

ReUse The Abbey

Adaptive Reuse of The Abbey of Santa Maria del Piano



**Politecnico
di Torino**
International
University

**Master of Science in
Architecture for Sustainability**

Authors:

Fariba Shirmohammadi
Fatemeh Zaghiyan

Supervisor:

Prof. Matteo Robiglio

Degree Thesis

A. Y. 2025-2026





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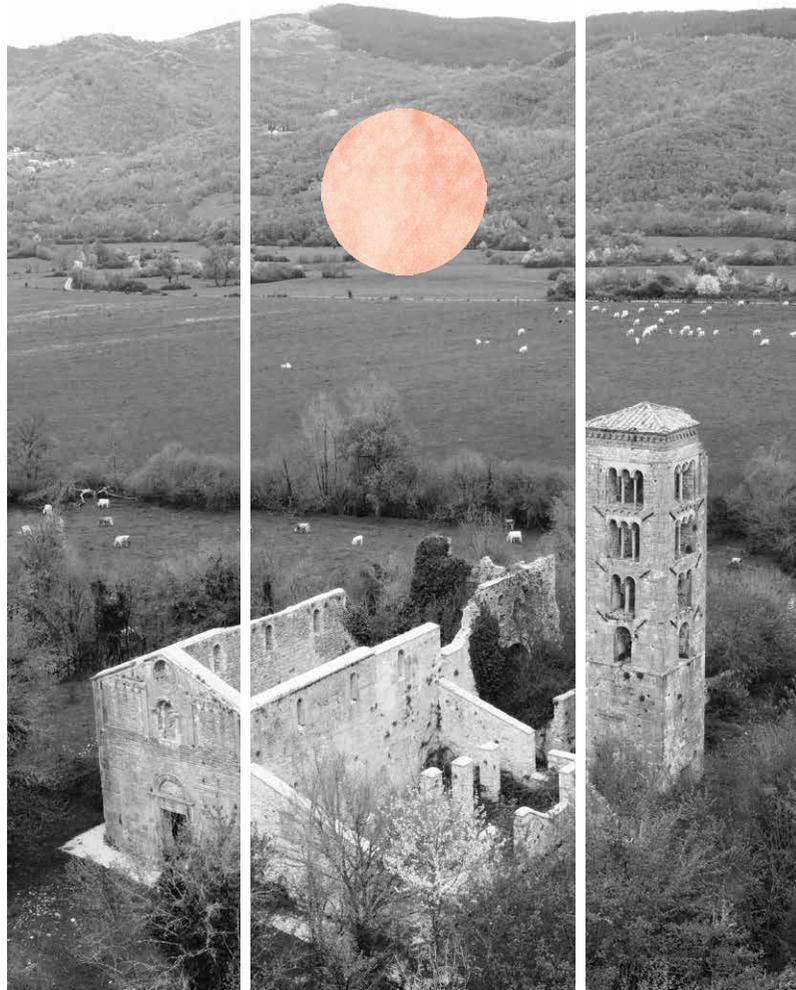
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Meditation

/,med.i'teɪ.jən/, noun.

the act of giving your attention to only one thing, either as a religious activity or as a way of becoming calm and relaxed

Abstract(EN)

The reuse of historic buildings is one of the major challenges and opportunities in today's architecture. In Europe, many religious sites are left unused because of changing populations, secular trends, and shifts in community involvement. Though these buildings hold centuries of cultural significance and architectural skill, they may fall into neglect without sustainable reuse strategies. Adaptive reuse has emerged as both a preservation method and a design approach that blends historical heritage with the needs of modern society (Bullen & Love, 2011; Plevoets & Van Cleempoel, 2019).

The Abbey of Santa Maria del Piano in Orvinio, Lazio, is a strong example of this approach. Built in the 9th century, the abbey has changed in form and function over the years. Today, although it remains a physical presence in the landscape, it no longer has an active religious role. The town of Orvinio is limited in its public and cultural activities. Its urban landscape is mostly residential, with small commercial venues, places of worship, and limited hospitality options (ISTAT, 2022). The lack of varied public spaces highlights a cultural and wellness gap, making the abbey a potential driver for renewal.

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ADAPTIVE REUSE

Conservation, restoration, and renovation all play important roles in safeguarding the built heritage, but adaptive reuse has emerged as an integrated and progressive approach. Unlike conservation, where existing building components are kept unaltered as much as possible, or restoration, where generally an establishment stays in some specified historic state, adaptive reuse enables the building to transform by incorporating new functions. Renovation, on the other hand, values newer trends but overlooks historical identity as well, thus compromising cultural identity (Douglas, 2006; Jokilehto, 2006).

Adaptive reuse is therefore superior to the others because it achieves a balance between preservation and innovation. It preserves the cultural and architectural values of the heritage but makes buildings continue to be useful and relevant in the present society (Plevoets & Van Cleempoel, 2019). Its dual attention not only preserves historic identity but also achieves long-term social, environmental, as well as economic returns, which the others tend not to realize.



ADAPTIVE REUSE

Ecologically, adaptive reuse minimizes the necessity for demolition and new construction, thus less material use as well as less carbon emissions. It also maintains the embodied energy built into old buildings, something consistent with the values of the circular economy (Conejos, Langston, & Smith, 2011). In comparison to renovation or new construction, adaptive reuse has made substantial savings in waste going to landfills as well as energy consumption (Bullen & Love, 2011). Economically, adaptive reuse injects life into local economies by promoting local tourist attractions, new business prospects, as well as being less expensive than outright new construction. It breathes life into neglected properties and turns them into productive ones, enhancing area property values as well (Langston, 2012). In contrast to conservation or restoration, where the latter might maintain heritage without necessarily being income-generating, adaptive reuse achieves sustainability as well as fiscal soundness.

From a social and demographic viewpoint, adaptive reuse promotes community involvement and reinforces cultural identity through the transformation of outdated spaces into centers of activity. It addresses demographic changes, including secularization and evolving lifestyles, by offering novel cultural and wellness amenities that align with contemporary needs (Yung & Chan, 2012). In this manner, it aids in averting population decrease in smaller towns, enhances local welfare, and revitalizes community dynamics.

Ultimately, therefore, adaptive reuse presents the most just and sustainable way of approaching the built heritage. Unlike conservation and restoration, it doesn't restrict buildings to their past contexts; unlike renovation, it doesn't negate authenticity. Instead, it integrates the values of the past with those of the contemporary moment as well as the future, thus promoting robust, equitable, and sustainable places.

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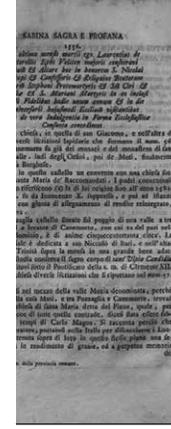
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Introduction

The reuse of historic buildings is one of the major challenges and opportunities in today's architecture. In Europe, many religious sites are left unused because of changing populations, secular trends, and shifts in community involvement. Though these buildings hold centuries of cultural significance and architectural skill, they may fall into neglect without sustainable reuse strategies. Adaptive reuse has emerged as both a preservation method and a design approach that blends historical heritage with the needs of modern society (Bullen & Love, 2011; Plevoets & Van Cleempoel, 2019).

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In this light, the proposal to turn the Abbey of Santa Maria del Piano into a meditation center addresses local and wider societal needs. On one hand, Orvinio and the nearby areas lack venues for cultural gatherings, wellness activities, and non-religious mindfulness practices. On the other hand, meditation is gaining importance as a worldwide practice that supports mental health, relieves stress, and enhances community well-being (Kabat-Zinn, 2003; Chiesa & Serretti, 2009). The abbey's unique spatial and atmospheric features, such as its acoustics, stone materials, height, and meditative quality, naturally align with what is needed for meditation. By introducing this new purpose, the abbey can once again connect with the community, ensuring its preservation while enhancing its social relevance.

Introduction

The specific goals of this research are to:

1. Explore the historical and architectural importance of the Abbey of Santa Maria del Piano within Orvinio's urban and cultural framework.
2. Analyze Orvinio's functional aspects, identifying gaps in cultural, social, and wellness facilities.
3. Create a proposal for adapting the abbey into a meditation center, merging architectural conservation with new functional demands.
4. Assess the project regarding sustainability, community involvement, and heritage preservation.

By pursuing these goals, the thesis shows how adaptive reuse can protect architectural heritage, rejuvenate underused towns, and meet emerging social needs. The Abbey of Santa Maria del Piano, envisioned as a meditation center, serves as a case study that demonstrates how architecture can connect history and modern life, spirituality and wellness, and local identity with global cultural trends.

Territorial Framework 01

The territorial framework provides important context for understanding the Abbey of Santa Maria del Piano in Orvinio, Lazio, Italy. Located in a hilly area between the Apennines and the Roman countryside, Orvinio features compact medieval structures, agricultural land, and limited infrastructure. These geographical traits create both challenges and chances for adaptive reuse (Sereni, 1997).

Historically, Orvinio has maintained its medieval identity and heritage. The abbey, which dates back to the 9th century, is a cultural landmark that has lost its religious function due to secularization and rural depopulation (Choay, 2001). Its reuse presents a chance to reinterpret heritage according to modern needs.

Demographically, the town reflects typical trends seen in Italian hill settlements, including an aging population, youth outmigration, and a gradual drop in residents (ISTAT, 2022). This situation emphasizes the urgent need for new cultural and wellness functions to draw visitors and strengthen community life.

Socio-economically, Orvinio remains modest, depending on agriculture, small businesses, and limited hospitality. The lack of wellness and cultural facilities highlights a gap that adaptive reuse could fill, diversifying the local economy and promoting sustainable cultural tourism (Richards, 2018).

Environmentally, the natural landscape offers a peaceful setting ideal for meditation and retreats. Adaptive reuse reduces environmental impact by preserving existing energy and cutting down on waste from demolition, meeting principles of a circular economy (Bullen & Love, 2011).

In terms of infrastructure, Orvinio is moderately well-connected by regional roads and limited public transport. Better integration with wider cultural and tourism networks is important to enhance the impact of the abbey's reuse (OECD, 2020).

In summary, the territorial framework presents a dual challenge: demographic decline and underuse of heritage assets. At the same time, it provides an opportunity to use adaptive reuse as a means of cultural preservation, social rejuvenation, and sustainable development in the area.



Geography and Location of Sabina

Introduction to Sabina

Sabina is a historical region located in Italy, a country in southern Europe known for its rich history, diverse landscapes, and cultural heritage. Within Italy, Sabina is situated in the central part of the country, primarily within the Lazio region, which is home to Rome, the nation's capital. Lazio is characterized by its varied terrain, including coastal plains, hills, and mountainous areas.

Within Lazio, Sabina is mainly located in the province of Rieti, a region known for its scenic beauty, historical significance, and proximity to the Apennine Mountains. Rieti is often considered the gateway to Sabina and serves as a central hub for the area's cultural and economic activities.

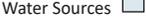
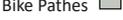
- Italy
- Lazio
- Rieti
- Sabina

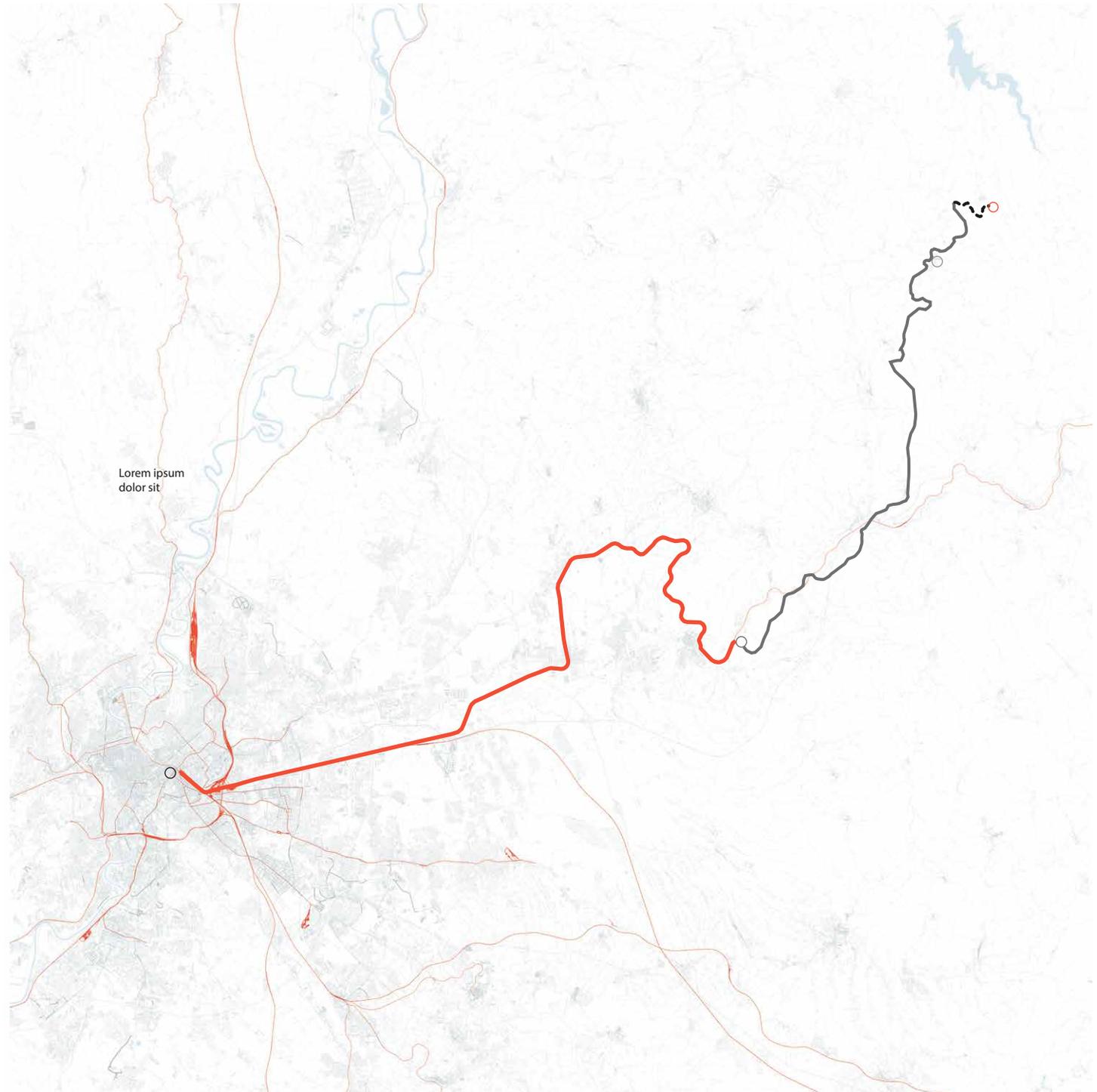
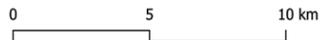
How to get to Santa Maria Del Piano

From Rome to The Abbey of Santa Maria del Piano

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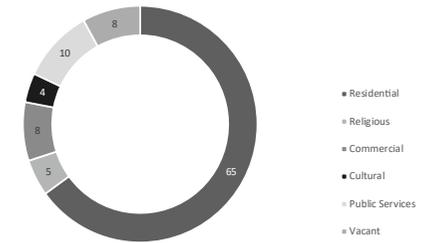
	T	i	m	e
	Car	Bus	Bike	Walk
Rome	80'	170'	300'	960'
Rieti	57'	117'	180'	660'
Tivoli	48'	81'	167'	540'

-  Santa Maria del Piano 
-  Orvino
-  Tivoli
-  Rome
-  Roads
-  Train
-  Buildings
-  Water Sources
-  Bike Pathes



Introduction to Orvinio

Orvinio is a medieval hill village with a limited population in the province of Rieti, within the region of Lazio, central Italy. At around 840 meters above sea level, the village features one of the highest "Borghi più belli d'Italia" (most beautiful villages of Italy) awards due to the conservation of the architectural fabric and historical authenticity. The settlement dates back to around the 9th century and took the form of religious and defensive centers with narrow stony streets, dense dwellings, and a prevailing central church. Currently, the village hosts around 350 inhabitants (ISTAT, 2022) with a strong cultural identity that is mostly based on agriculture. The village layout combines residential units, limited-scale commercial activities, religious buildings, as well as limited hospitality and service facilities. Despite the declining demography, the village still poses high cultural value along with landscape value to be an ideal context in terms of promoting heritage-led regeneration and architectural adaptation reuse projects.



Building Functions in Orvinio

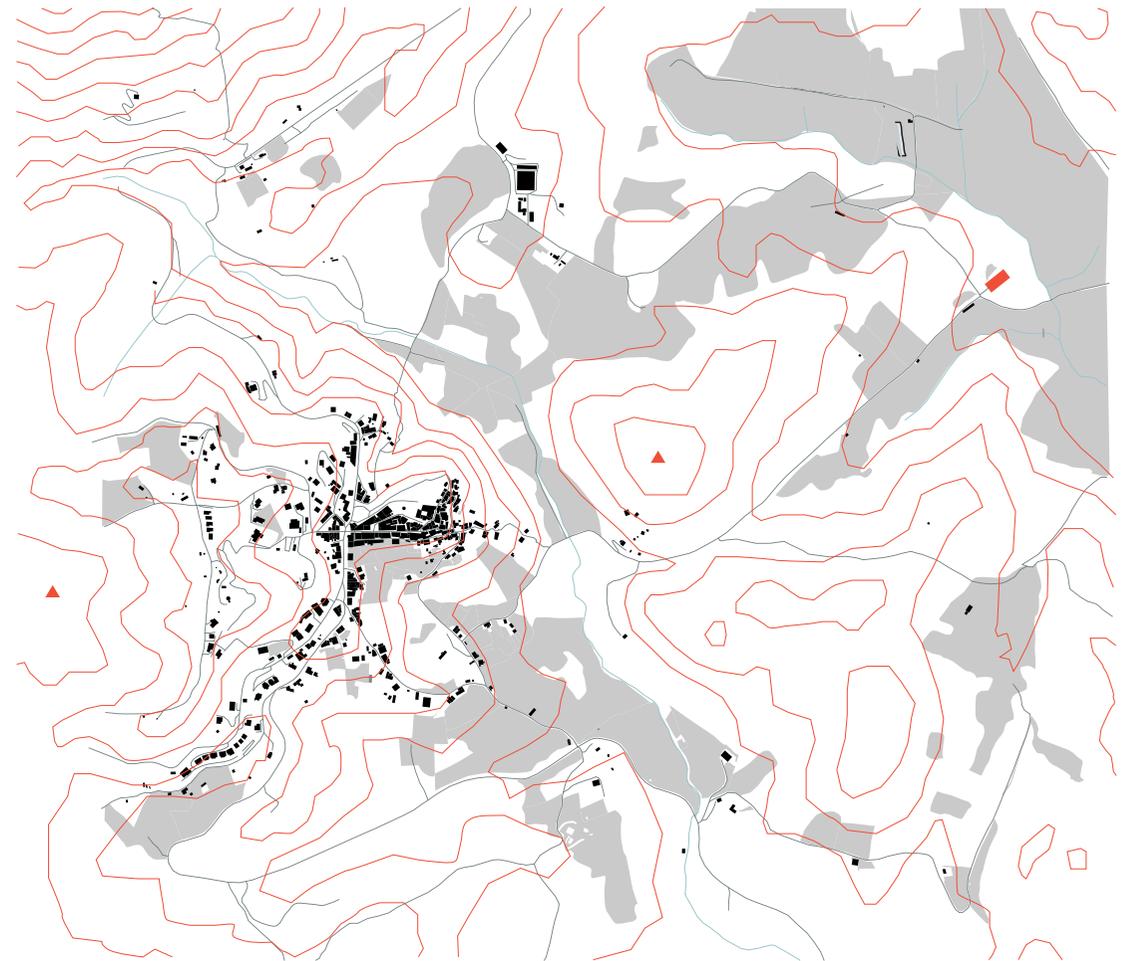


Topography, Location, and Geography of Orvinio

Orvinio is situated within the Monti Lucretili Regional Natural Park in the Lazio region, central Italy, at an elevation of approximately 830 meters above sea level. The territory is characterized by a complex orographic system belonging to the Sabina mountain chain, composed predominantly of limestone and marl formations shaped by erosion and tectonic activity. This geomorphological structure generates a varied landscape with steep slopes, ridges, and narrow valleys, contributing to the area's distinct environmental and visual identity.

The village occupies a strategic hillside position that harmonizes with its natural context, displaying an urban morphology that follows the terrain's topographical gradient. The compact built fabric, defined by narrow, winding streets and terraced structures, reflects an adaptation to the mountainous setting and historical defense needs. The surrounding landscape alternates between woodland areas—mainly oak and beech forests—and agricultural terraces traditionally used for olive cultivation, grazing, and small-scale farming.

From a broader geographical perspective, Orvinio lies approximately 60 kilometers northeast of Rome and 35 kilometers south of Rieti, within a transition zone between the Apennine uplands and the Roman countryside. This position has historically shaped its climatic conditions, land-use patterns, and socio-economic development, linking its identity to both mountain and rural environments



■ The Abbey of Santa Maria del Piano



- Water Ways
- Roads
- Buildings
- Water
- Forests
- Agriculture
- Topography Lines
- Summit Peak
- Orvinio

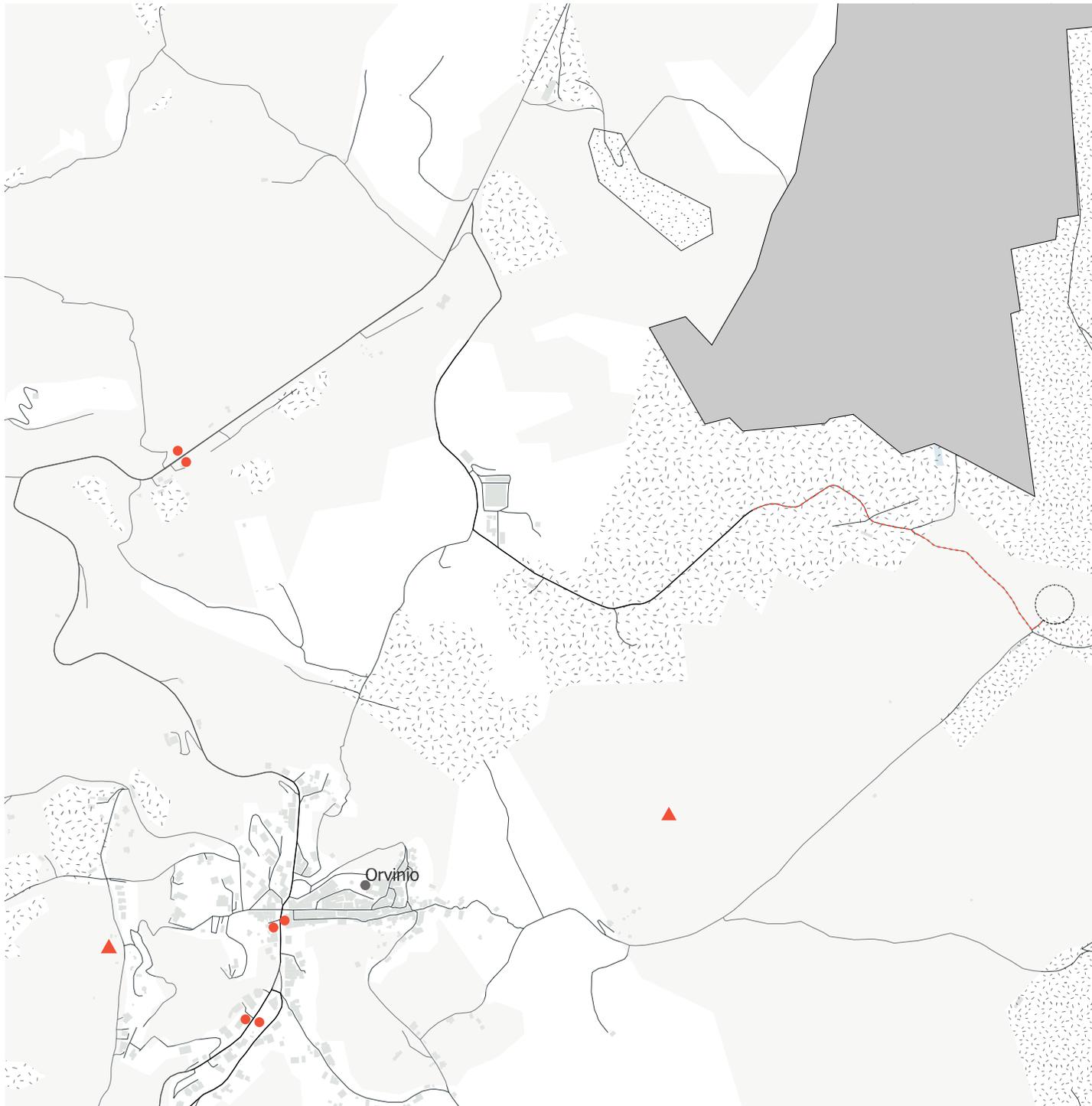
Environmental and Sustainability Aspects of Orvinio

Orvinio is located in the Monti Lucretili Regional Park. This area features forested hills, terraced farming, and strong ecological health. The village's small urban layout, made from local limestone and wood, shows years of careful environmental use and sustainable practices. The natural land features and building positions provide good airflow and sunlight, which lowers energy needs. Nearby farms and forests help absorb carbon, maintaining harmony between built and natural environments. These traits make Orvinio a great place for reuse projects that focus on low-impact design and connections among architecture, landscape, and culture



- Water Ways
- Roads
- Buildings
- Water
- Protected Natural Areas
- Agriculture
- The Abbey of Santa Maria del piano
- Area A





Public Transportation & Mobility in Orvinio

Orvinio has a limited but functional public transportation network due to its small scale and mountainous setting. The village is connected to nearby towns and to Rome mainly through COTRAL regional buses, with regular routes linking Orvinio to Tivoli and Rome (Ponte Mammolo station). There is no railway station within the municipality; the closest ones are located in Carsoli and Tivoli, accessible by bus.

Inside the historic center, movement is mostly pedestrian, as the narrow and sloped streets restrict car circulation. Private cars and small vehicles are the most common means of transport for residents, while motorbikes are frequently used in warmer seasons. Although the steep terrain limits cycling, pedestrian mobility remains central to the village's sustainable and human-scaled character.



 The Abbey of Santa Maria del Piano

 Bus Stations

 Summit Peak

 Main Road

 Pedestrian

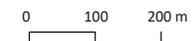
 Farmland

 Residential

 Forest

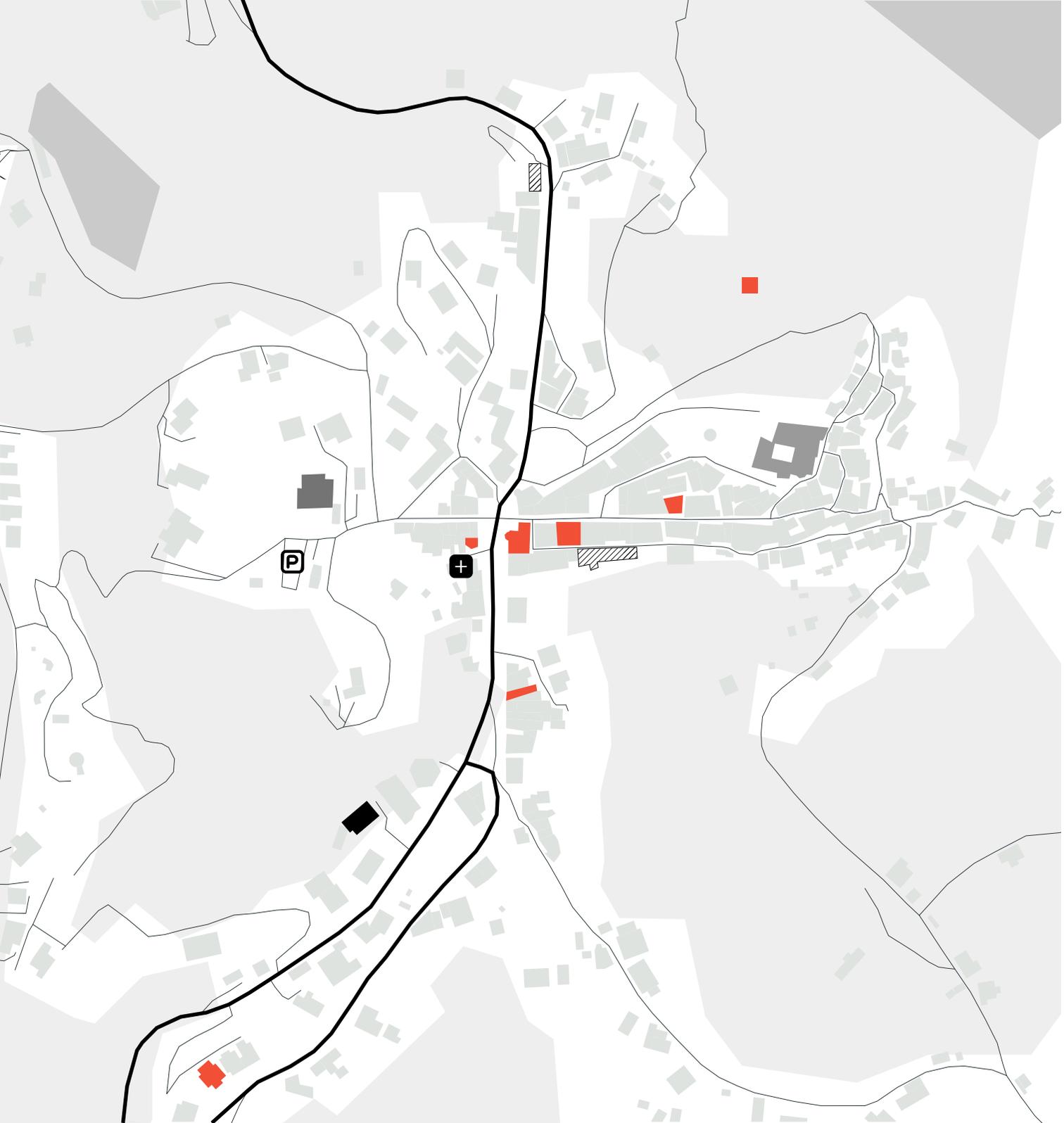
 Scrubland

 Grass - Meadow

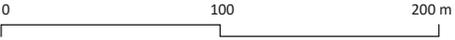


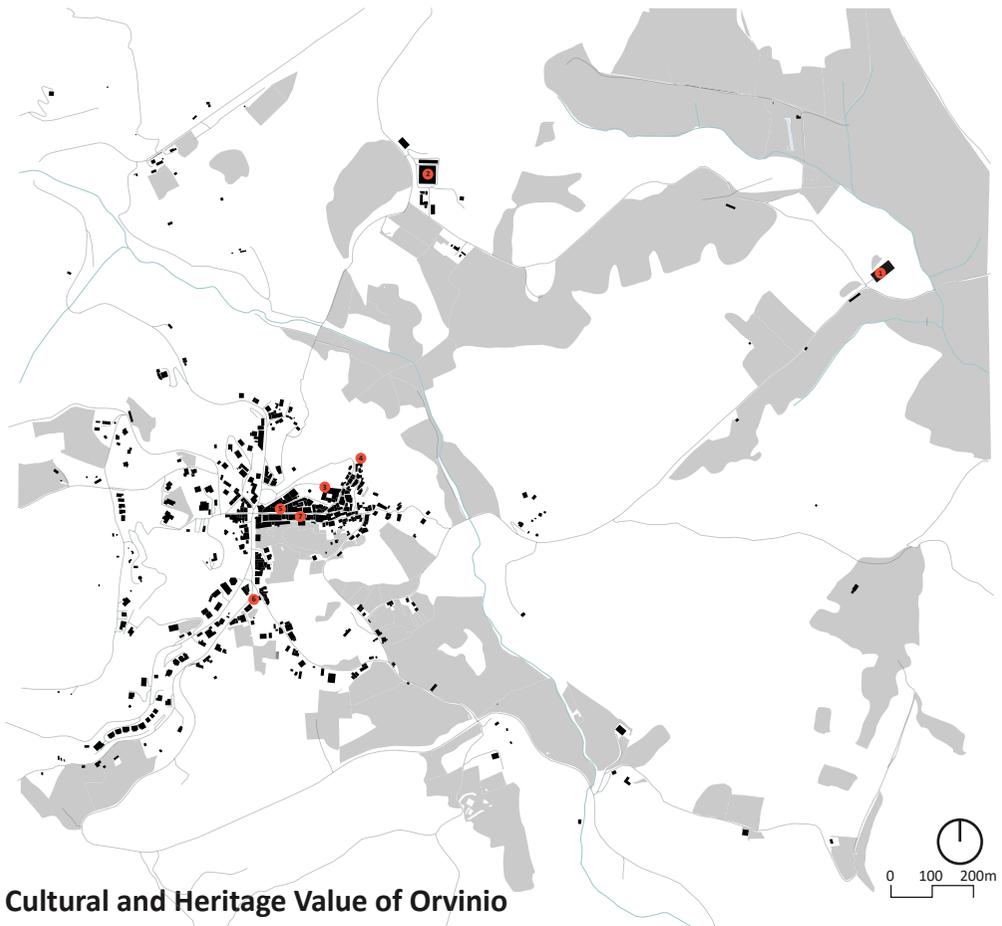
Socio-Economic Context of Orvinio

The socio-economic structure of Orvinio shows the traits of a small rural community with limited economic variety and a declining population. The local economy mainly depends on small-scale agriculture, seasonal tourism, and public services. There are few chances for cultural or commercial growth. This economic situation is reflected in the types of buildings found in the area. About two-thirds of the buildings are residential, while cultural, commercial, and hospitality spaces make up only a small portion. The lack of multifunctional buildings and the existence of vacant highlight the need for new programs that can boost economic activity without losing the village's historical identity. Repurposing existing heritage sites, such as the Abbey of Santa Maria del Piano, into cultural or wellness facilities can help strengthen local jobs, attract visitors, and improve long-term social sustainability.



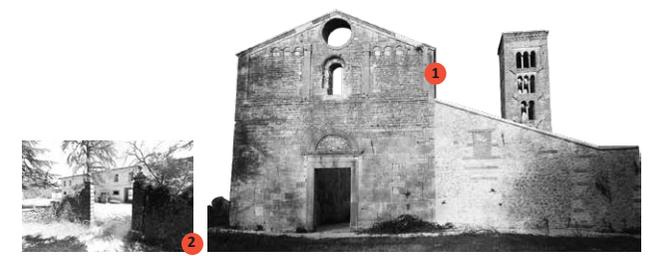
- Restaurant
- ▨ Hotel
- Residential
- Castello di Malvezzi
- Comune
- Carabinieri
- Pharmacy
- Parking
- Main Road
- Grass - Meadow
- Agriculture and Forest





Cultural and Heritage Value of Orvinio

Orvinio has a unique cultural identity shaped by its medieval roots, religious buildings, and well-preserved urban layout. The village grew around church centers, with the Abbey of Santa Maria del Piano acting as a significant spiritual, social, and territorial landmark. Its architecture, made from local limestone and noted for its simple decoration and balanced proportions, reflects the local style found in Lazio's hill towns. Even though it is small, Orvinio has a rich intangible heritage based on community traditions, rural skills, and local religious celebrations. The ongoing architectural character of the settlement, along with its beautiful setting in the Monti Lucretili area, adds to its cultural and aesthetic importance. Repurposing the abbey into a meditation and cultural center is not just about preservation; it is also a way to reinterpret this heritage. This change turns a symbol of faith into a space for reflection, wellness, and modern cultural activities



- The Abbey of Santa Maria del Piano 1
- Fattoria Marchese Malvezzi 2
- Castello di Malvezzi 3
- Belverde di Orvinio 4
- Main Square: Piazza del Comune 5
- san Giacomo 6
- Santa Maria dei Raccomandati 7



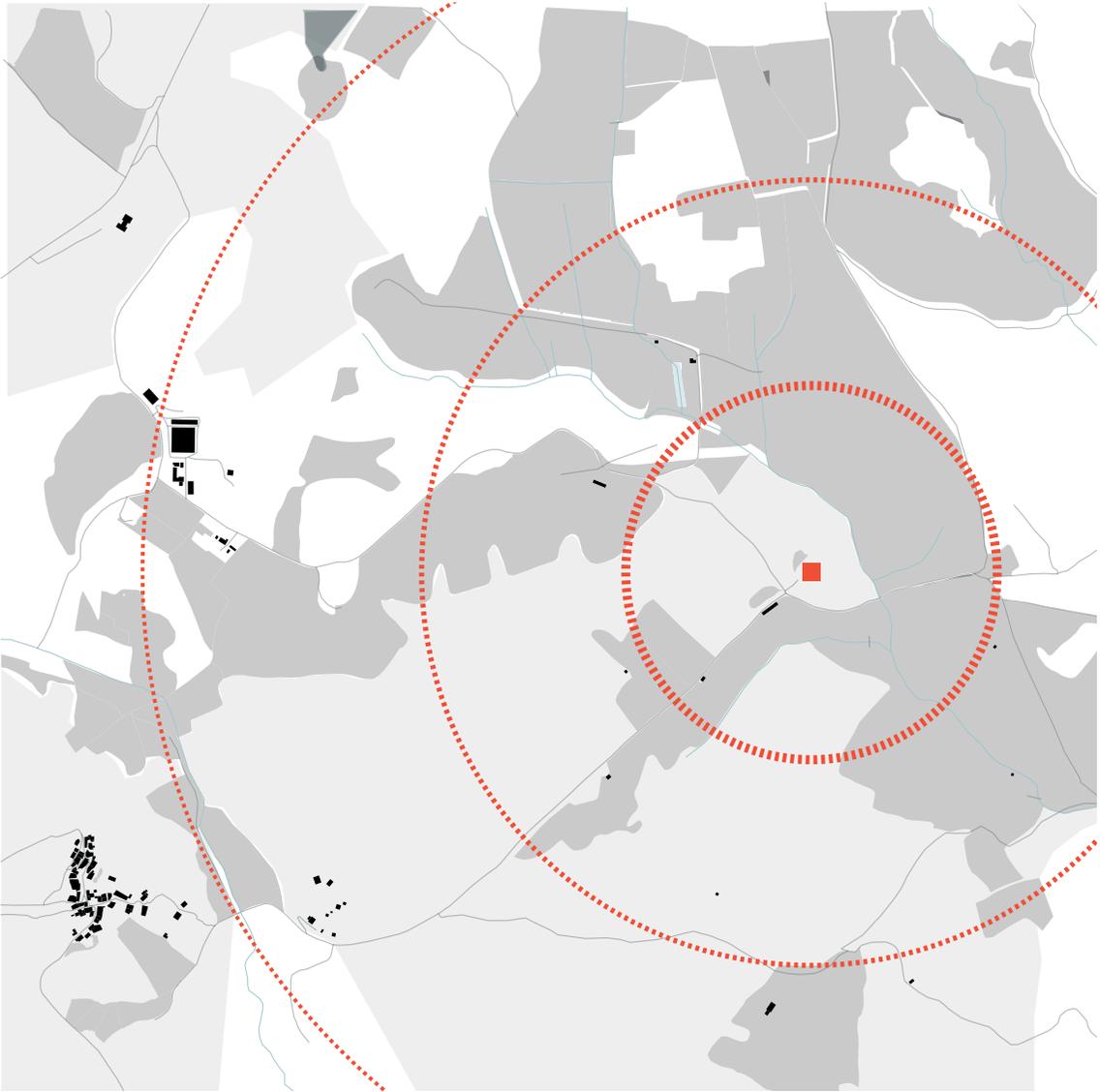
- Water Ways
- Roads
- Buildings
- Water
- Protected Natural Areas
- Agriculture
- The Abbey of Santa Maria del piano
- Area A

0 100 200 m



Surroundings of the Abbey of Santa Maria del Piano

Within a 300 m radius, the abbey is surrounded by open fields, low vegetation, and remnants of ancient stone walls. This creates a calm and secluded atmosphere. In a 700 m radius, the landscape changes to a mix of olive groves, grazing areas, and small rural paths. This shows the historic connection between the monastery and farming activities. At 1200 m, the wider area includes parts of the Monti Lucretili Natural Park, featuring denser forests, panoramic slopes, and scattered farmhouses. Together, these layers reflect the abbey’s integration into a natural and rural setting that maintains both ecological and cultural continuity.



■ The Abbey of Santa Maria del Piano

— Water Ways

— Roads

■ Buildings

■ Water

■ Forests

■ Agriculture



0 100 200 m

⋯ A 300-meter radius Area

⋯ A 700-meter radius Area

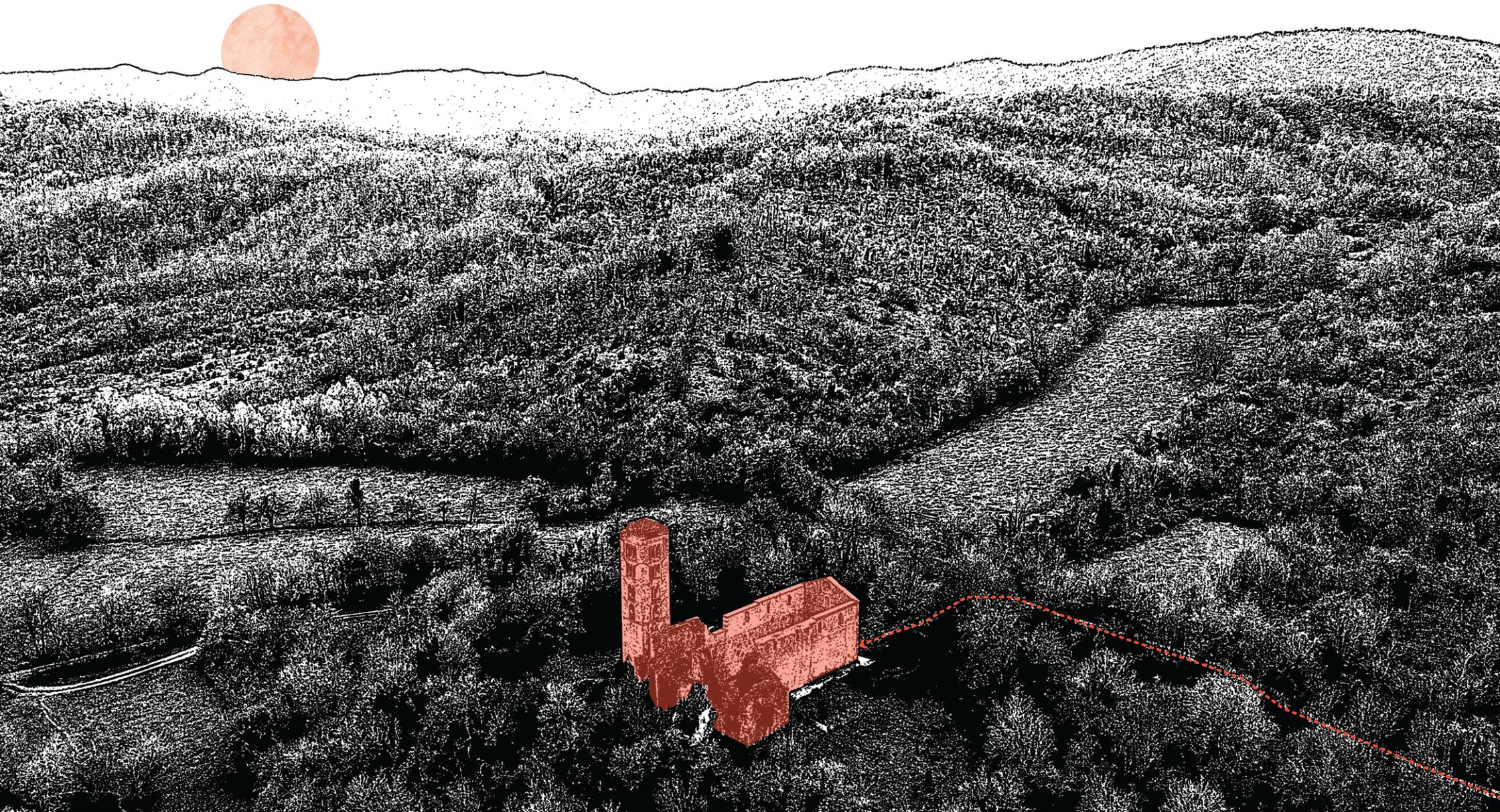
⋯ A 1200-meter radius Area





AREA A

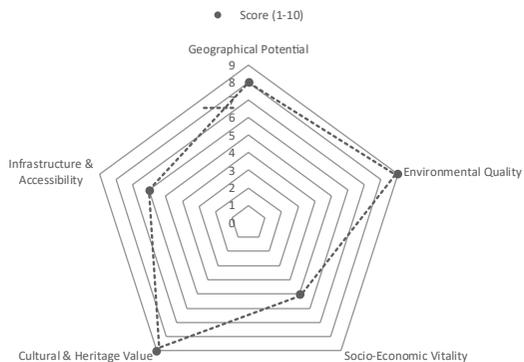
Site Plan
Entrance to The Abbey of Santa Maria del Piano



A Living Heritage in Balance: The Territorial Identity of Orvinio

The territorial framework of Orvinio shows a strong link between the landscape, architecture, and community identity. The village's close-knit structure, historical significance, and good environmental quality create a setting of great cultural and ecological value. However, problems like population decline, limited job options, and underused heritage sites pose serious challenges for sustainable growth.

Reusing the Abbey of Santa Maria del Piano presents a chance to tackle these issues. This approach combines protecting heritage, revitalizing the community, and maintaining environmental balance. Analysis shows that Orvinio's small size, ecological health, and rich cultural landscape make it a perfect place for low-impact projects focused on well-being, culture, and sustainability.



Historical Frameworks 02

Introduction

The Abbey of Santa Maria del Piano is an exemplary case of medieval monastic architecture located in central Italy, in the Muzia Valley between Orvinio and Montorio in Valle, in the Rieti Province. The placement on a modest plateau located in a mountainous scenario reflects its importance because it acted as a natural point connecting territories.

There is an obvious link between its foundation and very ancient routes of circulation, some of them of Roman and pre-Roman origins, like Via Salaria, Via Tiburtina, and Via Cecilia, to name but a few. In this context, and thanks to this infrastructural and geographical web, besides its religious role, another territorial role is related to its founding.

