

# Life in the Making

A Narrative of Craft Practices in Eshowe

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2024/11/08





**DECLARATION:**

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

No part of this report has already been, or is currently being, submitted for any such degree, diploma, or other qualification. I further declare that this report is substantially my work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references provided.

**Shannon Rees Govender**

**November 2024**

Submitted to fulfill part of the requirements for the degree of Master of Architecture (Professional), Department of Architecture, Faculty of Engineering, Built Environment, and Information Technology (EBIT), University of Pretoria University of Pretoria, 2024.

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<b>STUDY LEADER</b>	Communal Kitchen Exhibition
Cobus Bothma	
<b>COURSE COORDINATORS</b>	<b>MACRO CASE STUDY</b>
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<b>RESEARCH FIELD</b>	<b>MESO CASE STUDY</b>
Legacy, Identity C Memory	Eshowe
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## Life in the Making

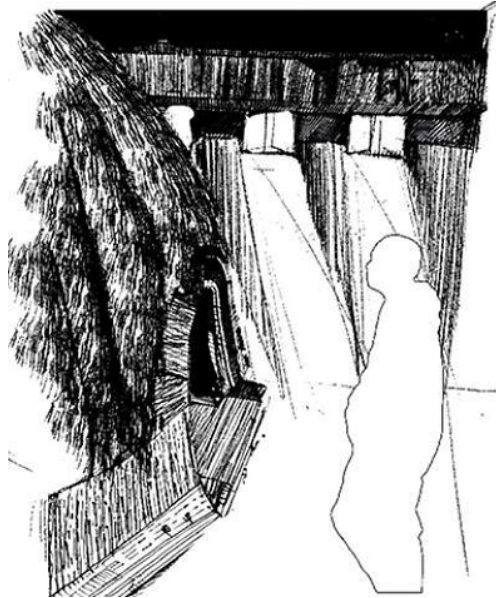
A Narrative of Craft Practices in Eshowe

### ABSTRACT

Eshowe, located on a hill in KwaZulu-Natal, is steeped in rich culture and craft traditions. This project seeks to harness the skills of local craftspeople—basket weavers and potters—to create a unique architectural space collaboratively. Eshowe's history and the vibrant Zulu culture provide a profound context for this endeavour, highlighting a community where craftsmanship and communal living are deeply intertwined.

Designing and creating craft workshops and kitchen exhibitions in Eshowe is pivotal. This Exhibition will serve as a vibrant hub for cultural exchange, where the rich tapestry of traditional knowledge and skills can be celebrated and preserved. It will also instil a profound sense of ownership and pride among the artisans as they witness their craft seamlessly integrated into the very essence of a communal space. Furthermore, the craft kitchen Exhibition will embody the spirit of sustainability, utilising local materials and traditional techniques that are not only environmentally friendly but also resilient. The need for this project to take place at a site like Fort Nongqayi Museum Village is paramount. The museum village is a cultural heritage beacon, attracting visitors eager to learn about and engage with Zulu history and craftsmanship. By situating the Craft Workshops here, the project not only preserves but also revitalises this heritage, making it a living, breathing part of the community. This integration of traditional craft with contemporary architecture exemplifies how the past and present can coalesce to create innovative and meaningful spaces. This project is about more than constructing a building; **it is about crafting a process that honours the artisans of Eshowe and enhances the architectural design process.** It is a testament to the enduring power of community, culture, and craft, showing how these elements can unite to shape physical spaces and the essence of making.

**Keywords:** Craft, culture, making, hands-on



Dedicated to my dad, whose passion for life knew no bounds.

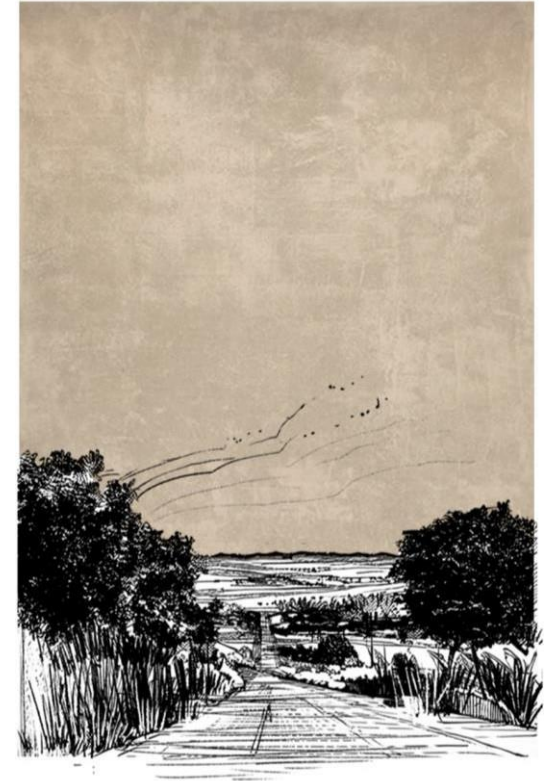
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“‘Craftsmanship’ may suggest a way of life that waned with the advent of industrial society- but this is misleading. Craftsmanship names an enduring, basic human impulse, **the desire to do a job well**”.

Richard Sennett, *The Craftsman* (2008:9)

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# 01 Introduction

## Design, Craft C The Architectural Design Process

### 1.1

#### The Disconnect between

##### ‘Making’ s Architects

Architecture has long been connected to the concept of craft (Ro, 2020:5). Traditionally, architects were "master builders" with a deep knowledge of materials, construction techniques, and the entire design-to-execution process (Jones, 2006:1-2). However, digital technologies and mass production methods have disrupted this model, prompting a re-evaluation of craft's role in contemporary architecture (Oksala C Orel, 2022:13-14). This report contends that craft remains crucial, integrating **traditional and digital tools** in the building process.

Historically, designers and craftsmen were one, collaboratively **"making together,"** but over time, their roles diverged (Can C Gizem, 2018:1597). This led to a linear architectural process, where architects handed over designs to builders for execution, confining craftsmanship to the construction phase (Mahoomdi, 2001:17). This model, however, overlooks the interactive, hands-on material expertise integral to craft (Zheng C Nitsche, 2017:338). Craft mode seeks to reintegrate this dynamic skill set within the architectural design process.

### 1.2

#### The Value of Craft

The value of craft in architecture lies in its process of **co-investigation, exploration, and assembly** (Sanders C Stappers, 2008:5; Nitsche C Zhang, 2018:1620-1621). This model fosters sustained partnerships, which are long-term relationships built on mutual trust and respect, acknowledging the unique skills of craftspeople and designers who collaborate at critical stages (Di Ruvo, 2020:3-4). Doyle aptly describes this synergy, stating, "Craft and design are intimate partners" (Doyle, 2007:9).

In this framework, **the communication phase is pivotal**, creating a collaborative loop where **crafted objects inform design**, transcending mere prototypes to embody the essence of craft and interactive design (Sanders C Stappers, 2008; Ingold, 2013). Designers play a crucial role in this process, moving beyond controlling every detail to supporting a system aligned with the craft's ethos (Barbar, Gorton C Jeffery, 2005:5-7). This process generates a dynamic collaboration, revealing unexpected elements during creation that **push design and craft boundaries** (Galante, 2018:24-26). Through this, South African architecture can cultivate **innovation, building functional, richly crafted spaces deeply rooted in the past and present, showcasing how these elements can coalesce to create meaningful spaces.**

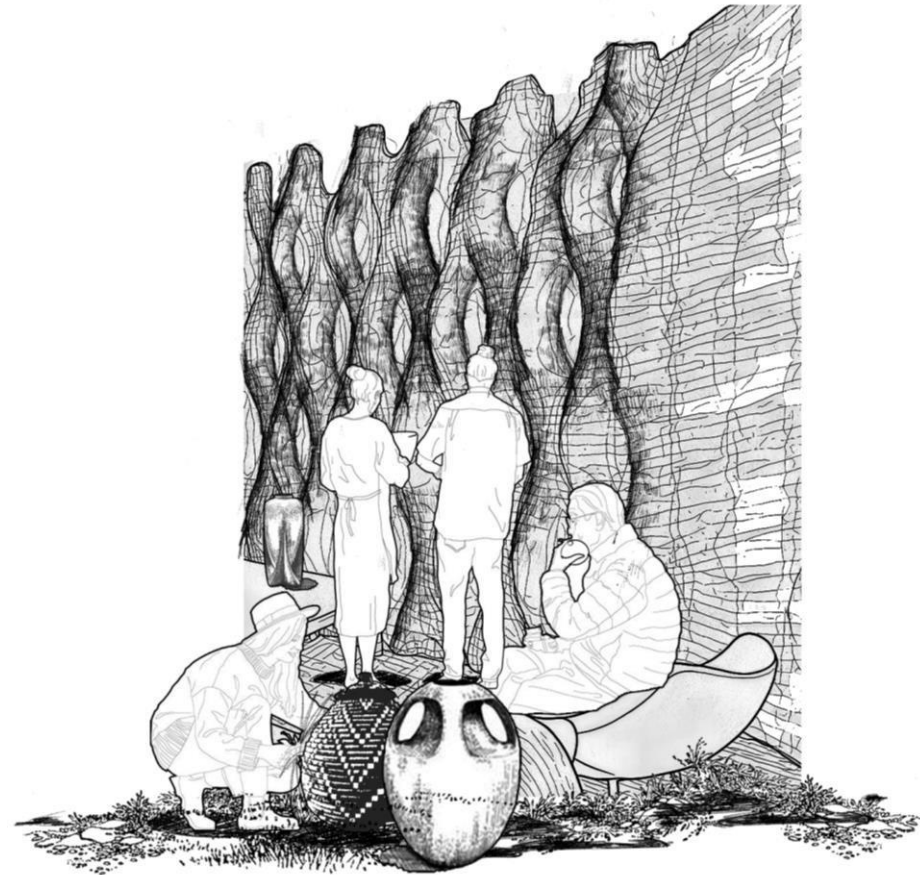


Figure 1: Conceptual Image of 3d Printed Adobe wall inspired by clay Zulu pottery (Author, 2024)

## 02 Background

### Issues C Opportunities

#### 2.1

##### Global

The growing disconnect between architects and craftspeople is a global issue that began with industrialisation. Traditionally, architecture depended on a "symbiotic partnership" (Nedzelskyi, 2017) where craftspeople shaped both form and aesthetics (Alavi C Tanaka, 2023). Industrialisation's emphasis on standardised, mass-produced materials reduced skilled craftspeople to mere executors of plans, limiting their creative input (Ruskin, 1903; Nasri C Mansour, 2019). This shift has weakened the collaborative essence of architecture, leading architects to favour modern, stagnant buildings over culturally rich, craft-informed spaces. Re-emphasizing this partnership could restore architecture's connection to place and heritage.



Figure 2: Moving away from cultural Space C towards stagnant modern movements (Author, 2024).

#### 2.2

##### Urban/Neighborhood

Given Eshowe's rich mentorship culture and historical roots, the neighbourhood issue bridges traditional Zulu craft with modern architectural practices. Industrialisation has distanced craft from design, risking the loss of meaningful community connections and the knowledge transfer essential to Zulu culture (Nedzelskyi, 2017; Ruskin, 1903). Addressing this requires restoring the collaborative "craft mode" approach (Pye, 1968; Metcalf, 2010), which fosters intergenerational learning and deepens connections between spaces and local cultural narratives (Foraker, 2015; Zhan,



Figure 3: Moving away from productive use of artefacts to museum artefacts (Author, 2024).

#### 2.3

##### Architectural

Eshowe offers a unique opportunity to blend traditional crafts with modern technology, restoring the collaborative nature of architecture. Integrating local Zulu crafts like pottery and weaving with advanced methods, such as 3D clay printing or timber technologies, can merge cultural identity with **innovation**.

This approach could reconnect architecture with its collaborative roots, enriching design with cultural and technological depth as well as a skills transfer process in connecting with artifacts and making.

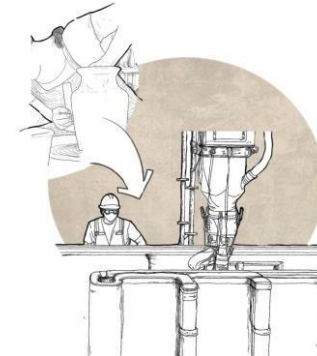


Figure 4: Potential interpretation of craft practices within technological Approaches (Author, 2024).

## 03 Theory Into Design

### The Value of a Craft Mode Approach in Architectural Design Process

#### 3.1 Craft Mode

##### The Enduring Power of Craft: Expanding the Transformative Potential of Craft Mode Architecture in South Africa

The resurgence of craft mode approaches in South African architecture offers a compelling response to the **homogenising effects** of globalised construction. Integrating traditional craftsmanship with collaborative design and technological innovation presents a pathway toward a more sustainable, culturally resonant, and socially equitable built environment.

Craft mode in architecture is an approach that integrates traditional craftsmanship with modern design innovations, creating a dynamic feedback loop between materials, human creativity, and cultural knowledge. Rather than viewing craftsmen as mere executors of plans, this mode emphasizes collaboration, where artisans actively shape the design, infusing each project with cultural depth and technical expressiveness. This approach values the process as much as the outcome, focusing on material mastery, sustainability, and community involvement. Craft mode architecture is about customizing design through hands-on engagement, where architects are "crafted" by existing crafts and traditions, drawing from local methods to inform and evolve architectural practice.

#### 3.2

##### The Role of Technology in Vernacular Architecture

Traditional making processes play a crucial role in building crafts within architecture by grounding design in local materials, techniques, and cultural identity. These methods promote sustainable, place-specific solutions, fostering a collaborative spirit that enriches architectural character and maintains the cultural essence of crafted spaces.

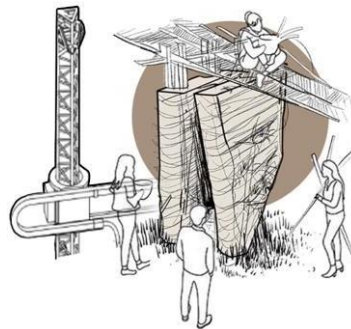


Figure 6: Concept of a collaborative on-site learning approach to architecture with craft (Author, 2024).



Figure 5: Craft Mode Approaches According to the Mprof Research module (Author, 2024).

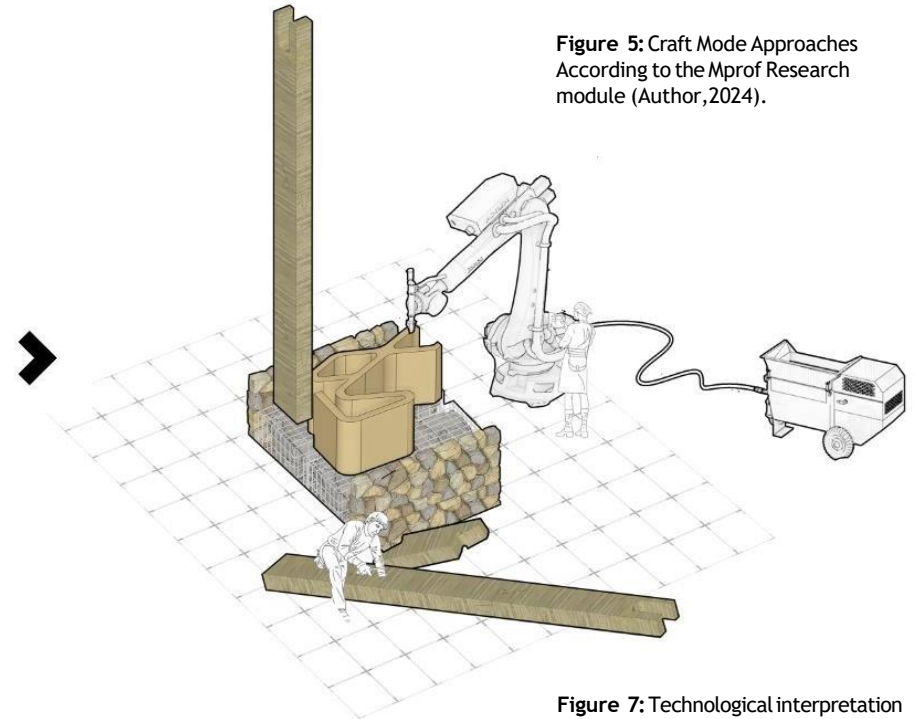


Figure 7: Technological interpretation of craft on site (Author, 2024).

## 04 Project Objectives

### The Value of a Craft Mode Approach in Architectural Design Process



**Figure 8:** Crafts that exist on site (Author,2024).

#### 4.1

##### Learn from existing craft practices on site

Engaging with local crafts on-site ensures that the design authentically reflects Eshowe's cultural heritage. By learning directly from artisans, the project respects and preserves traditional knowledge, grounding the architecture in local history and community identity.



**Figure 9:** Hands on Approach (Author,2024).

#### 4.2

##### Employ a hands-on approach to the architectural design and making process

A hands-on approach fosters a deeper connection between designers and materials, encouraging adaptability and creativity in response to real-time challenges. This tactile process also allows designers to be directly influenced by the unique qualities of local crafts, making the design more authentic and site-specific.



**Figure 10:** craft practice to technology (Author,2024).

#### 4.3

##### Transfer of knowledge systems to technology through on-site learning and collaboration with craftspeople

A live exhibit provides an interactive learning space, where visitors can witness and appreciate the making process. It also serves as a celebration of craft, highlighting the importance of traditional skills in a contemporary setting and strengthening community pride and engagement.



**Figure 11 :** Live Exhibition in Museums (Author,2024).

#### 4.4

##### Create opportunities for live exhibition spaces in interaction with museum culture and artefacts

Bridging traditional craft with technology creates a new architectural language that honours the past while innovating for the future. This transfer enables sustainable and culturally resonant design solutions, showing how heritage can drive technological advancements and contribute to the building's longevity and relevance.

## 05 Context

### How Eshowe came to be

#### 5.1

##### Historical Context

Zululand, the heartland of the Zulu Kingdom, is rich in history marked by encounters with English settlers, Norwegian missionaries, and deep-rooted indigenous craft traditions. During the early 19th century, King Shaka unified various clans into the Zulu Kingdom, creating a centralized state known for military prowess. British interests grew in the region, leading to the Anglo-Zulu War of 1879, in which British forces eventually defeated the Zulu Kingdom, marking a pivotal moment in Zululand's colonial history.

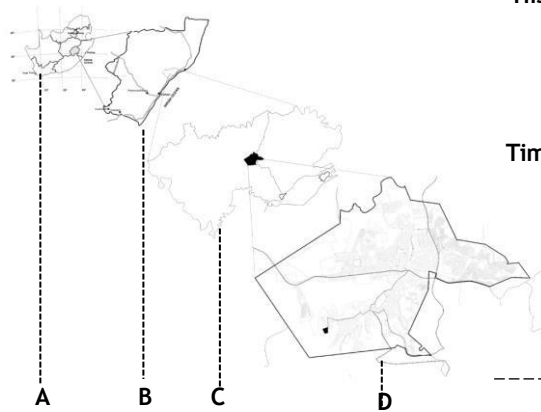


Figure 12: A: South Africa B:Kwa-Zulu Natal, C:King Cetshwayo District, D:Eshowe (Author,2024).

