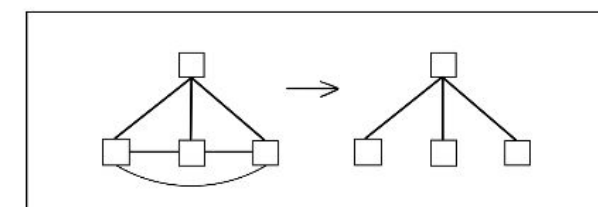
total dependency		1
unplanned integration		2
planned integration		3
modular zoning		4
no dependency		5

**2 Systematisation:** Group elements into independent modules based on their function, ease of assembly/disassembly, and expected lifespan.



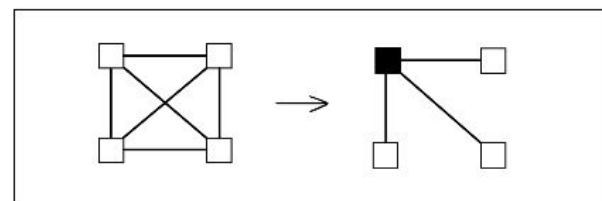
low		Element (profile)	1
basic		Component (facade frame)	2
moderate		Assembly (facade fragment)	3
high		Chunk (facade module)	4
very high		building	5

**3 Relational Dependency:** Minimize the number of connections that represent dependencies between different elements in a building.



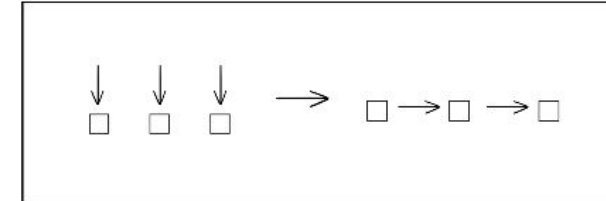
closed assembly		1
layered		2
stuck		3
table		4
open		5

**4 Base Element of the Configuration:** Design a key element that acts as an intermediary between other elements in the structure.



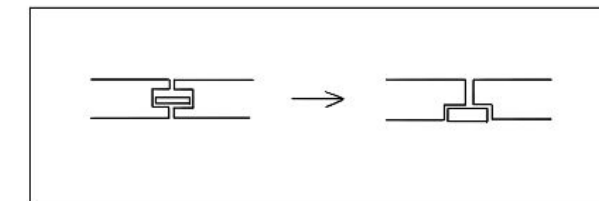
whole building		1
load-bearing structure		2
frame		3
intermediary connective element		4
accessory		5

**5 Assembly/Disassembly Sequencing:** Enable more parallel rather than sequential assembly to improve efficiency.



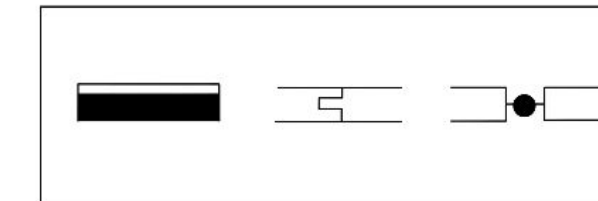
sequential		1
interlock		2
closed circle		3
parallel		4
gravity		5

**6 Interface Geometry:** Design product edges so elements can be recovered without damage, making them suitable for reuse.



closed		1
asymmetric/closed on one side		2
overlapping on one side		3
symmetric		4
open		5

**7 Connection type:** Use connections that allow for easy separation and recovery of elements, focusing on decomposition rather than just composition in reversible structures.

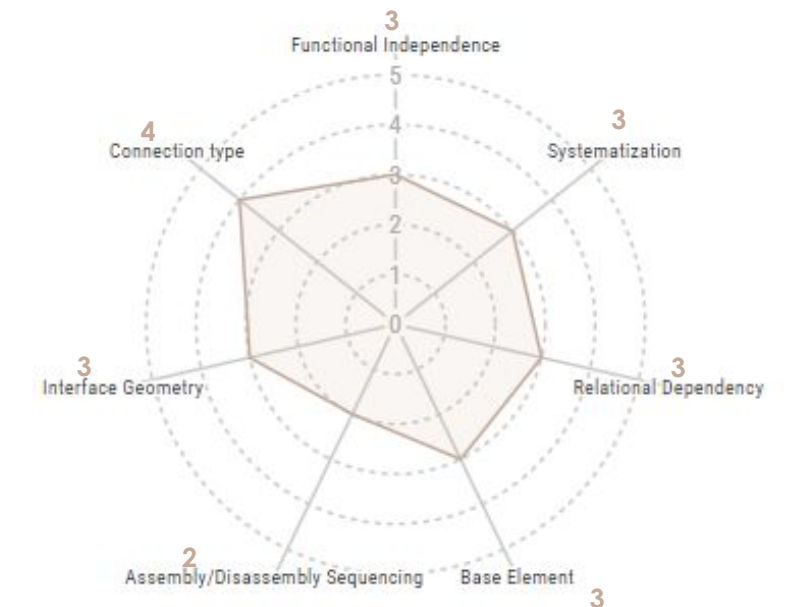


material bond		1
direct with connecting device		2
interlock		3
intermediary		4
gravity		5

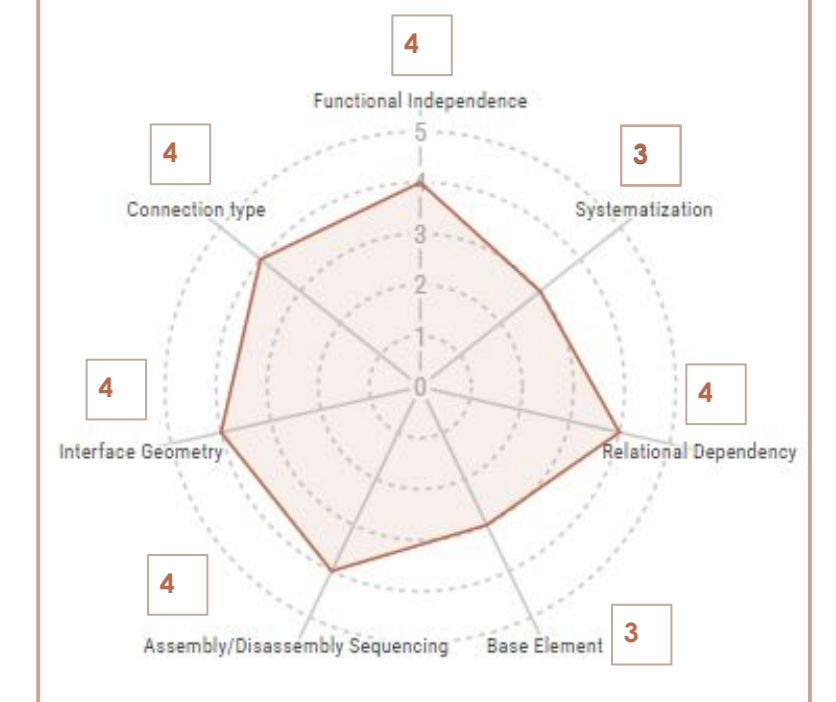
### BENCHMARK IDEALS

guided by the conceptual approach, degree of reversibility required in each ruin condition and informed by precedents

