



LIMES

Lalibela
Interpretation
Museum
and
Ethiopian
Sanctuary

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L I M E S

LALIBELA INTERPRETATION MUSEUM AND ETHIOPIAN SANCTUARY

A research and interpretation project

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Umuntu ngumuntu ngabantu - I am, because you are

Zulu

English translation



Tshegofatso Mako, 2018

FOREWORD

2015 was a year which marked a shift in my academic thinking. It was a year of conflict, protest and liberation within the higher learning institution. I was a second year architecture student at the University of Cape Town, South Africa. Students were protesting not only for the removal of a statue, but for a shift in our curriculum and school of thought. We needed a larger integration of representation of knowledge developed in and of the African continent in our curriculum. We were hungry to learn more about our ancestors, African poets, authors, architects as we believed there was significant worth in the comprehension of this knowledge in an institution of higher learning.

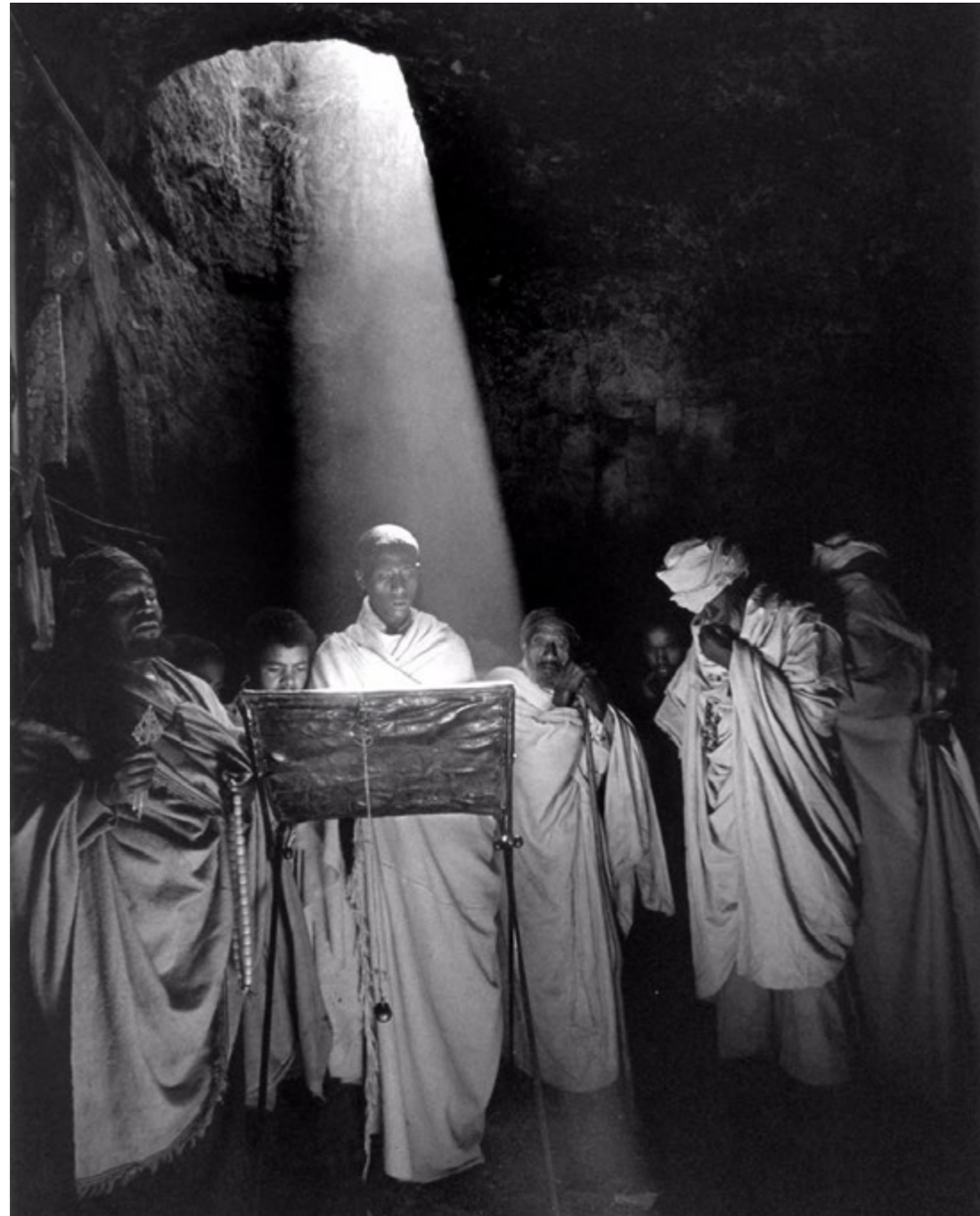
The introduction of art, museology, preservation began with my masters studies in 2019 at Politecnico di Milano, Italy. Although I have always taken interest in art and exhibitions, the privilege of studying it exponentially increased my desire to immerse myself in this 'new' field of knowledge. I was able to hone my craft and aesthetic at this institution.

This thesis is a culmination of events and moments experienced throughout my academic career. LIMES is the result of wanting to understand sites of significance and how they come into being. It is an intersection of my own faith and architecture.

After having traveled to Jerusalem, Israel in 2020 for a preservation workshop, there was an evident absence of an atmosphere which engaged one's spiritual awareness in a 'holy site' although having experienced it in mosques and other sites of religious practice. This trip was the genesis of the question, what aspects of design enhance the atmosphere of place in sites of significance?

The Rock-hewn Churches in Lalibela, Ethiopia is spoken about as possessing this atmosphere of place. This site is often referred to as 'The New Jerusalem' of Africa as it took inspiration from Jerusalem, Israel. It is the selected site of this research and interpretation project.

LIMES is the sharing of Knowledge
An Archive



Fernando Moleres. (n.d.)

CONTENTS

INTRODUCTION

Abstract	13
Architecture without architects	14
Keywords	16
Brief overview of Ethiopia	20
Role of faith in Ethiopia	22
Brief history of Lalibela	24
Pilgrimage	26
The oral narrative	30

SITE ANALYSIS

Geography	34
Climate	36
Arrangement of site	38
Building identification	40
Geology	42
Trenches	44
Water control	46
Typology of structure	48
Construction	52

PRELIMINARY

Major interventions on site	60
Specification of churches	62
Interiors [Images]	74
Object	78
Material	80
Urbanization	86
Tourism	90
Musealization	92
In conversations with Tek and Tadesse	96
Site selection	98

DESIGN PROJECT	104-167
-----------------------	---------

PRESENTATION	170
---------------------	-----

BIBLIOGRAPHY	184-187
---------------------	---------

INTRODUCTION

Abstract	13
Architecture without architects	14
Keywords	16
Brief overview of Ethiopia	20
Role of faith in Ethiopia	22
Brief history of Lalibela	24
Pilgrimage	26
The oral narrative	30



INTRODUCTION

ABSTRACT

LIMES is presented as the outcome of research and interpretation of a UNESCO world heritage site in Lalibela, Ethiopia. Marvelous and phenomenal in scale and architectural achievement, the 11 Churches form part of a complex which garners pilgrims, travelers and locals wanting to immerse themselves in the wonder of this site which visualizes architecture as sculpture. This research project seeks to explore the significance of an architecture which engages a deeper human connection with sacred spaces.

As a museum and first point of contact for the complex, LIMES serves to aid in the overall experiential quality and understanding of the site.

Born from the process of carving stone, this architectural project positions itself on a subterranean level, hidden from plain sight. It celebrates atmospheric qualities of space, that being material, tactility of surfaces, light, Intimacy of rooms, permanence of material, mass, void and the presence of culture and spiritual practices.

Together, The Rock-Hewn Churches and LIMES evoke an awareness of one's position on this earth. There is an intrinsic comprehension of time, what has passed and the many years to follow.

CONCEPTUAL MANIFESTATION

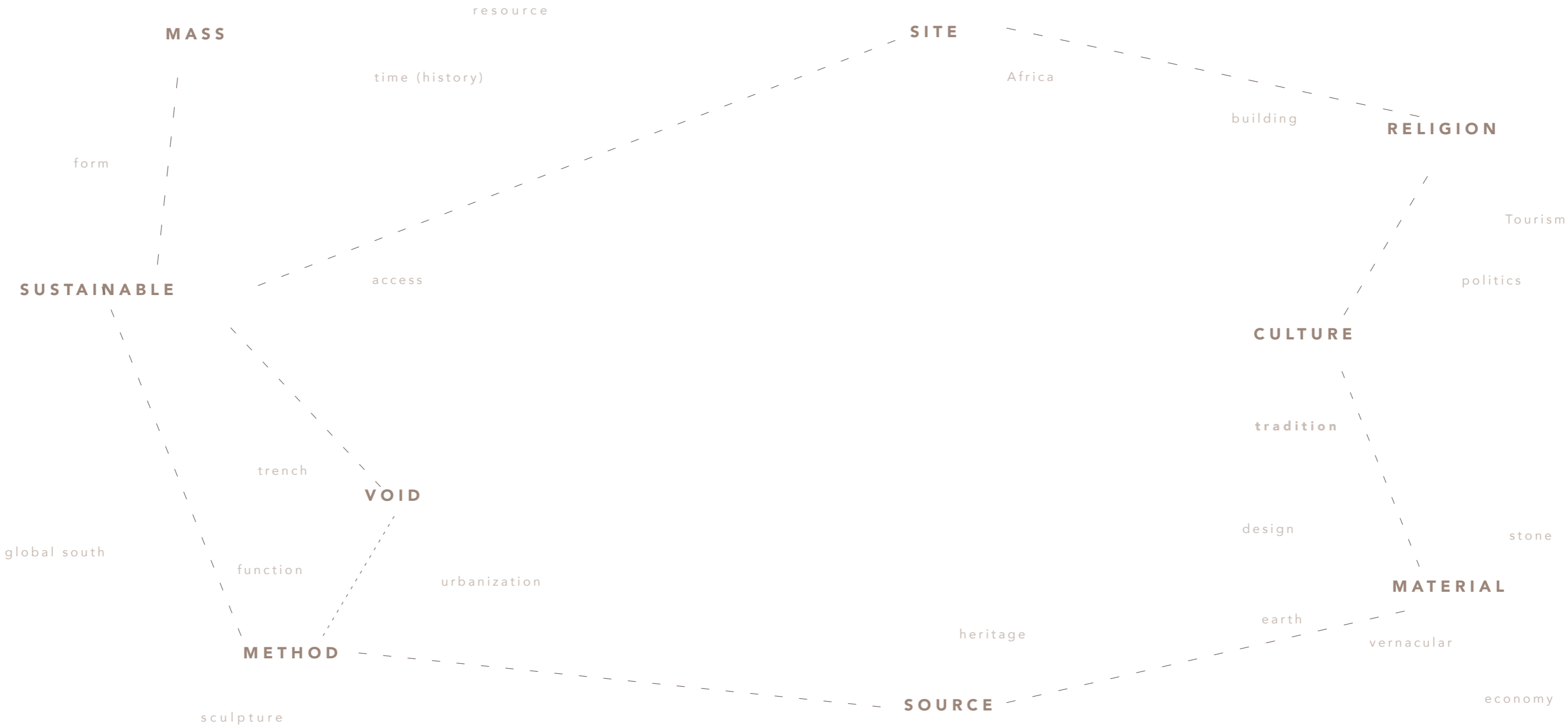
To design a sanctuary and museum in Lalibela is to provide an archive of knowledge and an experience which exhibits the expression of the site. The requirements in doing so are two fold. The first being research. Conducting research through various resources, including journals, online services, interviews etc. Simultaneous to the research, the identification of opportunity of what would be an essential addition to the site is necessary. A museum and welcome sanctuary is this manifestation.

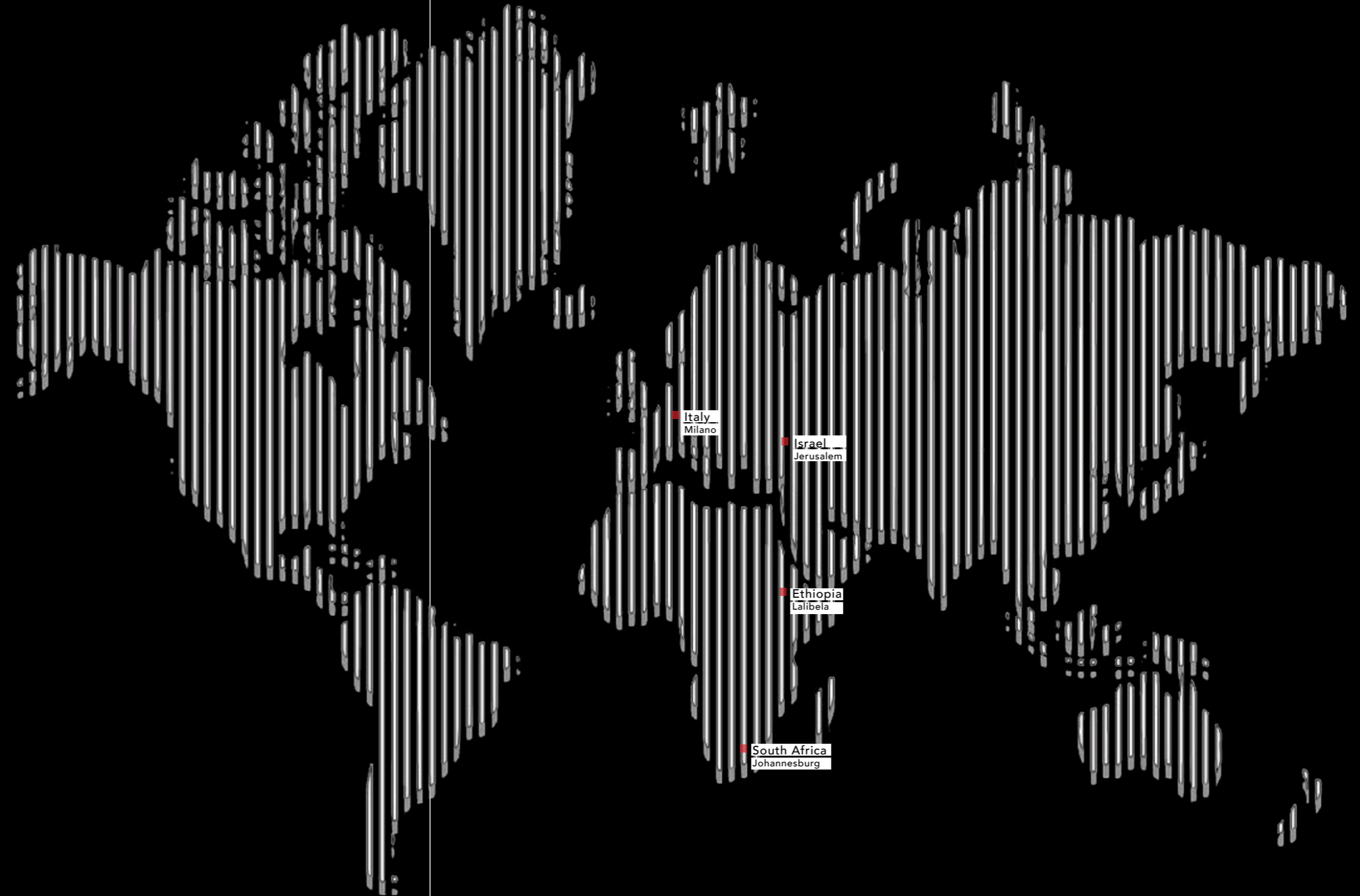
The second phase is the development of the project through the interpretation of the research conducted. As a result LIMES is an ideological proposal which is realized through excavation and the realization of a new building.



Petersen R & The Museum of Modern Art Archives, 1964

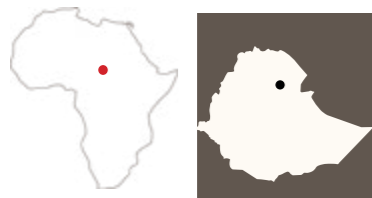
Photographed in 1964 at the Museum of Modern Art during the Architecture without Architects exhibition, curated by Bernard Rudofsky. This exhibition "the first of its kind, approaches architecture not with a historian's mind but with a naturalist's sense of wonder." (moma, 1964) This book also exhibits Lalibela, the site of focus for this thesis project. Bernard Rudofsky describes his archive as a way of introducing "the reader to communal architecture - architecture produced not by specialists but by the spontaneous and continuing activity of a whole people with a common heritage, acting within a community of experience" (Bernard Rudofsky, 1964)





Sites of significance in the development of this thesis have been identified as a South African author of this work, conducting the research through Politecnico di Milano, with Lalibela, Ethiopia as the project site. Jerusalem sits at the core of the emergence of Rock-Hewn Churches in Lalibela.

Coordinates: 800 N, 38 00 E
 Location: East Africa
 Area: 1,104,300 sq km
 Population: 120, 000, 000 (2022)



Dereje Belachew, 2014

BRIEF OVERVIEW OF ETHIOPIA

Ethiopia is a land locked country which is situated on the east of Africa (within the horn) with a population of 120 million people covering 1,104 million km². The capital city is located in the center, known as Addis Ababa.

Historically it is one of the oldest countries in the world and one of the first and oldest independent countries in Africa. It has never been colonized with the exception of a brief period of occupation by the Italians in 1936.

Ethnically Ethiopia is diverse with a range of people from differing groups such as the Oromo, Amhara, Somali, Tigray, Sidamo, Gurage and Welaïta.

Geographically speaking it is surrounded by Somalia, Kenya South Sudan and Sudan. Its territorial extent has varied since its founding. At one point the Aksumite empire was largely influential in how Ethiopia operated. As an order, the Pre-Axumite empire dates back to the 800 BC, This is then followed by the Axumite.

Theories exist about the influences from further regions such as India, The Byzantine period, Greece and Portugal. The Zagwe Dynasty (900-1270) is one which also played an integral part and is directly linked with Lalibela. The Federal Democratic Republic of Ethiopia was initiated in 1991 and began in 1994. There continues to be multiple conflicts in the Tigray region, where the thesis is located.

The economic growth of Ethiopia continues to grow as the country immerses itself in foreign investments. It is still considered a 3rd World and developing nation with high levels of poverty and disparities.



Philipp, 2015

ROLE OF FAITH IN ETHIOPIA

Ethiopia is a country which is rich in culture and heritage. Parallel to this is the strength in their beliefs as it is a country largely founded on religion with a large percentage of the population practicing Christianity and the Orthodox faith while Islam and the Muslim faith also characterize the country.

Although these are the dominating religions, there is a religious freedom for its citizens. Christianity was first founded in Ethiopia in the 4th century, being one of the oldest Christian bodies which exists. The two religions have existed in a space between tension and balance for centuries. Of the two interviews conducted it has become apparent that religion forms part of the politics of how the country is run. Tension exists primarily between these two primary religions. More recently in 2021, there has been greater conflicts with the news of the events and occupations in the headlines. As much as religion serves as a device of separation, it also unifies and brings many people together thus assisting with 'moving' the country forward in its development.

Ethiopian Orthodox Christianity

The Practice of this sect extends back to 1st Century AD as Ethiopia was amongst the first countries in sub-Sahara Africa to adopt the Christian religion. Most people adopted this sect of religion and is primarily seen in Tigray and Amhara which is located in the northern region . The Oldest churches are also located here.

Islam

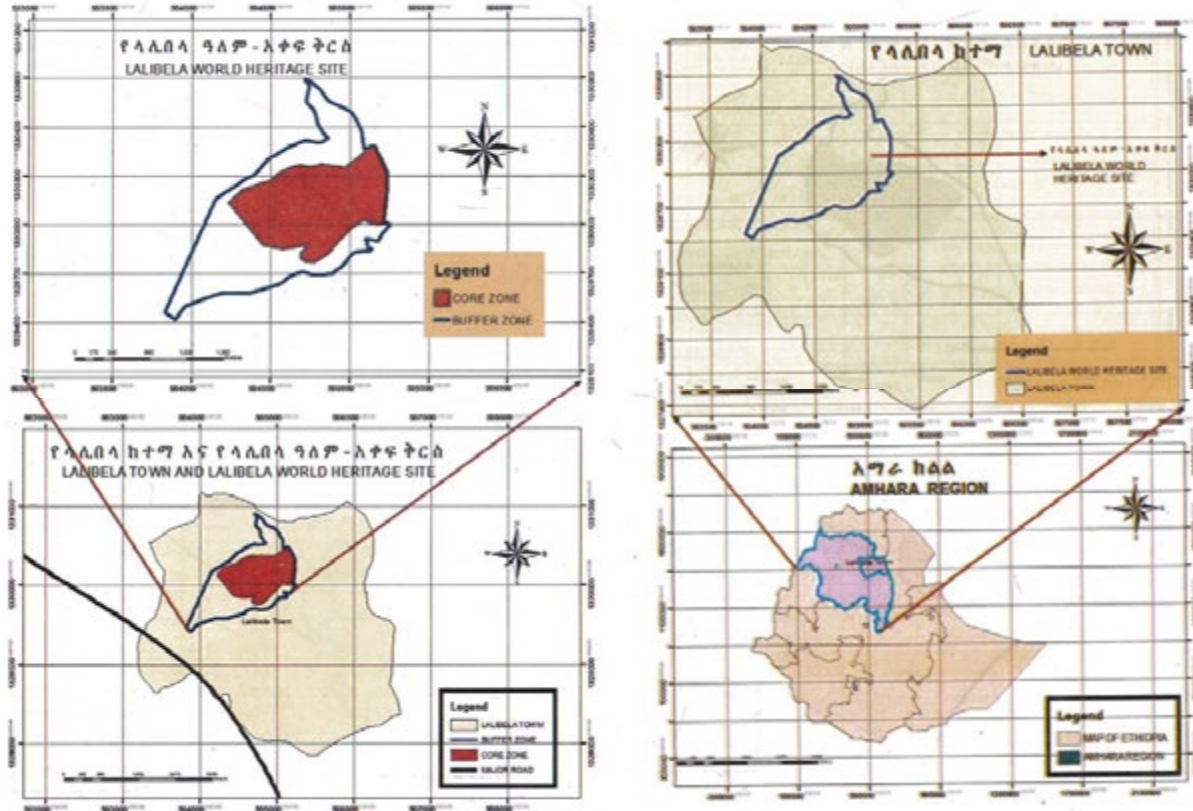
Religious persecutions in Mecca, Arabia resulted in Muslims seeking refuge in Ethiopia, as instructed by prophet Muhammad. The Axumites protected those seeking refuge from returning to their home countries. Today one sees a dominance in the Muslim population residing in Eastern Ethiopia.

Protestant Christianity

The Orthodox Christians form part of the largest group of Christians in Ethiopia while the Protestant are the second largest which can further be divided into sub-categories of Evangelicals and Pentecostals. As the concentration of Islam is in the east, so to is protestant Christianity concentrated in the Southern Regions.

Other

Additional religious groups exist however they are a minority in the country. These include Waaq, Judaism, Roman Catholicism and the Baha'i practice.



Maps of the property and buffer zone (Annex of Council of Ministers Proclamation 344/2015)

BRIEF HISTORY OF LALIBELA

The site is located in the northern region of Ethiopia in the Amhara Region. Lalibela in particular is one of Ethiopia's most sacred and holiest towns. A large portion of the population located in this region is Ethiopian Orthodox Christian. The landscape is mountainous and is roughly 645 km from Addis Ababa.

Often referred to as the 'New Jerusalem', Lalibela was founded by King Lalibela of the Zagwe dynasty in the 12th century during his reign. The act of construction is still to this day shrouded in mystery as many believe the site was built by 'Angels'. Other studies show the influence of craftsmen from Egypt, Jerusalem and India.

The rock-hewn churches in Lalibela Ethiopia have been at the forefront of sites identified by UNESCO, making the list of World heritage in 1978. The conservation of Lalibela as living heritage is continuously under consideration and garners international support because of its significance and magnificence. It is a site which brings in the highest economic activity as a socio-economic activity in the Amhara region and Ethiopia. Because of this it serves as a tourism resource for the region and country.

Lalibela is considered as living heritage because the site and churches are actively in use today by the locals and church goers, which use the site as a place of worship. Culturally Christianity sits at the core of religious practice and is almost perceived as a way of life for the locals.

A component which is often conversed about is the tangible and intangible characteristics of the site. The preservation of these characteristics are also key. Lalibela gained its position with UNESCO and ICOMOS because of 3 primary reasons of nomination, the first criteria being the "unique artistic achievement, due to their scale, variety and audacity in form" (Elene Negussie, 2010) The second justification is due to the site being an alternative destination for pilgrims and the third reason being the "Unique testimony" to civilization in Ethiopia in the conception stages.

As part of the interpretation of Lalibela, one recognises that these churches and site have distinctive features.

The beauty and mystery of these churches remain in their positioning underground, making their visibility very limited and dependent on proximity to site.

There are several theories as to why the churches are positioned underground. One being as a protection tactic from invaders and 'wars'. Having the churches built in the face of a mountain would be more visible thus easier for those seeking to overrun the site.

King Lalibela is said to have gone on several explorations. Jerusalem is one of the sites he visited, which serves as the primary influence and inspiration for the site Lalibela. As many would never have the opportunity to make the pilgrimage to Jerusalem in Israel, Lalibela served as a site for the devout Christians to visit as it possessed as much significance.

Lalibela was one of a few sites selected to be listed in the World heritage list in 1978. They still maintain their position in the World heritage list. The site is constantly under review for conservation and preservation strategies.