Throughout its history, there have been several phases of construction, transformation, and abandonment of the complex. These have left their marks on the architectural structure of the complex, which reflect changes triggered by different historical periods.

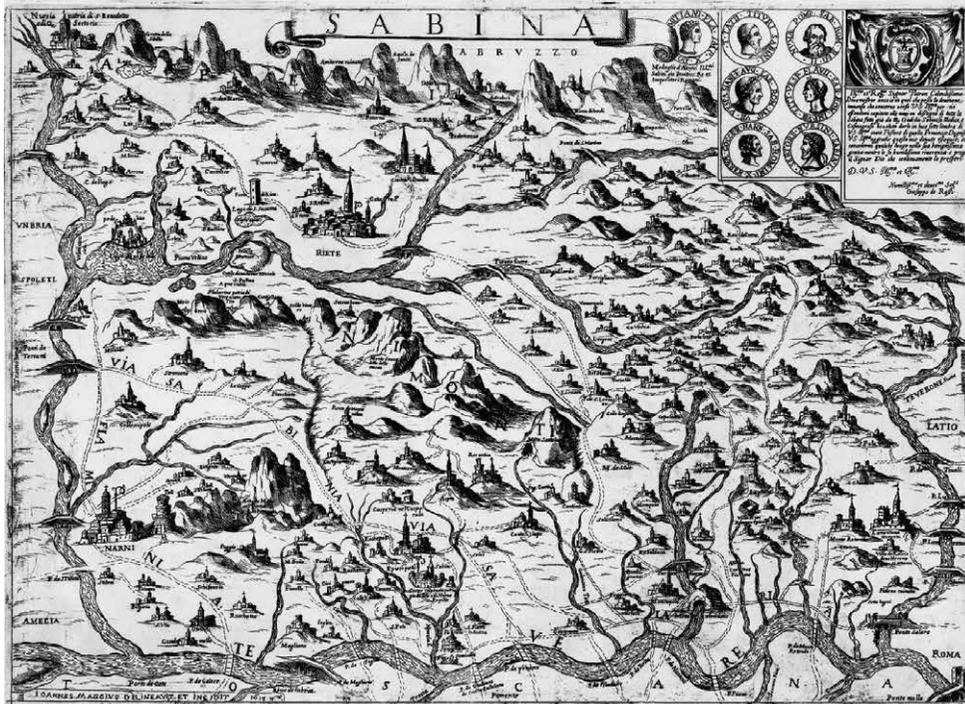
Subsequent episodes of structural decline, collapse, and restoration have contributed further to the current state of the abbey. Current restoration projects have focused on preserving the extant structures while working to resolve questions of authenticity of materials as well as interpretation of history. This historical context serves as the requisite background for examining the architectural development of Santa Maria del Piano.

Historical Development of Sabina Urban Development of Sabina

The urban development of Sabina, located in central Italy, has evolved through several historical phases:

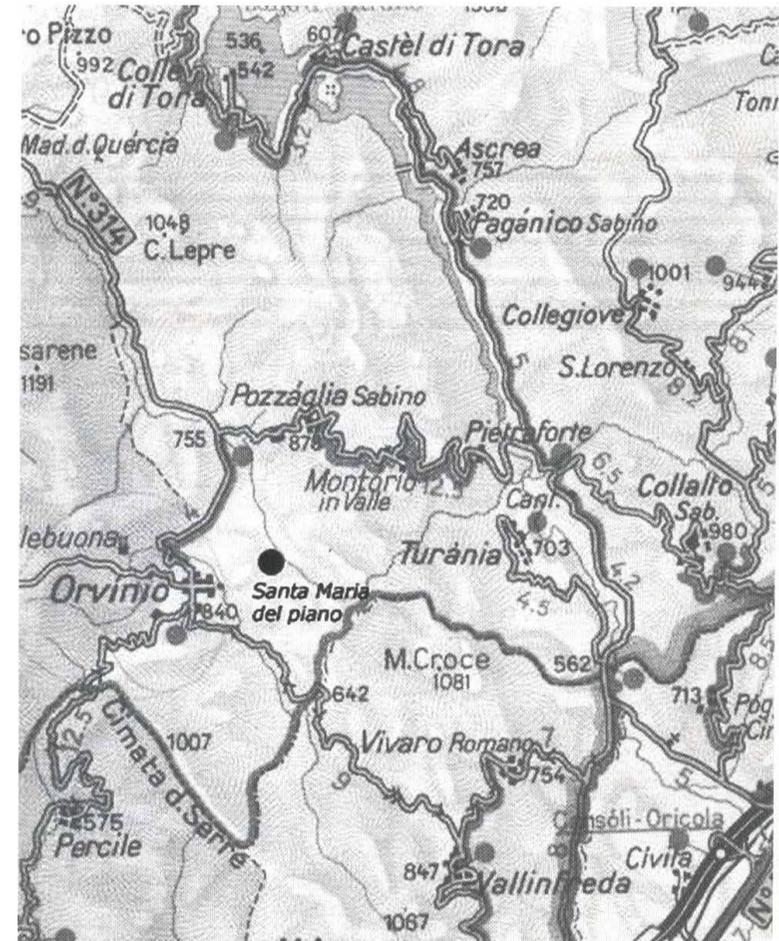
1. Roman Era: Roman settlements were rural, focusing on agriculture and olive cultivation, with small towns along important roads like the Via Salaria.
2. Medieval Period: Fortified towns and castles were established, with many towns, such as Rieti, growing around abbeys and churches.
3. Renaissance & Baroque: Urban growth continued with the construction of palaces and churches, blending medieval and new architectural styles.
4. Modern Urbanization: In the 19th and 20th centuries, proximity to Rome led to suburbanization, but Sabina maintained its rural character.

Sabina's urban development blends historical continuity with modern needs.



The Abbey of Santa Maria del Piano, Orvinio(RI)

The abbey known as Santa Maria del Piano, dedicated to the Virgin Mary, dominates the modest plateau of the Muzia valley, a few kilometers from Turano, in the province of Rieti. The Muzia Valley is a modest plateau that extends between 600 and 700 meters above sea level among the mountain ranges of the province of Rieti. A favorable combination of two factors, a strategic position and a variety of resources due to a specific and unique geological organization, makes the Muzia valley, in a large portion of the territory, an area particularly favorable to settlements, of which it is both the origin and the constraint.

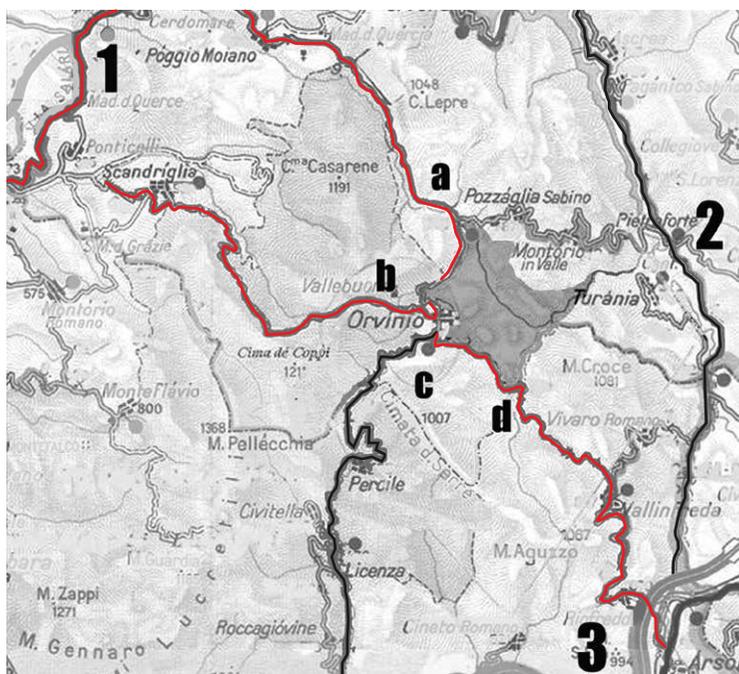


Geographical location of the abbey

Historical Road Maps

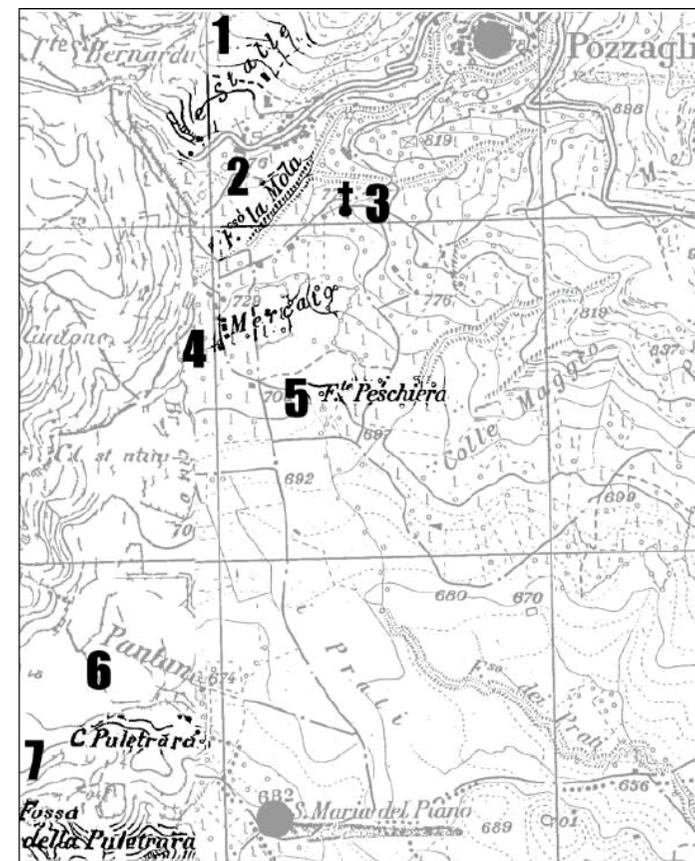
How to reach to Muzia Valley

The Abbey known as Santa Maria del Piano, dedicated to the Virgin Mary, dominates the modest plateau of the Muzia valley between Orvino and Montorio in Valle in province of Rieti. The complex occupies an ap
 In fact, it is situated on an ap Besides the factor of the availability of natural resources, the region is strategically located, given the fact that the region is the only plain within a wide radius of the mountains, thus being a morphological obligatory route to territories that were difficult to reach. It is thus a junction of a quadrilateral road network, established from the Neolithic era, and in the Roman era the network included the Via Salaria route to the north, the Via Tiburtina route to the south, the Via Cecilia route to the east, and a number of other small roads to the region of Rome.

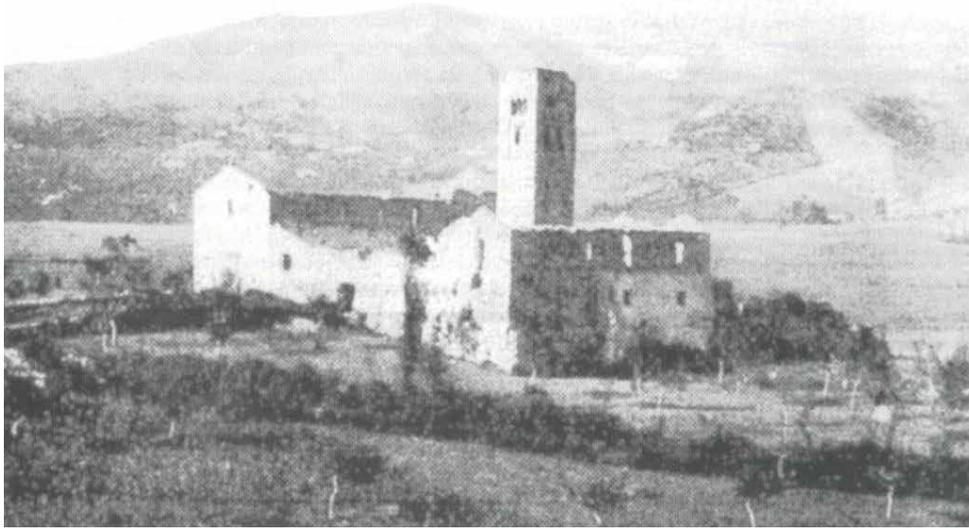


The ancient roadnetwork around the Muzia Valley: 1, the Via Salaria; 2, the Via Turanense; 3, the Via Valeria; a + c, the modern Licinese Provincial Road; b, today's Orvino-Scandriglia; d, today's Orvino-Carsoli.

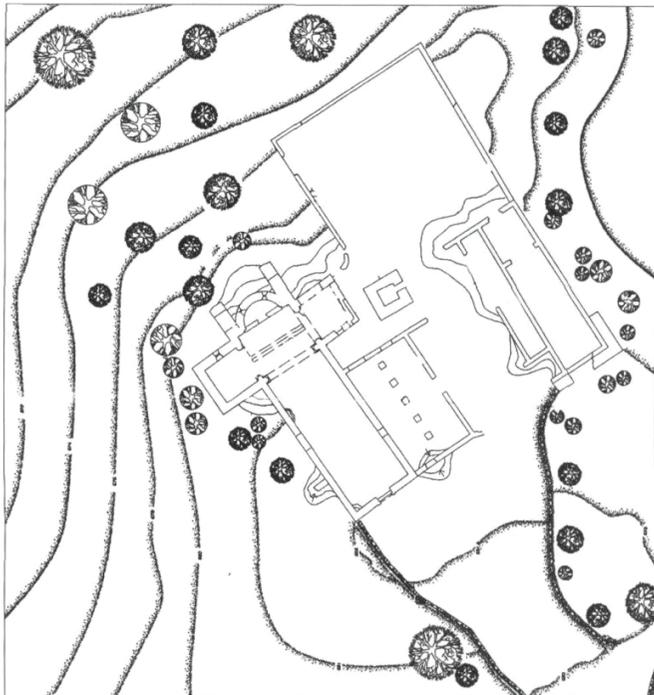
The position of the Muzia valley, being the only fast way from Turano to Lucretili, en route for Rome, was going to assume an even more defined strategic value in this context. Nor may it be said to be altogether surprising that the area of Pozzaglia, which has control of key points of intersection, is also that one area of the valley which is not visible from what is made the primary control point of the valley approaching from the west.



Muzia valley, Location of Roman sites



The abbey as it appeared in 1911 (after Fiocca, 1911)



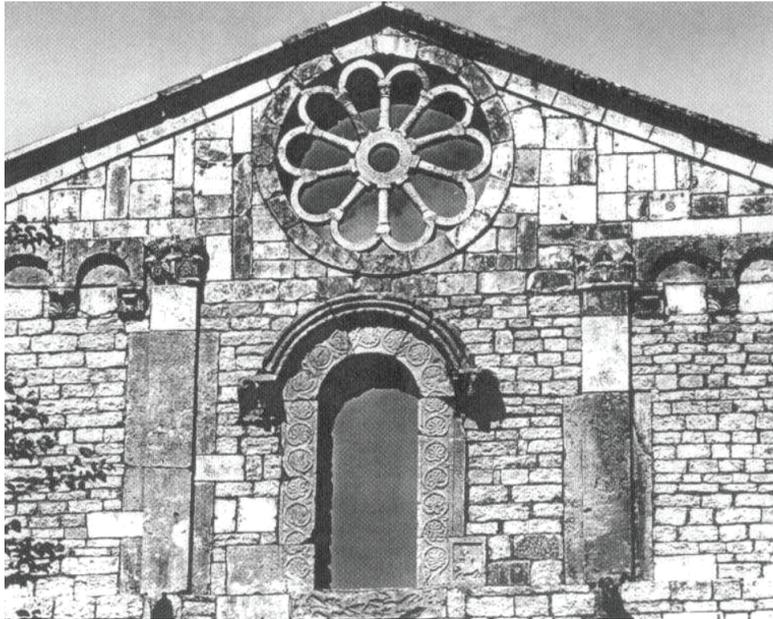
Plan of the complex highlighting the morphology of the promontory (based on the original by S. Celestini Campanari).

Historical Context and Romanesque Development of Santa Maria del Piano

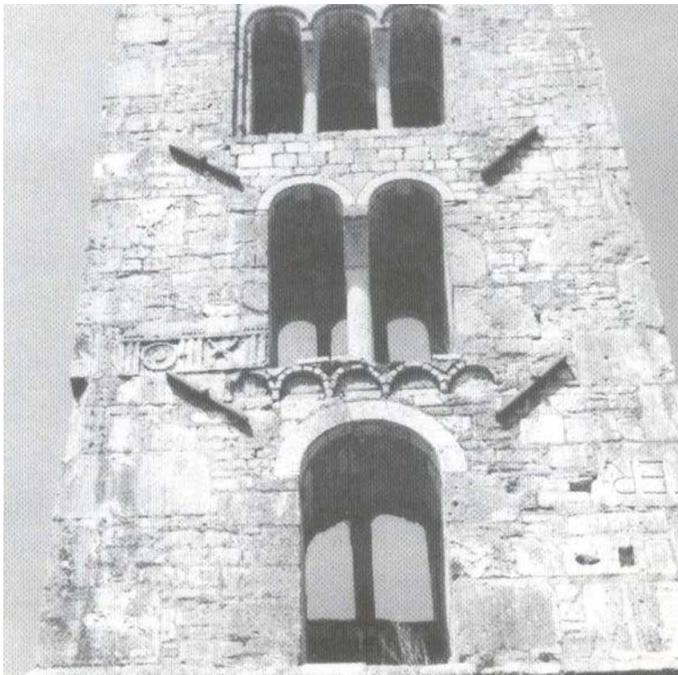
The archaeological evidence reveals consistency between the site context and the period of Republican Roman date insofar as isolated finds of ceramic and clay material have been made in the valley. Evidence of subsidence due to the presence of fill soil incorporating many small Roman fragments has been detected on the promontory by field surveys. While no detailed investigation has been carried out and it is impossible to be certain where an eight-sided building would be located, the fact that the promontory occupies an elevated and prominent site in conjunction with the quantity of stone blocks which include many that are very large in size suggests on-site recycling.

The present-day appearance of the Church of Santa Maria del Piano can be ascribed to a construction period that dates back roughly from the middle to the end of the eleventh century CE. This was a major, complex construction task, resulting in a church that was preserved until the end of the nineteenth century in excellent manner. Almost all architectural traces back to this period, and up until today, there has not been a traceable architectural predecessor before the eleventh century. However, the presence of a number of fragments of carved stones indicates the existence of a church from before the eleventh century.

The relief fragments found in the masonry of this sacred building date back to several phases. The largest and most cohesive group of relief fragments, produced in a style of Romanesque origin, can easily be assigned to a decorative cycle of a church of the eleventh century. The group consists of a nymphaeum featuring phytomorphic designs encircling eagle-shaped corbels, two lesenes inscribed on palm leaves, and a symmetrical arrangement



Decorative arrangement of the façade after the completion of the restoration works (Sopr. BB.AA.AA. Lazio).



Reused stone fragments on the walls of the bell tower.

Material Evidence and Construction Techniques

A bit later, at the end of the eleventh century and the beginning of the twelfth, a bas-relief of a knight appears at the right end of the one-lancet window frame. Its dating is evidenced not only by stylistic considerations, but also by the fact that it occupied the space defined by the stone forming the window ring in which it was carved. A second set of sculpted fragments dates back to an earlier period, which may be estimated at about the tenth century CE. The most famous of these, and of course the latest in the group, is the frontal slab of a single light window showing a boar hunt. Notably absent from the documentation of photographs gathered in the 1950s by restorers of the church is this fragment, which was the first to vanish through theft. While such themes are well-represented in Lombard funeral art, the sculptural quality of its execution dates it to about the early tenth century.

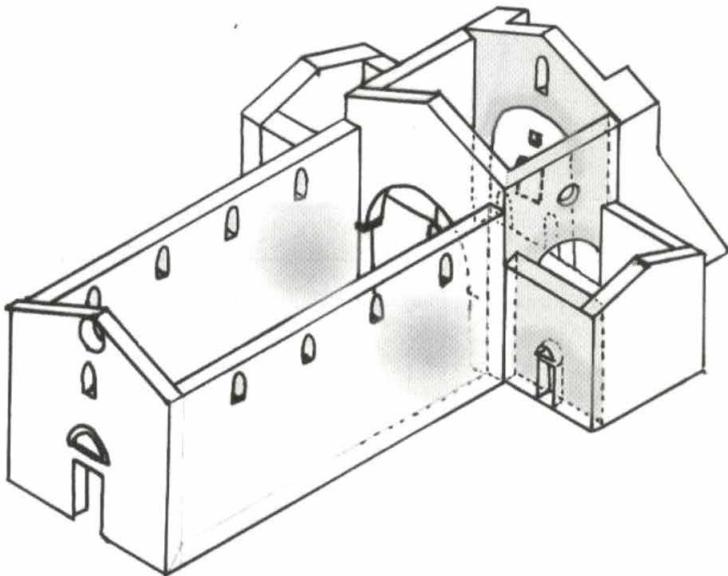
A further examination of the parameters related to wall construction supports the theory that there was a pre-existing religious framework on which the site was built. In general, materials used for the construction and later renovation of this religious monument and what could be seen in other monastic buildings tend to agree with the morphological characteristics found in the area of the Muzia Valley and region. This excludes certain sectors of the façade construction of the monastery, certain fragments re-examined within the bell tower, and certain initial decorative elements within the church that used high-quality white marble with a fine grain, which found local manifestation though perhaps selectively used by builders during the Roman era.

The most widely used building stone is an extremely dense, fine-grained limestone that is widespread in this area and used both for masonry units and for making most mortars and plasters. The resultant walls are still standing at several points where the building of the Lienese road crossed areas of moraines less than one kilometer from the abbey site and thus serve to further verify the strong connection between geological and building conditions in this region.

The Abbey of Santa Maria del Piano Through Time

The travertine facade seems to have been reused during the 11th-century renovation, although it was specifically reapplied in the southern transept, which acted as the principal monastic entrance. There is variation in the material used in the decorations to demarcate this area from the rest of the church. From a structural perspective, the presbytery and the apse stand on a foundation that has made them prone to structural movements and constant need for conservation.

Construction was heavily dependent on reclaimed materials, with new quarrying commenced only when the Roman supplies were exhausted. This middle period, evident in reused stones, reflects both a shortage of materials and a desire for a sense of continuity.



Axonometric view of the church showing the location of the areas with the highest concentration of travertine (based on the original by S. Celestini Campanari).



Northern interior: load-transfer point of the apsidal area and junction with the presbytery wall. The reused limestone facing is identifiable, unique within the interior, corresponding to the southern corner.



View of the external facing of the southern nave wall between the transept arm (where the trace of the collapsed wall is visible on the right) and the space adjacent to the church (on the left, obscured by vegetation).

Historical Development of Sabina

Architectural Evolution in Sabina

Materiality and Techniques

Local Materials

Abbeys and urban buildings in Sabina utilized local stone, brick, and wood, readily available and suited to the environment. Stone (limestone, sandstone) ensured durability, brick provided thermal efficiency, and wood (oak, chestnut) was used for roofs and beams.

II. Building Techniques

Traditional methods emphasized sustainability and longevity:

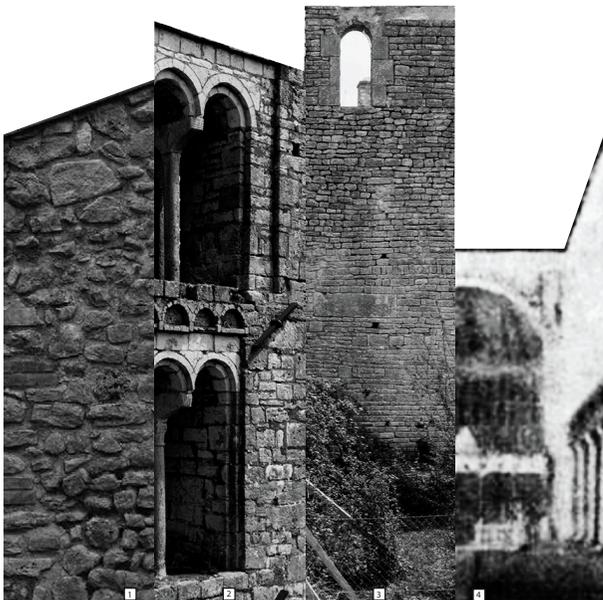
- Dry Stone Walls: Used for retaining walls and enclosures, allowing natural drainage.
- Lime Mortar: Breathable and effective for binding stones and bricks.
- Vaults and Domes: Distributed loads and improved insulation.
- Carved Masonry: Added ornamentation to functional designs.

III. Architectural Adaptation to Climate

Buildings adapted to Sabina's Mediterranean climate through:

- Thick Walls: Provided thermal mass for temperature regulation.
- Small Openings: Minimized heat loss and solar gain.
- Orientation: Maximized sunlight in winter and ventilation in summer.
- Sloped Roofs: Shed rainwater and provided shade with terracotta tiles.

These strategies ensured comfort, resilience, and harmony with the environment.



- Limestone walls 1
- Anchor bars 2
- Small Openings 3
- Vaults and Domes 4

Historical Development of Sabina

Preservation of Historical Features

General Historical Features in Abbeys

The architecture features a blend of structural and decorative elements, including original stone masonry, intricate buttresses, and Gothic or Romanesque vaulting. Windows, such as stained glass and rose windows, display biblical themes and symbolic designs. Religious iconography is emphasized through frescoes, murals, and carved sculptures depicting saints and biblical stories. The spatial layout includes hierarchical naves and aisles, cloisters for monastic life, and an apse housing the altar. Functional elements like crypts, bell towers, and chapter houses serve practical and spiritual purposes. Additionally, the environmental integration is highlighted by herbal gardens, water systems, and adaptive design features responding to the climate.



- 1 Buttresses
- 2 Rose Windows
- 3 Religious iconography
- 4 Hierarchical naves and aisles
- 5 Bell towers

The Abbey of Santa Maria del Piano Through Time

The quality of materials differs depending on visibility and functionality: travertine is chosen for major surfaces. The anomalies of structural features in the south transept probably relate to past access to the bell tower and destruction of upper structures.

There is a clear period here in the building, characterized by extensive ornamentation and architectural alterations.

The addition in the 13th century of the rose window and the marble façade combined artistic ambitions with possible political overtones related to power struggles within the church.

The reduction and strengthening of the nave walls were also a component of a unified 13th-century architectural program that was associated with changes made to the façade.

Subsequent interventions ensured further structural reinforcement of the apse and changed its use, perhaps under noble ownership. Structural evidence shows that there was a significant cult image in use before.



The closing wall of the apsidal conch, where the upper window, the central cornice with masonry remnants, and two lateral openings partly obscured by vegetation can be recognized.



External masonry of the southern presbytery wall and the corresponding pier of the transept access arch.



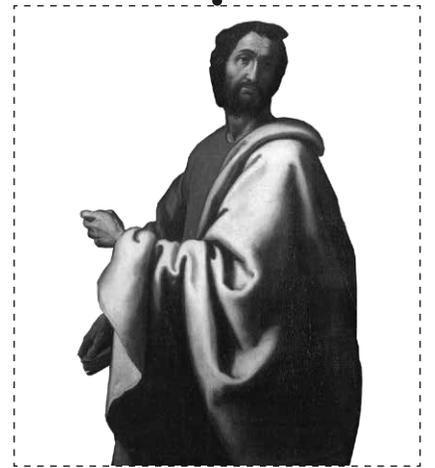
View of the internal face of the southern nave wall: a sequence of masonry arrangements can be identified, approximately symmetrical to the corresponding northern wall.

However, scholars unanimously dismiss this claim due to lack of evidence. An archaeological analysis reveals that the construction of the abbey took place during the middle to late eleventh century. This is because the construction methods, materials, and designs match the prevailing styles during the period. In addition, ornamentation from the tenth century and elements from the Roman period are also used in the construction. This therefore puts forward the idea that a pre-existing religious structure likely stood at the site, with a possibility that a structure from the Roman period could be beneath it. The slope upon which the apse stands suggests that pre-existing structures could have been reused for the foundation.

There is a local tradition that the abbey was founded by Charlemagne in the late eighth or ninth century, with some texts mentioning the year 817.

The Legend: It is said that Charlemagne ordered the building of this church as an act of thanks to Divine Providence in celebration of a successful battle against the Saracens (or in some accounts, the Lombards) that took place on the plains close to this site.

In addition, an inscription on the façade states that presbyter Bartholomew restored the church in 1219: Bartholomeus hoc op fierificit 1219.



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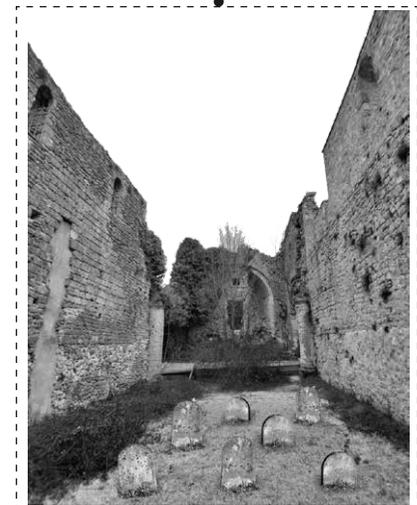


The abbey was already going through a state of deterioration since the late medieval era when it was administratively dissolved as a consequence of the Napoleonic occupation of the Papal States.

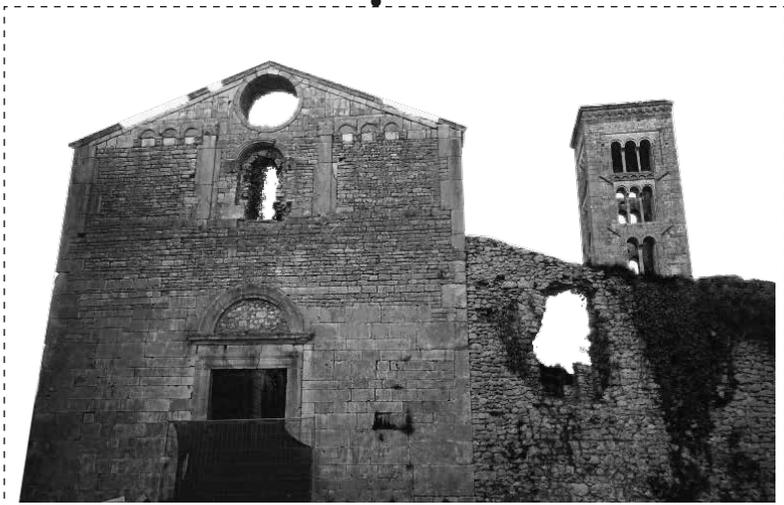
The Action of Pius VII: Under heavy pressure and threats of exiling himself, Pope Pius VII was involved in the official dissolution of the monastery. The management of the properties of the abbey was handed over to the Napoleonic regime.



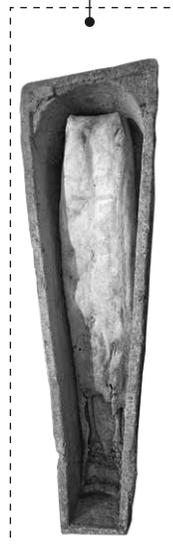
In 1855, suddenly a severe cholera epidemic occurred in Orvinio which affects the abbey of Santa Maria del Piano. The abbey was transformed into a cemetery for the abundant of dead people lacking place to be buried. Subsequently the doors and the roof and floors were removed to be converted to a cemetery.



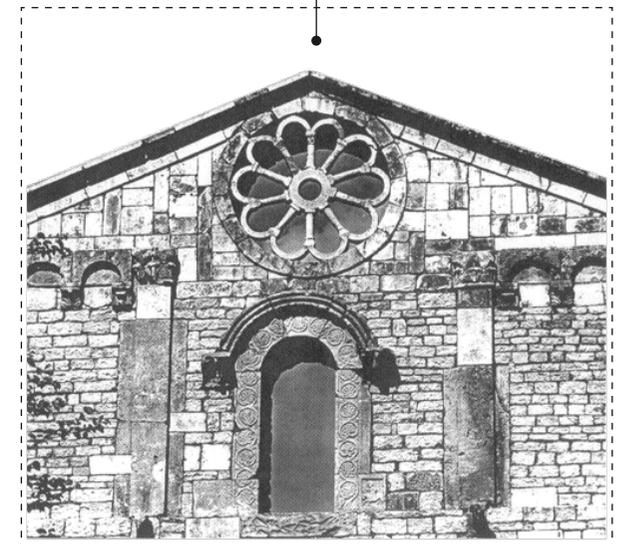
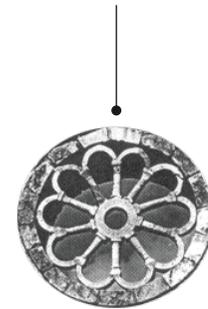
Excavations carried out during the transformation of the abbey to the cemetery for cholera epidemic, as well as earthquakes occurred during that period affected the statics of Santa Maria del Piano which contributed to the collapse of entire facade in 1952.



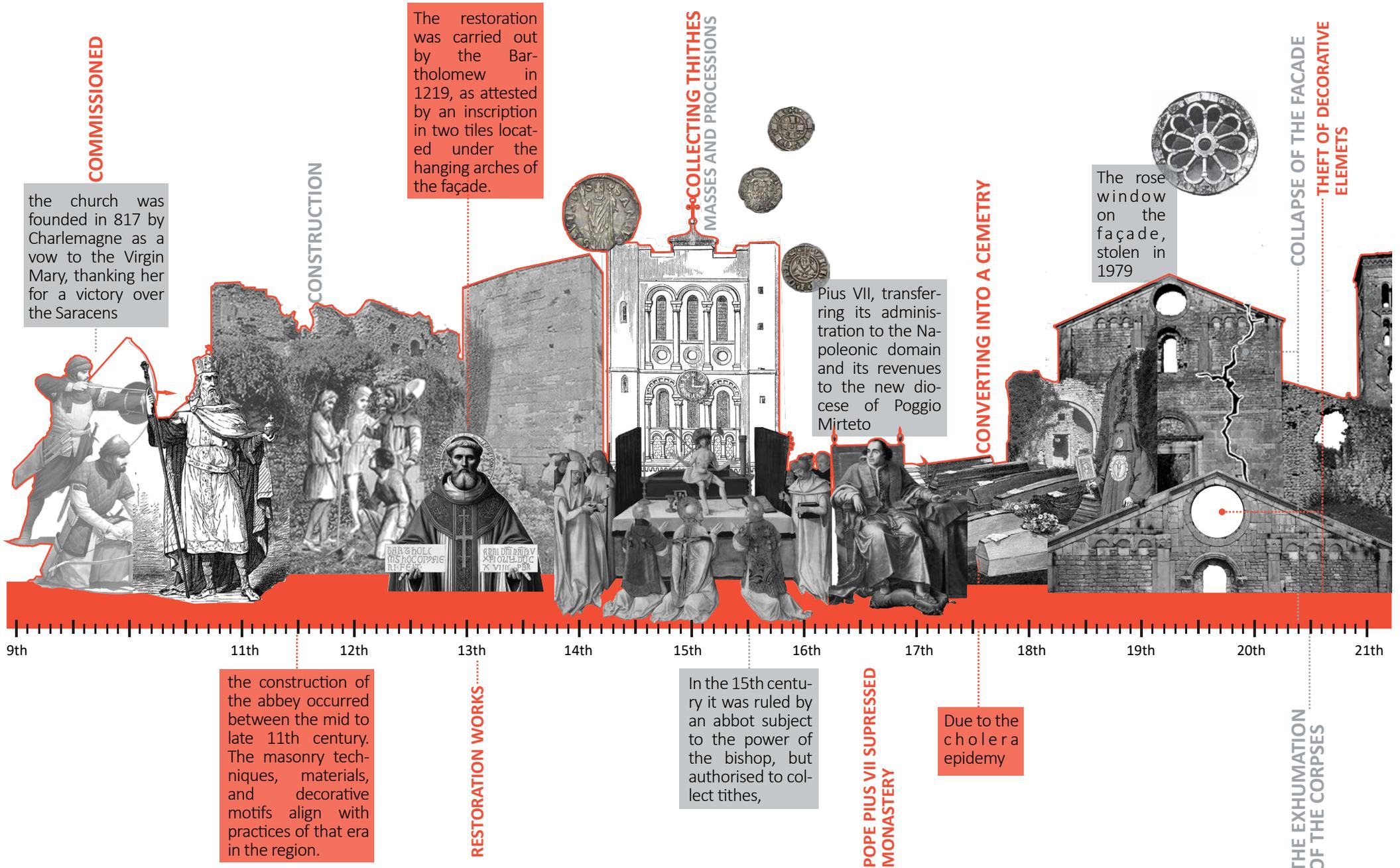
Converting the abbey to a cemetery, Santa Maria del Piano had been left abandoned. When the government and local authorities decided to restore it, the remains of the victims of cholera being buried there were considered as an obstacle, therefore, a formal exhumation was carried out in 1949 and the remains of corpses were removed from the sub-floor, transported to the municipal cemetery of Orvinio, making the abbey deconsecrated as a cemetery.



After removing the remains of cholera victims from the sub-floor of the abbey and the later earthquakes, substantial restoration efforts had been done on the abbey, however the complex was left abandoned. This contributed to theft of decorative elements including the rose window, internal capitals and sculptural decorations during 1970 to 1980.



History Timeline



Analysis 03

Climate Analysis

Introduction: Climatic Context and Architectural Influence

The Orvinio climatic context, a historical hill town in the Rieti region (Lazio, Central Italy), has significantly influenced the town's architecture and urban development. Orvinio is located around 840 meters above sea level, close to a region characterized by both Mediterranean and Continental climates. Its urban design, featuring dense stone buildings, very narrow and winding streets, and highly restricted public spaces, is a result of a long historical process that has adapted to this specific environmental context.

Historic built environments have traditionally been shaped by climatic factors, ranging from the orientation of buildings to make the most of solar gain during winter to designing buildings to maximize thermal mass through stone masonry, in addition to designing compact settlements to reduce the effect of wind while maintaining a stable internal microclimate. In modern sustainable design, there is a need to integrate timeless design knowledge in-line-with climatic conditions, which has inherent relevance in sustainable design.

The following sections will offer a comprehensive climatic analysis for Orvinio, using the CBE Climate Tool (University of California, Berkeley), the Copernicus Climate Data Store (CDS) dataset, as well as the dataset of the Italian Air Force Meteorological Service (MeteoAM). A variety of parameters will be considered for analysis; these include: temperature variation, solar irradiation, rainfall and relative humidity, wind pattern, degree days, and the Urban Heat Island (UHI) effect.

Temperature Variations

Orvinio, as per the CBE Climate Tool (2024), has an average annual mean temperature of around 12.6°C, showing strong seasonality. The average temperature during the winter months (December to February) varies between 3-5°C, sometimes going below freezing, whereas during the summer months (July to August), it varies between 24-26°C. The average diurnal temperature range is moderate, which is also affected by the tempering effect offered by the surrounding hills and forests. The moderate range of temperature allows for passive wintertime heating and provides acceptable levels without the need for heavy air conditioning during summer months. The architecture is designed to use more densely packed layouts, minimize facade exposure, and utilize higher thermal mass materials such as limestone and tuff.

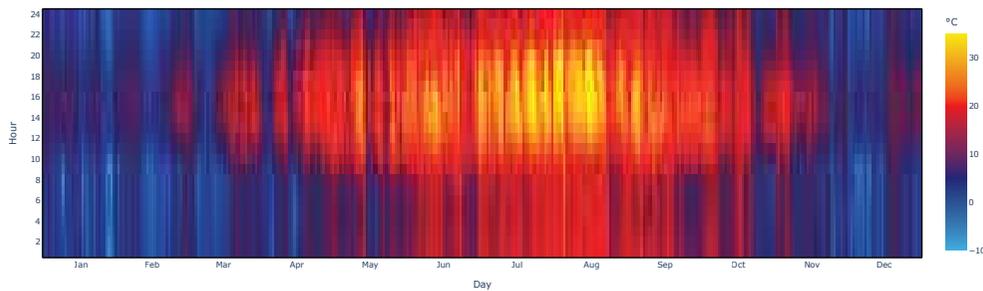


Fig1.

This figure represents the dry bulb temperature profile for Qazvin across the entire year, from January to December, at different times of day, as visualized on the vertical axis. The color gradient illustrates temperature variations, with cooler temperatures shown in shades of blue

Solar Radiation

The Based on CBE Berkeley Climate Platform data and additional NASA SSE data available, Orvinio receives around 1,500kWh per year and per square meter of GHI. The maximum solar strength takes place mainly from May through August. However, solar strength drops significantly during the winter season. This sharply distinct variation within a year highlights the significance of orientation-responsive design.

South-facing surfaces are ideal for solar gain. However, overhangs, deep reveals, and shading by vegetation can be very effective for reducing solar gain within Orvinio during summer. This climatic variation makes solar panel power and solar water heaters possible solutions for Orvinio's old architecture to transform towards sustainability.

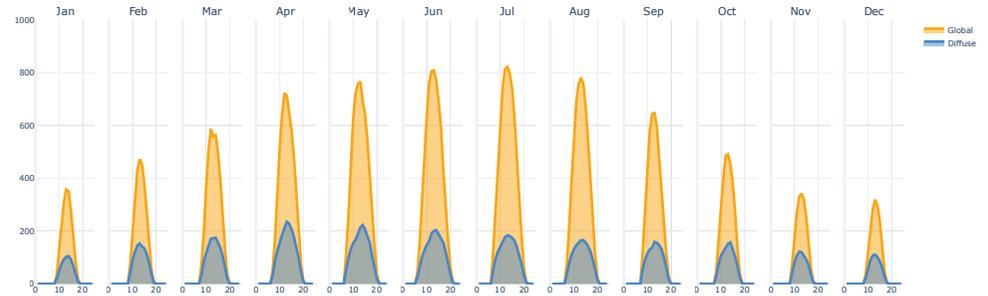


Fig1.

this graphs shows the amount of energy gained from the sun s and intensities.

Precipitation and Humidity

Orvinio receives an average rainfall of 950 to 1,000 mm per year, most of this rainfall being recorded during the period from November to March. The reduced rainfall in the months of July and August is also symptomatic of the Mediterranean climate. The relative humidity is mostly around 70 to 75 per cent, the highest levels being reached in the early morning hours of winter due to valley fog and inversion phenomena. It is imperative in this climate for the building envelope to be designed in a way that effectively deals with moisture in order to prevent condensation and damage to the building envelope. The building envelope design in local traditional architecture is a clear indication of humidity control by passive means that correlate with the local climatic conditions.

Wind Patterns

In Orvinio, the prevailing winds mainly come from the western and south-western portions, thus carrying moisture from the Tyrrhenian Sea. The wind speeds are generally of a medium level, ranging from 2 to 4 meters per second. The winter climate brings about the entry of the Tramontana winds that come from the northeastern side, thus sometimes causing sudden changes in the temperatures, while the summer climate brings about more gentle winds, thus acting as a source of gentle relief. The morphology of the town, which is in the form of narrow alleys running in line with the topography, acts as a passive wind control system.

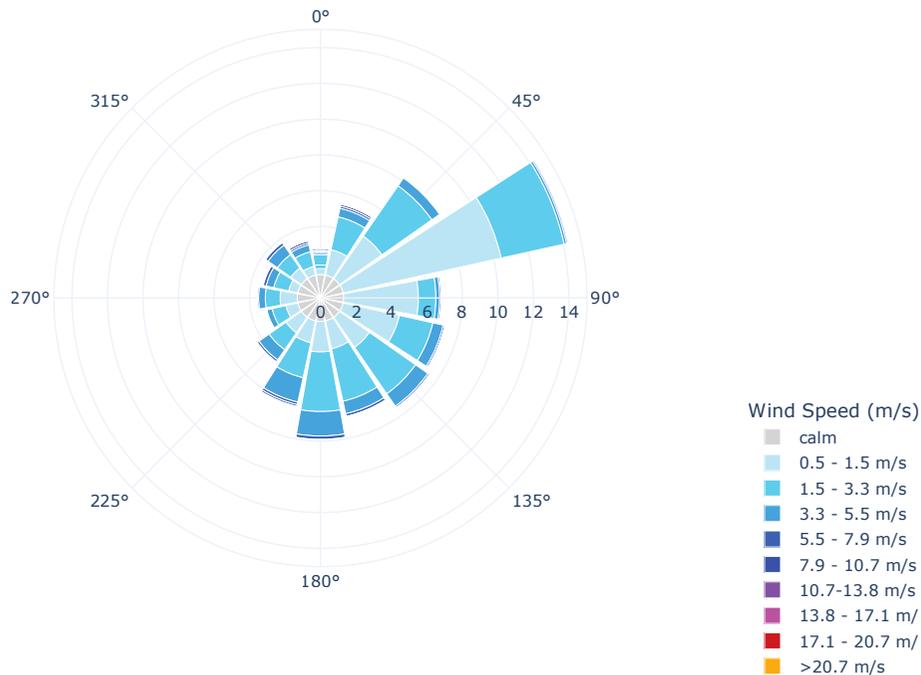


Fig3. This wind rose chart provides a comprehensive overview of the wind patterns in Orvinio throughout the year. It shows the frequency and speed of winds from various directions, measured in meters per second (m/s), giving important insights into the prevailing wind directions and intensities.

Heating and Cooling Degree Days (HDD & CDD)

Keeping in mind the climatic conditions, efficient energy retrofitting techniques should be focused on techniques aimed at reducing heat loss. Insulating buildings and making them energy-efficient appears to be a key concern, as it can lead to a substantial reduction in heating energy demand due to the conservation of consistent temperatures. Also, techniques aimed at improving airtightness through filling gaps and cracks in buildings can be helpful in reducing heat loss and preventing drafts. Even in Orvinio, high-performance glazing, such as double-glazing and triple-glazing, can be an effective technology for improving thermal comfort and further reducing heating energy demand. Even though it is primarily a matter of concern related to heating demands, it can be a key concern for Orvinio to have efficient natural ventilation techniques for buildings, regardless of the lower demand for cooling.