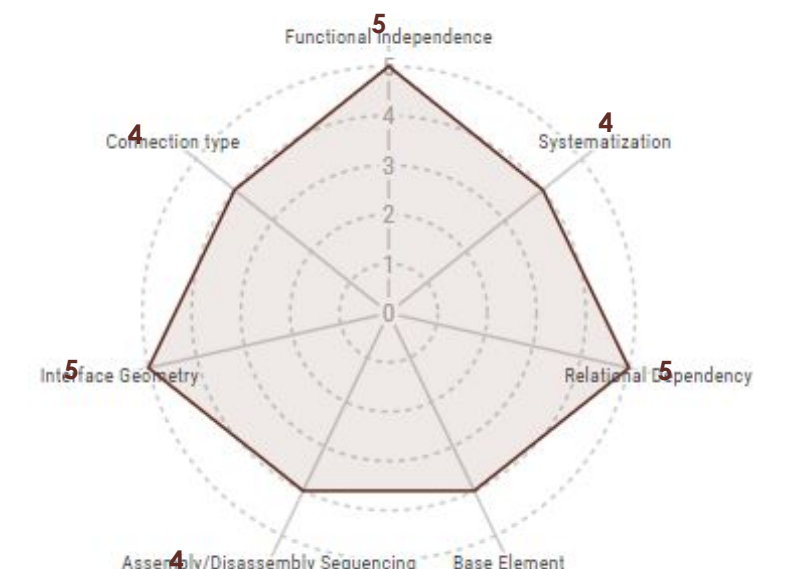
#### Memorialise



#### Re-frame (Focus)



#### Re-signify

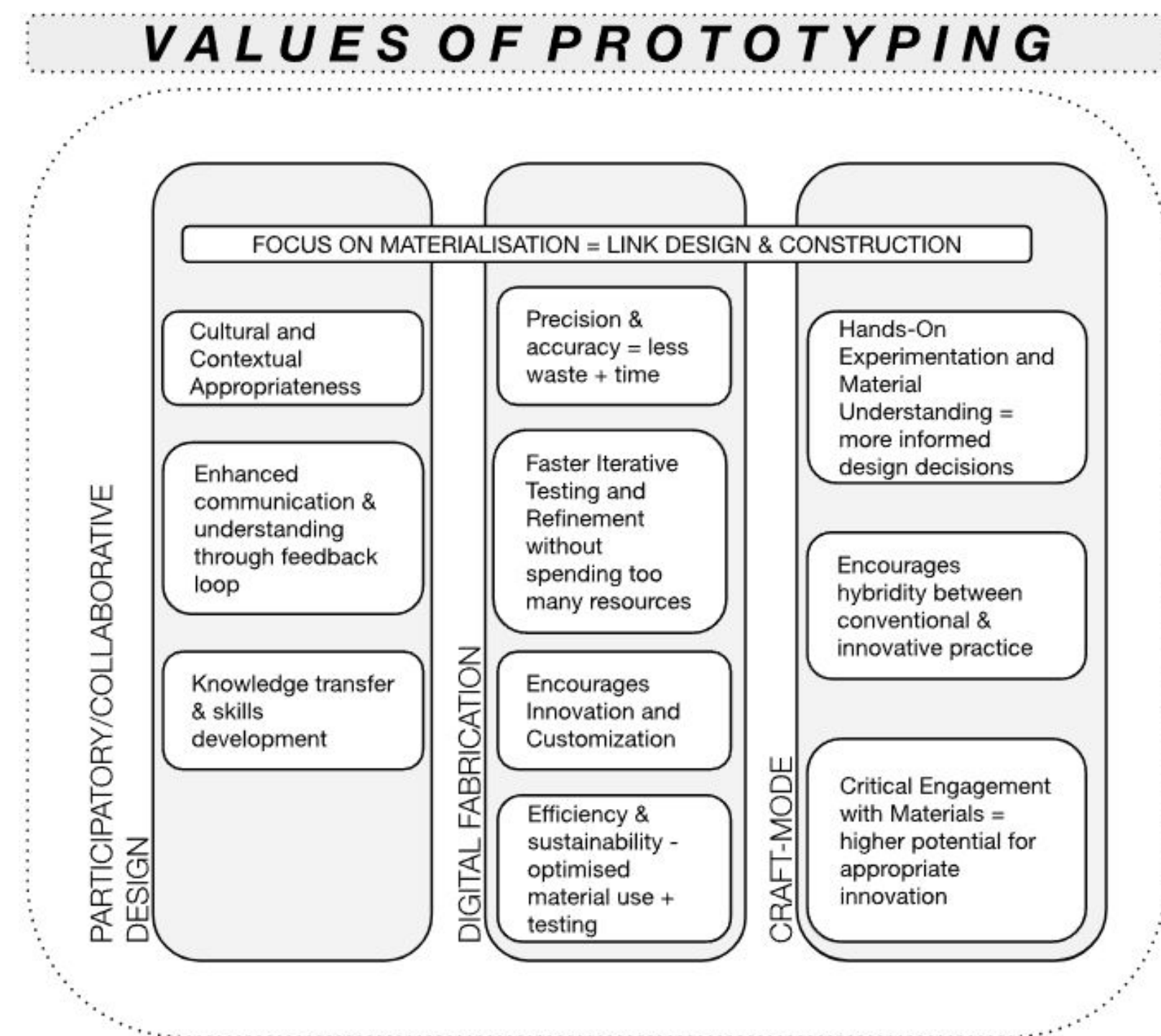


Reversibility framework (Author, 2024) adapted from Design Strategies for Reversible Buildings Durmisevic(2019:52-71)

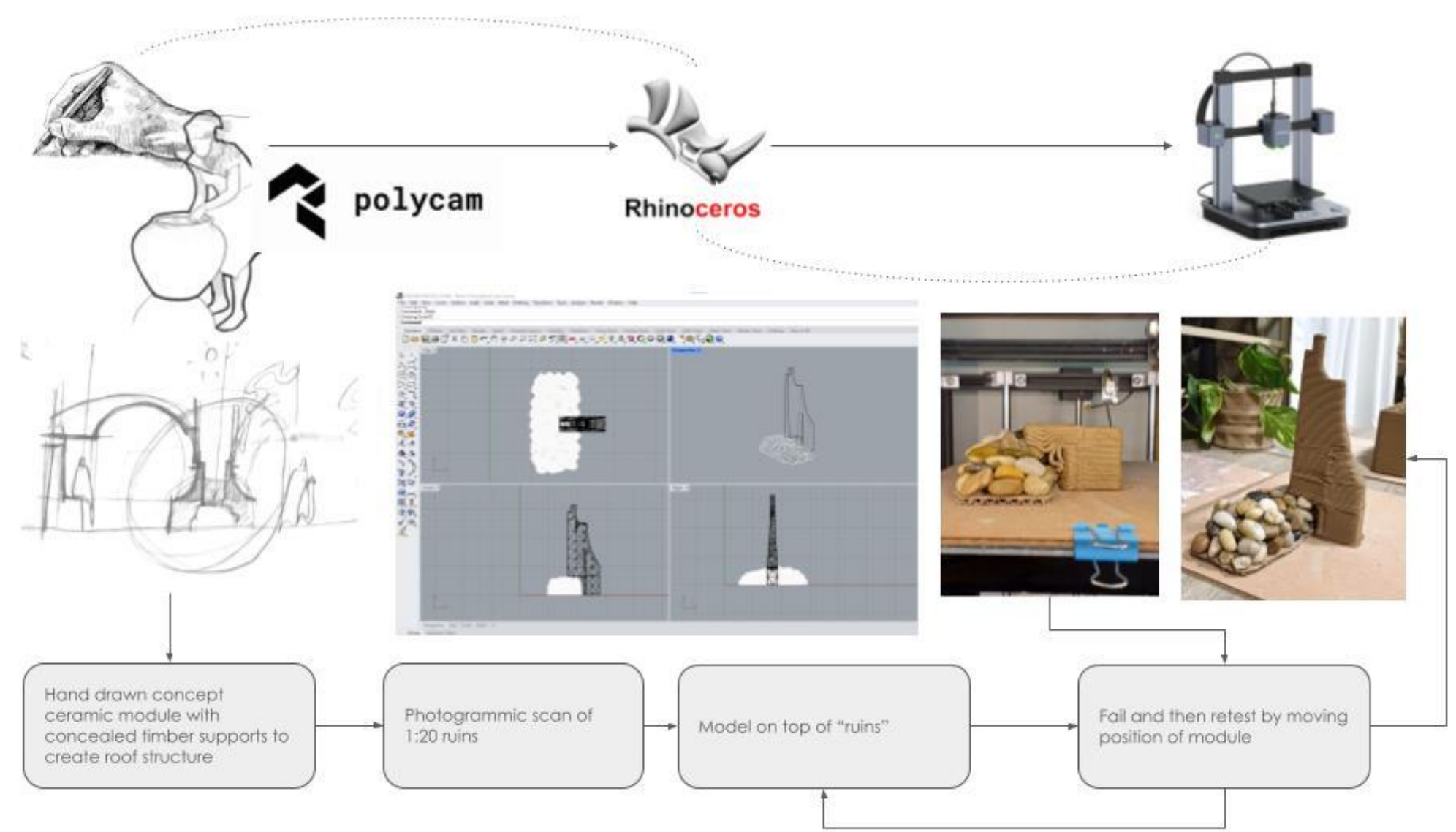
Degrees of reversibility required for each ruin condition (Author, 2024)

# DIT DPD INTEGRATION & INTERPRETATION

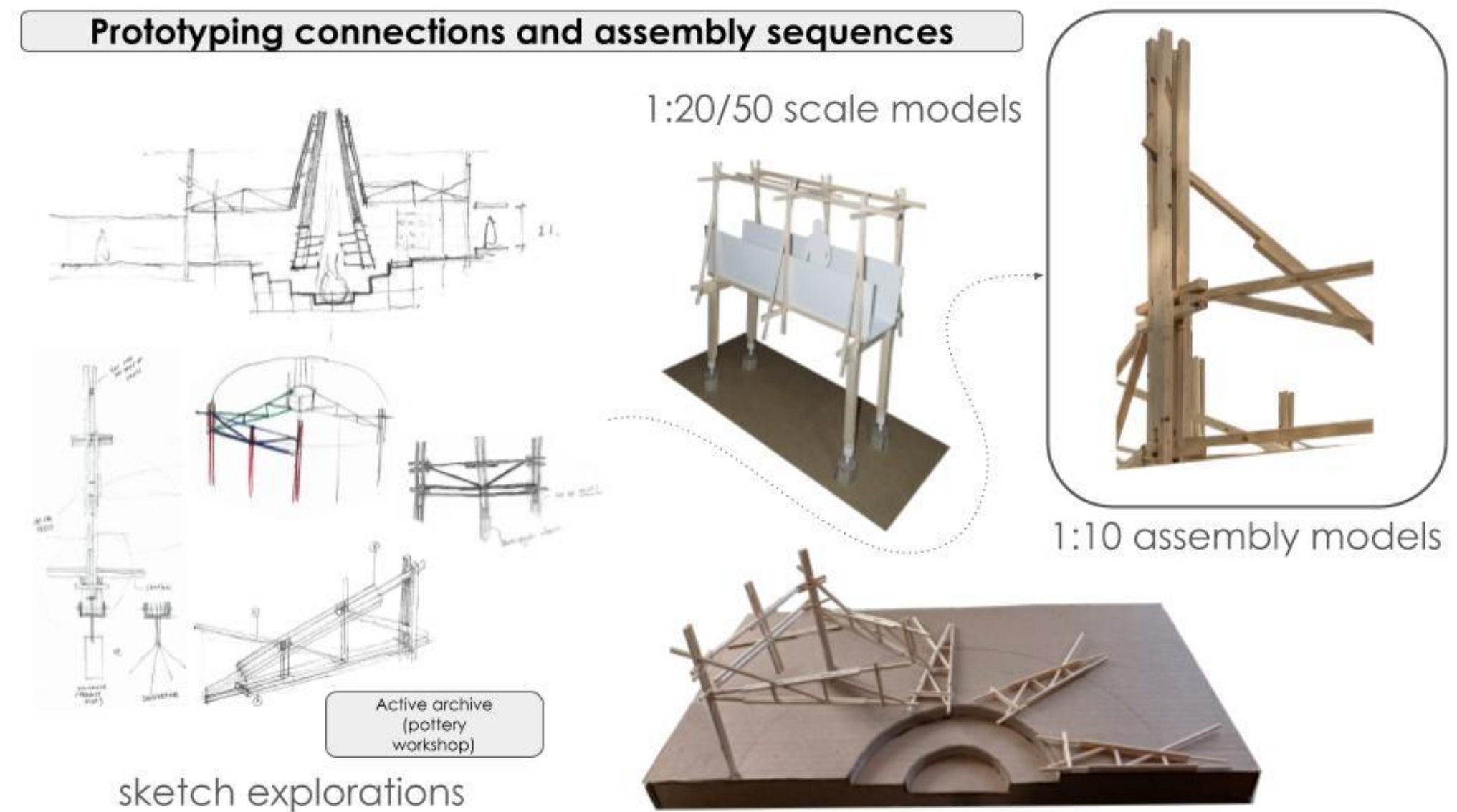
The mini-dissertation research study titled "A critical analysis of the role of prototyping in circular design processes in South Africa" (Author, 2024), explored the value of prototyping design on various scales. One of the main findings was that prototyping enables a closer relationship and understanding of the materialisation of design, ultimately linking design and construction, where the designer constantly engages in a circular and reflective process where design and construction are not separated. Three main design processes were explored: participatory/collaborative design, digital fabrication, and craft mode, the values of each are shown in Figure 26.