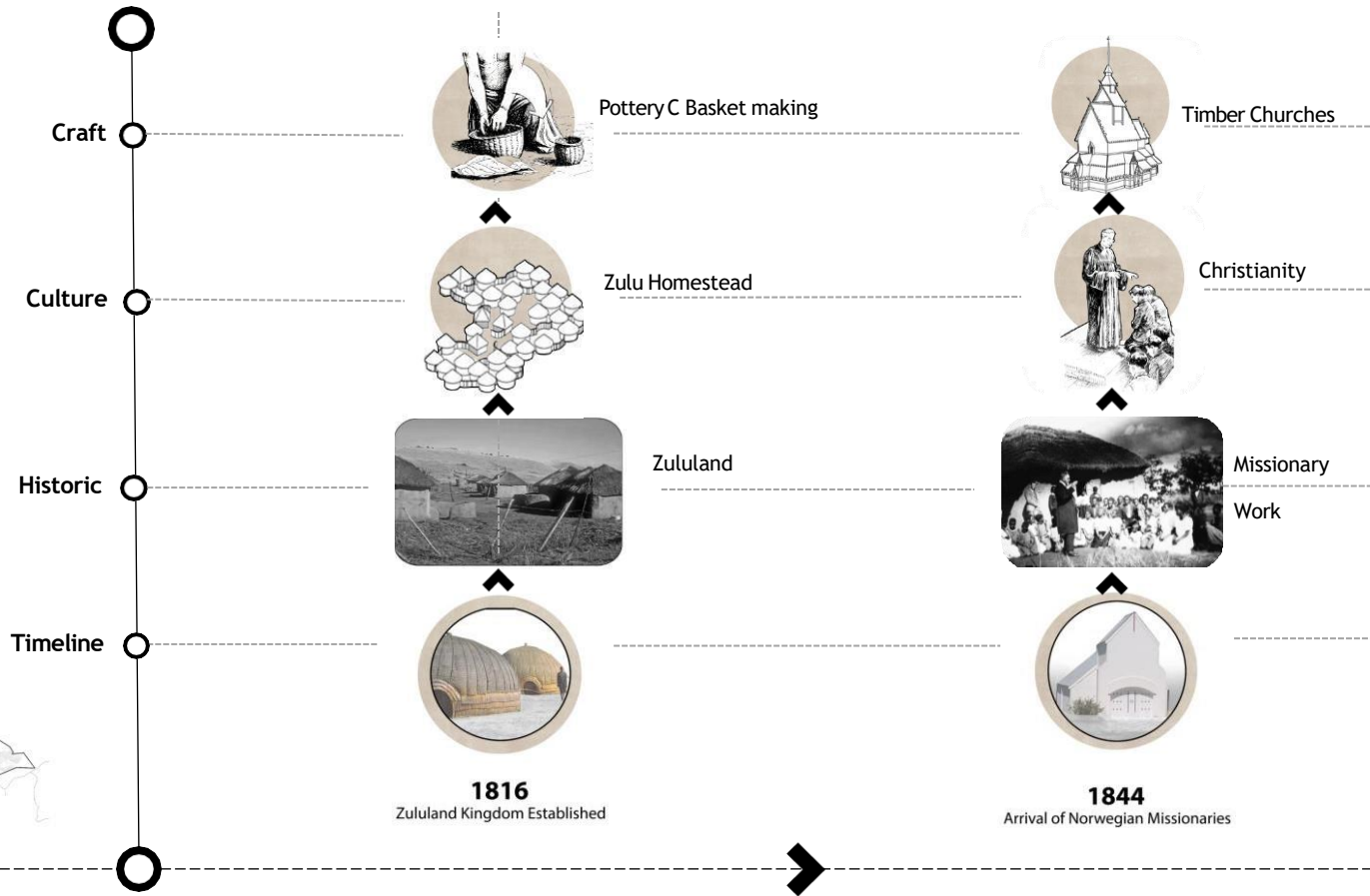
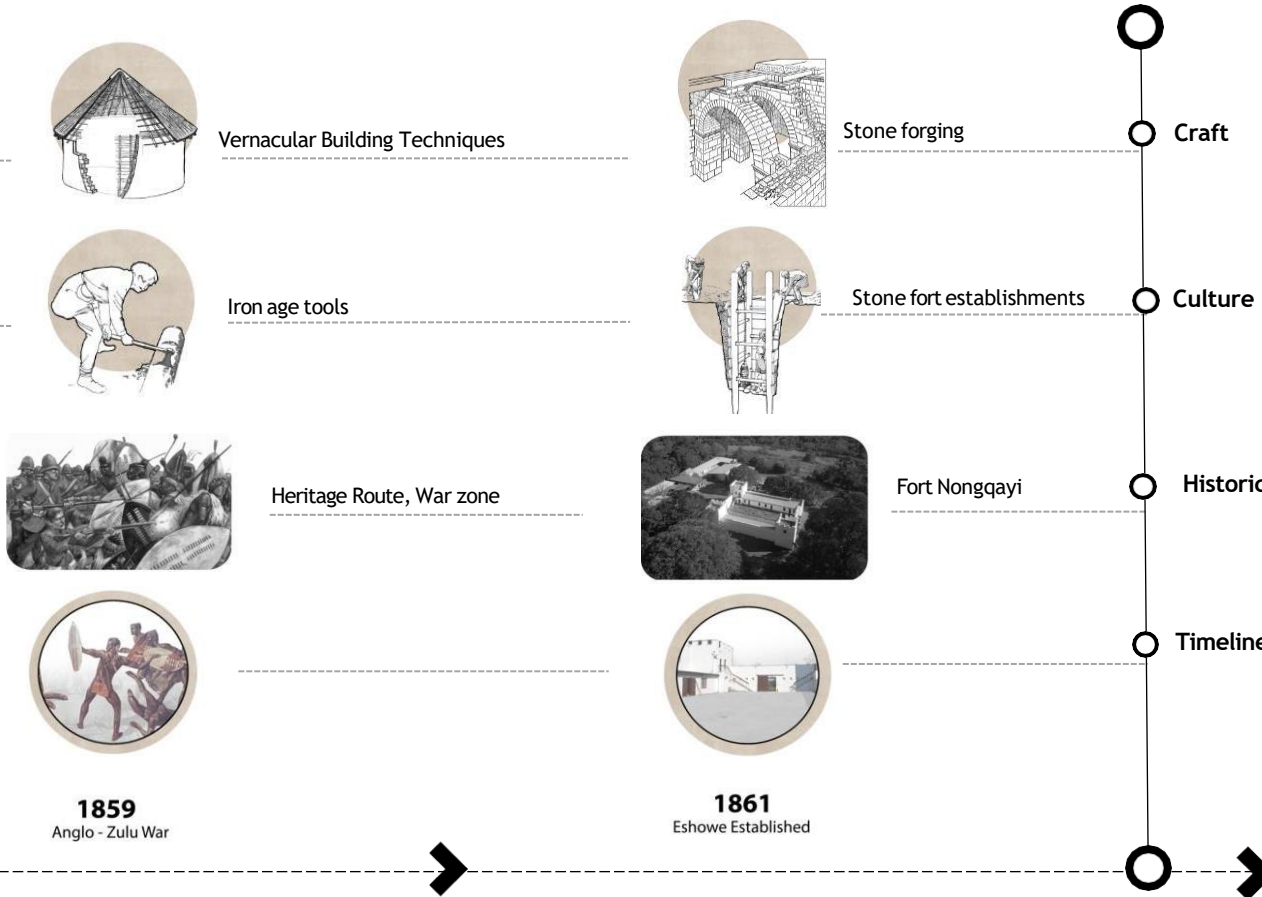


Figure 13: Timeline representing how the market town of Eshowe came to be (Author,2024).

## 05 Context

### How Eshowe came to be



### 5.2

#### Historical Context Continued

Norwegian missionaries arrived in the late 19th century, introducing Western education and Christianity to places like Eshowe while influencing local cultural practices. Despite this, Zulu craftsmanship thrived, particularly in pottery, basket weaving, and traditional iron and stone construction. Zulu pottery, known for its distinct coiling methods, had both practical and ritualistic uses. Wicker basket-making, often from palm leaves, featured intricate weaving techniques passed down through generations, supporting local economies and cultural identity.

The region also has evidence of Iron Age and Stone Age communities, with early construction techniques seen in stone walls and settlements. These layered histories reflect Zululand's resilience, blending indigenous skills with influences from missionaries and settlers, sustaining a vibrant heritage of craft and culture.

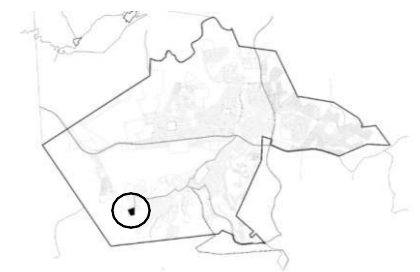


Figure 14: Establishment of the Market town of Eshowe (Author, 2024).

## 05 Context

### Macro Site Analysis

#### 5.3

##### Macro Scale

Eshowe, one of the oldest towns in Zululand, began as a mission station established by Norwegian missionaries in the late 19th century. Drawn to the area's elevated, forested landscape, they set up a base to spread Christianity and education among the Zulu people. In 1887, the British, following their victory in the Anglo-Zulu War, formalized Eshowe as an administrative center to control the Zulu Kingdom.

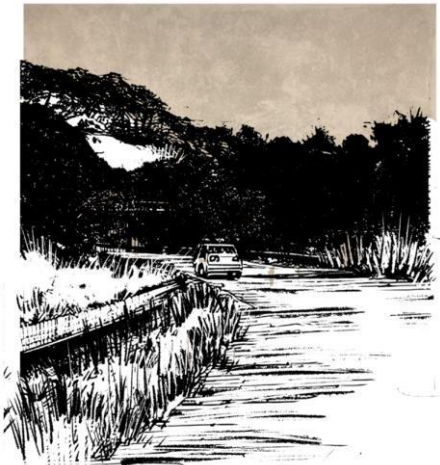


Figure 15: Approach to Eshowe by car (Author, 2024).

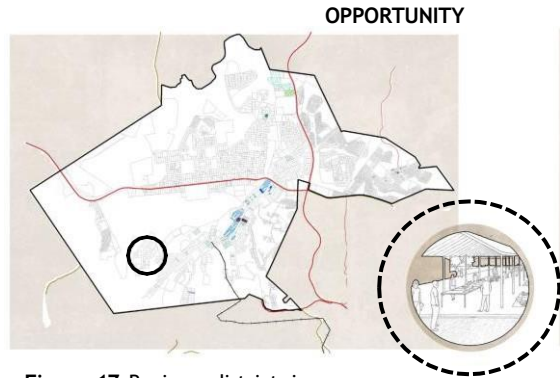


Figure 16: Macro site of the town of Eshowe at 1:100 (Author, 2024).

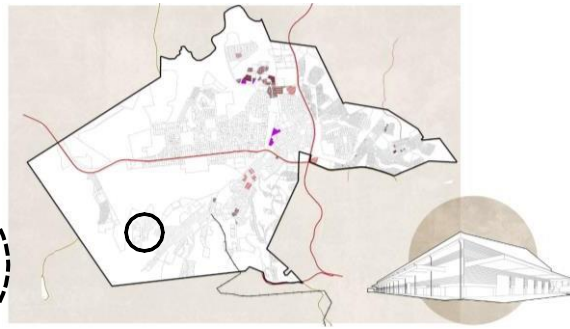
## 05 Context

### Macro Site Analysis

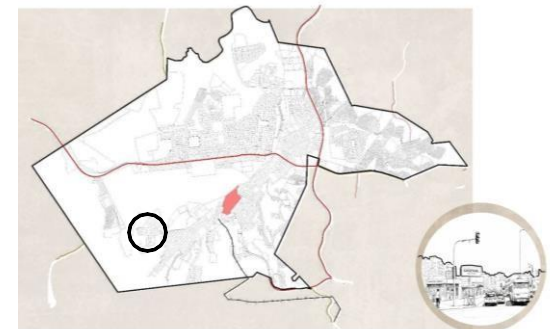
#### 5.4 Macro Scale



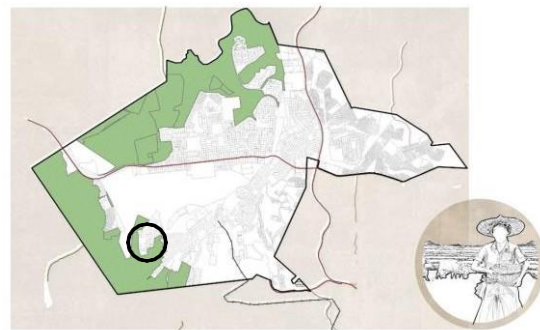
**Figure 17:** Business districts in Eshowe consisting of catering, Market crafts and food stalls (Author,2024).



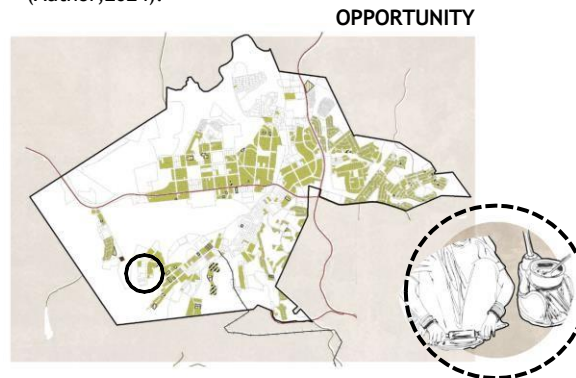
**Figure 18:** Industrial district consisting of mainly timber nurseries (Author,2024).



**Figure 19:** transit hub for busses, taxis C cars (Author,2024).



**Figure 20:** Agriculture consisting of fruits, vegetables (Author,2024).



**Figure 21:** Households in Eshowe consisting of home business around craftspeople and caterers (Author,2024).



**Figure 22:** private public space consisting of mainly closed off greenfield sites (Author,2024).

## 05 Context

### Meso Site Analysis

#### 5.5 Meso Scale

##### The Enduring Power of Craft: Expanding the Transformative Potential of Craft Mode Architecture in South Africa

Eshowes CBD is a lively market town in Zululand, deeply rooted in the skills and crafts of its people. Known for its vibrant crafts markets, the town thrives on handmade goods that showcase Zulu artistry, including pottery, beadwork, woven baskets, and textiles. Much of this economy is driven by women, who form the backbone of Eshowe’s craft industry. Their creations not only sustain local culture but also provide essential income, empowering women as economic leaders in their communities.

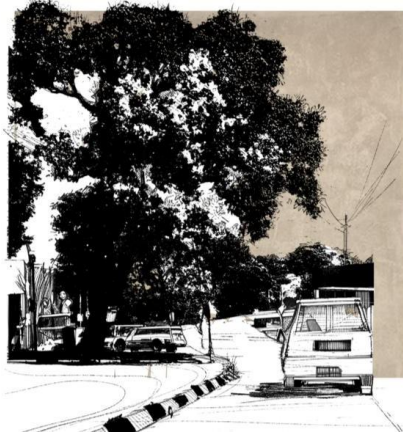


Figure 23: Driving towards Inner Eshowe towards Fort Nongqayi Museum Village (Author,2024).

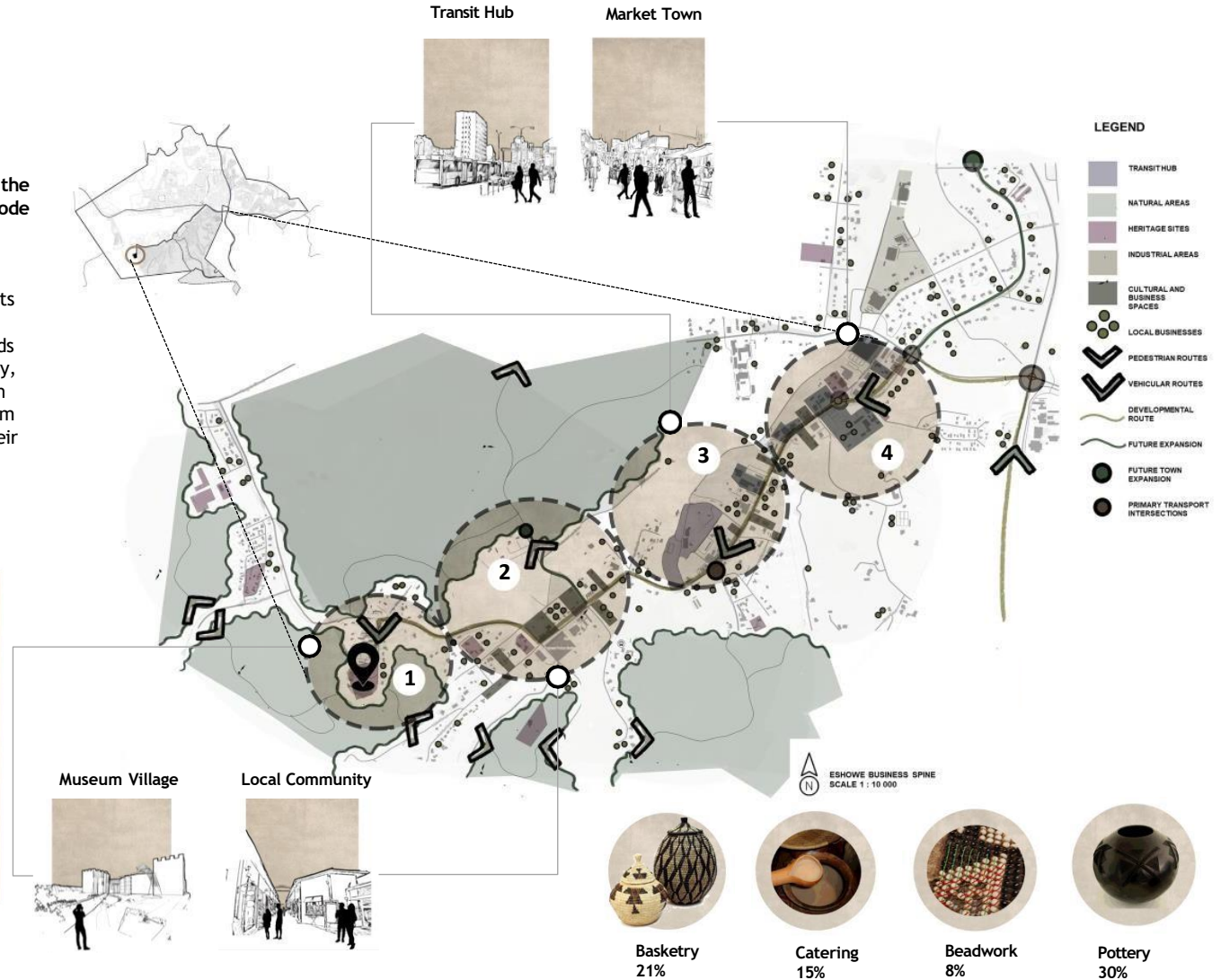


Figure 24: Eshowe Meso scale analysis of the main (Author,2024).

## 05 Context

### Neighbourhood Analysis

#### 5.6 Meso Scale

Eshowe is enveloped by dense, lush vegetation, with sprawling forests and natural landscapes that create a serene and vibrant atmosphere. The area is interspersed with winding trails, leading through rich greenery, offering peaceful walks where nature is in full bloom. These trails connect visitors with the land, revealing hidden corners of the neighborhood, where the air is fresh and the sounds of birds and wildlife echo through the trees. The intertwining of vegetation and trails gives Eshowe a sense of harmony, making it a place where nature and community coexist in a rich, untamed embrace.