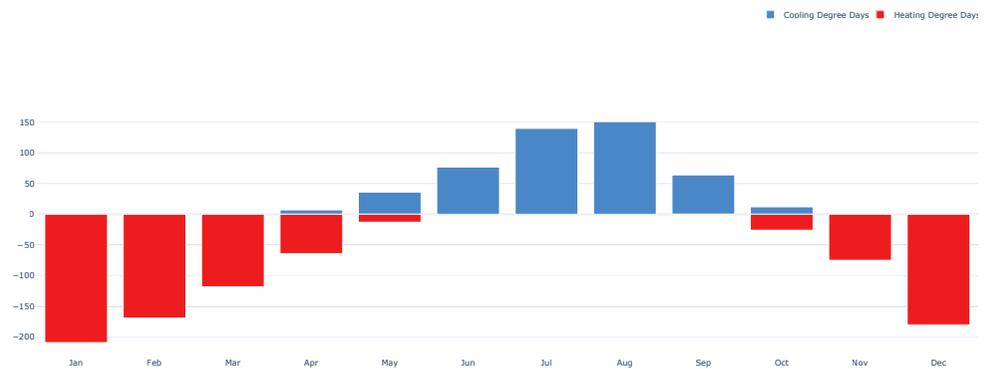


Fig4. This graph depicts the Heating Degree Day (HDD) and Cooling Degree Day (CDD) for Orvinio throughout the year, offering a clear view of the seasonal demands for heating and cooling in buildings.

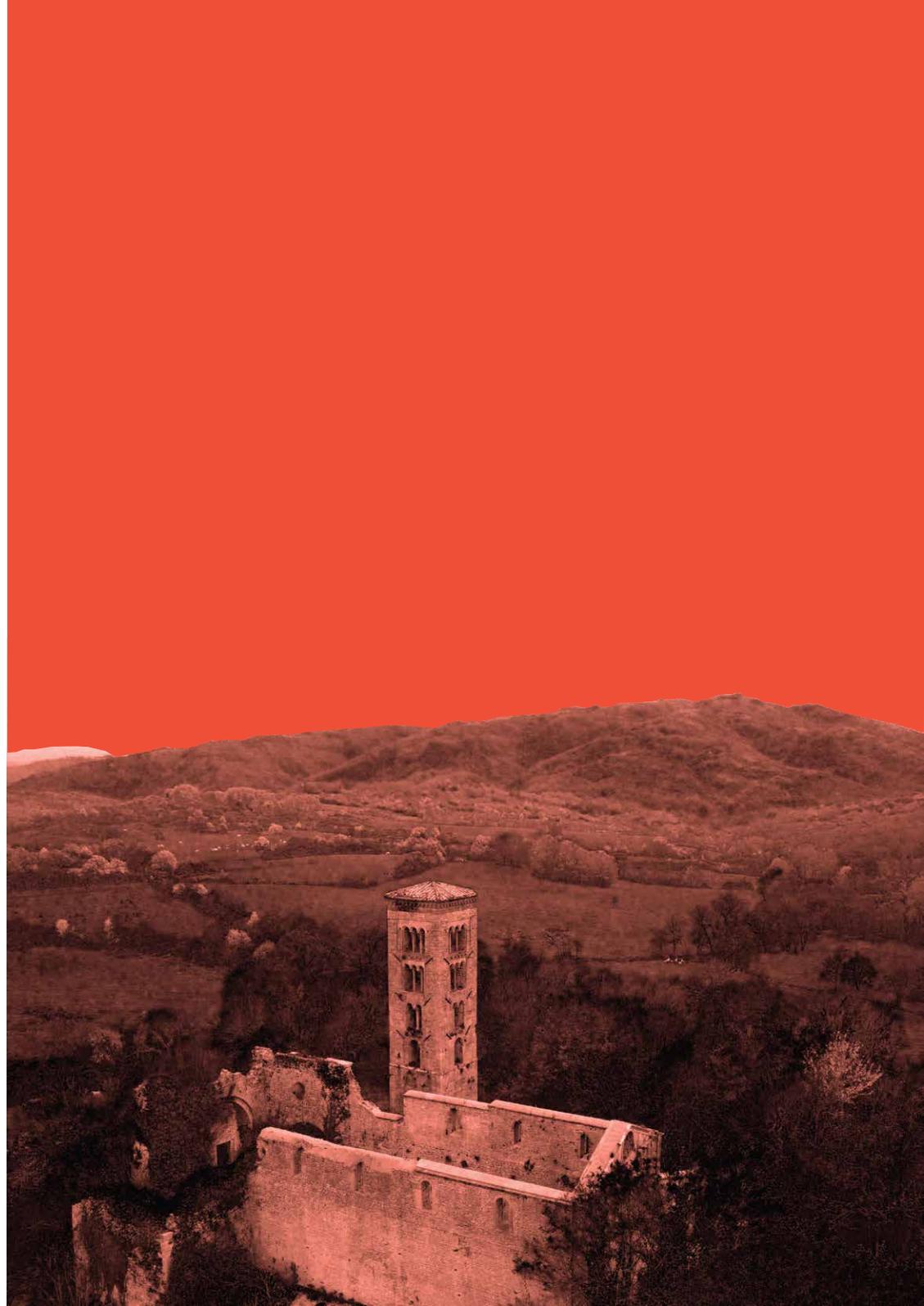
conclusion

Orvinio's climate combines both Mediterranean and mountainous elements in such a way as to produce moderate summers and cold winters with a well-balanced hydrological cycle. The combination of the different elements of the climate does not only appear in the weather; rather, it has managed to produce long-cherished habits of habitat development. A walk through Orvinio will show how architectural design has managed to incorporate adaptation.

Further, these architectural pieces not only act as symbols of the past but also as role models. For instance, dense masonry is simply a decorative element not just for aesthetic reasons but also to ensure a good indoor environment without overdependence on modern means of cooling. The orientation of buildings is also deliberate; for instance, some houses are oriented to take advantage of direct winter sunlight without being vulnerable to glare during summer.

For designers and conservation professionals today, this heritage provides much methodological inspiration. Modern design can reinforce sustainability by playing on what is already known. Improving the passive solar characteristics—perhaps by the application of new glazing systems or better shading—may well complement the traditional building envelope. The application of renewable energy sources—perhaps discreet solar or geothermal heating—may well be compatible with the building aesthetic without detracting from it.

All such factors have their foundation in hard data about the climate. It is true that a source such as CBE Berkeley Climate Tool coupled with hard data about the climate in Europe and in Italy itself would form a foundation for future action. So too would a data-based approach enable a smarter set of decisions on design, whether it concerns materials that have the right properties for a given region's climate or a plan for preserving that is sensitive to Orvinio's particular climate and culture.



Analysis 03

Adaptive Reuse Case Studies

This chapter offers a comparison of the case studies chosen, serving as a crucial methodological stage of the research. This analysis is aimed at examining systematically a number of approaches to design, space organization, functional adaptation, and sustainability. A comparison of case studies according to common criteria is used to explain similarities and dissimilarities of architectural solutions to a number of common tasks.

By this comparative analysis, the study aims to establish best practices, constraints, and innovative solutions that have been shown to be effective in different ways. Great emphasis has been placed on the approach adopted by each project to deal with the challenges of adaptability, environmental performance, and relationship with the context. The results obtained from this comparative analysis form the basis for the conclusion of the research, which are further developed in the next stages of the research.

Domino Sugar Refinery
Adaptive Reuse of an Industrial Landmark



From Industry to Innovation
Overview

- Architects: PAU
- Area: 460000 ft²
- Year: 2023
- Photographs: Max Touhey
- Lighting Consultants: L'Observatoire International

- Landscape Architects: Field Operations
- MEP Consultants: Ettinger Engineering Associates
- Structural Engineering: Silman
- Interior Architects: Dencity Works Architecture



Original Function, Industrial Sugar Refinery

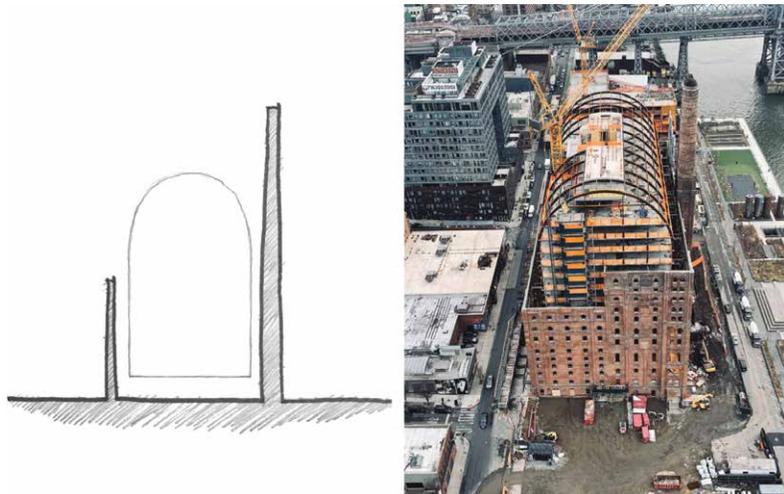
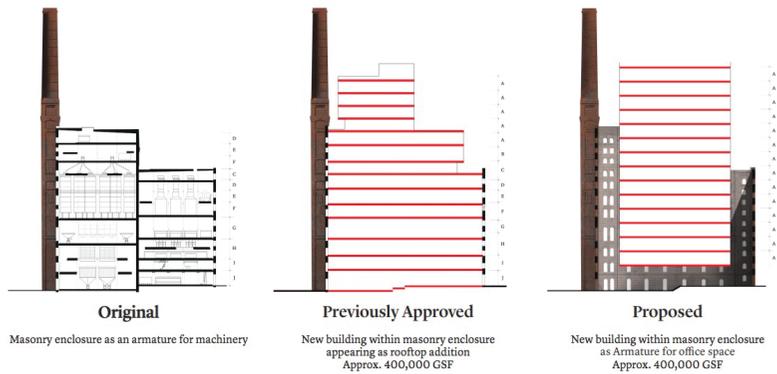


New Function, Mixed-Use Cultural & Commercial Hub

Conceptual Framework

A Building Within a Building The Core Concept

- Building Within a Building
- Temporal Dialogue
- Humanizing the Monumental
- Transparency = Transformation
- Public Reclamation
- Sustainable Preservation



Architectural Intervention

Material Dialogue: New Life Inside Old Walls

- **Preservation Strategies**
 - Historic brick shell and chimneys fully retained
 - Original volume and façade rhythm preserved
 - Masonry cleaned, stabilized, and reinforced
- **New Elements**
 - A glass and steel building is inserted into the retained shell.
 - The independent floor plates, core, and façade system, as well as the transparent façade, are included.
 - A green roof and infrastructure upgrade are incorporated into the design unobtrusively.
- **Material Contrast**
 - Brick side by side with glass and steel.
 - Solid, aged materials contrast with transparent, new materials.
 - This contrast creates a pictorial story of time and change.
- **Insertion Method**
 - Obstacles create a gap between the old and the new.
 - A free-standing inner volume preserves the original walls.
 - The new elements are in harmony with the traditional cycles but interpret them in terms of light and openness.





Spatial and Functional Organization

Programmatic Rebirth, From Refinery to Workspace

Spatial Layout & Zoning

Programs are vertically organized:

- Ground Floor: Lobby, retail, and public areas.
- Upper Floors: Open-plan office space.
- Roof: Green roof and building systems.

Zoning: This integrates private work zones with public components to animate the edge of the building.

Types of Programs

- Office spaces incorporating modern designs and natural lighting.
- Street-level retail and cafes.
- Public lounges, meeting places, and community spaces.
- Support spaces, such as circulation cores, restroom, service areas.

Circulation & Access

- There is an independent core system inside the original shell.
- There are many entry points, which helps to create a strong relationship with Domino Park.
- Accessible routes with clear pathways make it easy to navigate.
- Circulation increases interaction between the historical and modern layers of space.



Sustainability and Innovation

Past Meets Future, Sustainability in Reuse

• Energy Efficiency

It is all electric and uses no fossil fuels.

- High performance glazing, insulation, and HVAC provide low energy demand.
- The design aims to achieve LEED Gold certification.

Daylighting & Ventilation

- Large glazing areas and voids ensure maximum illumination.
- A smart layout is suitable for passive ventilation and lighting control.

Biophilic Design

- A vertical garden is located between the old building and the new building.
- The connection to the Domino Park relates to the relationship between landscape and architecture.



Relevance to Adaptive Reuse Principles

Architectural Atmosphere, Light, Material, Space

• Success Factors

- It retains the brick façade but incorporates a modern glass building
- Balances the monumental scale of the industrial structure with human-scale, light-filled interior spaces
- Transforms an old industrial area into an exciting and inclusive work environment

• Honoring History, Adding Value

- Preserves the original character and architectural details of the building
- Incorporates modern design elements that integrate well with the historical surroundings
- Creates new cultural relevance and utility without diminishing the cultural significance of the past.

• Model for Future Adaptive Reuse

- Proves that adaptive reuse can achieve high levels of sustainability
- Demonstrates how heritage buildings can be repurposed for modern-day usage
- Advocates a circular economy model in the design of architecture. - Associated with immigrant laborers & the working class

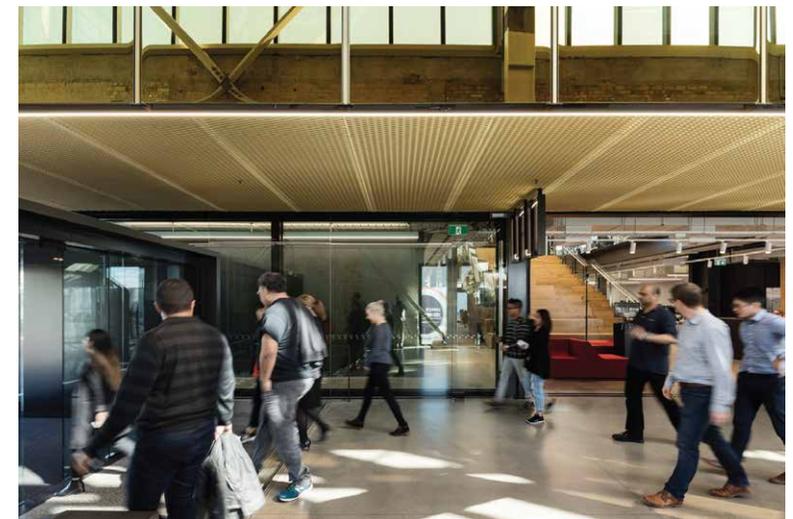




Original Function, warehouse

**From Old to Contemporary
Overview**

- Architects: Warren and Mahoney
- Built Area: 5700 m²
- Year: 2016
- Photographs:Simon Devitt
- Category: Offices, Adaptive Reuse, Sustainability
- City: Auckland
- Country: New Zealand



New Function, workplace hub

Conceptual Framework building within a building

The architectural idea for Mason Bros. is based on the principle of contrast inserted into the preserved memória, which has been metaphorically defined as a “building within a building.” Instead of attempting to erase or replicate the past, the architects inserted a new glazed building into the old shell. This approach emphasizes architectural legibility, where the new building is clearly different but well balanced with the existing structure. The intervention creates a dialogue in terms of time and material. The masonry and concrete are associated with time and patina, while the insertion represents lightness, accuracy, and flexibility. This represents the idea that adaptive re-use goes beyond material preservation to the preservation of time, thereby creating narratives that are not restricted to a particular point in time.

The guiding design philosophy is based on the concept of urban resilience and cultural continuity, which views industrial heritage in a positive light in relation to modern urban living. The project is also associated with immigrant workers and the working class.



Architectural Intervention Material Dialogue, New Life Inside Old Walls

In the Mason Bros project, the use of contrast in the architectural design is a sophisticated and respectful approach to the use of materials in architecture.

Historic Preservation: The brick exterior, concrete beams, steel trusses, and sawtooth roof were preserved and restored, giving the space the tangible history and architectural integrity.

Modern Insertion: In this space, a series of glazed mezzanines, steel partitions, and light frameworks have been inserted. These spaces contrast the raw quality of the original building with the clarity associated with modern office space design.

Laneway as Spine: There is a central laneway measuring 60 meters that runs through the entire building. The laneway serves as the social and physical spine of the building. The laneway allows for deep penetration by sunlight and helps to organize the flow of people through the building.

Touch Tactile Palette: Blackened steel, engineered wood, acoustic felt, and polished concrete create a rich tactile palette, blurring the line between the industrial edge and comfort.

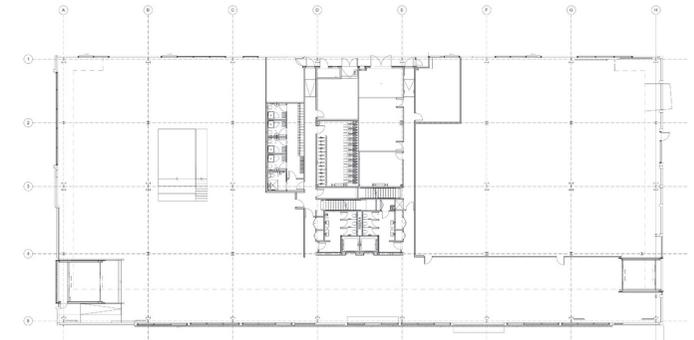
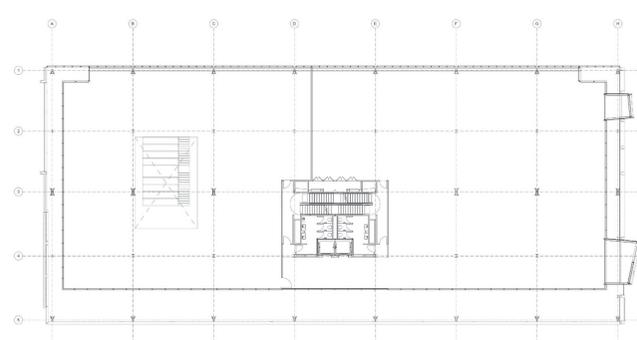
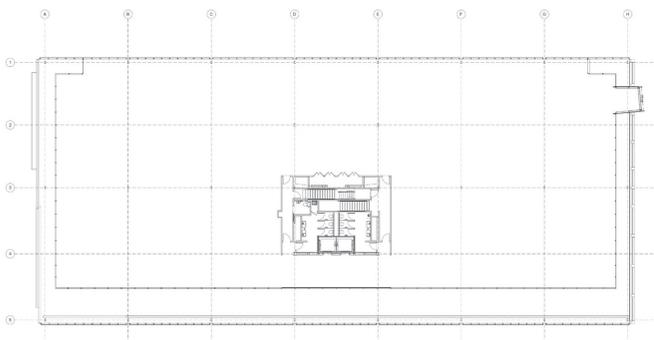
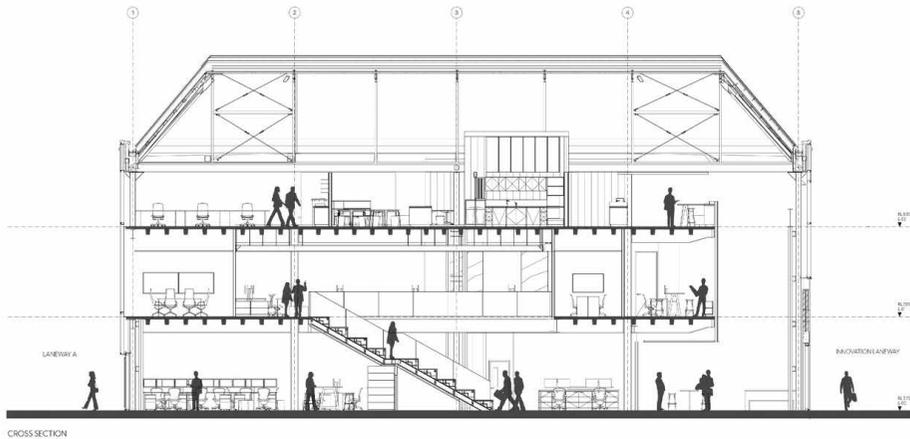


Spatial and Functional Organization Programmatic Rebirth

Mason Bros transforms an abandoned 1920s engineering warehouse into a vibrant multi-tenant workplace hub. What was once a space of industrial output has become a collaborative innovation ecosystem, hosting architecture studios, tech firms, and public event spaces.

It acts as a civic anchor on a city-wide scale, boosting the amenity with openness, ease of access, and shared spatial programs in Auckland's Innovation Precinct. The environmentally led transformation crowned by a 6 Green Star rating-innovative structure reuse, natural ventilation, and daylight optimization-raises the flag for sustainability.

It is architectural and social and ecological-the rebirth of a relic into a high-performing catalyst for the future that is rooted in immigrant labor and working-class communities.



Relevance to Adaptive Reuse Principles Architectural Atmosphere, Light, Material, Space

The Mason Bros example very successfully incorporates all of the major elements of adaptive reuse, particularly with regard to atmosphere, light, material, and composition:

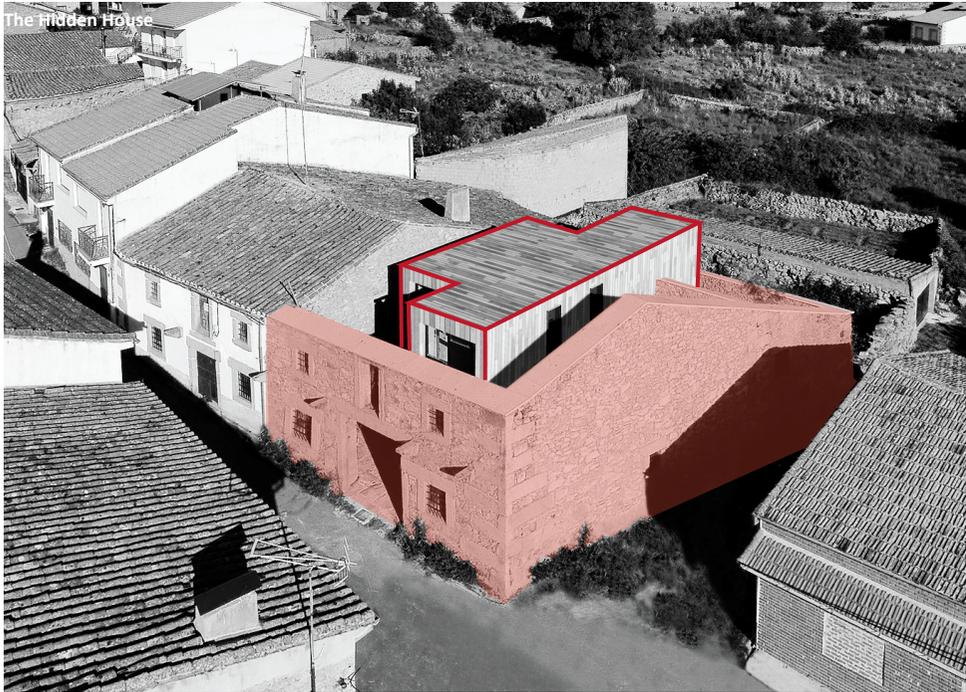
Architectural Atmosphere: This area maintains its sense of industry, which is promoted rather than detracted from. This ensures that the experience of the users is unique and can't be achieved in a new development.

Light: It is imperative that the sawtooth roof, which serves as the daylighting system, be restored. This not only highlights the historical past of the building, which is industrial, but also serves to improve the thermal and lighting efficiency.

Material: Material honesty is shown in this project, where what is to be preserved is restored, what is to be exposed is exposed, and new material is introduced which is of its time. The conflict between old material and new material is thus made use of as a tool of narration.

Spaces: The spatial strategy proposes modular and reconfigurable interiors that are informed by the original building's logics while accommodating variable uses. Vertical layering, internal transparency, and social nodes facilitate evolution within the building.





From Old to Contemporary Overview

- Architects: Stoneman Architects, Juan Ignacio Vilda Marín
- Built Area: 158 m²
- Year: 2024
- Photographs: Juan Manuel Rojas Fernandez , Juan Ignacio Vilda Marin
- Category: Houses, Adaptive Reuse, Historic Preservation
- Calculation Of Structures And Installations: CQD Ingenieria
- Quantity Surveyor And Safety Coordinator: Manuel Miguel García
- Structural Engineering: Silman
- Country: Spain



Original Function, Castilian cattle shed



New Function, Modern residential unit

Conceptual Framework building within a building

At the heart of the project, there is a philosophical dialogue that takes place between two realities of time—a rough, decaying past, and a modern, precision-oriented present. Rather than trying to recreate the old building, the architects have chosen to make a clear distinction between the old and the new.

This project claims that heritage is not a temporal construct and is instead the basis for the creation of new narratives.

It is a reflection of post-industrial sensibilities, where industrial fabrication provides solutions to labor shortages and budget constraints, especially in rural areas.



Architectural Intervention Material Dialogue, New Life Inside Old Walls

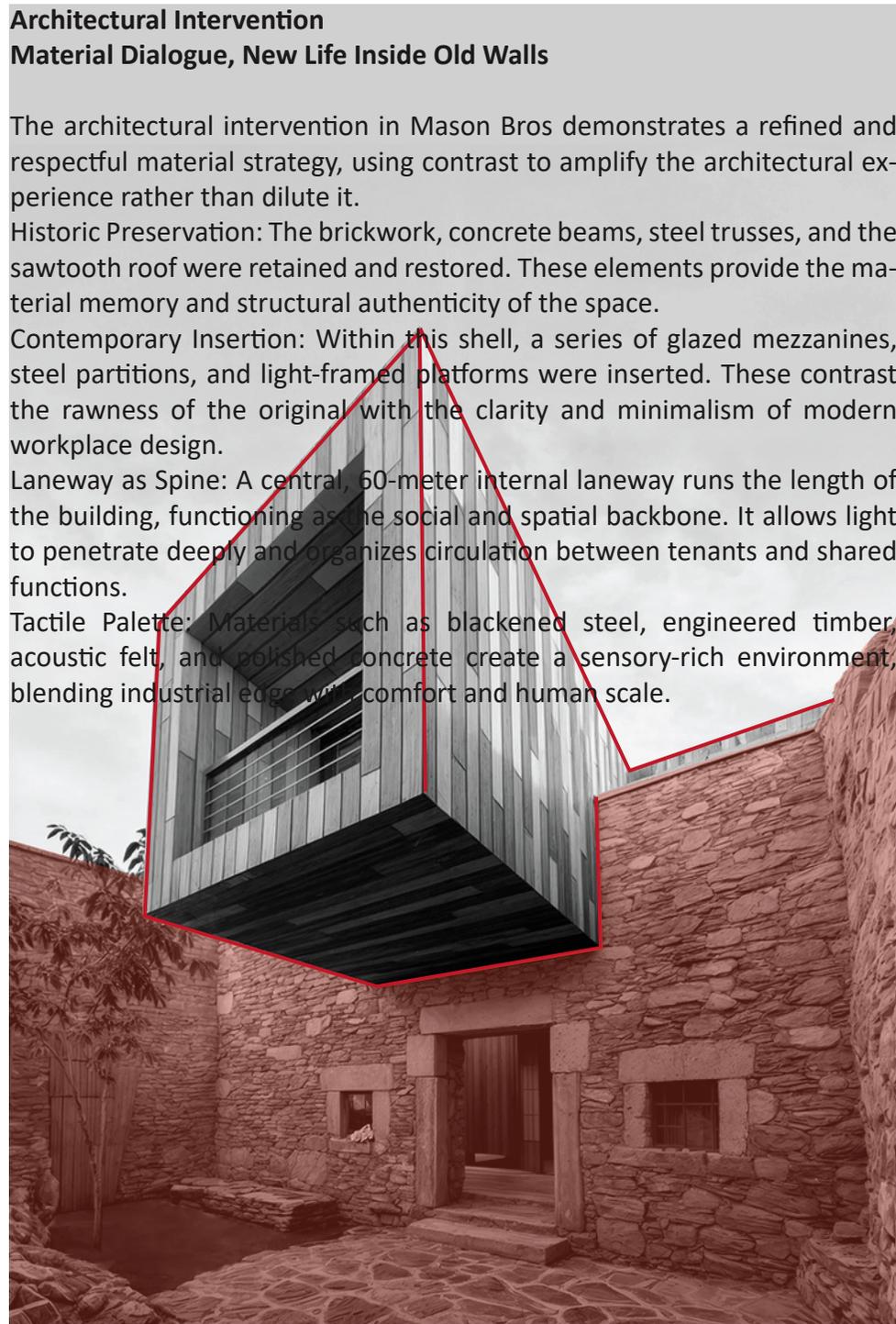
The architectural intervention in Mason Bros demonstrates a refined and respectful material strategy, using contrast to amplify the architectural experience rather than dilute it.

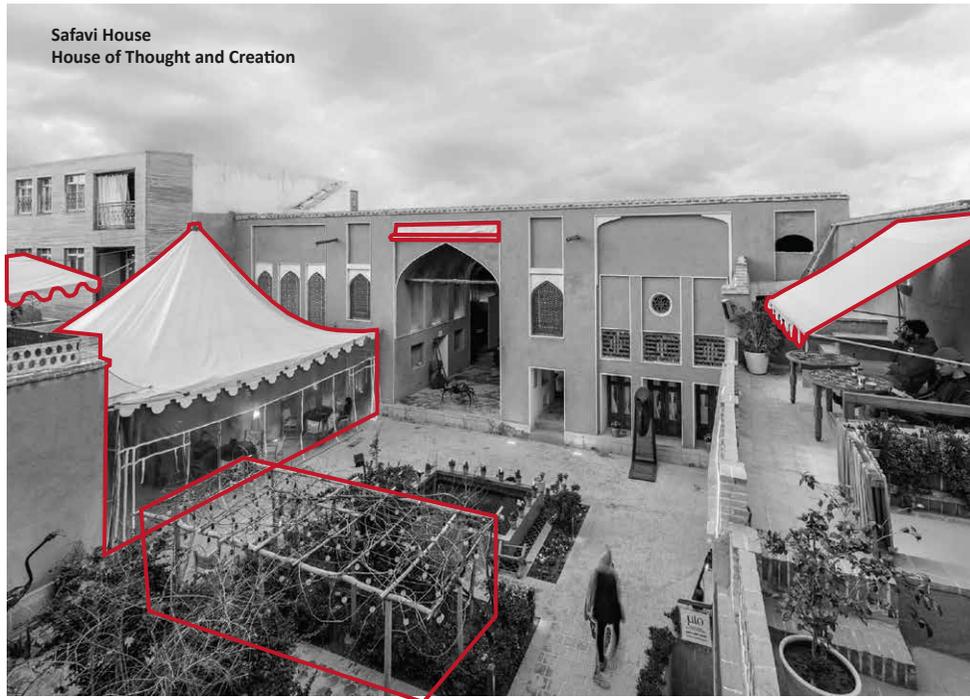
Historic Preservation: The brickwork, concrete beams, steel trusses, and the sawtooth roof were retained and restored. These elements provide the material memory and structural authenticity of the space.

Contemporary Insertion: Within this shell, a series of glazed mezzanines, steel partitions, and light-framed platforms were inserted. These contrast the rawness of the original with the clarity and minimalism of modern workplace design.

Laneway as Spine: A central, 50-meter internal laneway runs the length of the building, functioning as the social and spatial backbone. It allows light to penetrate deeply and organizes circulation between tenants and shared functions.

Tactile Palette: Materials such as blackened steel, engineered timber, acoustic felt, and polished concrete create a sensory-rich environment, blending industrial edge with comfort and human scale.





From Old to Contemporary Overview

- Architects: Polsheer Architects
- Area: 1700 m²
- Built Area: 700 m²

- Year: 2017
- Category: Houses, Adaptive Reuse, Historic Preservation
- City: Esfahan
- Country: Iran

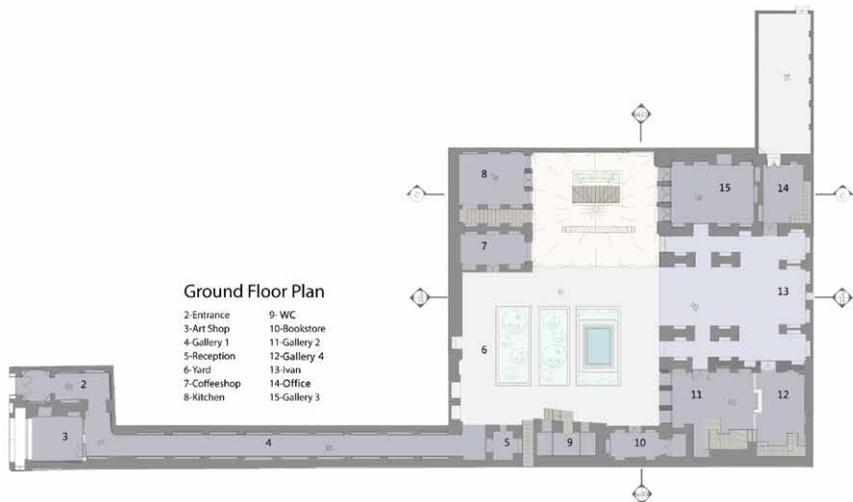
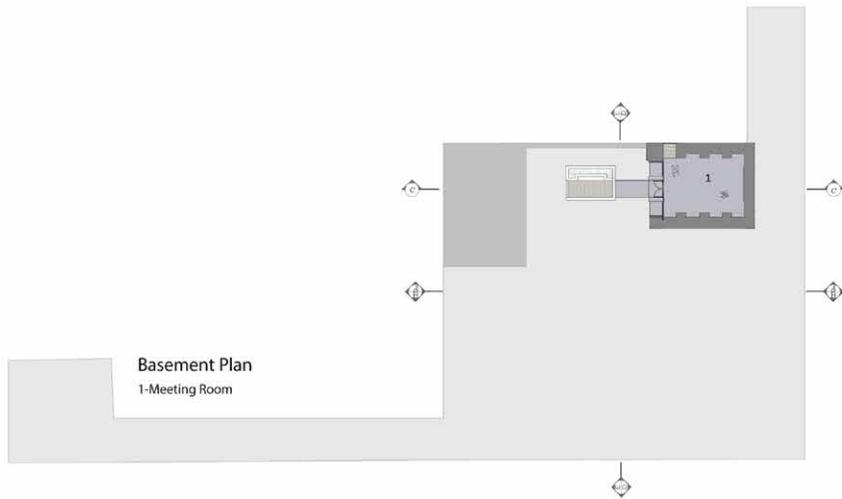


Original Function, House

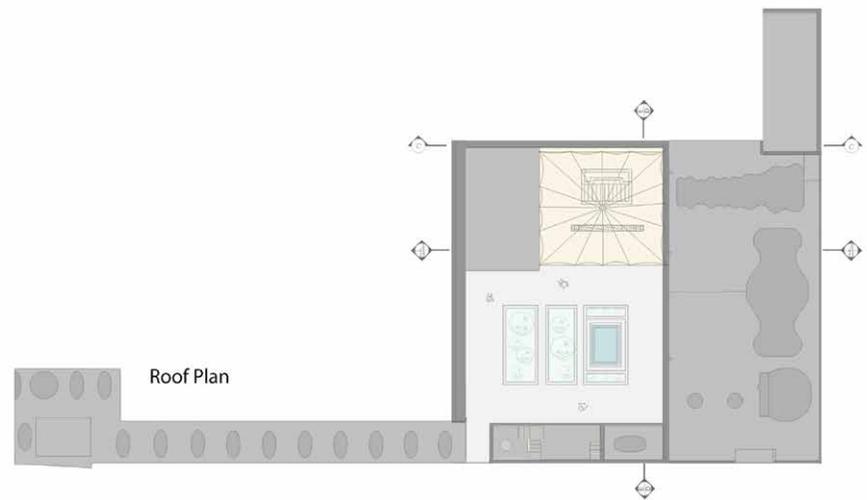


New Function, Multi-purpose cultural space

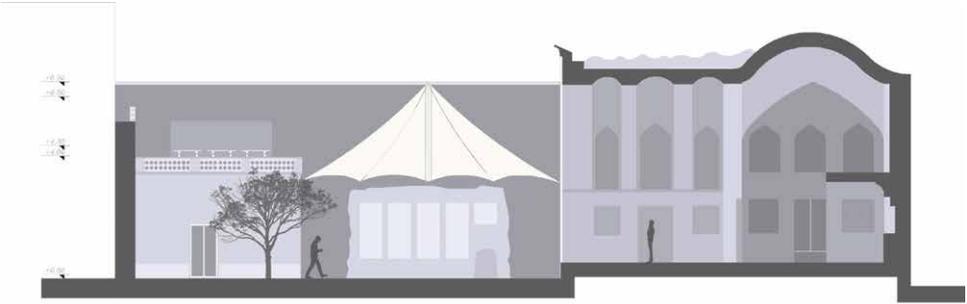
Plans
Basement plan, Ground floor plan



Plans
First floor plan, Roof plan



Sections
Section A-A, Section B-B



Section A-A

Sections
Section C-C, Section D-D



Section C-C



Section B-B



Section D-D

Conceptual Framework

Respectful Transformation, Light Installation

The adaptation of the Safavi House was based on a conceptual approach focused on "respectful transformation," which represents a philosophy of architectural intervention as a means of upgrading without imitation or heavy intervention. Rather, the objective was to preserve the original architectural identity while incorporating subtle functional upgrades that would allow for new functionality. Fundamentally, the project reflects a conviction that historical architecture can be used for current purposes without diminishing its cultural identity.

The central aspect of this approach is the concept of "spatial narrative," whereby the building itself serves as an educational device. The building invites the visitor to interpret the history embedded within it, even as they engage with the contemporary narrative. The architects took a non-invasive approach, whereby all the contemporary additions were made in such a way that they were evident and reversible.

In addition, the project redefines the building in relation to the urban and social environment. The building, which previously existed as a forgotten relic, is now reengaged with the community as a public space for culture, encouraging creativity and a sense of place through the reuse of the building as a means of reviving culture.

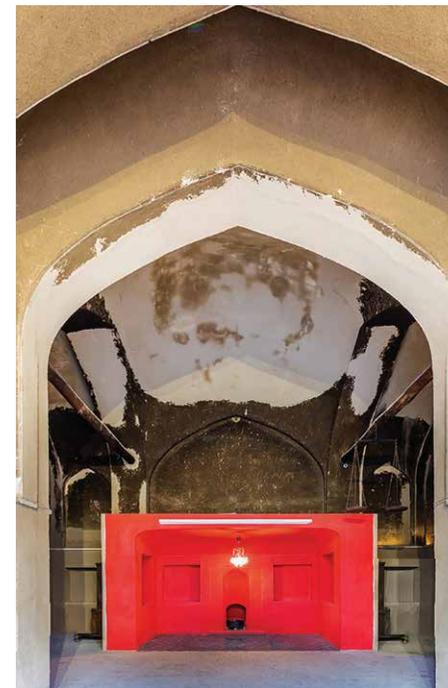


Architectural Intervention

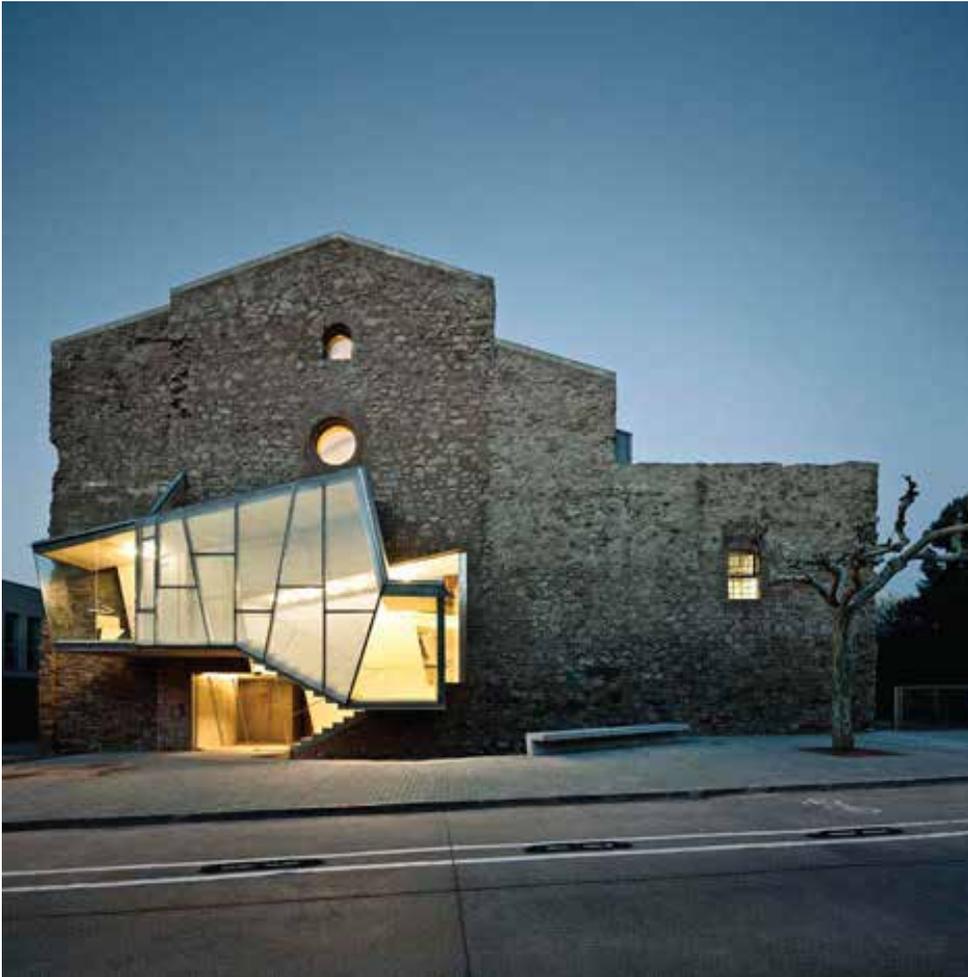
Material Dialogue, New Life Inside Old Walls

The architectural intervention focused on a careful restoration of the existing structure, along with the addition of modern elements that respect the building's historical context. Key aspects include:

- **Material Preservation:** Original materials like adobe walls, wooden beams, and traditional plasterwork were restored to their former glory.
- **Contemporary Additions:** Modern materials such as glass and steel were used sparingly, creating a conversation between old and new without overwhelming the original architecture.
- **Spatial Reconfiguration:** Interior spaces were modified to accommodate new functions, such as exhibition areas and workshop rooms, while keeping the building's traditional layout.
- **Lighting:** Natural light was used through existing openings, and subtle artificial lighting was added to improve the ambiance without taking away from the historical atmosphere.

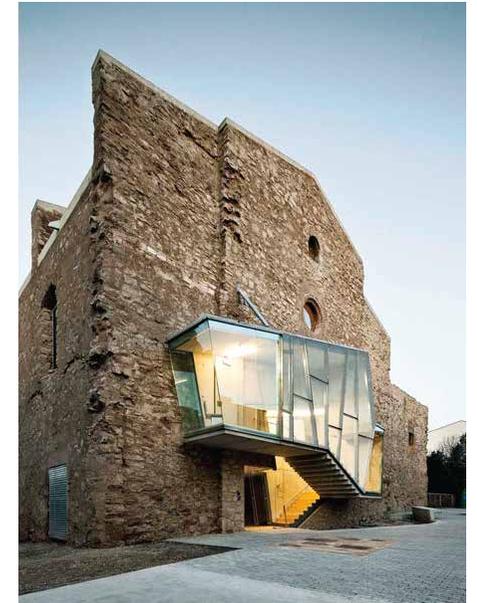


Convent de Sant Francesc

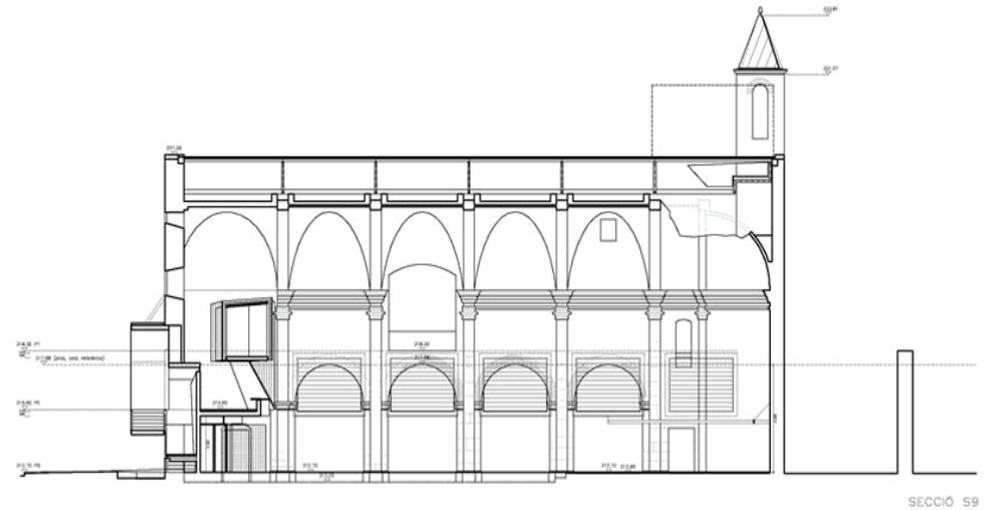
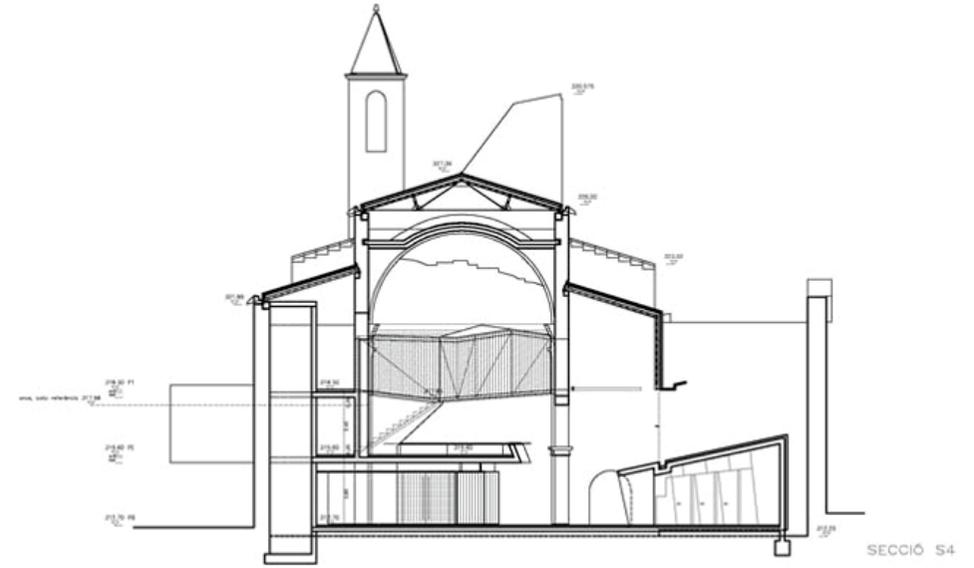


Architects: David Closes
Area: 950 m²
Year: 2011
Photographs: Jordi Surroca

The Church of Sant Francesc in Santpedor was renovated to serve as a cultural building, with the inclusion of an auditorium and a multi-purpose room. The project was undertaken in two phases, with a third phase proposed for the conversion of the upper levels into a historical archive.