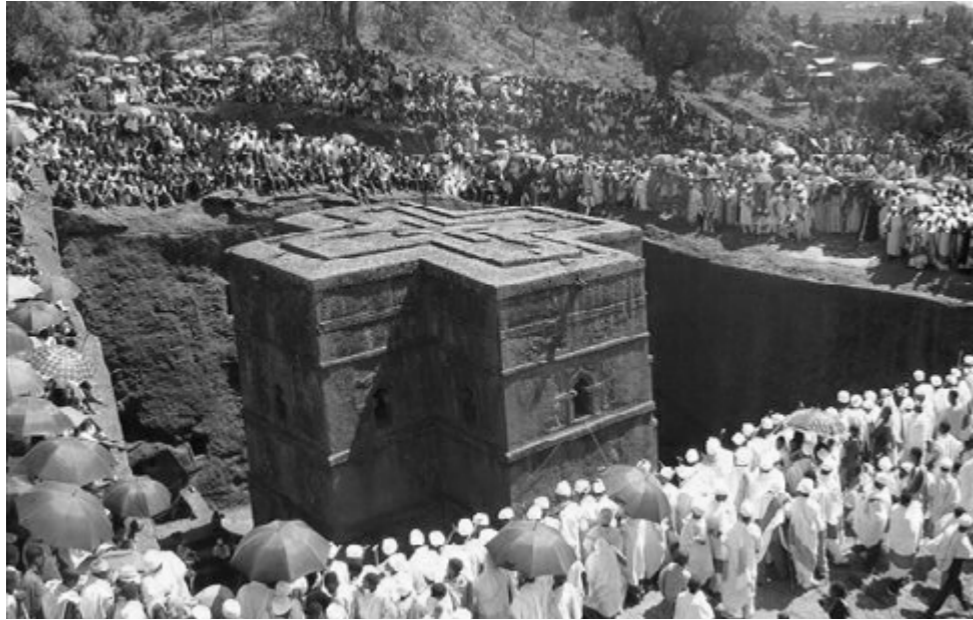
International Fund for Monuments, inc., 1967

PILGRIMAGE

A Pilgrimage is a journey a person goes on to connect to ones faith or self. Generally many Ethiopians aspire to complete this journey to Lalibela at least once in their lives. The following images display the procession of these 'events'. The site is used on an everyday basis and continues to cater to worship goers for Sunday services.



J.Countess, 2016



Ethiopian sky, 2015



Pappone, 2012



UNESCO public domain photograph, 2009



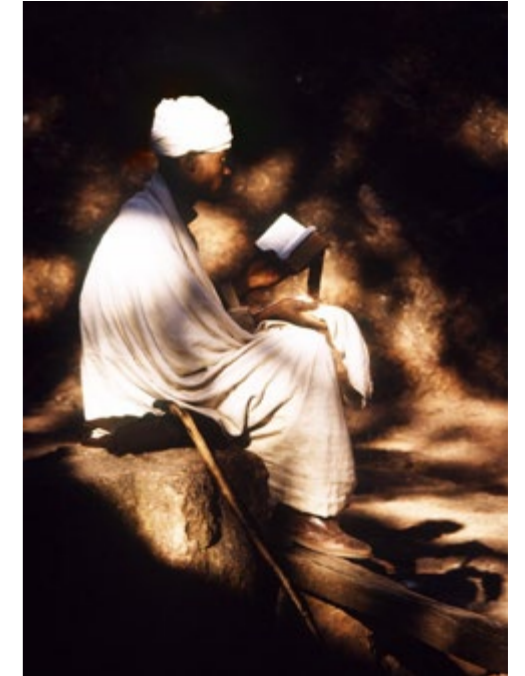
Kanashevich, 2017

THE ORAL NARRATIVE

The oral narrative and history of Lalibela is a component of the story telling that remains today. Story telling forms part of the documentation approach of many countries in Africa, Ethiopia being one of these countries. The narratives vary between the story tellers , however the approach of oral narrative remains consistent. It is a 'history' passed down from one generation to the next.

The story of a site relates to the believability of the events that have occurred. Today Lalibela as with many historical sites such as Jerusalem have stories which target the tourism industry. This narrative may differ from the knowledge retained by the locals living around the site. The coherence of this story in the physical and written space is a culmination of multiple historians, authors, architects and other professions observing and analysing the details of the churches themselves, potential timelines of stories, and a combination in the belief of both science and faith.

Francisco Alvares, a Portuguese missionary, is recorded as one of the firsts to have documented the Lalibela complex in the 1520's. Many details were omitted however he was able to translate the monumentality of the complex to international readers. This documentation was furthermore developed by the Italians during the Italian invasion and occupation of Ethiopia which lasted for a very brief period.



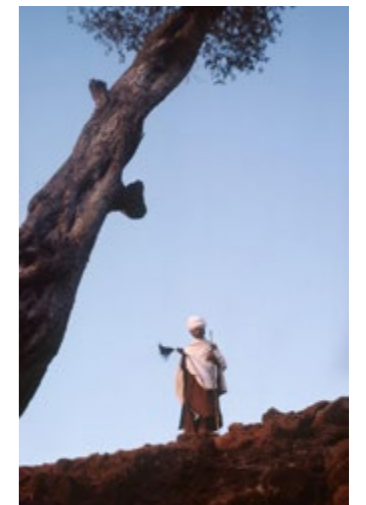
Coulson, David, 1985



Coulson, 1985



Coulson, 1985



Coulson, 1985

SITE ANALYSIS

Geography	34
Climate	36
Arrangement of site	38
Building identification	40
Geology	42
Trenches	44
Water control	46
Typology of structure	48
Construction	52



Stacy Tomczyk

GEOGRAPHY

Coordinates: 120 02.034N 390 02.611 E

Altitude above sea level: 2480m

Distance from Capital city: 700 km

33.3% mountains

53% plain

13.65% river valleys

Valleys, gorges, rugged mountains,

Plateaus and volcanic plugs.



Contours

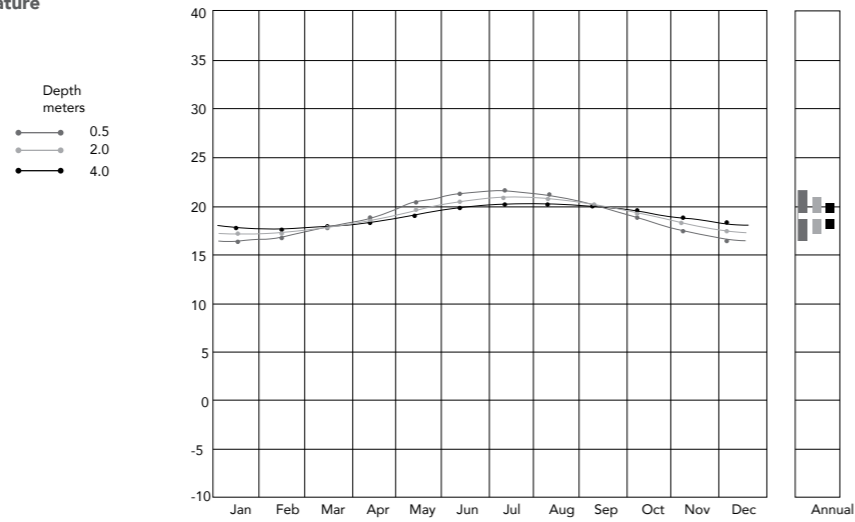
The churches located in the north follow the same alignment. The east-west orientation of the crest aided in the excavation process. The excavation of the churches sit in-line with the overall landscape and topography



Roads and paths

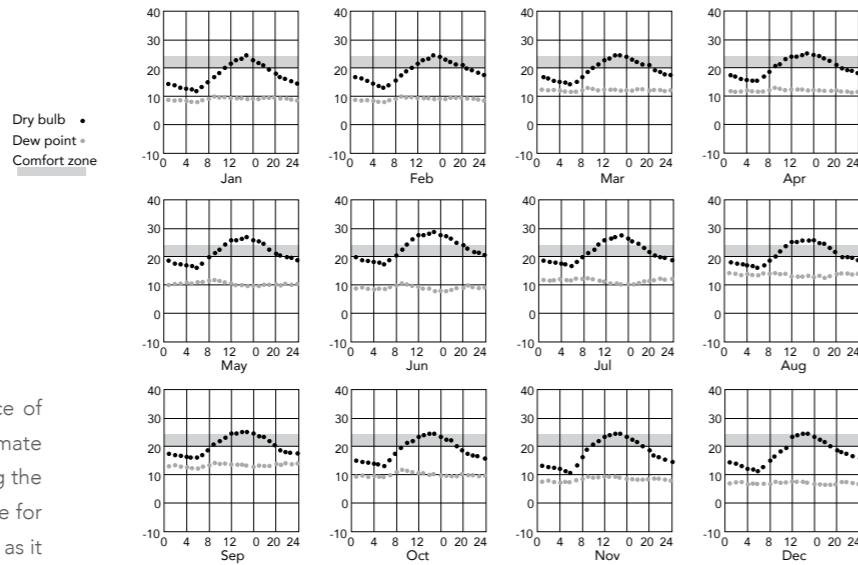
The navigation through the site can be separated into primary roads and secondary paths, many of the paths are facilitated by the trenches on site.

Ground temperature



As the complex sits on a subterranean level, it is important to understand what temperatures are presented there. A depth of 4m has recorded temperatures between 18 and 22 degrees. The deeper one goes, the less range in temperature is presented.

Dry bulb x Dew point

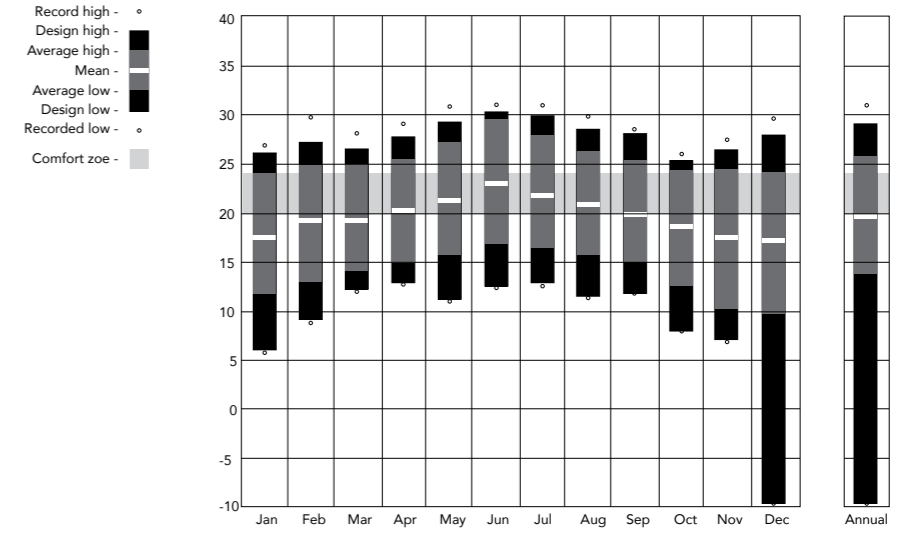


CLIMATE

The conditions of a site have an influence of the construction and use of a site. The climate of Lalibela has been assessed below using the tool, 'Climate Consultant'. The weather file for Combolcha (swera 633330 wmo) was used as it was the closest recorded file to the site.

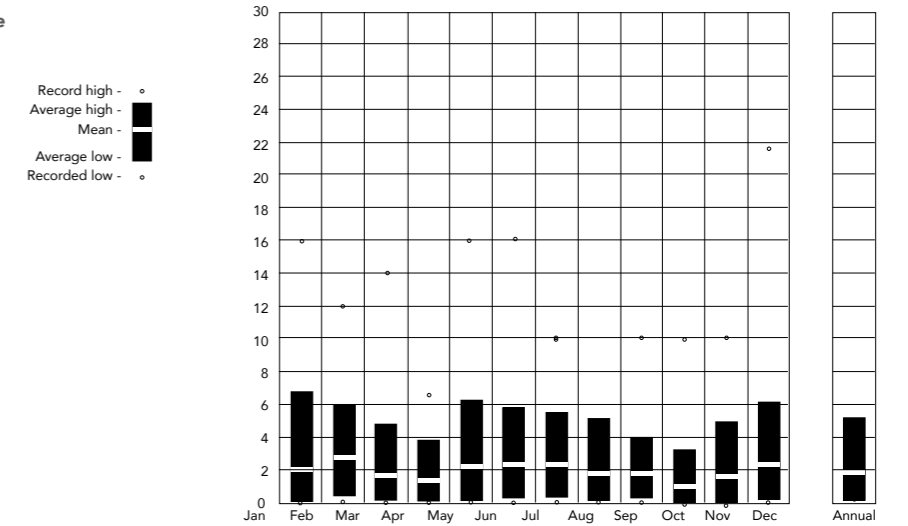
The Dry bulb sits at the highest range of the comfort zone between the winter months, this ensures adequate conditions of comfort. However, during the summer period this marker sits above the comfort zone, additional measures need to be taken to ensure comfort.

Temperature range



The average temperature sits at a 18-24 range with the highest records above the 30 mark. The average lowest temperatures are recorded at 10. A good comfort level is present during the spring and summer seasons.

Wind velocity range



Wind is a component to be considered when assessing the additional sheltering structures on site. On average the wind sits at a low - neutral velocity, with the odd events of recorded highs.

ARRANGEMENT OF SITE

- Buffer zone
- Core
- Surrounding context



The complex is categorised under 3 groups, The first group is composed of 6 churches while the second group has 4 churches and the third, 1. The Jordan river, named from that which runs through Jerusalem in Israel separates Group 1 and 2 with group 3 sitting on the same side of the river as group 1.

BUILDING IDENTIFICATION

Group 1

- 1 Biet Medhane-Alem
- 2 Biet Mariam
- 3 Biet Maskal
- 4 Biet Danaghel
- 5 Biet Debre-Sina
- 6 Biet Golgotha

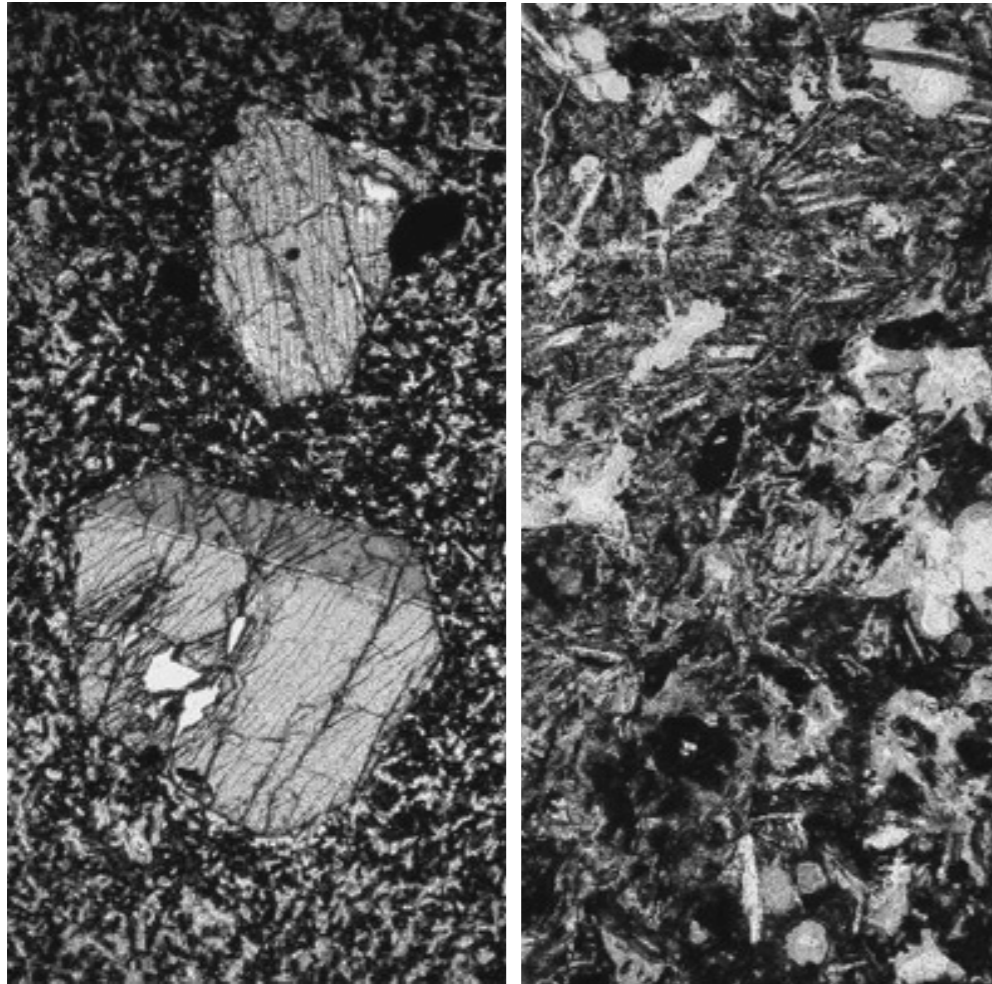
Group 2

- 7 Biet Emanuel
- 8 Biet Mercureos
- 9 Biet Abba Libanos
- 10 Biet Gabriel Ruffael

Group 3

- 11 Biet Giorgis





Delmonaco, Giuseppe & Margottini, Claudio & Spizzichino, Daniele, 2009

GEOLOGY

As a project composed of geomorphology, the primary ground type found is Basaltic rock which has emerged from volcanic tuff. This rock type determines the accuracy and speed at which the churches are carved.

This basaltic rock is tougher than the sandstone used to carve the churches further north in the Gheralta mountains yet is softer than the granite used to carve other churches in the south of Ethiopia. Iron tools were used to excavate through the stone.



- Building
- Gray gravelly silt
- Moderately weathered scoriaceous basalt

- Moderately-highly weathered scoriaceous basalt
- Massive basalt
- Excavated material

The site is one with geomorphological constraints which were encountered by the original carvers.

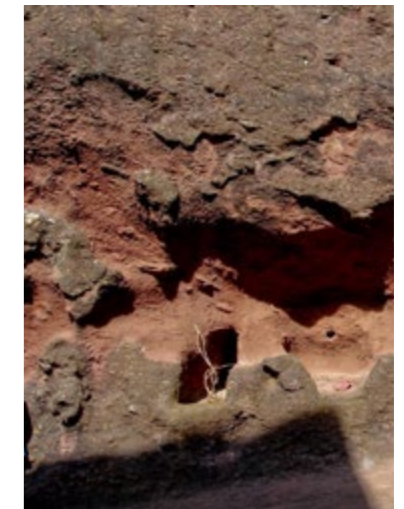
Description of rock:

The fused basaltic ejecta is compact yet has properties which provides an ease for carving. The resistant basalt below the scoriae acted as a limit of the depth of where development should stop.

The direct area of Lalibela is composed of scoriaceous basalts, silt and clay soils. The harder basalt was avoided.

The entire environment of Lalibela displays dark coloured basalt rock. Scoriaceous basalts (reddish brown hues) only appears in the church complex

The decision of where to carve and situate the different churches reflects a high level of knowledge of the site from those constructing in the past.





TRENCHES

The trenches located on the site serve various functions. The first being water drainage. As the churches sit on a subterranean level, the trenches allow for a flow of water from the higher levels of the ground towards the river or catchment areas, to be used during the dry seasons.

Another fundamental use for the trenches is the creation of passageways and routes allowing access into the different courtyards and churches.



Ruther Heinz, 2008

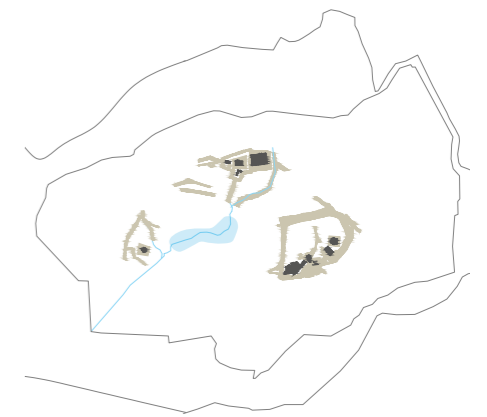
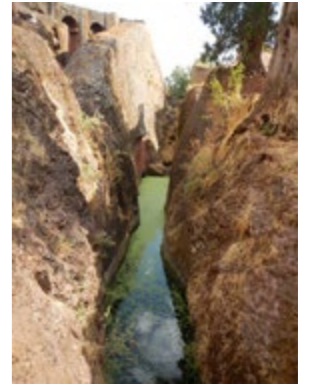


Martin, 2016

WATER CONTROL & HYDRO ENGINEERING

Water control is an extremely important aspect of this complex, The positioning of the tunnels and passages of the churches are all interconnected and direct the water flow down. Aspects of religion and water are also intertwined on the site.

The water which runs through the site is said to be holy- water. The basaltic rock is porous however a distinction should be made between the water absorbed by the buildings and the water which runs past and through the structures.



The Jordan river is an artificial gorge which serves as a body of water which separates the north and south groups. In addition it assists with the drainage system for the complex. There are a few tributaries which flow off of this. Each grouping of churches, primarily the principle churches have a collection pool where the water collects before progressing to the Jordan river.

This most often occurs in the wet season. The depth at which water travels became a determining factor of how deep the tunnels, passageways and churches would be. Water in Lalibela controls the economy of religion, agriculture as well as the socio- economic economy.

TYPOLGY

Typologies of Rock Hewn structures

■ Present on the Lalibela site

Diversity of types according to morphology		On Vertical cliffs	On Low gradient and plain			
Evolution of types		Natural or artificial cliff types 1	Pit type 2	Lineal type 3	Court type 4	Monolithic type 5
BASE TYPES	Hewn-out cavities or carved rocks C	Hypogea on cliffs: cavelike, lobular, cell like, chamberlike Aperatures on natural or artificial cliffs Monk Caves - Petros and Paulos	Pit hypogea: Pit like or chamber like burials, votive shelters, sacred wells Spring of Biet Giorgis	Lineal rock structures a) on Surface: ditches , drainages, gutters: semi arched trenches, lineal ditches, tagliata b) Underground: Tunnels, cunicula, drainage galleries, Runways, passages	Rock-hewn courts: pit type, lobedtype, or-thogonal type Semi-rock dwellings in ditches and hypogean courts Pre Christian hut floors Biet Gabriel	Mobile and in situ monolithic structures: Menhir, stelae, obelisks and monolithic rocks hewn or chiselled Monolithic cross, entrance to eastern group
INTEGRATION OF BASE TYPES	Hewn-out cavities or carved rocks on different matrixes D	Mines and Quarries. a) on cliff b) ditch b1) open sky Biet Gabriel b2) underground c) tunnels				
		Cliff dwellings Village Entrance Eastern Group	Trenched Villages Eastern group	Villages in court quarries and monoliths Court of Biet Gabriel		
ELABORATION OF ORIGINAL TYPES	Works of art, hydraulic or productive structures in cave architectures E	Rock art inside natural or artificial cliff hypogea: Frescoes, sculptures, vaults, masonry structures, workplaces, Architectural structures, water collecting wells, cliff face cisterns, fountains, beehives, dovecotes Yemerhane Christos	Rock art inside ditch or gallery hypogea: Tumuli, dolmens, rainwater harvesting on slopes, wells, cisterns and snow pits, water gatherers and dispensers, aqueducts, cess-pits, nimphaea, ritual bathing rooms, monumental entrances, siloses, stairs and fortifications, Spring of Biet Giorgis, Biet Gabriel collectors Adams Tomb	Rock art in court hypogea: Architectural structures, impluvia and megarons, hypogean courts, workplaces Millstone of Biet Gabriel	Rock art inside monolithic structures: Graffittor paintings in monoliths Paintings and relieves in the churches of Lalibela	
EVOLUTION OF BASE TYPES	Hypogean architecture by subtraction and modelling F	Cave-shape architecture: Cave dwellings temples and hypogean churches Biet Danaghel	In ditch hypogean architecture: Dwellings, hypogean temples and churches in ditch. Complex ditches ditches and chambers. Multi-level burials hypostyle hypogean structures Biet Mercureos archaic phase	Hypogean court architecture: Court hypogea with spread monolithic rocks. Covered galleries. Court of Biet Gabriel		
	Hypogean architectures with rock hewn or built-up facades G	Cliff face hypogean architecture: Vliff hypogea with carved or built up monumental facades Biet Maskal		Semi-monolithic hypogean architecture: Complexes and monuments with sculptured facadees on more sides but anchored to the bedrock, under cover or cliff Biet Gabriel; Abba Libanos, Biet Golgotha, Biet Lehem		
	Three dimensional hypogean architecture H			Monolithic Hypogean court architecture: Monolithic complexes with roof and four sides free from the bedrock. Biet Mariam, Biet Giorgis, Medhane Alem, Biet Emanuel		

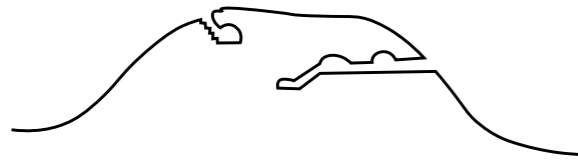
(sourced from: Pietro Laureano, IPOGEOA and adapted thereafter)

TOP VIEW OF THE 3D LASER SCAN MODEL

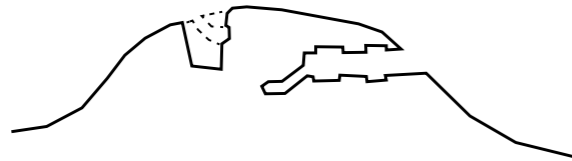
Produced by Zamani Project



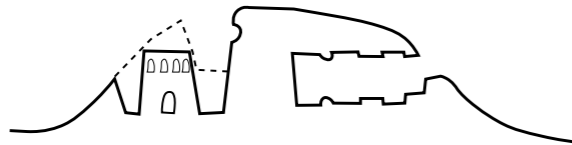
Rock-cut stratigraphy: Sequencing the Lalibela churches



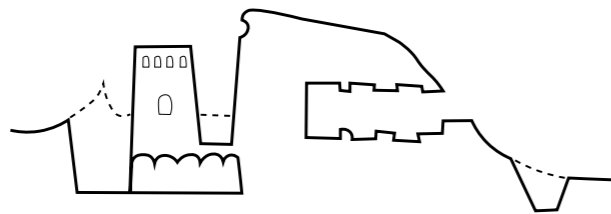
TROGLODYTIC PHASE



HYPOGEAN PHASE



MONUMENTAL 1 PHASE



MONUMENTAL 2 PHASE

Lalibela: A synthetic generalised diagram illustrating the phasing of Lalibela proposed in this article (F-X Fauvelle- Aymar & R Mensan)

SEQUENCE CONSTRUCTION OF INDIVIDUAL CHURCHES

There are no confirmed records accounting for the chronology of construction of the individual churches. There are however indications of Biet Giorgis being the last church constructed within the complex.

The churches are primarily monolithic as they use the process of carving from rock from ground level down. This requires the excavation of a trench which further develops into the detailing of entryways, arches, alters, stairs, doors etc.

The first stage is comprised of tunnels and entrances. Transformation has led to the Hypogean phase which sees galleries being transformed into larger chambers with an increase of spatial conditions such as roof height and floor area. Pillars and doorways were also added to this phase which can be identified as ornamentation. At a later stage open-air courtyards and trenches were integrated. These lead to the interior spaces.

Technically a gradual process of detachment was used as opposed to the removal of large blocks. This process ensures for an ease of development and a more detailed result.

The construction process can also be considered as in-situ. The remaining material from the removal process defines the spatial conditions. It considers the conditions of void and mass.