Values of prototyping in circular design processes of participatory/collaborative design, digital fabrication and craft-mode (Author, 2024)



Iterative digital fabrication prototyping process (Author, 2024)

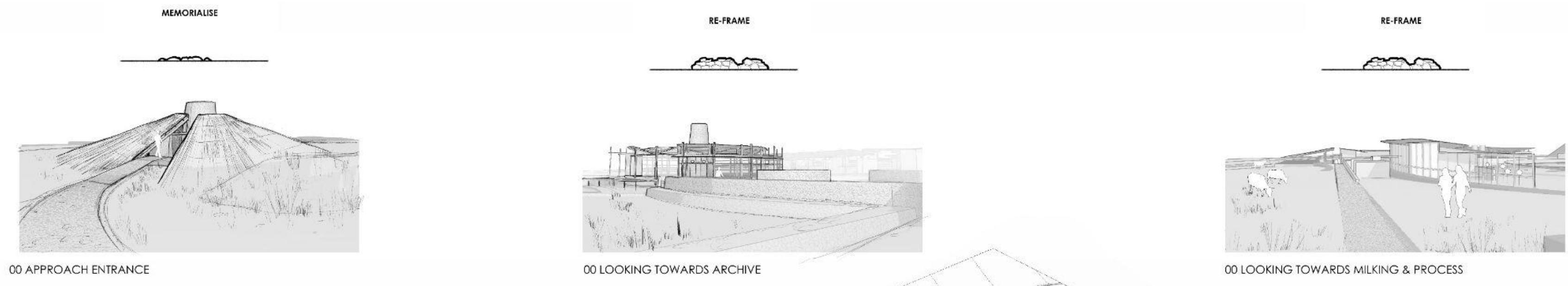


Prototyping process of timber structural system (Author, 2024)

Due to the site's complexity and sensitivity, various concepts were tested through both simple models and scaled components using a hybrid of hand-based and digital methods. This approach allowed the author to engage in diverse design processes, consulting professionals and community resources to understand local needs and attitudes. Initially, I experimented with 3D printing in clay, combining advanced technology with a historically significant material. Using Polycam, I created photogrammetric scans of a ruin mock-up, placing a Rhino-modelled, hand-sketched concept onto the scanned ruin. This process highlighted the challenge of aligning high-tech precision with the ruin's irregularity, yielding interesting results. Timber, historically significant in Bakoni settlements, was then explored with modern dry-joinery and bolted connections for greater precision and sensitivity.

# ITERATION 5

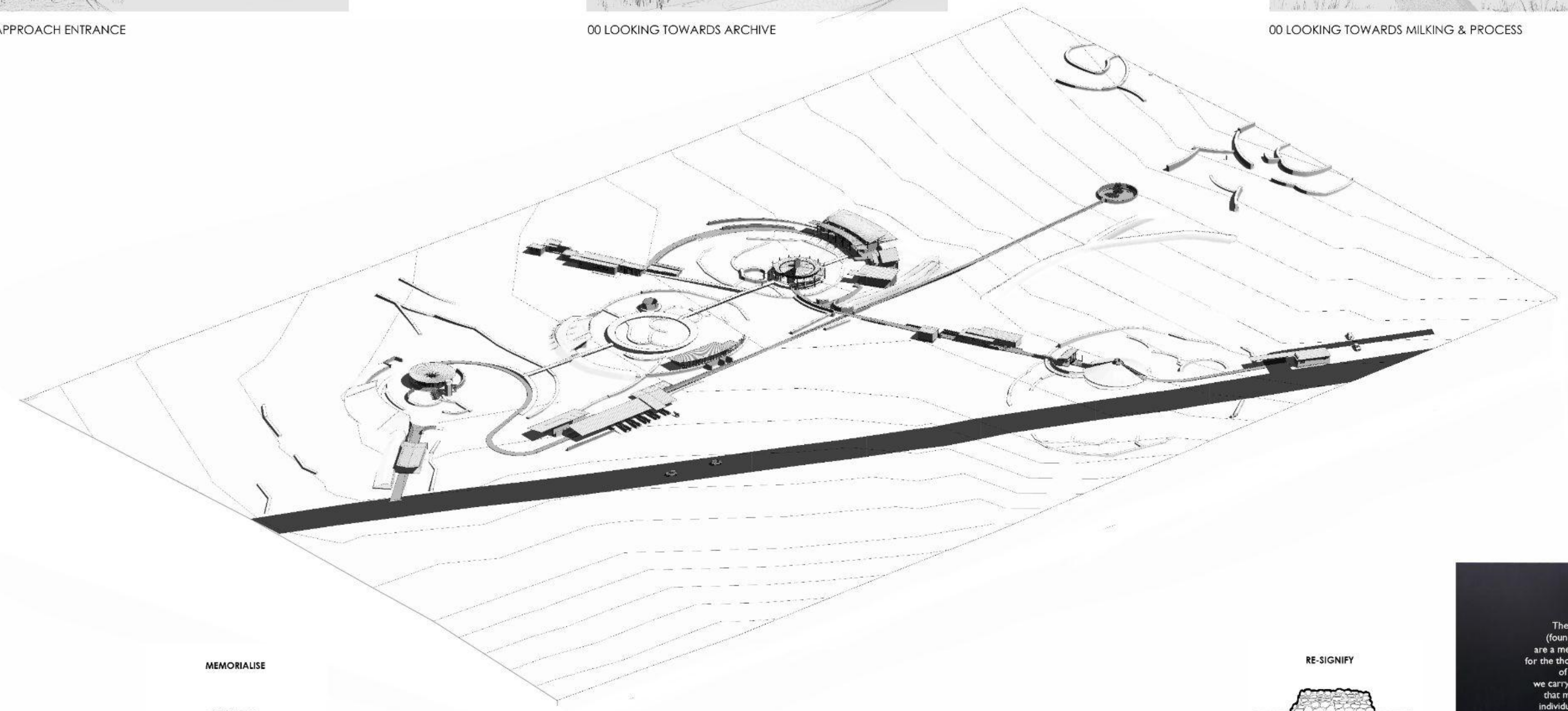
Reversibility principles were applied to each program in correspondence with the spatial requirements, resulting in the following axonometric model being produced with its respective perspectives. Building footprints and roof planes were minimised, however, the contrast between more reversible versus semi-reversible, relating to spaces further away from the ruins was not clear enough, resulting in the negotiation between the architecture and the ruin being too blurred. It became important to play more deliberately with the roof and ground plane so that the ruin would be highlighted in the centre.