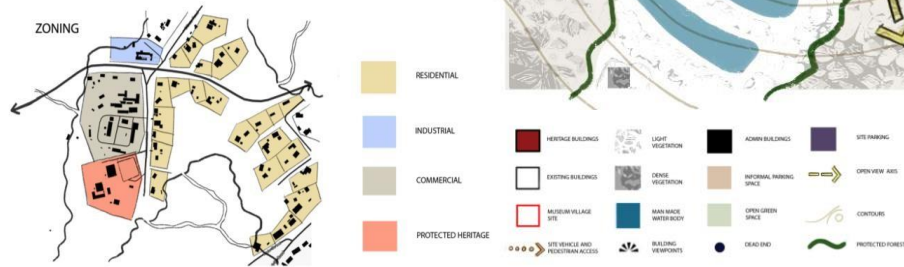


Figure 25: Zoning of the Site (Author, 2024).

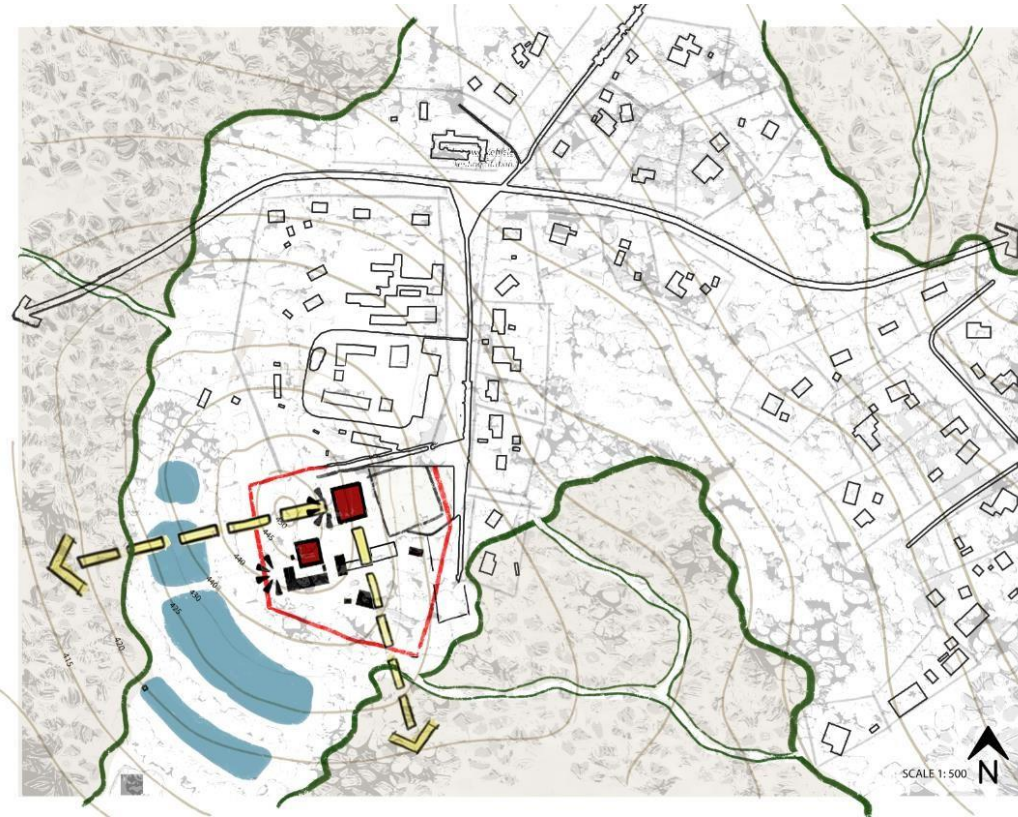
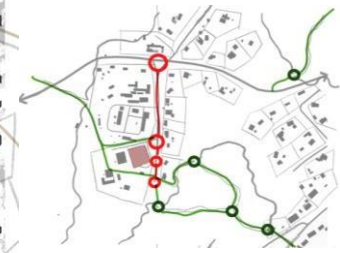


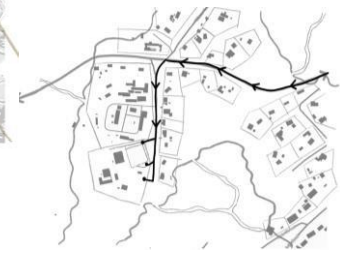
Figure 26: Key representing the site (Author, 2024).



Chosen site and Water Sources



Walking Paths vs Car Paths



Journey to Site

Figure 27: Eshowe Meso scale Plans (Author, 2024).

## 05 Context

### Micro Site Analysis

#### 5.7 Micro Scale

The Fort Nongqayi Museum Village in Eshowe is a historical complex featuring three significant buildings that preserve Zululand's cultural heritage. The original Fort Nongqayi, built in 1883, housed colonial Zulu police and now showcases artefacts from the Anglo-Zulu War era. The Vukani Museum, known for its Zulu arts and crafts collection, holds an impressive display of traditional pottery, beadwork, and woven baskets, highlighting the region's rich artistic legacy. The Missionary Chapel Replica represents the early Norwegian mission influence, reflecting the blend of colonial and Zulu histories. Together, these buildings offer a unique insight into Zululand's vibrant past.

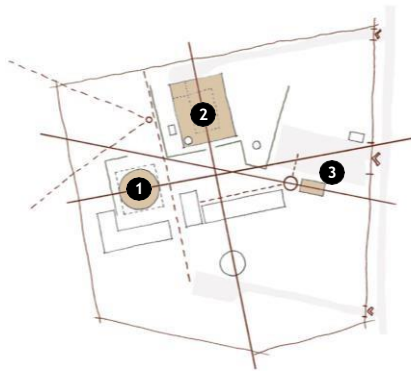


Figure 28: Diagrammatic Depiction of the site (Author, 2024).

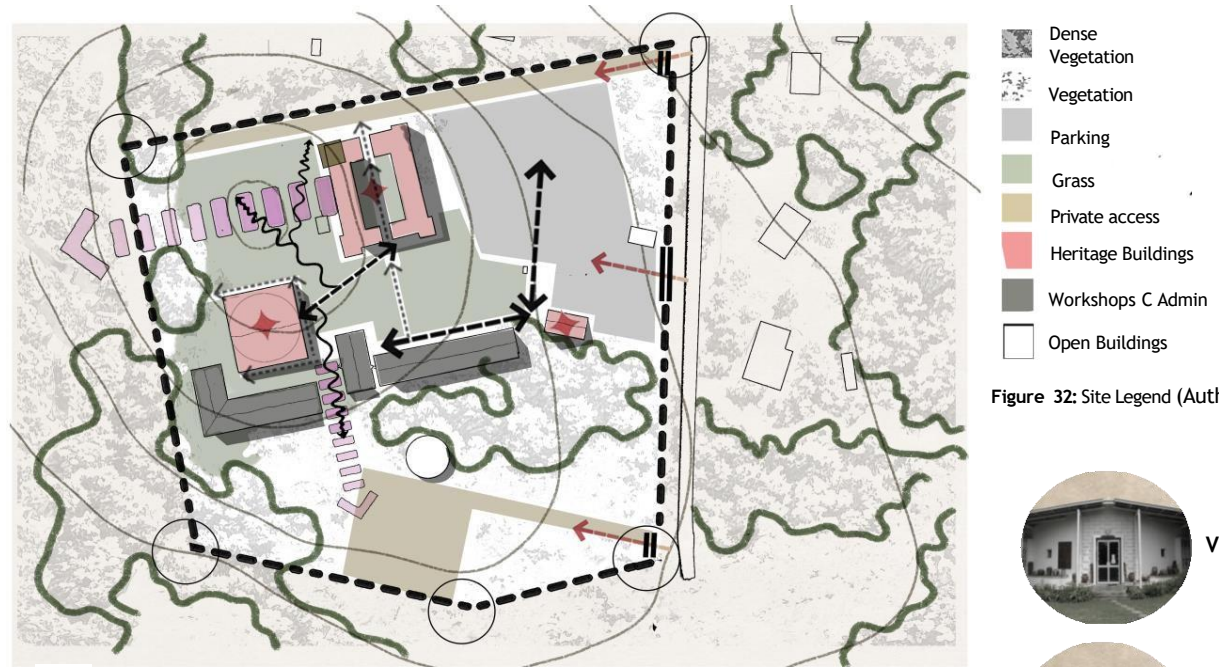


Figure 32: Site Legend (Author, 2024).

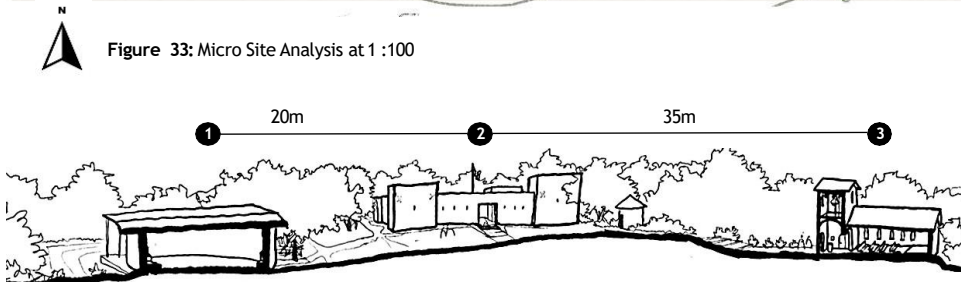


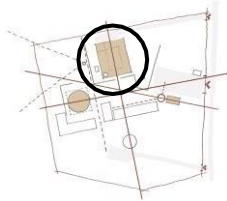
Figure 29: Prominent buildings on site (Author, 2024).



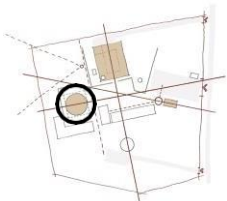
## 05 Context

### Micro Site Analysis

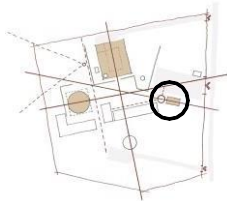
#### 5.8 Meso Scale



Fort Nongqayi  
Museum Village



Vukani Museum



Norwegian Chapel

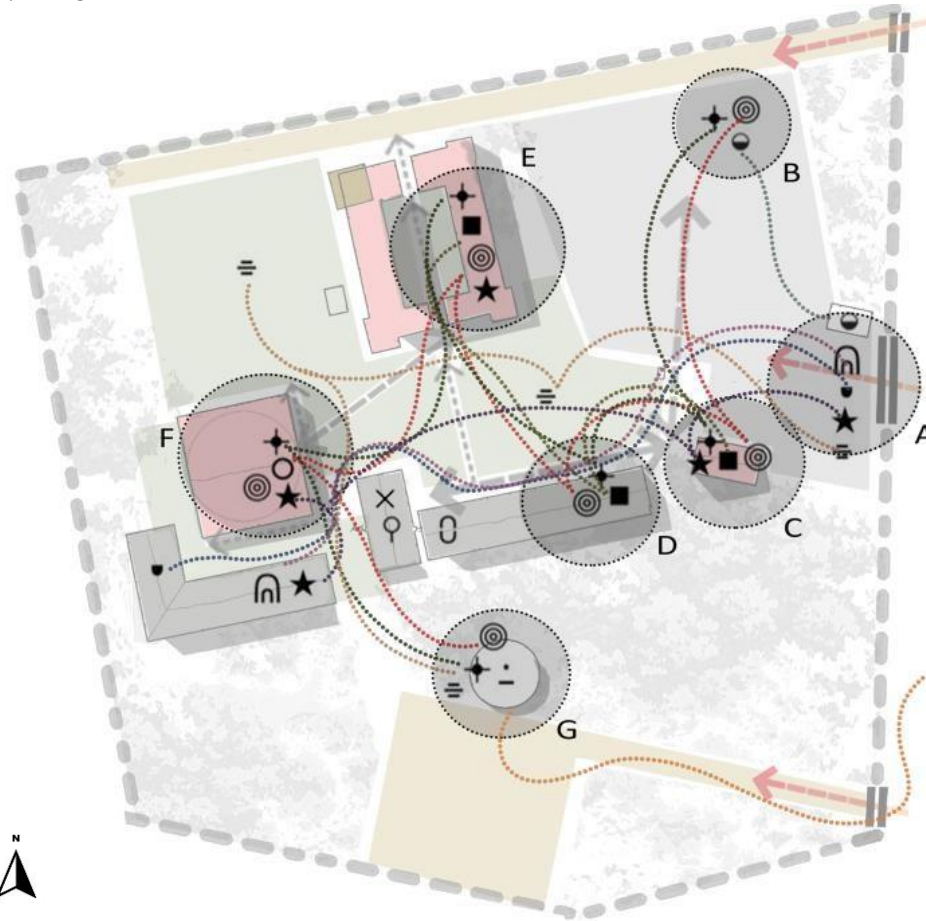


Figure 30: Journey Through Heritage Buildings (Author, 2024).

## 05 Context

### Micro Site Analysis

#### 5.9 Micro Scale



Curators



Garden Staff



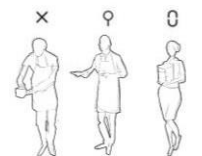
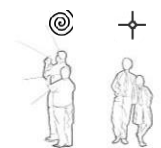
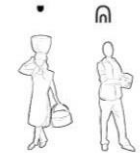
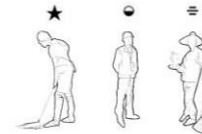
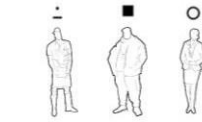
Craftspeople



Locals & Tourists



Serving staff and guests



• Vukani Curator

■ Fort Nongqayi Curator

○ Norwegian Capel curator

★ Cleaner

● Site Management

≡ Gardener

🧺 Basket Maker

🏺 Pottery Maker

⊕ Locals

🎯 Tourists

👤 Serving staff

✕ cooks

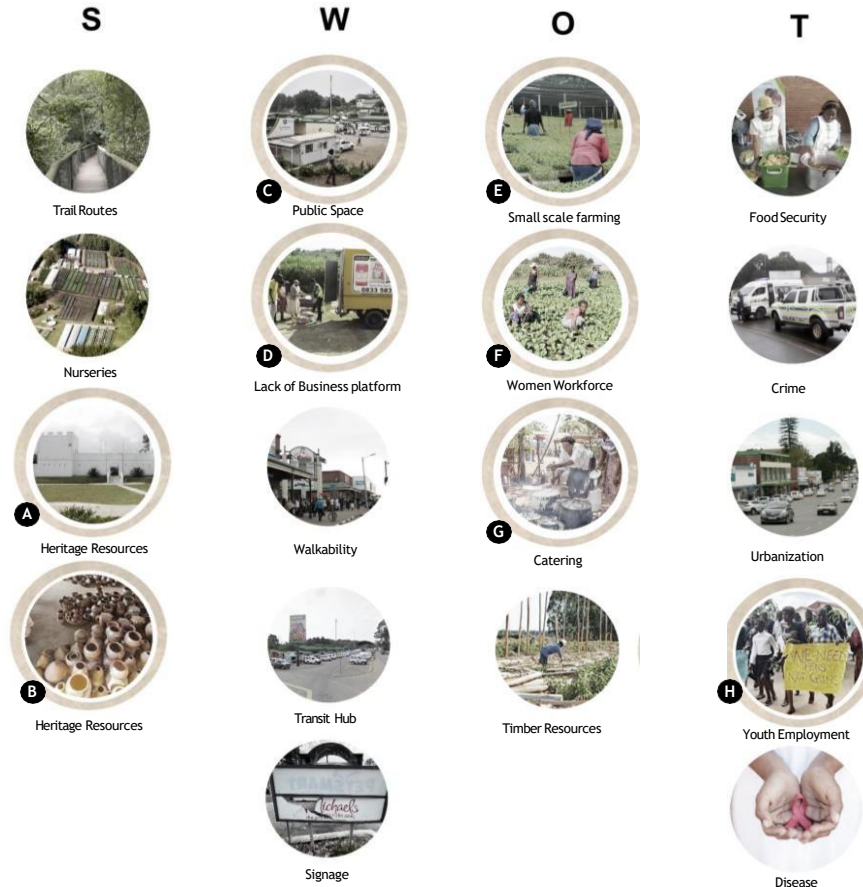
♀ waiters

Figure 31: User Analysis of Existing users while on a site visit. It is important to note that as of late, the serving staff numbers have been deteriorating (Author, 2024).

## 05 Context

### SWOT Analysis & Deductions

#### 5.10 Towards craft and Kitchen Exhibition



### Reasoning

#### Public Space

Available space for public gathering

Lack of public space that exist in Eshowe therefore the site presents a good opportunity to engage with the locals

#### Educational

Learning space through history & Making

Education opportunity exists in the curation of museum exhibits on site for youth and local engagement

#### Workforce Opportunity

Craft available as well as value to local economy

On site learning can occur with the renewing of the craft workshops for a business platform

#### Working Heritage

Heritage resources available in Building stock

The exhibits can be used as a community and cultural hub where stories can be learned and shared through interacting with the artefacts

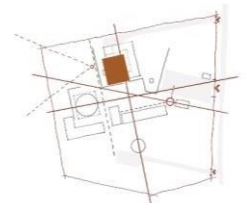
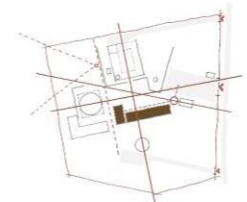
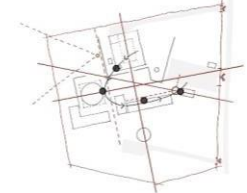
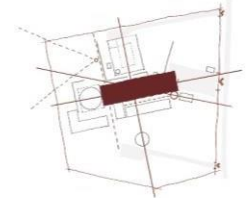
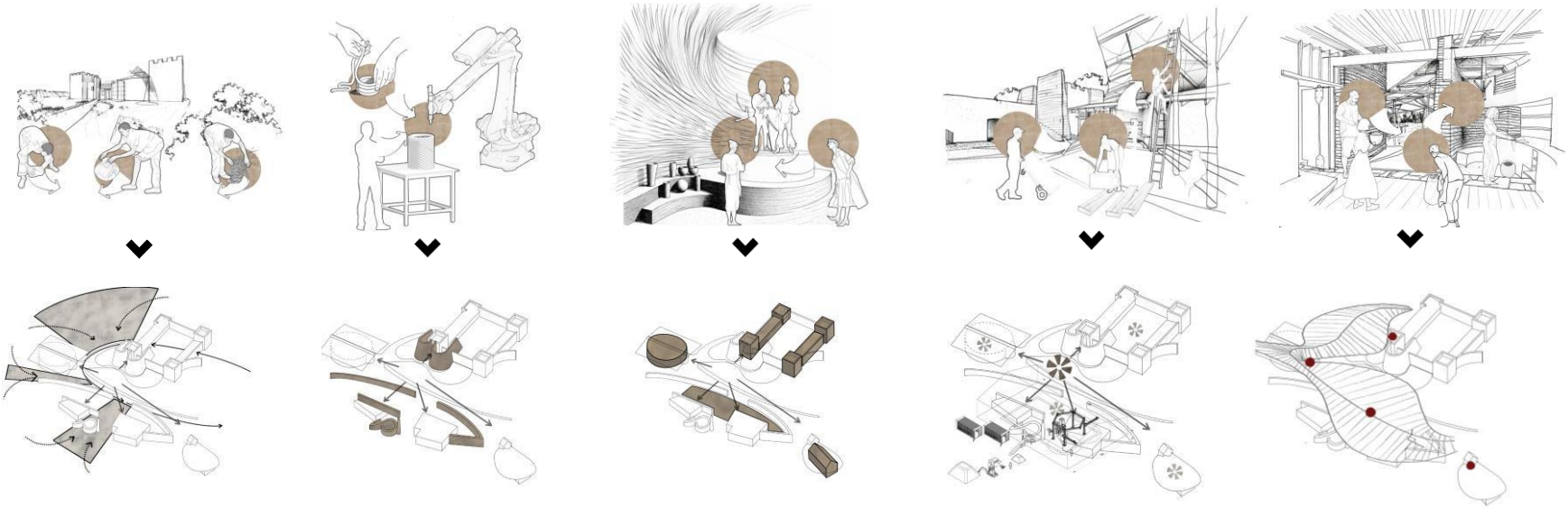


Figure 32: SWOT analysis of site and context and reasoning for why fort Nongqayi museum village presents a good opportunity as a site to engage with (Author,2024).