The complexity of any new adjustments to the site is made by the belief that the previous structures were carved by the Angels. As the soil on the site is holy, all changes are managed with most stone needing to remain on site when excavated.

The feasibility and approach to construction remains under question as various academics, historians and archaeologists have differing perspectives on the date of construction and manner of construction. There are certain facts in place with the knowledge that the churches were built when king Lalibela was in power with the influence of the Aksumite empire. Today many locals attest to the fact that the churches were built by the Angels.



Bernard Gagnon, 2016

CONSTRUCTION. RELIGION OR SCIENCE?

Carved forms are not unfamiliar to the archaeological world. Other such examples include Petra in Jordan and Kailash Temples in India. Lalibela presents one of the only situations where the construction has been carved from ground, below into the earth's surface. There is a phenomenon attached to how the churches were constructed.

Oral history and the proposition of the churches being built by Angels guides the belief of the site. Counter acting this narrative of angels is not received well with the locals. The chronology of the churches also raises questions and is not completely documented because of the narrative. In the Tigray region there are several examples of churches which have been cut from the rock. The Aksumite 'landscape' has had a large influence on the appearance of the churches at Lalibela. The scale, wall construction, openings all take influence. A construction process termed 'the monkey head' system where there are courses of masonry and wood are all apparent.

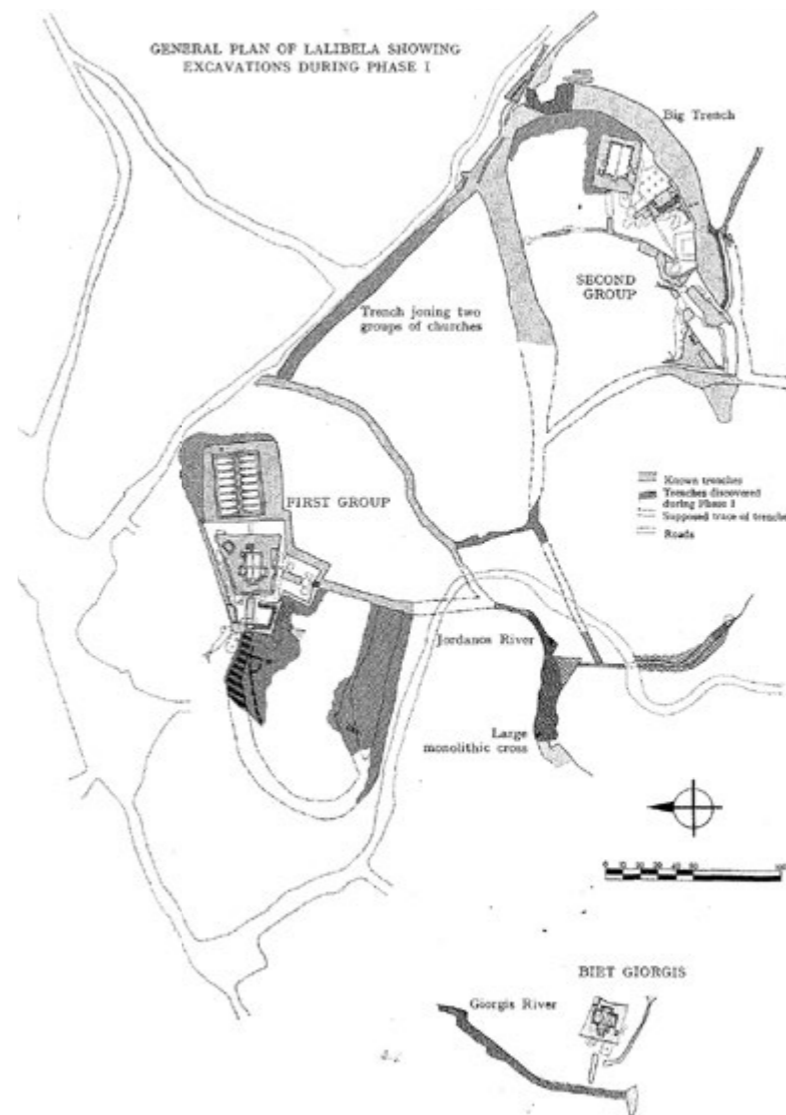
A theory spoken by Tadesse Girmay, of whom was interviewed, highlights an incident of structures burning from the timber. This resulted in both the Aksumites and those living around Lalibela returning to a construction which only involved the rock and omitted timber. "Wide foundations, recessed ground plans, chamfered columns, distinctive window and door frames inter alia all appear to be themes borrowed from the secular, indigenous architectural canon, and are adapted to the usual mediterranean liturgical space: the basilica; these motifs reappear later in the context of the rock-cut churches." (Finneran, 2009)

Several considerations would have been made when carving the monolithic structures. As the only material of construction was rock, the carvers would have needed to assess how close to the skin of the structures to carve, as to not disrupt or jeopardize the overall structure of the churches.

It would have been a process of removing from the solid mass to create voids to inhabit. Many of the churches use either internal or external columns as an architecture element to hold up the roof.



International Fund for Monuments, inc., 1967



International Fund for Monuments. Lalibela Phase - 1

Published in 1967, the book Lalibela Phase I, Adventure in Restoration, produced the two graphics on the page. Both an indication of the excavations during the initial phase.

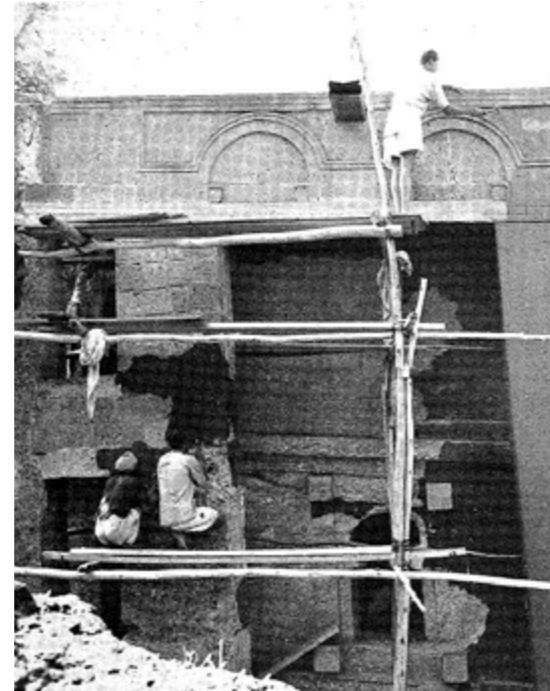
PRELIMINARY

Major interventions on site	60
Specification of churches	62
Interiors [Images]	74
Object	78
Material	80
Urbanization	86
Tourism	90
Musealization	92
In conversations with Tek and Tadesse	96
Site selection	98

MAJOR INTERVENTIONS ON SITE



UNESCO mission report, 2007



International Fund for Monuments, inc., 1967



UNESCO WHC Archives



C. Bosc-Tiessé/CFEE, 2009.



Year
Action
1950s

Disappointment of local community
1. Community exclusion in planning
2. Material integrity compromised

1966-77

A team of five technicians from Bergamo, Italy undertook preservation work on the site.

1989

Framed wood and corrugated iron roof sheets.
UNESCO & Ministry of Culture of Ethiopia
Perception:
A success by the local community and clergy
-Simplicity
-Reversibility
Objective:
Save mural paintings and reliefs

2007/8

Controversial
Fund from the EU
- water management
- Presents dangers to the churches
- Heavy structures
-Dominates Landscape
- Exclusion of community

2009-2015

A program was launched to introduce 'alternative and less visually intrusive conservation methods.' which can be taught to and replicated by a group of craftspeople which would further enforce the conservation work.

SPECIFICATIONS OF CHURCHES

Church	Length (m)	Width (m)	Height (m)	Columns Exterior	Columns Interior	Windows
Biet Medhane Alem	33.50	23.50	10.00	34	38	51
Biet Mariam	15.00	11.00	10.00	6	6	40
Biet Maskal	14.63	2.47	3.55		4	4
Biet Danaghel	9.88	8.77	4.17	1	4	1 (blind)
Biet Debre Sina	9.73	8.90	5.53		4	26 (for complex)
Biet Golgotha	10.30	6.42	4.60		4	
Biet Gabriel- Ruffael	19.50	17.50			7	5
Biet Mercureos	31.00	25.00	6-8	8	10	8 (not original)
Biet Emanuel	17.5	11.5	11		4	53
Biet Abba Libanos	9	7	7		4	35 (15 blind)
Biet Giorgis	12.5	12	12		4	21 (9 blind)

Yerukmisrak Kebede, 2008



Hart, 2010

GROUP 1



Biet Medhane Alem
33.50 x 23.50 x 10.00



Biet Maskal
14.63 x 2.47 x 3.55

GROUP 2



Biet Emanuel
17.50 x 11.50 x 11.00



Biet Mercureos
31.00 x 25.00 x 6-8



Biet Mariam
15.00 x 11.00 x 10.00



Biet Danaghel
9.88 x 8.77 x 4.17

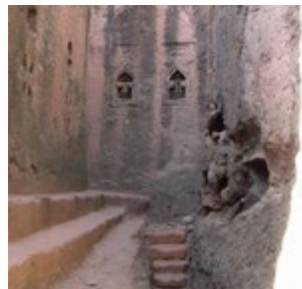


Biet Abba Libanos
9.00 x 7.00 x 7.00



Biet Gabriel- Ruffael
19.50 x 17.50

GROUP 3



Biet Debre Sina



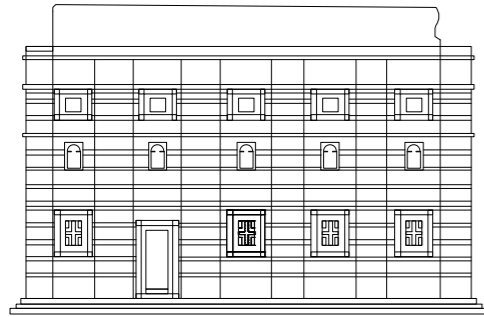
Biet Golgotha



Biet Giorgis
19.50 x 17.50

BIET MEDHANE ALEM

33.50 x 23.50 x 10.00



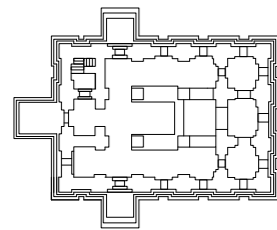
Name Translation

House of World Saviour

Description

Recognised as the largest church on the site. It is measured at 11m in height with a total of 72 pillars of which 34 externally and 38 Internal. There is a total of 51 windows. This church is also surrounded by a courtyard. It presents a rectangular form. The roof is recognisable as it decorated with ornamentation in a carving process which are also architectural motifs. The Roof pitch follows the slope, while a centre line determines the double slope which feed off of it. The ornamentation is in the form of crosses.

Exterior columns of all sides of church, gabled roof, projected eaves, two window rows (decorated), 3 doors (north, south,



Type

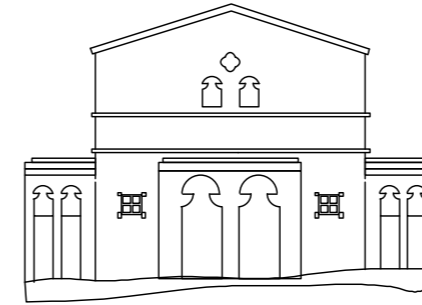
Monolithic

Characteristics

- Interior walls do not have any carved decoration.
- Nave, 5 aisles, 8 bays, narthex
- Room only accessible to priests and deacons
- Flat ceiling in aisles, nave has barrel vault,
- 4 rows of pillars, interior pillars have ornamentation.
- 3 empty graves/ tombs,
- crosses on windows

BIET MARIAM

15.00 x 11.00 x 10.00



Giovanni Lami, 2007

Name Translation

House of Marry

Description

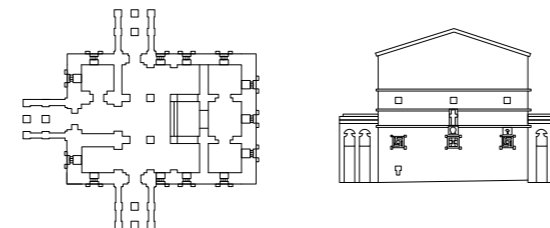
A seven room church surrounded by a courtyard. Biet Mariam is located centrally amongst the 1st group. A rectangular pool exists in the ground of this courtyard. It presents a rectangular form. The windows on the higher level are plain, without decoration whilst the lower windows have crosses and additional ornamentation. As part of the preservation strategy a steel shelter was added to this church.

Type

Monolithic

Characteristics

- Exterior porches and mural paintings
- Three projected porches
- 9 variety of crosses
- 3 entrances (west, north, south)
- Cruciform shape
- Flat roof on porches
- Axumite style monkey-head doorway
- Arches in porch entryways
- From Bete Medhane Alem courtyard.



BIET MASKAL

14.63 x 2.47 x 3.55



Chuck Moravec, 2016

Name Translation

House of the Cross

Type

Semi-monolithic

Characteristics

- Small gallery, two aisles, 4 pillars
- Relief crosses as decoration
- Hypogea architecture with rock hewn or built-up facade

Description

One of the smallest churches and worship spaces, appears to be grotto like. It is located on the north side of Biet Mariam. This church is south facing with only 1 facade. The facade is recognised as having 10 arcades. Crosses are also used in the relief of the facades. Two doors are visible from the exterior, they are of the Axumite style, (monkey-head system). Backroom accessed by left door, Interior access from right door. There are a total of two windows in the facade.

BIET DANAGHEL

9.88 x 8.77 x 4.17



ashtronort, 2015

Name Translation

House of Virgins

Type

Semi-monolithic

Characteristics

- Lacks ornamentation
- Hypogea architecture by subtraction and modeling

Description

Located on the south end of Biet Mariam, this structure is supported on 4 columns. This space often fills with water, hence the addition of a door. Alternatively one can refer to this space as a grotto as it is the most primitive of the Lalibela complex churches

BIET DEBRE SINA

9.73 x 8.90 x 5.53

**Type**

Semi-monolithic

Characteristics

- Bas-relief figures
- Multiple altars

Description

One of the more secretive sites in Lalibela. This is due to its significance within the religious realm. Both Debre Sina and Biet Golgotha are linked to one another and often spoken about together. Together they can be referred to as Biet Michael

BIET GOLGOTHA

10.30 x 6.42 x 4.60

**Type**

Semi-monolithic

- The tomb of king Lalibela

BIET GABRIEL-RUFFAEL

19.50 X 17.50

**Name Translation**

House of the Cross

Type

Semi-monolithic

Characteristics

- Monumental front facade
- Axumite in style
- Open sky quarry

Description

The original entrance of Biet Gabriel is still undetermined. However a long bridge facilitates access across the long trench. There is the presence of hypogea architecture by subtraction with modeling within the court. Prior to being defined as a church, there were considerations of this building serving other functions.

BIET MERCUREOS

31.00 X 25.00 X 6-8



Ruther, 2006

Name Translation

House of Mercureos

Type

Semi-monolithic

Characteristics

- Underground structures
- Undergone restoration
- Hypogean architecture by subtraction.

Description

It is visibly apparent that Biet Mercureos has undergone extensive work as it presents many damages. Like Biet Gabriel, this church served another function before being used as a 'holy' space.

BIET EMANUEL

17.50 X 11.50 X 11.00

**Name Translation**

House of Emanuel

Type

Monolithic

Characteristics

- Walls which are recessed and projected
- Axumite in style

Description

This church is one of the easily recognised facades due to the detail in facade. It is of considerable dimension. The interior plan is similar to that of two larger churches in the first group. There is a central nave on the interior of this church. The roof is currently in a negative condition with the rest of the church also at risk of deterioration.

BIET ABBA LIBANOS

9.00 X 7.00 X 7.00



Bernard Gagnon

Name Translation

House of Libanos

Type

Semi-monolithic

Characteristics

- monumental front facade
- Construction located beneath a layer of rock

Description

Different from the other churches presented, Abba Libanos has one primary facade which is ornamented with openings. There is a carved corridor which is accessible from the sides of the church and travels to its back. The Roof of this building is in a natural rock state which has not been disturbed.

BIET GIORGIS
12.50 x 12.00 x 12.00**Name Translation****Type**

Monolithic

Characteristics

- Isolated church
- Hewn-out, Pit type spring
- Works of art, hydrolic or productive structures in cave architecture

Description

This church is undoubtedly the most recognised and celebrated church in the complex. Access is given via trenches and passages. The cruciform shape resembles the continuous motif of the cross exhibited throughout the complex. The windows utilise the monkey head system. The roof also reflects the process of carving which is easily visible by visitors.



Lalibala: Church of the Redeemer Diagonal Int. view Rock-cut Church Nave. (n.d.).

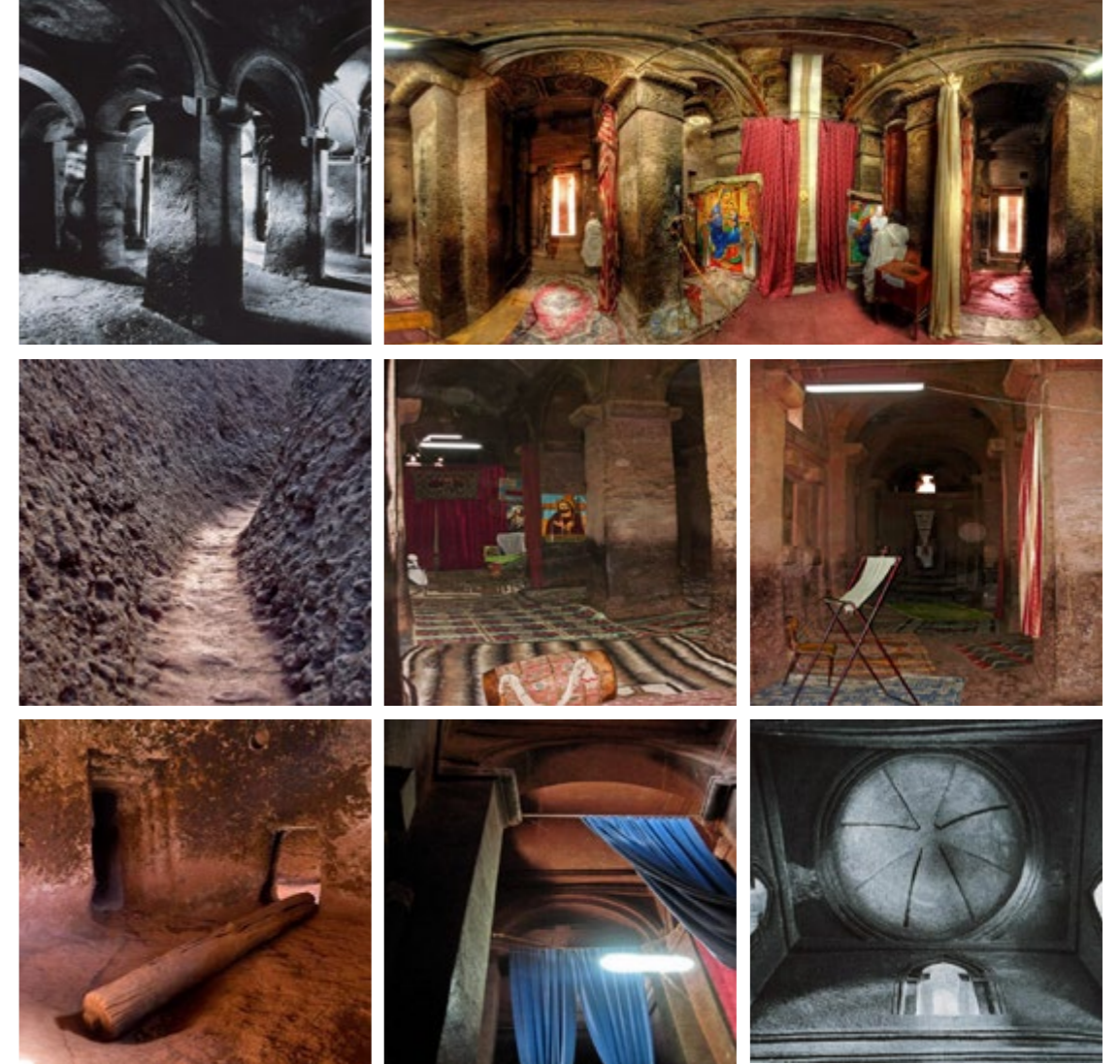
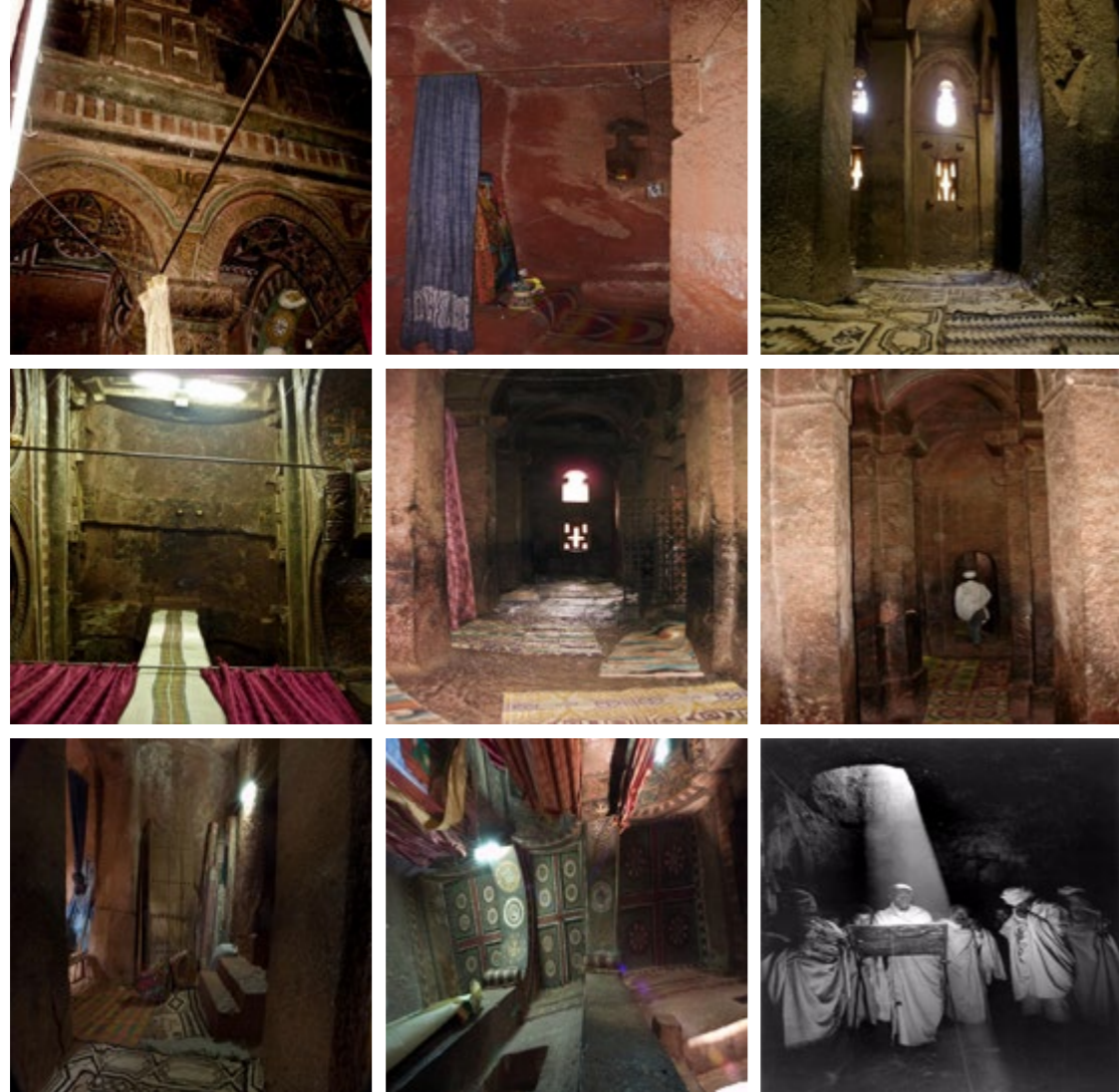
[Images]. <https://jstor.org/stable/community.13918895>

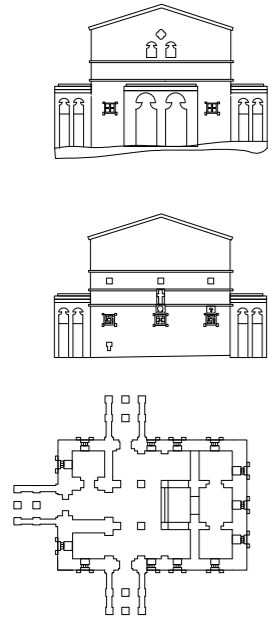
INTERIORS

There is a clear division between the interior spaces and exterior. The rooms which are sheltered with a roof sit within the extreme interior while many of the courtyard spaces possess interior qualities, although absent of a roof.

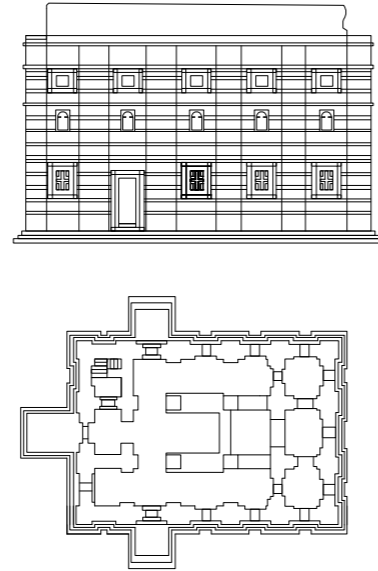
The most interior rooms are used to store and display sacred artifacts. Very often the exterior rooms are used for ceremonial purposes.

Another fundamental use for the trenches is the creation of passageways and routes allowing access into the different courtyards and churches.