00 APPROACH ENTRANCE

00 LOOKING TOWARDS ARCHIVE

00 LOOKING TOWARDS MILKING & PROCESS

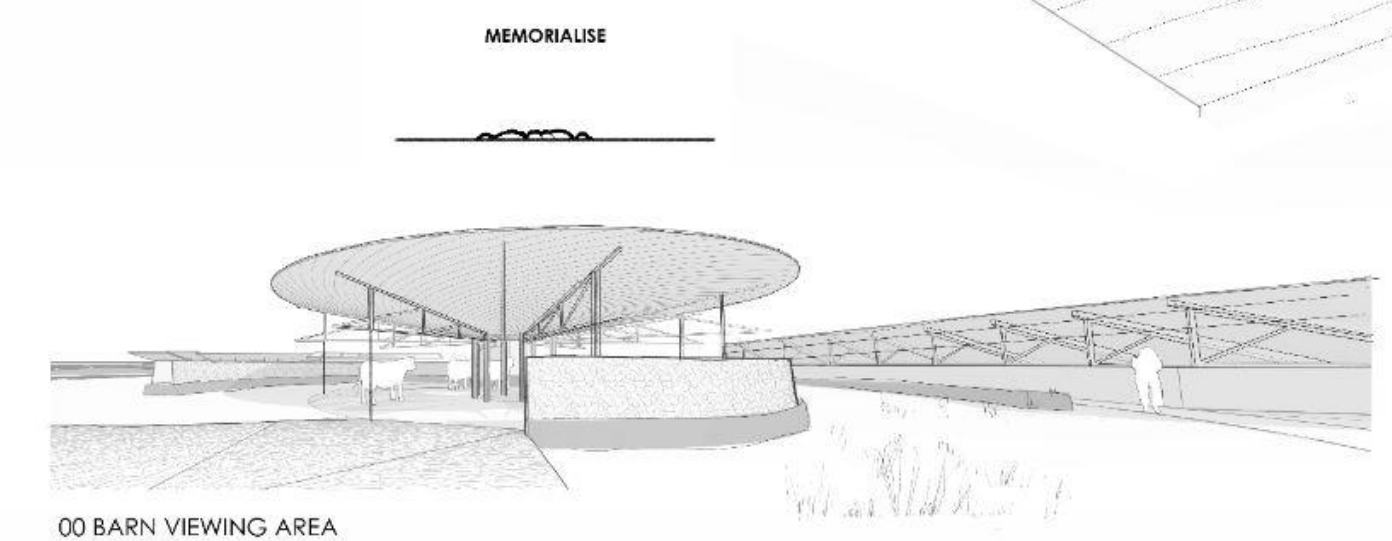


reversible

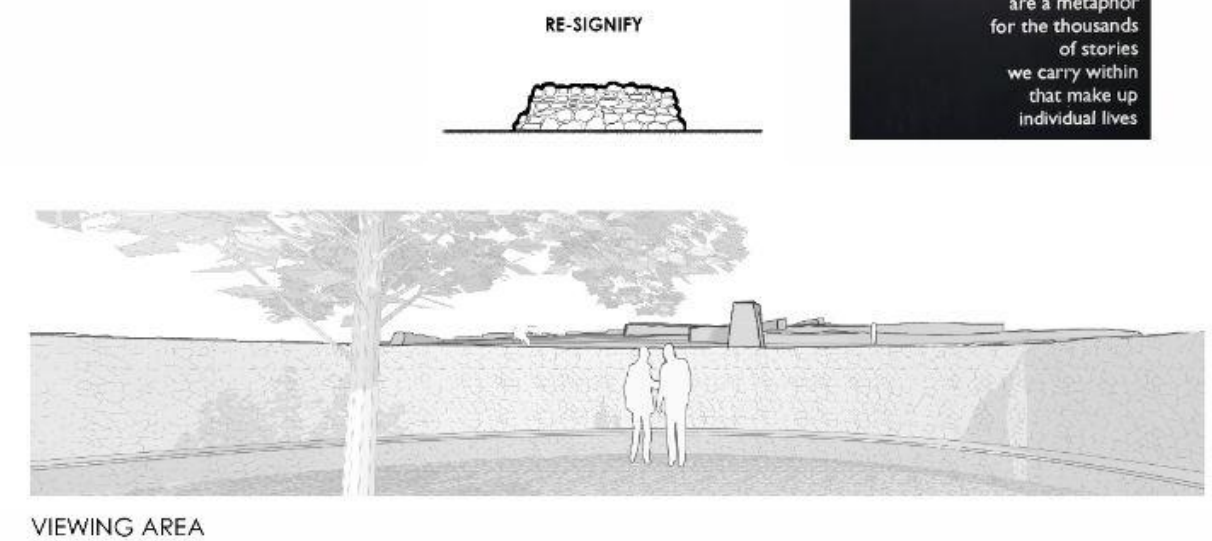


THE RUIN AS THE IN-BETWEEN

semi-reversible



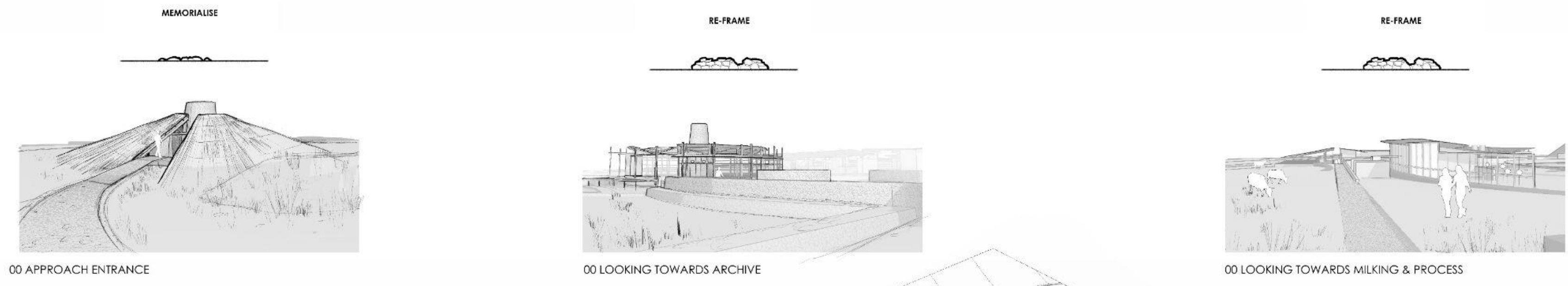
00 BARN VIEWING AREA



VIEWING AREA

# ITERATION 5

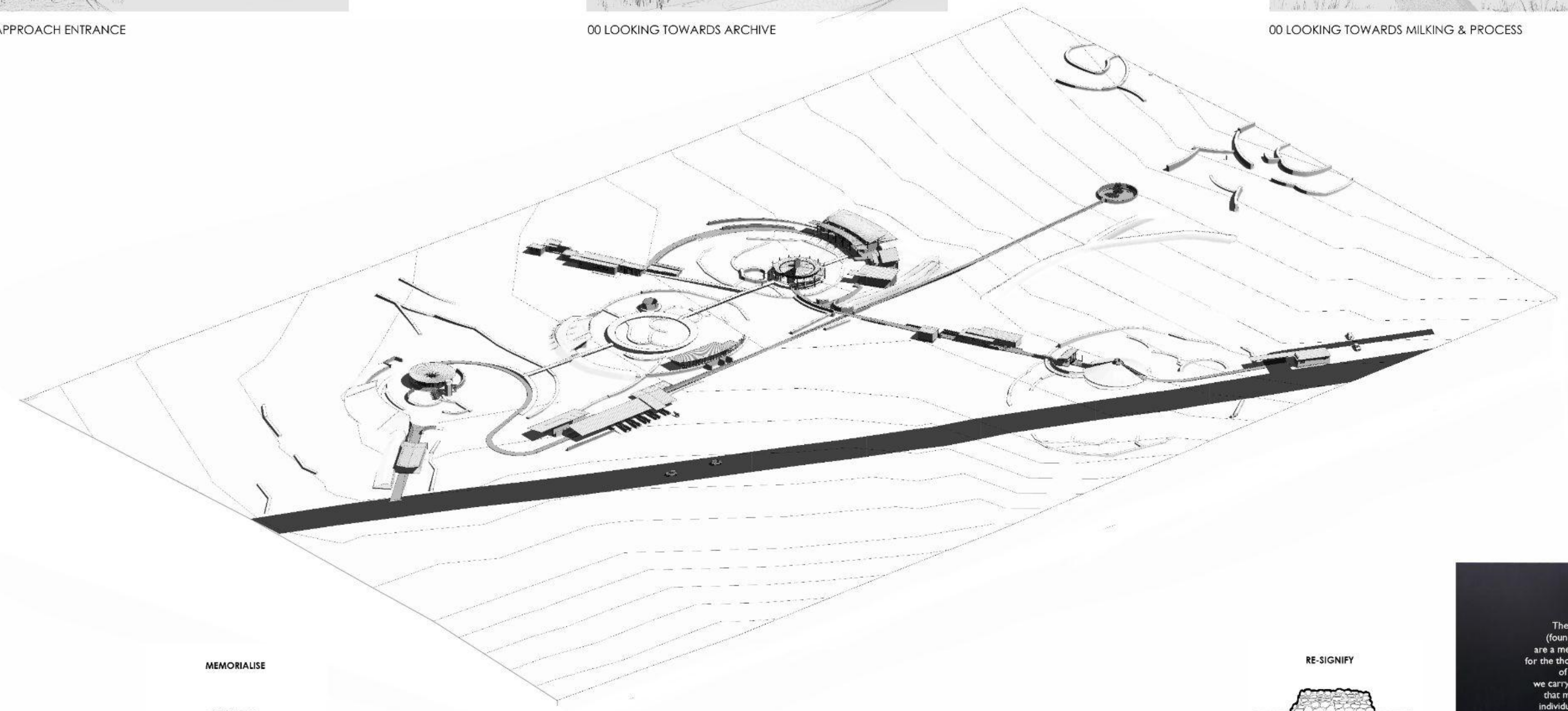
Reversibility principles were applied to each program in correspondence with the spatial requirements, resulting in the following axonometric model being produced with its respective perspectives. Building footprints and roof planes were minimised, however, the contrast between more reversible versus semi-reversible, relating to spaces further away from the ruins was not clear enough, resulting in the negotiation between the architecture and the ruin being too blurred. It became important to play more deliberately with the roof and ground plane so that the ruin would be highlighted in the centre.