## 06 Design s Spatial Intentions

Designed for a hands-on approach



**Figure 33 :** Design Intentions towards Spatial Strategies (Author,2024).

### 6.1 Site Resources

Using materials sourced directly from the site allows for a deep connection between the architecture and its surroundings. It ensures sustainability, reduces transportation impact, and fosters a design that reflects the local landscape, traditions, and the inherent qualities of the land.

### 6.2 artefact to tech

Transferring artifact knowledge to technology bridges tradition and innovation, allowing time-honored craftsmanship to inform modern design. This fusion enables the preservation of cultural techniques while enhancing them with technological precision, creating structures that honor heritage while embracing new possibilities for functionality and expression.

### 6.3 Guides curation

Creating pathways that guide visitors through the site allows them to experience the exhibition spaces organically, with each step revealing a new chapter of the story. The design of these paths is intentional, encouraging exploration while offering moments of reflection as the journey unfolds, seamlessly integrating the landscape and exhibits.

### 6.4 Build s Maintain

An on-site building process fosters a deep connection between the construction and the land. It allows the materials, tools, and techniques to evolve in response to the environment, ensuring the structure feels inherently rooted in its surroundings. This approach emphasizes craftsmanship, collaboration, and a hands-on involvement in shaping the space.

### 6.5 Cultural Exchange

Exhibitions and architecture that links and invites people to understand culture through eating and participation transform the act of sharing a meal into a living experience of heritage. As visitors engage with traditional foods, they become active participants in the story, connecting through shared rituals and flavors, embodying the culture in a personal and immersive way.

## 07 Precedents

### 1. Design C Heritage

#### 7.1 Castello Vecchio

Carlo Scarpa's restoration of Scaliger Castle, starting with the 1958 "From Altichiero to Pisanello" exhibition, involved removing later additions to reveal the building's original features. The design created a **unified museum path, integrating modern concrete with ancient materials and reinterpreting traditional techniques, such as coloured stucco.** This approach culminated in the display of Cangrande I's equestrian statue.



Figure 34: Castello Vecchio of Cangrande I's equestrian statue entry way (Villas Veritas, 2023)

Location:

Verona, Northern Italy  
45° 26' 14.39" N  
10° 59' 9.59" E

Opened:

1942

Designer:

Carlo Scarpa

Value to Research's Design:

Integration of crafted elements between new and existing within a museum exhibition

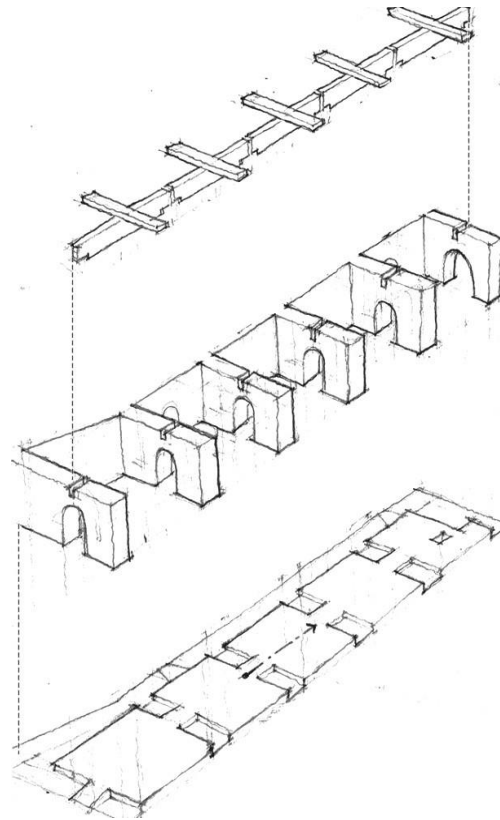
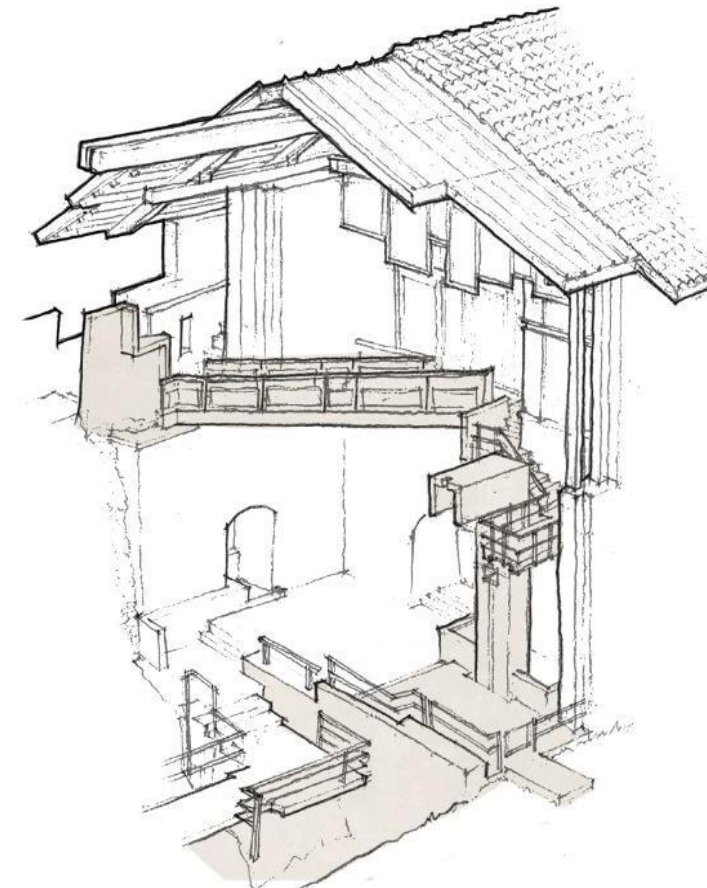


Figure 35: Relationship between structure, walls (left) and floor as well as the integration of new elements to exemplify artworks(right). ( Author,2024)



## 07 Precedents

### 2. Public space vs material use

#### 7.2 The Thread

The design uses a parametric transformation of the **traditional pitched roof**, **inverting it to form a series of courtyards** within the building's plan while creating shaded studio spaces along the courtyard's edges. This roof inversion also serves as an efficient method for collecting and storing rainwater in cisterns. Covering a total area of 1000m<sup>2</sup>, the project meets significant domestic and agricultural water needs for the community.



Figure 36 : Entrance way to outdoor courtyard (Archdaily,2024)

"It is one thing to build a building," says Mori, "but the most important thing is how you run it, how you program it, and how it becomes a truly sustainable program useful to the community."  
**Toshiko Mori, Architect**

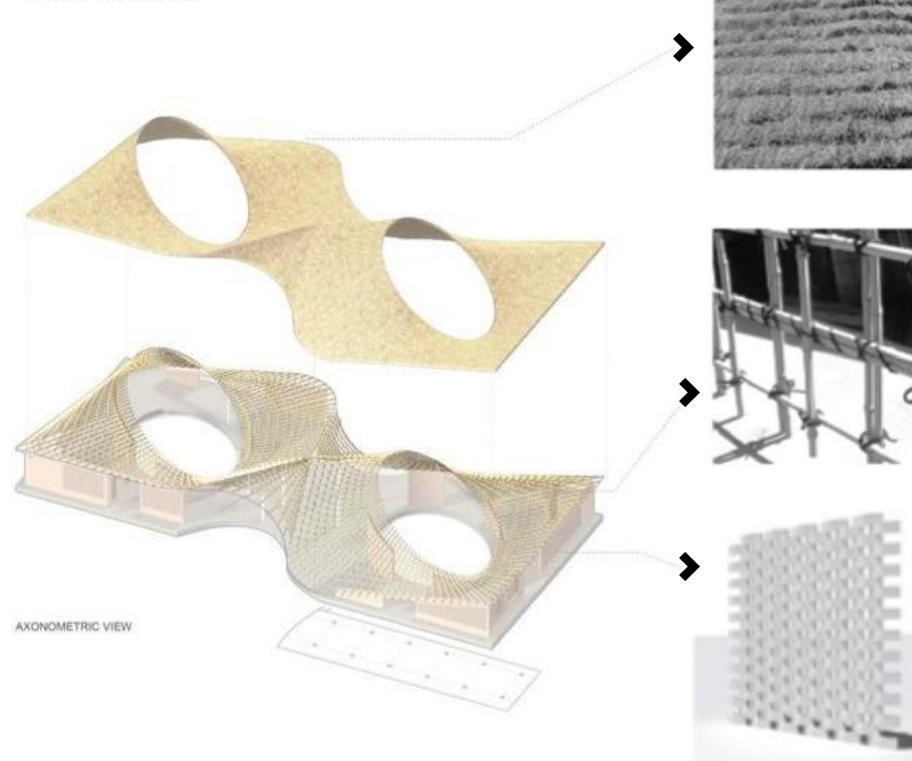
**Location:**  
Rural village in Tambacounda  
13°46'8"N  
13°40'2"W

**Opened:**  
2015

**Designer:**  
Toshiko Mori

**Value to Research's Design:**  
Integration of building elements within public space as well as community collaboration

MATERIAL AND STRUCTURE



AXONOMETRIC VIEW

Figure 37 : Relationship between structure, walls and roof with material choices (Archdaily,2024)

Figure 3G: Relationship between structure, walls (left) and floor as well as the integration of new elements to exemplify artworks(right).

Figure 3G: Relationship between structure, walls (left) and floor as well as the integration of new elements to exemplify artworks(right).

Figure 3G: Relationship between structure, walls (left) and floor as well as the integration of new elements to exemplify artworks(right).

## 07 Precedents

### 3. Making process

#### 7.3 TECLA house

TECLA is an innovative circular housing model that combines research on traditional construction methods, bioclimatic principles, and the use of local, natural materials. As a nearly zero-emission project, its design minimizes waste and scraps by utilizing locally sourced materials. The use of raw earth further contributes to TECLA's status as a pioneering example of low-carbon housing.



Figure 38 : Covering and 3d printing on site process with the WASP printer (WASP,2024).

**Location:**

Massa lombarda, Italy  
44.4479° N  
11.8230° E

**Opened:**

2021

**Designer:**

Mario  
Cucinella

**Value to Research s Design:**

Implementation of an on-site learning process of a sustainable technology



Figure 3G : on site learning experimenting and testing process (WASP,2024).

## 07 Precedents

### 4. Complex Technology configuration

#### 7.4 TOVA Prototype

IAAC unveils Spain's first 3D-printed earth building, a groundbreaking project born from ongoing research into innovative solutions for social and environmental challenges. Constructed at the Vallldaura Labs this prototype bridges the gap between traditional earthen architecture and cutting-edge 3D printing technology. It represents a significant step toward transforming future architecture while offering practical solutions.



Figure 40 : TOVA entryway configured parametrically and 3d printed with adobe on site(WASP,2024)

<b>Location:</b> Forest Campus in Collserola Natural Park, Barcelona 41°26'24"N 2°55'7"E	<b>Opened:</b> 2022	<b>Designer:</b> <a href="#">Institute for Advanced Architecture of Catalonia (IAAC)</a>	<b>Value to Research's Design:</b> Implementation and configuration of a new technology that is sustainably and collectively configured
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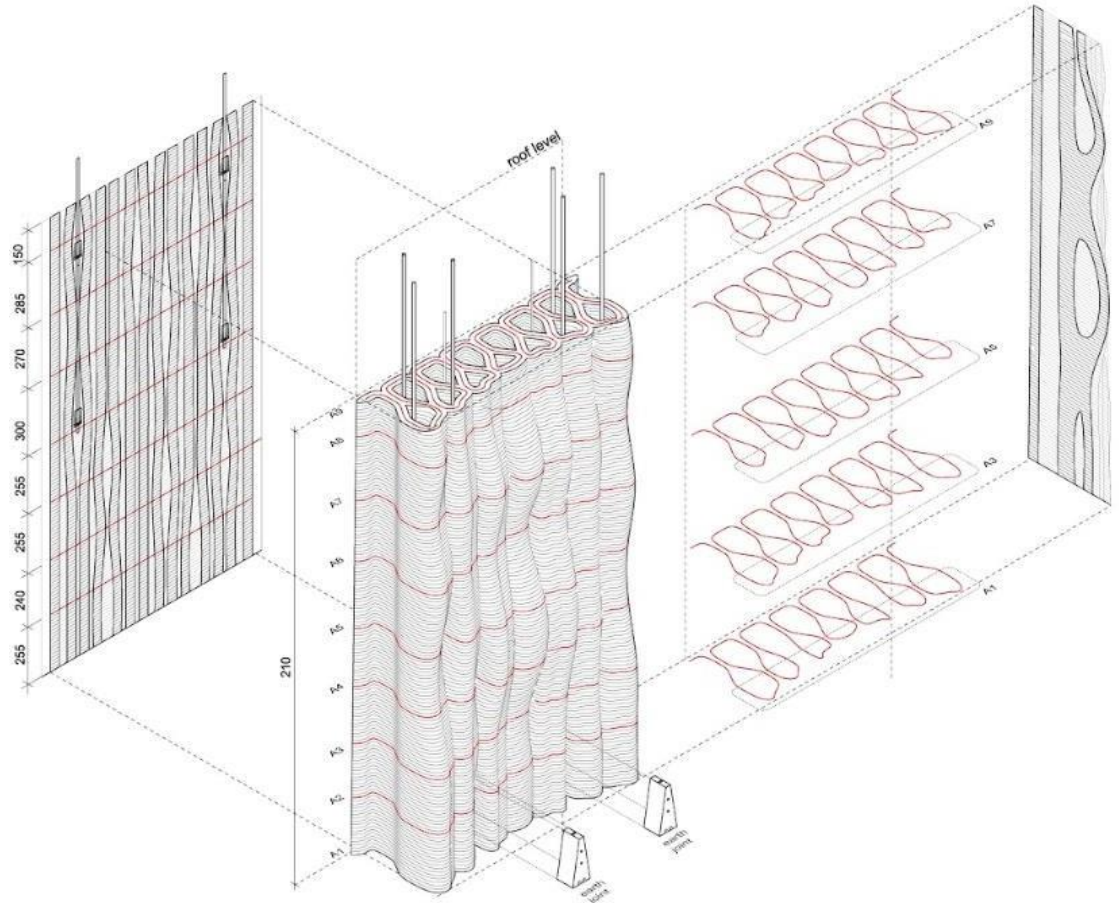


Figure 41 : wall configuration that is printed in segments rapidly on site across a day-by-day printing timeline (WASP,2024)

## 08 Heritage to Technological Approach

### Extraction on craft value from the Site

#### 8.1

#### Value Matrix

The methodology begins by creating a value matrix that extracts key cultural, material, and community-based values from Eshowe and the Fort Nongqayi museum village complex, categorized into three approaches:

**Value-Based Approach:** Focuses on heritage and sustainability.

**Community-Based Approach:** Strengthens the local social fabric.

**Material Based Approach:** Uses local, natural materials.

A trajectory for technology and building process is followed:

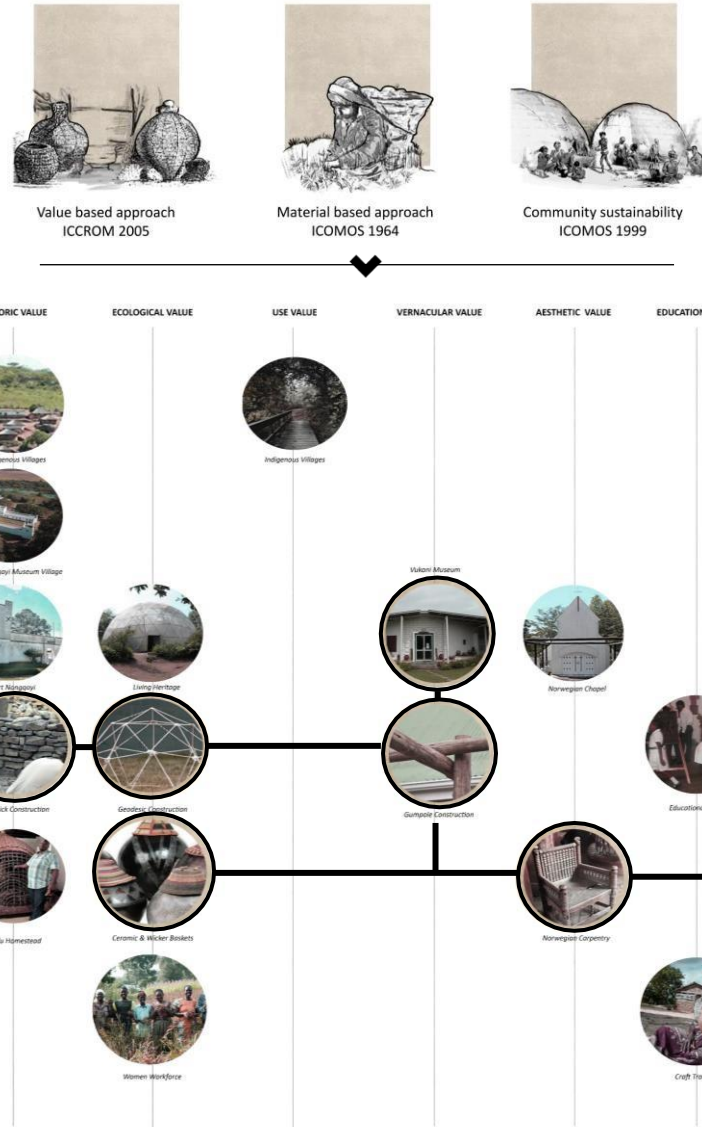
**Artifact:** Cultural history.

**Material:** Locally sourced resources.

**Technique:** Traditional craftsmanship.

**Technology:** Modern innovations like 3D printing and energy-efficient systems.

This led to a **technological approach** that blends traditional craft with modern technology, ensuring sustainability while honoring cultural heritage.



**Figure 42:** Heritage value matrix that extracts values of the context and the site to configure a technological approach that is based on productive heritage values (Author, 2024).

**Figure 43:** from artefact to technology, important indicators developed from value matrix (Author, 2024).

## 08 Technologies Implemented

### Design, Craft & The Architectural Design Process

#### 8.2 From Heritage Value to Innovative Technology

The artifact, materials, and techniques were carefully analyzed and integrated to develop a technology suited to the site's specific needs.

This technology choices is designed to be **sustainable and passive**, **utilizing locally sourced materials and focusing on a low-waste approach** to minimize environmental impact. By grounding the technology in the local context, the goal is to improve sustainability through efficient, resource-conscious solutions. At the same time, this approach encourages innovation by **exploring new ways to blend traditional practices with modern advancements**, creating a model that is both eco-friendly and forward-thinking.



Figure 44: deriving technology from the site using artefact material and techniques (Author,2024).