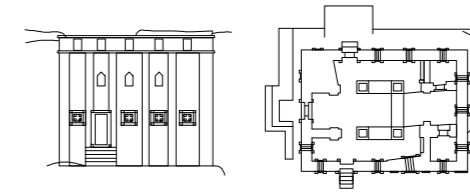




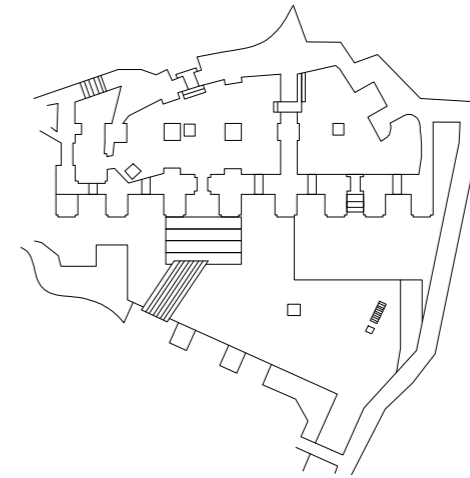
Biet Mariam



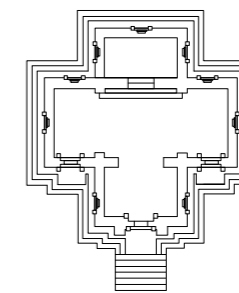
Biet Emanuel



Biet Abba Libanos



Biet Gabriel- Ruffael

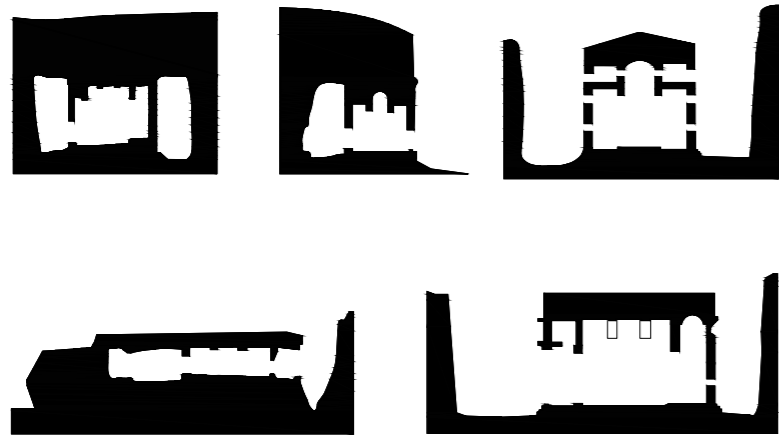


Biet Giorgis

BUILDING AS OBJECT

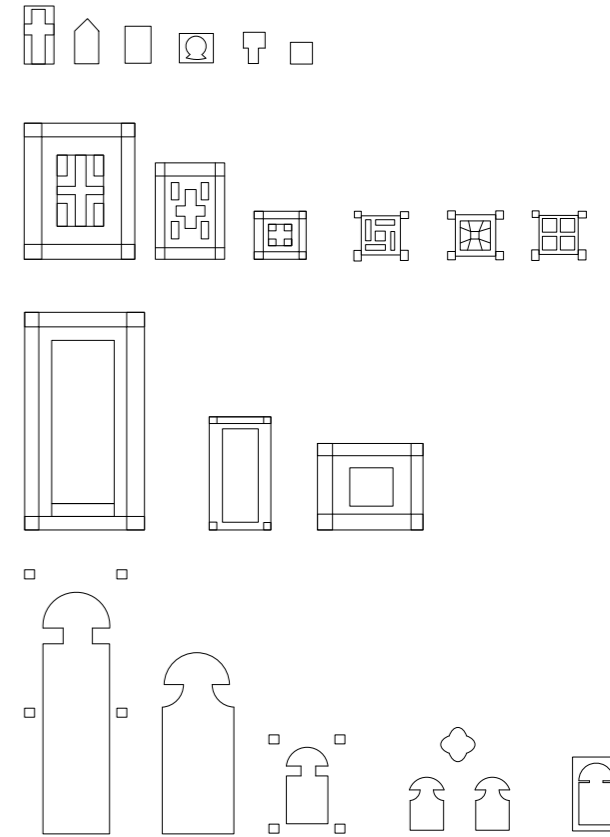
Each building as a 'sculpture' can be viewed as an object which sits in composition with the entire complex. Certain architectural elements which are present in these structures are visible in Orthodox Axum architecture. While assessing the overall object, one highlights components of a site of faith

such as the overall structure, alter points, entrances, processional routes and open spaces versus more intimate spaces.



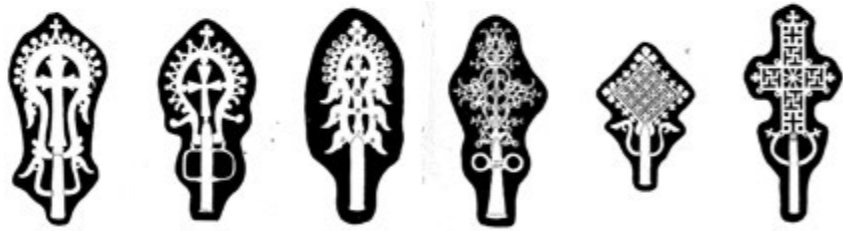
Ceiling section profiles

In the process of carving, one gains a greater understanding of the 'voids' of significance based on the surface heights and form of the roof. The visible roof forms are flat, domes and vaulted. Some of the roofs are supported by columns and archways.



Openings

The openings on the site serve as physical, visual and light access into the interiors of the churches. Above one can see several typologies of openings identified on the different churches, many of which are typical in Axum architecture. These drawings have been made proportional to the particulars being compared.



International Fund for Monuments, inc., 1967

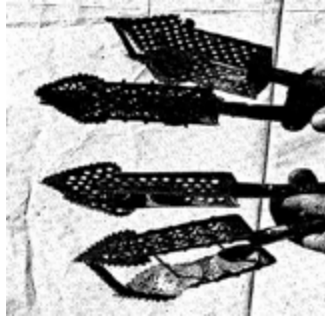
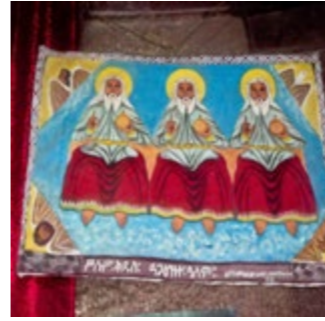
OBJECTS OF SIGNIFICANCE

Ecclesiastical objects, objects which refer to or related to the church, have great meaning within the practice of faith. These range from robes, paintings, crosses, black and silver artefact's, scrolls etc. These objects are still used in practice today. A few objects have been under security risk and have been stolen which continues to be problematic for the complex.



International Fund for Monuments, inc., 1967

Artifact as object | A Shift in Scale



Movable antiquities:

- Processional hand crosses
- Bells
- Chandeliers
- Robes
- Turbans
- Paintings
- Artworks
- Ceremonial umbrellas
- Scrolls and manuscripts
- Crowns of Kings
- Silver and wooden cross
- Gold and Silver



Massimo Rumi , 2015

URBANIZATION RATES

The development of Lalibela has evolved over the decades. The site is benefited from the clear and widespread views of the surrounding areas, as mentioned prior the reasoning for this was protection from enemies, the hilltop also ensured protection during the flooding season. The site is also rich for cultivation.

The houses and residential components around the site initially started off as tukuls and huts.

Today they are still visible and used however, modern materials have been introduced such as concrete and corrugation.

The forms have also adapted from the circular shape of the hut to a rectangle. Lalibela acts as the nucleus of which development spreads out from either side of it in an 'organic' manner.

Other than the overall significance of Lalibela, focus has been placed on the built structures and the process of construction. Questions such as who was involved in the processes is considered. There is not always research focused on the people living in and around Lalibela.

Access to the site was restricted for a long period as the only modes of arriving to the site was via foot or mule. During a later period, around the 60's the construction process of a rough airstrip began. This allowed more people who were interested in the site, from far locations to visit. In the 90s minor roads were created which opened up the opportunity for vehicular access.

The site is situated in a densely populated residential area, which in the past years has undergone a resettlement strategy to alleviate the negative impact it was having on the site and monolithic structures.

Lalibela and the rock hewn churches is the nucleus in which development sprawls from in the four directions. The diagrams to follow show the growth and expansion during an earlier period. The urban footprint 'grew from an area of 1.22km² to 3.056 km².36 In 2015' The dramatic topography of the site is an added factor which indicates where expansion occurs. It is evident that the north is more feasible for agricultural and living thus experiencing the greatest growth.

The Ethiopian Sustainable Development Project (ESTDP) set out an intention with the World Bank between 2009 – 2015 to undertake a relocation strategy which relocated over 700 residents and households around the rock hewn churches in Lalibela to surrounding sites measuring a few Kilometers from the town centre.

The large number of households around the site was a result of increased tourism and as a result "small business opportunities" for the locals. Stalls for the sales of goods and cultural items relating the churches and Ethiopia brought in a profit. Restaurants and hotels were built to manage the increase of unsuitable activities, such as brothels and drinking sites, nears a site of religious practice and institute. The increase in people also triggered a negative impact on the site because there were not enough facilities and sanitation systems to serve a significant growth. After a large population increase and visible encroachment, at a point which started to damage the site, strategies to alleviate the pressure were established.



Photo: Radermecker, 2009



2006



2010



2012



2013



2014



2018



2020



2020-2006 Difference

Source: All images developed from Google earth

■ Growth in density
 □ Reduction in density



TOURISM

The economic development that Lalibela can provide for Ethiopia is constantly a point of consideration. How does the government capitalise on the cultural heritage asset? Hence the ESTDP being an initiative from the government. One such approach was through heritage and tourism. The relocation of many residents was in addition to everything else, reasoned as a way to **enhance the experience of the tourist**. Prior to the Global pandemic and Corona virus, Ethiopia set out a growth plan in their income status by 2025. Tourism was earmarked as one of the strategies.

Currently the greatest generators of income for Ethiopia is the service and manufacturing industry as well as the agriculture sector. The economic value of tourism prior to covid was marked at and generating "US\$2.9 billion annually contributing about 4.5% of the GDP. In 2016, 871,000 tourists visited Ethiopia". There is a desire to make Ethiopia one of the top travel destinations in Africa with a benchmark of bringing in 2.5 million. The ministry of culture and tourism is responsible for actioning out a strategy.



Airport built to encourage tourism



Current ticket office and museum on site



UNESCO WHC report, 2018
Current ticket office and museum on site

MUSEALIZATION

A musealization project which aims to create an environment which will exhibit and express the craft and formation of how the Lalibela churches were built. The museum is targeted at the tourism industry as Lalibela is one of the highest income generators for the economy in the Amhara region.



museum proximity to site

Category	Description	Responsibilities	Interests/expectations
Community	Home owners/tenants	Continued conservation of the built heritage of Lalibela	<ul style="list-style-type: none"> Improved living conditions Improved livelihoods
Institutional	The Ethiopian Orthodox Church Lalibela	<ul style="list-style-type: none"> Primary custodians of the main features of the WHS, the churches 	<ul style="list-style-type: none"> Limit damages caused to churches by poor waste management in surrounding area Improved church surroundings, better lodging for monks and nuns
Local Government	Lalibela Municipal Council	<ul style="list-style-type: none"> Primary implementing arm of government policies at local level 	<ul style="list-style-type: none"> Improved revenue from tourism receipts Improvement of infrastructural amenities for government To be able to exert political power on course of events In support of maintaining the landscape and its attributes
Regional Government	Amhara regional office of culture and tourism	<ul style="list-style-type: none"> Coordinates regional heritage matters under the federal system Coordinate with ARCCH in management in the management of Lalibela 	<ul style="list-style-type: none"> The effective harnessing of the cultural resources for the promotion of tourism and enhanced regional revenue Improved site conservation
Federal Government	The Authority for Research and Conservation of Cultural Heritage (ARCCH)	<ul style="list-style-type: none"> Responsible, in coordination with regional and local governments, for the implementation of the management and conservation plan of the WHS of Lalibela 	<ul style="list-style-type: none"> Interest in maintaining landscape as a cultural asset Improved site conservation Guidelines to ensure the effective management of the traditional buildings on the site UNESCO's primary contact for WHEAP
	Ethiopian Ministry of Culture and Tourism	<ul style="list-style-type: none"> Supervising ministry of the ARCCH Ensures coordination between heritage management and tourism promotion Hosts the World Bank ESTDP programme 	<ul style="list-style-type: none"> Primary interest is increasing tourism revenue Enhancement of national tourism receipts Has tourism in maintaining landscape as a tourism asset
Research interests	Ethiopian Institute of Architecture, Building Construction and City Development, Addis Ababa University	<ul style="list-style-type: none"> To develop effective architectural solutions to urban environments in Ethiopia 	<ul style="list-style-type: none"> Mandate to provide adapted solutions to Ethiopian urban development Favours hands-on, applied research
	Amhara Urban Planning Institute	<ul style="list-style-type: none"> To develop and implement local development plans for better living conditions 	To be determined (TBD)
	Craterre-ENSAG	<ul style="list-style-type: none"> Temporary secretariat of WHEAP and responsible for coordination of WHEAP activities 	<ul style="list-style-type: none"> Research in earth architecture/construction

Category	Description	Responsibilities	Interests /Expectations
Private sector/Civil society	Hotel Proprietors	<ul style="list-style-type: none"> Development of tourism facilities Entrepreneurship 	<ul style="list-style-type: none"> Encouragement of traditional building models in hotel development
	Non Governmental Organisations	<ul style="list-style-type: none"> Act as a bridge between government and civil society 	<ul style="list-style-type: none"> Identification and development of business skills in earth construction Forestation and 'greening' programmes
Development and International partners	UNESCO	<ul style="list-style-type: none"> Overall oversight responsibility for World Heritage Sites and programme coordination of WHEAP 	<ul style="list-style-type: none"> Successful implementation of WHEAP
	World Bank	<ul style="list-style-type: none"> Fund and supervise the ESTDP project 	<ul style="list-style-type: none"> Major road construction in Lalibela Enhancement of the quality and variety of heritage as a tourism product and services Increased national foreign exchange earnings, Job creation
	CHDA	<ul style="list-style-type: none"> Responsibility for regional training activities 	<ul style="list-style-type: none"> Involvement in coordination of WHEAP activities in the Africa region

Developed by Ishanlosen ODIAUA, 2010

The table indicates the various stakeholders involved in the Rock-hewn Churches in Lalibela. These are the entities which would require consultancy when designing a new construction. The Lalibela Interpretation Museum.

IN CONVERSATIONS WITH TEK AND TADESSE

TEKLEHAYMANOT WOLDESENBET

- There is a shortage of light in the area. A design that is inclusive of generators capitalize on South Light
- There are tunnels underground. However because of a lack of access these tunnels haven't all been mapped out.
- Alongside every plot there is an open ditch for the water to collect.
- in reality there is a short rain period. Between 2-3 months max per annum
- Large % of tourists are going into Lalibela out of the entire Amhara region. There is an airport located in Lalibela because of this
- x14 flights per day during the eclipse.

Who is your Client?

1. Ethiopian Orthodox Church
2. City administration = tourism board. Federal tourism minister
3. Private collectors museum

- There is a general rule for churches to be located on top of a hill, Could also be systematic positioning for combat. "An invisible complex"
- The churches are sheltered all the way around, with the earth surrounding

Both work and teach at the university in Addis Ababa
Video calls were had between myself, Tek and Tadesse in understanding the site and cultural practices in Ethiopia and Lalibela.

Tadesse Girmay, MA, Lecturer, Conservation of Urban and Architectural Heritage

TADESSE

- In general pictures are not allowed in the ticket office and downstairs museum. Old way of thinking
- Mixing of religion and science. Ambiguity between the two... references Robert Venturi's Complexity and contradiction in architecture
- Gap of information in mapping of the water system. Today there is mismanagement of these systems.
- The Walters Art Museum has one of the largest collections of artefacts from Ethiopia and Lalibela
- Construction process = the monkey-head system religious dimension of carving rock
- Mentions prominence of "new project on site" and scale. Visibility and dominance.
- Difference between display (museum) and storage. Museum insinuates its temperature regulated. Currently don't have this on site. asked me to consider open- air museum.
- Currently there is a local market every Saturday, close to the site, however this project doesn't have to have a relationship with the market.
- Honeydew museum = source of honey in the area +supports livelihood of the people.
- Museum related to Artefact. Religious aspect. Tangible and Intangible
- currently in conflict zone
- His own theory Pre-Axum it's and axumite period. When they were building out of wood and red masonry. Intact structure. Metamorphic rocks and timber cross sectionally. There was a previous issue with the previous construction of the timber burning... (being perishable) so the Lalibela people learnt to not include timber and only use rock, thus the buildings being monolithic. The axumites also practiced this way of construction at a later period. by fire and water
- They tried to copy those buildings but in rock. Must find places to carve in rock to carve, which is dependent of the type of rock. In extreme north there is sandstone and limestone where you also find cave churches. Which are softer than that at Lalibela. If you go to the extreme which is Axum the churches have been carved from granite. Where there is a strong civilization there is a possibility to construct.
- No dominance at all however museum needs to be Visible. "If it's not visible it becomes meaningless. The site doesn't have a museum. Storing in a very unconditioned room.



🕒 Master plan: current situation

SITE SELECTION

Two sites which formed part of the consideration for the design phase of the project. Both locations possessed positives and negatives. A decision was made to move ahead with site number 2 after assessing its benefits and consulting with Tadesse, who is very familiar with the site and surrounding region.

- Landscape
- Trenches
- project site options
- Market - weekly Saturday
- Existing museum and welcome centre

SITE 1

Benefits:

- Easy access to site
- One of the designated sites of the resettlement program
- Close proximity to previous ticket office and museum.
- sits along the Jordan river line

Conflicts:

- In the UNESCO heritage core zone meaning restrictions to new construction.
- Sits 'higher' than the churches which is against their practice of faith.
- New design might dominate site because of scale and position.

SITE 2 (selected)

Benefits:

- On the edge of the core zone
- Beautiful view of the Mount of Olives, Lalibela churches and surrounding landscape
- Lower 'Level' than the churches
- Will not dominate.
- More space for construction

Conflicts:

- Slightly removed position from site.
- steep gradient





SITE NUMBER 2

The Roads are not completely developed, Meaning one can establish a 'better' access point to the site. North of the site is where the weekly Saturday Market happens. Hundreds of people occupy this space then.

DESIGN

Statement and objective	104
Design considerations taken	108
Materiality	114
Project	120

STATEMENT		OBJECTIVE
<p>LIMES is presented as the outcome of research and interpretation of a UNESCO world heritage site in Lalibela, Ethiopia. This research project seeks to explore the significance of an architecture which engages a deeper human connection with sacred spaces.</p> <p>As a museum and first point of contact for the complex, LIMES serves to aid in the overall experiential quality and understanding of the site.</p> <p>Born from the process of carving stone, this architectural project positions itself on a subterranean level,</p>	<p>hidden from plain sight. It celebrates atmospheric qualities of space, that being material, tactility of surfaces, light, Intimacy of rooms, permanence of material, mass, void and the presence of culture and spiritual practices.</p> <p>Together, The Rock-Hewn Churches and LIMES evoke an awareness of one's position on this earth. There is an intrinsic comprehension of time, what has passed and the many years to follow.</p>	<p>What am I doing?</p> <p>Designing a museum and sanctuary</p> <p>FOR</p> <p>The living heritage and archaeological site, Lalibela</p> <p>TO</p> <p>Better preserve the knowledge, artefact and transition into the comprehension of the site</p>

CHARACTERISTICS	WHY IS THIS NECESSARY?	HOW?
<p>Lalibela is a site of significance which is characterised by:</p> <ol style="list-style-type: none"> 1. The mountainous terrain 2. Rock-Hewn Churches 3. Religious significance <p>The site currently exhibits:</p> <ol style="list-style-type: none"> 1. A high tourism rate 2. Inadequate facilities for locals and visitors 	<p>The current site has a small ticket office with 1 room serving as the museum. There is a need to improve the facilities both for the preservation of the artefact and overall experience of the site. In addition, LIMES intends to capitalise on the exponentially growing tourism industry in the Amhara region.</p> <p>A museum serves as a mode of archiving, celebrating and exhibiting knowledge.</p>	<p>To design a sanctuary and museum in Lalibela is to provide an archive of knowledge and an experience which exhibits the expression of the site. The requirements in doing so is two fold.</p> <ol style="list-style-type: none"> 1. Conducting research through various resources, including journals, online services, interviews etc. <p>The identification of opportunity of what would be an essential addition to the site is necessary. The second phase is the development of the project through the interpretation of the research conducted. As a result LIMES is an ideological proposal which is realized through excavation and the realization of a new building.</p>



Source: Tshego Mako

Physical clay model of site in a process of understanding the contours and the process of carving.

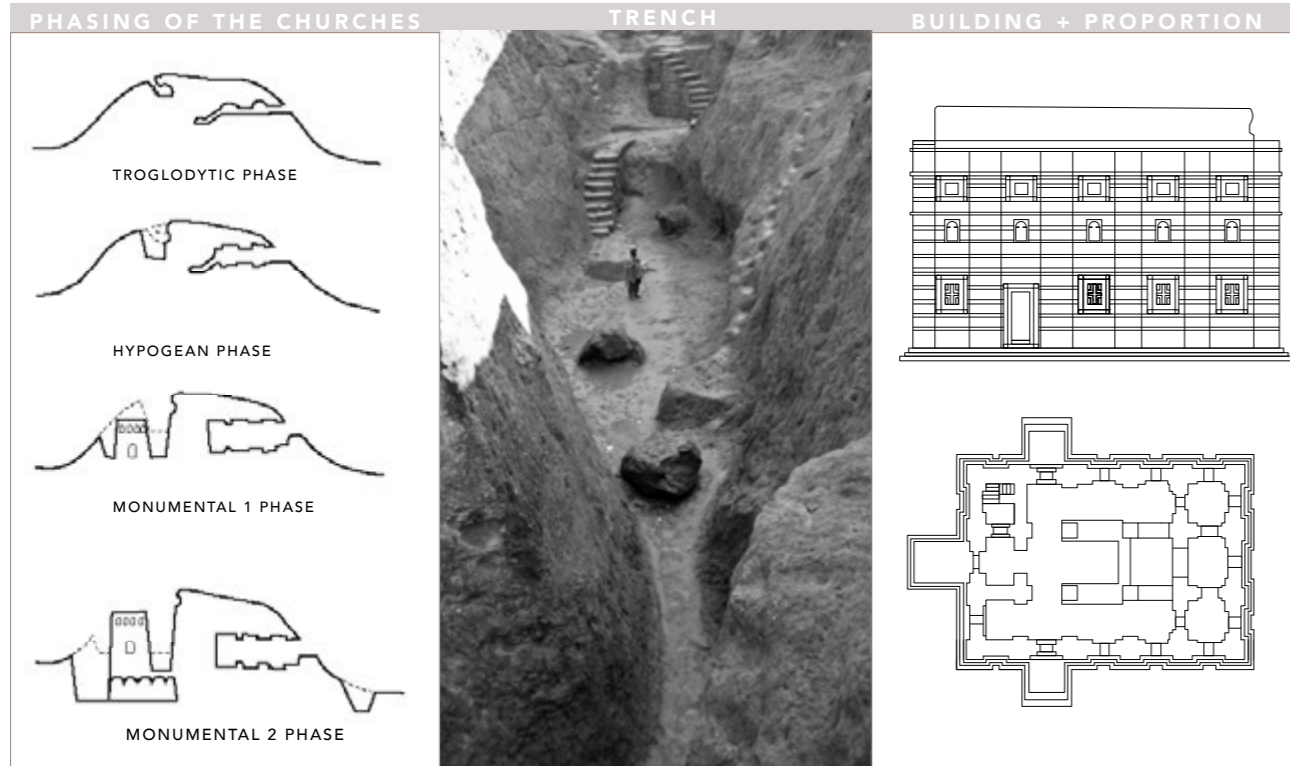
DESIGN CONSTRAINTS

- Building Orientation
- Water flow
- Trench system
- Gradient
- Core Zone
- Church site + View
- Materiality
- Proportion + Scale
- Museum - Physical site

PROGRAM

- Ticket office
- Large exhibition rooms x1 or x2
- Small exhibition rooms
- Sacred room worship space

Considerations made



Source: Tshego Mako and R Mensan

Utilising knowledge of the phasing of construction as the expression of the museum.

Lalibela: A synthetic generalised diagram illustrating the phasing of Lalibela proposed in this article (F-X Fauvelle- Aymar & R Mensan)

Trenches form part of the journey of navigating through the site. They are also used as a system to manage the water system.

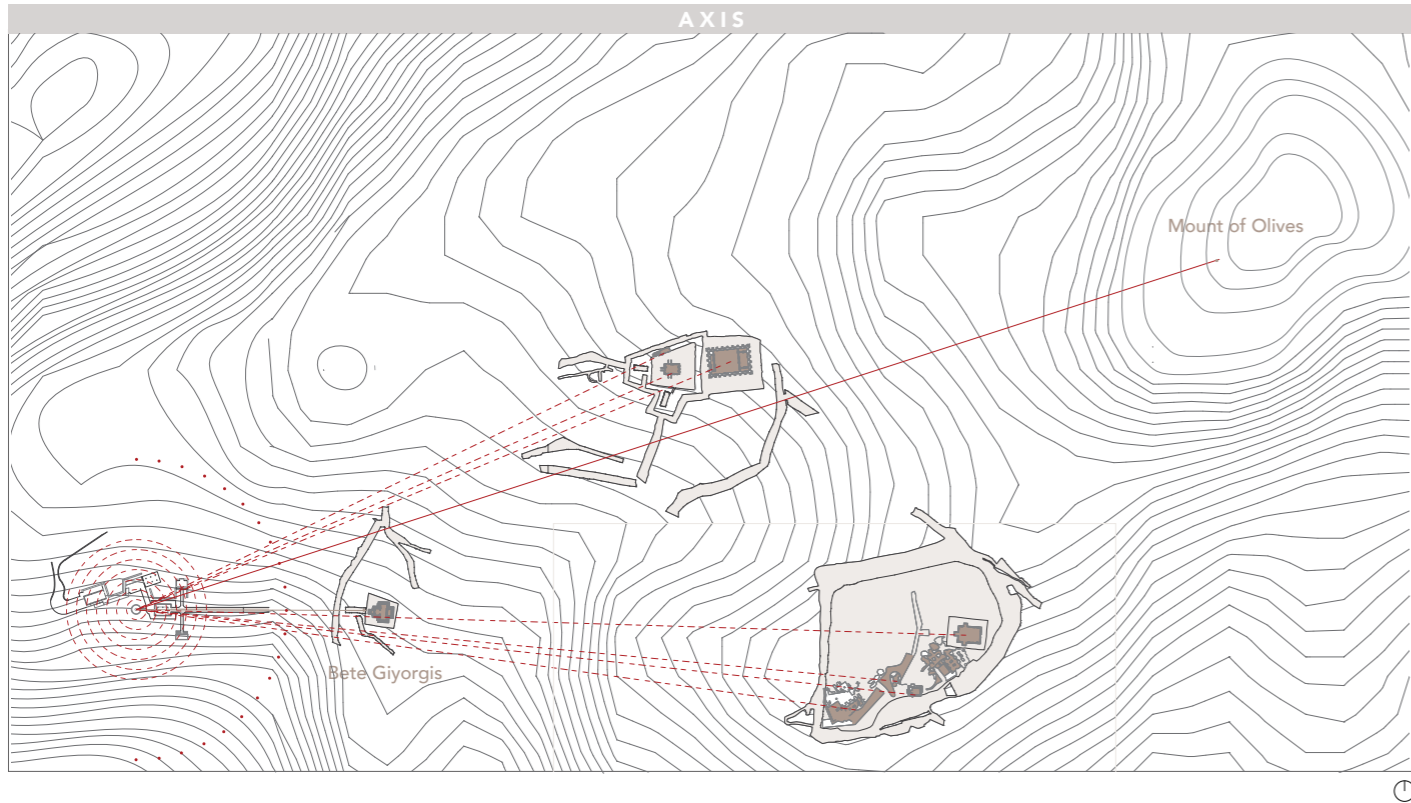
Both the building typology, grid system and East west facing orientation will be interpreted in the new design. The scale and proportion of the existing churches will be reduced in the application of the museum design



The different spaces/ rooms need to reflect the various sectional opportunities seen at Lalibela.