Built in the period 1721 to 1729, the convent functioned until 1835, after which it was demolished in 2000, except for the church and part of the wall that was in a deteriorated condition.





The restoration work was conducted while ensuring the original elements of the church remained intact. These include the original wear and tear as well as the parts of the church that were missing.

New structures for vertical transportation (stairs) and sanitation (toilets) as well as additional rooms have been built without affecting the oneness of the principal nave of the church. A circular route has also been created for the purposes of viewing the church from different angles.



Astley Castle

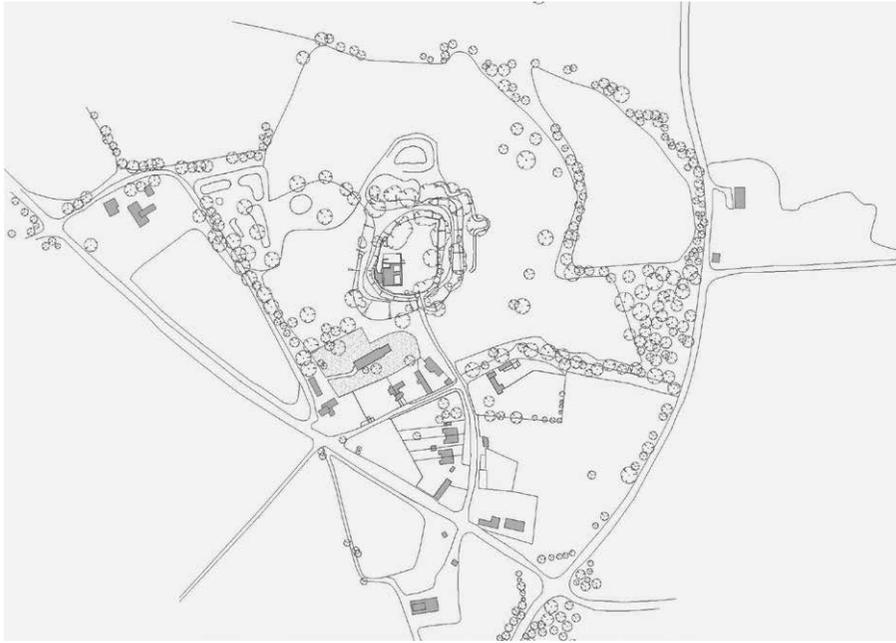


Location: Warwickshire, England
Architects: Witherford Watson Mann
Area: 950 m²
Year: 2013

A modern dwelling, designed by Witherford Watson Mann, stands behind the decaying walls of the twelfth-century ruined castle in Warwickshire, England, and is one of the six projects nominated for the Stirling Prize in 2013.



This medieval castle, which belonged to an English aristocratic family, has been in ruins since the 1970s, having been ravaged by a devastating fire that reduced the hotel inside to rubble.





.Because no funds were allocated for the restoration of the building, the architectural charity The Landmark Trust decided to run a competition for the design of a holiday home that would fit inside the decaying building, for which London-based practice Witherford Watson Mann won in 2007.

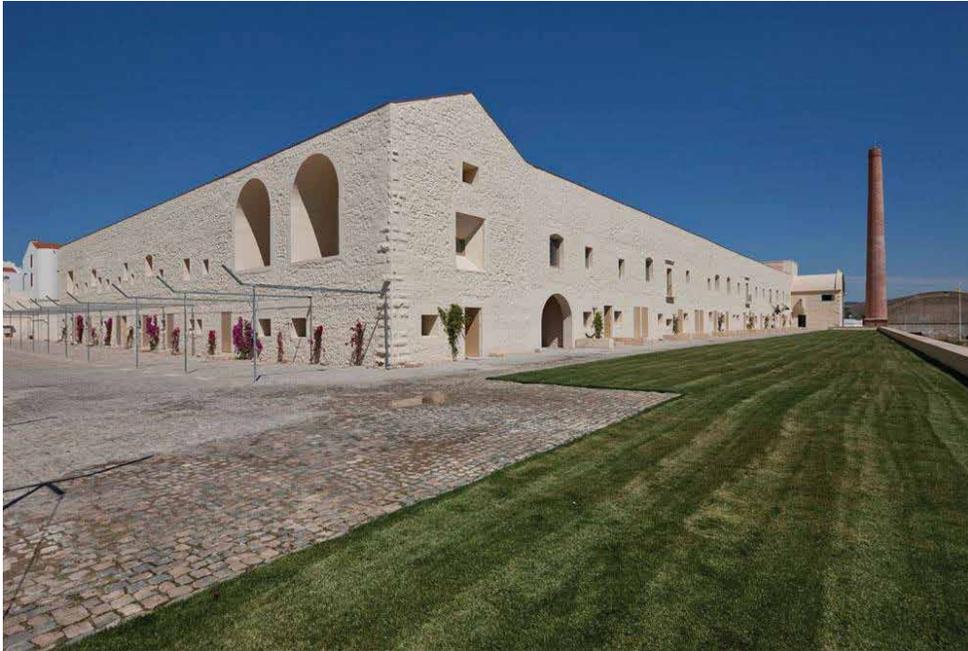
The winning design features a two-story dwelling that appears to “sit” within the massive sandstone walls of the existing fabric. This is made possible through the use of clay brickwork to fill the spaces between the walls, thus creating a visible contrast between the old building and the new one.

A system of floors and ceilings is implemented through the laminated wood beams, resulting in living areas as well as bedrooms in the oldest part of the castle.

The roof is made of wood and covers the extensions added in the sixteenth and eighteenth centuries. Instead of covering the extensions entirely, the roof is designed as a hollow structure in order to provide the courtyard entrances which are exposed to the elements.



Convento Das Bernardas Eduardo Souto de Moura



It has a history of over five centuries and was founded in the year 1509 and is the only Cistercian institution in the southern part of Portugal. This building was affected by the earthquake of 1755 and was extensively damaged. However, the Manuelin portal was spared and is intact to this day. This building has undergone several renovations until the time when the orders in Portugal were disbanded, and it was sold at a public auction and converted into a factory. It was eventually abandoned after the extensive renovations.

Architects: Eduardo Souto de Moura

Area: 8164 m²

Year: 2012

Photographs: Luis Ferreira Alves

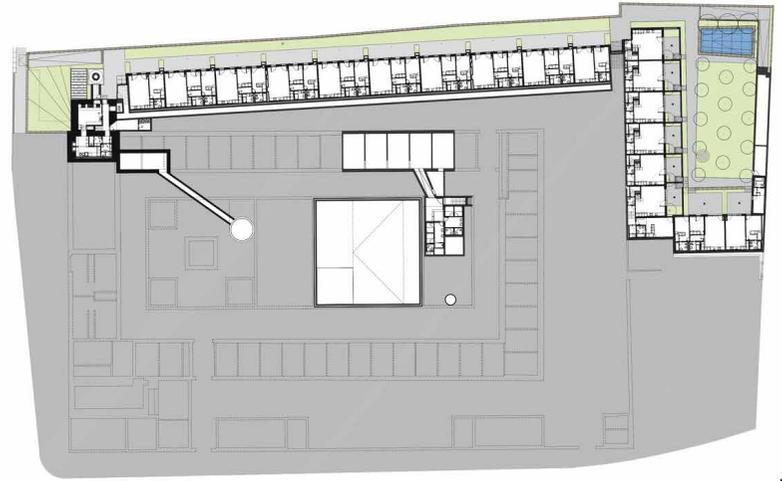
Manufacturers: CS Telhas

Structural Consultants: Estudos e Projectos Lda, A2P





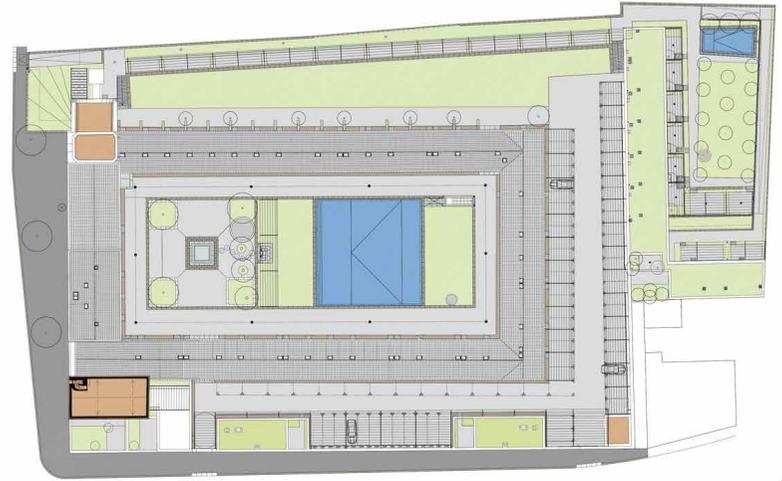
N
LEVEL 1 PLAN



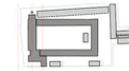
N
LEVEL -1 PLAN



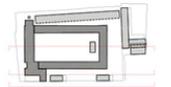
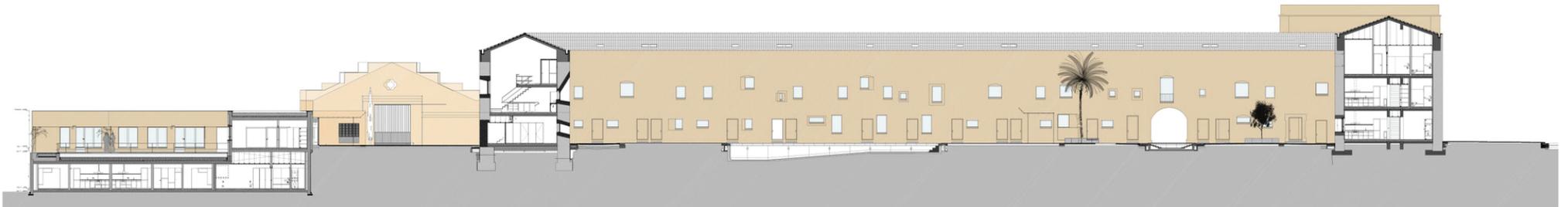
N
LEVEL 0 PLAN



N
ROOF PLAN



NORTH WING SECTIONS



WEST WING SECTIONS





The challenge of the project, as presented by the Entrepasto, is to turn the historic monument into a residential complex. This development includes 78 villas of differing sizes, such as studios and three-bedroom houses, designed using high-quality materials, as well as the addition of the property extension. Apart from the residential features, the property includes two saltwater pools, inspired by the large number of salt pans in the region of Portugal. The most visible feature of the development is the preservation of the former building, keeping the lines of the original façades, as well as the Manueline-Gothic entrance. Located above the Ria Formosa, as well as the mouth of the Gilão River, the Bernardas Convent presents a unique observation point.



St. Ann's Warehouse



St. Ann's Warehouse locates its new theater in an 1860 Tobacco Warehouse in Brooklyn Bridge Park in DUMBO. The building houses a major flexible presenting theater space, a control booth and seating rake, a smaller studio theater space, a public lobby and foyer area, administrative offices, dressing rooms, and public restrooms.



Architects: Marvel Architects

Area: 25500 ft²

Year: 2015

Manufacturers: Lutron, B-K Lighting, Bodine Signify, Cree, David Weeks Studio, Encore, Epie Metals, Glomar, IAC Acoustics, Kemper System, Legion Lighting, Lithonia Lighting, Metalux, Progress, Progress Lighting, RAB Lighting, SteelOeck, Vistabrik, WAC Lighting

Lead Architects: Jonathan Marvel, Lissa So, Zachary Griffin

Construction Management: Yorke Construction

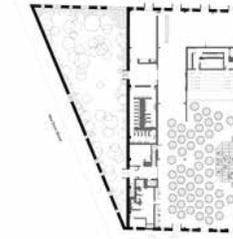
Landscape: Michael Van Valkenburgh Associates

Engineering: Silman, Buro Happold

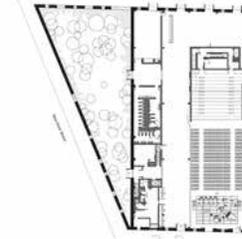




FLEXIBLE THEATER



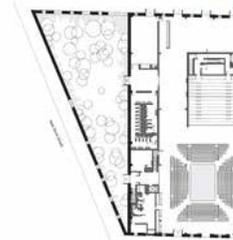
GALA



CONCERT



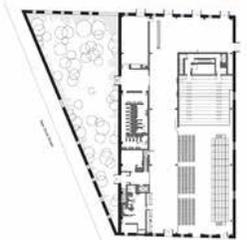
END STAGE



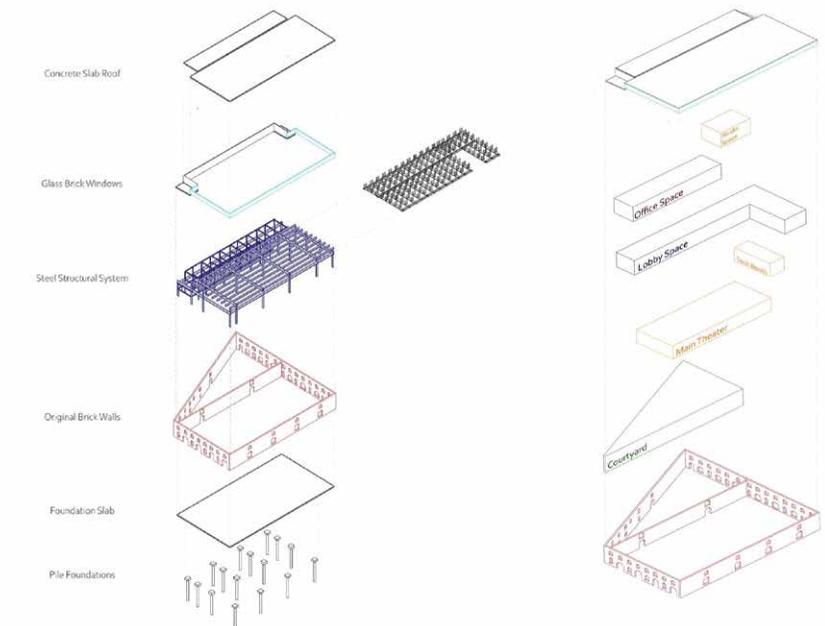
IN THE ROUND



TWO SHOWS



LINEAR END STAGE





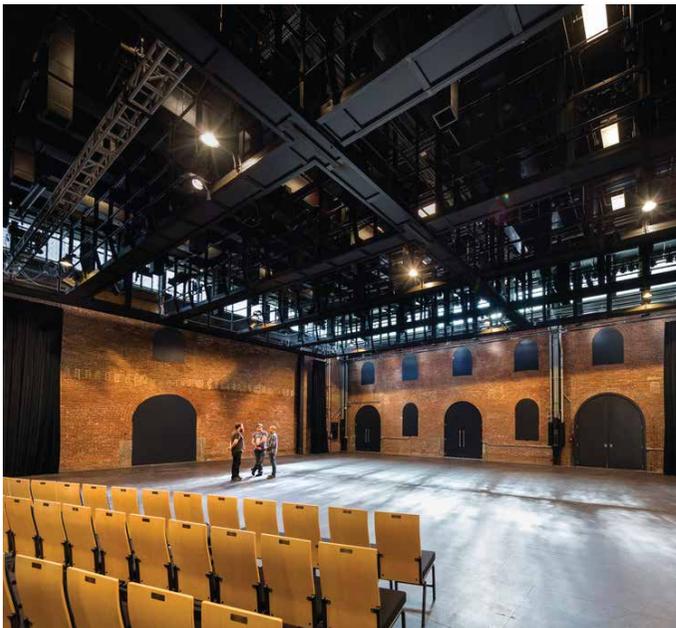
1. Program:

- Main flexible presenting theater space
- Control booth and seating rake
- Small studio theater space
- Public lobby and foyer
- Public restrooms
- Dressing rooms
- Administrative offices

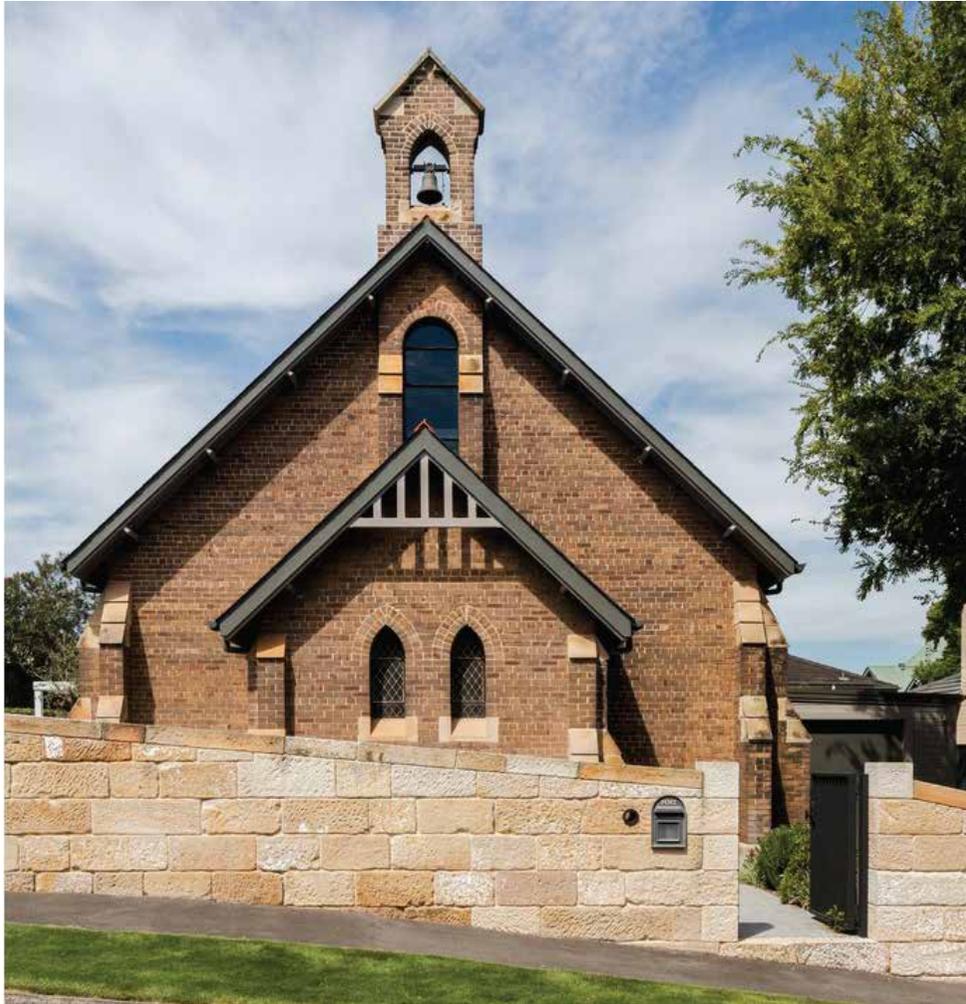
2. Design Intent:

- Create a flexible performance venue that can accommodate any type of theatre configuration, such as end stage, thrust, and in-the-round.

- Create a facility which respects the historical lineage of the Tobacco Warehouse (existing building) as well as the lineage of St. Ann's Warehouse and its past locations, such as other DUMBO warehouses and the church where the organization was founded. This should include the exposure of the existing brick structure with new glass brick clerestory elements.



The Church Residence / Michiru Higginbotham



Architects: Michiru Higginbotham

Area: 700 m²

Year: 2022

Manufacturers: Brodware, Elton Group, Gineico Lighting, Living Tiles, Ownworld, STS Stone, Woodos

Builders: Straight Up Built

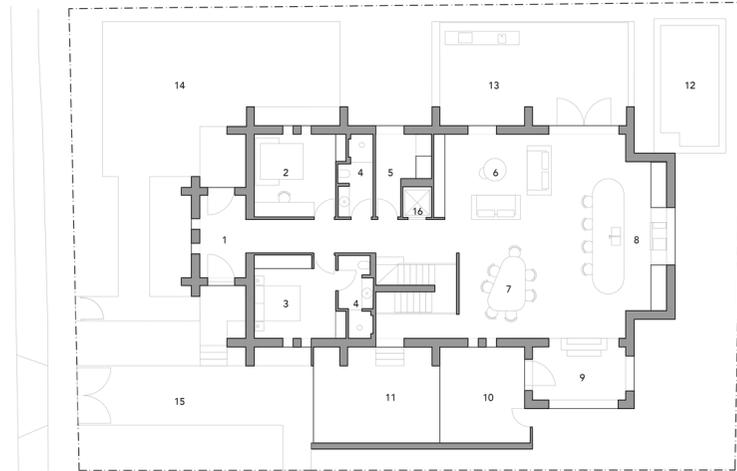
Landscape Architects: Andrew Pearce Landscape Design

The building, which was originally designed as a community church and theatre, has also seen a remarkable revival, transforming into a three-story contemporary dwelling.



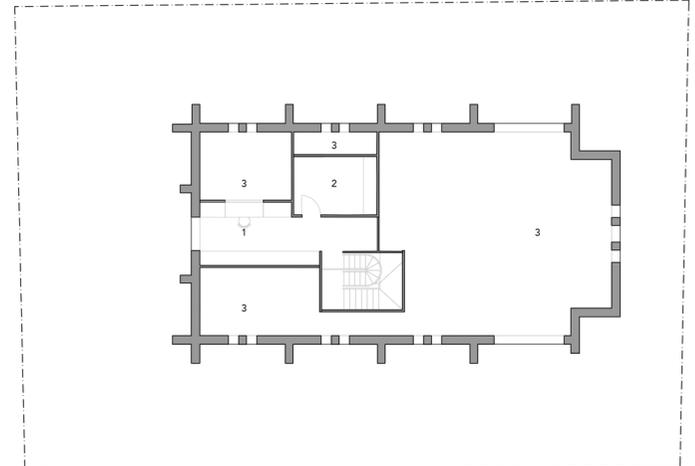
The Church experiences a great revival, displaying a modern dwelling that incorporates modern living with the historical appeal of its brick and sandstone exterior. While preserving the building, The Church retains its original exterior design but incorporates a modern design inside.

- Legend
- 1 Entry
 - 2 Study
 - 3 Guest Bed
 - 4 Bathroom/Ensuite
 - 5 Laundry
 - 6 Living
 - 7 Dining
 - 8 Kitchen
 - 9 Observatory
 - 10 Gym
 - 11 Garage
 - 12 Pool
 - 13 Outdoor Dining + BBQ
 - 14 Lawn
 - 15 Driveway
 - 16 Lift



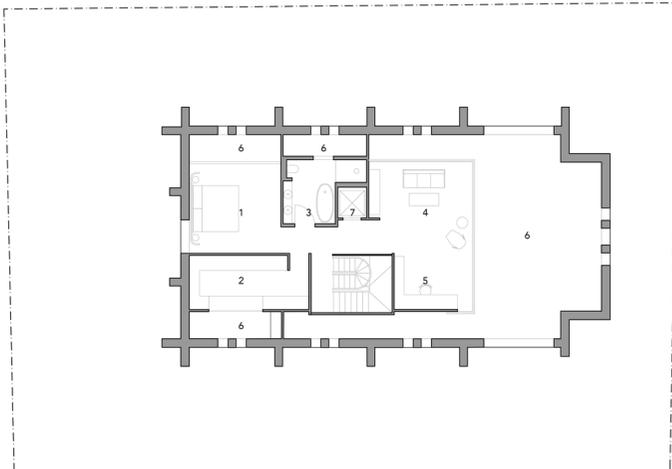
LEVEL 1 PLAN

- Legend
- 1 Loft Study
 - 2 Storage
 - 3 Void To Below



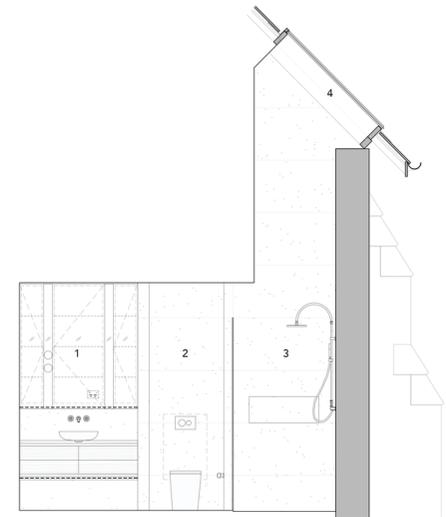
LEVEL 3 PLAN

- Legend
- 1 Master Bed
 - 2 Walk to Robe
 - 3 Master Ensuite
 - 4 Reading
 - 5 Media
 - 6 Void To Below
 - 7 Lift



LEVEL 2 PLAN

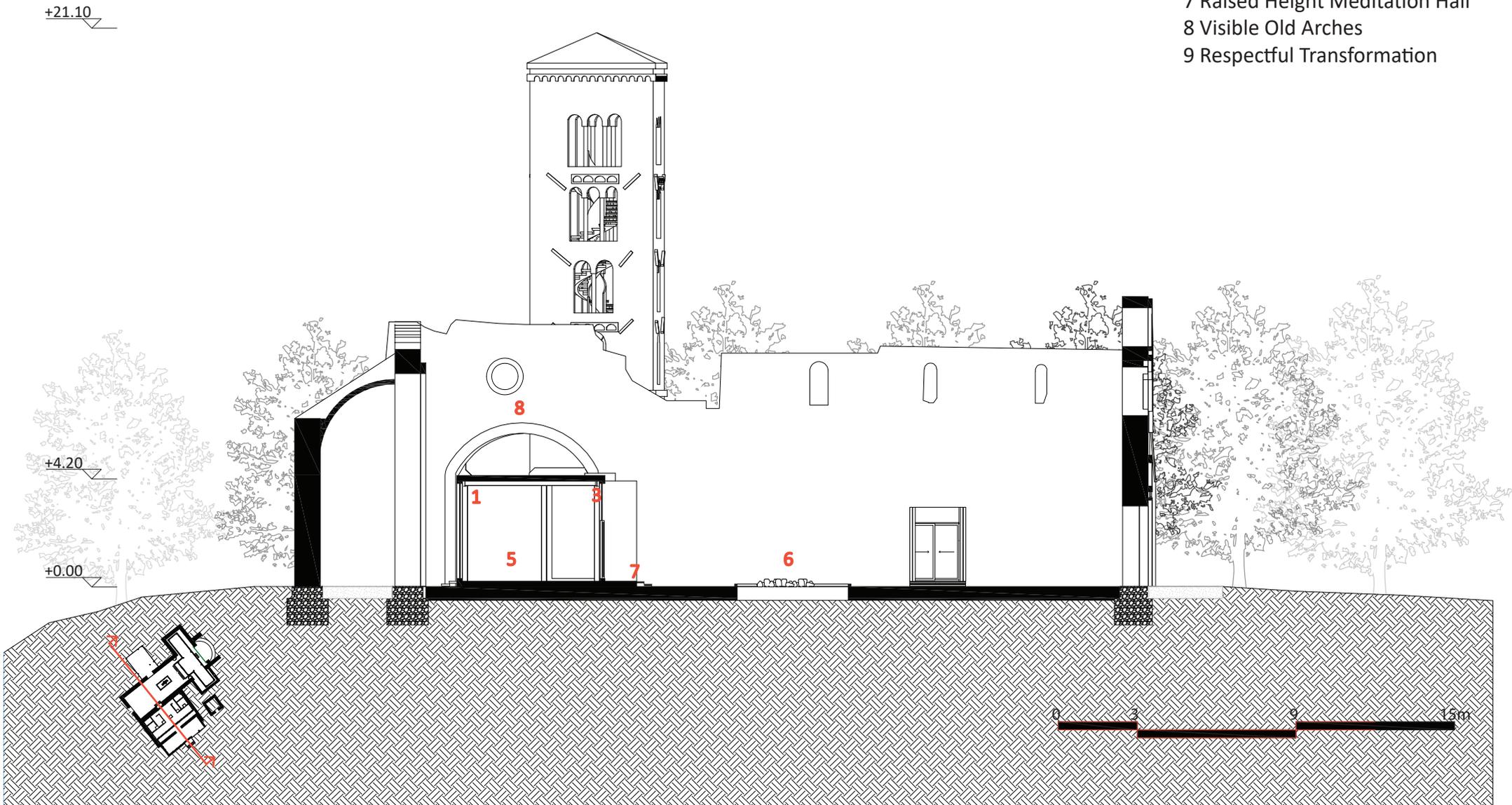
- Legend
- 1 Vanity
 - 2 Toilet
 - 3 Shower Enclosure
 - 4 Skylight



SECTION

Inspired Strategies :

- 1 Building In Building
- 2 Extention Building
- 3 Steel Structure
- 4 Light Installation
- 5 Glass material
- 6 Rock Garden
- 7 Raised Height Meditation Hall
- 8 Visible Old Arches
- 9 Respectful Transformation



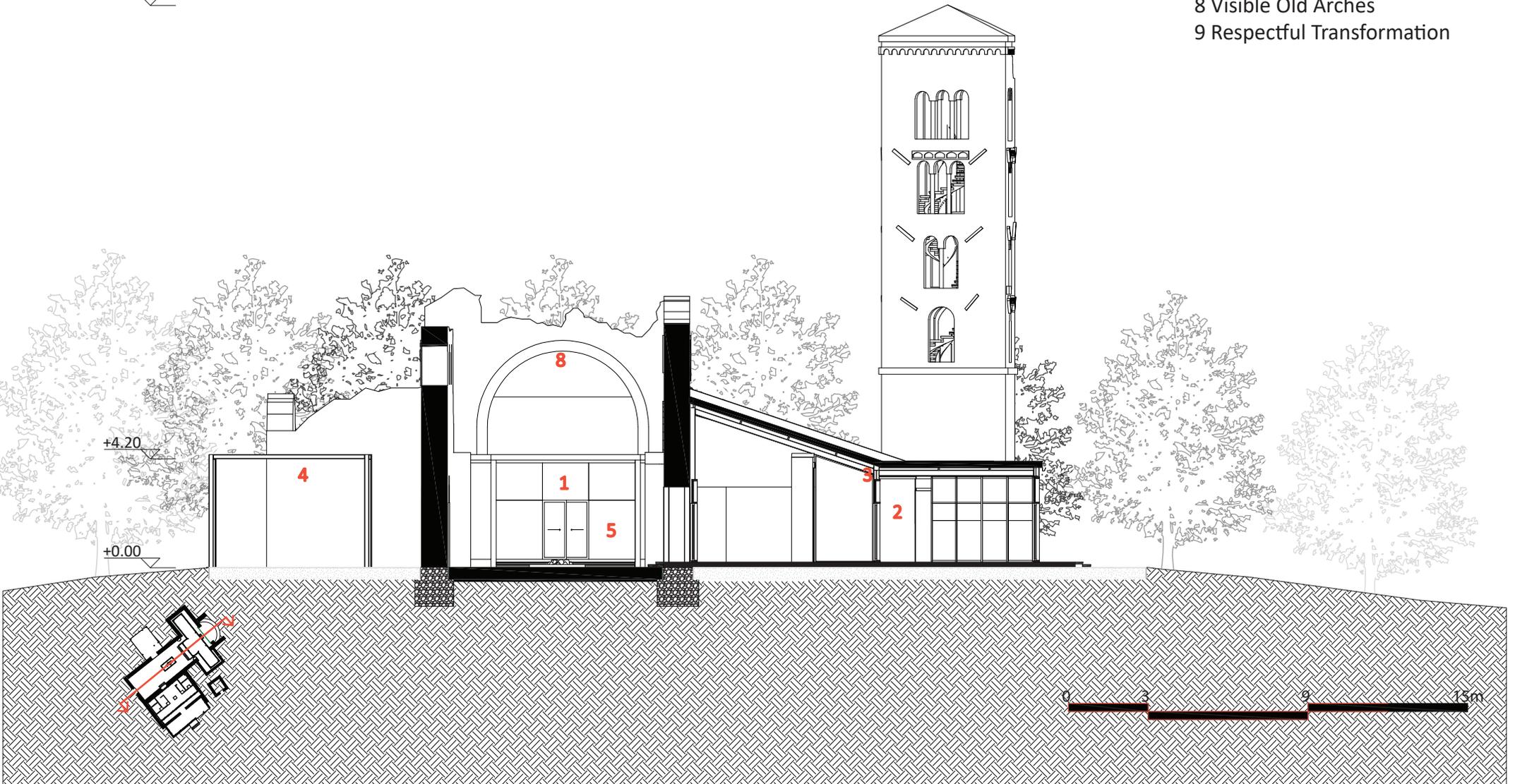
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- 8 Visible Old Arches
- 9 Respectful Transformation

+21.10

+4.20

+0.00



Analysis 03

Meditation Center Case Studies

Case Studies Analysis

In this chapter, twenty selected case studies are introduced, arranged into two sets that address the issue from complementary aspects. In the first set, there are ten adaptive reuse projects where existing buildings are converted into different new functions. In these projects, various strategies of reuse, ranging from structural improvement to the relationship between the retained parts and the newly added parts, considering the aspect of heritage value, performance, and context, are extracted.

The second series is based on ten meditation and contemplation facilities and is selected according to their space and sensorial quality of design. Analyzing those works allows seeing how architecture can be used to enhance quietness and mental health through space sequencing, thresholds, proportions, controlled daylight, material quality, and acoustic-thermal comfort. Taken together, both series form a framework of references that define how the thesis approach to design is to combine the proposed transformation strategies with the needs of meditation-related spaces.



Meditation Hall Overview

- **Location:** Cangzhou, China
- **Architects:** HIL Architects
- **Completion Year:** 2018
- **Area:** 600 m²
- **Project Type:** Adaptive reuse of retail units into a meditation and yoga center

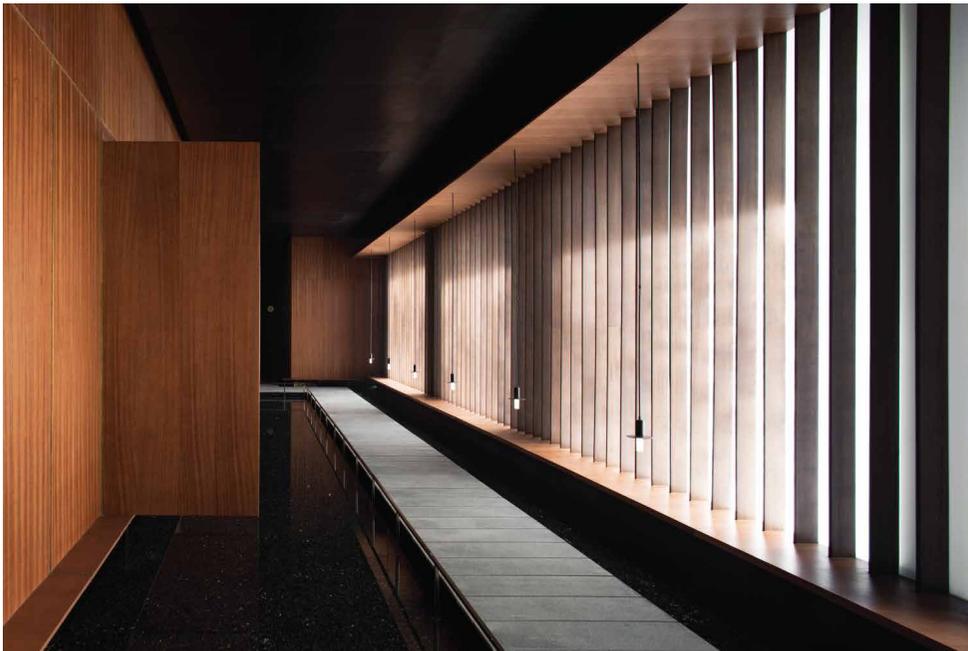


Spatial Program and Zoning

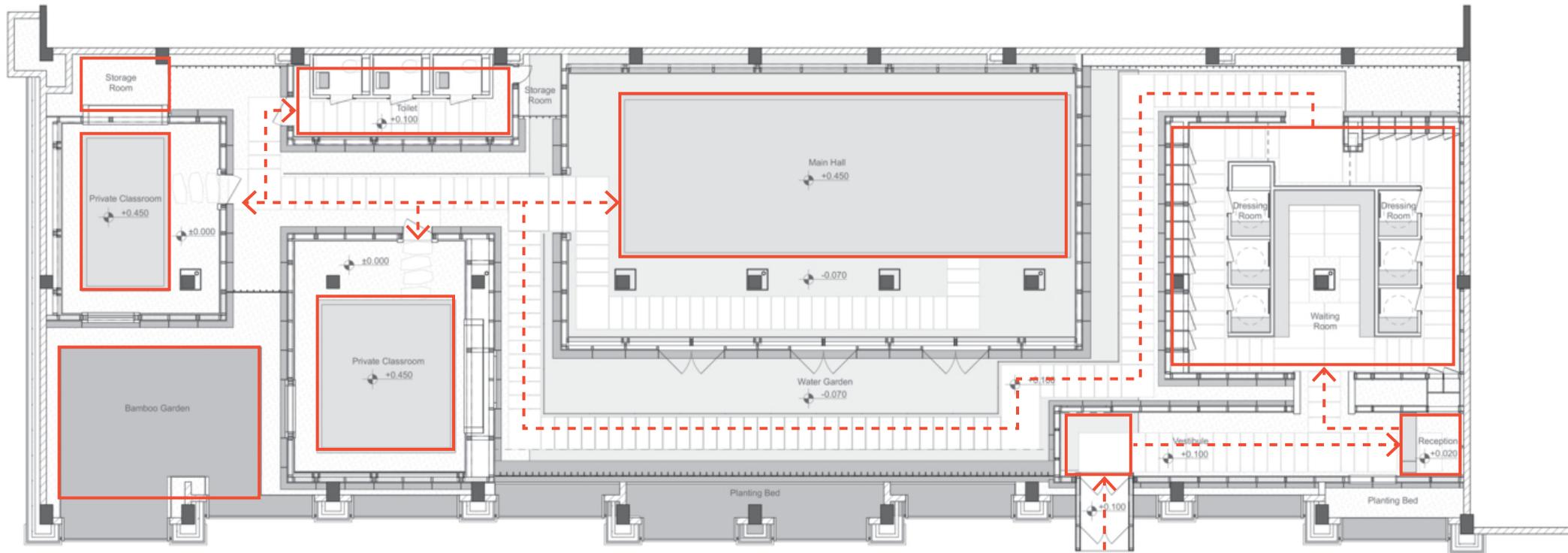
The project transforms a series of retail environments into a meditative space. The design of the interior reflects an “inner-outer” paradigm and provides a connection between the outer, busy environment and the inner peaceful space.

Key Spaces:

- **Reception Area** - Serves as the first transitional zone that mediates between the noisy public space outside and the quiet inside.
- **Waiting Room and Wardrobe:** It is a designated area for visitors for preparation before entering a meditation session.
- **Main Meditation Hall:** Refers to the main room allocated for meditation, marked by a temple-like ambiance.
- **Private Classrooms:** They are small rooms designed for individual or group classes.
- **Restrooms:** Supporting facilities which are incorporated into the design.
- **Water Corridor:** This is a corridor with a water fountain to promote the meditation process.



Circulation & Spatial Flow and Spatial Relationships Diagram



The circulation plan is meant to guide visitors through a progressive sequence of spaces ultimately to reach the holy of holies, starting from the external environment itself

•**Entry Sequence:** The visitors leave the sunlit and bustling street and enter into the reception, followed by the waiting area and the wardrobe.robe.

•**Main Hall Access:** There exists a corridor that leads one to the main meditational hall, where the walkway has been made to ensure a relaxation process.

•**Water Hallway:**It serves as a transition area; there is filtered natural light inside, as well as water features.

•**Private Rooms:** The major path for circulation is still accessible, and there is space allocated for solo practice in isolation.

Architectural Highlights and Light & Atmosphere

- Adaptive Reuse:** The proposed project gives new life to existing retail structures, and this example illustrates that sustainable design can often produce significant place-making.
- Spatial Transformation:** The existing structural elements are hidden or re-fashioned to suit the intended use.
- Symbolism:** It is inspired by the wetlands just adjacent, as the "water corridor" becomes a metaphorical string pulling it all together.
- Materiality:** The combination of natural and industrial materials creates a dialogue between tradition and modernity.

Lighting has a pivotal role in the creation of a meditation environment

- Natural Light:** Light passes through horizontal slots in wooden louvers to create a diffused light source.
- Water Reflection:** Light movements upon the water surface of the corridor create lively reflections within other spaces.
- Material Palette:** Wood, concrete, and brass allow for a material palette that creates a warm, inviting atmosphere.
- Acoustic Design:** Designs and materials used result in maximum quietness and maximum reduction of noise, so that serenity is promoted.created.



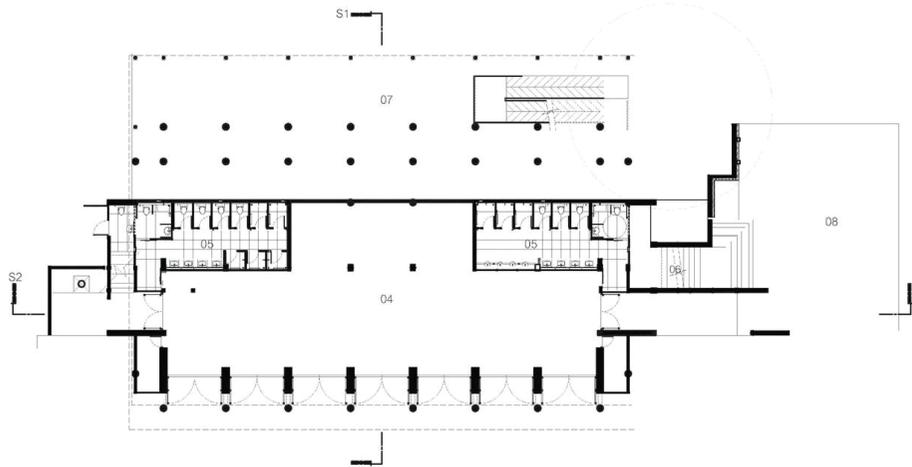


Sattapirom Meditation Center Overview

- **Architects:** Ken Lim Architects
- **Area:** 1000 m²
- **Year:** 2017
- **Photographs:** Xaraj, Photographic Atelier

Spatial Program & Zoning

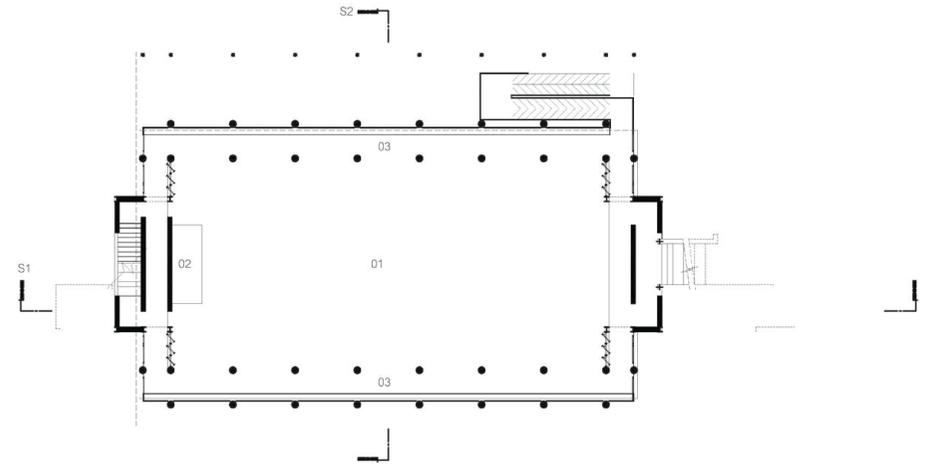
Satrapiroom Meditation Center
1st FLOOR PLAN



- 01 HALL
- 02 BUDDHA STATUE
- 03 WALKWAY
- 04 MULTIPURPOSE ROOM
- 05 RESTROOM
- 06 SYSTEM ROOM
- 07 INDOOR COURT
- 08 OUTDOOR COURT



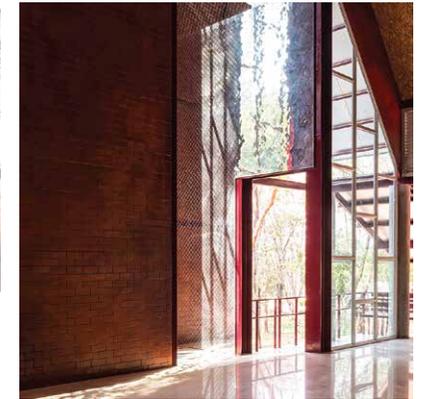
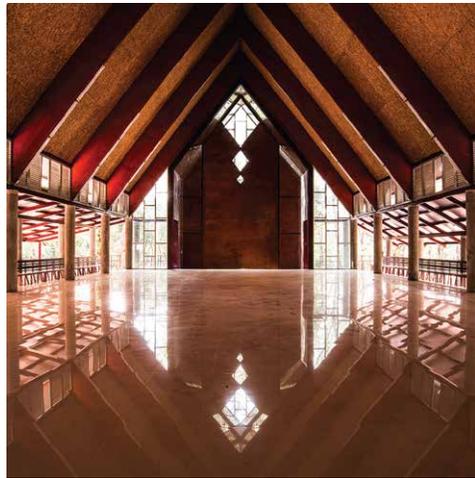
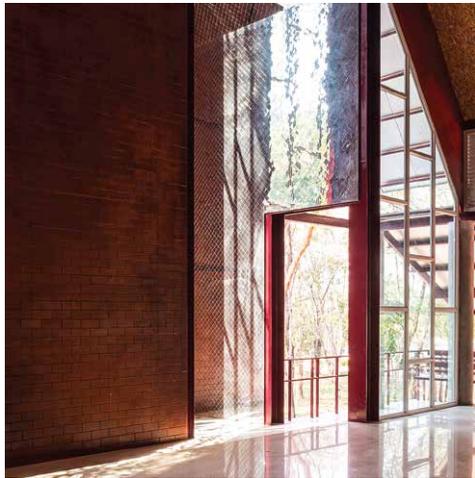
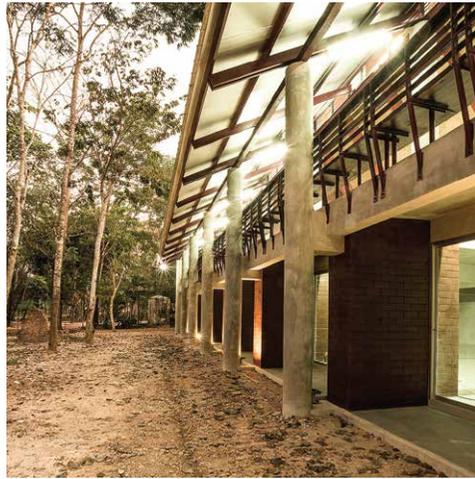
Satrapiroom Meditation Center
2nd FLOOR PLAN



Zoning Pattern:

- The layout of the pavilion has an irregular but hierarchical-ly structured
- pattern in which the Meditation Hall comes out as the dominant feature.
- In terms of functionality, the service facilities are grouped together. The design of the building has not followed a rigid structure but instead has a flowing structure perceptible at the perceptual levels.