Sustainable C Context driven stride towards innovation and technology choice

Reasons for choice besides that of contextual/Conceptual reasoning developed in the matrix

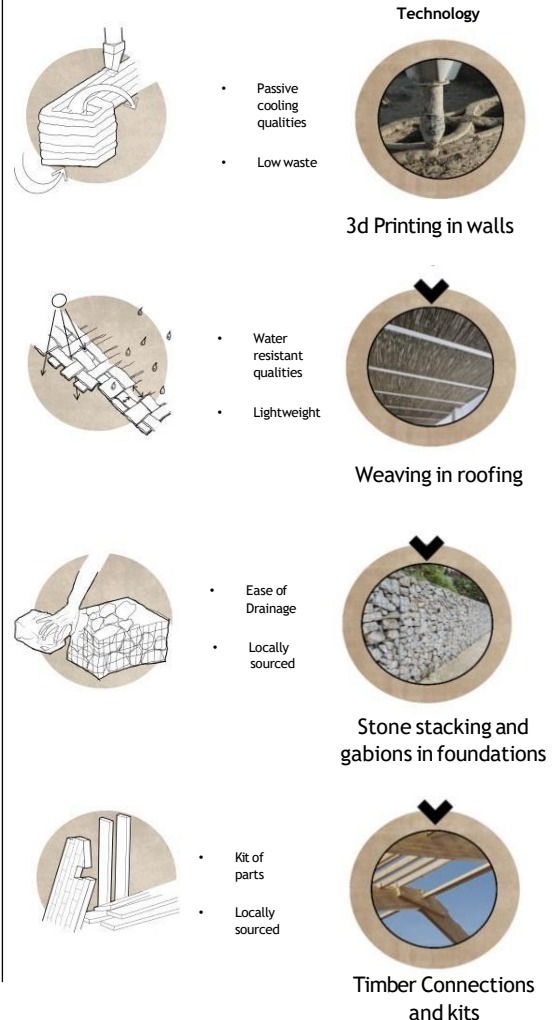


Figure 45: Chosen technologies for design process (Author,2024).

## 09 Detailed Technological Approach

### Phasing for technological system choices

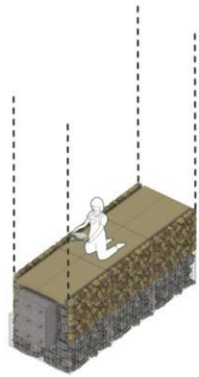


Figure 46: Stone C Gabion Construction foundation (Author,2024).

1

#### G.2 Phase 1

##### Gabions s Stone packing

Gabions are filled with stones sourced on-site, minimizing transportation and environmental disturbance. They provide excellent drainage and thermal stability, absorbing heat during the day and releasing it at night, contributing to passive temperature regulation. The structure's permeability helps reduce erosion and naturally integrates with the landscape.



Figure 47: From coiling of pots to 3d printing of adobe walls (Author,2024).

2

#### G.3 Phase 2

##### 3D Printing (in Adobe)

Using clay in 3D printing is highly sustainable as it's abundant, recyclable, and locally sourced, reducing transportation emissions. It also allows precise material use, minimizing waste, and its thermal mass properties provide natural insulation, which reduces heating and cooling needs.

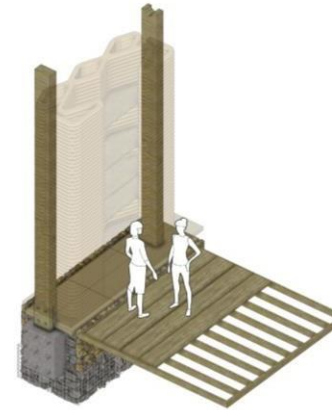


Figure 48: Timber construction for ease of assembly and structure (Author,2024).

3

#### G.4 Phase 3

##### Timber (GLT and LVL)

renewable and has a low embodied carbon footprint. GLT and LVL offer structural strength while remaining lightweight. Timber also has excellent insulating properties, reducing the need for additional heating. It's locally sourced and integrates well into traditional forms, which are often passively climate-responsive.



Figure 49: weaving baskets to weaved roof (Author,2024).

4

#### G.5 Phase 4

##### Wicker Roofing

A wicker roof made from natural materials like palm reeds is sustainable due to its low embodied carbon and renewability, minimizing environmental impact. Its woven structure, designed to expand and tighten with moisture, enhances water resistance by creating a natural barrier against leaks.

## 10 Iteration Process

### Iterations by Drawing

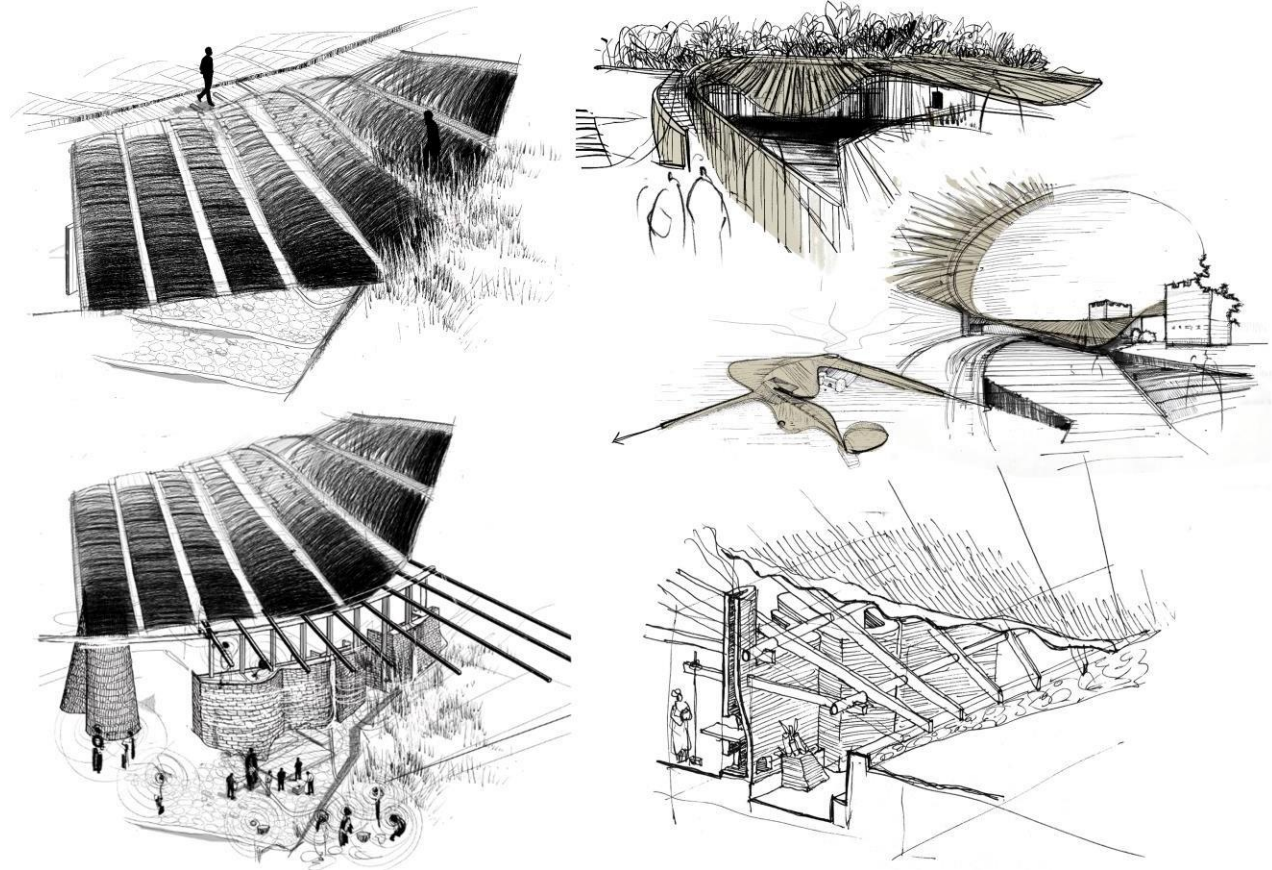
#### 10.1

##### Roof, Wall, Floor

The drawing exploration process involved an iterative approach that tested Western ideals of form-making alongside shapes and configurations uniquely suited to Eshowe's context. This process was not just about experimenting with abstract forms but rather about finding shapes that could respond sustainably and harmoniously to the site.

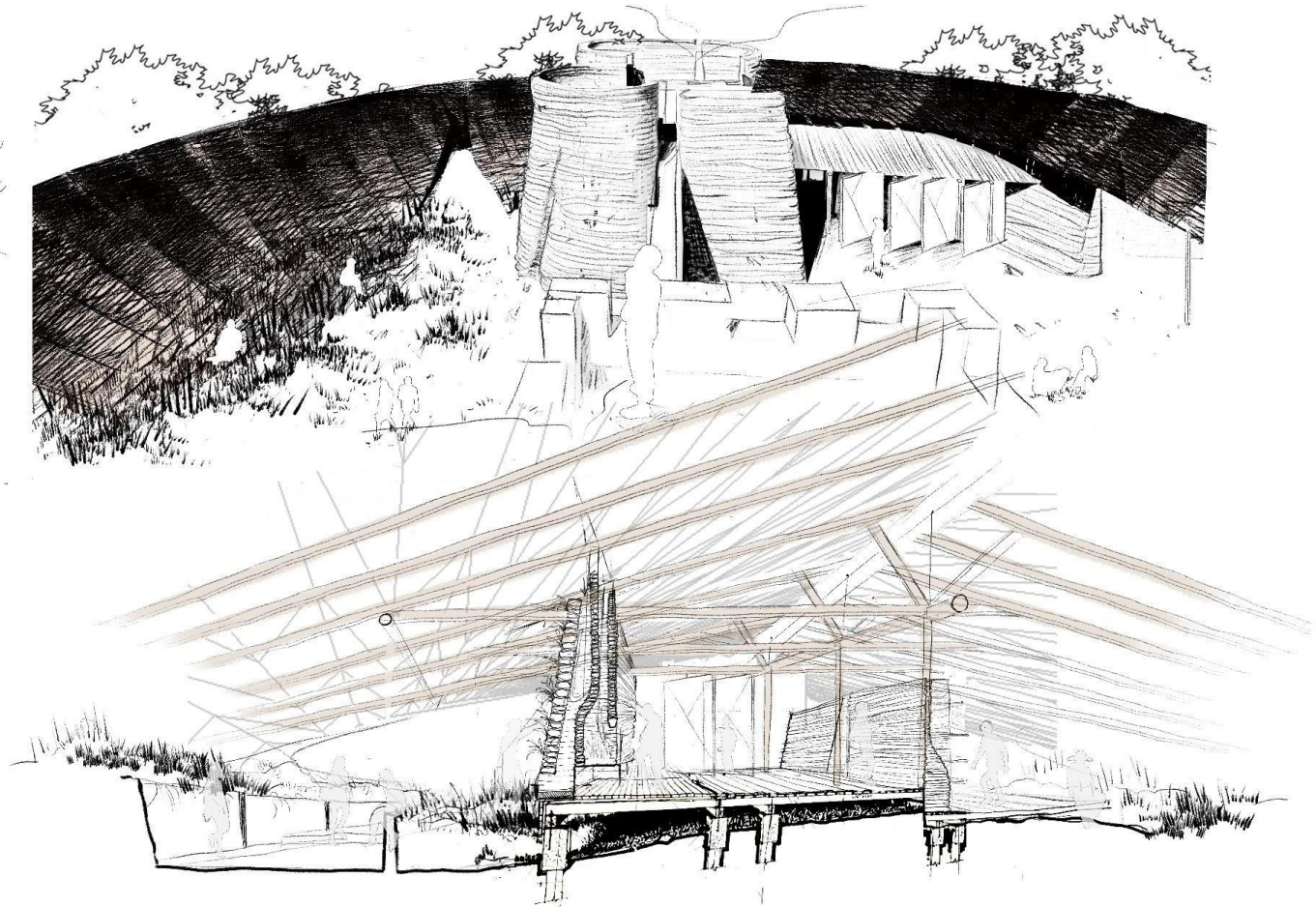
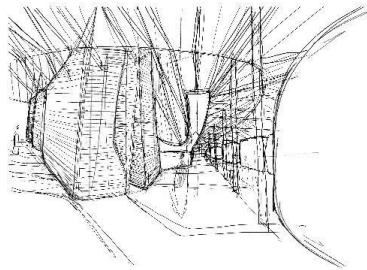
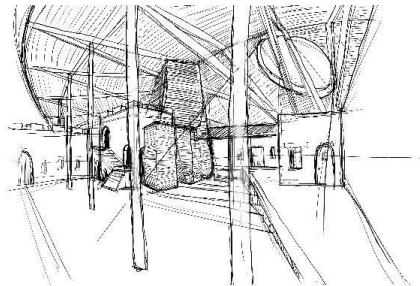
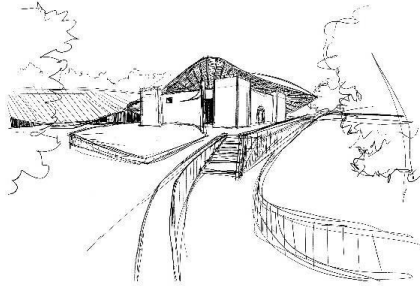
Each iteration examined the balance between Western architectural influences and Eshowe's vernacular, aiming to identify configurations that would blend innovation with local relevance. This required exploring not only structural shapes but also the interaction of these forms with the environment, focusing on factors like natural light, ventilation, and material efficiency.

The iterations involved adjusting and refining each form to align with local construction techniques, reinterpreting vernacular building methods in ways that would make the structures efficient, low-impact, and reflective of Eshowe's cultural identity. By continuously refining these forms, the process generated a design language that respected local craftsmanship while introducing new, sustainable ways to achieve functional and aesthetic goals.



**Figure 50:** Form making of roof shapes and wall configurations based on vernacular structural connections inspired by Vukani museum as well as the roof and wall inspired by basket weaving and pottery making accordingly (Author,2024).

## 10 Iteration Process Iterations by Drawing



**Figure 51:** Spatial and experiential exploration of the in between spaces on site (Author, 2024).

**Figure 52:** Construction configuration exploration of various technologies and how they work together (Author, 2024).

## 10 Iteration Process

### Iterations by Drawing

#### 10.2

##### Technology materialised

This process was guided by extensive research in pattern and form-making, exploring how traditional Zulu designs can inform contemporary architecture. Consultations with Drip Additive Manufacturing facilitated testing the structural efficiency of 3D-printed models, allowing for iterative development that merges cultural heritage with innovative technology. By integrating these elements, the project aims to create spaces that honor Zulu identity while utilizing modern construction techniques for enhanced sustainability and functionality.

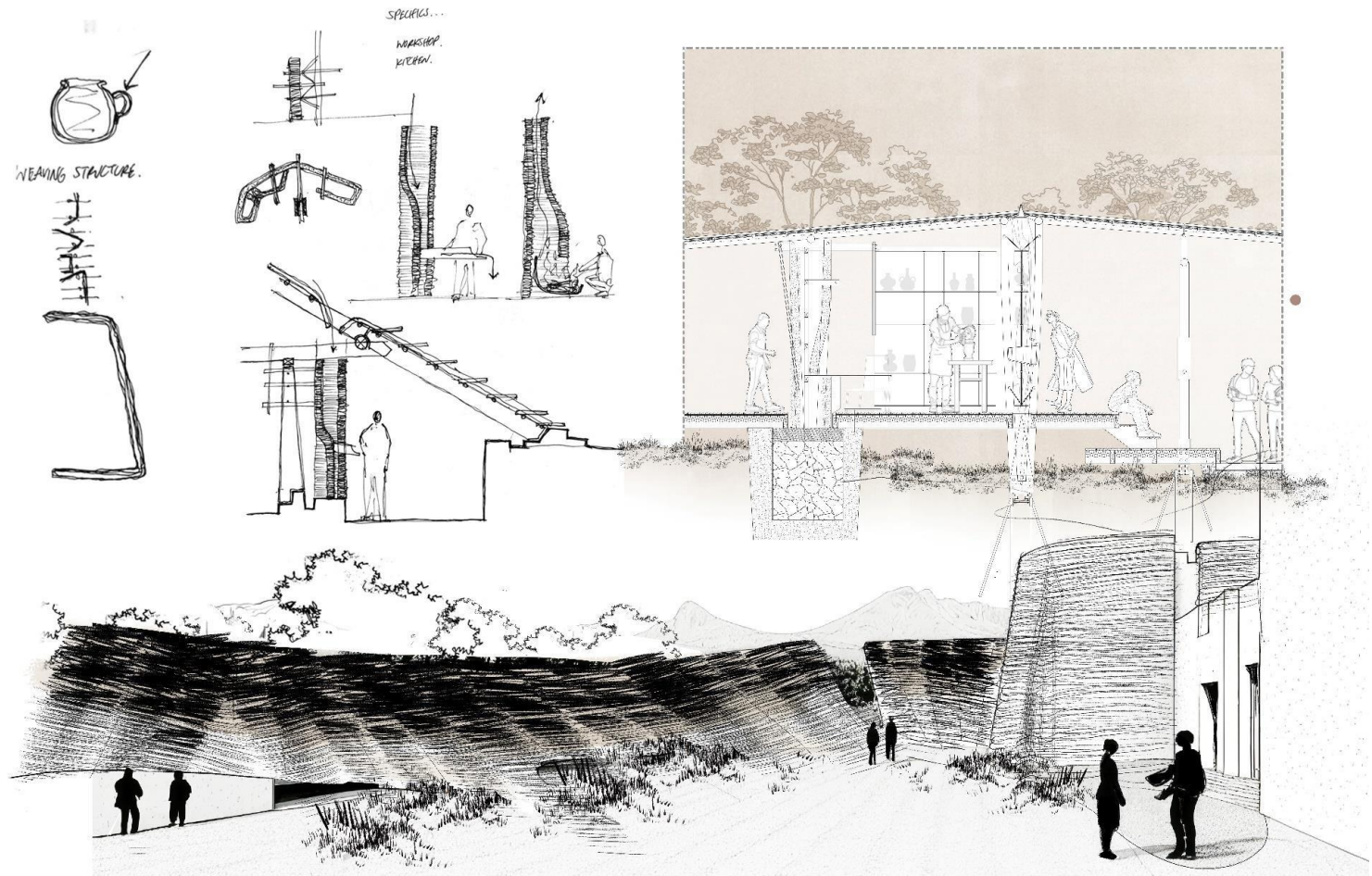


Figure 53: From conceptual construction to explorations on how the technology would work on site whilst maintaining purity of materials (Author,2024).

## 10 Iteration Process

### Iterations by Drawing

#### 10.3

##### Plan s Pattern Making

This process was guided by extensive research in pattern and form-making, exploring how traditional Zulu designs can inform contemporary architecture. Consultations with Drip Additive Manufacturing facilitated testing the structural efficiency of 3D-printed models, allowing for iterative development that merges cultural heritage with innovative technology. By integrating these elements, the project aims to create spaces that honor Zulu identity while utilizing modern construction techniques for enhanced sustainability and functionality.