00 APPROACH ENTRANCE

00 LOOKING TOWARDS ARCHIVE

00 LOOKING TOWARDS MILKING & PROCESS

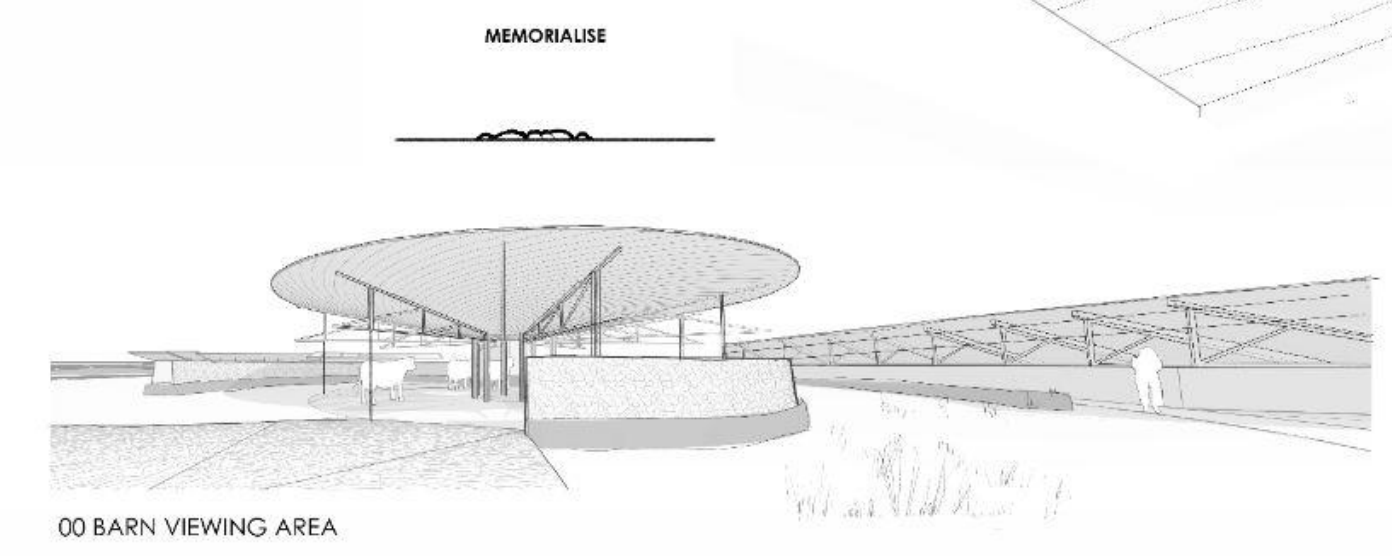


reversible

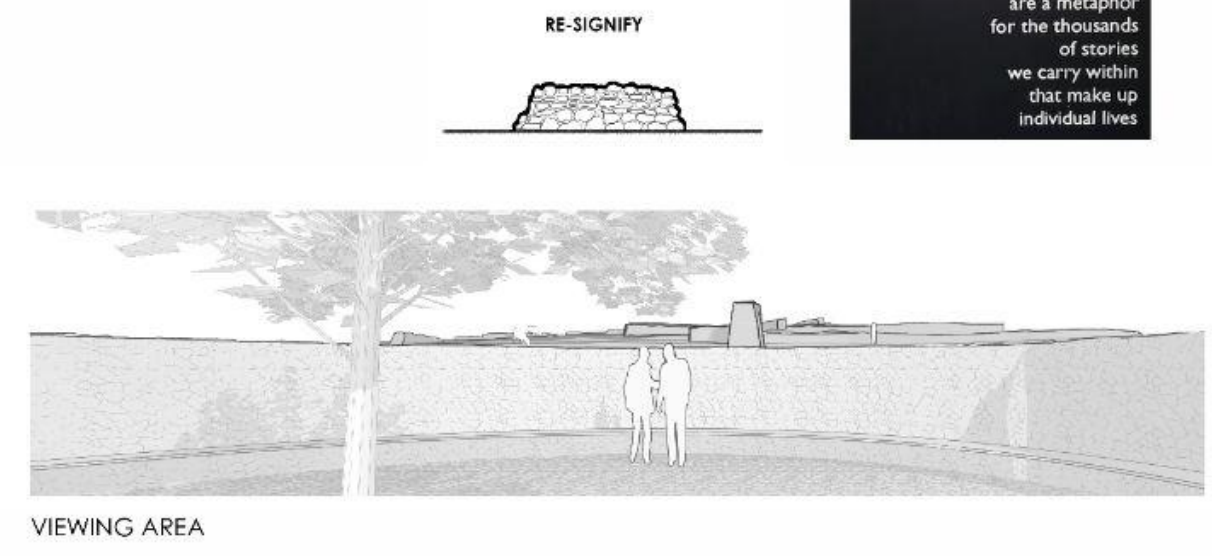


THE RUIN AS THE IN-BETWEEN

semi-reversible



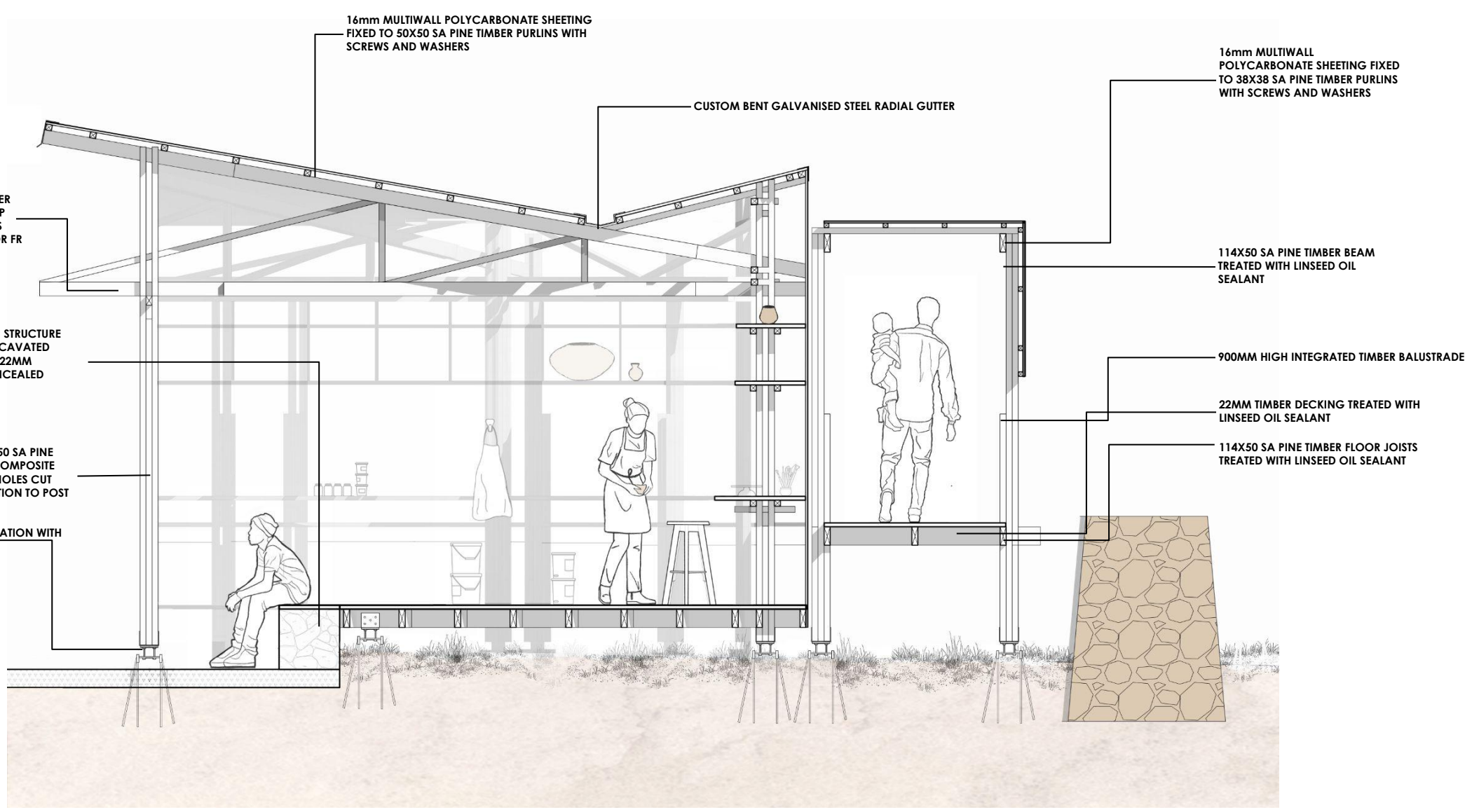
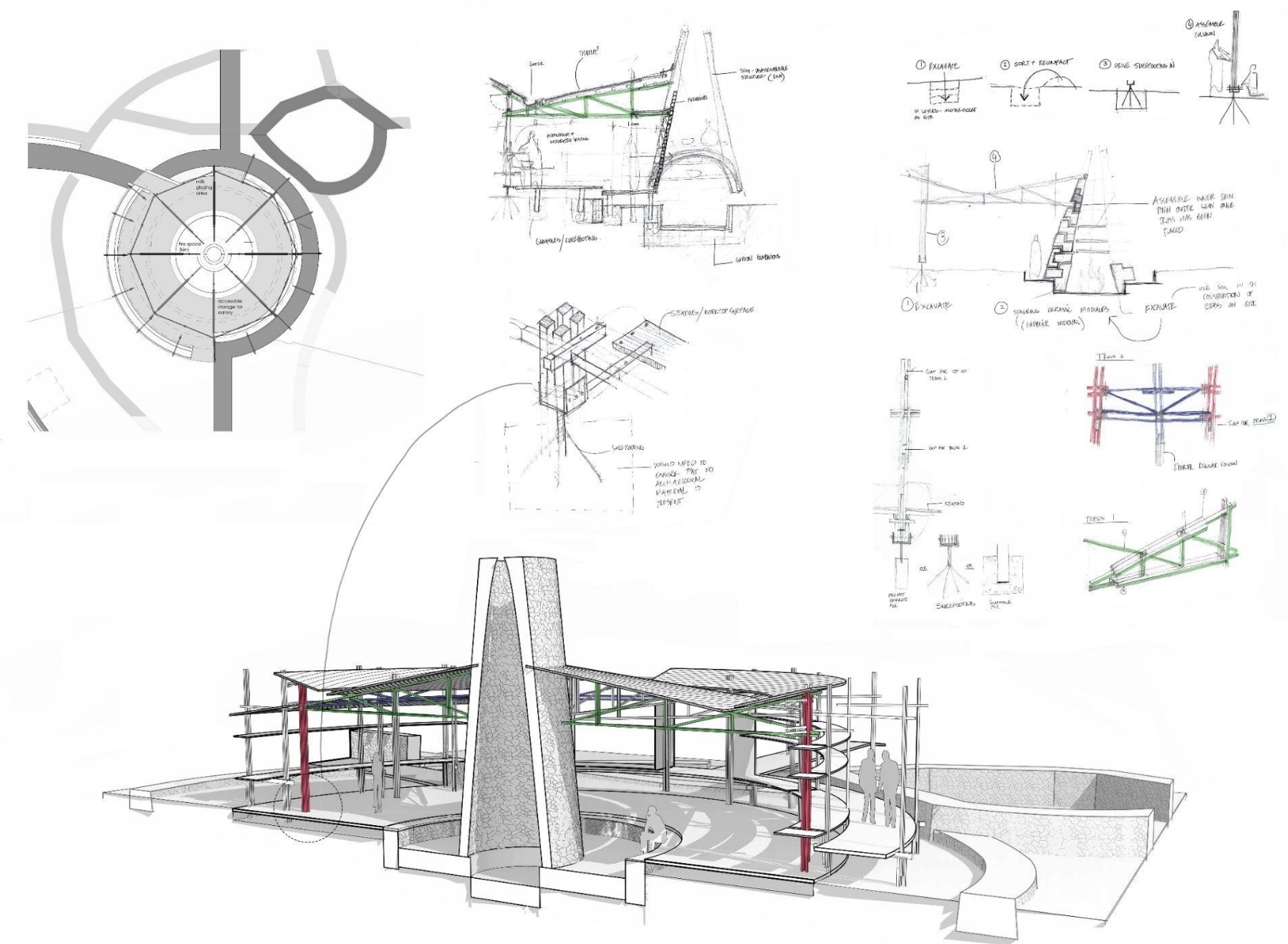
00 BARN VIEWING AREA