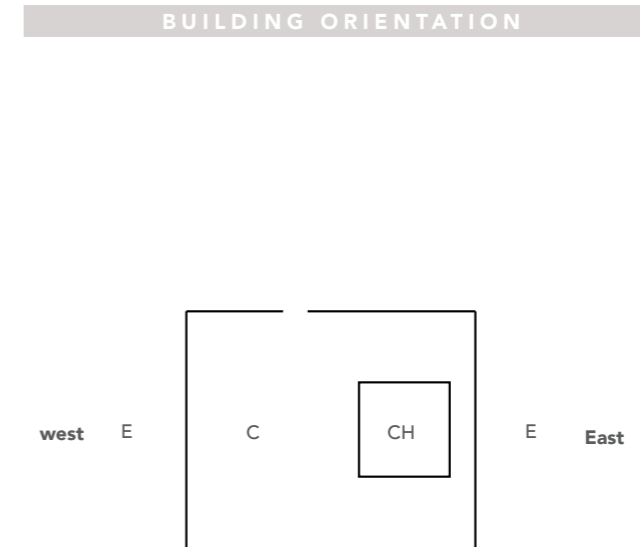
The 'Jordan river' is a distinctive separator between the first, third groups and the second group in Lalibela. It is also included in the trench system with a few catchment areas.

The site in Ethiopia is currently occupied by rebels as it is a conflict zone. However the image captures Mount of Olives in Jerusalem(2020). Lalibela is modeled after Different significant points in Jerusalem, Mnt of Olives and the Jordan river being two of them.

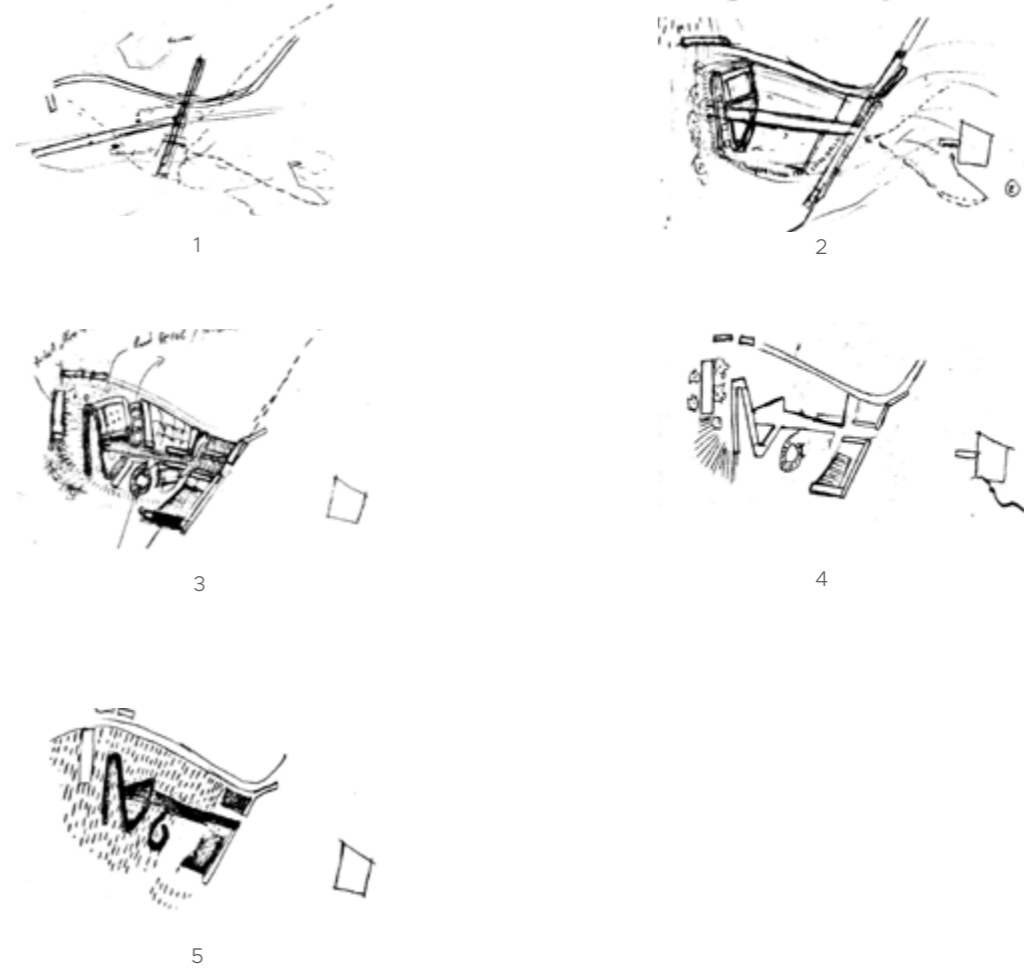
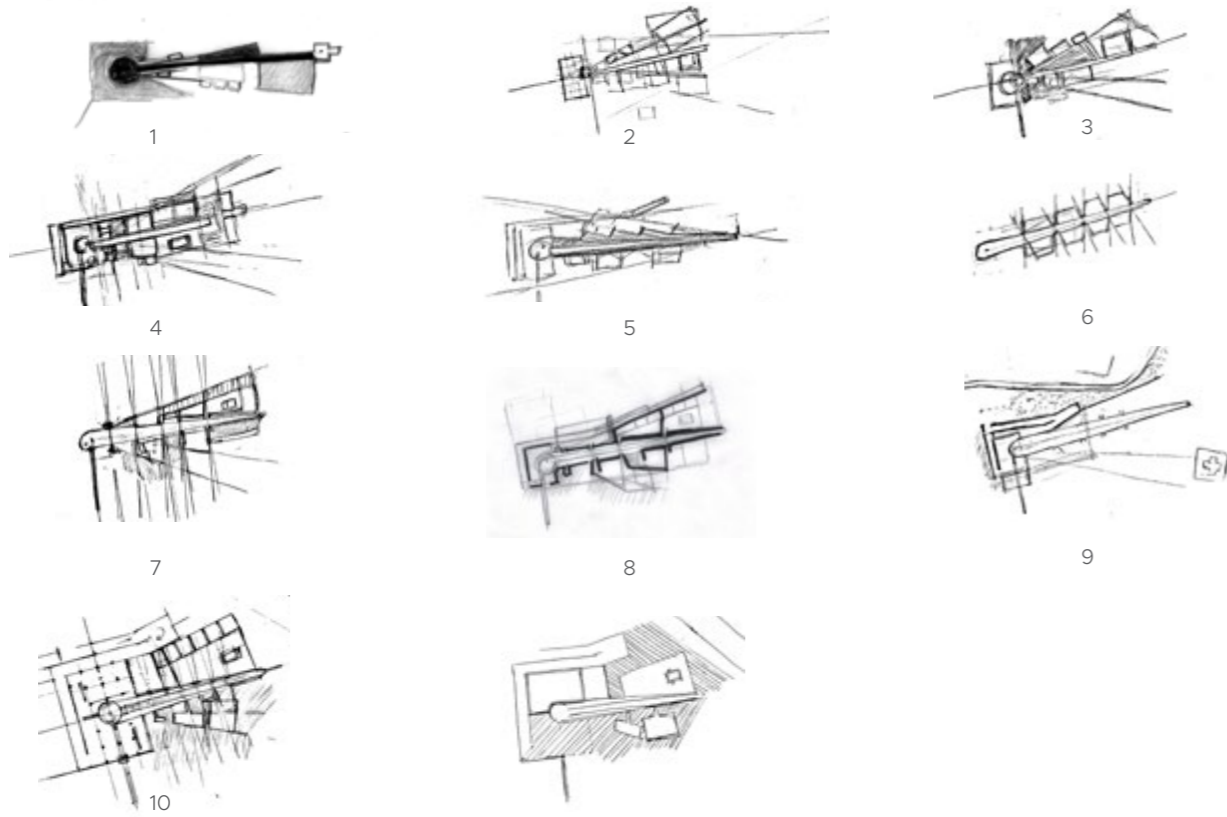
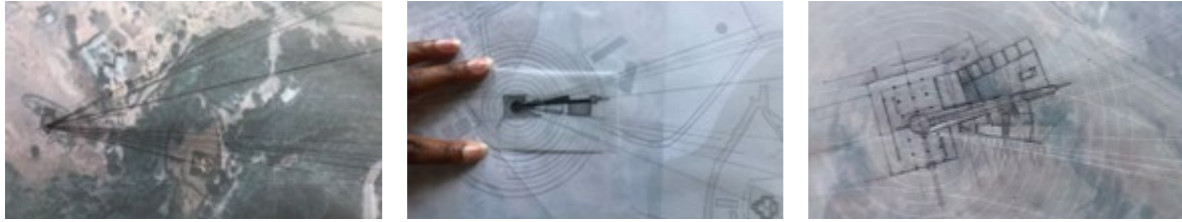


Finding the axis forms part of a core approach in the design of LIMES. Multiple lines deriving from the individual churches in the complex to the project site have been considered.

Biet Giyorgis serves as the primary axis of which the main trench is guided towards. The direction of Mount of Olives and secondary axis forms part of the orientation and flow of some of the buildings.



The existing complex exhibits a flow of access into the churches in the west to east direction. In addition to the order of the most exterior position of observer and worshiper being the position above ground (E), Courtyard (C) located at a lower level and Church (CH) being the most sacred position is evident. Both C and CH can be interpreted as Interior spaces exposed at differing levels.



DESIGN SEQUENCE

A initial design process which used the primary axis towards the Mount of Olives as an anchor point of locating program. This axis line also served as a large trench and system of controlling water. Creating perspective towards the mount was important hence the narrowing with of the passage and trench in that location.

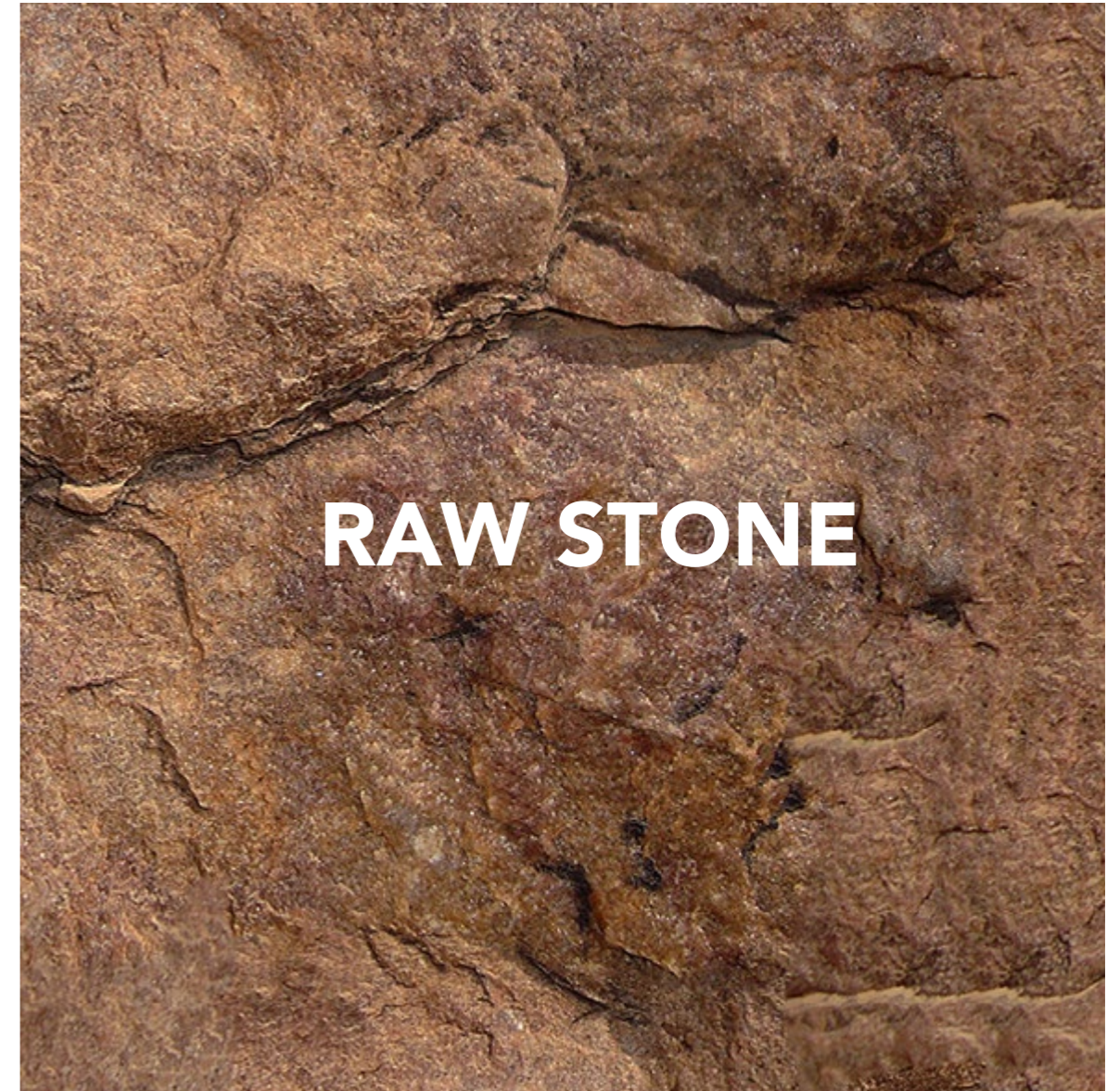
More intermediate design developments shifted the primary orientation from Mount of Olives towards Biet Giorgis. This allowed for ease of access onto the existing site.

MATERIALITY

As a complex composed of geomorphology, the primary ground type found in Lalibela is Basaltic rock which has emerged from volcanic tuff. This rock type determines the accuracy and speed at which the churches are carved. In the past Iron tools were used to excavate through the rock. Although compact, the basaltic rock has properties which provides an ease for carving. The resistant basalt below the scoriae acted as a limit of the depth of where development should stop. Material forms part of a core aspect of the emergence of the complex. So to will it serve as a core component of the emergence of LIMES. Different applications of the same material will be used as seen at Therme Vals by Peter Zumthor. Additional materials will support the presence of stone and add to the overall atmosphere of the project.



- Building
- Gray gravelly silt
- Moderately weathered scoriaceous basalt
- Moderately-highly weathered scoriaceous basalt
- Massive basalt
- Excavated material



Red basaltic rock exhibited at Lalibela.

STONE FOUNDATION

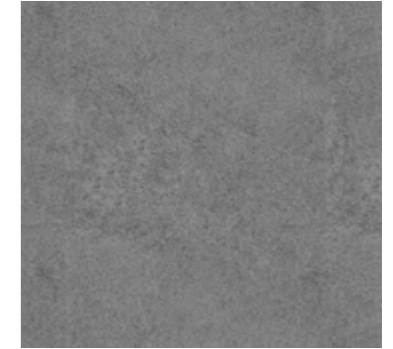
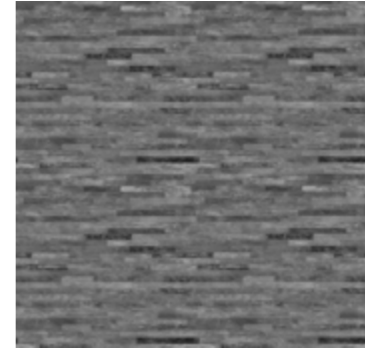
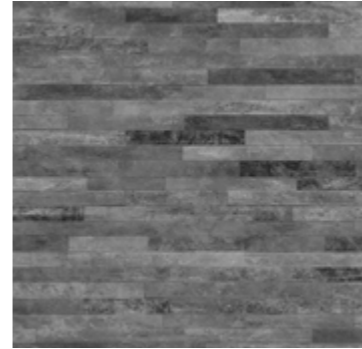
WALL

STONE STACKED

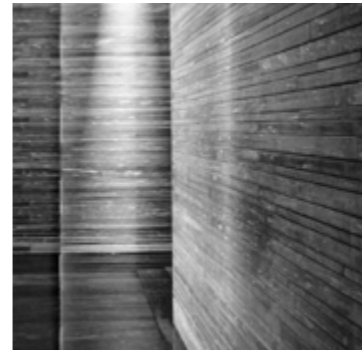
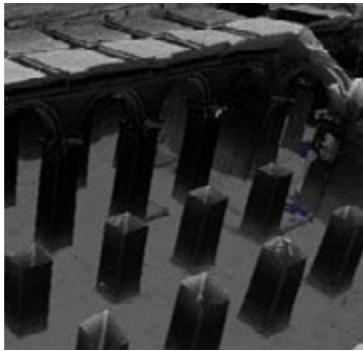
STONE FINELY STACKED

STONE PROCESSED

IMAGE



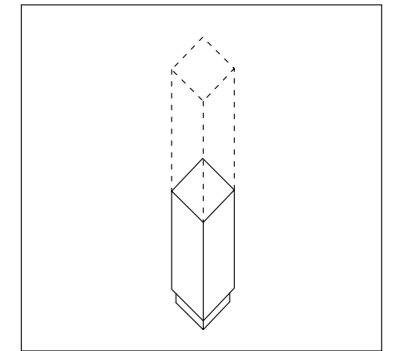
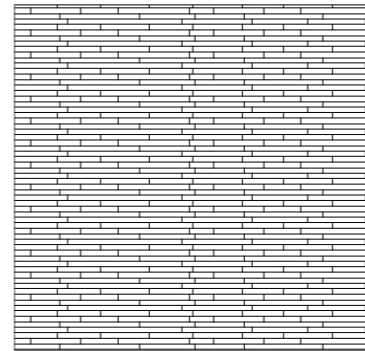
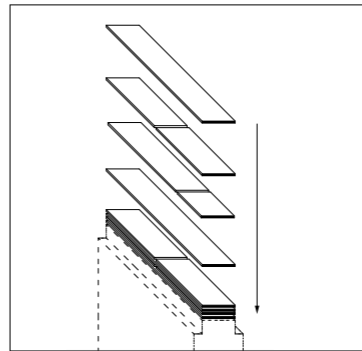
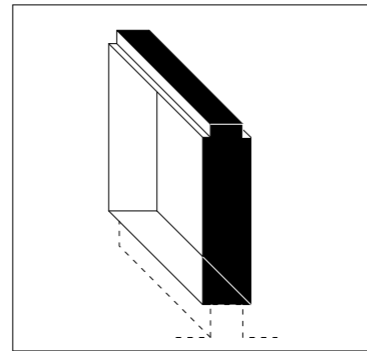
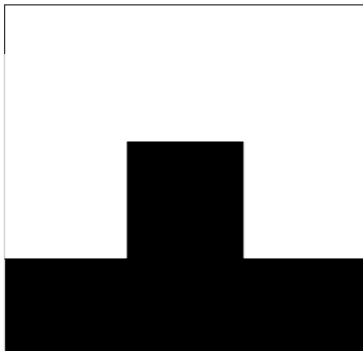
REFERENCE



Interior photogrammic scan reflecting the core

Therme Vals by Peter Zumthor.

APPLICATION



SKY/ AIR

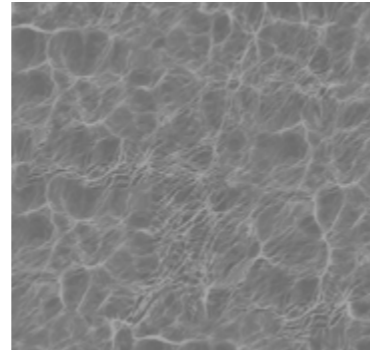
WATER

LIGHT

CULTURE

VEGETATION

IMAGE



REFERENCE



Blet Giorgis

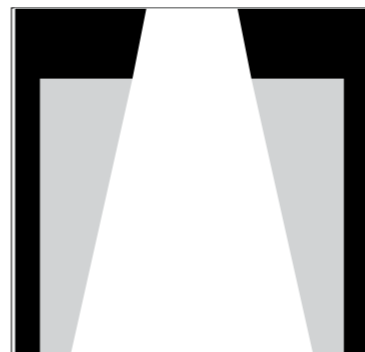
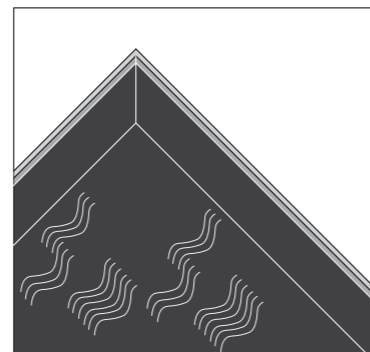
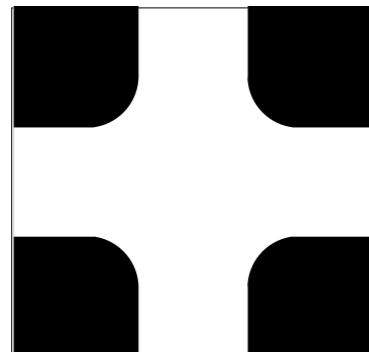
Tadao Ando, Church on the Water

Tadao Ando Church of the Light

Lalibela ceremony session

Therme Vals by Peter Zumthor.

APPLICATION



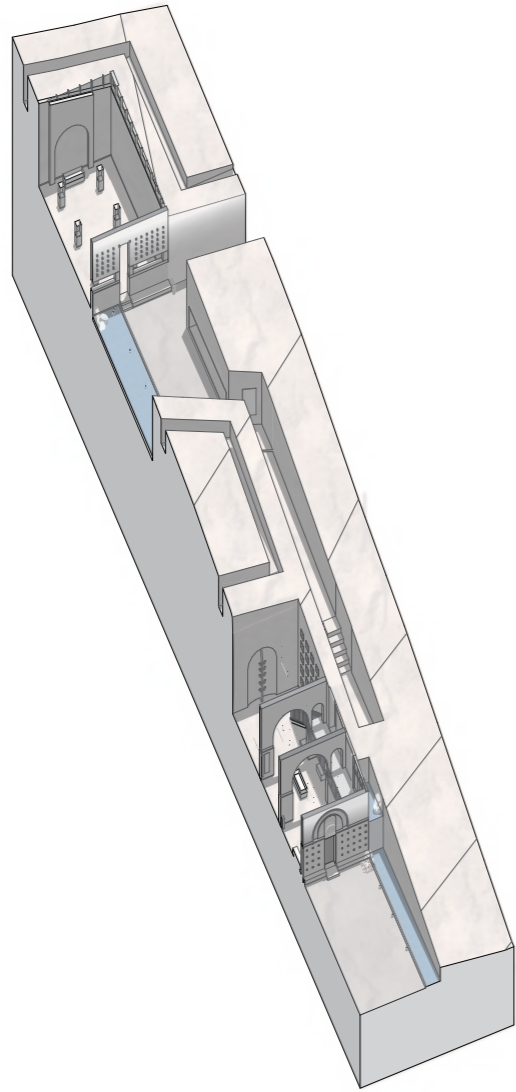
PROJECT INTRODUCTION

Born from the idea of a museum which expresses the trench, LIMES is a project which descends into a subterranean level. Trenches are commonly used as a design device by the Zagwe Dynasty. They connect the different churches and groups. A design decision was made to place the project along two axis's, A primary and secondary one. One commences a journey along the secondary axis which is orientated in the direction of Mount of Olives, a site of significance where Jesus was said to have ascended into heaven. A slow decent gives rise to the immersion of an underground landscape, with the sky exposed. B1 and B2 are interior spaces located along this axis. The Primary axis is orientated in the direction of Biet Giorgis, One of the rock-hewn churches connected to the complex. The Cross formation commonly seen throughout the complex as a motif inspired the overall excavation along this axis. One descends further into the earth's crust before an ascent into the main complex.