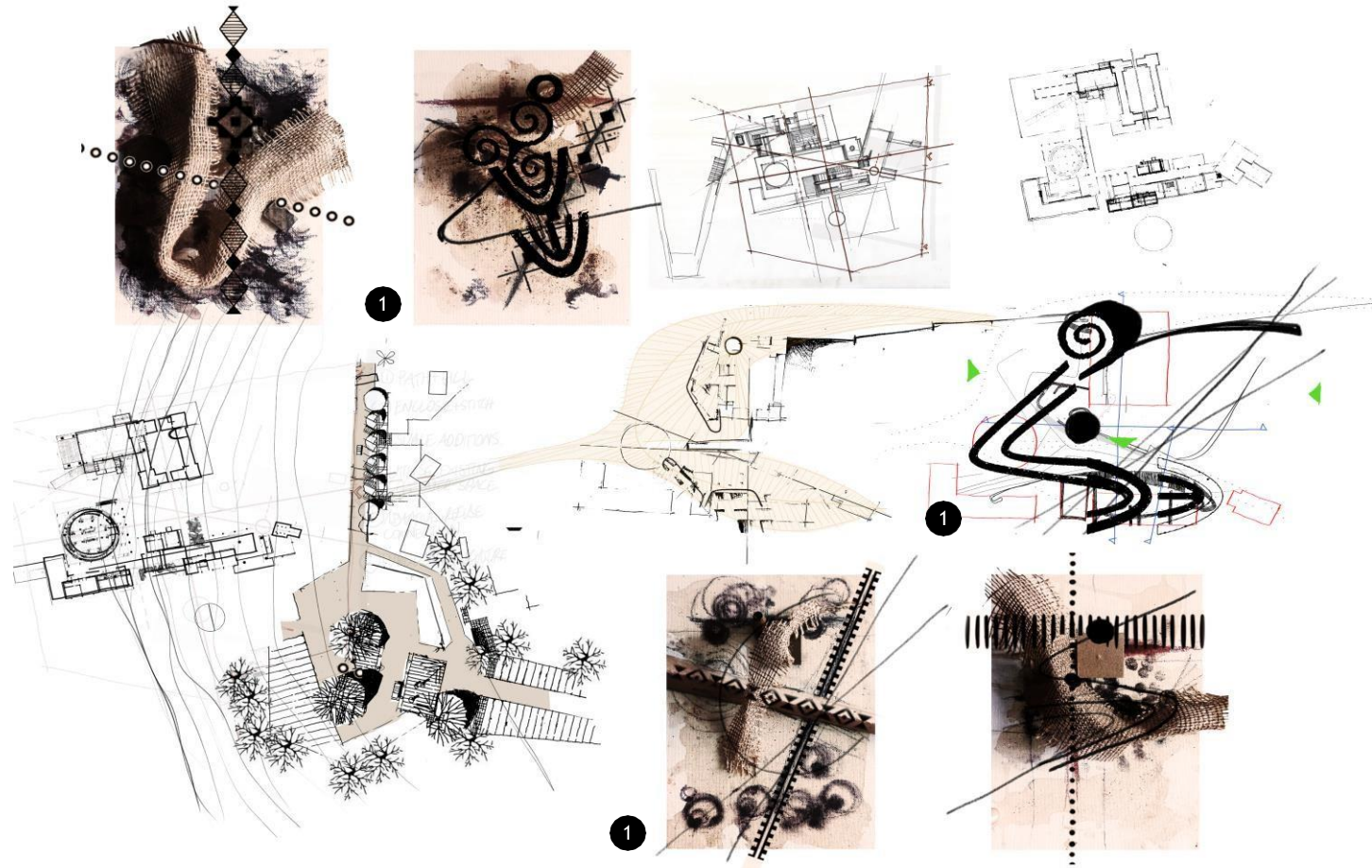


Figure 54: Testing pattern making within the development of the plans (Author, 2024).

## 10 Iteration Process

### Iterations by Physical Modelling

#### 10.4 Site s Form making

The physical modeling phase began with the intent to move beyond the limitations of drawings and explore forms in a more tactile, three-dimensional way. By working directly with physical materials, the modeling phase allowed for a hands-on examination of shapes and configurations, providing insights that could not be captured through sketches alone.

This phase was instrumental in defining the making process, as it encouraged an iterative, trial-and-error approach. By constructing physical models, it became possible to experiment with different structural arrangements, test material behaviors, and refine design ideas based on immediate, visual feedback. This process also enabled a deeper understanding of how various forms would respond to real-world factors, such as gravity, balance, and scale, which are often challenging to visualize on paper.

#### key

- 1 Site model
- 2 Context shape iterations
- 3 Primary roof form making

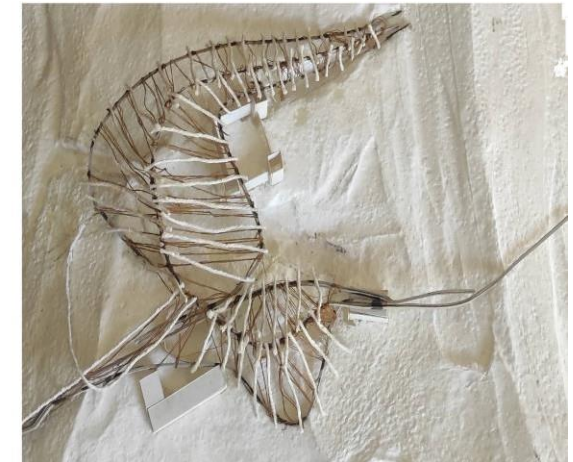
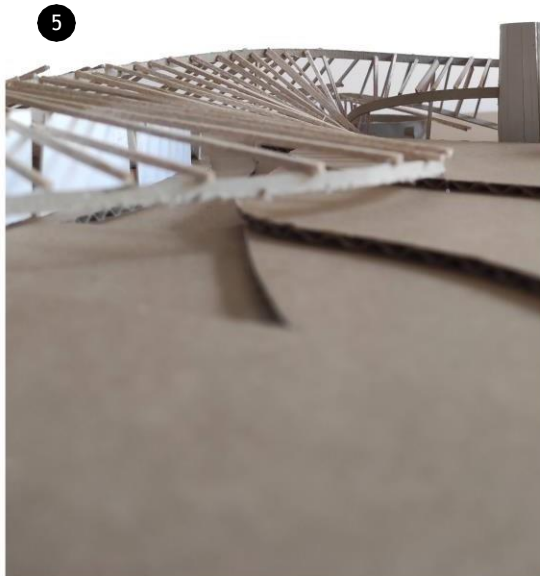


Figure 55: First model iterations of the site and the surrounding context (Author, 2024).

## 10 Iteration Process

### Iterations by Physical Modelling



key

- 4 Primary roof textural form making
- 5 Structural potential

Figure 56: First model iterations of complex shapes and dynamic/parametric design (Author, 2024).

## 10 Iteration Process

### Physical Modelling

#### 10.5

##### Site modelling with structure

Site modeling with structural elements helps visualize how a design interacts with the land, topography, and environmental conditions. It enables testing of load-bearing components, spatial arrangement, and material scale in context, ensuring structural integrity. This approach is essential for refining design solutions that align with both the site's natural features and structural needs.

##### key

- 6 Building interaction with roof and landscape
- 7 Structural interaction with site

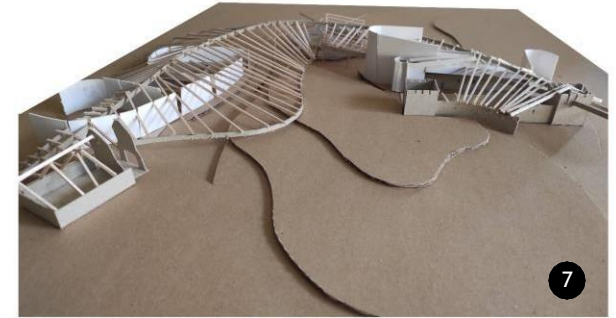


Figure 57: Exploring scale and structural relationship to large scale forms (Author,2024).

## 10 Iteration Process Prototyping

### 10.6

#### Initial prototyping

Initial 3D printed prototyping began with plastic to experiment with pattern-making techniques. This phase allowed for testing intricate design patterns, understanding print behaviors, and refining structural aesthetics. Working in plastic provided a flexible, accessible medium to quickly adjust designs before moving to final materials such as clay and adobe suited for the project's needs.

#### key

- 3 Plastic Exploration shaping
- 7 Layered Pattern making
- 9 Height exploration
- 10 Shape suited for strength

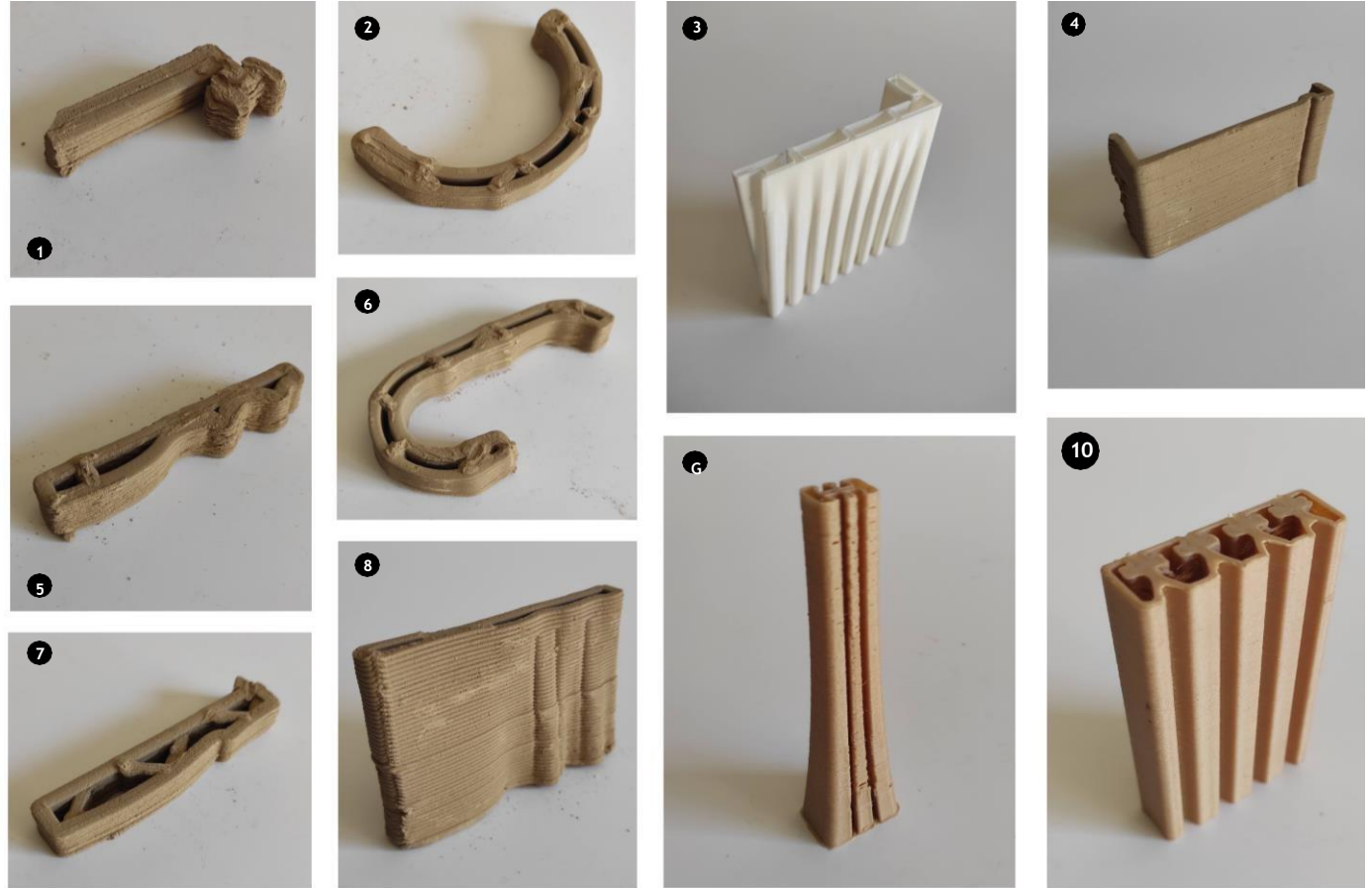


Figure 58: Prototyping of printed wall with DRIP Additive manufacturing, exploring with plastic as test runs before utilizing clay models (Author, 2024).

## 10 Iteration Process Prototyping

### 10.7

#### Trial s Error

Key considerations during 3D printing included monitoring the weight of prints, as heavier pieces could strain structural integrity. Slumping was another concern, as unsupported areas tended to sag under their own weight. Additionally, thin-walled sections were prone to cracking, requiring careful calibration of thickness and print speed to maintain stability and avoid material weaknesses during and after printing.

#### key

- 11 Slumping due to weight
- 13 Holes due to pattern fill
- 18 Cracking due to non curved directional path changes

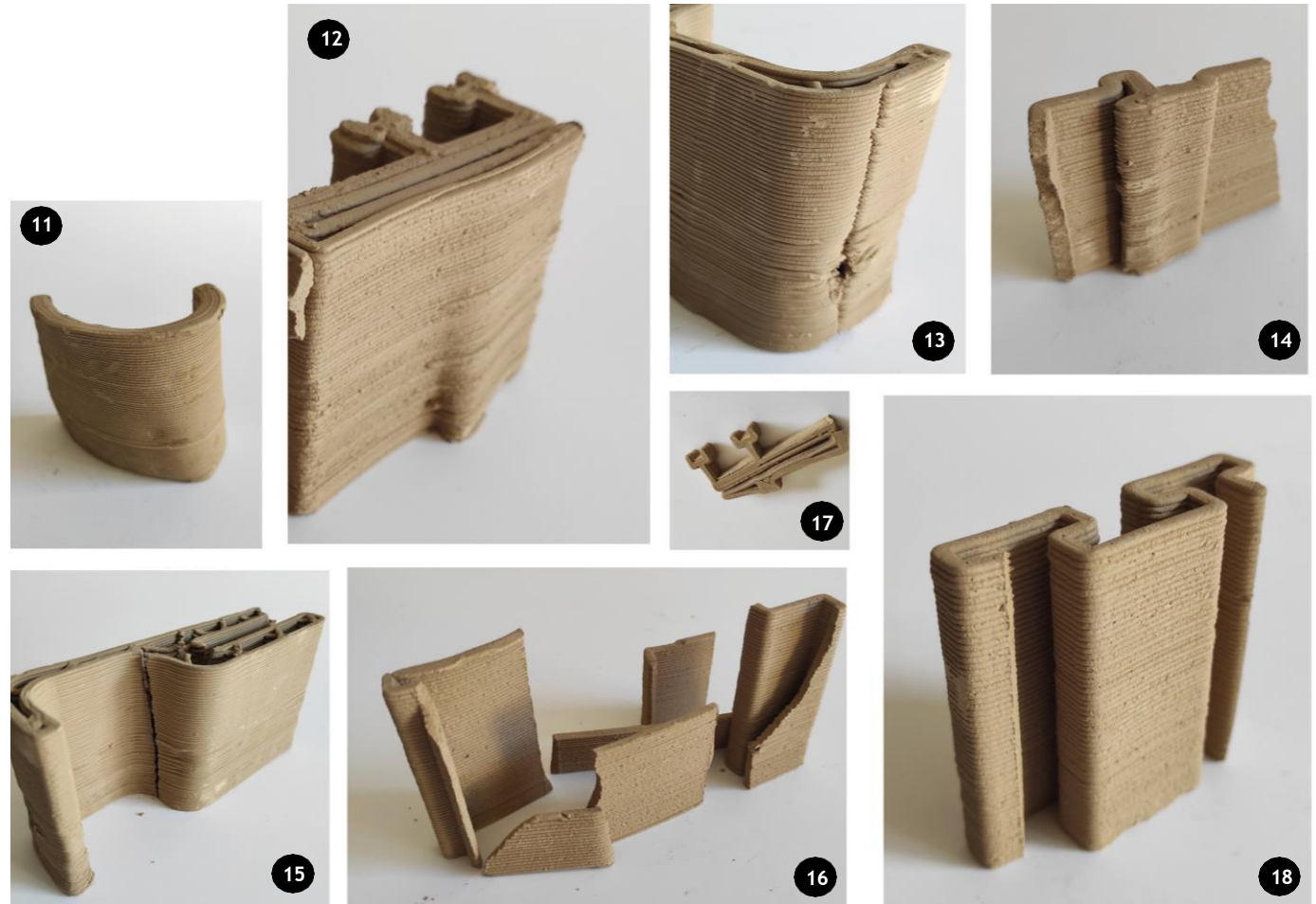


Figure 5G: Trial and error process finding errors through printing processes C shapes that may or may not work (Author, 2024).

## 10 Iteration Process Prototyping

### 10.8

#### Extrusion for function

Over-extruding and under-extruding clay significantly impacted the 3D printing process, occasionally leading to structural failures but also introducing unexpected, beneficial textures and tactile qualities. Over-extrusion created thick, uneven layers, adding a rough, handcrafted feel, while under-extrusion resulted in delicate textures and finer details. These variations influenced the aesthetic, enriching the final design with unique, organic patterns.

#### key

- 20 Over extruding of the 3d printing pipe
- 22 Over extruded base
- 12 Patterns with a thin extrusion nozzle to create fine waves



Figure 60: Exploring with the extrusion and pattern making that could come of making these walls effective and useful dynamic spaces (Author, 2024).

## 10 Iteration Process

### Prototyping

#### 10.9

##### Materials working together

The 3D printing process was used to explore how timber could integrate with prototypes, enhancing form-making and structural expression. This approach allowed testing of timber's compatibility with printed forms, evaluating joint techniques, and visualizing material interplay. The process enriched the design by merging organic timber elements with printed structures.

##### key

- 27 Pattern holes for timber member configuration
- 28 Timber structural design test
- 31 Exploration of pattern making with structure

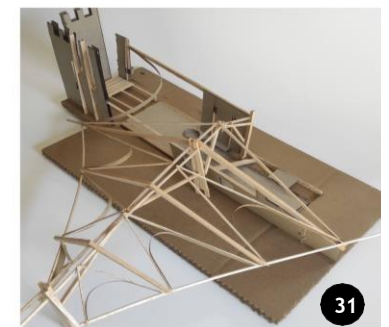
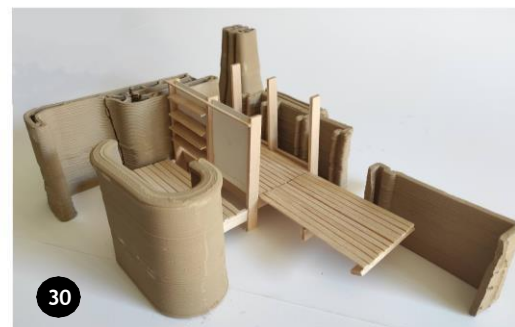
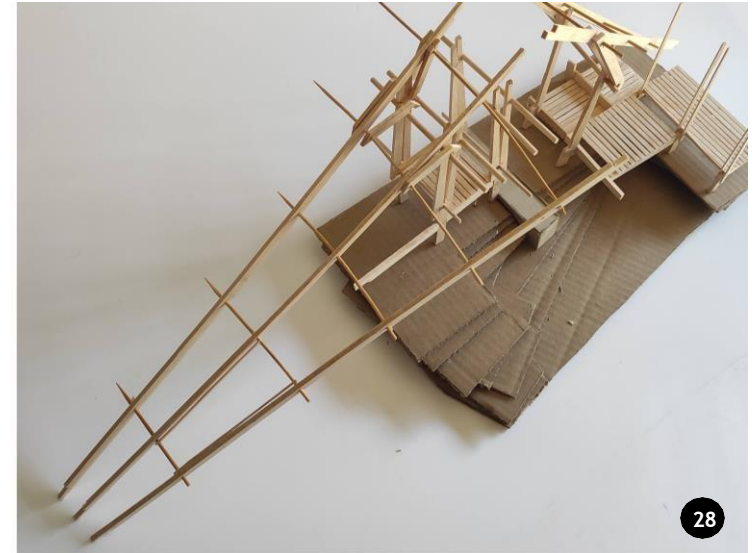


Figure 61: Exploring the structural relationship of 3d printed clay prototypes with timber and how they can work together (Author, 2024).