VIEWING AREA

The stones (found here) are a metaphor for the thousands of stories we carry within that make up individual lives

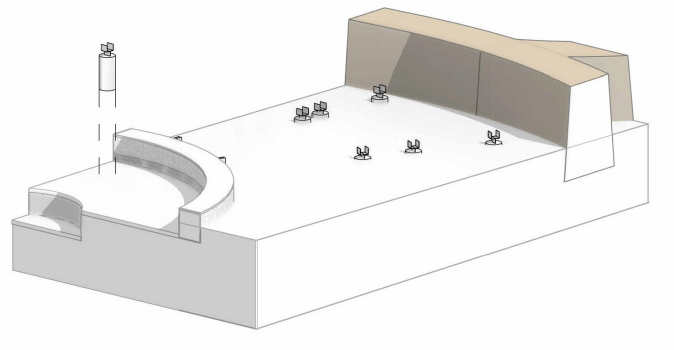
# ACTIVE ARCHIVE ITERATIONS | REVERSIBILITY



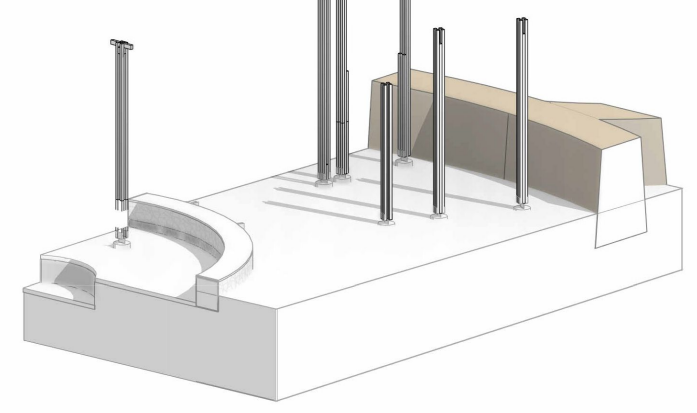
Initial sectional exploration of the active archive (Author, 2024)

Initial technification of the active archive with improved more reversible foundations (Author, 2024)

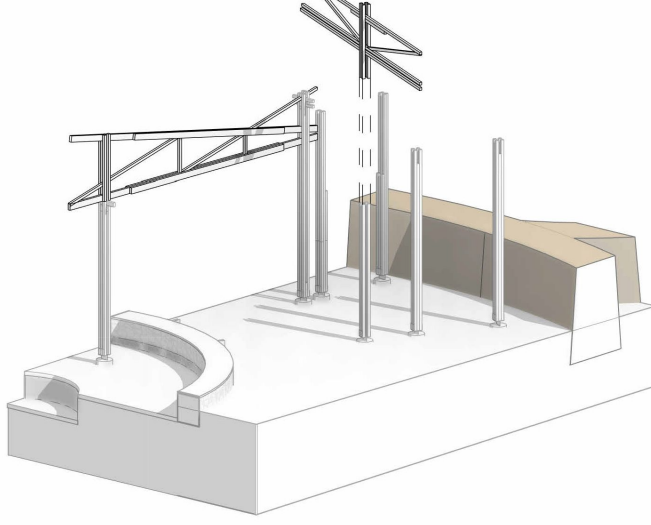
**1** Site excavated by archaeologists - pits prepared for precast foundation units with gravel backfill.



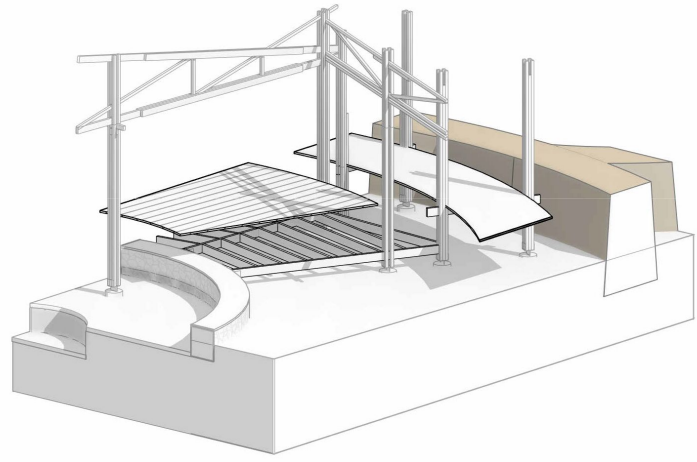
**2** Pre-fabricated 150x150 composite columns bolted into anchor posts.



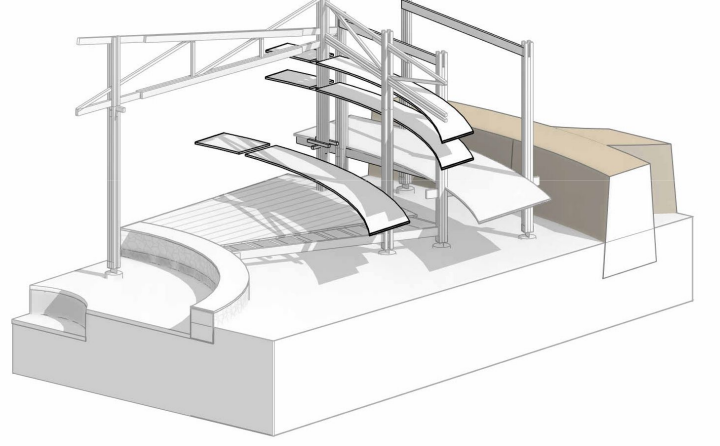
**3** Pre-fabricated timber trusses placed into notches in columns and fixed with bolted connections.



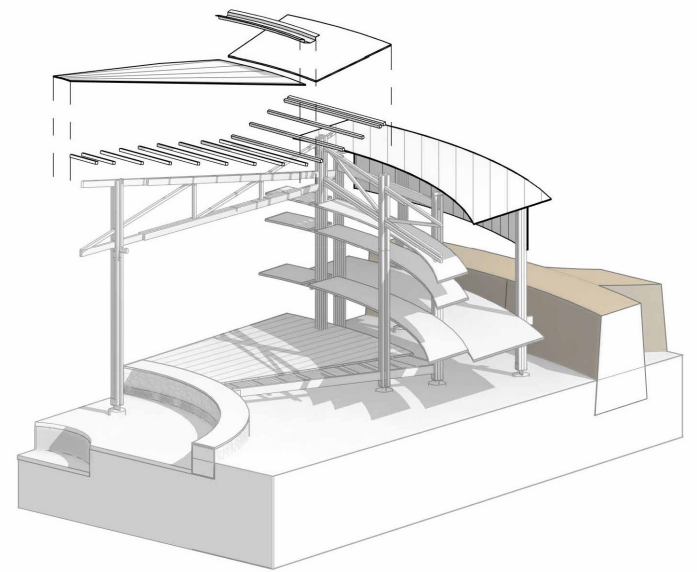
**4** Floor joists placed and bolted through notches in column system and bolted onto anchor post footings.