Space	Function	Approx. Size	Notes
Meditation Hall	Main group meditation space	~120 m ²	Open pavilion, raised, most prominent volume
Multipurpose Room	Group activity, learning	~40–50 m ²	Semi-enclosed pavilion
Dining Pavilion	Shared monk & guest meals	~30–40 m ²	Positioned near kitchen, under roof, open sides
Kitchen	Food preparation	~20–30 m ²	Located discreetly at service side
Toilets & Showers	Hygiene facilities	~15 m ²	Clustered near dining & public zones
Timber Decks / Paths	Circulation, pause points	~variable	Elevated walkways connecting all functions



Circulation & Spatial Flow

Crucial spatial relationships involve the Entrance and common deck serving as orientation devices. Service functions like kitchen and toilet facilities are relocationated peripherally so as not to distract the sacral area. The Walkway serves as an important boundary zone, acting as both symbolic and sensorial filters between activity and contemplation. The Main Hall, although not centrally located, derives its prominence in experiential terms since every pathway leads emotionally to it.

Architectural Highlights and Light & Atmosphere

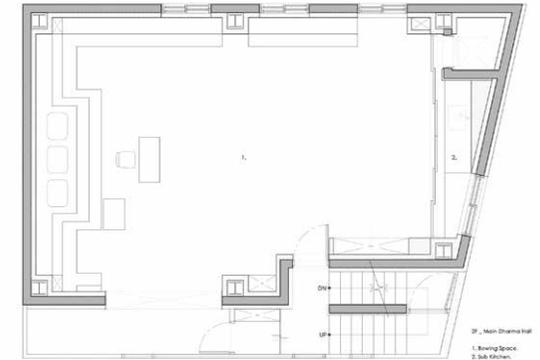
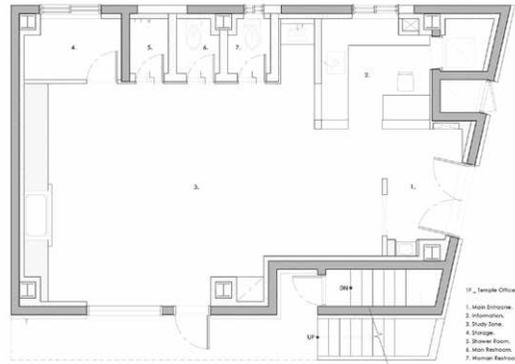
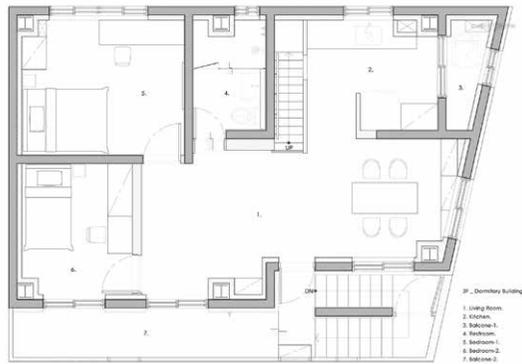
Natural light pervades the interior through the open sides of the pavilions, light roofing, as well as the filtered canopy of the trees above. The materials are thus used as follows: The use of wood to make walkways, structural components, and decks brings a sense of warmth and naturalness into the environment. The use of metal roof sheets brings a sense of lightness and practicality, ideas very appropriate for a tropical environment. The use of concrete footings brings a sense of heaviness to the structures without making them look ugly. Accordingly, the overall experience promotes a space where the whole environment can be an extension of the forest itself—to be noiseless, warm, and detail-filled.



**Bohyun Buddhist Meditation
Centre
Overview**

- **Architects:** Design by 83
- **Area:** 270 m²
- **Year:** 2017
- **Location:** Busan, South Korea

Spatial Program & Zoning



Space	Function	Approx. Size	Notes
Main Hall	Meditation and ceremonies	~100 m ²	Central space with natural lighting and minimalist decor.
Dining Area	Communal meals and gatherings	~50 m ²	Features long wooden tables fostering community interaction.
Altar Room	Housing the Buddha statue	~30 m ²	Accessible via a circular opening, symbolizing a spiritual threshold.
Monks' Quarters	Private living spaces for resident monks	~40 m ²	Designed with minimal furnishings to support a contemplative lifestyle.
Service Areas	Kitchen, storage, and restrooms	~50 m ²	Functionally designed to support the daily operations of the center.

Zoning Principle

These spatial domains are interwoven in complex patterns that allow for smooth transits of light, sound, and air from one zone to another and are distinguished through subtle gradations in scale and light level and other variables that allow for clarity in function while promoting fluid spatial and affective transitions. This creates a dance of silence in which transitions are deliberate and occur in a natural manner and are certainly not abrupt.



Circulation & Spatial Flow

In the Bohyun Centre, the walk replaces a linear movement with one that incorporates elements of meditation in its path. The walk is intended to be slow and, in a way, sensorially rich in the following ways:

- The entry point combines the body and the mind through creating a state of quiet.
- Progression occurs in stratified increments, each stratum representing a successive stage of openness or focus.
- Secondary routes of circulation act as serene retreats located near monk quarters or service areas to provide routes that never cross meditation routes.
- The central pathway or axis is made less significant; rather, the walking process moves through a series of transitions which expose or conceal views.

Design strategy: Employing the concept of stepped levels, thresholds, and filtered transitions in the place of doors in controlling the degree of emotional subjugation. A progressive approach to the main meditation room is used to improve the sense of clarity of spirituality.

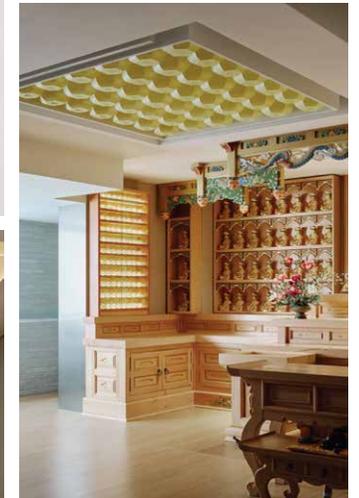
Architectural Highlights and Light & Atmosphere

Natural Light

Light is not arbitrary; it is a ritualized presence. Skylights, vertical openings, and openings for filtered light bring light as a presence rather than a flood. Light responds to natural textures, varying according to the time of day to signify stillness. The building provides light while ensuring the absence of glare.

Material Palette

The major material palette includes warm wood, polished concrete, natural stone, and matte brass. Materials are handled in a sincere and matter-of-fact way, eschewing any kind of glossy or ornamental finishes. Textures vary in their ability to reflect light. Atmos The environment is muted, textured, and reflective. Acoustics are reduced, corners are rounded, and the altar itself is unostentatious. The building encourages self-awareness, which is further promoted by the unity of material, sound, and light.





Glazed Meditation Room Overview

• **Architects:** Ming Gu Design

• **Type:** Residential extension
(within traditional courtyard
typology)

• **Year:** 2017

• **Location:** Nanjing, China

Spatial Program & Zoning



Zoning Pattern:

- Core: Glass meditation pavilion (sacred, intimate)
- Middle ring: Courtyard (threshold between worlds)
- Outer layer: Traditional home (memory, support)

Space	Function	Estimated Size
Glass Meditation Room	Seated reflection, contemplation	~12–15 m ²
Inner Courtyard	Pause, open-air buffer zone	~40–50 m ²
Covered Corridor	Transition between house and pavilion	~5–7 m ²
Existing House	Support (entry, dining, daily living)	Unmodified

This onion-like layering expresses a transition from collective memory toward individual clarity.



Circulation & Spatial Flow

The circulation strategy is radial and experiential, based on traditional Chinese courtyard movement.

- **Entry:** Visitors pass through the old timber structure into a shaded corridor.
- **Transition:** The courtyard serves as a chance to decompress and offers a moment to slow down.
- **Approach:** As one walks across the courtyard, the transparent meditation room stands out visually.
- **Engagement:** Entering the glass room symbolizes a shift from solid to light, from inside to outside, and from past to present.

The spatial flow is both physical and mental, guiding the body and calming the mind.

Architectural Highlights and Light & Atmosphere

Natural Light:

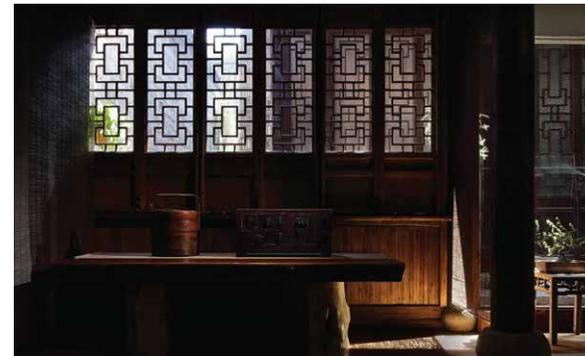
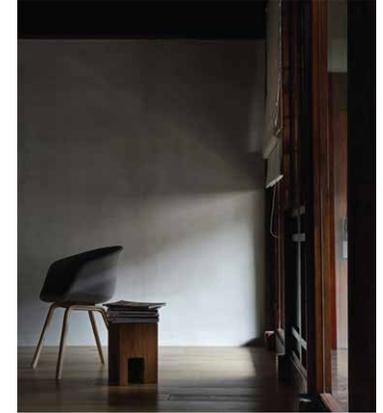
- The room gets full daylight filtered through the trees and courtyard walls.
- Shadows move across the floor and interior. They shift constantly, highlighting time, change, and awareness.

Material Palette:

- Glass: Total transparency, symbolizing vulnerability and openness.
- Steel/Timber Frame: Light structural support, sharp but refined.
- Stone Courtyard & Brick Walls: Groundedness, age, and cultural continuity.

Atmosphere:

- Weightless, bright, and serene.
- There are no decorative elements, only air, nature, and reflection.
The glass enclosure feels like a lantern of silence, glowing softly within the solid courtyard.

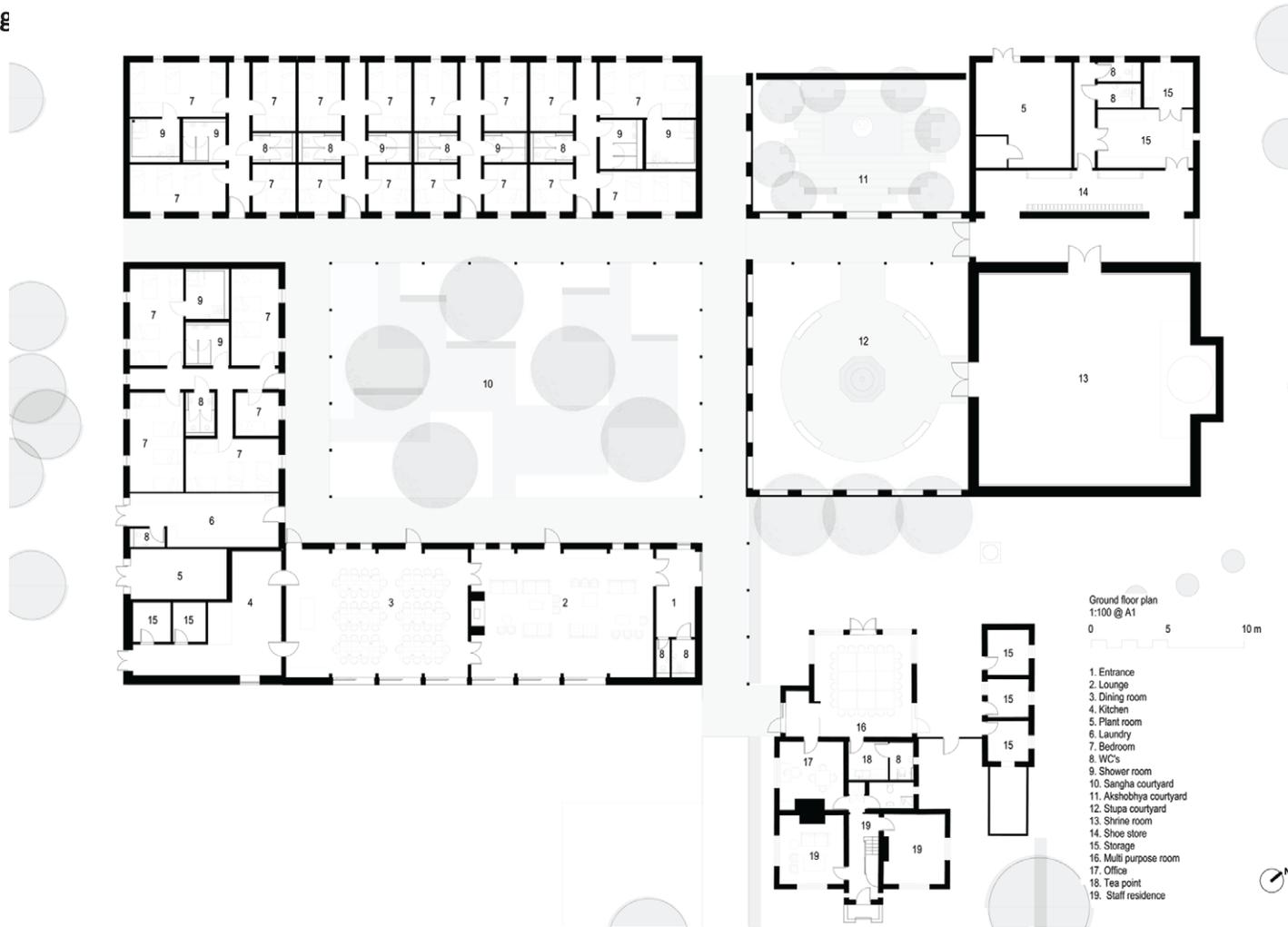




Vajrasana Buddhist Retreat Centre Overview

- **Architects:** Walters & Cohen Architects
- **Area:** 1,210 m²
- **Year:** 2016
- **Location:** Suffolk, England
- **Client:** London Buddhist Centre

Spatial Program & Zoning



Space	Function	Approximate Size
Sangha Courtyard	Main social/communal courtyard	~450–500 m ²
Shrine Room	Primary meditation hall	~150–180 m ²
Stupa Courtyard	Contemplative courtyard (with stupa)	~120–150 m ²
Dining + Kitchen Area	Communal meals and preparation	~100 m ²
Accommodation Pods	Living quarters for ~60 people	~15–20 pods (~400 m ² total)
Akshobhya Courtyard	Quiet garden/retreat zone	~100 m ²
Service + Storage	Technical and staff areas	~60–80 m ²

Zoning Pattern:

The design separates public–semi-public–private zones across three rings:

- Outer Zone : accommodation and arrival/service
- Middle Ring : dining, circulation, and transition spaces
- Inner Zone: courtyards and Shrine Room (spiritual core)

The cloister-like layout helps retreatants naturally move inward — physical-ly and spiritually — toward stillness.



Circulation & Spatial Flow

Vajrasana's spatial arrangement is intended to be a meditative progression, integrating movement with spiritual experience.

- **Arrival:** Upon entry, visitors are met with a calm axis and framed views of the Sangha Courtyard.
- **Pathways:** Covered walkways lead visitors through the site, easing the change between social, personal, and spiritual areas.
- **Rhythm:** Courtyards break up movement, providing visual and emotional pauses.
- **Shrine Room:** The destination differs spatially, acoustically, and atmospherically. Its height, darkness, and quietness strengthen the feeling of sacred arrival.

The plan slows the body and calms the mind, encouraging inner reflection.

Architectural Highlights and Light & Atmosphere

Natural Light:

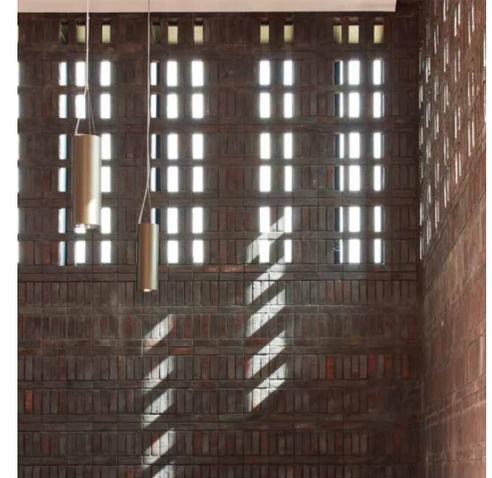
The design brings in soft light using clerestory windows and open brickwork. This makes for a calm and thoughtful feeling inside.

Materials:

- Charred Wood: The outside of the homes is covered in charred wood, which gives a natural feel.
- Brick: The Shrine Room has dark, shaded bricks that add to its depth and texture.
- Concrete and Wood: The building shows its true construction with exposed concrete and wood.

Atmosphere:

The mix of natural materials, soft lighting, and smart space planning helps create a setting that's good for thinking and meditation.





**Meditation Pavilion & Garden /
GMAA**

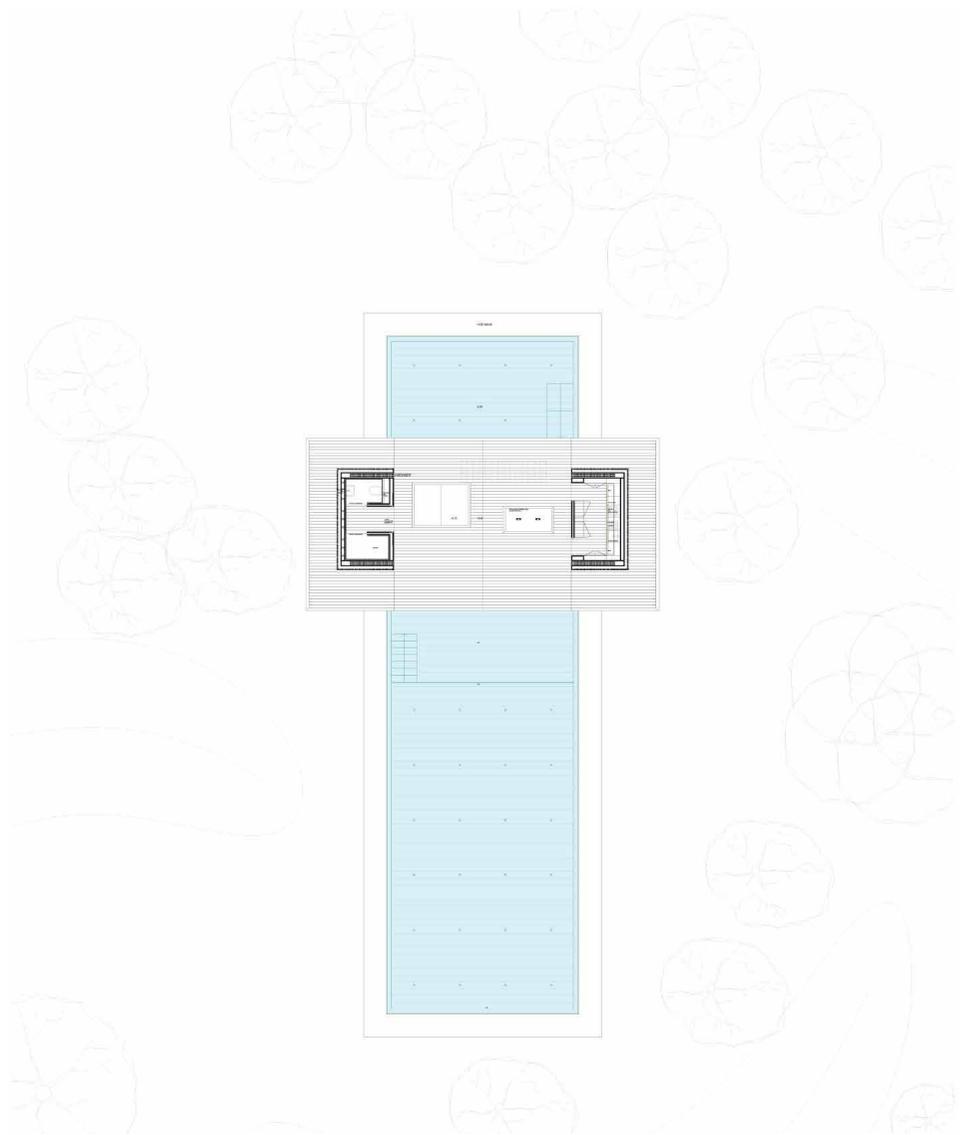
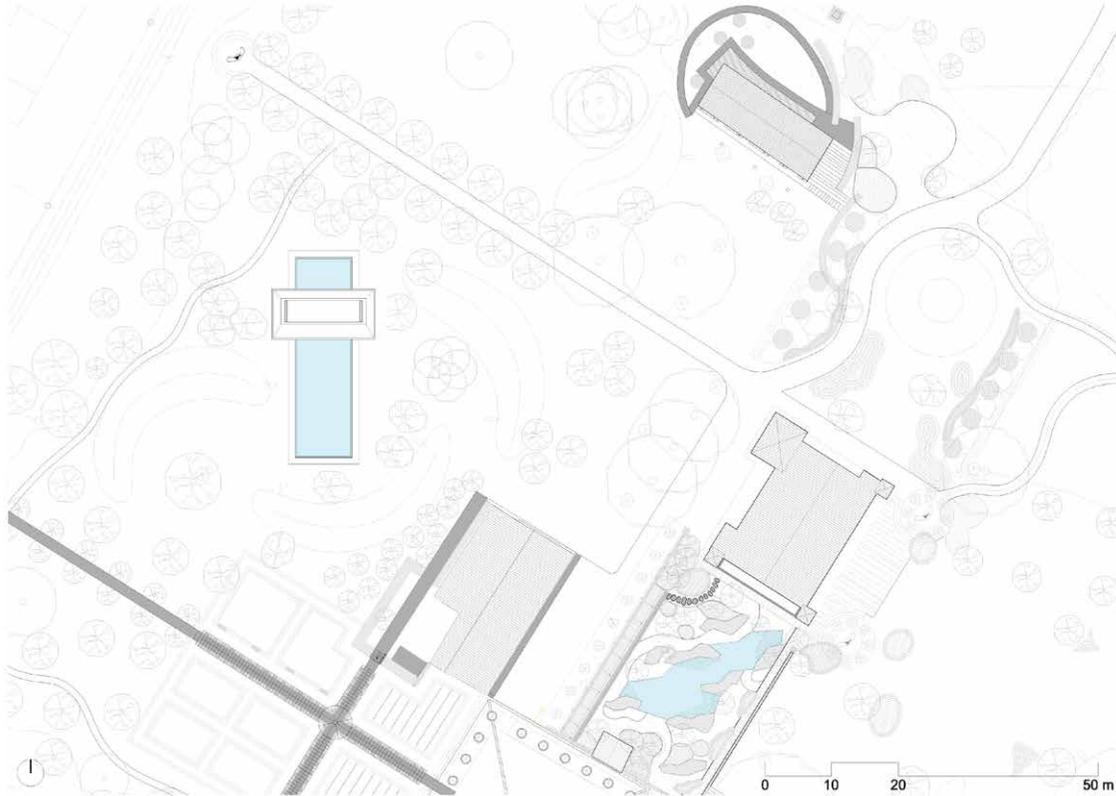
• **Architects:** GMAA

• **Area:** 120 m²

• **Year:** 2013

• **Location:** Geneva, Switzerland

Spatial Program & Zoning



Zoning Pattern:

- Pavilions are scattered within the landscape.
- Communal spaces and services are separated from quiet spaces.
- Public and private spaces are separated by paths and buffers of the landscape.



The Meditation Pavilion matches well within the overall design of the park in which it is located and thus adds to its composition by virtue of its own attributes.

The proposed design for the pavilion is one which seems to arise out of the unique blend of wood architecture and appears to float above the intersecting water body in such a manner as to perfectly orient towards the four directions.

The relationship between the pavilion and the surface of the water is also defined by a component that highlights a vegetal landscape, which encircles a private park that envelops the pavilion. The hills of Gramineae that encircle the site establish a dynamic vegetal zone around the pavilion and the pool, which has a seasonal change in color and dynamic aspects. The zone effectively conceals the pavilion from view and only offers occasional glimpses as one approaches, passing over the hills that enclose the site. A complete understanding of the pavilion is possible only after entry into the hills.



Architectural Highlights

- Although the pavilion itself is organized into the landscape with a visible order, the components are arranged to create order.

The Main Meditation Pavilion serves as the visual, spiritual, as well as spatial, focus of the entire area.

- The secondary contemplation areas and the pavilion units are scattered around to encourage solitude and contemplation.
- Circulation routes provide connections between all zones, encouraging slow movement.
- The community spaces like the gathering pavilion, tea area, and multi-purpose space are located near the main entrance area. - Through landscaping such as water features, gardens, and shaded courts, quiet zones are separated from the remaining spaces.



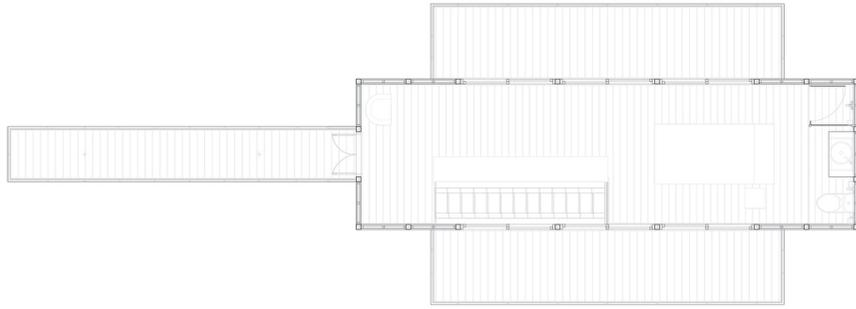


• **Architects:** Arsomsilp Community and Environmental Architect

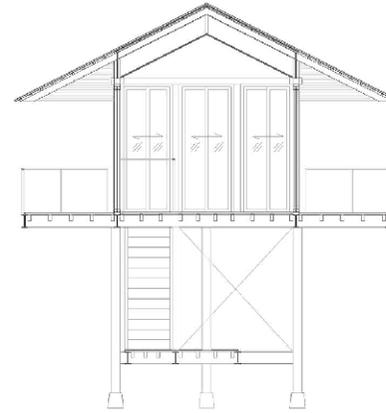
• **Area:** 68 m²

• **Year:** 2021

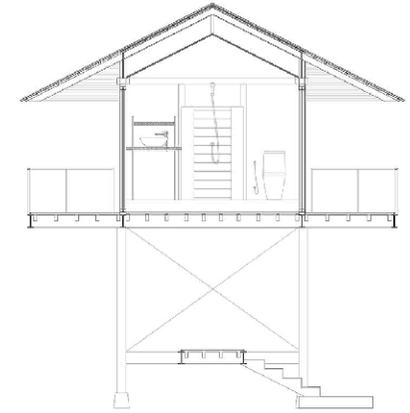
• **Location:** Thailand



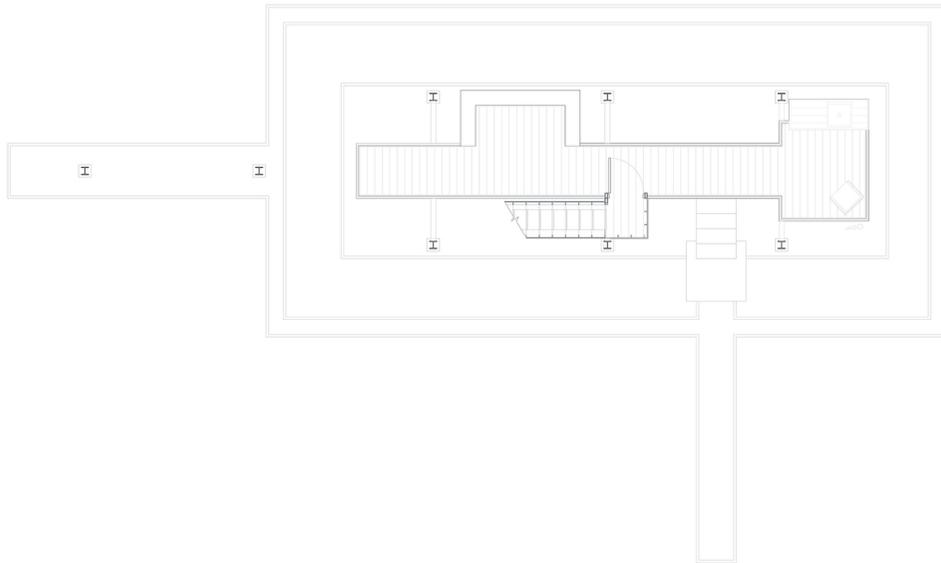
2ND FLOOR PLAN
0 1 2.5 5



CROSS SECTION 01
0 1 2.5 5



CROSS SECTION 02
0 1 2.5 5



1ST FLOOR PLAN
0 1 2.5 5

Zoning Pattern:

- Pavilions are scattered within the landscape.
- Communal spaces and services are separated from quiet spaces.
- Public and private spaces are separated by paths and landscape buffers.



This residence has the unique setting of being located amidst a natural setting, flanked by two mountain ranges, one on either side, which provides a direct view of the sunrise as well as the sunset. This setting represents, among other things, the Wheel of Life, which reflects the themes of impermanence, suffering, and the non-fulfillment of the soul.



Architectural Highlights

- The structural material used was wide flange metal, which posed many problems.
- The metal parts were already pre-cut before transporting, eliminating the need for cutting equipment during transport.
- A walking style of meditation, involving a daily 10km walk back and forth in nature, was incorporated into the meditation practice.
- The balcony and expanded walkways are conducive for walking meditations.
- It provides a functional space where there can be solitude in nature by isolating one person.





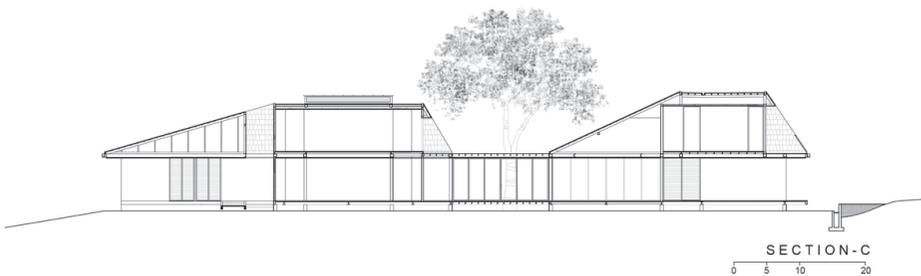
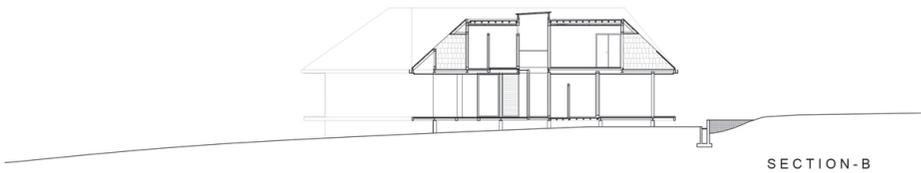
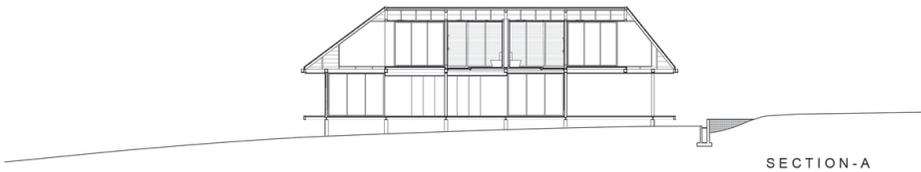
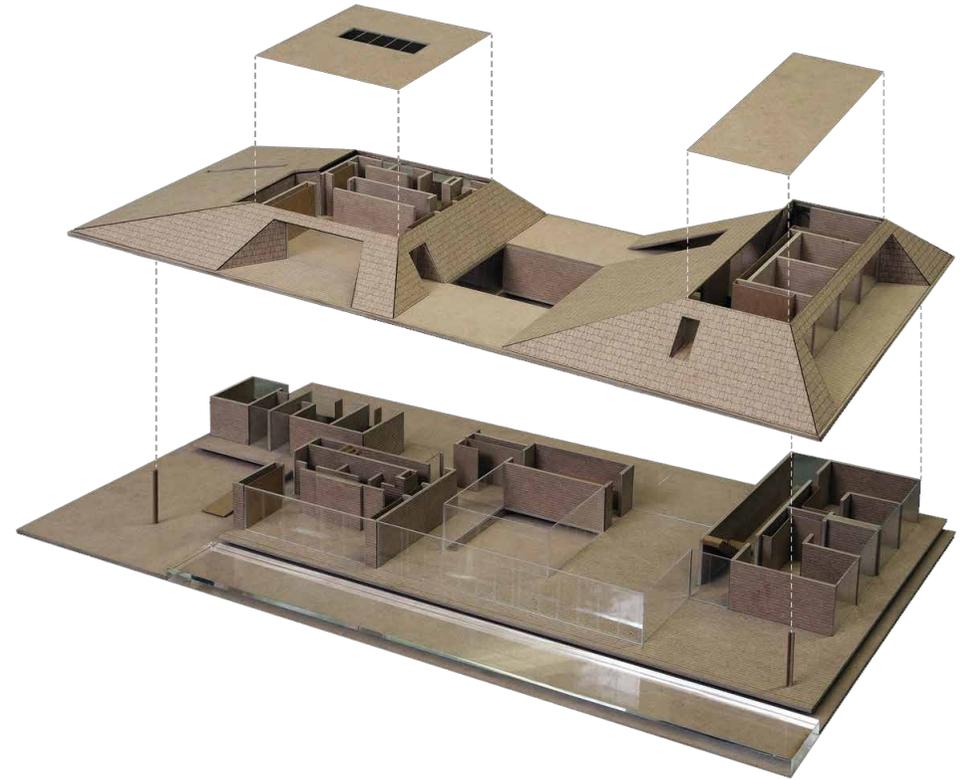
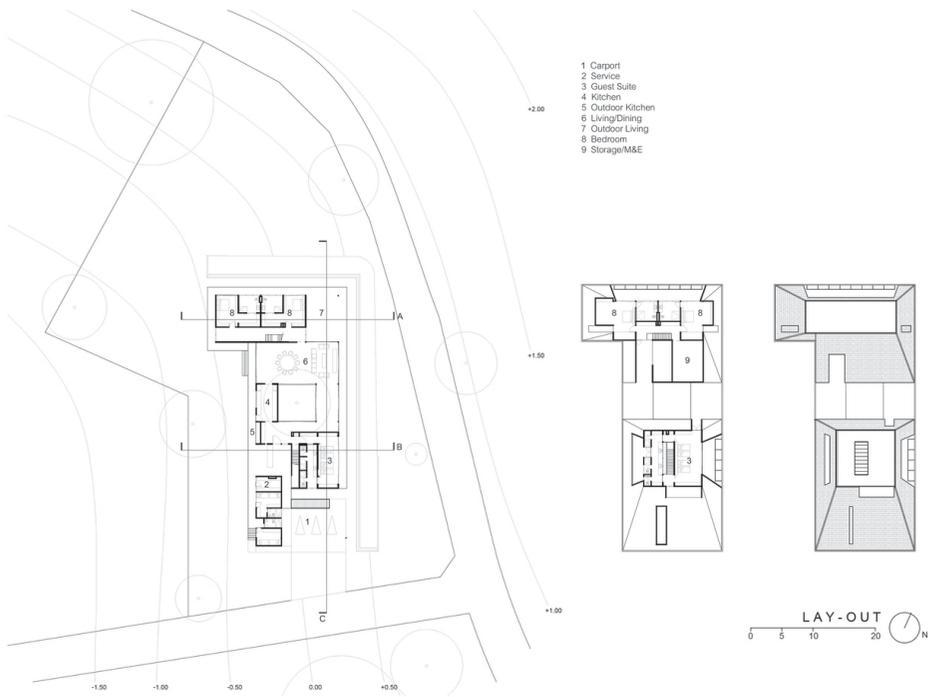
Baan Rai Thaw Si

• **Architects:** SOOK Architects

• **Area:** 860 m²

• **Year:** 2015

• **Location:** TAMBON MU SI, THAILAND



Zoning Pattern:

- Religious and meditation areas like meditation halls, stupas, and meditation pavilions are strategically located amidst the landscape.
- The community and transition areas, like open pavilions and instruction spaces, act to link the inner sanctums with the external visitor areas.
- Landscape elements and pathway buffers, which include gardens, forest paths, and water features, serve purposes such as demarcating areas, influencing movement patterns, and promoting awareness.

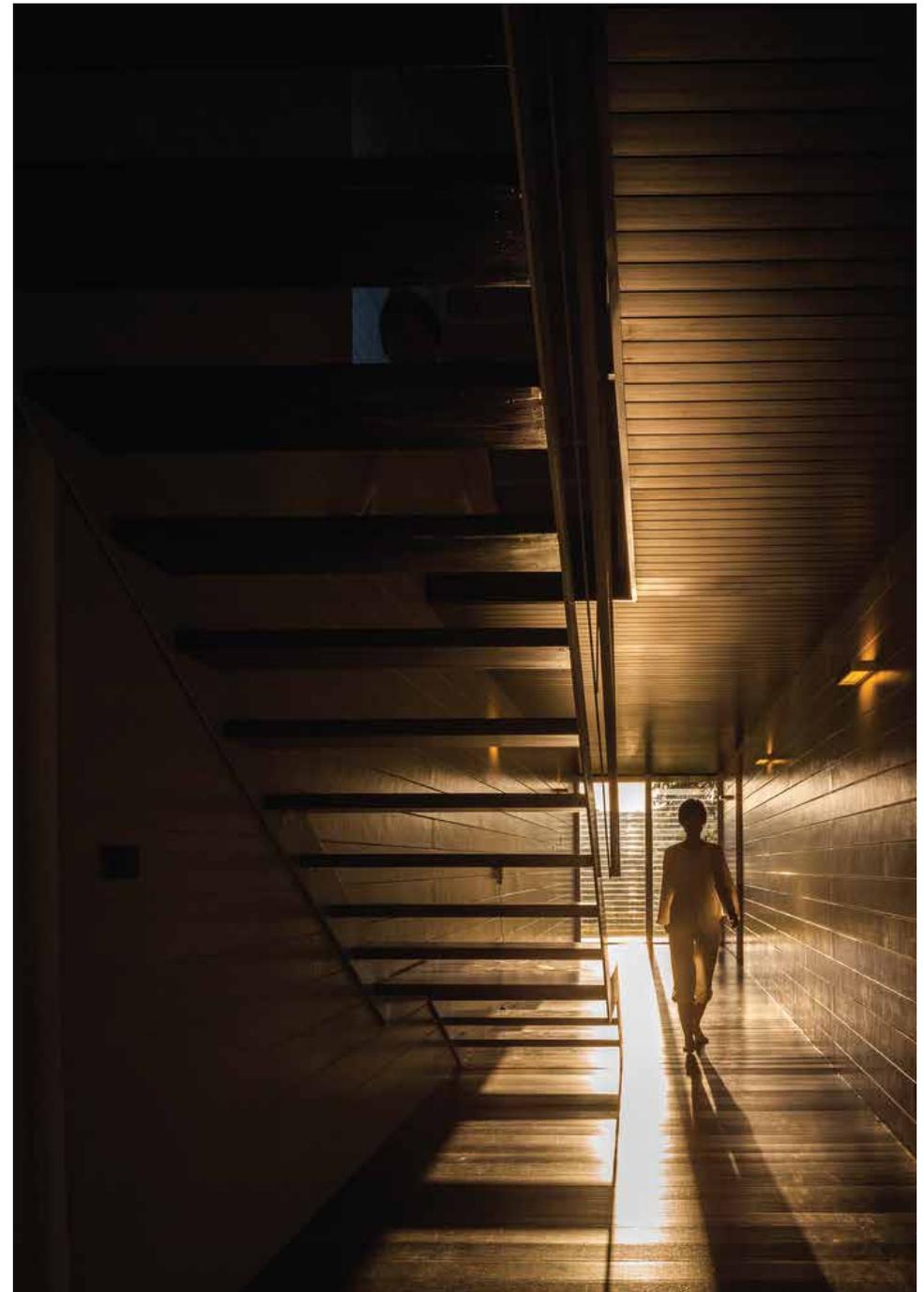


The “baan rai thaw si” house in Thailand takes inspiration from a local tree, which serves not only as a major architectural feature but also a central point of the architectural design. The local tree has also been positioned in a manner where it can receive adequate sunlight, which has been taken into account in the architectural style of the house. The architectural structure itself provides inspiration through its appearance of a mountainous landscape. Another architectural feature of this structure is the pond placed at its foot.



Architectural Highlights

- It contains a natural system for wastewater treatment and is self sufficient in its water supply.
- One specification was that there had to be an interchangeable common space where different events could be held for all ages.
- The reflecting pond in the building creates the effect of spaciousness and calmness.
- The tree that is present inside the courtyard serves as a great center piece this “baan rai thaw si” house works according to nature.





Zen Centre at Baogusi Buddhism Temple

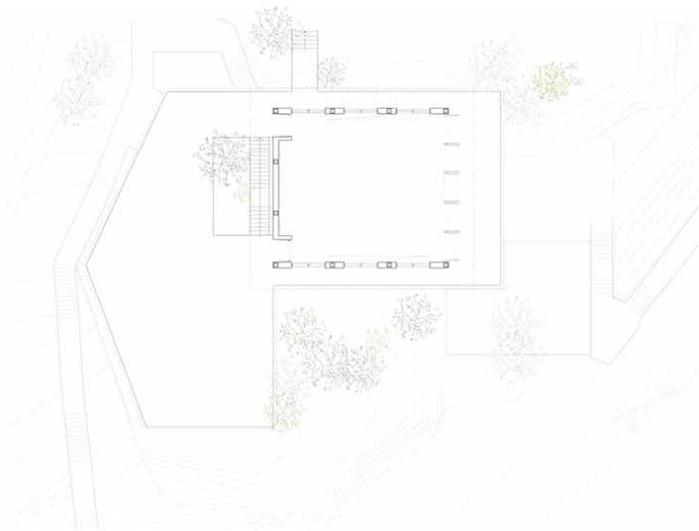
• **Architects:** Approach Architecture Studio

• **Lead Architects:** Jingyu Liang, Siyu Ye

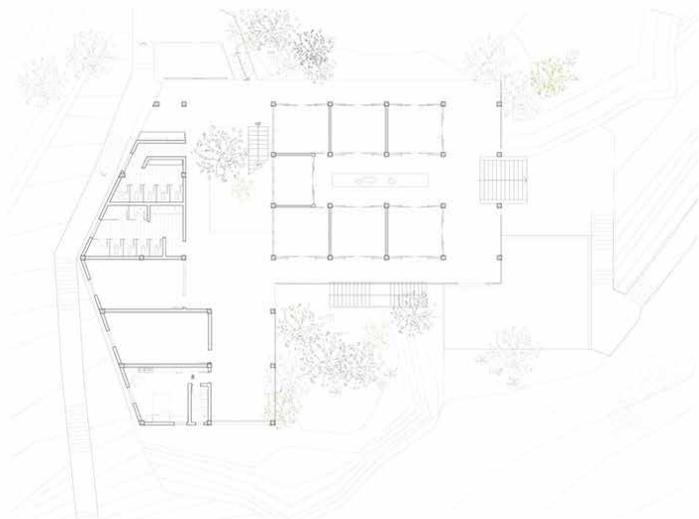
• **Area:** 552 m²

• **Year:** 2017

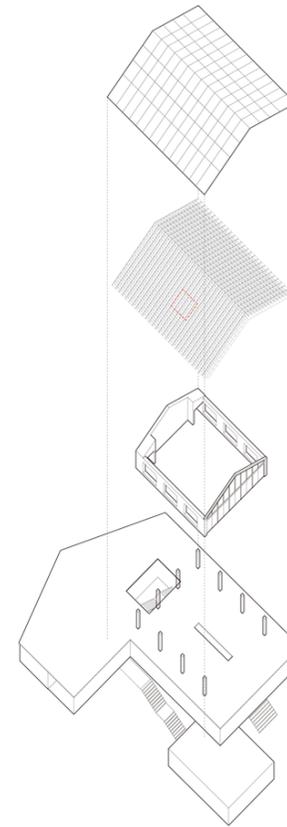
• **Location:** LEZHI, CHINA



second floor



ground floor



EXPLODED AXONOMETRIC

Zoning Pattern:

- **Holy and Quiet Zones:** The meditation rooms and monastic cells are placed deep inside to allow for seclusion and quiet.
- **Semi-public Transitional Spaces:** Courtyards, Dharma halls, and tea meditation rooms all fall within this category.
- **Public Access Zones:** Areas including the reception area, teaching halls, and exhibits are located close to the entry points.
- **Landscape Buffers and Pathways:** Gardens, groves, water features, and related paths can provide buffers and aid pedestrian flow.