# 11 Program Narrative

## 3.1 Program Narrative

This design invites you into a narrative journey, where each step unveils a deeper layer of Zululand’s soul:

**1. Welcome of Origins** - Arrive at the fort and share in Zululand’s history with a welcoming meal in the kitchen exhibition.

**2. Living Traditions** - Discover the Vukani Museum, where the crafted tools and artifacts reveal the spirit of Zulu daily life.

**3. Hands of Creation** - Enter the workshop, witnessing the skillful making of objects and the passing of knowledge.

**4. Sanctuary of the Soul** - Conclude in the chapel, immersed in the quiet poetry and essence of the place

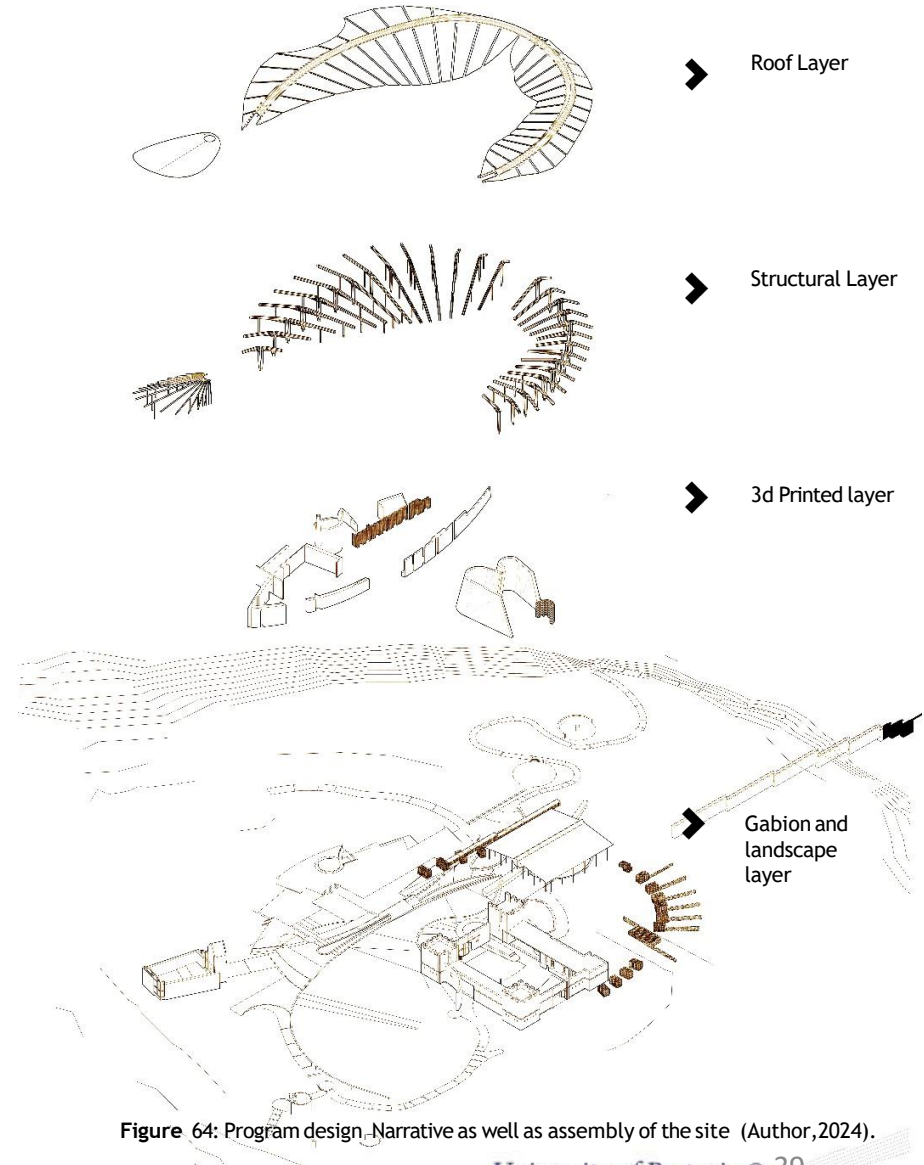
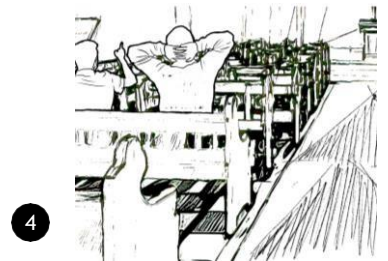
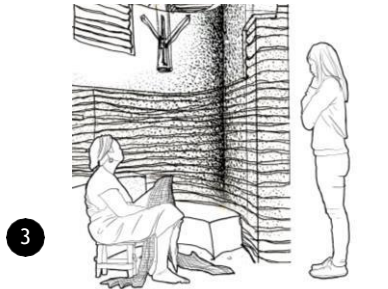
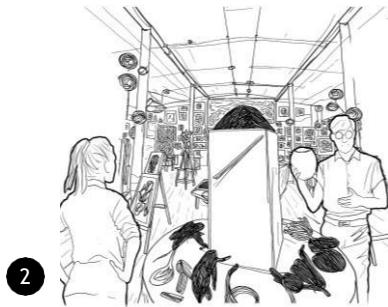
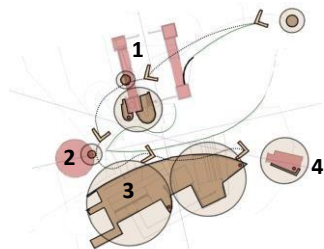
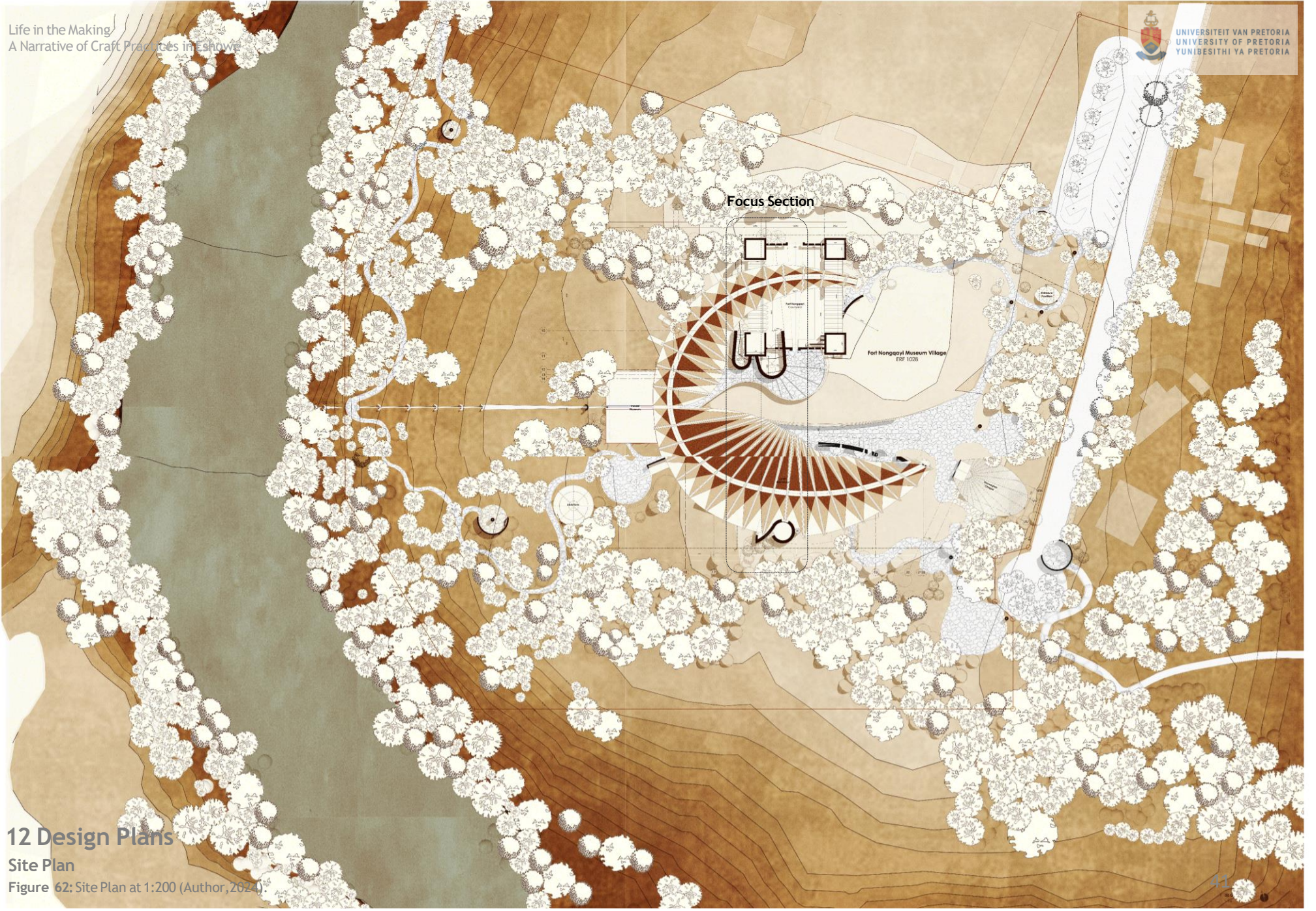


Figure 64: Program design Narrative as well as assembly of the site (Author,2024).



## 12 Design Plans

### Site Plan

Figure 62: Site Plan at 1:200 (Author, 2024).

# 12 Design Floor Plan Experience

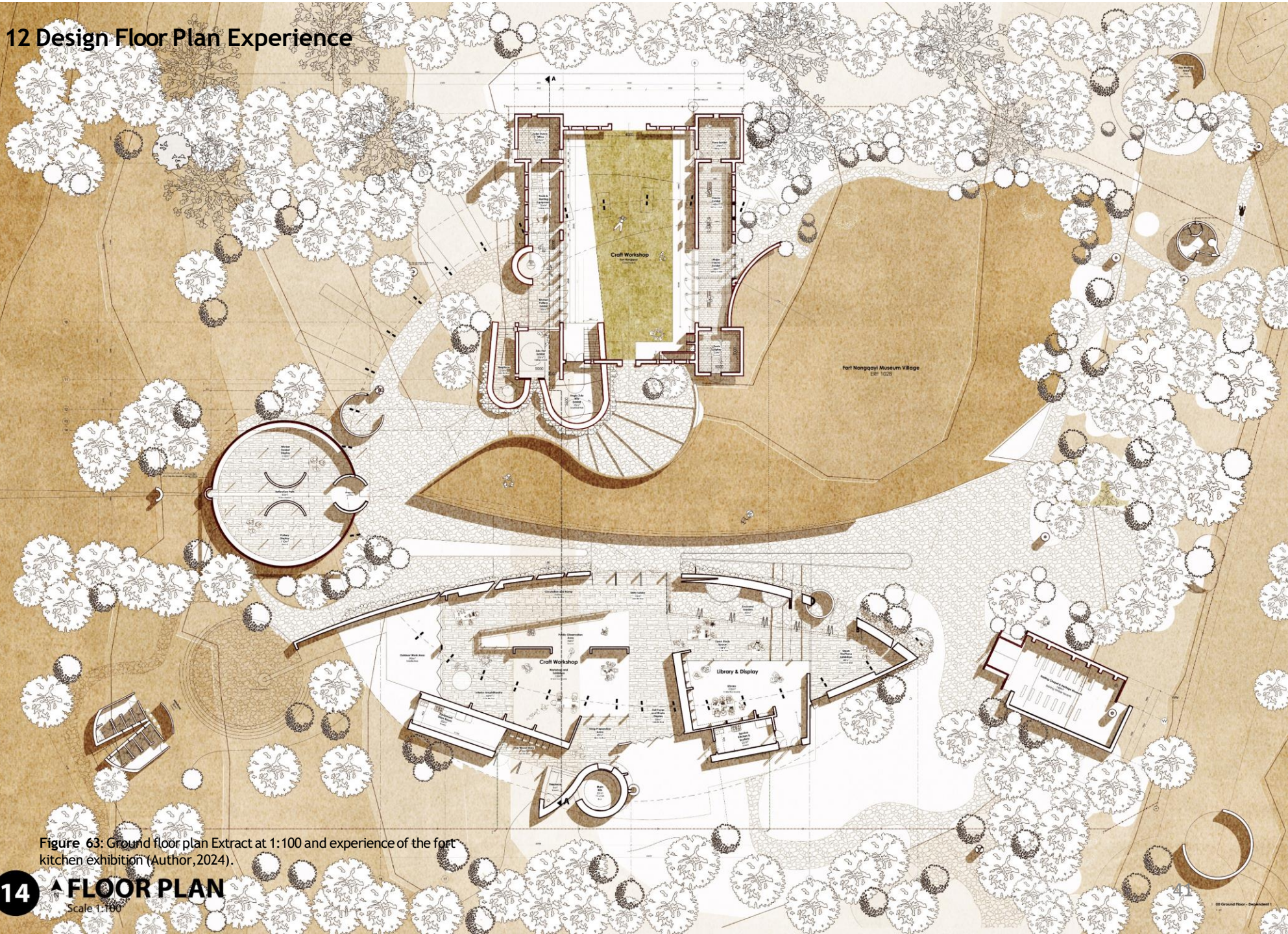


Figure 63: Ground floor plan Extract at 1:100 and experience of the fort kitchen exhibition (Author, 2024).

## 13 Construction Process

### Craft & Collaboration on site

#### 13.1 Making Processes

In Phase 1, the construction process commences with the creation of a resilient foundation through stone gabions, crafted in close collaboration with stonemasons and landscapers. Together, they shape each gabion with precision, aligning with the natural terrain. This teamwork roots the structure deeply in its surroundings, grounding the future build.

#### PHASE 1.

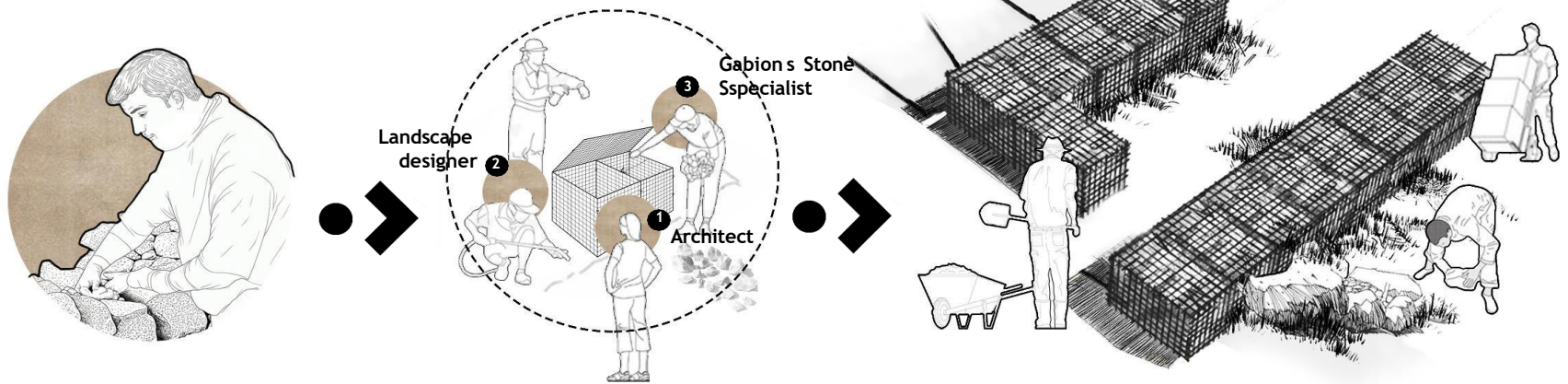


Figure 65: Stone stacking and gabion configuration (Author,2024).

STEP 1  
Pre - production

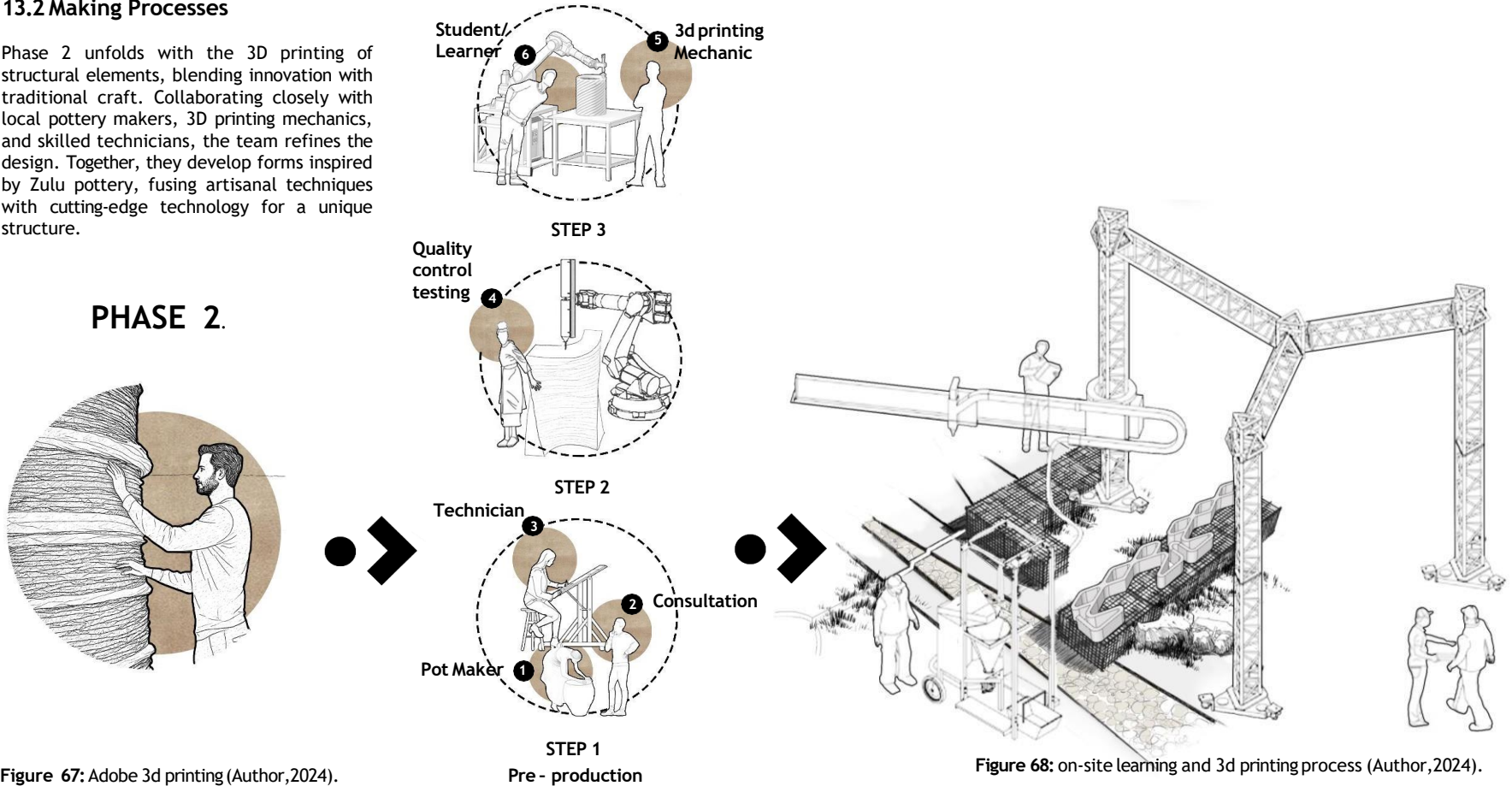
Figure 66: Onsite learning and landscaping process (Author,2024).