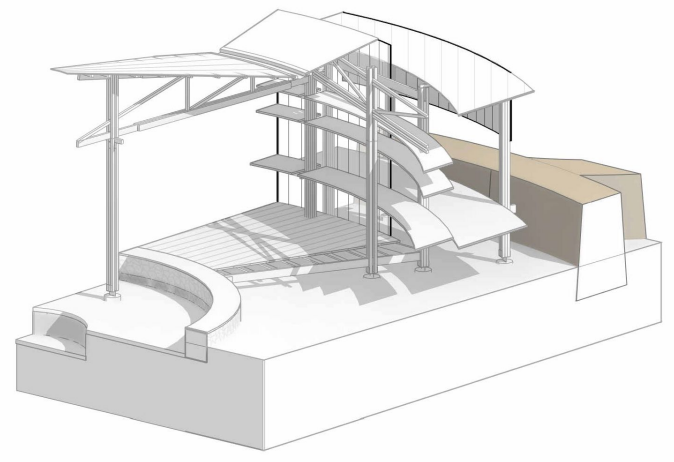
**5** Shelf and work table supports notched and bolted into column structure - 22mm linseed oil treated worksurfaces and shelves fixed onto supports with concealed fixings.



**6** 50x76 SA Pine timber purlins fixed onto notches in truss. 0.53mm corrugated roof sheeting fixed with screws and washers to purlins.



**7** 16mm multiwall polycarbonate fixed to framed structure with screws and matching washers. Aluminum edge trim strips connecting panels allowing for maintenance/servicing. Aluminium drip trim edge closures on all exposed edges.



**1. Suboptimal Interface Geometry & Connection Type of Foundation:**

- **Rigid and Complex Connections:** The geometry of the foundation connections likely hinders ease of disassembly. Instead of opting for simplified, modular, or mechanical connections that can be easily separated, the current design uses materials and methods that create permanent bonds, making future alterations challenging.
- **Impact on Site:** The prefabricated pile foundation may cause a higher impact on the site, especially during excavation and installation, contradicting the DfD principle of minimal site disturbance. This could affect the historical ruins and compromise the reversibility of interventions.

**2. Limited Separation Between Roofing and Truss Elements:**

- **Layered Relational Dependency:** the layered nature of the assembly of the roof to wall connection reduces the ability to recover elements without damaging the the timber elements - mainly due to notched connections that are screwed together.

# FINAL WORK | SITE PLAN

**1 Arrival Pavilion - Memorialise:** Visitors enter a pavilion set within vegetative berms, evoking the ancient landscape. Molded artifacts are displayed, and an open "Sky Space" invites reflection on history and transience.

**2 Artefact Drop-off Zone- Reframe:** This transitional area allows visitors to leave offerings or artefacts, contributing actively to the site's history. It serves as both a symbolic and functional space for community participation and initial artefact processing.

**3 Active Archive - Reframe:** A pottery workshop and kiln reframe the past as visitors engage in traditional pottery-making. Movable timber displays and the kiln embody the site's evolving narrative and blend of permanence and adaptability.

**4 Artefact Labs - Reframe:** The labs assist in the organic residue analysis and various testing of artefacts found on site and in the surrounds, allowing for the exploration of experimental preservation processes in collaboration with the public in a controlled manner.

**5 Milking Parlor**

**6 Dairy Processing**

**7 Eatery - Resignify:** Visitors witness traditional dairy processing using pots from the archive, culminating in the eatery where food is served in these vessels, linking ancient practices with sensory, contemporary experiences.

**8 Barn Viewing Area - Memorialise:** Adjacent to the dairy area, a viewing space offers a glimpse into pastoral traditions, connecting visitors to the heritage of livestock farming.

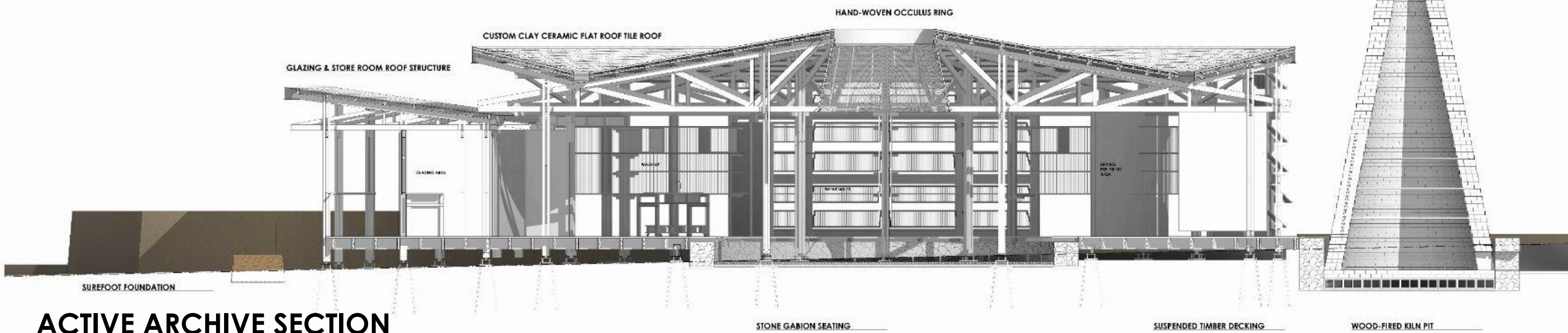
**9 High Significance Ruins - Conclusion:** The journey ends at the preserved ruins at the site's highest point. The architecture here recedes, allowing the ruins to resonate as a cultural monument.



Figure 34: Final floor plan arrangement and associated programs (Author, 2024)

# FINAL WORK | SECTIONS & CONSTRUCTION

## TYOLOGIES



### ACTIVE ARCHIVE SECTION

Figure 35: Active archive pottery workshop section highlighting lightweight fabrication (Author, 2024)

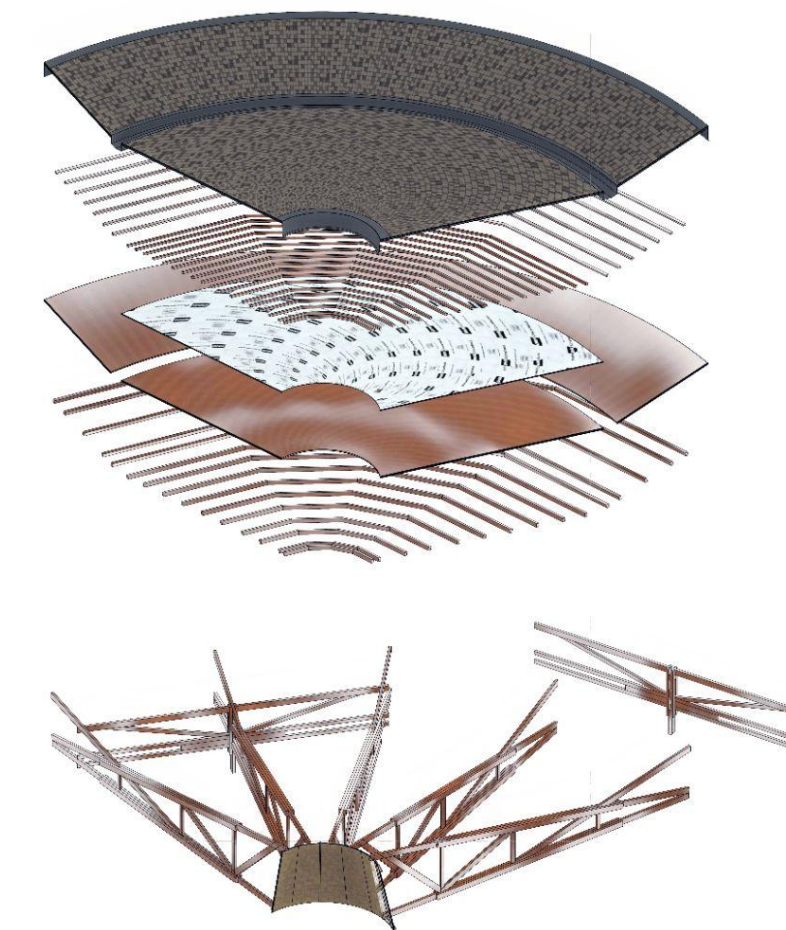


Figure 36: Exploded axonometric diagram of the active archive pottery workshop structure (Author, 2024)