Baiguosi Buddhist Temple is situated in the mountains within Sichuan Province, China, and has a history that dates back to the Sui Dynasty. The construction site is in an isolated area and within mountains, with the design of this complex intended to blend with trees in an effort to maintain the original relationship between the structures and trees. In this design, original features of the teahouse, such as the small garden and rock garden, have been incorporated. The design will accommodate an expanded capacity in terms of area covered.



Architectural Highlights

The architects have used a wooden truss system in constructing the glazed gable roof. The truss system uses small laminated rods made of bamboo. These rods can be assembled without any machines. These rods measure 2cm by 4cm in cross-section yet have a strength equal to steel and are able to sustain a span of over 12 meters. The rods are obtained from local sources.





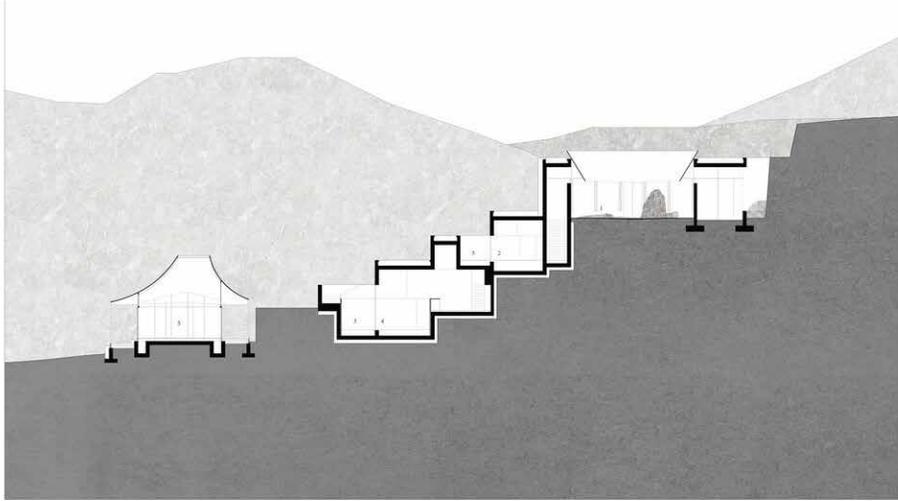
Upper Cloister in Aranya Golden Mountain

• **Architects:** Atelier Deshaus

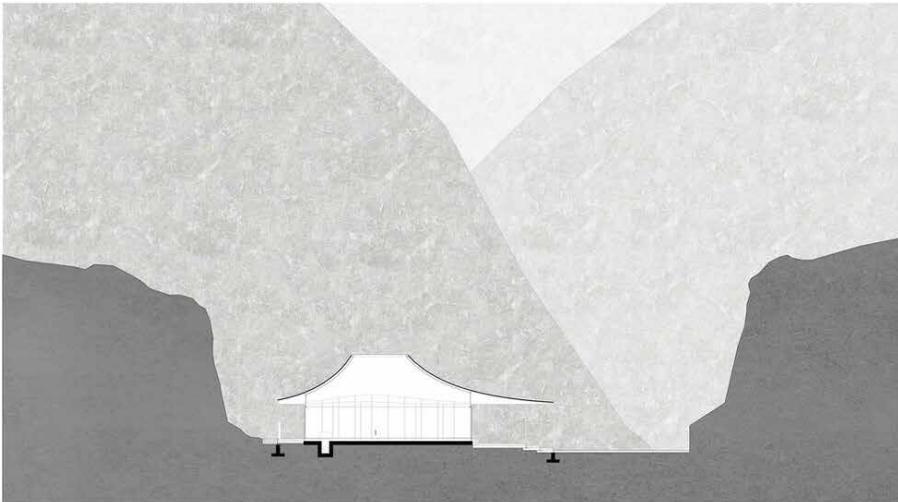
• **Area:** 615 m²

• **Year:** 2022

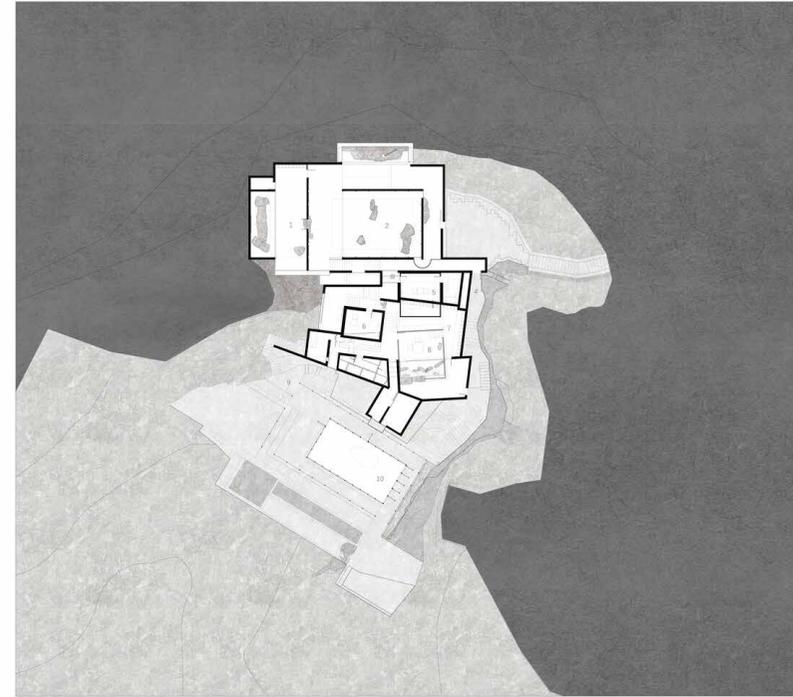
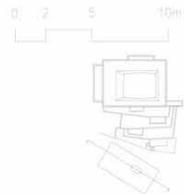
• **Location:** CHENGDE, CHINA



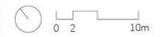
1. Courtyard
2. Meditation room I
3. Enclosed yard
4. Sutra transcribing room
5. Zen hall



1. Zen hall



- 1 Hall of Insight / Awareness
- 2 Infinite Mind
- 3 Stone Chamber
- 4 Stone Path
- 5 Meditation Room 1
- 6 Meditation Room 2
- 7 Reading Area
- 8 Writing Room
- 9 Aranya (Retreat)
- 10 Cloud Rising Hall



Zoning Pattern:

- **Private Meditation Rooms:** Unremarkable spaces used for private meditation, located in a natural environment.
- **Communal Pavilion:** This is a community center with an outdoor court, which helps to organize community activities.
- **Buffer Zones:** Pathways and vegetation that serve as transition zones between private and public realms.
- **Service Areas:** These are isolated regions that function independent of main activity zones.

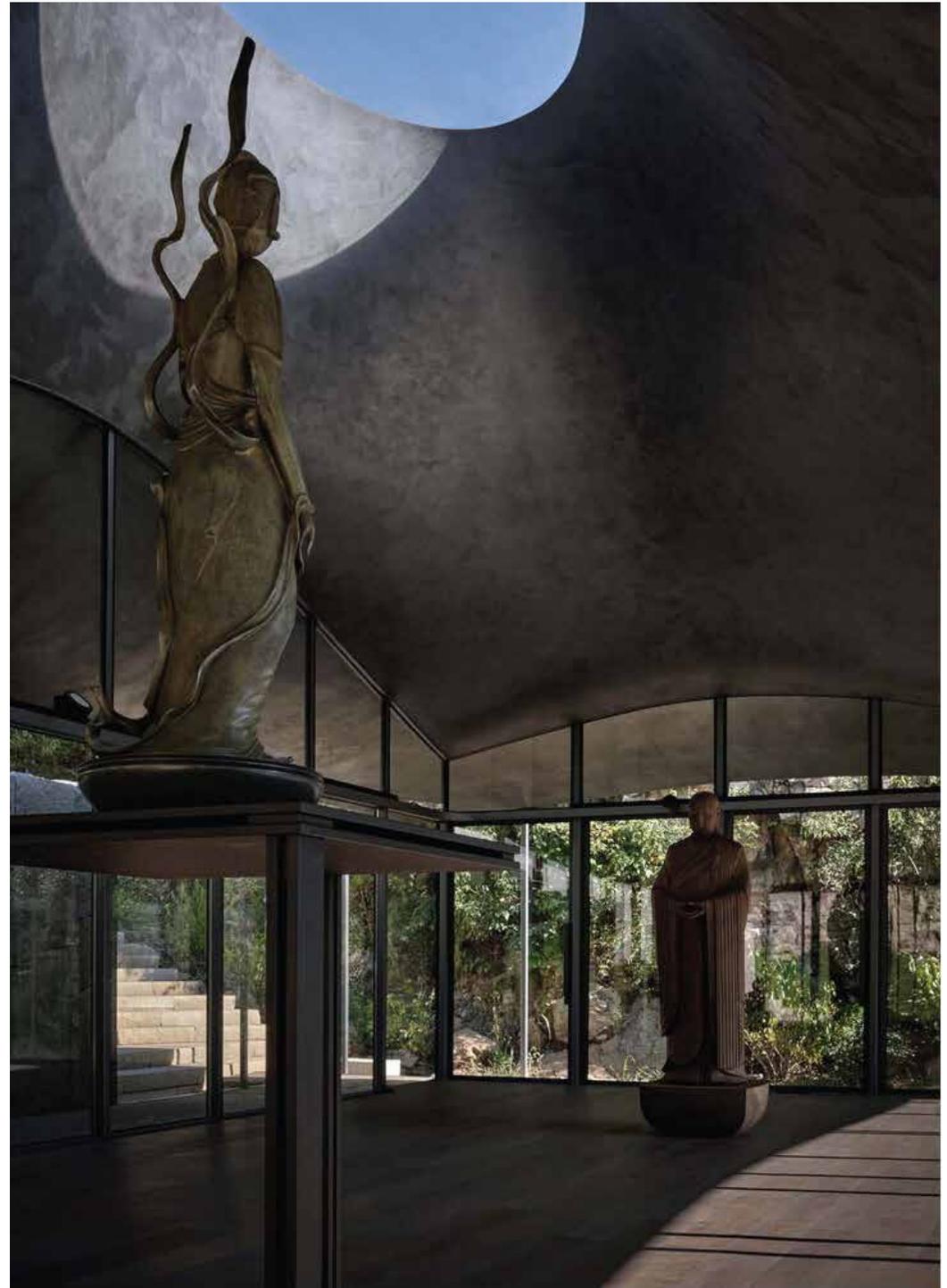


The Upper Cloister of Aranya, Golden Mountain is a spatial refuge of spirituality nestled inside the mountainous environment. The meditation hall of Aranya is a light architectural presence that interrupts the environment with a mere touch of their surroundings, thus enabling a relationship between the ancient Great Wall and this architectural creation over scales of time and space. The resulting series of spatial experiences from the entrance courtyard to meditation hall through upper cloister creates an internal experience of time.



Architectural Highlights

- This meditation hall, marked by its steel structure and carbon fiber roofing located in the foothills, symbolizes an iconographic expression of the Chinese character.
- The courtyard's flooring is of light-colored chiselled concrete.
- Having water reflecting the mountains and sky in the background of the area where people will meditate creates an ambiance of serenity.
- The meditation hall and the adjacent enclosed area, called Aranya, are exactly aligned with the spatial representation of the original meaning of "the quiet place in the world."
- There is a system of interconnected spaces that leads from the upper to the lower levels, including: the stone yard (Endless Meaning), the Buddhist hall (Omniscience Hall), the meditation room, the reading room, the writing room, and finally the meditation hall (Aranya).



Analysis 04

Survey Analysis

Purpose of the Survey

Objectives and Scope

Adaptive Reuse Potential

Transforming the Abbey of Santa Maria del Piano into a meditation center integrates sustainability, functionality, and heritage preservation through:

1. Environmental Sustainability

Biophilic Design: Courtyards, natural materials, and landscape views.

Passive Climate Strategies: Utilizing thermal mass, ventilation, and shading.
Renewable Energy: Solar panels, thermal systems, and rainwater harvesting.

Sustainable Materials: Lime-based mortars, reclaimed wood, and local stone.

2. Functional Adaptability

Flexible Layouts: Meditation and communal spaces within the historic structure.

Acoustic & Sensory Design: Soundproofing and natural soundscapes.

Accessibility: Ramps, pathways, and wayfinding for inclusivity.

3. Feasibility of Conversion

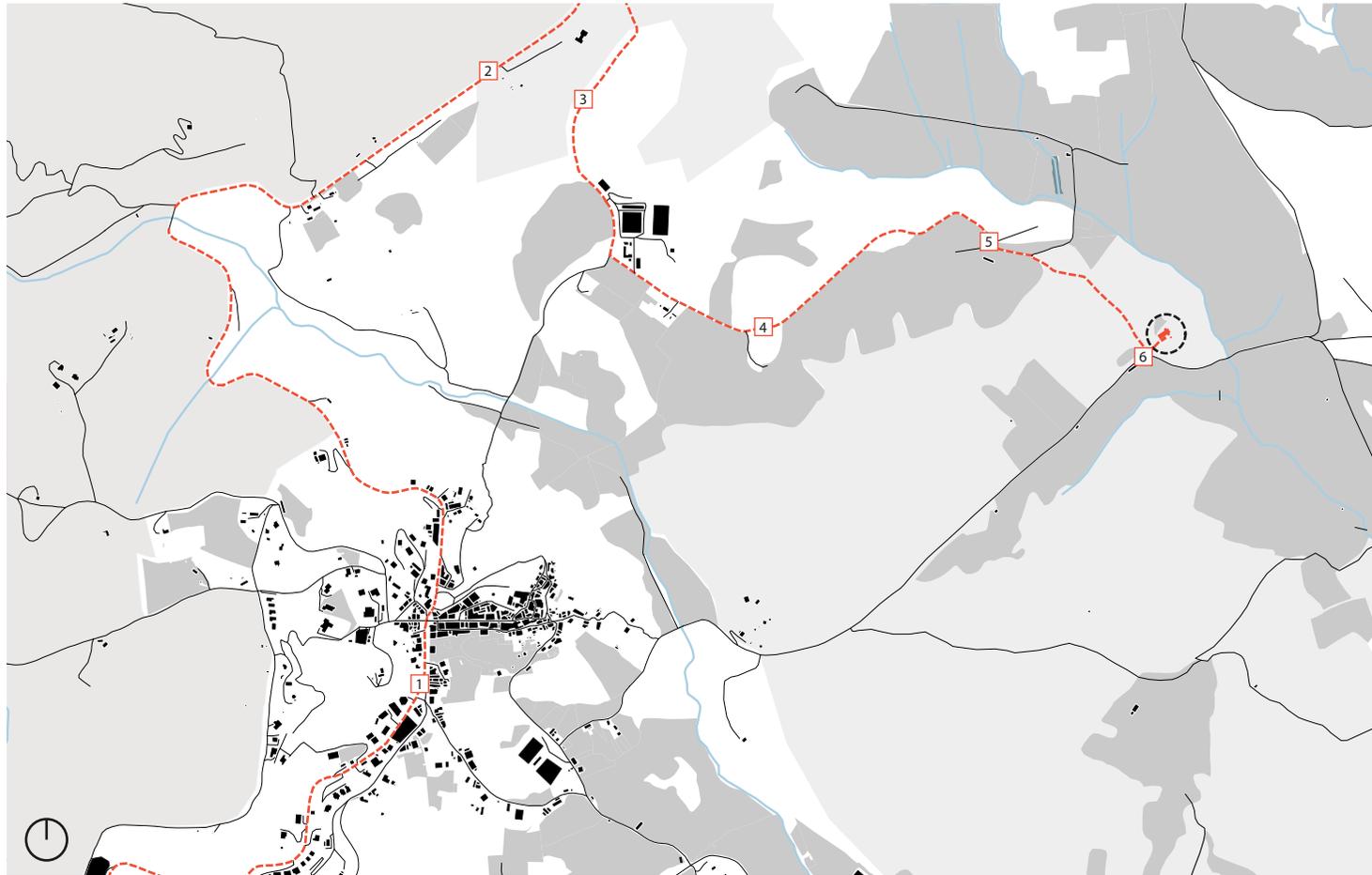
Structural Reinforcement: Ensuring safety and stability.

Regulatory Compliance: Aligning with heritage and zoning laws.

Economic Viability: Renovation costs, funding, and long-term management.

This strategy preserves history while creating a sustainable, functional retreat.

Reaching The Site



1



2



3



4



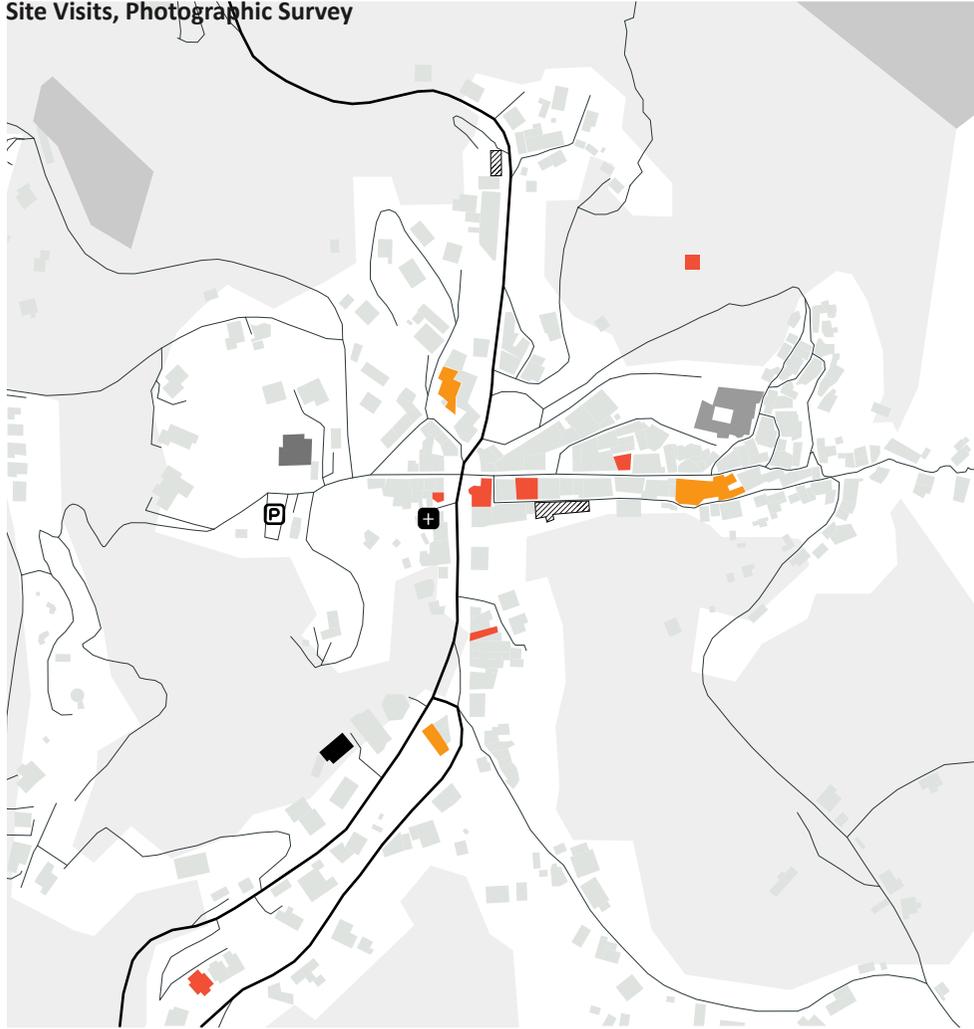
5



6



Site Visits, Photographic Survey



- Restaurant
- ▨ Hotel
- Residential
- Castello di Malvezzi
- Comune
- Carabinieri
- + Pharmacy
- P Parking
- Main Road
- Grass - Meadow
- Agriculture and Forest
- Church



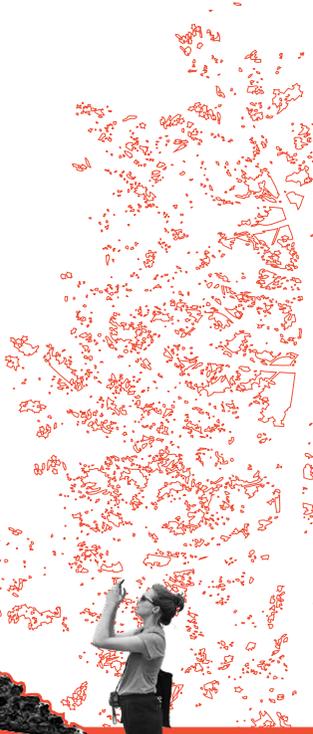
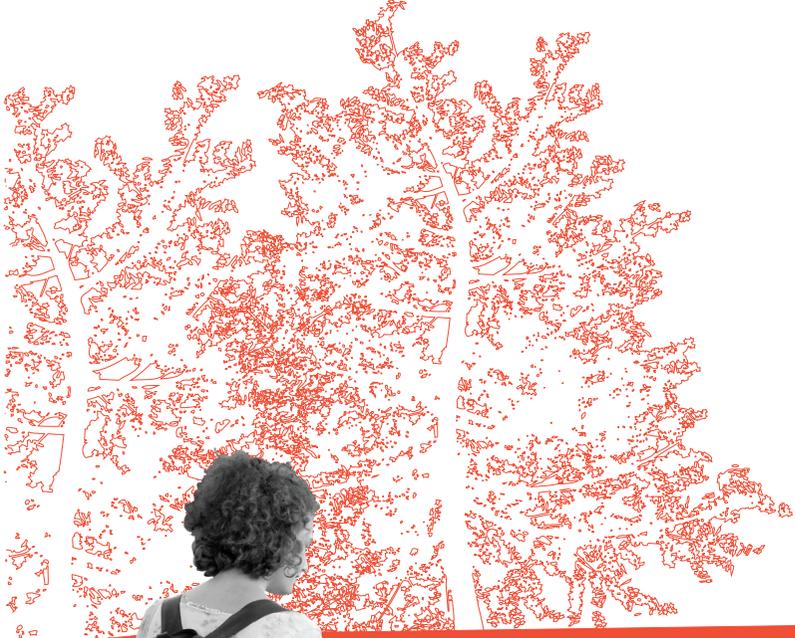
Site Visits, Photographic Survey



- Restaurant
- Hotel
- Residential
- Castello di Malvezzi
- Comune
- Carabinieri
- + Pharmacy
- P Parking
- Main Road
- Grass - Meadow
- Agriculture and Forest
- Church



For Whom?!



Site Visits, General Layout

Relationship with the Natural Environment

The Abbey of Santa Maria del Piano maintains a deep connection with both its natural surroundings and nearby settlements.

Natural Environment

Landscape Integration: The abbey is surrounded by lush greenery, creating a serene and secluded atmosphere that enhances its historical and spiritual essence.

Ruins and Nature: Over time, vegetation has intertwined with the architecture, forming a unique balance between the built and natural environment.

Urban Context

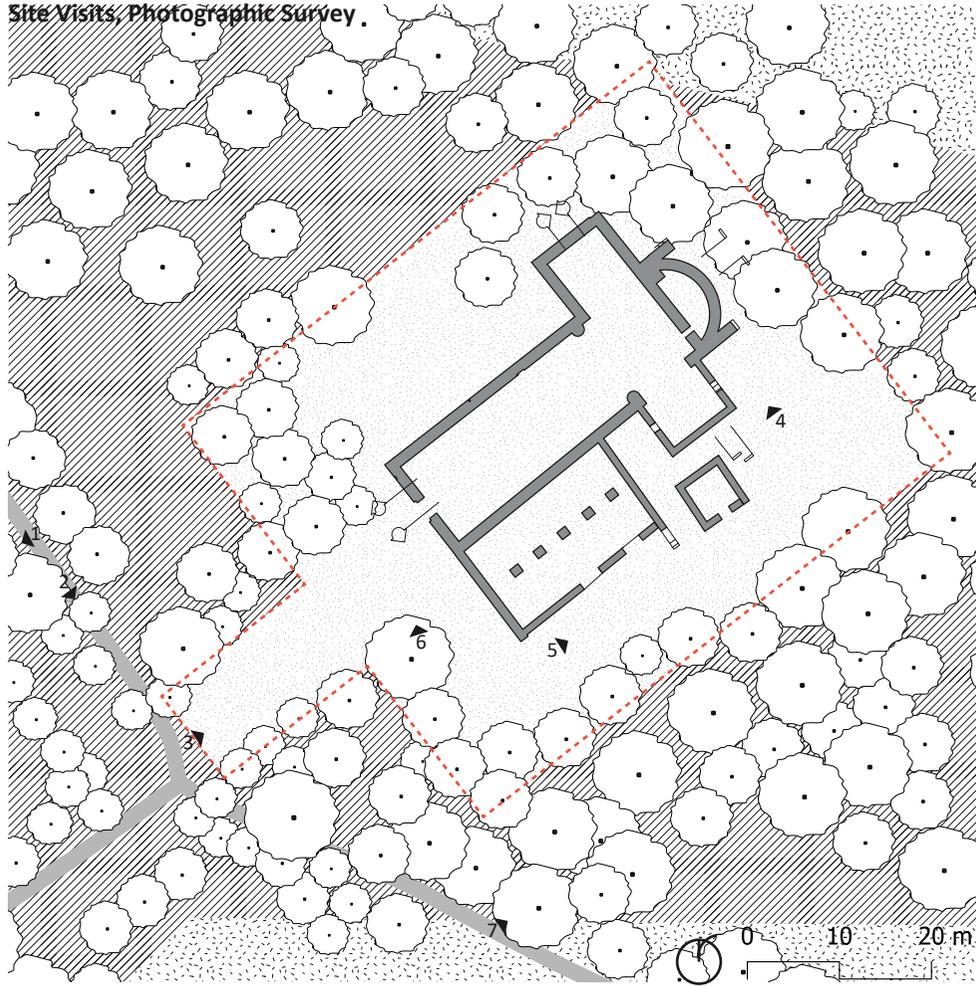
Proximity to Orvinio: Historically linked to the village, the abbey once served as a spiritual and cultural hub for the local community.

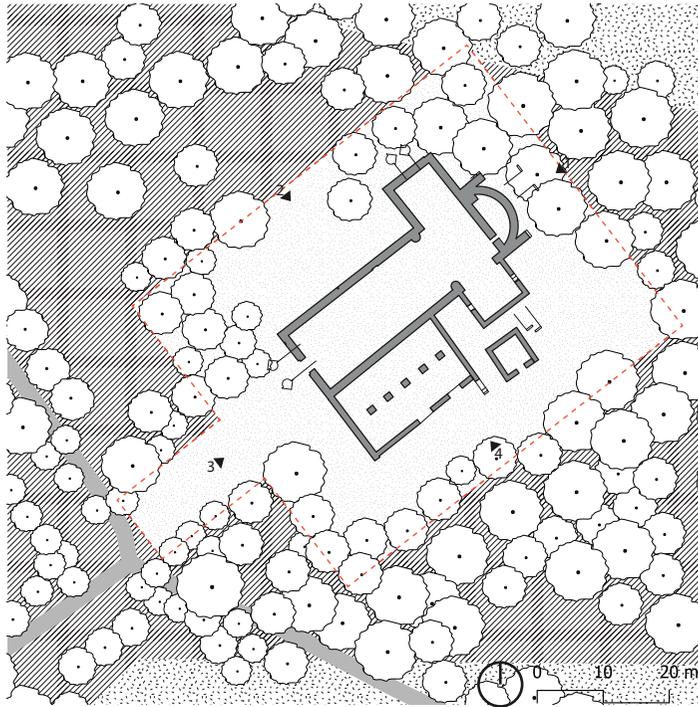
Connectivity: Situated along ancient pathways, it played a role in regional movement and monastic networks.

Preserving this delicate balance between nature and history is essential for any adaptive reuse strategy, ensuring the abbey remains both accessible and sustainable.



Site Visits, Photographic Survey





- North-East Façade 1
- North-West Façade 2
- South-West Façade 3
- South-East Façade 4



Site Visits, Photographic Survey

Façade Composition

The façade of the Abbey of Santa Maria del Piano reflects the principles of Romanesque architecture, characterized by geometric balance, proportion, and historical layering of materials. Though now in ruins, the remaining elements offer valuable insights into its original design and stylistic influences.

Symmetry & Proportions

The façade follows a symmetrical composition, with a centrally positioned main entrance as the focal point.

Proportions adhere to Romanesque principles, emphasizing solid, vertical masses and rhythmic spacing of structural components.

The 20-meter-high bell tower, dating to the 11th century, serves as a vertical counterbalance to the horizontal façade.

Stylistic Elements

Reused Roman Elements (Spolia): The façade integrates Roman inscriptions, triglyphs, and sculptural fragments, likely repurposed from a nearby ancient site.

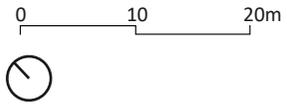
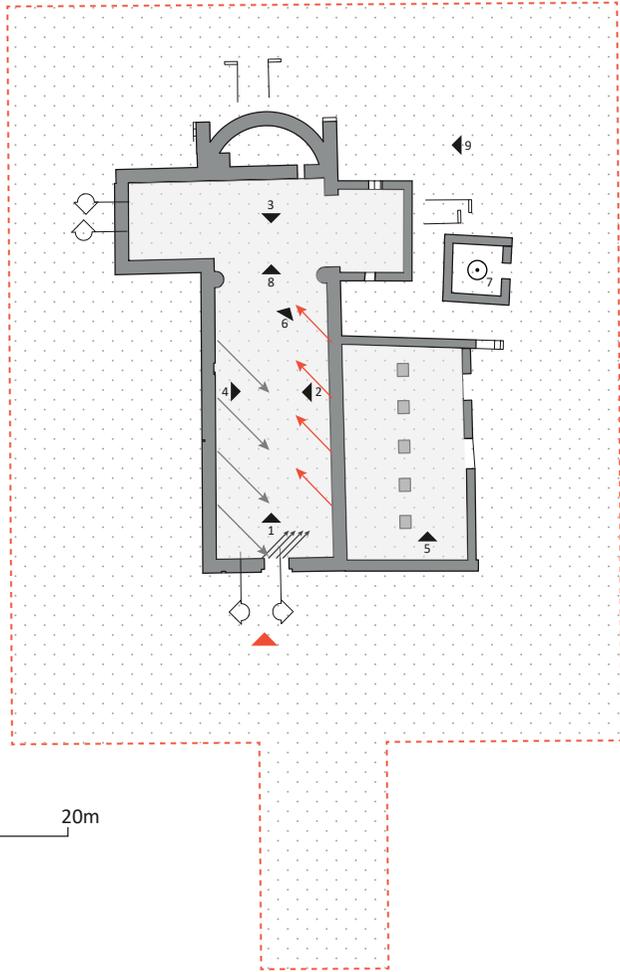
Historical Inscriptions: An epigraph above the entrance commemorates a major restoration in 1219, led by Presbyter Bartholomew.

Masonry & Decorative Details: The use of local stone, semi-circular archways, and carved capitals align with Romanesque craftsmanship, though many sculptural elements have been lost over time.

Despite its ruinous condition, the abbey's façade remains a testament to medieval architectural ingenuity, blending local craftsmanship with classical

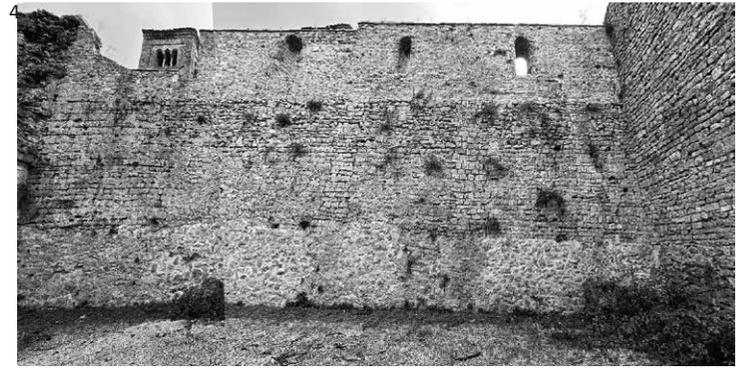


Site Visits, Photographic Survey
Inside of the Building



Flooring
 □ Earthen Ground
 □ Gravel Ground

Natural Light Rays
 ← South-East Windows (Morning)
 ← North-West Windows (Evening)
 ← South-West Facade Window (Afternoon)



Site Visits, Photographic Survey

Main Entrance and Decorative Features

The Abbey of Santa Maria del Piano, despite its ruined state, retains traces of its architectural and artistic heritage, particularly in its main entrance, columns, and decorative elements.

Main Entrance & Portals

The facade, though weathered, still reflects the Romanesque architectural style, with evidence of a central entrance leading into the nave.

An inscription above the entrance states that Presbyter Bartholomew restored the church in 1219, marking an important historical intervention. Elements of Roman spolia (reused Roman architectural fragments) are integrated into the facade, including triglyphs and decorative stone carvings.

Columns & Capitals

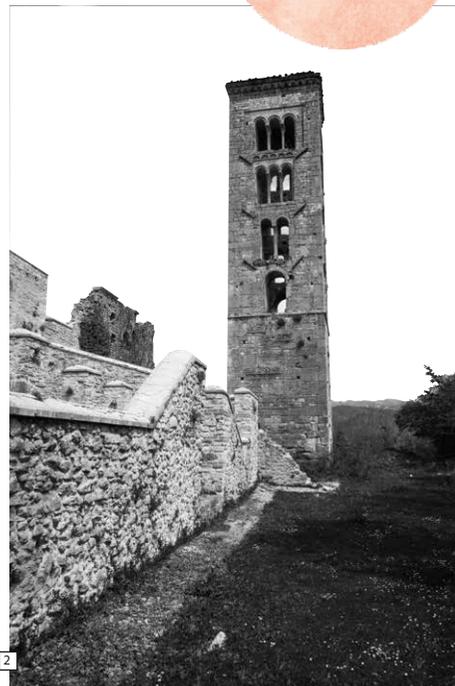
Corinthian capitals and column bases remain scattered across the site, indicating that the abbey once featured intricately carved supports, possibly from an earlier structure.

Some of these elements may have been repurposed from ancient Roman buildings, highlighting the reuse of classical materials.

Sculptures & Ornamentation

Much of the abbey's sculptural decoration has been lost due to looting and deterioration, but fragments of bas-reliefs and carved stone details suggest that the site once had richly adorned surfaces.

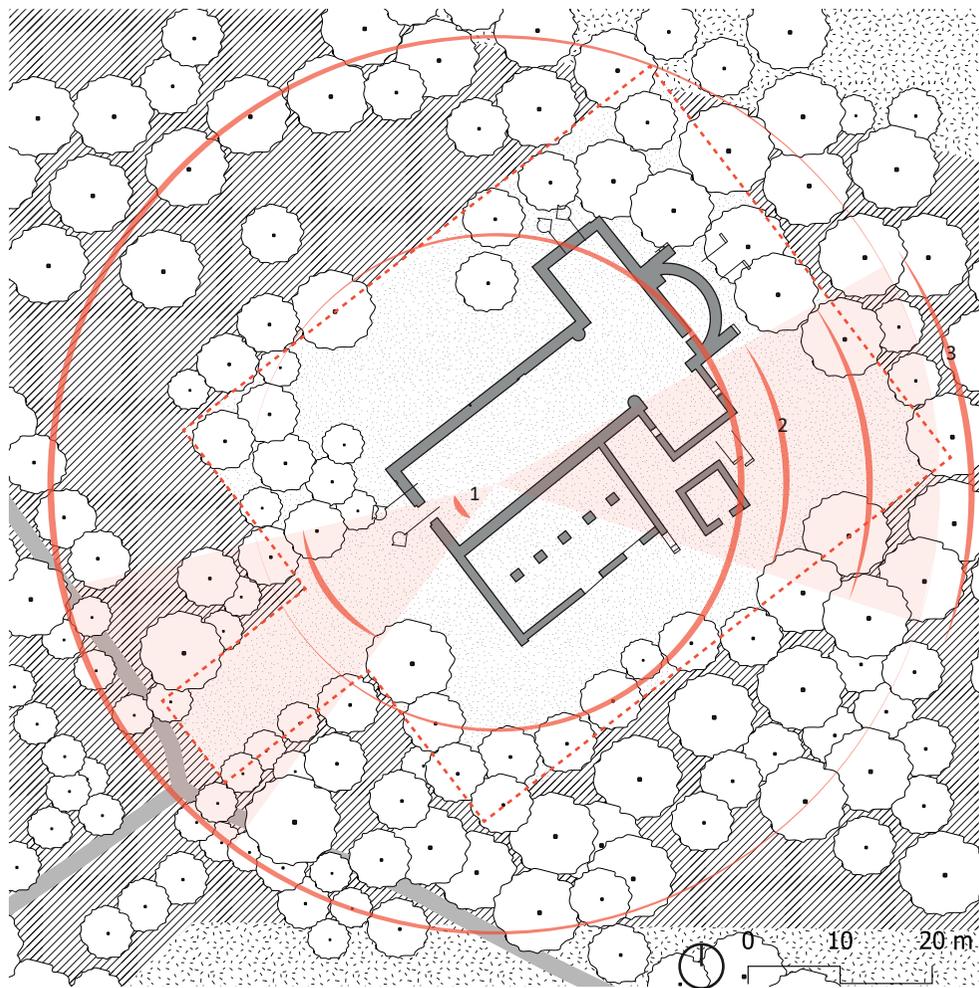
The bell tower (20m tall, dating back to the 11th century), though structurally compromised, remains the most prominent surviving architectural feature.



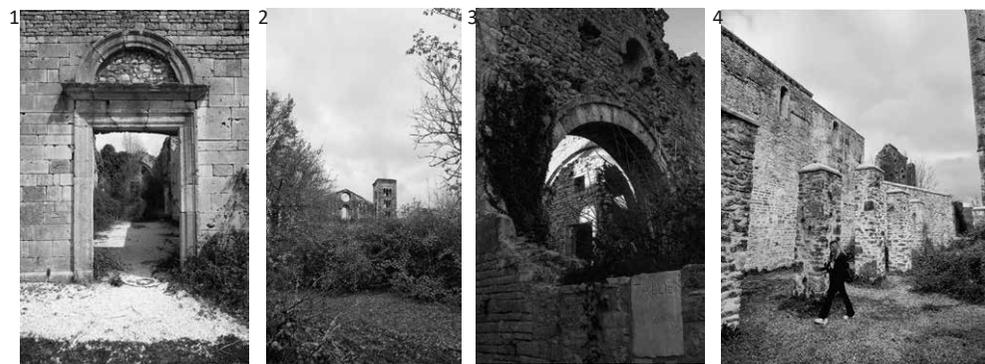
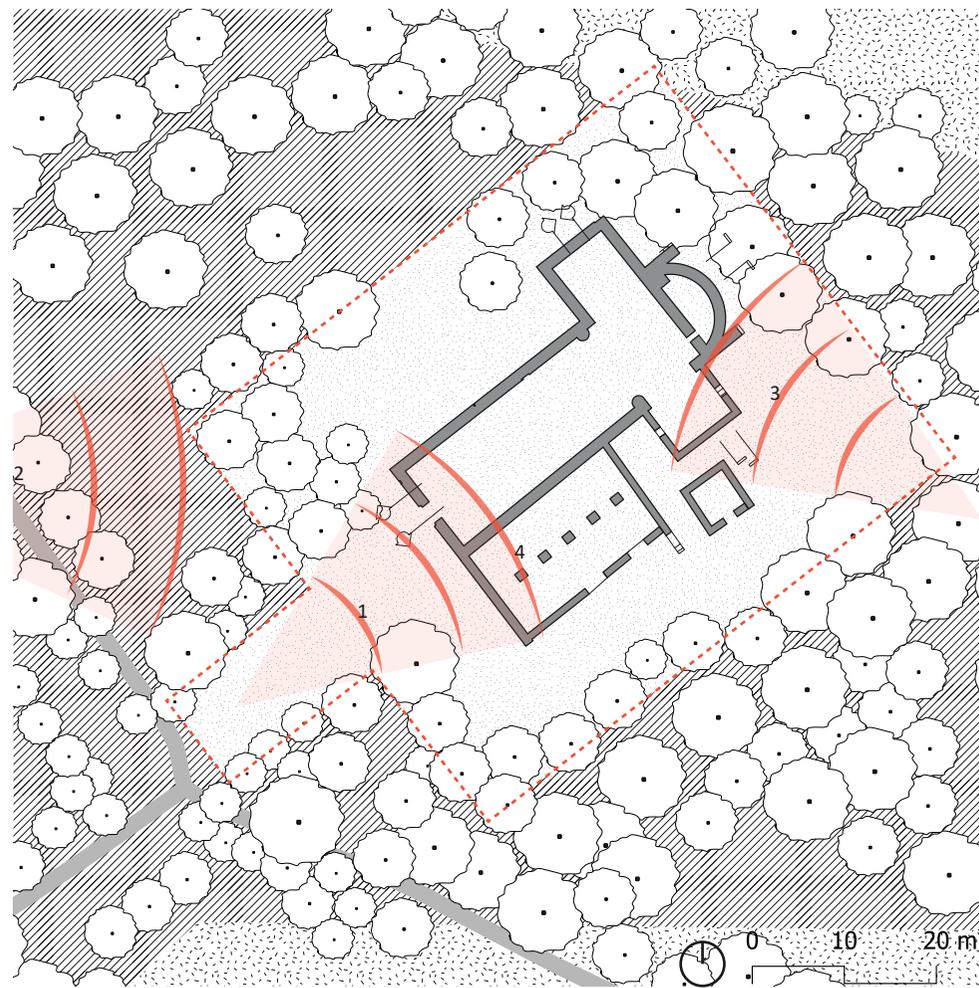
- 1 Main Entrance
- 2 Bell Tower
- 3 Pillar and Arch
- 4 Decorative Elements



Site Visits, Photographic Survey
In to Out View



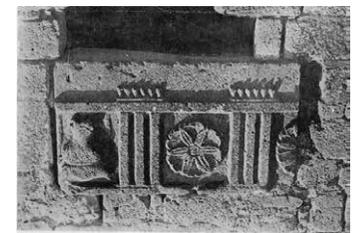
Site Visits, Photographic Survey
Out to In View





Site Visits, Photographic Survey Art Works

The Abbey of Santa Maria del Piano preserves fine examples of medieval artistry through its capitals, motifs, and decorative arches. The stone capitals feature stylized vegetal and symbolic figures, blending Romanesque geometry with spiritual meaning. Carved motifs, floral, geometric, and occasionally zoomorphic, express harmony between nature and faith. The decorative arches, with moulded profiles and sculpted impostes, frame sacred spaces and emphasize the rhythm of light and shadow. Together, these elements reflect the abbey's fusion of spiritual devotion and refined craftsmanship, turning its architecture into a lasting symbol of medieval art and faith.



Site Visits, Current State of Preservation Physical Stability and Areas of Concern

The Abbey of Santa Maria del Piano, a historic 9th-century structure, stands today in a state of significant deterioration, with structural vulnerabilities and material decay threatening its long-term survival.

Physical Stability

The facade and 11th-century bell tower (20m high) are among the few surviving elements, though they show signs of structural weakening.

Large portions of the roof and supporting walls have collapsed, leaving the interior exposed to the elements.

Key Areas of Concern

Material Degradation: Prolonged exposure to weathering and moisture has eroded the stone masonry and carved details.

Vegetation Overgrowth: Invasive plant growth is accelerating structural decay, with roots penetrating cracks and destabilizing walls.

Looting & Vandalism: The abbey has suffered theft of decorative elements, including the loss of its Cosmatesque rose window and sculptural details.



- 1 Theft and Vandalism
- 2 Mechanical Degradation
- 3 Weathering Erosion
- 4 Vegetation Growth
- 5 Exposure of interior
- 6 Material Loss
- 7 Weathering Erosion

Site Visits, Current Condition and Missing Elements

Several original components of the Abbey of Santa Maria del Piano have been lost over time. The cloister, monastic wings, and roof structure have mostly disappeared, leaving only the main nave, transept, and apse intact. The façade's rose window, once a key source of light and symbolic ornament, is now partially damaged, yet it still reveals traces of the abbey's refined Romanesque craftsmanship and spiritual geometry.



Site Visits, Condition Assessment

Past Restoration Efforts

The Abbey of Santa Maria del Piano has undergone multiple restoration efforts aimed at preserving its architectural integrity, though it has continued to face structural deterioration and neglect.

1. Medieval Restoration (1219)

The earliest documented restoration occurred in 1219, led by Presbyter Bartholomew, as noted by an inscription on the façade. This effort likely aimed to repair damage from natural aging or external attacks, emphasizing the abbey's cultural and religious importance.

2. 20th-Century Restoration (1953-1957)

By the early 1900s, the abbey had fallen into severe disrepair, with collapsed roofs, deteriorated walls, and invasive vegetation. In 1952, the Italian government acquired the site, leading to a major restoration supervised by the Lazio Monuments Authority from 1953 to 1957, which focused on:

Structural Reinforcement: Stabilizing walls and the bell tower.

Preservation of Romanesque Elements: Conserving stonework and medieval inscriptions.

Site Cleaning and Protection: Removing invasive vegetation and cataloging fallen masonry.

Despite these efforts, the abbey was not fully restored for functional use, leading to continued neglect and decay.