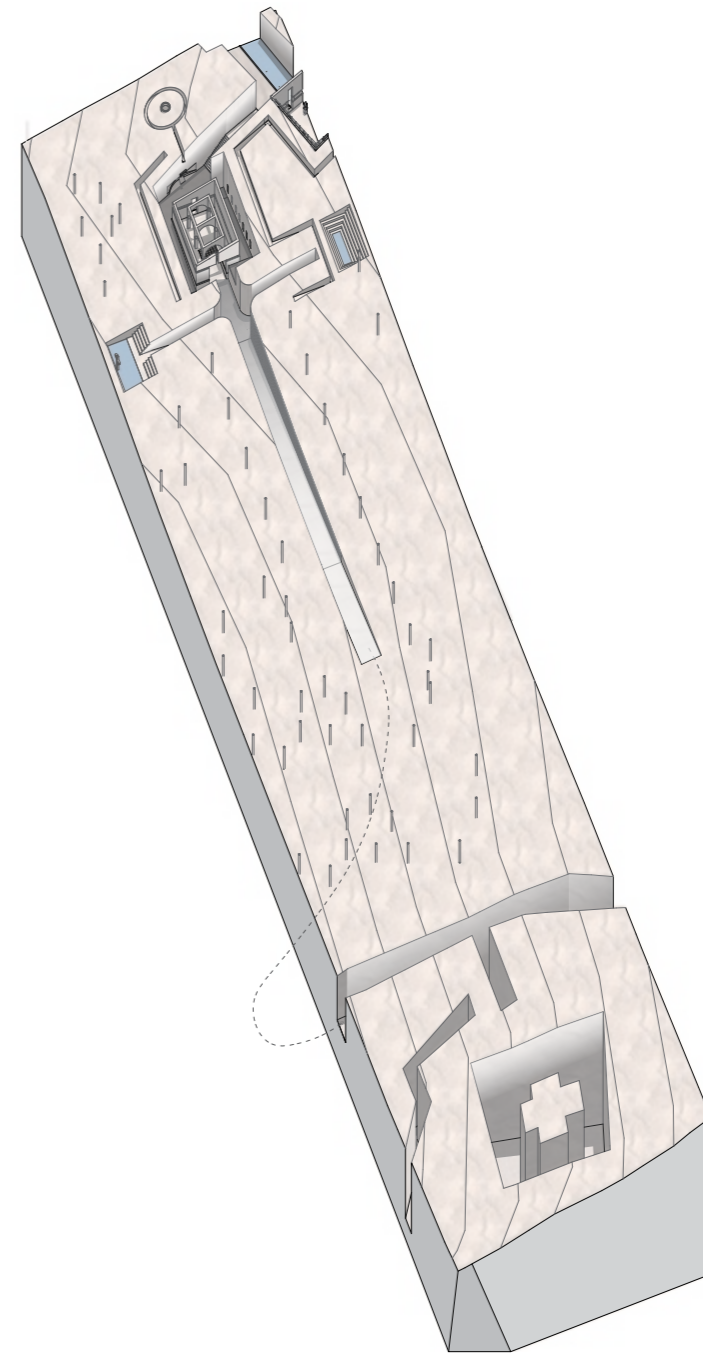


Master plan: proposed situation





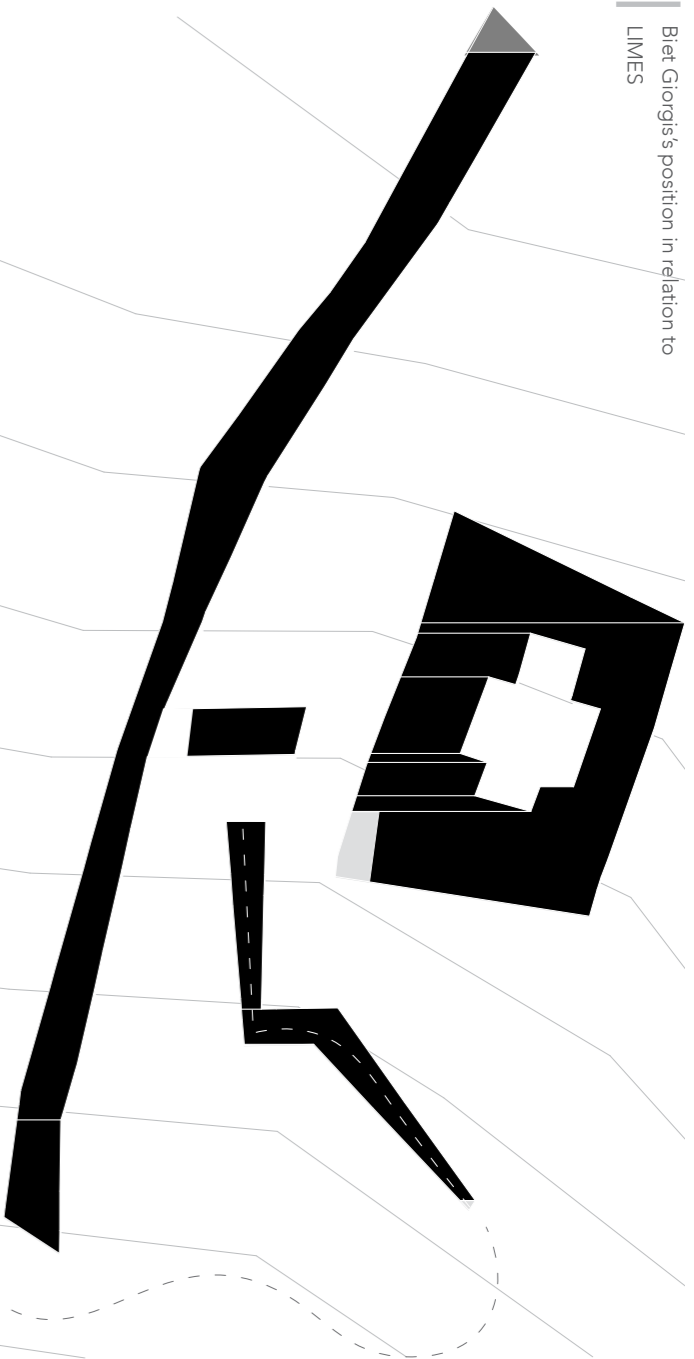
Secondary axis diagram



Primary axis diagram



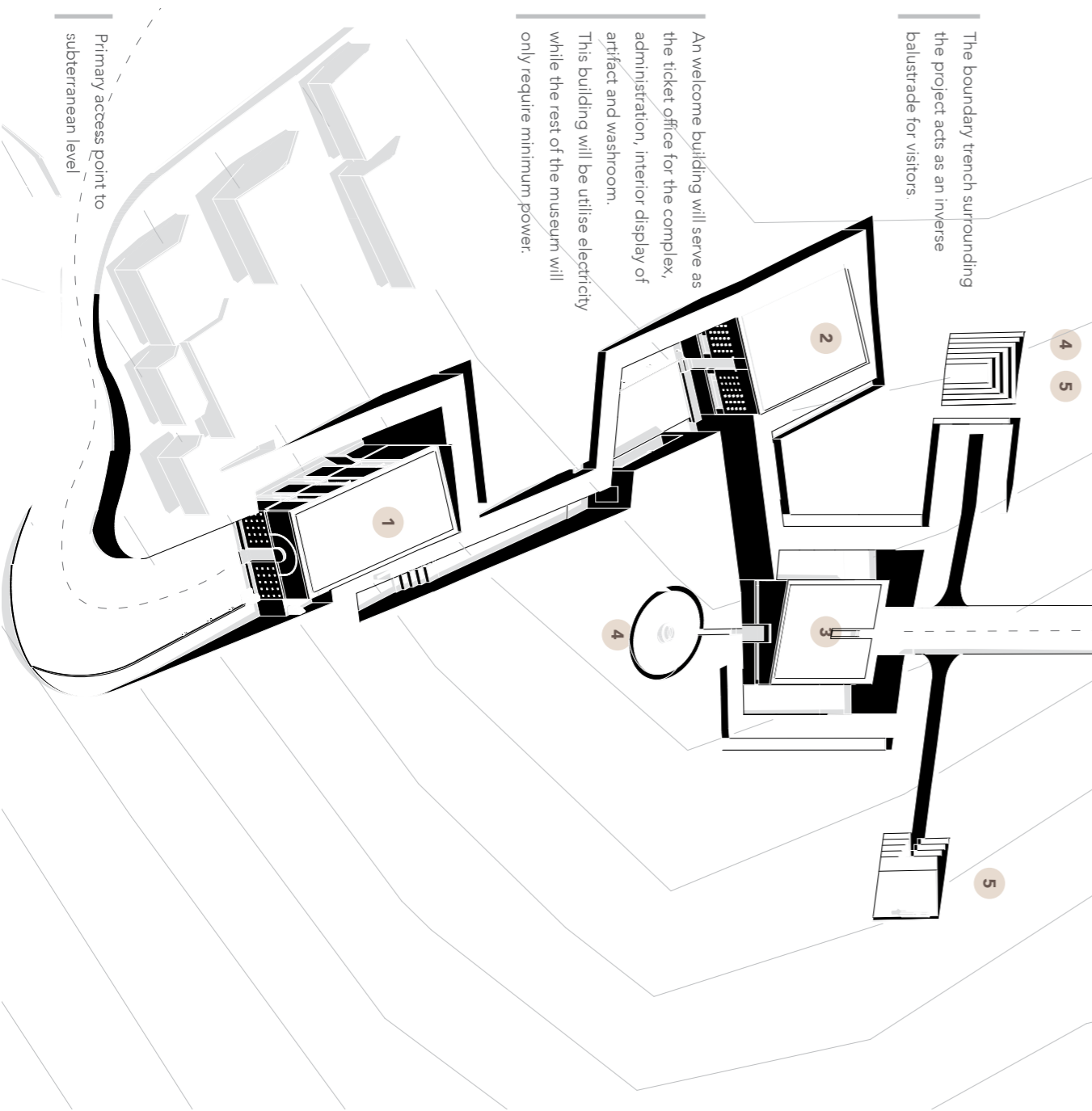
Proposed roof plan



The trench eventually merges with the top of the terrain at the point where two existing paths guide one towards Biet Giorgis

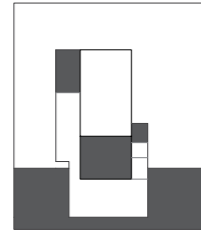
The boundary trench surrounding the project acts as an inverse balustrade for visitors.

An welcome building will serve as the ticket office for the complex, administration, interior display of artifact and washroom. This building will be utilise electricity while the rest of the museum will only require minimum power.

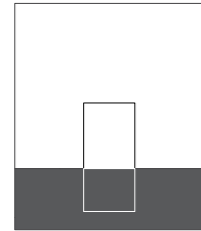


Primary access point to subterranean level

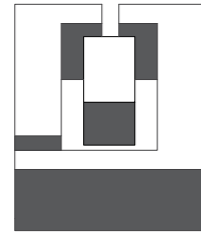
TPOLOGY



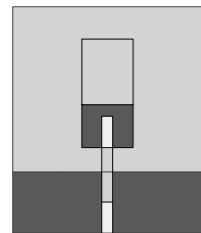
- 1 Semi-monolithic - Monolithic with a rock hewn facade. 2 sides encased in stone.



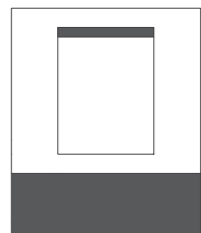
- 2 Semi-monolithic with rock hewn facade. 3 sides encased in stone.



- 3 Monolithic, Three dimensional hypogean architecture. 4 Sides exposed.

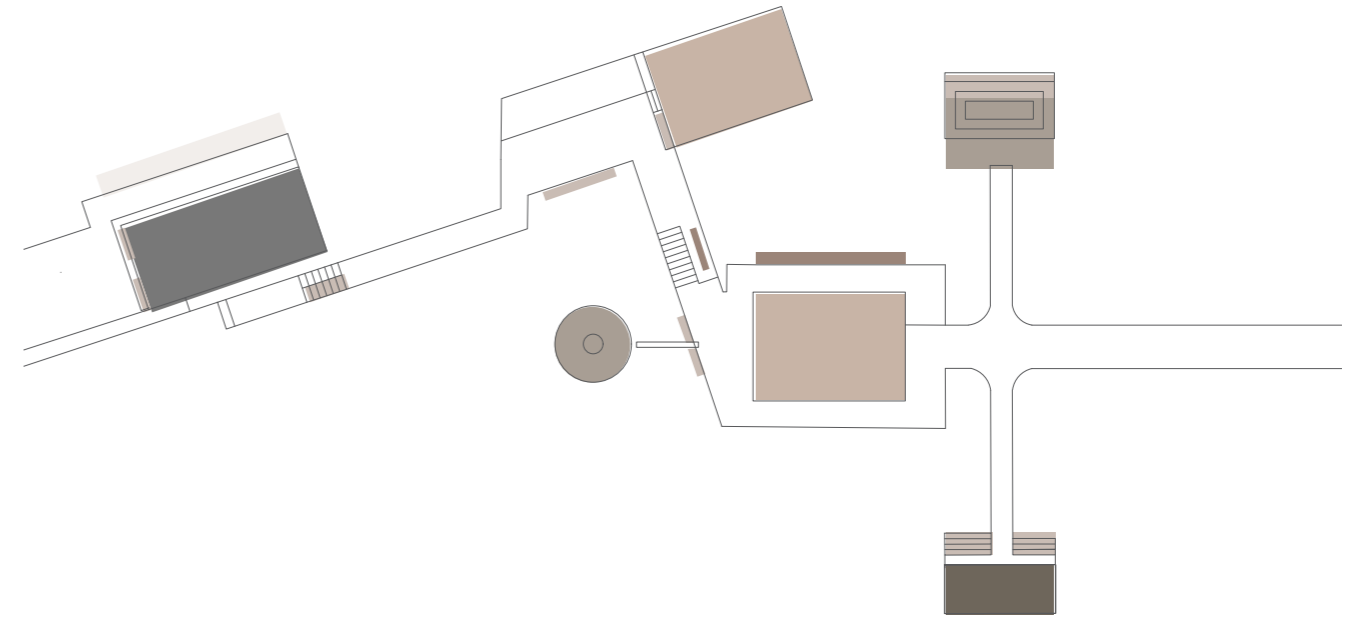


- 4 Hewn-out cavities.

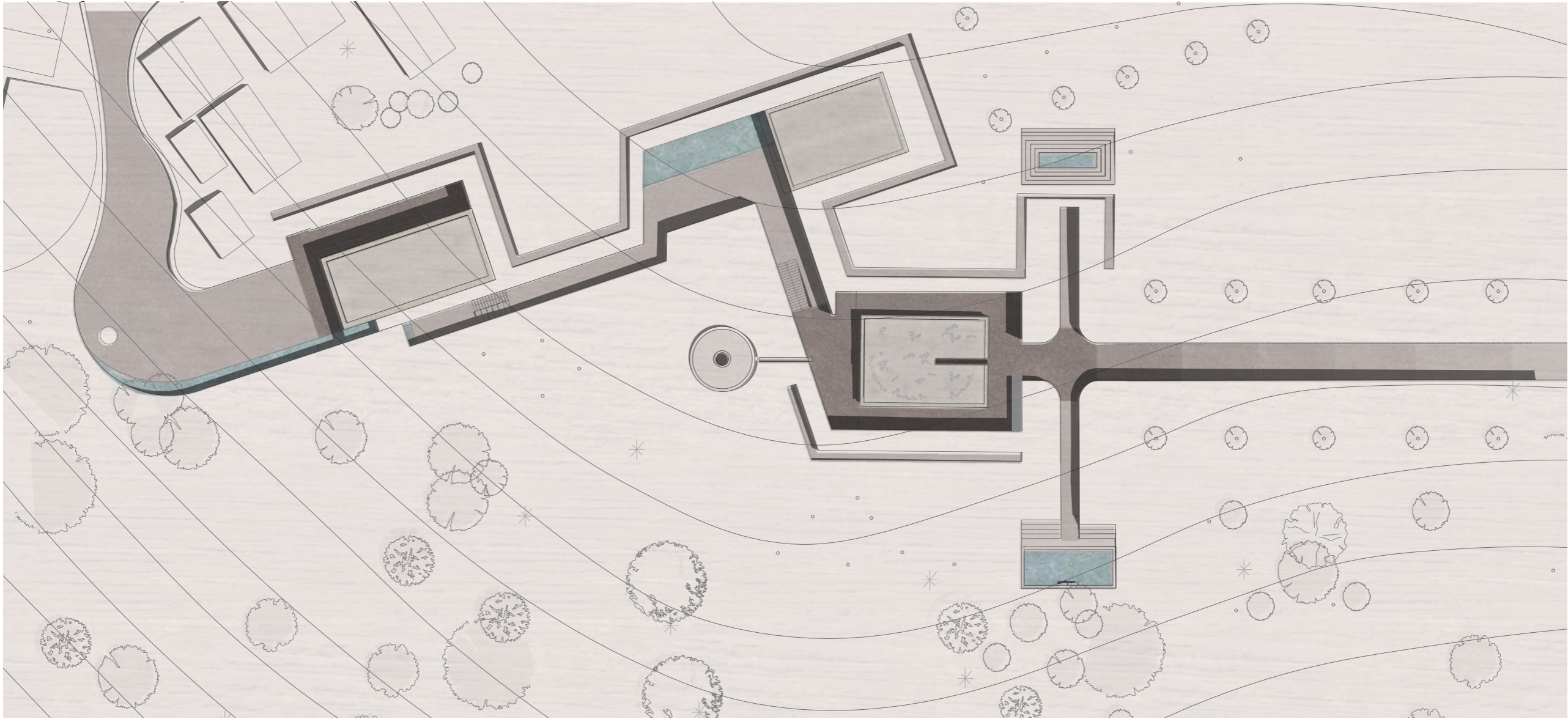


- 5 Excavated ground, exposed to sky.

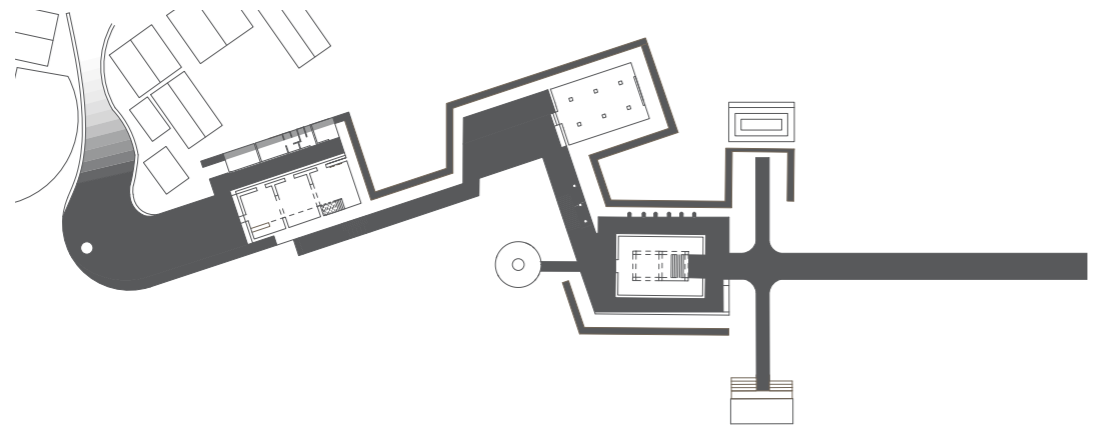
PROGRAM



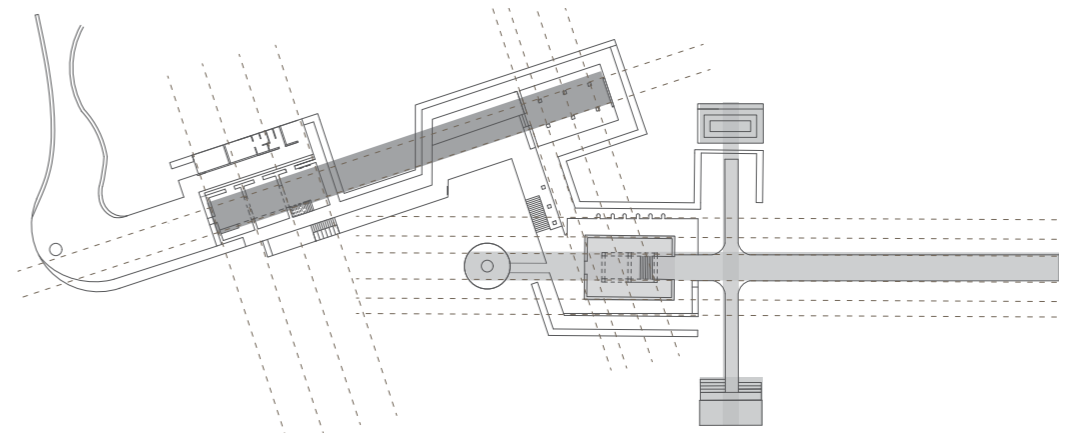
- Entry building + Interior exposition
- Services
- Seating
- Exterior exposition
- Interior exposition
- View Point + Worship space
- Cave like spaces



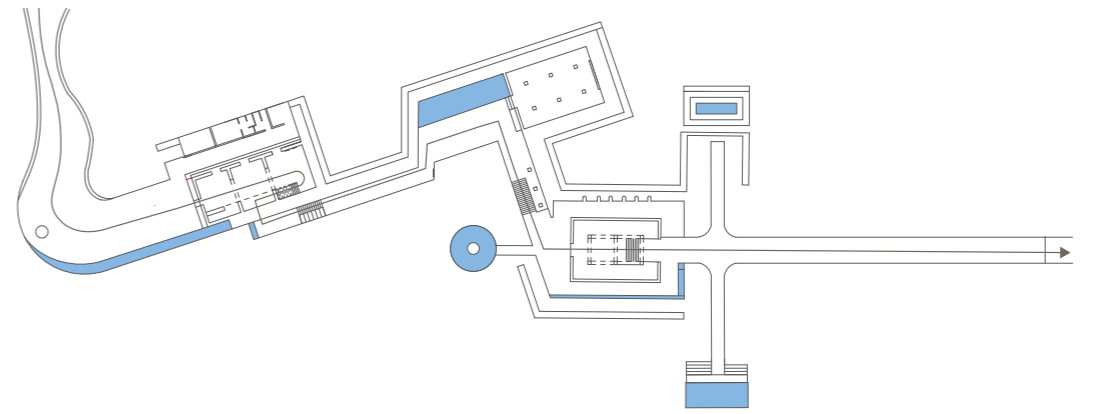
Roof plan
1:100



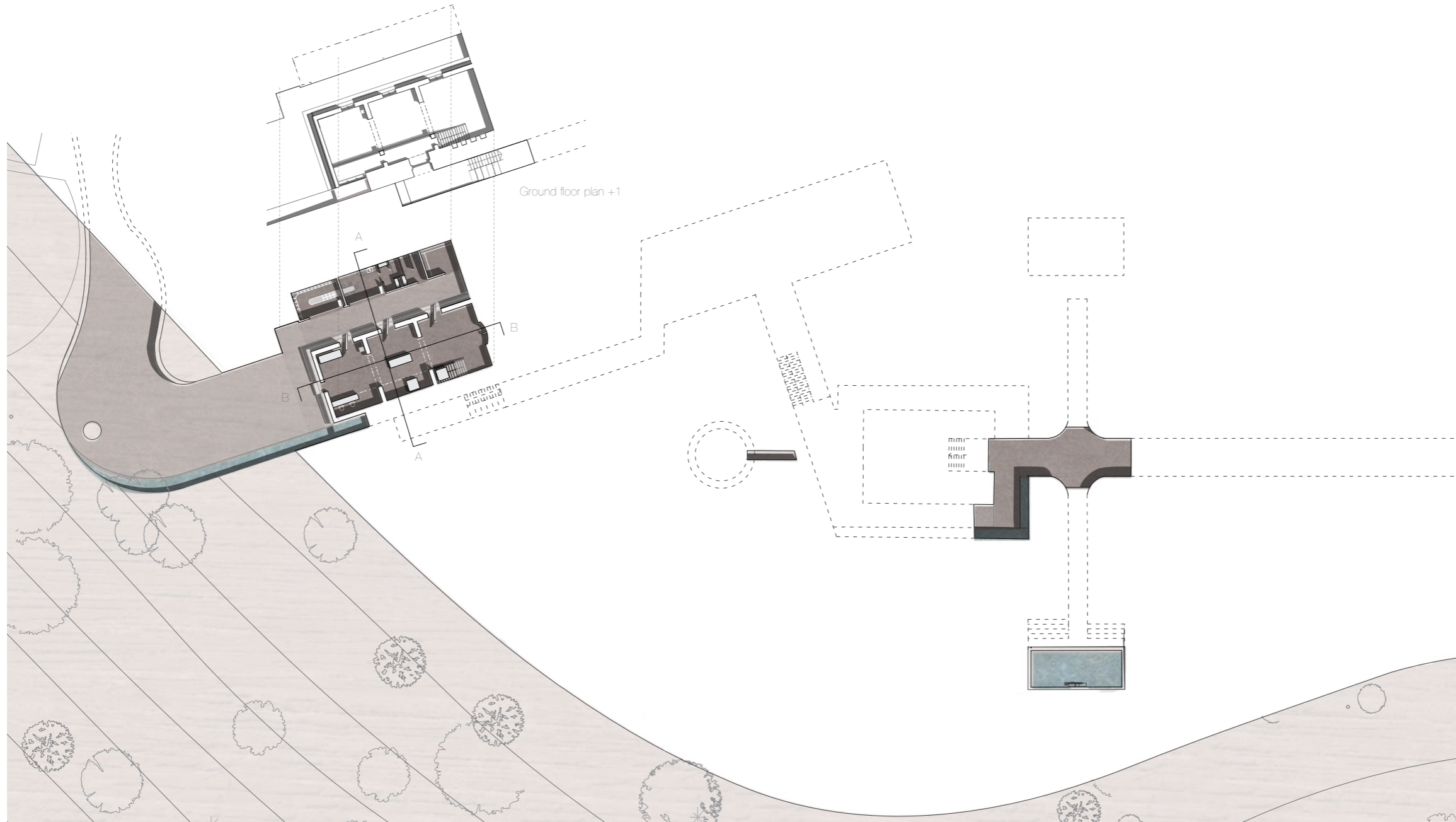
-Trenches



- Form
- Proportion + Direction



- Presence of water
- Route through museum

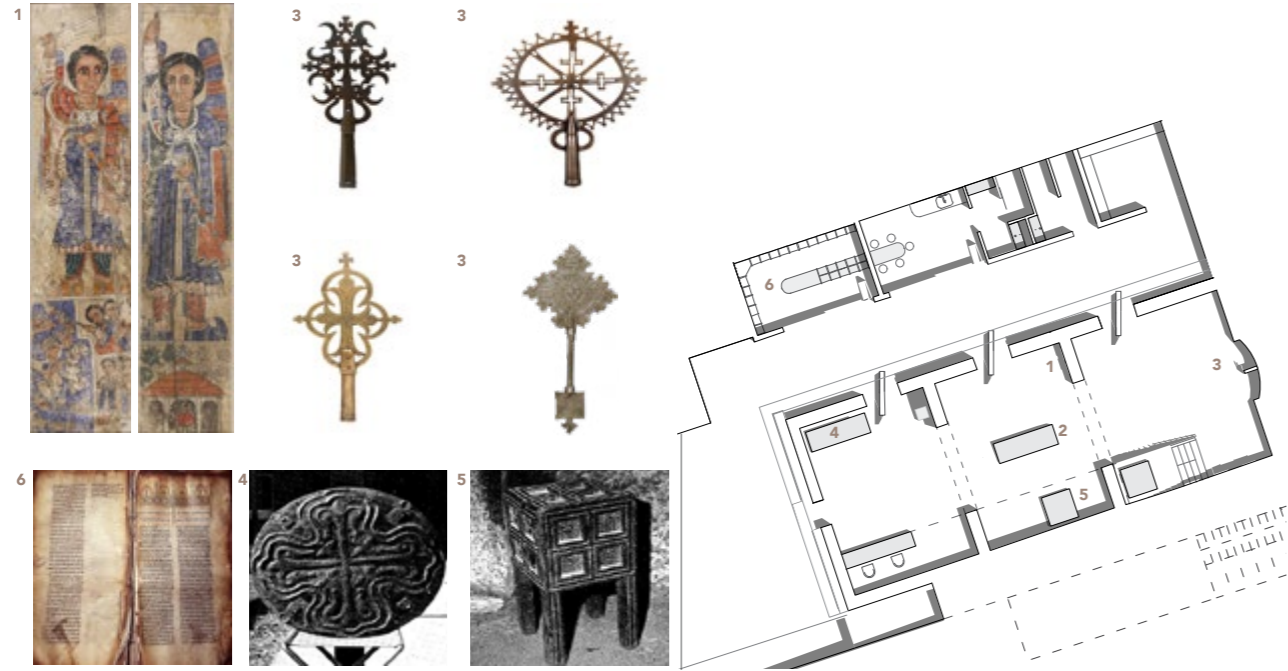


WELCOME EXHIBITION_ B1

The welcome building offers those unfamiliar with the site with additional information. It serves as a ticket office and a shelter for the removable antiquities which are often used for celebratory purposes during festivals. More recently important artefacts in Lalibela have been at risk of theft because of inadequate 'safe keeping' strategies. Offset from the core of the building is a service wing where additional storage and cloak-rooms can be found.