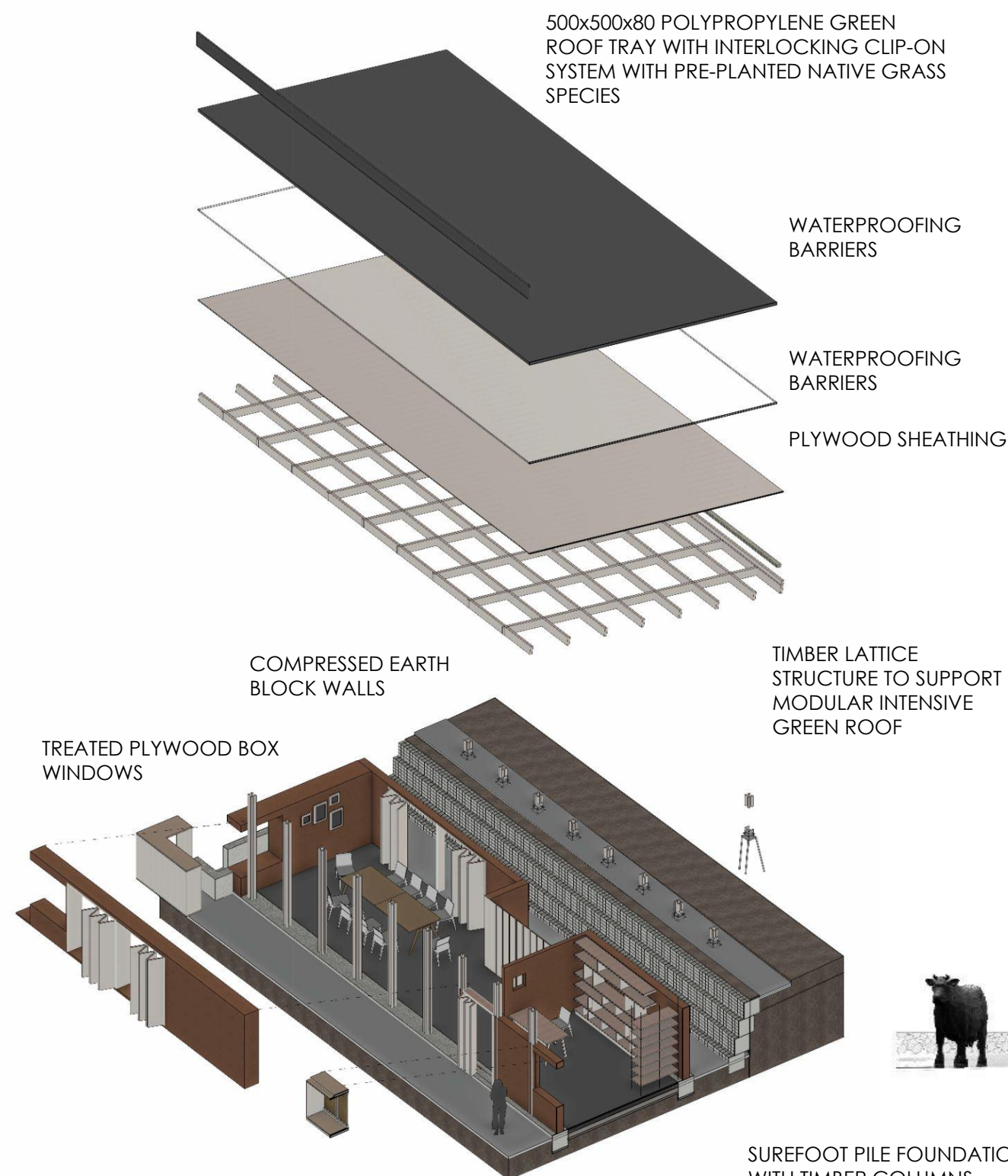


Figure 37: Exploded axonometric diagram of the artefact drop-off structure (Author, 2024)

**Active Archive - Reframe:** The workshop is central to many of the activities happening on site, bringing together old and new ways of moving within and working with the landscape. The focus is on complete reversibility, with mainly prefabricated elements where no wet works are used, dry-stacking methods are prioritised and no remnants will be left should the workshop move or change function, other than the centralised pit and wood-fired kiln pit.. The oculus is used as an architectural device linking to connecting with the sky and is emphasised with a hand woven reed skylight element. The wood-fired kiln is made by dry stacking fire bricks and calcium silicate boards as kiln shelves. There will be perforations in this kiln to allow for the space to be illuminated during night time fires.

**Artefact Drop-off - Reframe:** This initial drop off zone is characterised by its more stereotomic form, using compressed earth bricks made on site in the designated excavation zones to ensure that no ruins are impacted, as well as retaining gabion structures. Again, by using no wet works, the structure is able to be disassembled, the only trace being left will be the terraces, intentionally left behind for later occupation or cultivation. The fact that the artefact drop-off is located further away from the ruins warrants a more heavy architecture, blending in with the landscape.

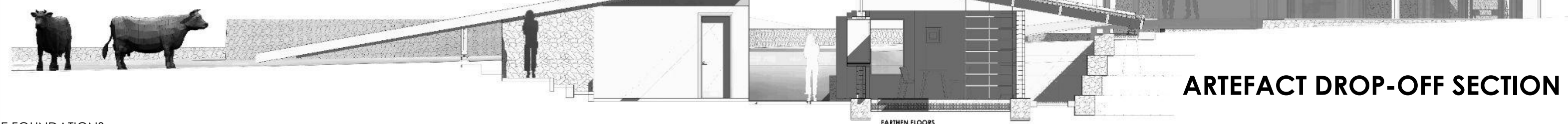
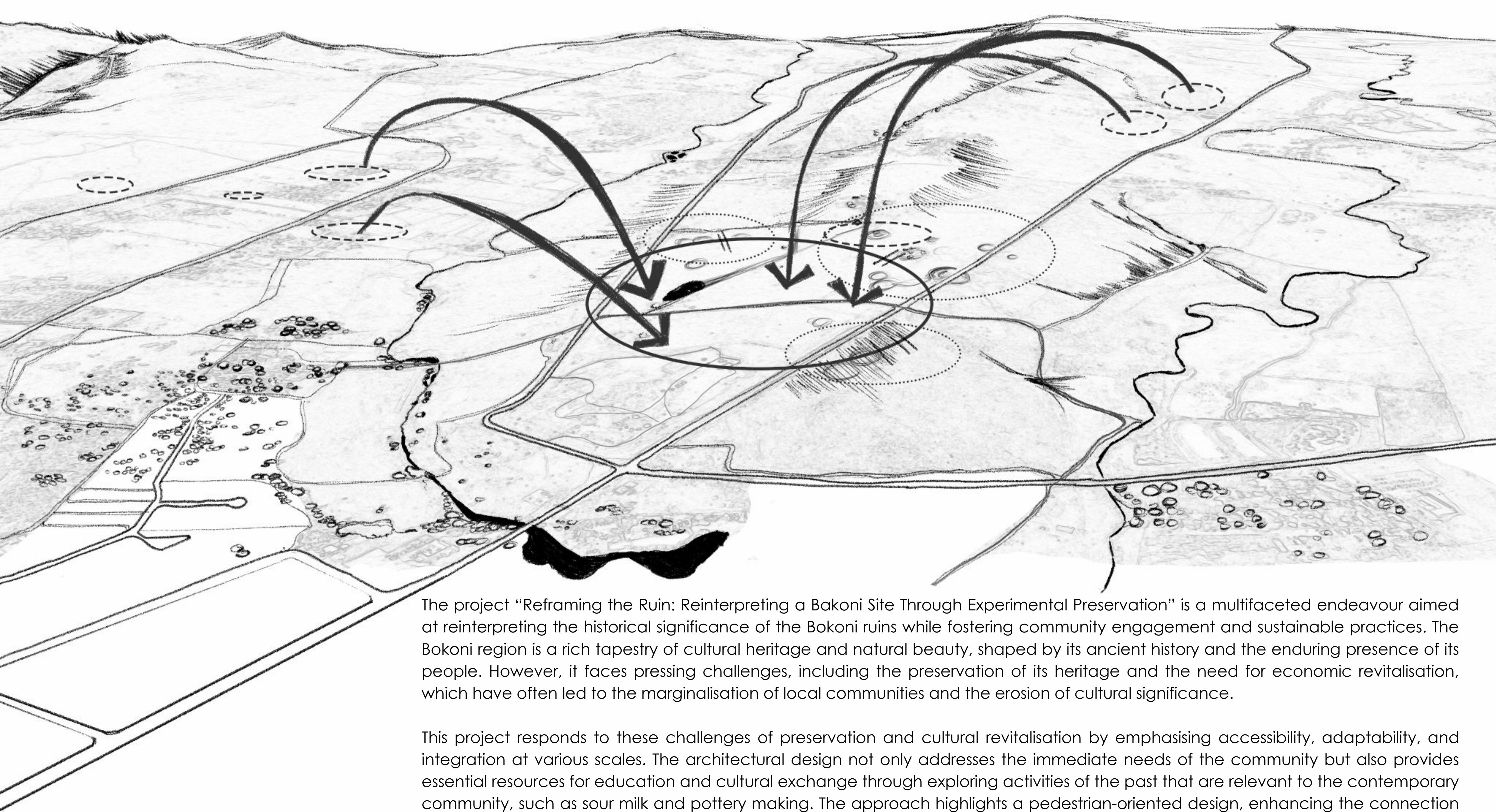


Figure 38: Artefact drop-off section highlighting earthen construction and modularity (Author, 2024)





The project "Reframing the Ruin: Reinterpreting a Bakoni Site Through Experimental Preservation" is a multifaceted endeavour aimed at reinterpreting the historical significance of the Bokoni ruins while fostering community engagement and sustainable practices. The Bokoni region is a rich tapestry of cultural heritage and natural beauty, shaped by its ancient history and the enduring presence of its people. However, it faces pressing challenges, including the preservation of its heritage and the need for economic revitalisation, which have often led to the marginalisation of local communities and the erosion of cultural significance.

This project responds to these challenges of preservation and cultural revitalisation by emphasising accessibility, adaptability, and integration at various scales. The architectural design not only addresses the immediate needs of the community but also provides essential resources for education and cultural exchange through exploring activities of the past that are relevant to the contemporary community, such as sour milk and pottery making. The approach highlights a pedestrian-oriented design, enhancing the connection between public and private spaces and celebrating the complex identity of the Bokoni region as a place of gathering and resilience. This project illustrates the transformative potential of architecture in enriching cultural narratives and community vibrancy, particularly within ruin contexts. It offers spaces that embody dignity and respect for the diverse users who interact with the site.

In summary, this year-long design process has culminated in a nuanced intervention that harmonises architectural elements with the historical and cultural context of the Bokoni. The final design successfully balances complexity and sensitivity while prioritising community integration. This project exemplifies the critical role of architecture in addressing multifaceted issues. It reinforces the need for such initiatives in South Africa, transcending the built form to connect with broader narratives of heritage, identity, and social cohesion.

Figure 40: Aerial perspective drawing of artefact and knowledge sources accumulating and becoming embedded in the site (Author, 2024)

## CONCLUSION

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# PHYSICAL PIN-UP EXCERPTS