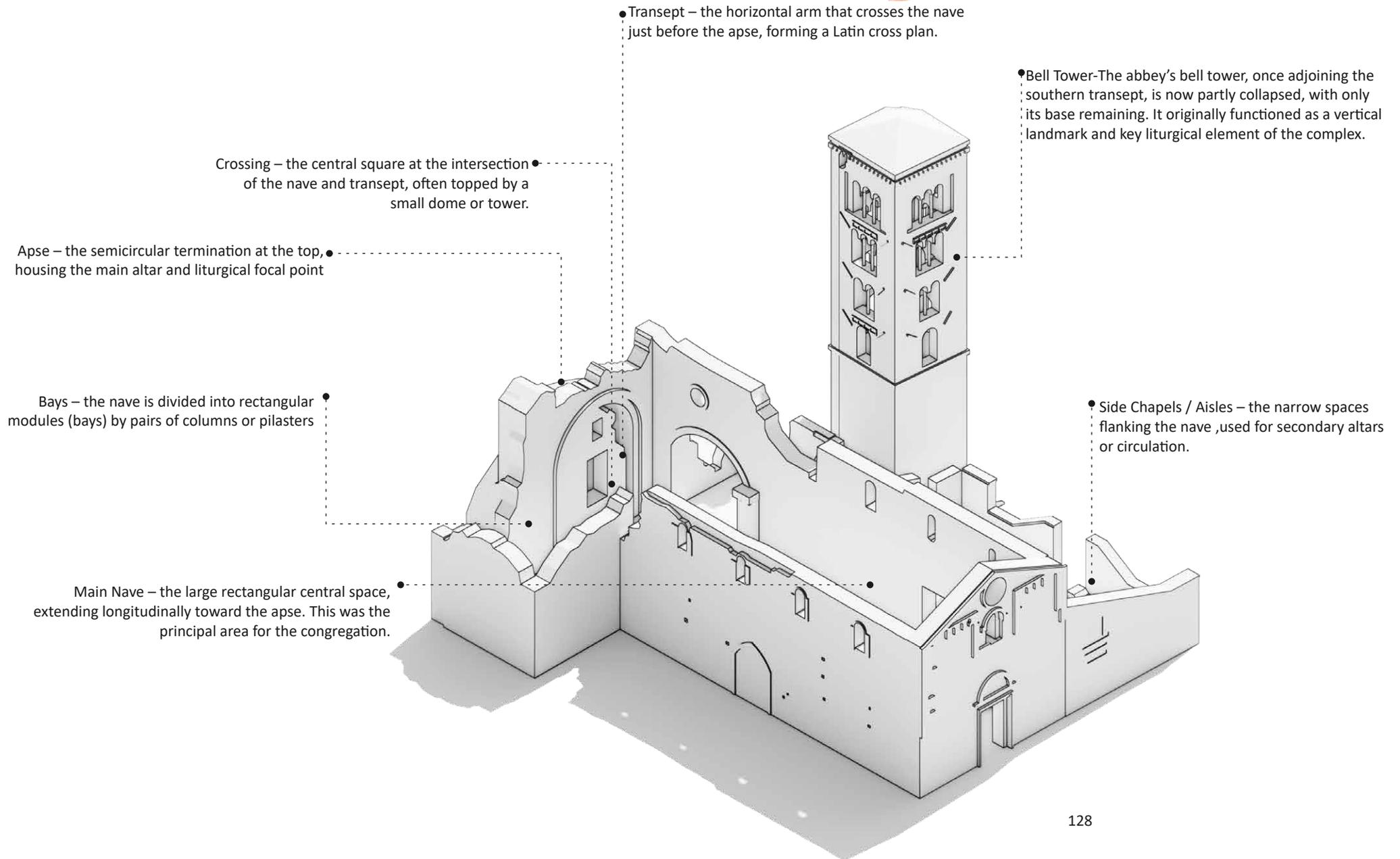
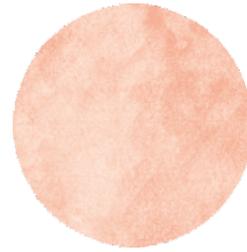
3. Contemporary Preservation and Future Plans (2024 - Present)

Today, the abbey remains in ruins, but recent initiatives aim to revitalize and adaptively reuse it.



1 Before Restoration

2 After Restoration





Current State of Preservation

Decay Analysis

During years, the Abbey of Santa Maria del Piano has experienced decay in many types. First of all some brick materials have been replaced the missing stone materials during the restorations. Secondly, one can witness deep erosions on the stones of the facade. Moreover, at the bottom of the bell tower Saline Efflorescence has been appeared, which is White substance that comes out on the surface of the masonry and can cause detachment of superficial parts. Besides, during the restorations, the material of plaster has been added to some parts of the facade. During the time, due to the growth of the vegetation and mixing with the building we can have biological degradation.

The roof of the complex has been completely lost but based on what is left, it has been assumed that the roof must have been a tile roof.



Degradation

-  Weathering of Stone
-  Adding Plaster
-  Deep Erosion
-  Saline Efflorescence
-  Brick Replacement
-  Biological Degradation
-  Missing Tile Roof

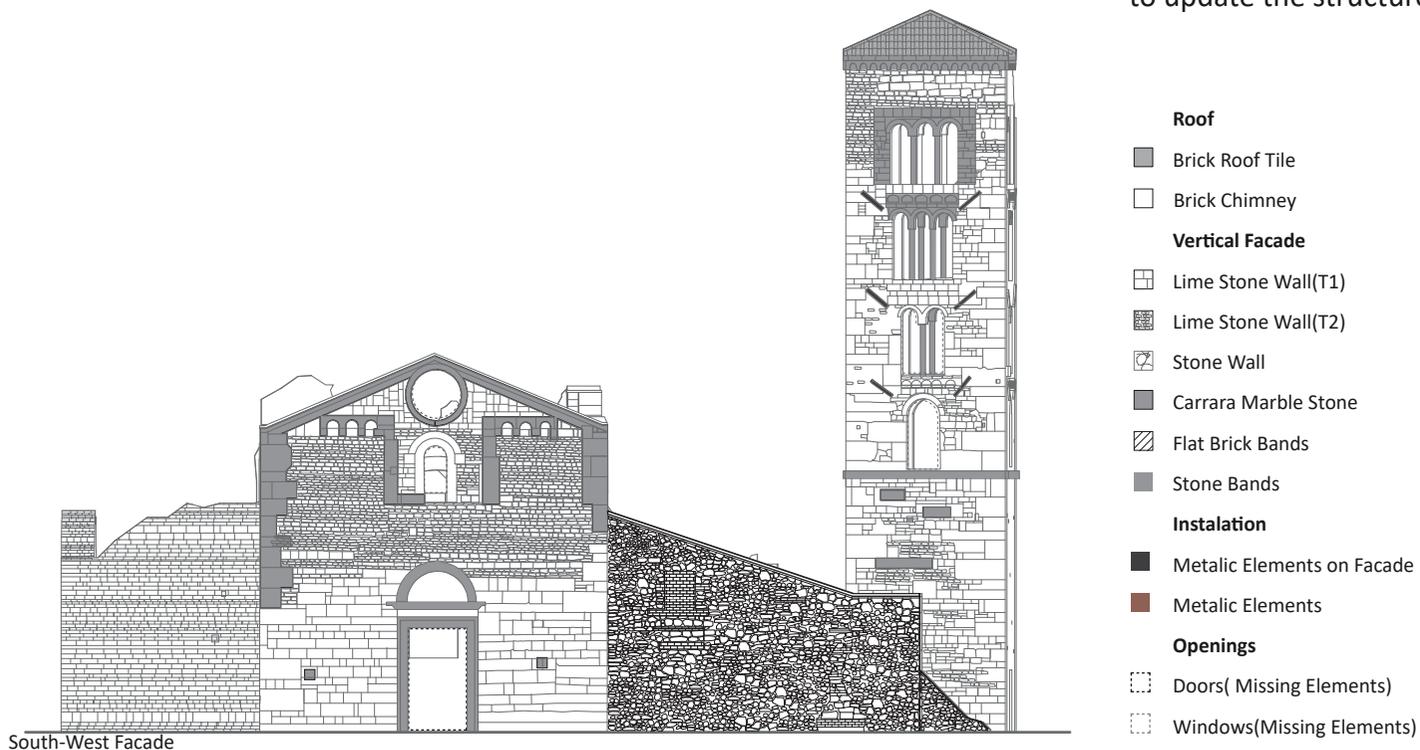
Current State of Preservation Construction Elements

The abbey's construction highlights the use of local limestone for the main structure, with Carrara marble added in later restorations for decorative elements, especially on the façade and capitals.

The façade, altered in 1229, includes rough-hewn stones and a 15th-century door replacing the Romanesque original. Wooden beams support the nave's roof, while stone ribbed vaults cover the transept, likely topped with terracotta tiles or slate.

Interior features include stone columns with intricately carved capitals, stone slab flooring, and narrow pre-Lombard-style windows framed in stone or marble.

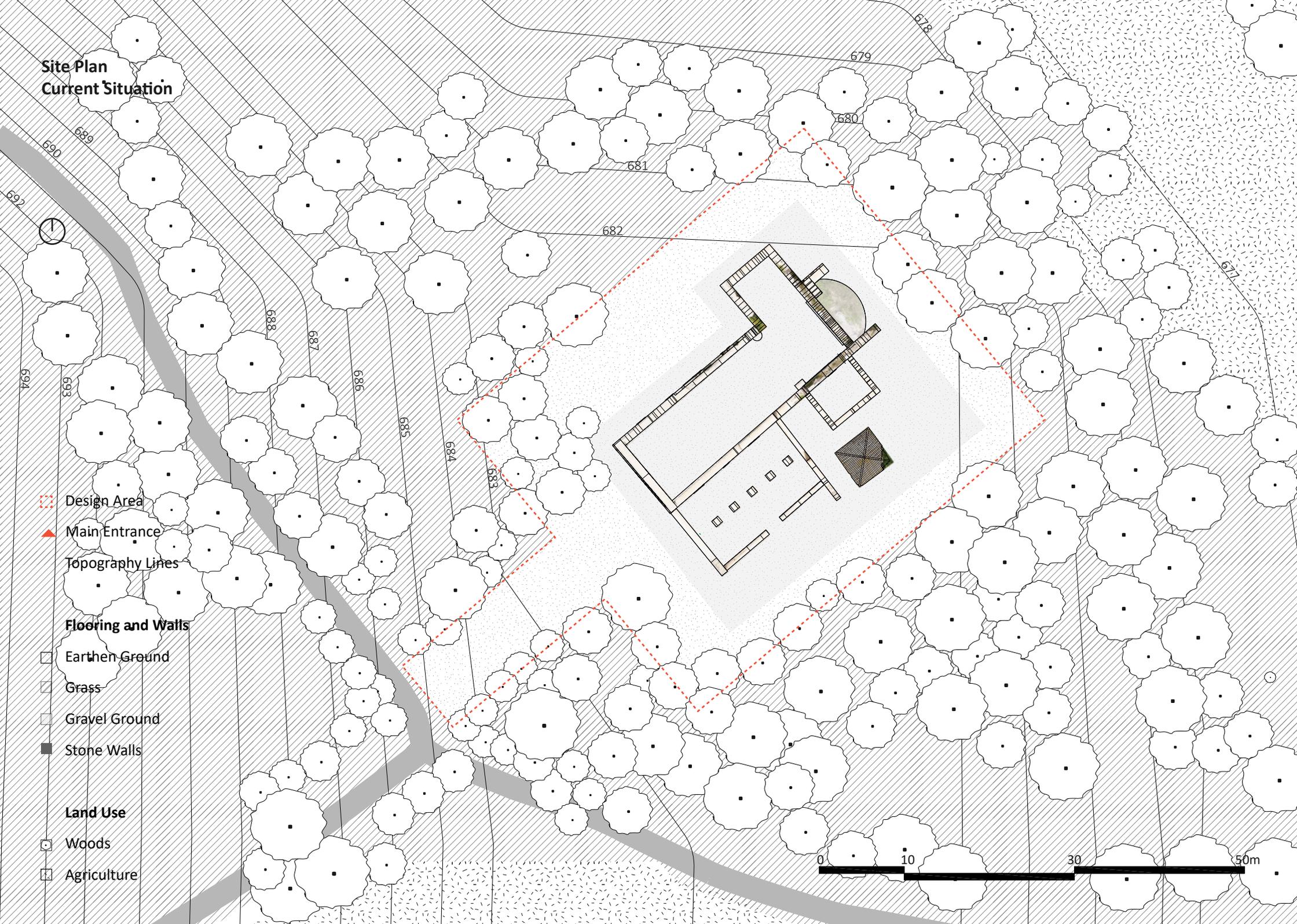
The monastic buildings incorporate stone arches and wooden beams for upper-level support. Renovations employed a mix of stone, mortar, and marble to update the structure and decorations.



South-West Facade

- Roof**
- Brick Roof Tile
- Brick Chimney
- Vertical Facade**
- ▣ Lime Stone Wall(T1)
- ▤ Lime Stone Wall(T2)
- ▥ Stone Wall
- Carrara Marble Stone
- ▨ Flat Brick Bands
- Stone Bands
- Instalation**
- Metallic Elements on Facade
- Metallic Elements
- Openings**
- ⋯ Doors(Missing Elements)
- ⋯ Windows(Missing Elements)

Site Plan Current Situation



Design Area

Main Entrance

Topography Lines

Flooring and Walls

Earthen Ground

Grass

Gravel Ground

Stone Walls

Land Use

Woods

Agriculture

0 10 30 50m

Ground Floor Plan Current Situation

□ Design Area

▲ Main Entrance

Spaces

1 Main Nave

2 Bays

3 Apse

4 Crossing

5 Transept

6 Side Chapels

7 Bell Tower

Flooring and Walls

□ Earthen Ground

▨ Grass

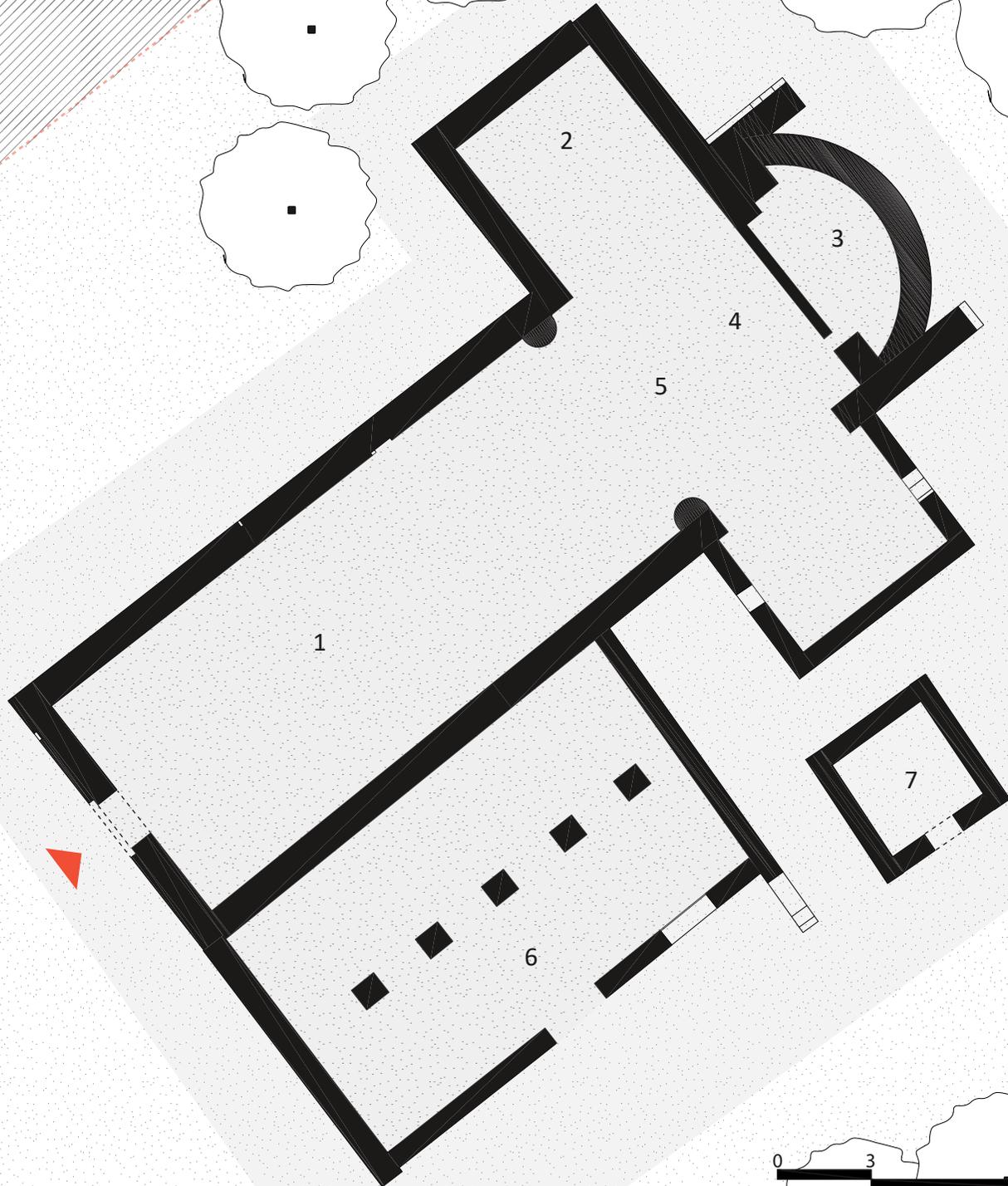
■ Gravel Ground

■ Stone Walls

Land Use

■ Woods

■ Agriculture

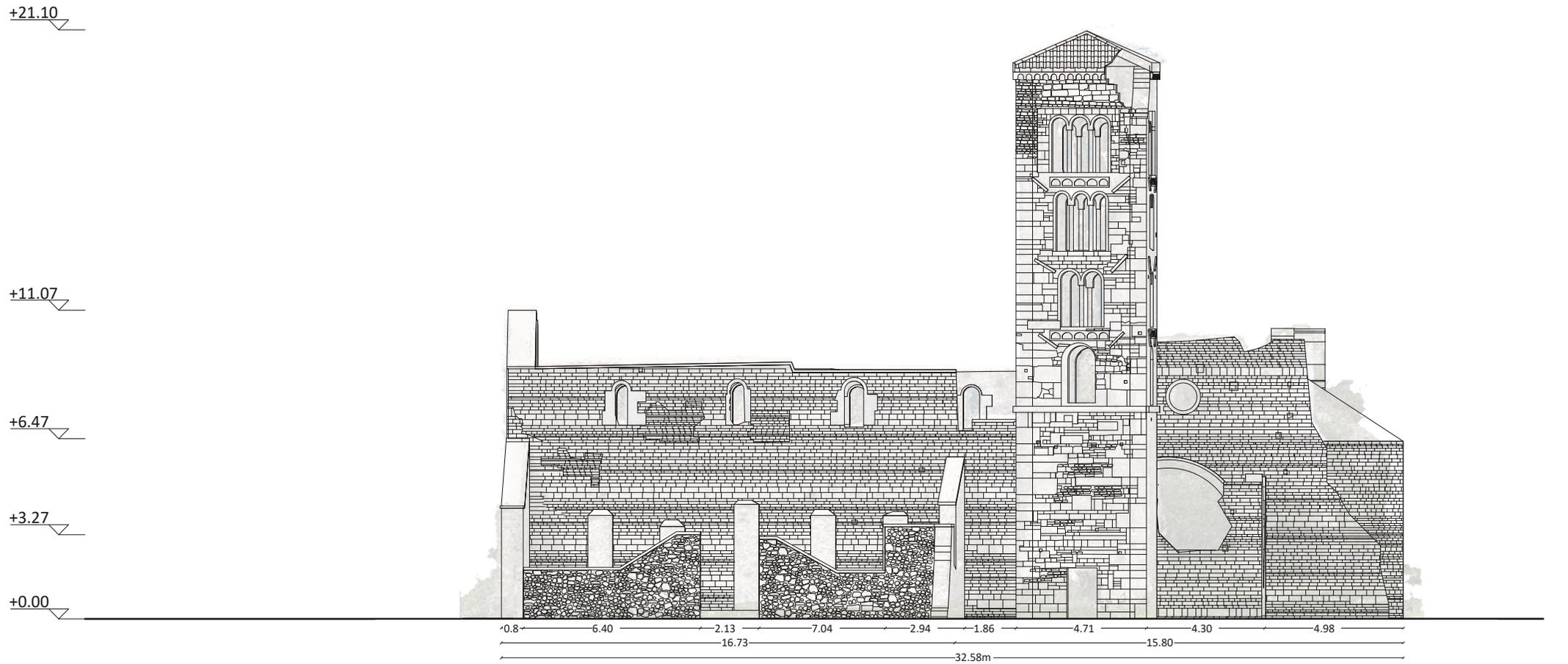


0 3 9 15m

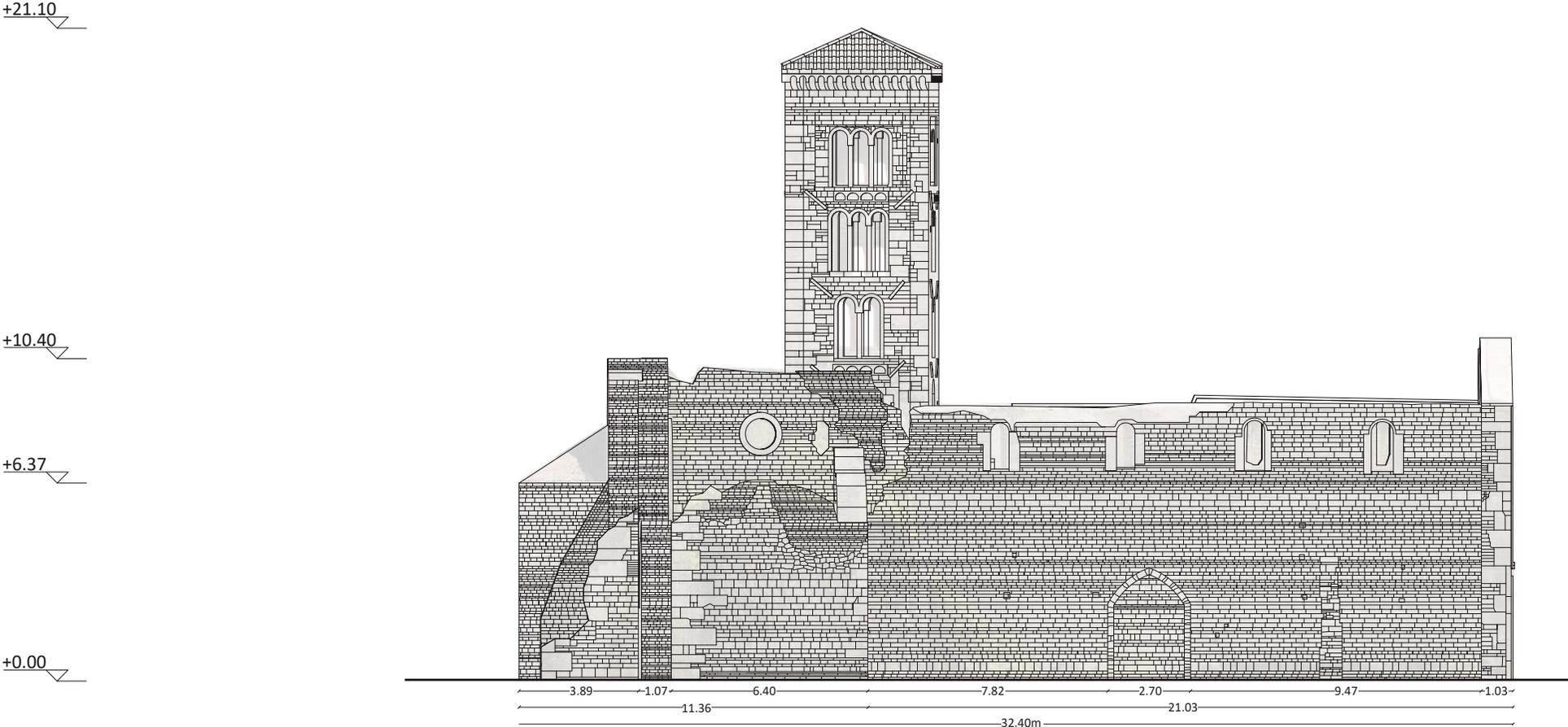
SW Elevation
Current Situation



SE Elevation
Current Situation



NW Elevation
Current Situation



1/100

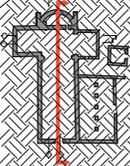
Section A-A
Current Situation

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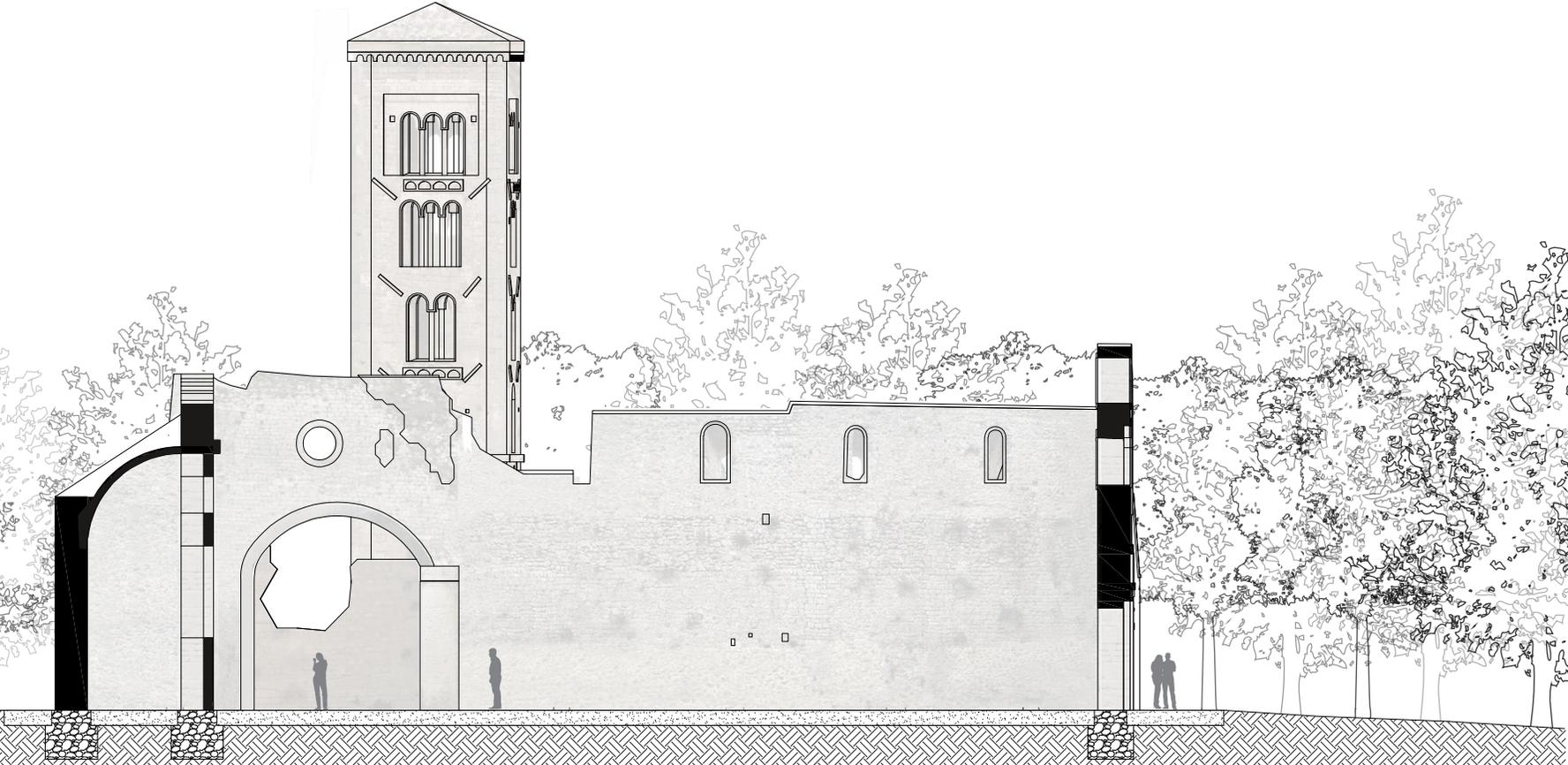
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+6.37

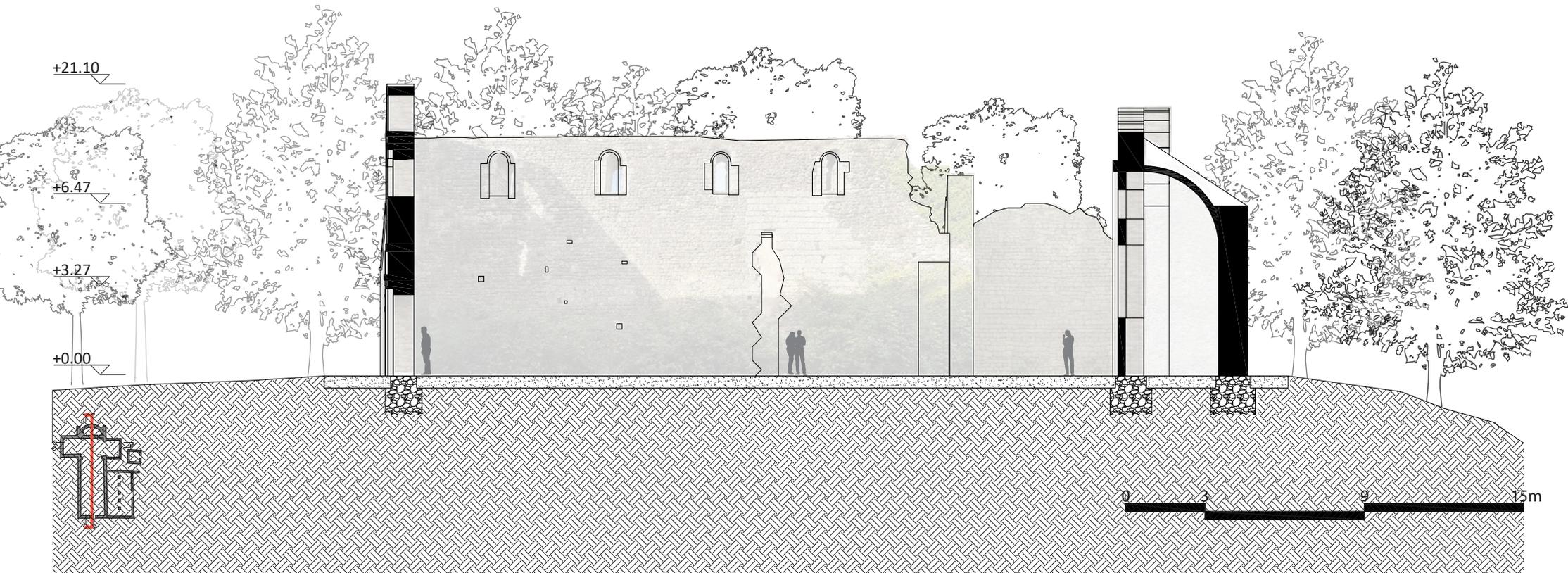
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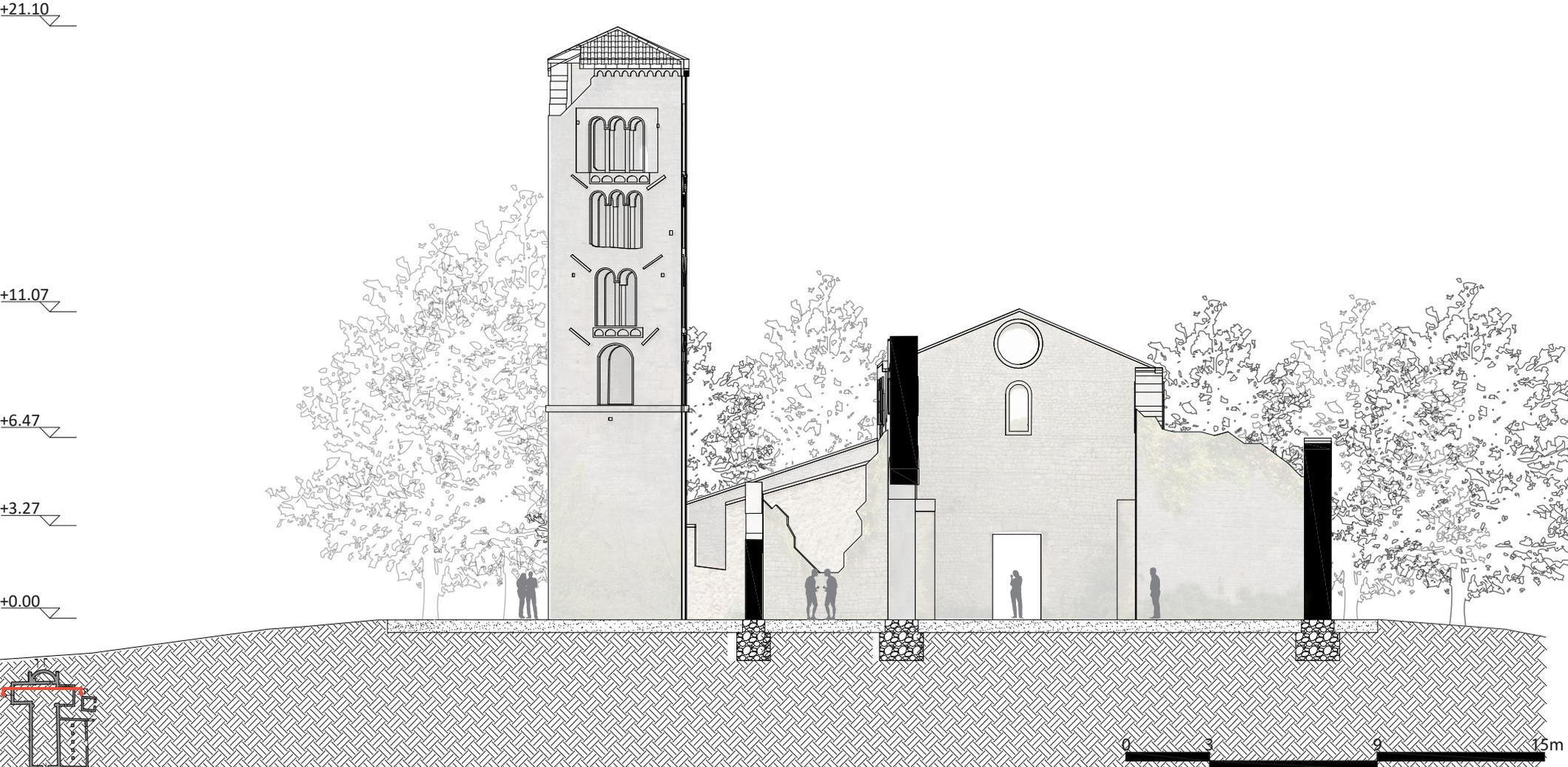
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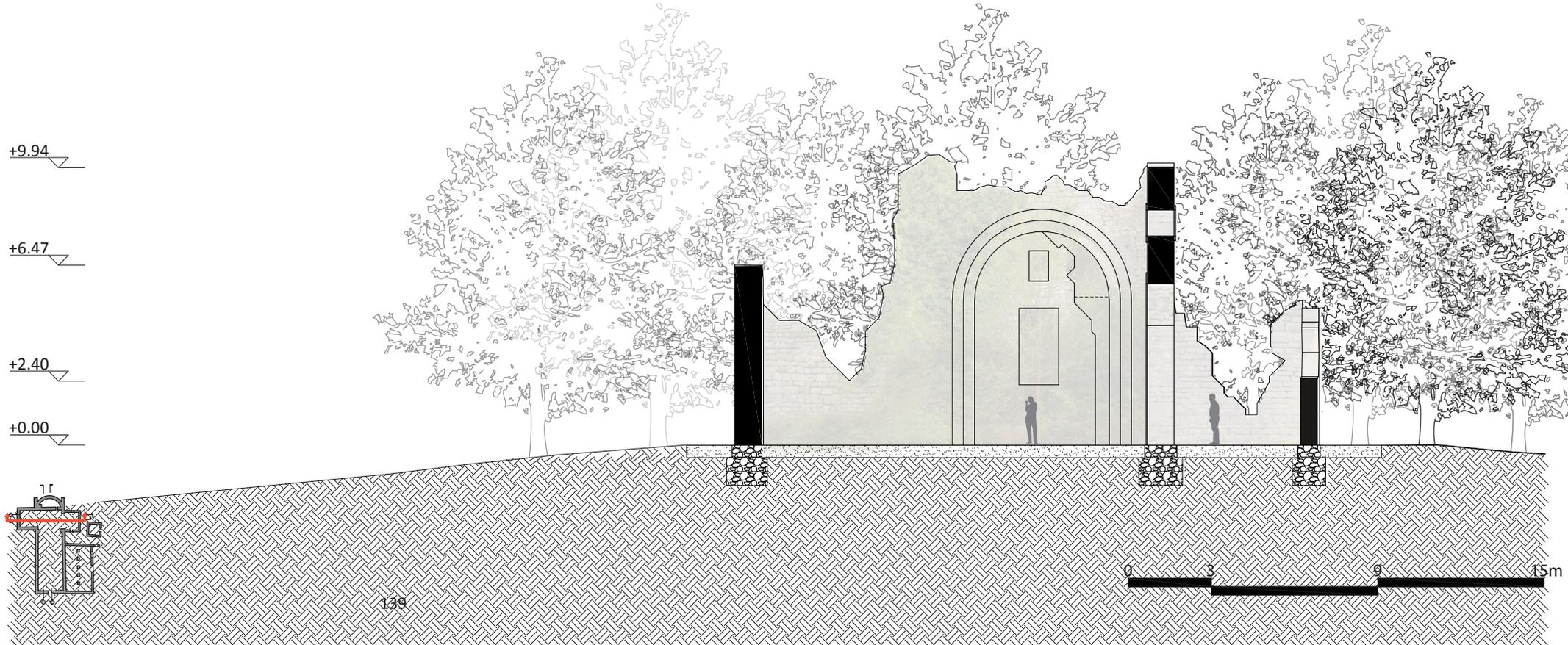
Section B-B
Current Situation



Section C-C
Current Situation



Section D-D
Current Situation



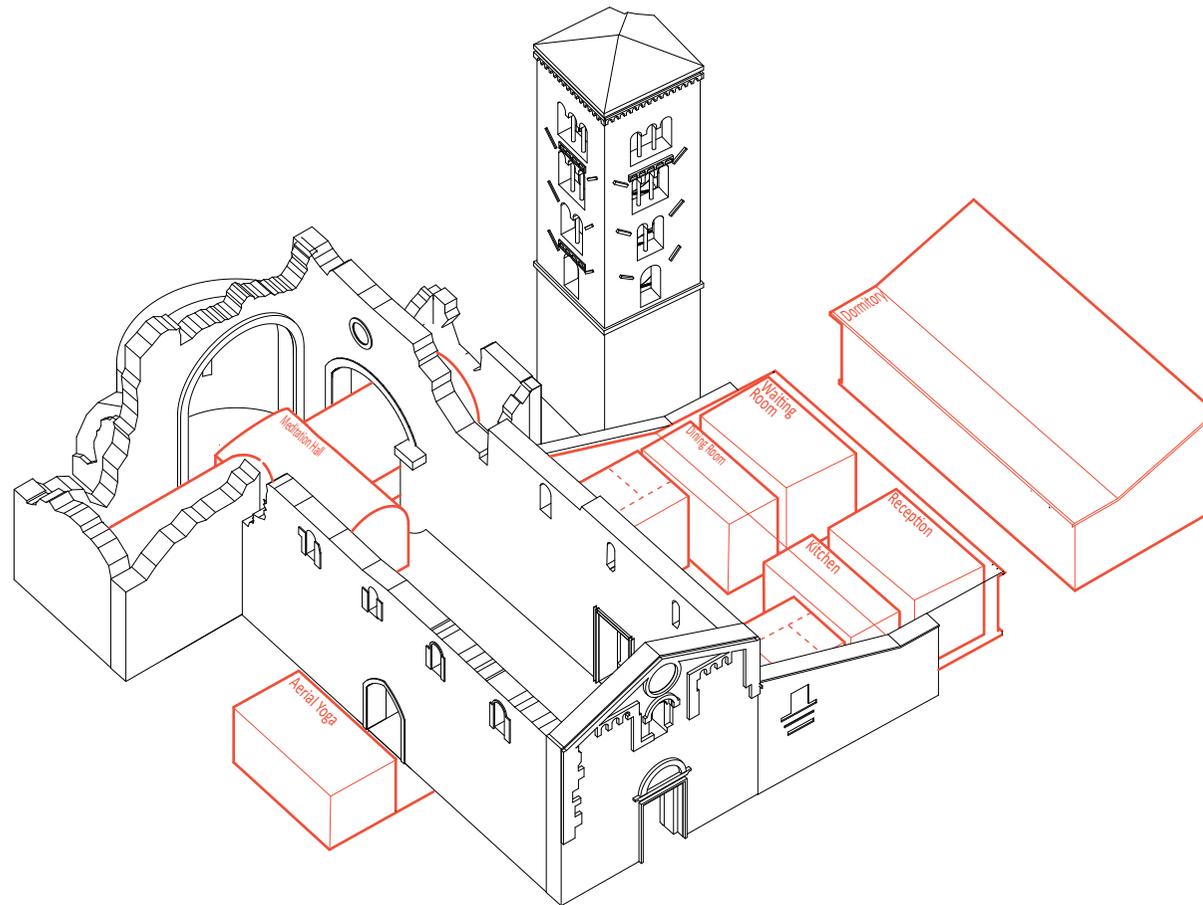
The Design 05

Design Introduction

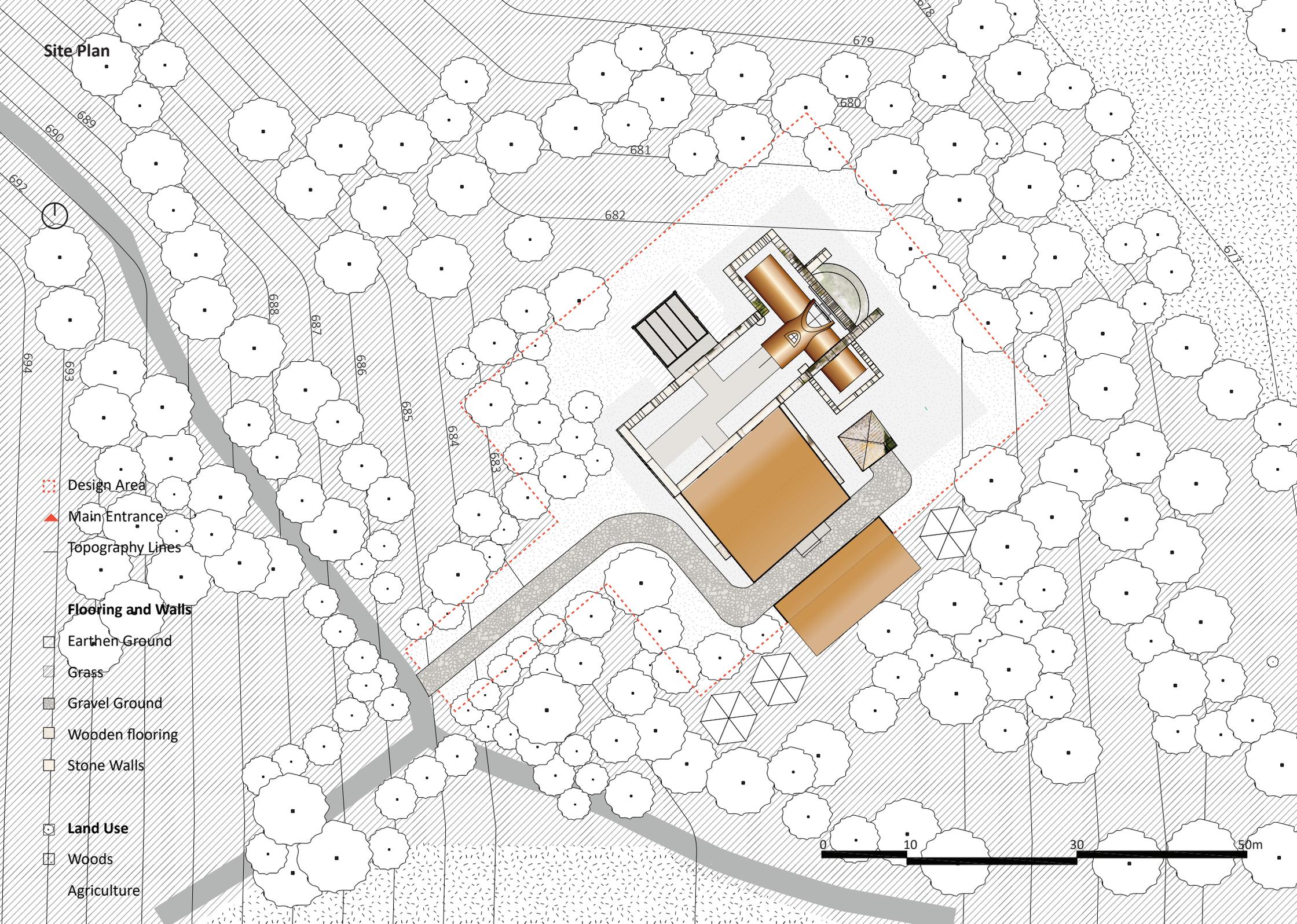
The current design proposal is rooted in the principles of adaptive reuse with the aim of preserving the architectural identity while facilitating a sustainable transition. In this line, the project incorporates the strategy of building within a building to ensure that new uses are incorporated without damaging the original building. At the same time, there is an extension that has carefully considered the current needs in relation to the surrounding environment.

A lightweight structural system is employed throughout the intervention in order to have minimal physical presence within the existing building and to achieve a high degree of reversibility and temporal flexibility. The strategy adopted not only has a positive effect on the environment, it also enhances the relationship between the past and the present, ensuring that the new strata are readable, respectful, and flexible.