Housing Movable Antiquities



1 Processional hand crosses
 2 Bells
 3 Chandeliers
 4 Robes

5 scrolls and manuscripts
 6 Crowns of Kings
 7 Silver and wooden cross

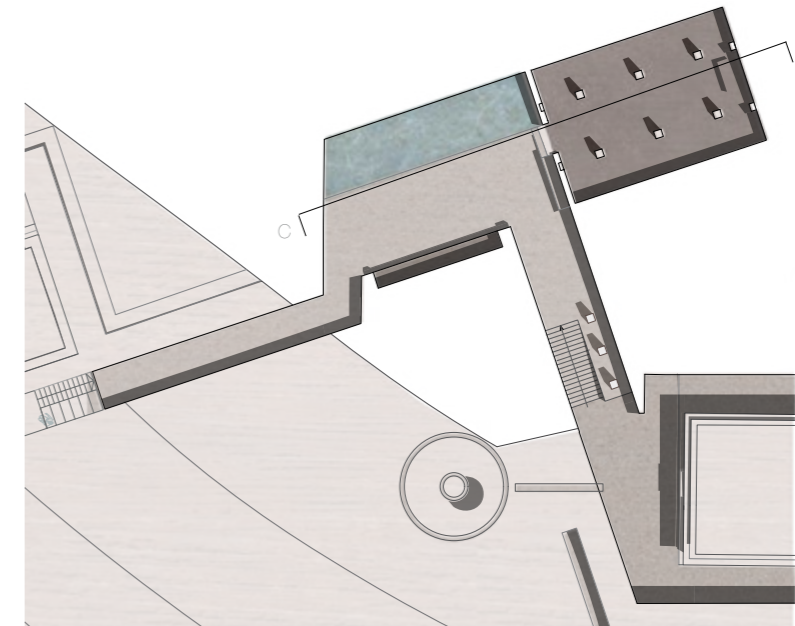
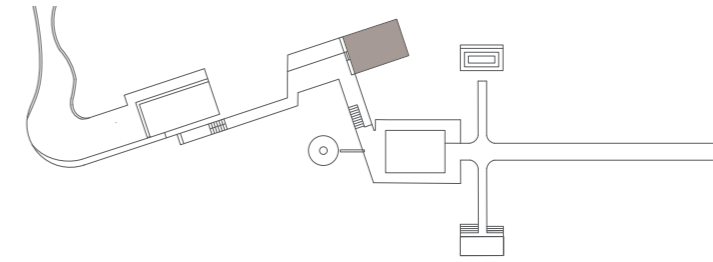
8 Turbans
 9 Paintings
 10 Artworks
 11 Ceremonial umbrellas





B2_ INTERIOR EXHIBITION

A large body of water welcomes visitors from the narrow passage into a communal rest area. This is where b2, a semi-interior exhibition space is located. The cross formation of the openings is once again a celebration of the cross motif. It also enhances the lighting conditions on the interior. The podiums are intentionally places where columns would be found in a 'more traditional' design. The typology of this room is similar to Abba Libanos where the front façade is exposed.



B2 Long Section
1:500



mass | void

LIMES celebrates spaces which are carved and embedded. The act of doing so provides a much stronger connection of building and landscape. An initial large mass of stone has transformed into a landscape with punctures and voids.

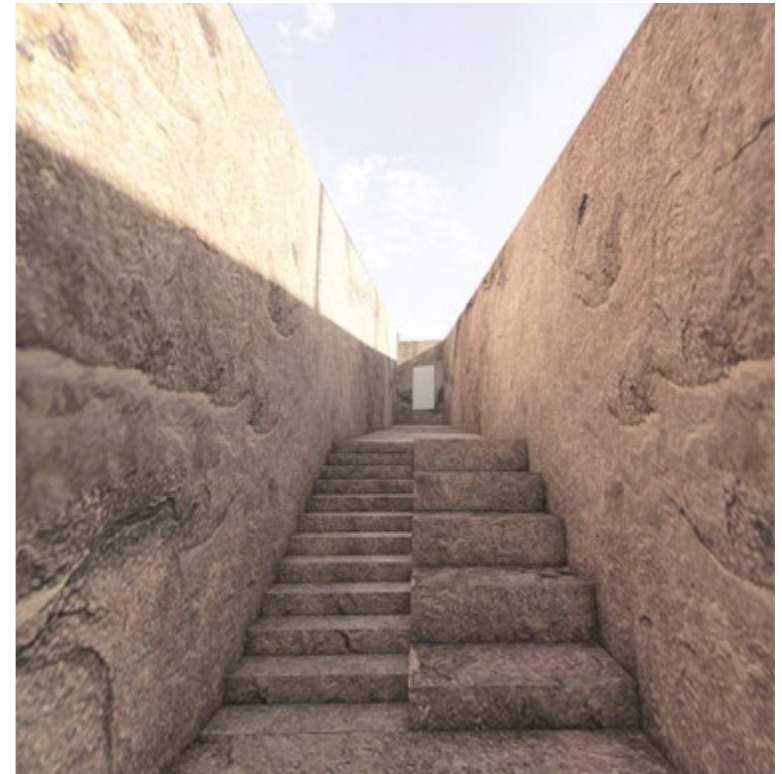
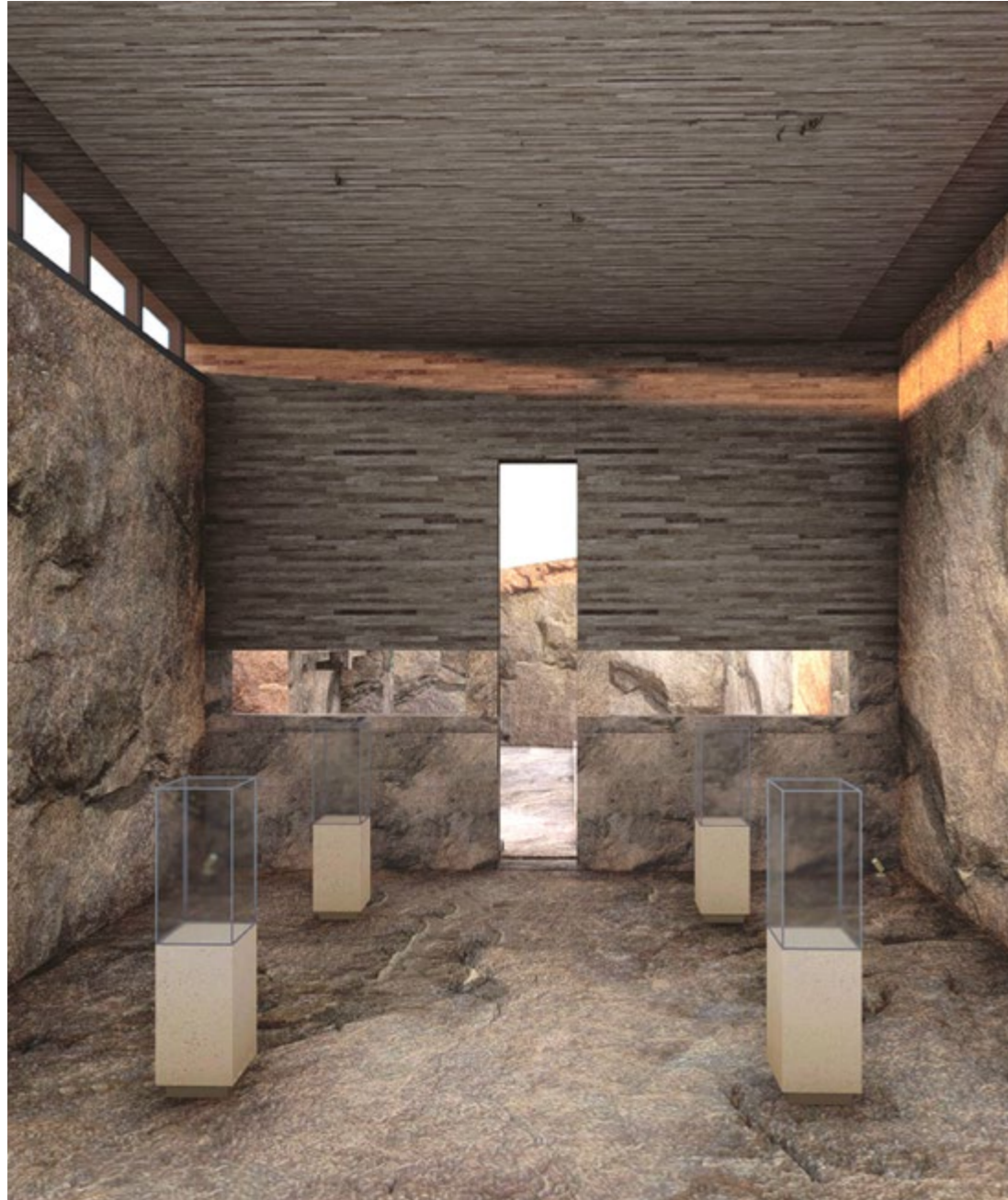
communal space

Areas where worshippers and travellers can collectively meet are just as essential as the intimate and more isolated moments. LIMES depicts a series of these in the form of courtyards as the larger open spaces frame the interior rooms.



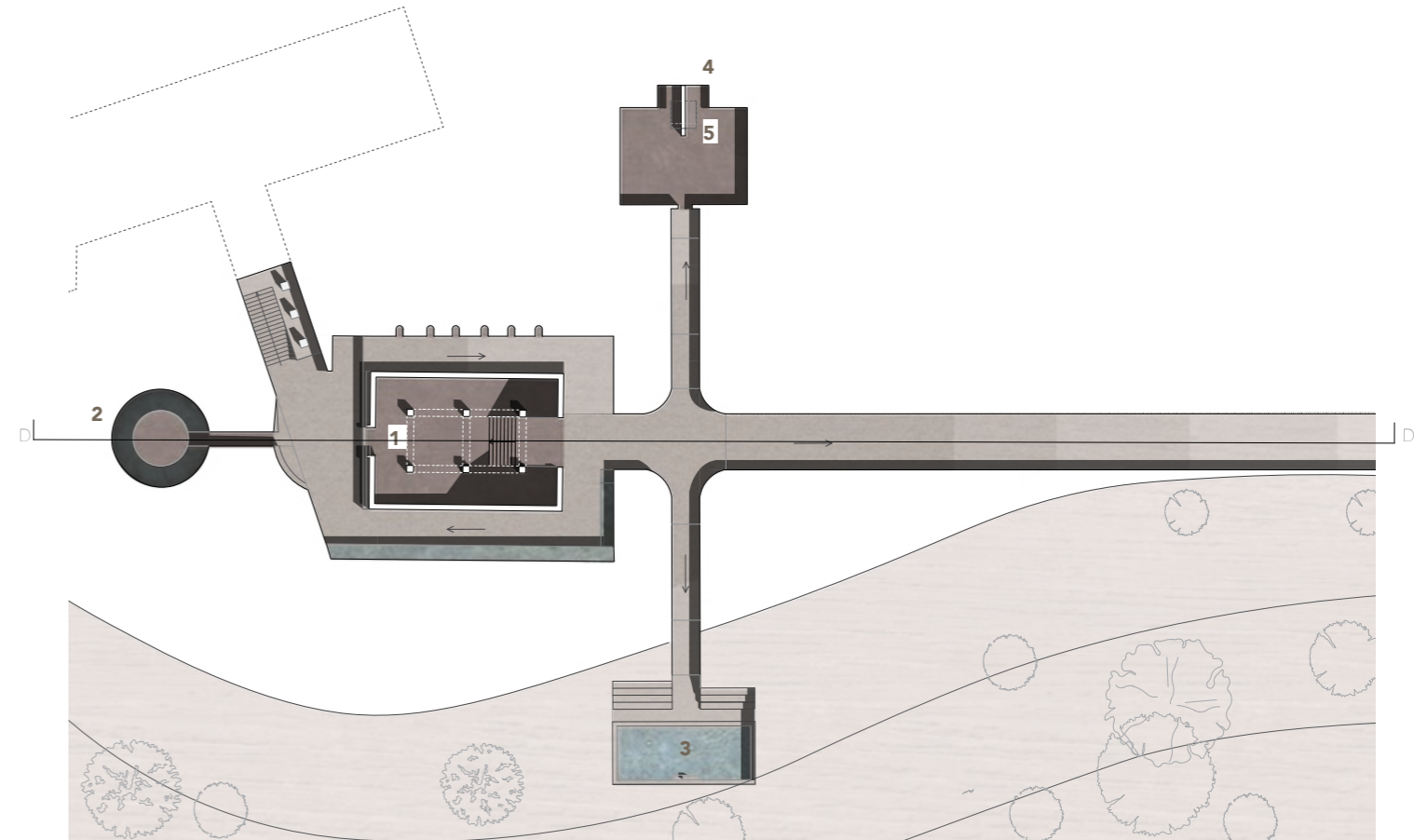


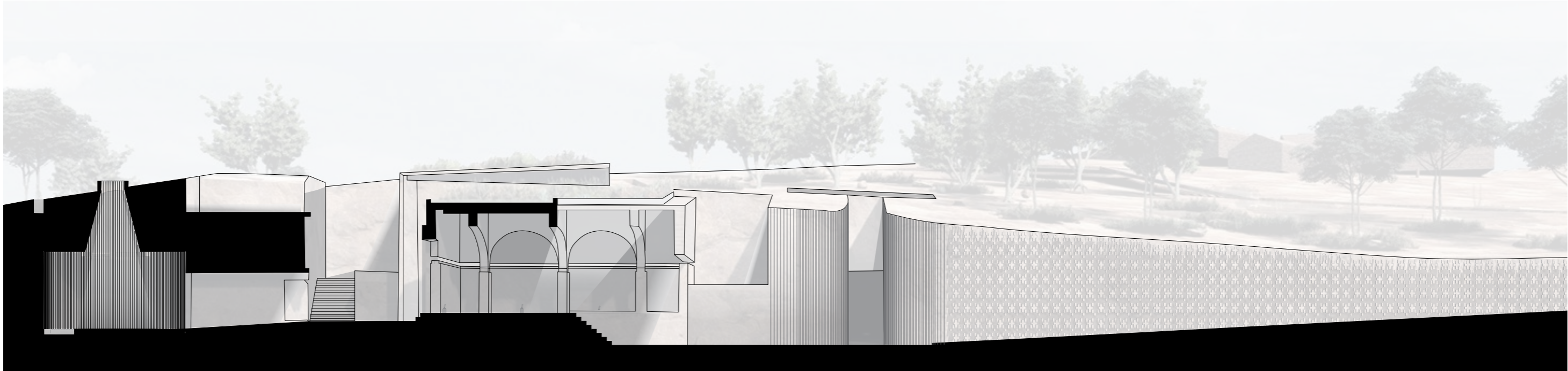
B2 Section C-C
1:100



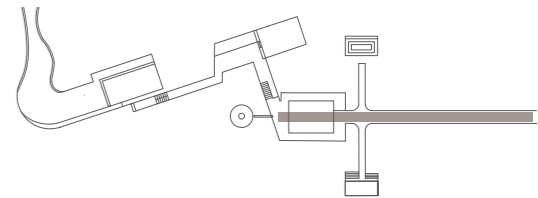
Primary axis

A journey through the primary axis encourages a sense of exploration where visitors encounter several opportunities to travel in differing directions. Along this axis one finds closed intimate spaces as well as open and public points to gather.





Long trench section
1:200



1



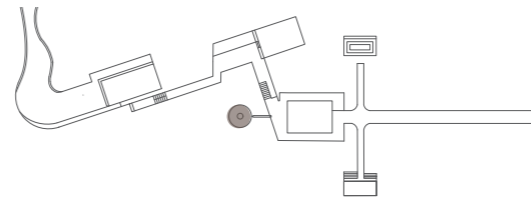
The Interior of B3 presents a level change on the interior as a signal and transition from one significant condition to the next



2



The circular cave like interior is located at the apex of the cross. It defines the axis of significance and is a catchment area for water.

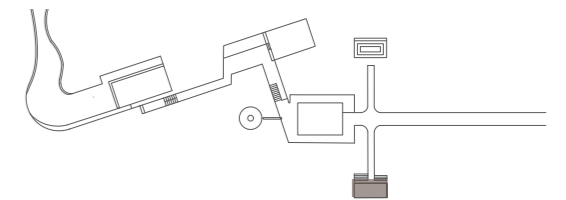


3



Lower pool view point

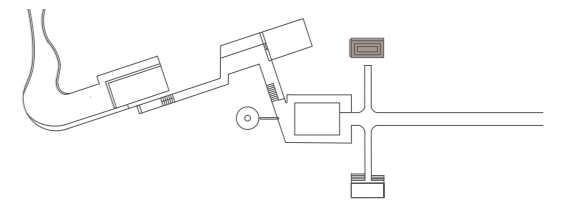
A worship and observation point. Beautiful views of the landscape and valley are exhibited from this point



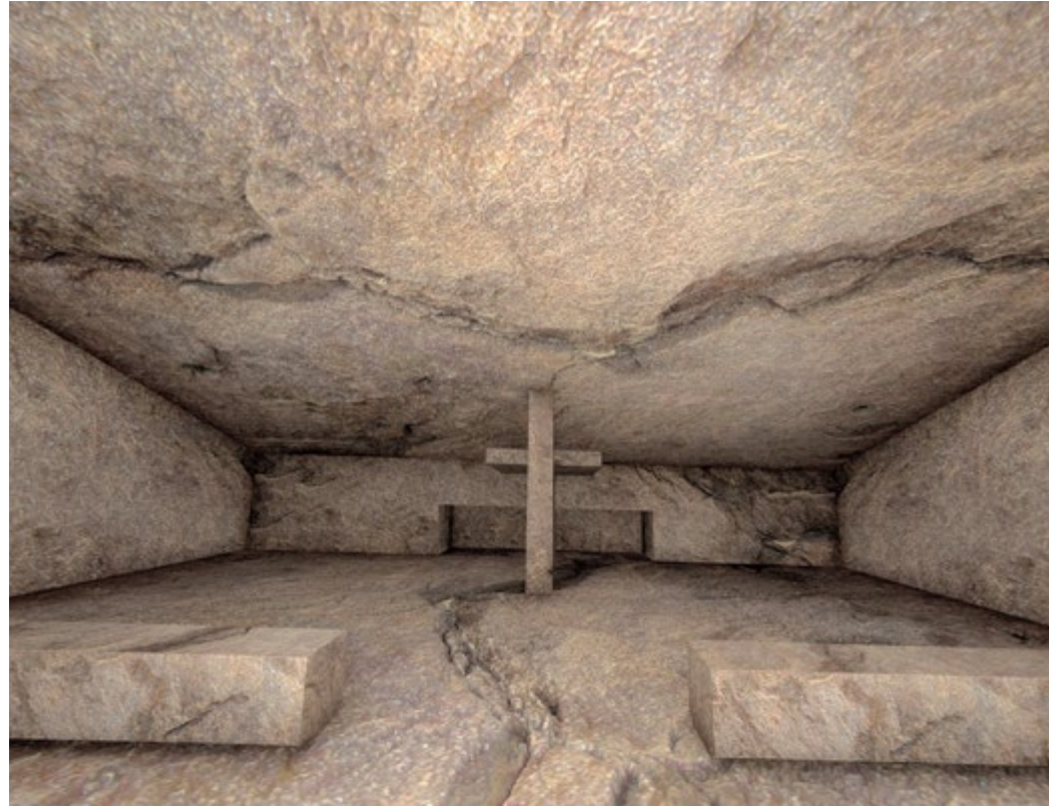
4



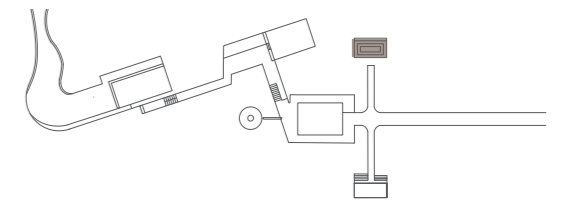
This stepped catchment serves as a resting point for the locals as it is located close to the market.

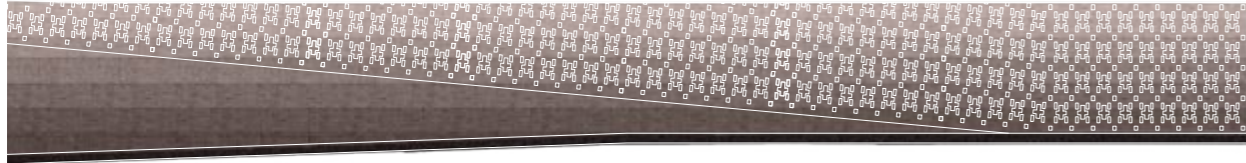


5

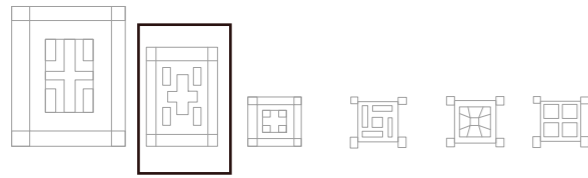


Below is an intimate 'cave like' worship area





A deconstruction of the same selected motif

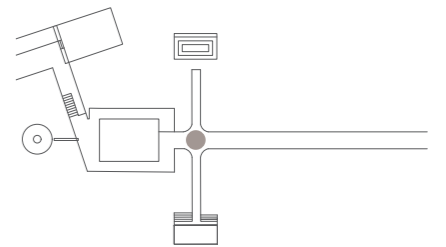
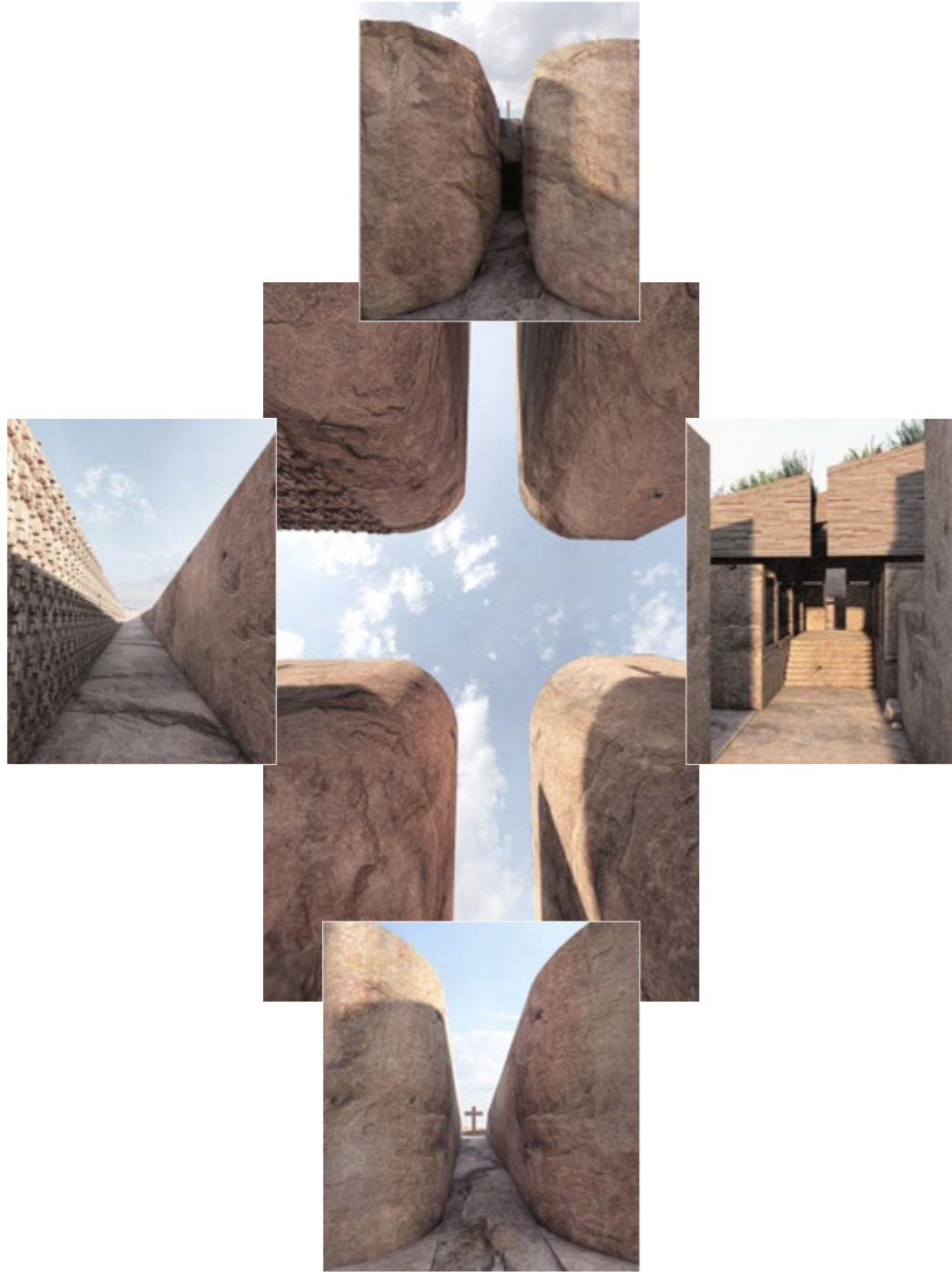


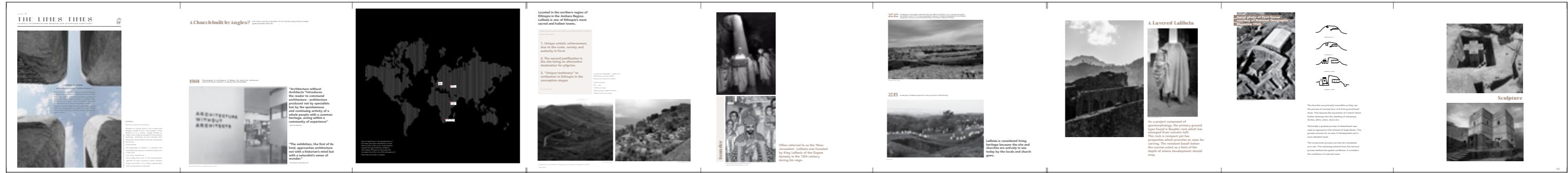
Selected window motif



Elements to extrude out from wall
Sectional diagram

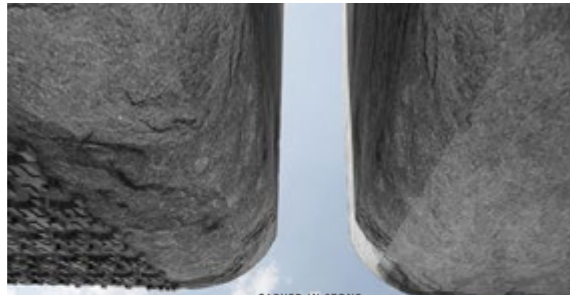






Magazine format panel 1

April 2022 ^{NI}
THE LIMES TIMES
 LALIBELA INTERPRETATION MUSEUM AND ETHIOPIAN SANCTUARY



CARVED IN STONE
 Architecture by subtraction. I sculpted architecture

Born from the process of carving stone, this architectural project positions itself on a subterranean level, hidden from plain sight. It celebrates atmospheric qualities of space, that being material, tactility of surfaces, light, intimacy of rooms, permanence of material, mass, void and the presence of culture and spiritual practices. Together, The Rock-Hewn Churches and LIMES evokes an awareness of one's position on earth. There is an intrinsic comprehension of time, what has passed and the many years to follow.