# 13 Construction Process

## Craft & Collaboration on site

### 13.2 Making Processes

Phase 2 unfolds with the 3D printing of structural elements, blending innovation with traditional craft. Collaborating closely with local pottery makers, 3D printing mechanics, and skilled technicians, the team refines the design. Together, they develop forms inspired by Zulu pottery, fusing artisanal techniques with cutting-edge technology for a unique structure.



## 13 Construction Process

### Craft & Collaboration on site

#### 13.3 Making Processes

In Phase 3, timber CNC construction and mass timber design come to life, enabling efficient on-site assembly. This phase involves intricate pre- and post-production planning, where each timber element is carefully shaped and refined with contingencies in mind, ensuring that each piece integrates seamlessly to support the final structure.

#### PHASE 3.

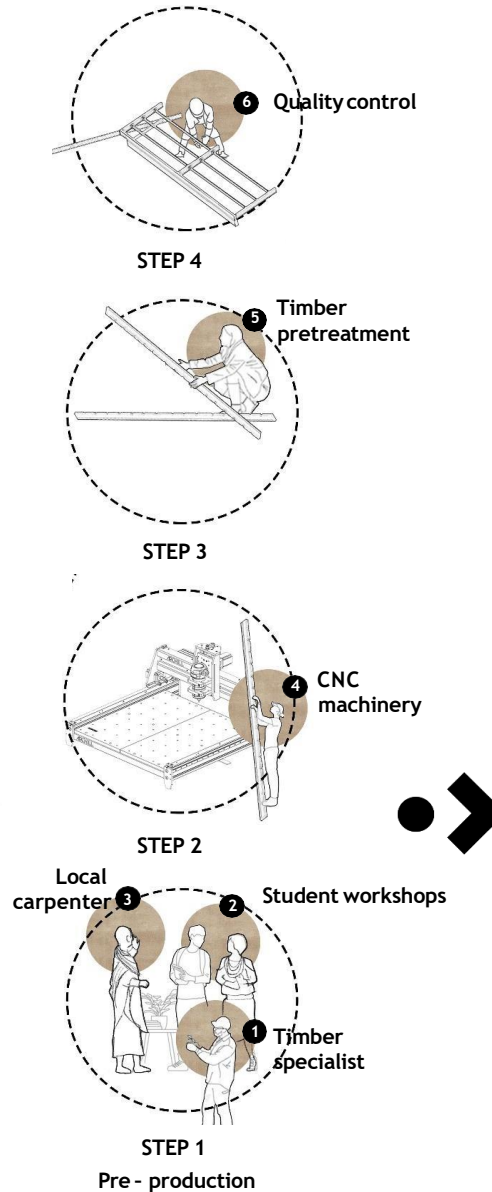
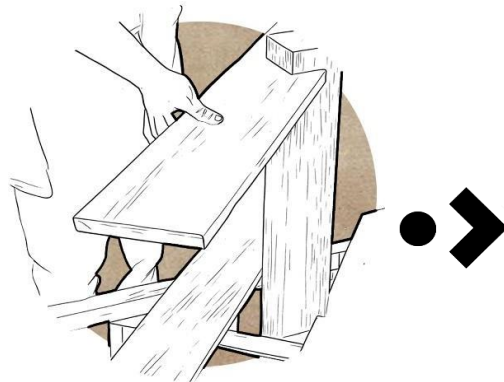


Figure 66: Timber vernacular and mass timber construction (Author,2024).

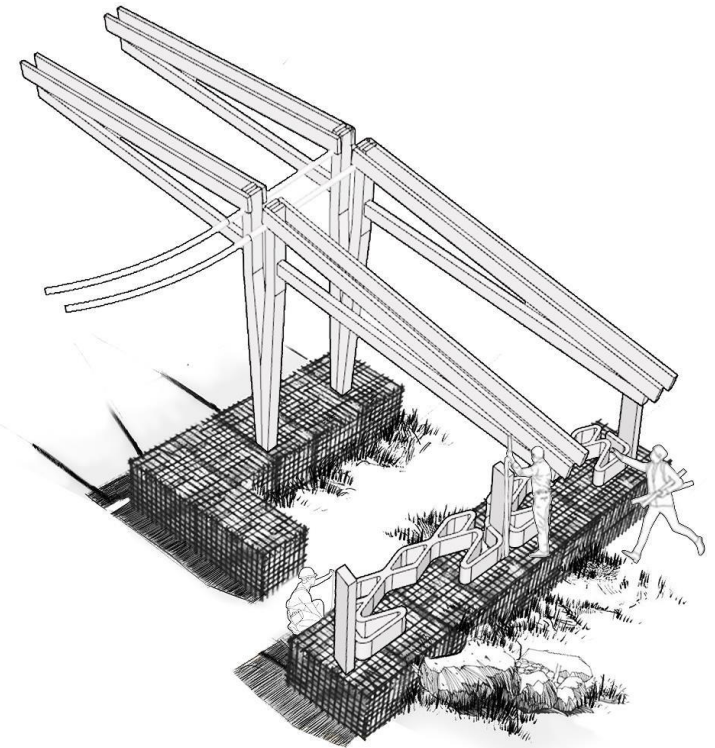


Figure 70: On-site timber configuration and measurements (Author,2024).

## 13 Construction Process

### Craft & Collaboration on site

#### 13.4 Making Processes

Phase 4 centers on weaving elements together on-site to craft the roof, bringing the pre-production vision into architectural reality. The woven design, meticulously planned beforehand, is carefully translated to fit the structure, creating a roof that unifies materials and craftsmanship, merging function and artistry in a cohesive architectural form.

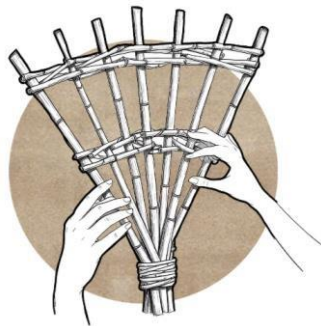


Figure 71: Wicker basket weaving (Author,2024).

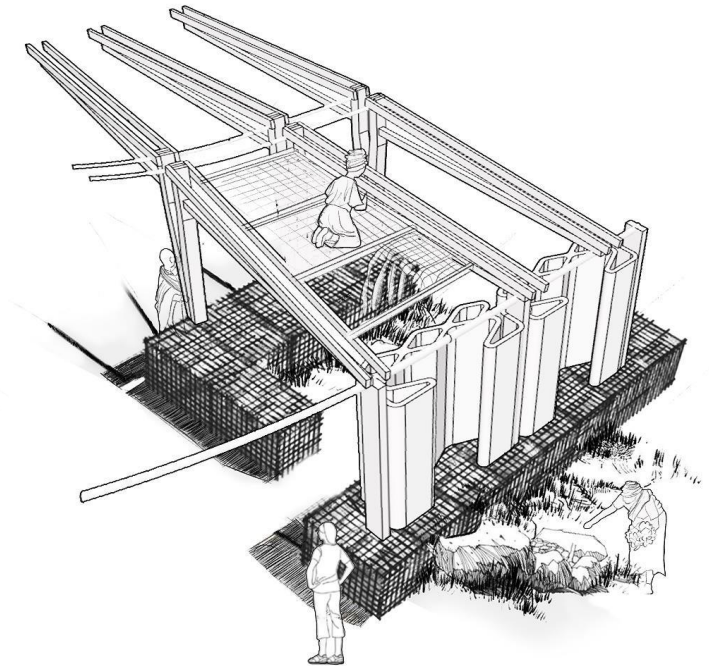
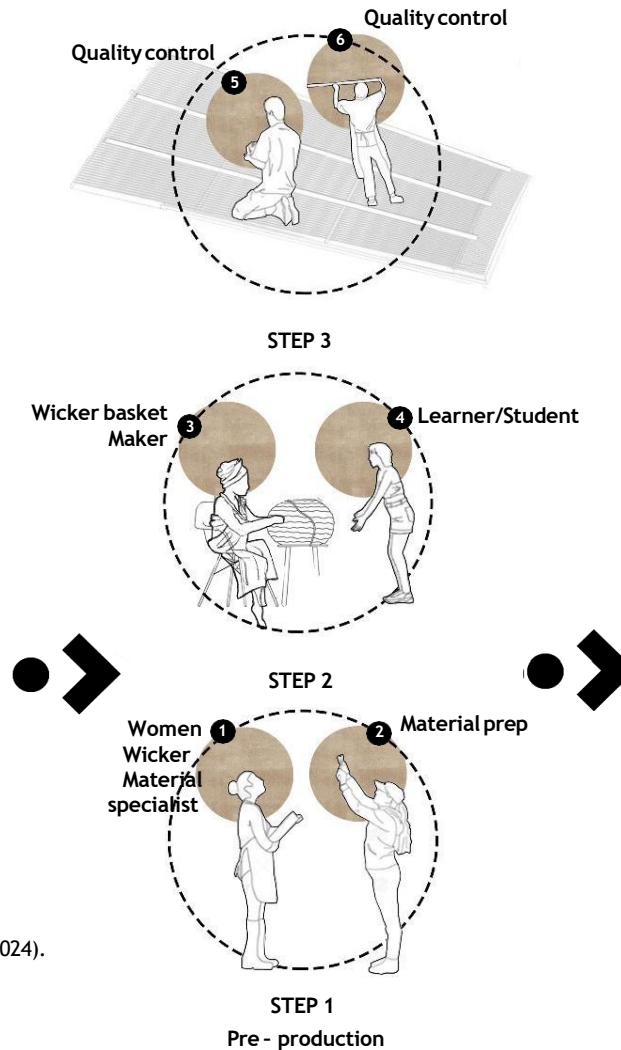


Figure 72: On-site learning process of weaving (Author,2024).



## 14 Details: Sectional Axonometric of Craft Workshop Details

### Design, Craft, The Architectural Design Process

#### Technical Section AXO OF WORKSHOP

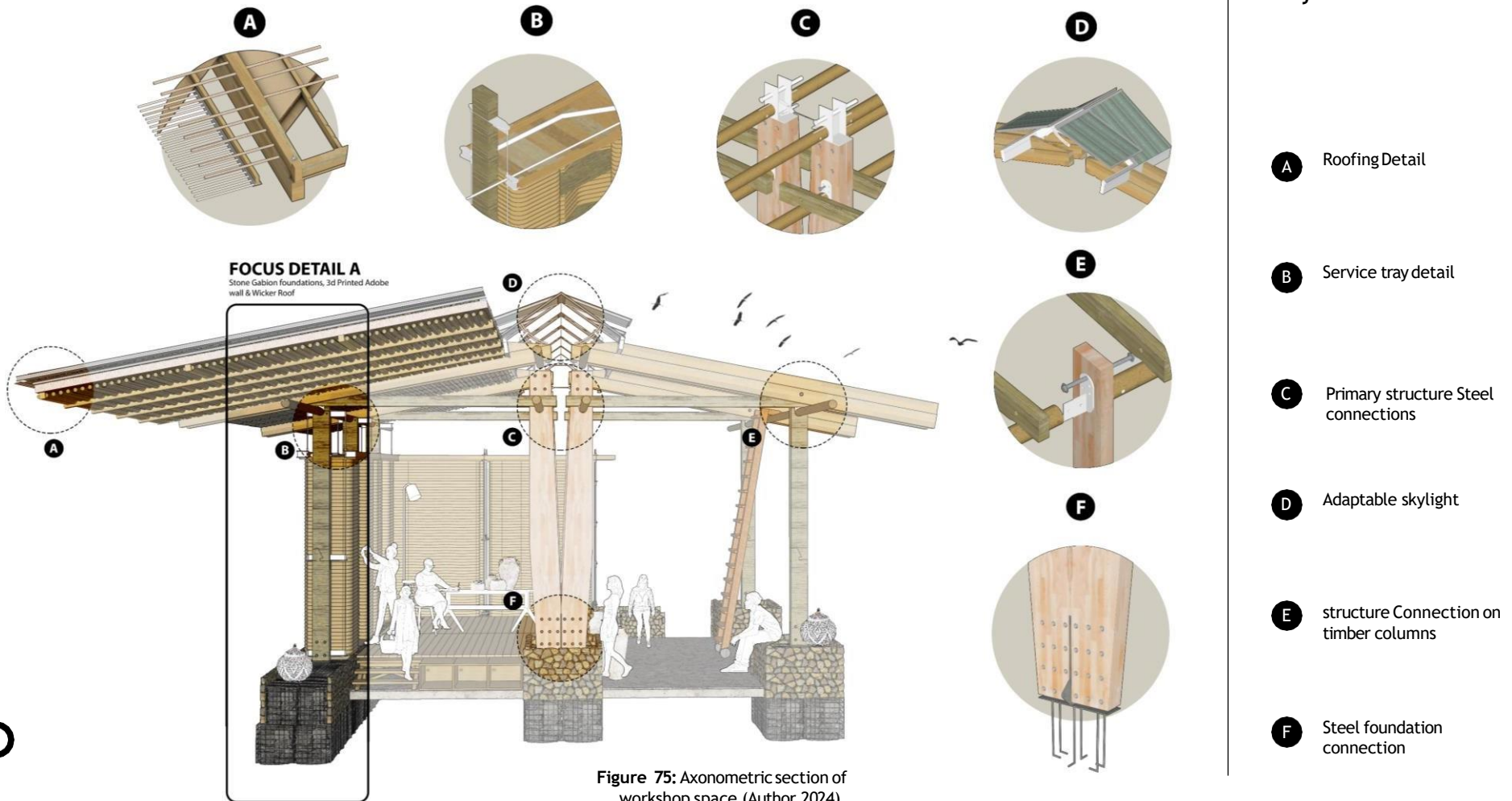


Figure 75: Axonometric section of workshop space (Author, 2024).

## 15 Perspectives

### Design, Craft ,The Architectural Design Process

#### Craft workshop



Figure 76: Craft Workshop Interior Design, low sun, nearing night (Author,2024).

## 15 Perspectives

### Design, Craft ,The Architectural Design Process

#### Fort Kitchen Exhibition



Figure 77: Interior fort Nongqayi Museum Kitchen Exhibition (Author,2024).

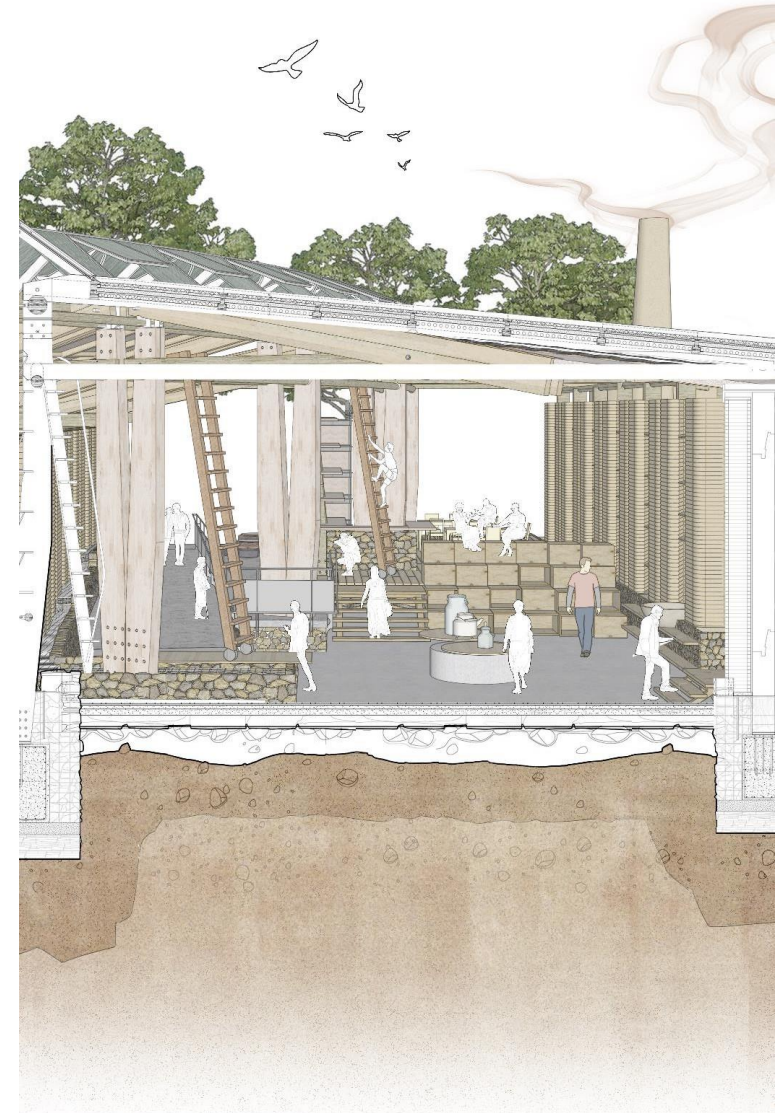
## 15 Perspectives

### Design, Craft, The Architectural Design Process

exterior



Figure 78: Sneak Peaks of design Vignettes and Construction Detailing (Author,2024).



## 16 Conclusion

### Design, Craft C The Architectural Design Process

#### 3.1 Critical Reflection on the Architectural Process

Moreover, the reliance on skilled craftspeople raises profound questions about the long-term sustainability of craft-based approaches in architecture. As crafts diminish in prevalence in many regions, finding and training artisans who can execute these traditional methods is a challenge. This raises ethical questions as well—are we truly respecting these crafts, or are we co-opting them into design trends that might dilute their original meanings?

For architects, working with craft brings a visceral understanding of materials from a place, sharpening their sensitivity to how wood, clay, or stone behave and transform under different conditions. This tactile experience enables more intuitive and nuanced design decisions, as architects witness firsthand how specific tools or techniques reveal material qualities that may influence form, detailing, or assembly methods. Additionally, collaborating closely with artisans builds a network of specialised skills, fostering relationships that can lead to innovative, site-specific projects.

#### 3.1 Final Design Outcome

The project successfully fulfilled its initial objectives by adopting a hands-on approach to architecture and building. By creating a live exhibition space that incorporated local crafts, we engaged the community in the construction process, fostering a sense of ownership and pride in their cultural heritage. The integration of Zulu craftsmanship with modern techniques, such as 3D printing and timber construction, showcases the potential for museum spaces to be productive environments where craft is ever-present. This innovative fusion pushes the boundaries of traditional practices, demonstrating that craft can lead to new forms of innovation. Ultimately, the project highlights the importance of community involvement and sustainable practices in architecture, paving the way for future endeavours that honour local traditions while embracing modernity.

**“In crafting, there are no mistakes, only new discoveries and unique creations.”**

- Adapted by Justine Jenkins from House of Mahalo

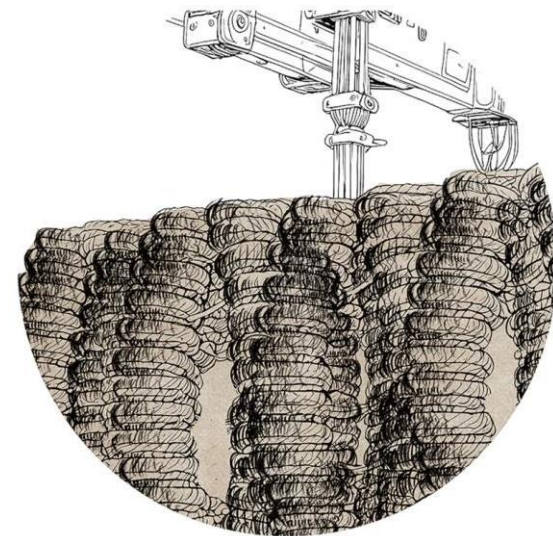


Figure 7G: 3d printing of adobe sketch (Author, 2024).

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Figure 80: Interior of fort Nongqayi Museum (Author,2024).