Archive

ROLE OF FAITH IN ETHIOPIA

Ethiopia is a country which is rich in culture and heritage. Parallel to this is the strength in their beliefs, as it is a country largely founded on religion with a large percentage of the population practicing Christianity and the Orthodox faith while Islam and the Muslim faith also characterize the country.

PILGRIMAGE

The pilgrimage to Lalibela is a landmark that many Ethiopians aspire to complete at least once in their lives.

THE ORAL NARRATIVE

Story telling forms part of the documentation approach of many countries in Africa, Ethiopia being one of them. It is a 'history' passed down from one generation to the next.

A research and interpret project by Zengqian He

A Church built by Angels? Oral history and the proposition of the churches being built by Angels guides the belief of the site.

1964 Photographed at the Museum of Modern Art during the Architecture without Architects exhibition, curated by Bernard Rudofsky



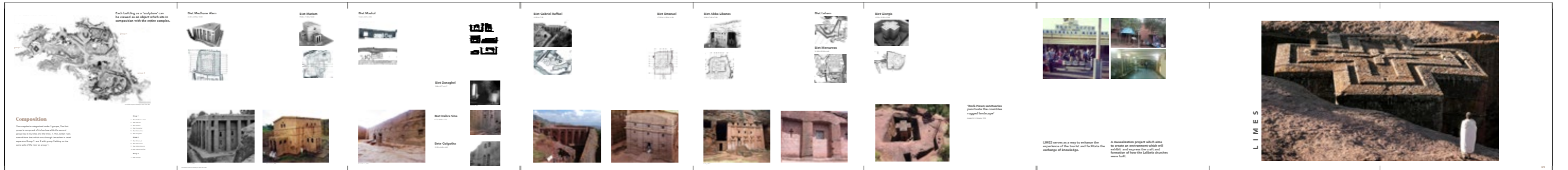
Peerman R & The Museum of Modern Art Archives, 1964

"Architecture without Architects "Introduces the reader to communal architecture - architecture produced not by specialists but by the spontaneous and continuing activity of a whole people with a common heritage, acting within a community of experience"
 - Bernard Rudofsky

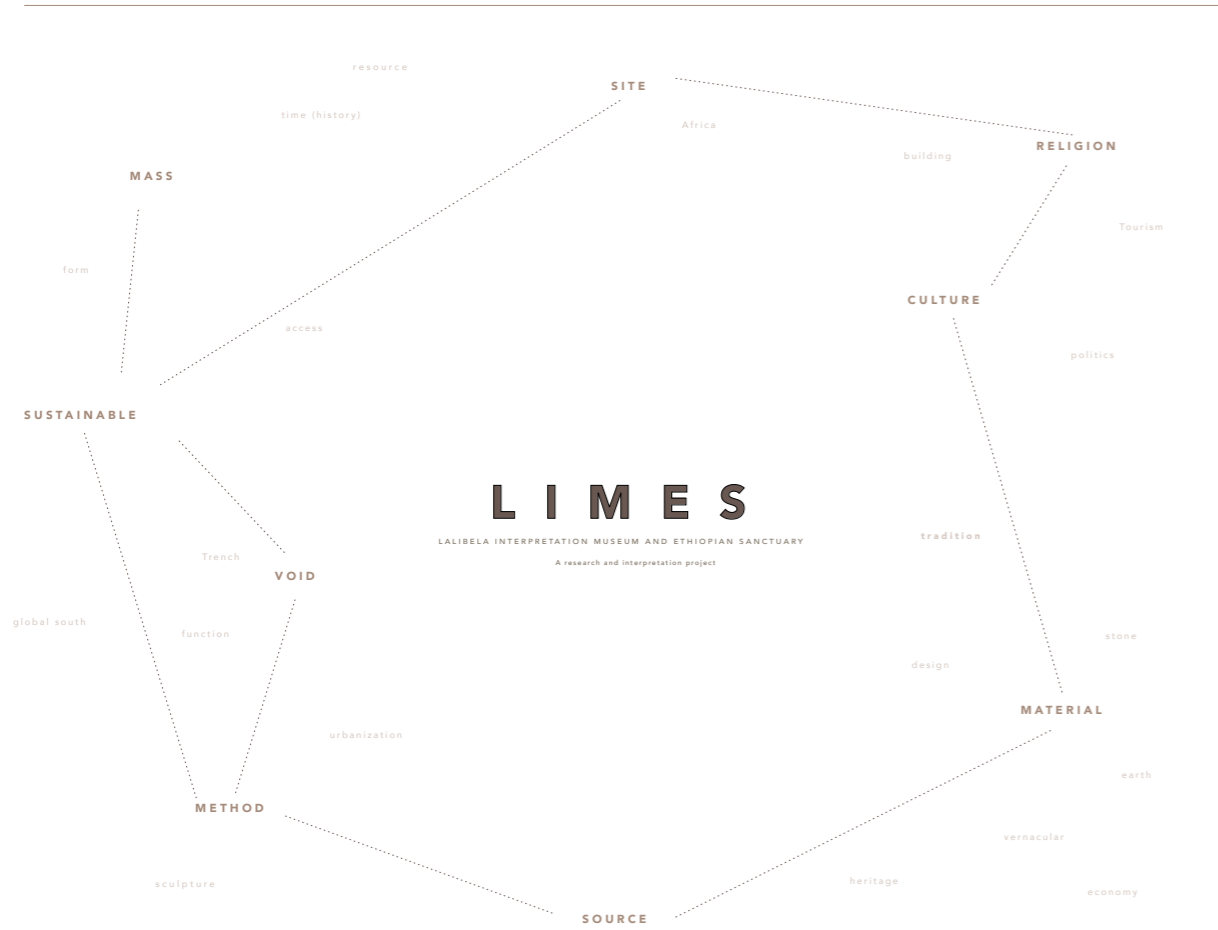
"The exhibition, the first of its kind, approaches architecture not with a historian's mind but with a naturalist's sense of wonder."
 - The Museum of Modern Art



Magazine format panel 2



Magazine format panel 3



STATEMENT	OBJECTIVE	CHARACTERISTICS	WHY IS THIS NECESSARY?	HOW?
LIMES is presented as the outcome of research and interpretation of a UNESCO world heritage site in Lalibela, Ethiopia. The research project seeks to explore the significance of an architecture which engages a deeper human connection with sacred spaces. As a museum and first point of contact for the complex, LIMES serves to add to the overall experiential quality and understanding of the site. Born from the process of saving stone, this architectural project positions itself on a subterranean level, hidden from plain sight. It celebrates atmospheric qualities of space, that being material, tactility of surfaces, light, intimacy of rooms, permanence of material, mass, void and the presence of culture and spiritual practices.	Together, The Rock-Hewn Churches and LIMES create an awareness of early position on the earth. There is an intrinsic comprehension of time, what has passed and the many years to follow. FOR The living heritage and archaeological site, Lalibela TO Better preserve the knowledge, artifact and transition into the comprehension of the site	Lalibela is a site of significance which is characterized by: 1. The mountainous terrain 2. Rock-Hewn Churches 3. Religious significance The site currently exhibits: 1. A high tourism rate 2. Inadequate facilities for locals and visitors	The current site has a small ticket office with 1 room serving as the museum. There is a need to improve the facilities both for the preservation of the artifact and overall experience of the site. In addition, LIMES intends to capitalize on the exponentially growing tourism industry in the Amhara region. A museum serves as a mode of archiving, celebrating and exhibiting knowledge.	To design a sanctuary and museum in Lalibela is to provide an archive of knowledge and an experience which enables the preservation of the artifact and overall experience of the site. The requirements in doing so is two fold. The first being research. Conducting research through various resources, including journals, online sources, interviews etc. Simultaneous to the research, the identification of opportunity of what would be an essential addition to the site is necessary. A museum and welcome sanctuary is the need of the hour. The second phase is the development of the project through the interpretation of the research conducted. As a result LIMES is an ideological proposal which is realized through excavation and the realization of a new building.

MATERIALITY

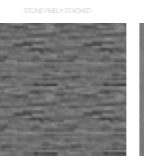
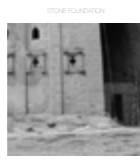
As a complex composed of geomorphology, the primary ground type found in Lullia is basaltic rock which has emerged from volcanic soil. This rock type determines the accuracy and speed of which the churches are carved. In the past iron tools were used to excavate through the rock, although compact, the basaltic rock has properties which provides an ease for carving. The resistant basal below the screen acted as a limit of the depth of where development should stop. Mailed form part of a core aspect of the emergence of the complex. So to will it serve as a core component of the emergence of LIMES. Different applications of the same material will be used as seen at Thème, led by Peter Zumthor. Additional materials will support the presence of stone and add to the overall atmosphere of the project.

STONE (NO)



Red basaltic rock exposed at Lullia.

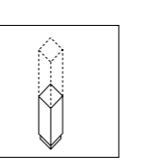
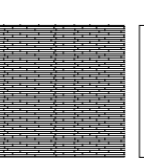
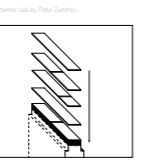
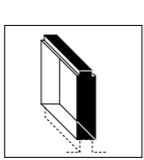
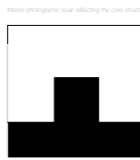
FACE



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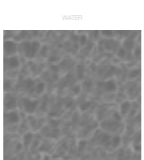


APPLICATION



- Building
- Gray gravelly silt
- Moderately weathered scoriaeous basalt
- Moderately highly weathered scoriaeous basalt
- Massive basalt
- Excavated material

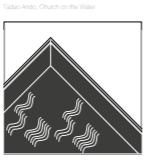
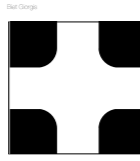
FACE



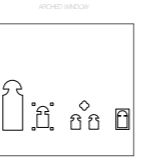
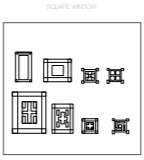
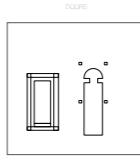
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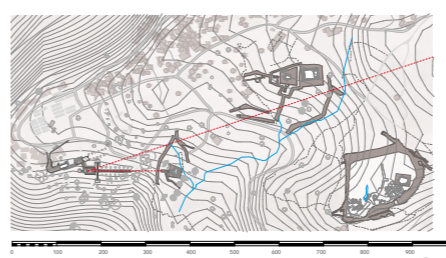
APPLICATION



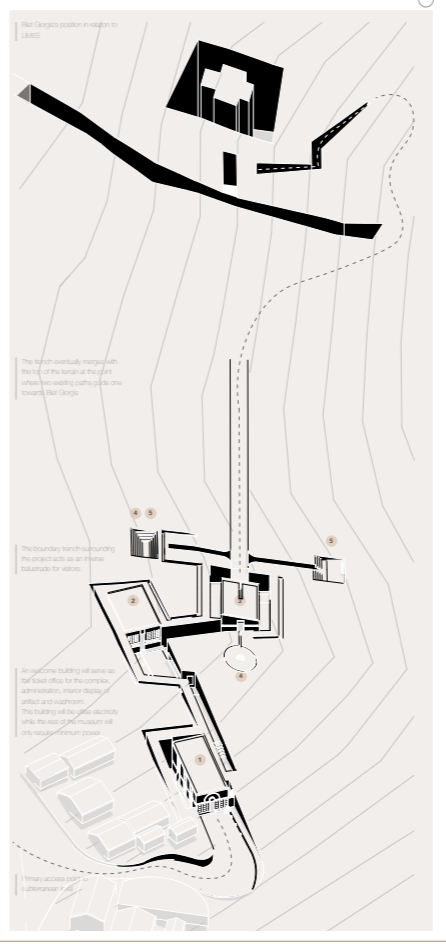
LEFT OFFRANGE



These various forms of openings are currently exhibited on the site.



Site Changes position in relation to LIMES.



TYPOLGY

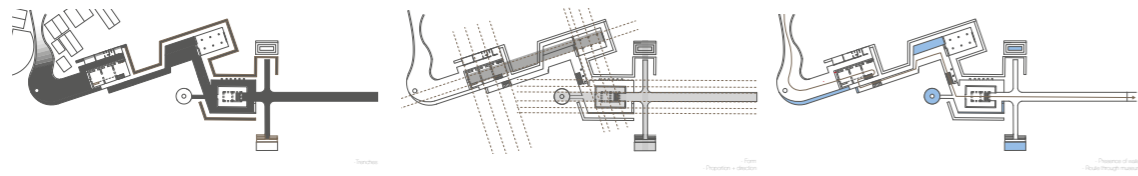
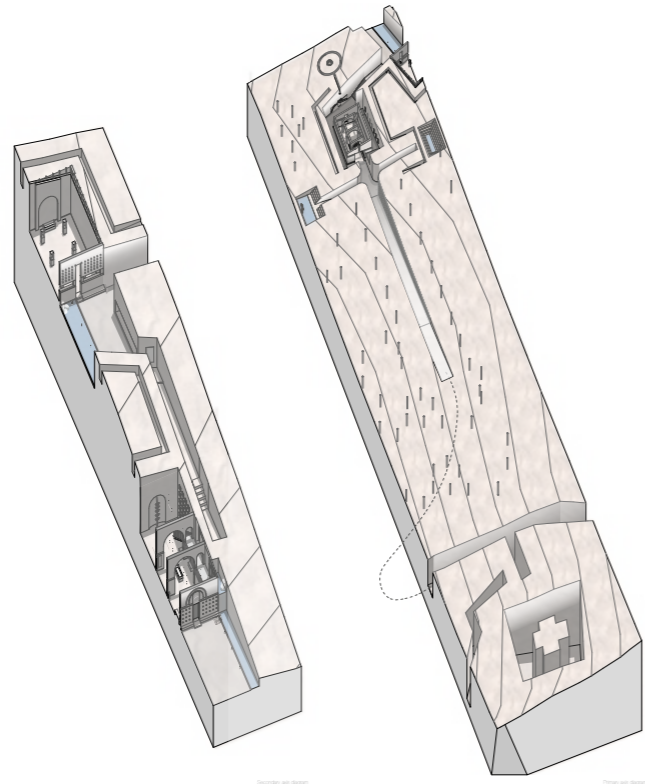
	<p>1 Semi-monolithic, monolithic with a rock floor facade, 2 sides enclosed in stone.</p>
	<p>2 Semi-monolithic with rock floor facade, 3 sides enclosed in stone.</p>
	<p>3 Monolithic, three-dimensional pyramidal architecture, 4 sides exposed.</p>
	<p>4 Heavy cutout.</p>
	<p>5 Excavated ground, opened to sky.</p>

PROGRAM

- Entry building + visitor reception
- Services
- Quality
- Elderly reception
- Prayer reception
- View Point + prayer space
- Core live spaces

PROJECT INTRODUCTION

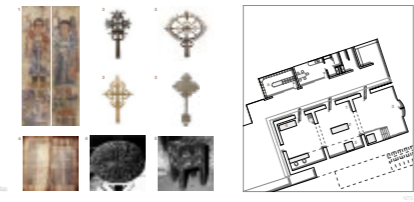
Born from the idea of a museum which crosses the town LIMES is a project which descends into a subterranean use. Trenches are commonly used as a design device by the Zagreb Dynasty. They connect the different churches and groups. A design decision was made to place the project along two axes. A primary and secondary one. One commercial journey along the secondary axis which is orientated in the direction of Mount of Olive, a site of significance where Jesus was said to have ascended to heaven. A slow descent gives rise to the immersion of an underground landscape, with the sky exposed. E1 and E2 are linear spaces located along the axis. The primary axis is orientated in the direction of Basil George. One of the rock-hewn churches connected to the complex. The Cross formation commonly seen throughout the complex as a motif inspired the overall excavation along the axis. One descends further into the earth's crust below an ascent into the main complex.



WELCOME EXHIBITION_01

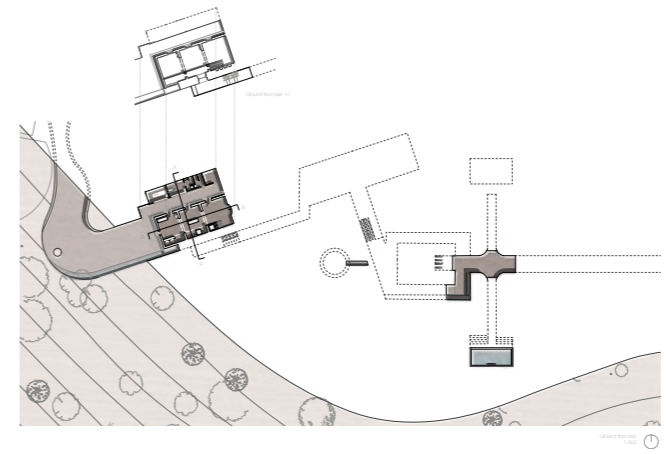
The welcome building offers those unfamiliar with the site with an essential information. It serves as a better office area similar for the removable antiques which are often used for celebratory occasions during festivals. More recently important artifacts in Ljubana have been at risk of their loss because of inappropriate hole leaving strategies. Offer from the core of the building is a service wing where additional storage and classrooms can be found.

HOUSING MOVABLE ANTIQUITIES



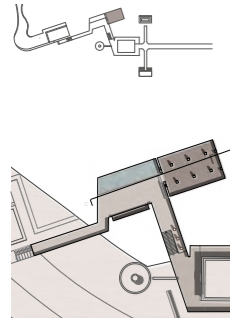
EXHIBITION OF WORK

- | | | |
|---------------------------|--------------------------|------------------|
| Processional hand crosses | Icons and manuscripts | Tapestries |
| Bells | Covers of books | Paintings |
| Chandeliers | Steel and wooden crosses | Resists |
| Ribbons | | Contemporary art |



MASS VOID

LIMES celebrates spaces which are carved and embedded. The act of doing so provides a much stronger connection of building and landscape. An idea large mass of stone has transformed into a landscape with punctures and voids.



COMMUNAL SPACE

Areas where worshippers and travellers can collectively meet are just as essential as the intimate and more isolated moments. LIMES depicts a series of these in the form of courtyards as the larger open spaces frame the interior rooms.



Site Context 1:500

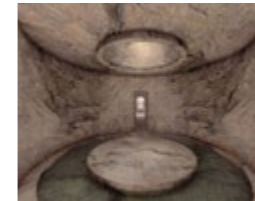
Communal Courtyard 1:500



A large body of water welcomes visitors from the narrow passage into a communal rest area. This is where BC, a semi-interior ventilation space is located. The cross formation of the openings is once again a celebration of the cross motif. It also enhances the lighting conditions on the floor. The podiums are intentionally placed where columns would be found in a more traditional design. The typology of this room is similar to Alaba Libanos where the front facade is exposed.



1 The motor of BC presents a visual change on the interior as a signal and transition from one significant condition to the next.



2 The circular stone structure is located at the apex of the valley. It defines the axis of significance and is a catchment area for water.



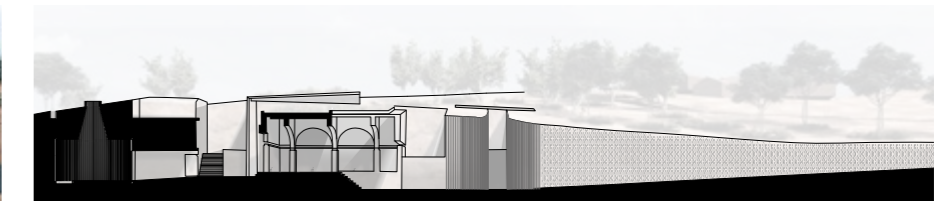
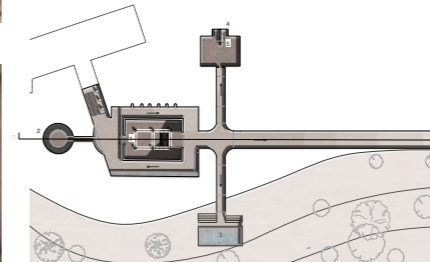
3 A worship and observation point. Beautiful views of the surrounding valley are captured from this point.



4 The shallow catchment serves as a resting point for the flock and it is located close to the market.



5 Stone is an intimate, calm and soothing area.



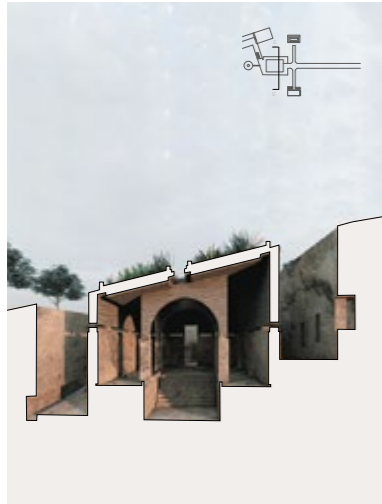
Long distance view of BC



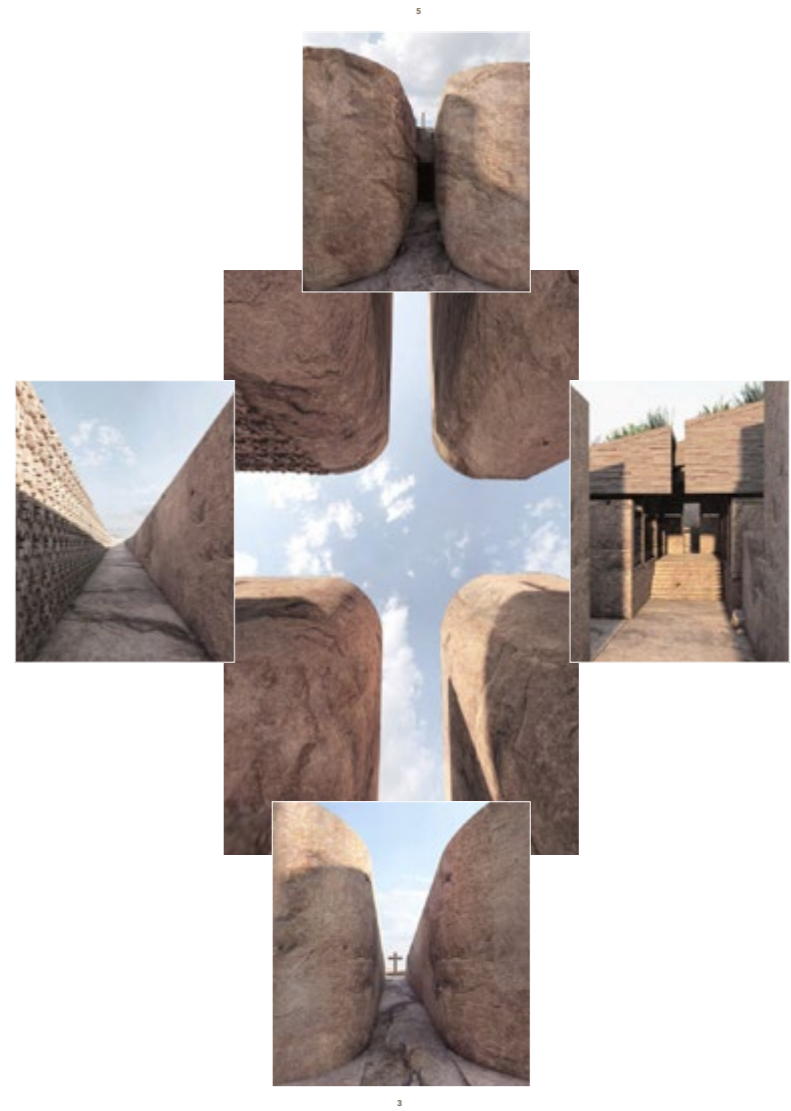
EMERGING FROM THE STONE
The ascent up the primary trench marks the transition from LIMES to the Rock-Hewn Churches. A foot path at the end of the trench guides one towards Bar Gorge.



ROCK HEWN CHURCH COMPLEX
Visitors will once again descend into the stone to experience the grandeur of the UNESCO site, Lalibela.

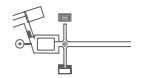


02.02.2024
1:100



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