Spatial Program
Old-New Integration



Site Plan



Design Area

Main Entrance

Topography Lines

Flooring and Walls

Earthen Ground

Grass

Gravel Ground

Wooden flooring

Stone Walls

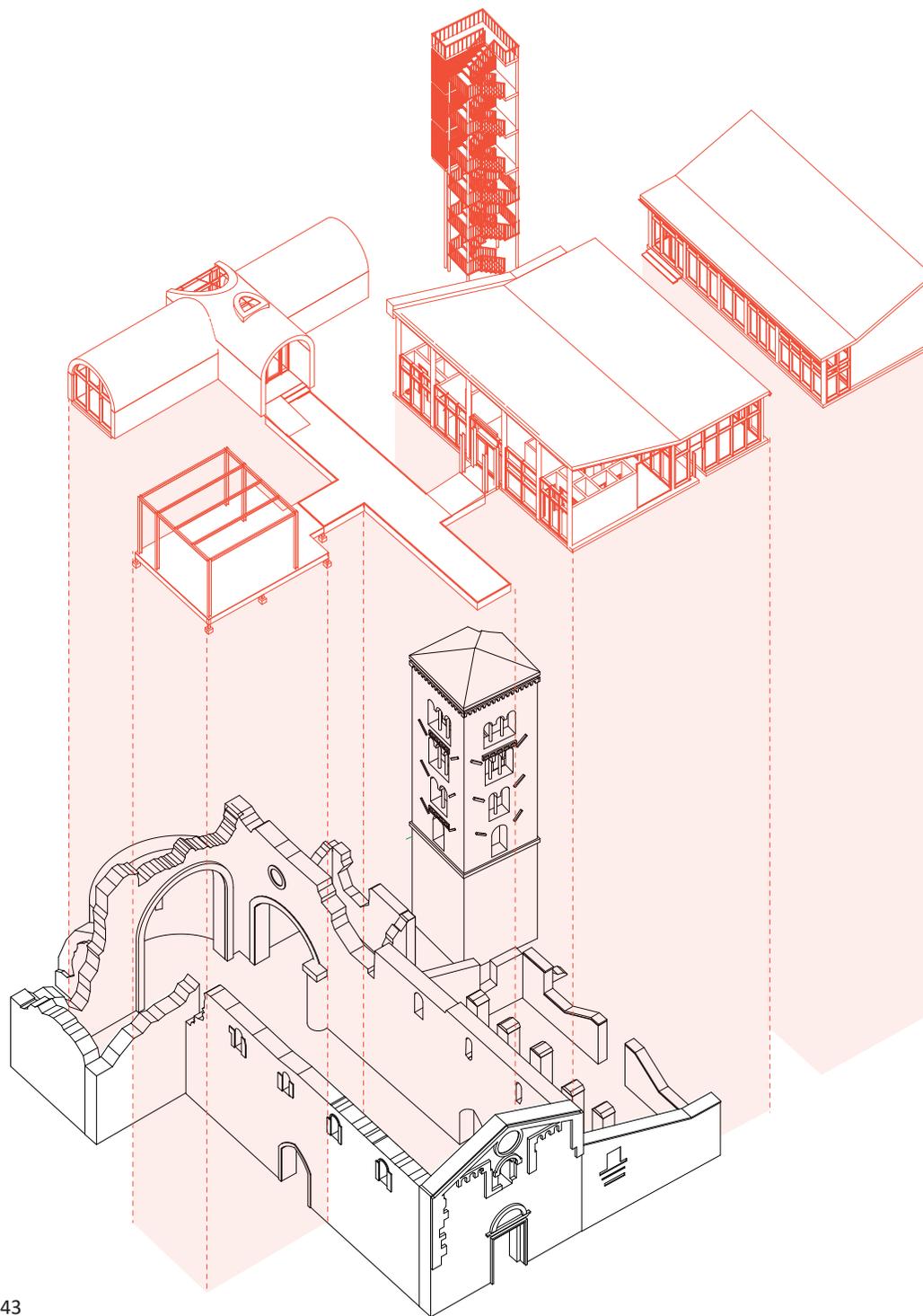
Land Use

Woods

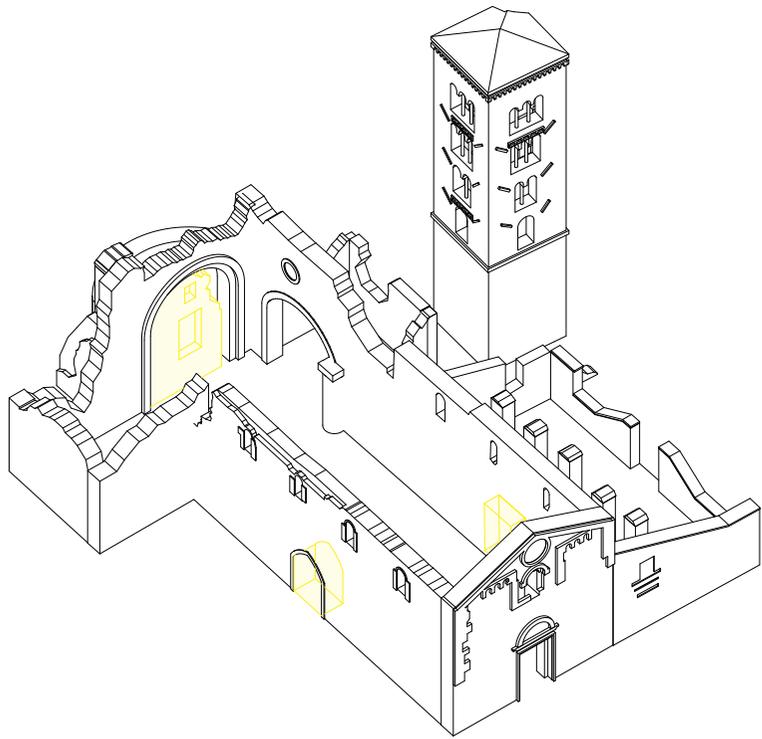
Agriculture



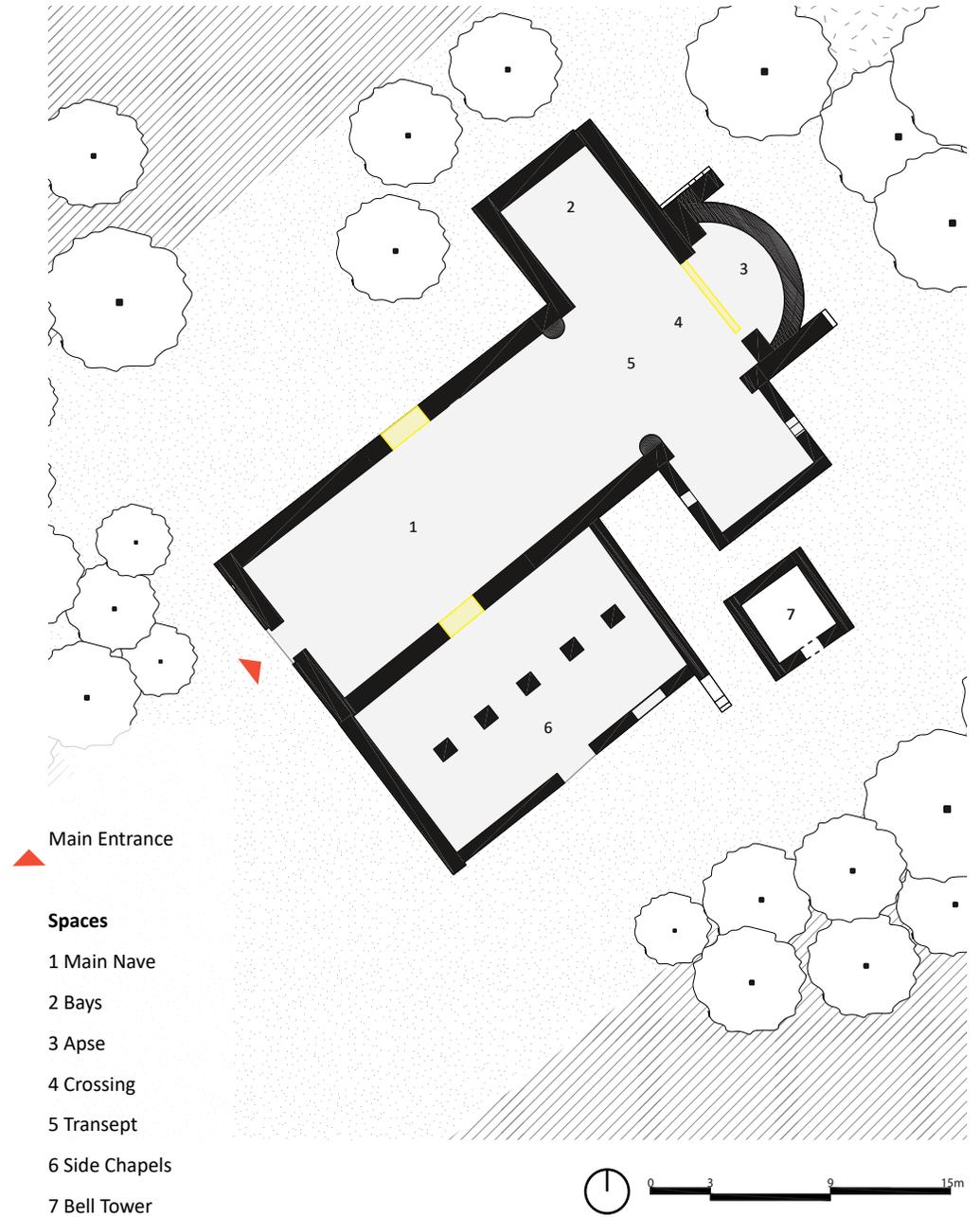
Building within a Building
Old-New Integration



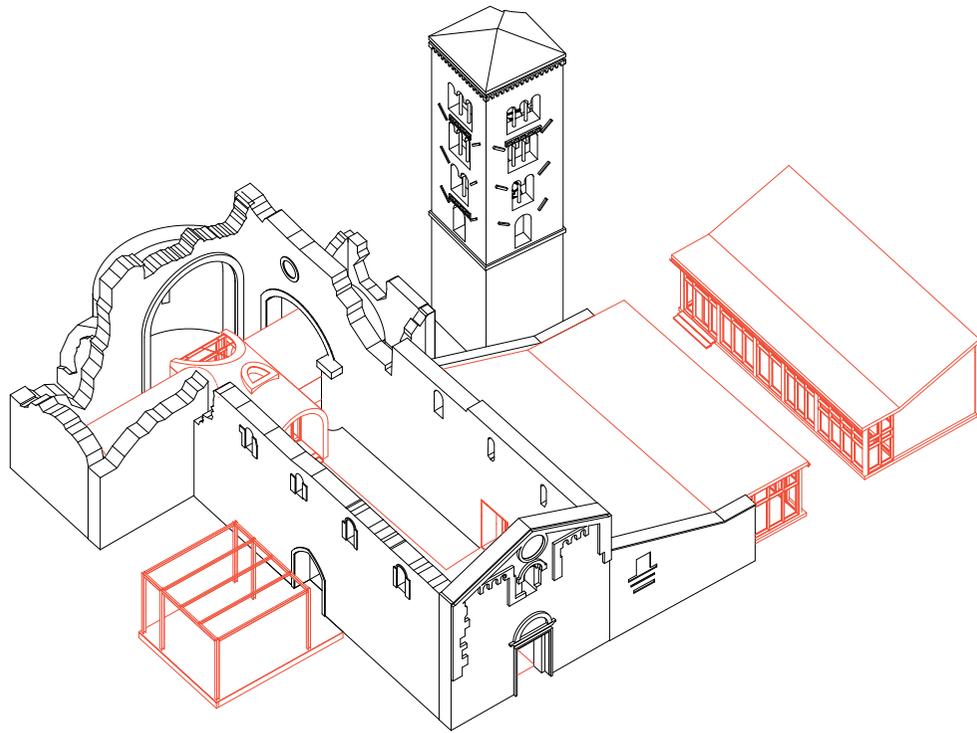
Demolition
Axonometry



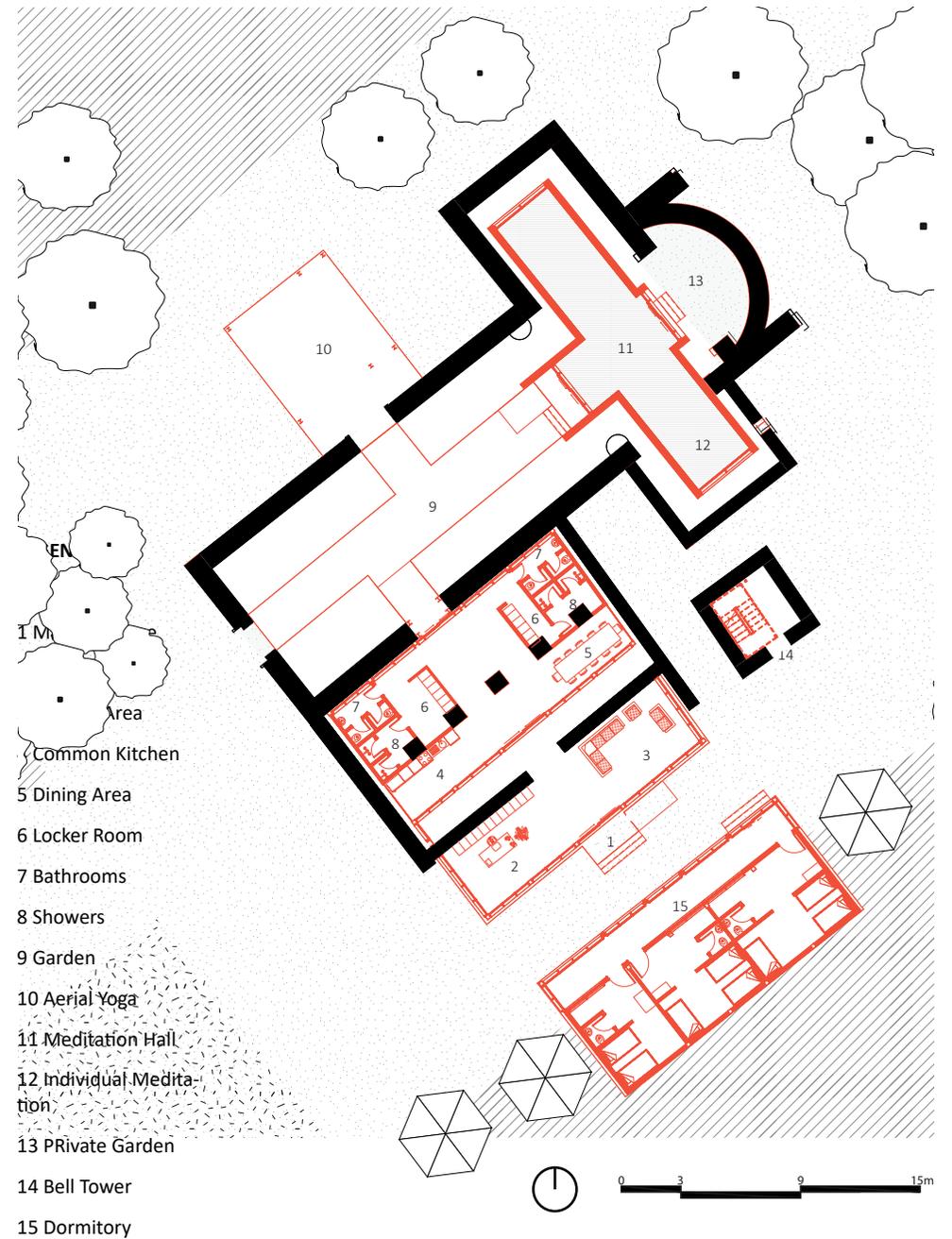
Demolition
Ground Floor Plan



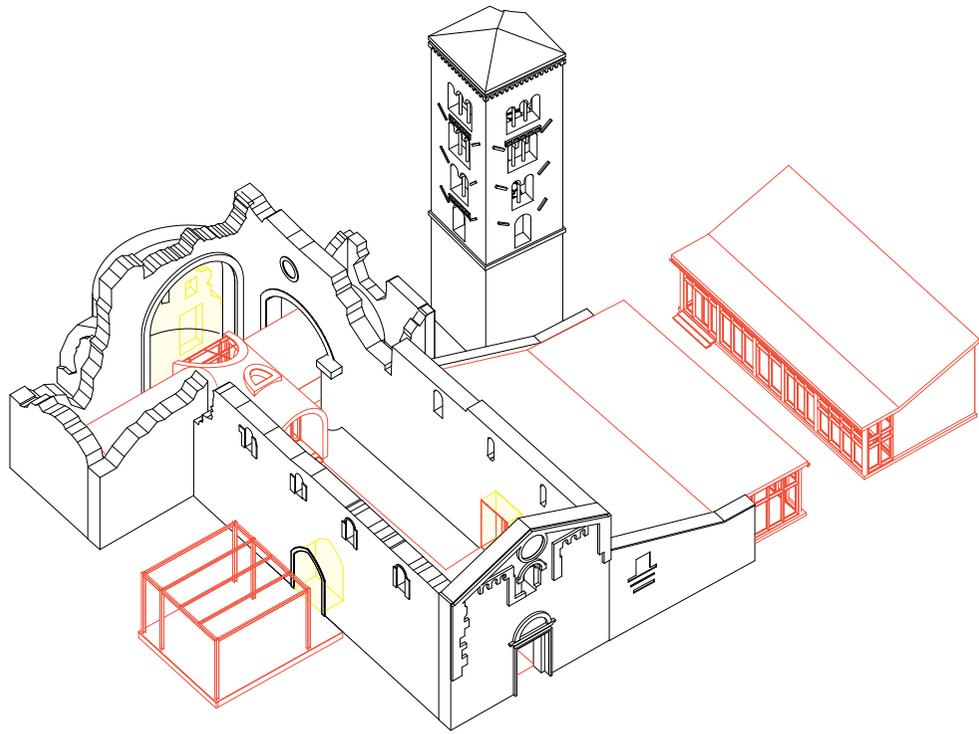
**Construction
Axonometry**



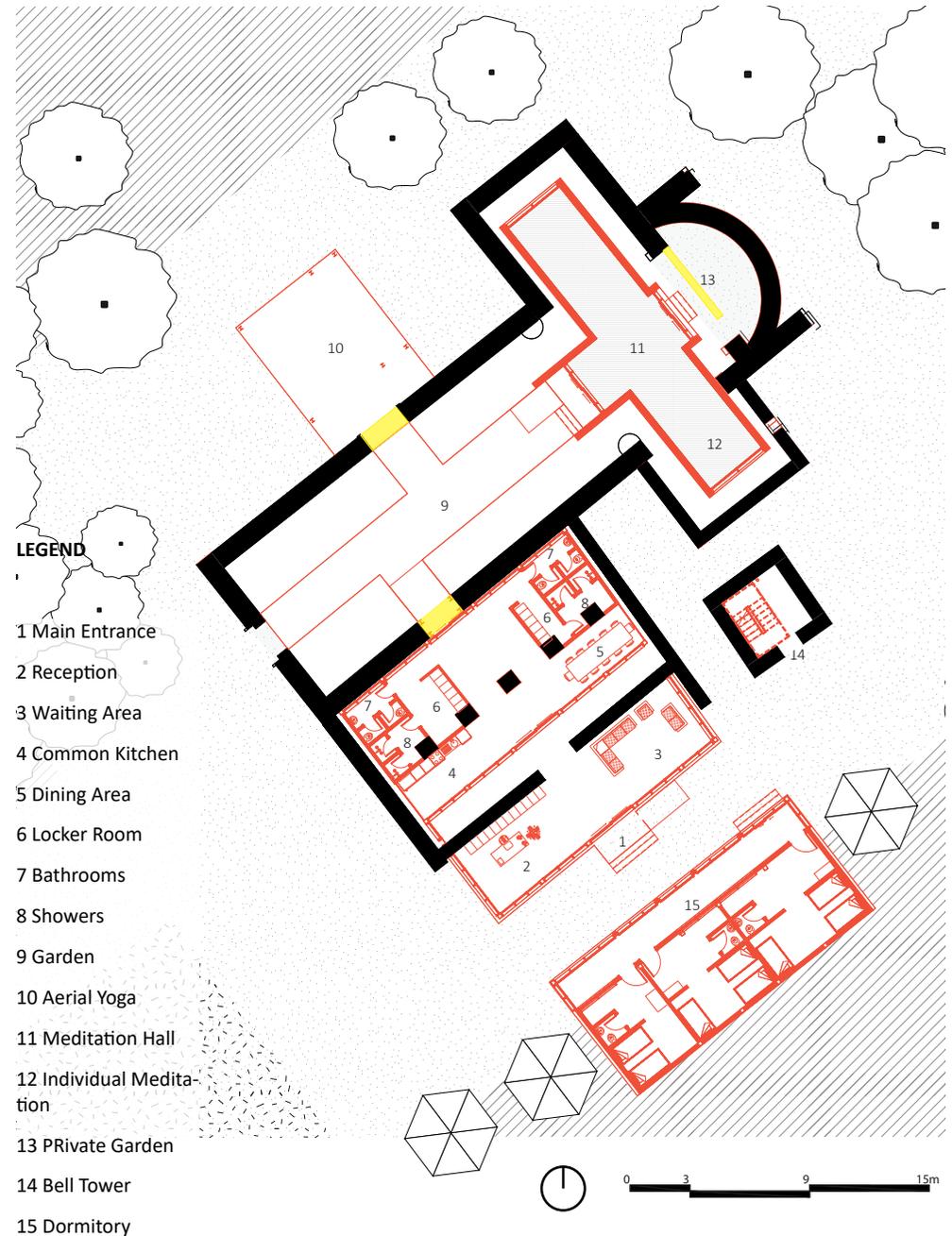
**Construction
Ground Floor Plan**



**Construction and Demolition
Axonometry**



**Construction and Demolition
Ground Floor Plan**

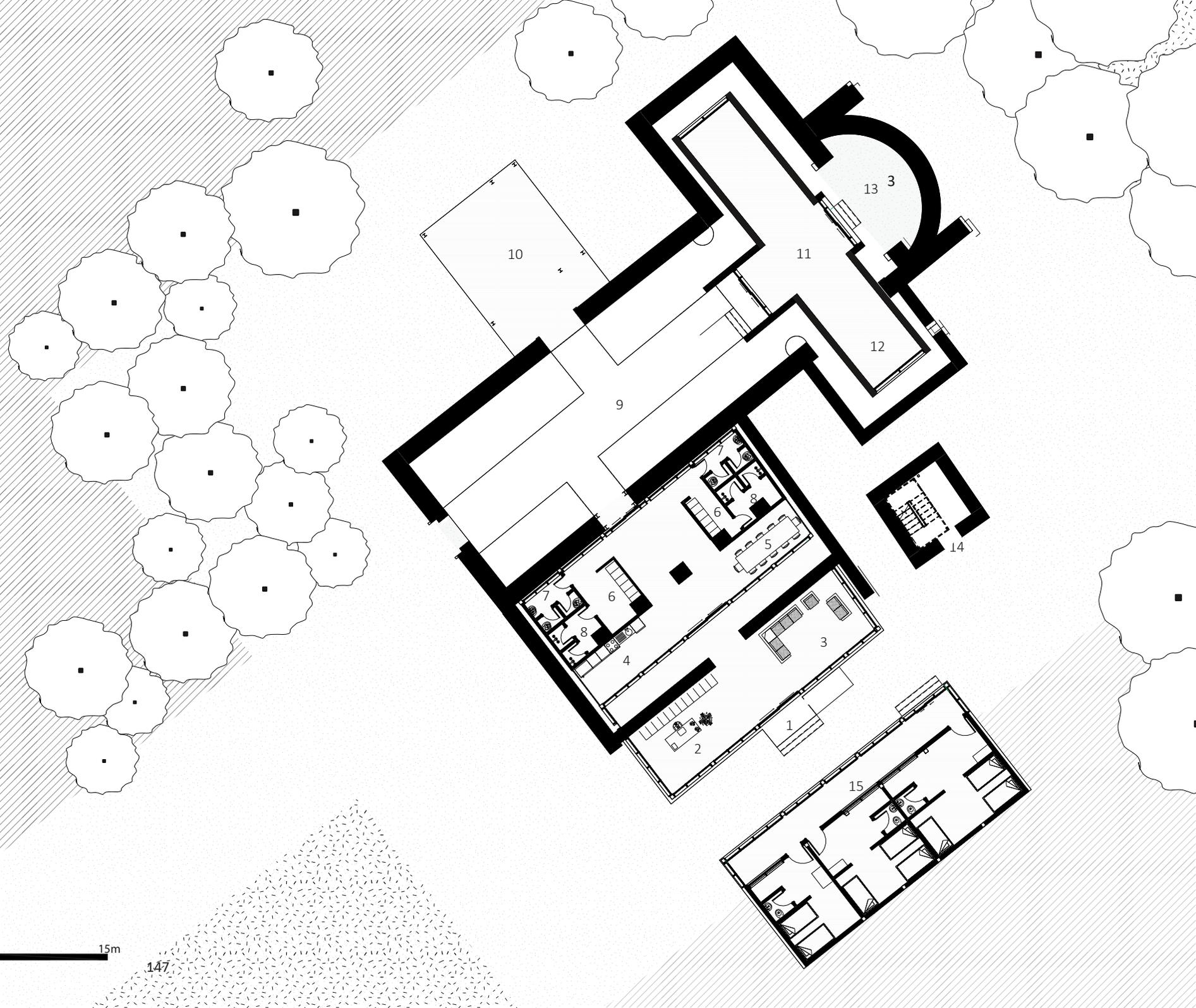


LEGGEND

- 1 Main Entrance
- 2 Reception
- 3 Waiting Area
- 4 Common Kitchen
- 5 Dining Area
- 6 Locker Room
- 7 Bathrooms
- 8 Showers
- 9 Garden
- 10 Aerial Yoga
- 11 Meditation Hall
- 12 Individual Meditation
- 13 Private Garden
- 14 Bell Tower
- 15 Dormitory

Flooring and Walls

-  Earthen Ground
-  Grass
-  Gravel Ground
-  Stone Walls



SW Elevation

+21.10

+11.07

+5.73

+4.00



0 3 9 15m

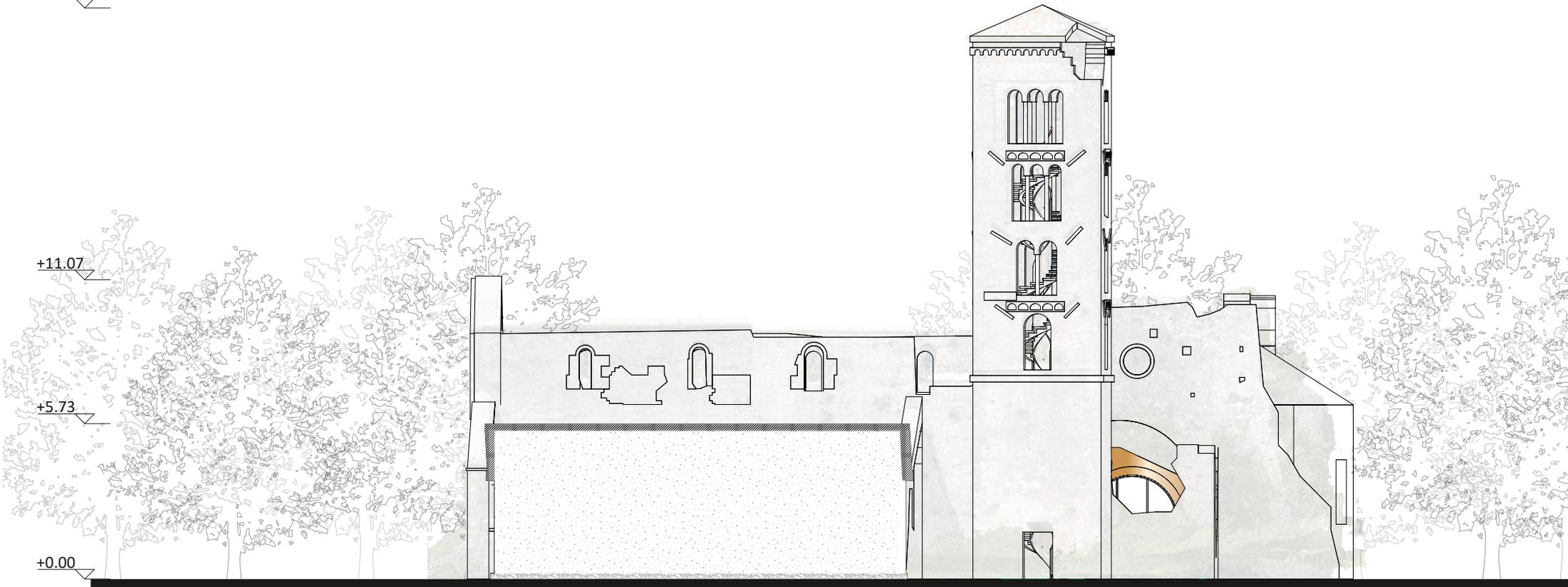
SE Elevation

+21.10

+11.07

+5.73

+0.00



NE Elevation



NW Elevation

+21.10

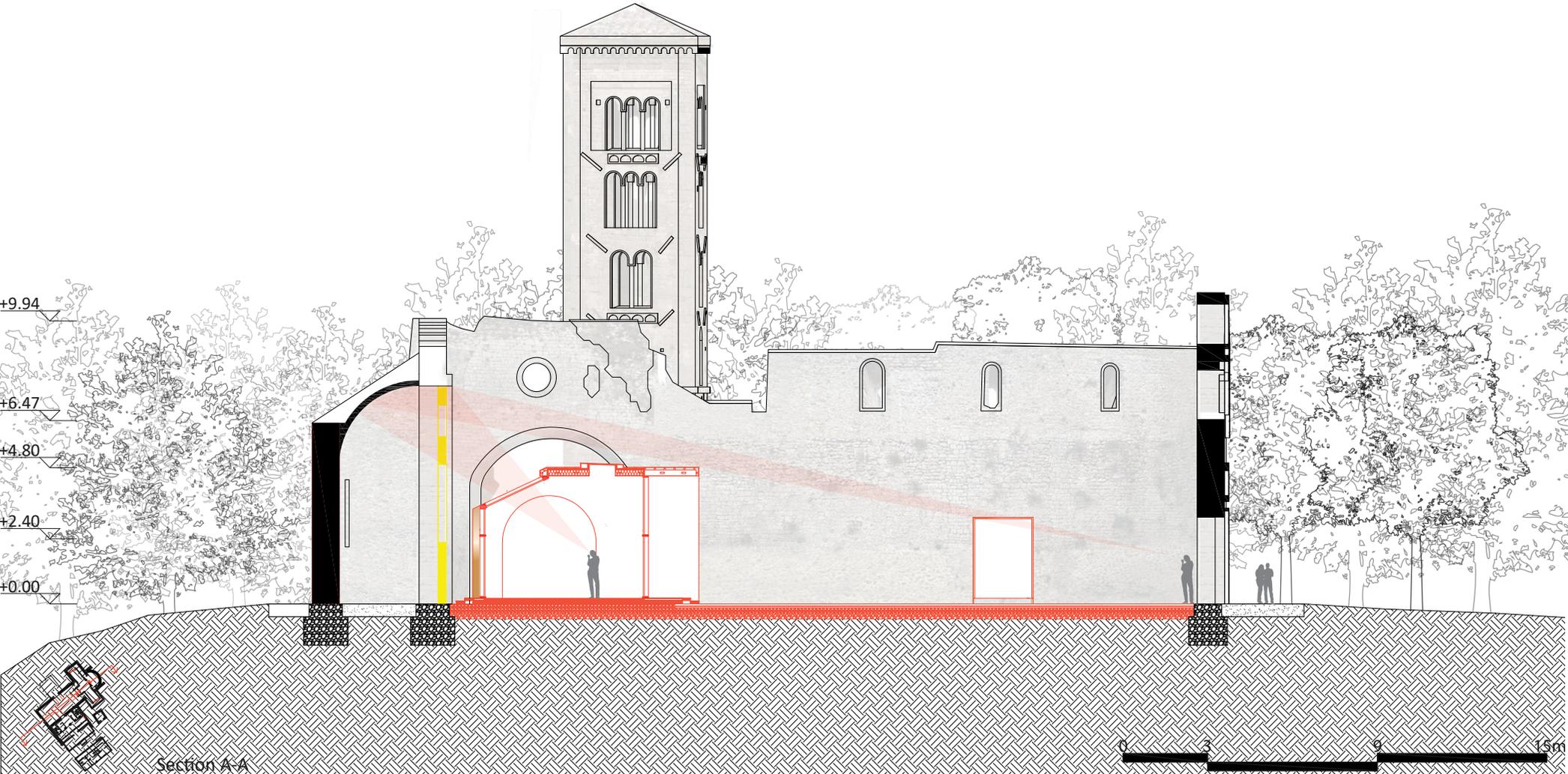
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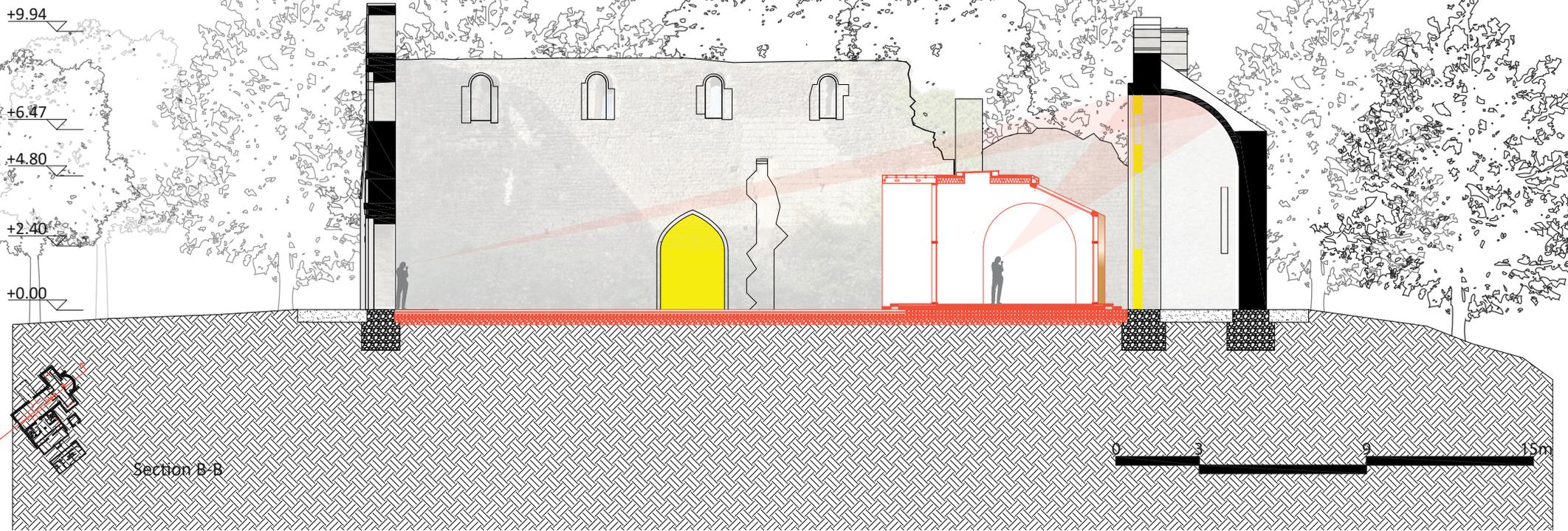
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Sections
Section A-A



Sections
Section B-B



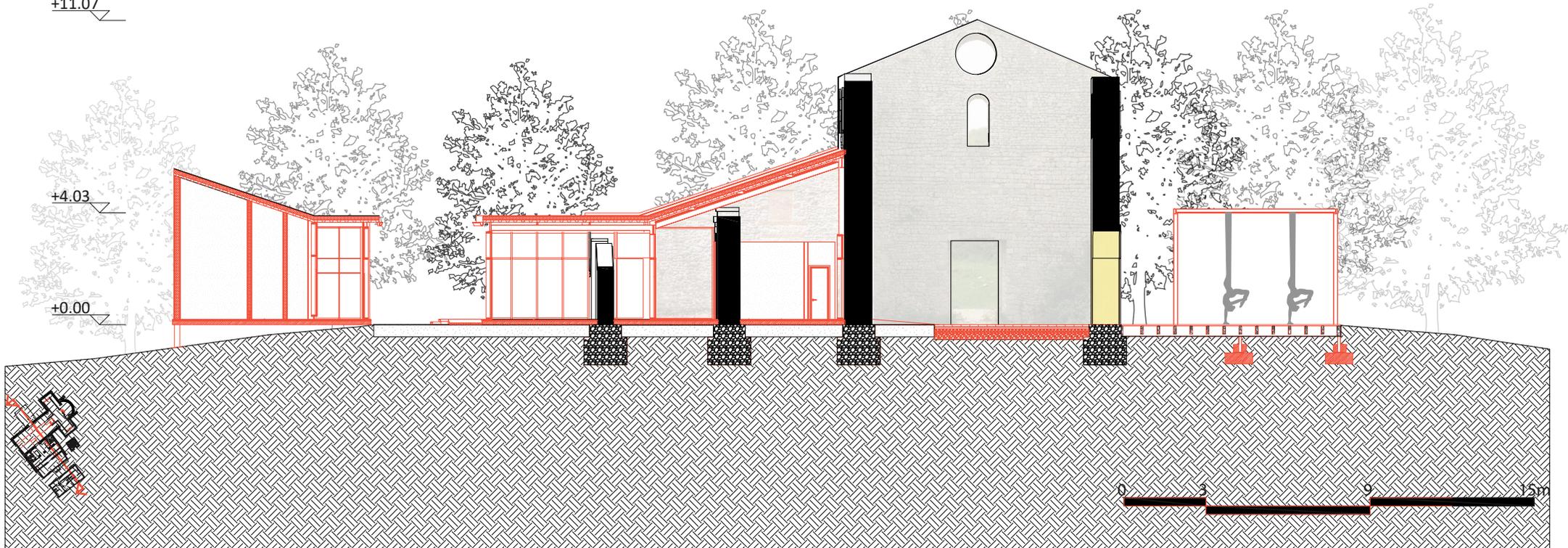
Sections
Section C-C

+21.10

+11.07

+4.03

+0.00

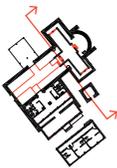


Sections
Section D-D

+21.10



Section Perspective



Section Perspective



Dormitory Room

Dormitory
Foyer
157

Garden

Reception
Waiting Area

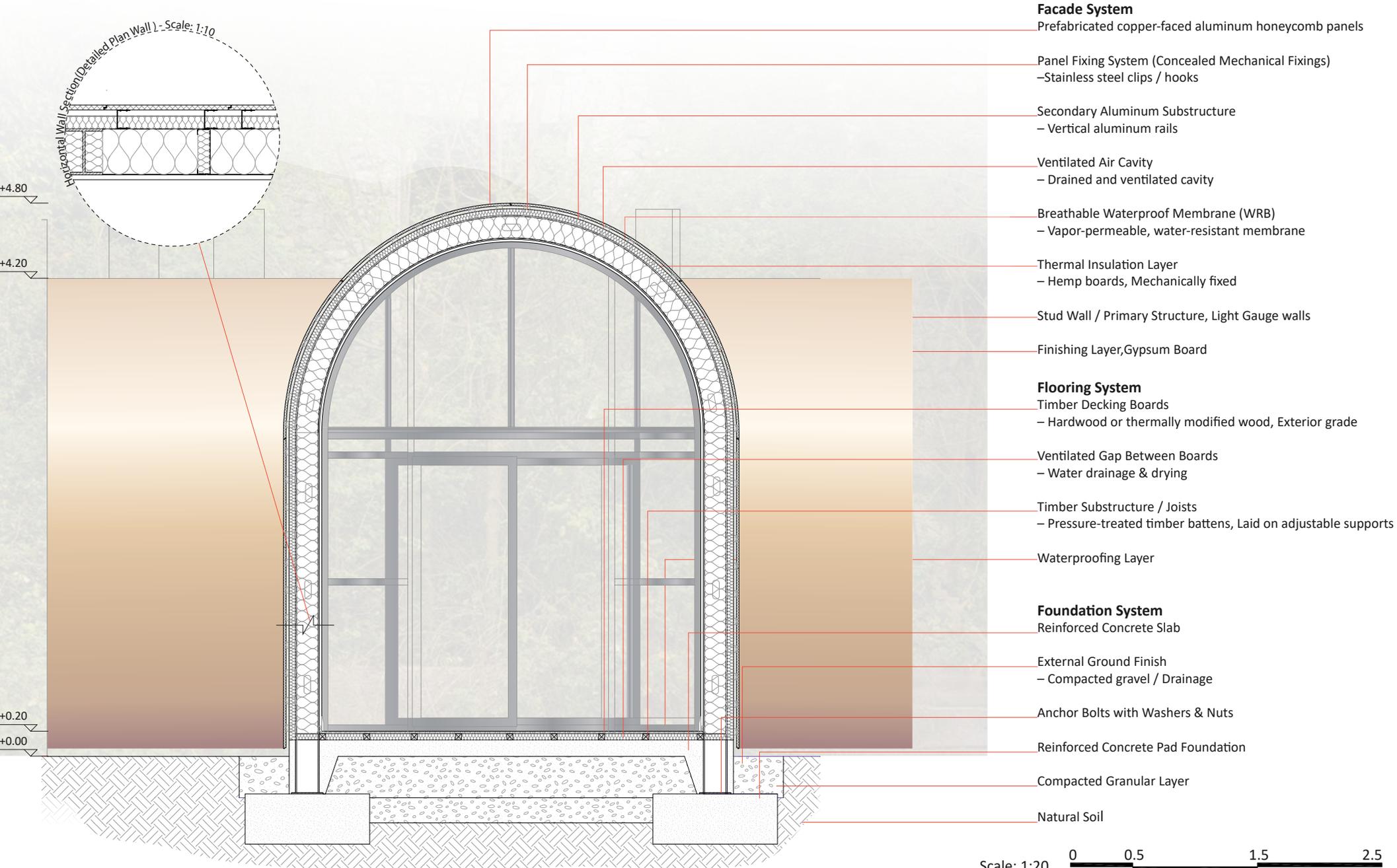
Kitchen
Dining Area

Locker Room
Shower
Bathroom

Private Garden

Aerial Yoga

Wall Section Meditation Hall



Facade System

Prefabricated copper-faced aluminum honeycomb panels

Panel Fixing System (Concealed Mechanical Fixings)
– Stainless steel clips / hooks

Secondary Aluminum Substructure
– Vertical aluminum rails

Ventilated Air Cavity
– Drained and ventilated cavity

Breathable Waterproof Membrane (WRB)
– Vapor-permeable, water-resistant membrane

Thermal Insulation Layer
– Hemp boards, Mechanically fixed

Stud Wall / Primary Structure, Light Gauge walls

Finishing Layer, Gypsum Board

Flooring System

Timber Decking Boards
– Hardwood or thermally modified wood, Exterior grade

Ventilated Gap Between Boards
– Water drainage & drying

Timber Substructure / Joists
– Pressure-treated timber battens, Laid on adjustable supports

Waterproofing Layer

Foundation System

Reinforced Concrete Slab

External Ground Finish
– Compacted gravel / Drainage

Anchor Bolts with Washers & Nuts

Reinforced Concrete Pad Foundation

Compacted Granular Layer

Natural Soil









Conclusion and References

06

Conclusion

This thesis explored the adaptive reuse of the Abbey of Santa Maria del Piano, a 9th-century religious building constructed largely through recycled and reassembled materials, originally functioning as a church within a rural and historical context. The project was guided by a deep respect for the architectural, material, and symbolic values of the existing structure, understanding it not as a static artifact, but as a living architectural organism capable of accommodating new meanings and functions over time.

The design strategy is firmly grounded in the principles of adaptive reuse, proposing the insertion of a new architectural system within the historic fabric rather than its replacement or domination. A clear architectural dialogue is established through the construction of a new structure inside the existing building, intentionally emphasizing the distinction between historic and contemporary interventions. This differentiation is expressed through the deliberate use of contrasting materials, construction techniques, and spatial language, ensuring that the new elements remain clearly legible, reversible, and respectful of the original structure.

To accommodate specific functional requirements of the new program, selected portions of the historic fabric that hold lesser architectural significance are extended through lightweight and minimal additions. These extensions are carefully located and dimensioned so as not to compromise the primary spatial, architectural, and historical identity of the abbey. All interventions are based on a thorough reading of the building's structural logic, spatial hierarchy, and material characteristics, reinforcing an approach that prioritizes understanding and respect over formal imitation.

The transformation of the former church into a meditation center represents a functional reinterpretation that maintains strong conceptual continuity with the building's original spiritual role. Rather than introducing an incompatible use, the new program amplifies existing qualities of silence, introspection, and contemplation, allowing the abbey to continue serving as a space for inner reflection within a contemporary context.

Material selection plays a central role in the project's sustainability strategy. In accordance with circular economy principles, the design prioritizes reversible, demountable, and recyclable materials, minimizing irreversible impact on the historic fabric. This approach allows future changes of use to be accommodated without damaging the existing structure, preserving the abbey's integrity for subsequent generations. The new architectural interventions are therefore conceived as temporary and adaptable layers within

the long life cycle of the building, rather than as permanent transformations.

In conclusion, the project demonstrates how adaptive reuse can function as a balanced architectural methodology—one that respects historical identity while enabling meaningful transformation. This approach resonates with the principles articulated in the work of Matthew Robiglio, where reuse is understood as a process of continuity rather than replacement, as well as with the strategies of Lacaton & Vassal, who emphasize addition, restraint, and the preservation of existing value. It also reflects the careful articulation of old and new found in the work of Carlo Scarpa and the measured, respectful interventions of David Chipperfield, in which contemporary architecture remains legible while acknowledging the authority of the historic fabric. Through material clarity, reversibility, and programmatic sensitivity, the proposal offers a sustainable and respectful model for the reactivation of historic religious architecture—one that ensures continuity while remaining deliberately open to future adaptation over time

Conclusion:

This thesis examines the adaptive reuse of the Abbey of Santa Maria del Piano, a religious architectural structure from the ninth century, largely built using reclaimed materials, originally serving as a church in a rural historical setting. This project is based on a great appreciation for the architectural, material, and symbolic qualities contained in the existing architectural structure, not just seeing it as a finished object but as a living architectural being that is capable of being assigned new meanings.

The design approach is based on the principles of adaptive reuse and involves the implantation of the new architectural system within the historic environment, as opposed to replacing or overriding it. A clear architectural dialogue is created by the construction of the new architectural system within the existing building, hence emphasizing the difference between the historic and the modern systems. This difference is defined by the contrast in materials, construction methods, and spatial language, hence establishing the difference between the historic and modern systems in the design. Additionally, in order to satisfy the functional needs of the program, selected parts of the ancient structure, which are of secondary architectural importance, are expanded using light architectural additions. These additions are strategically placed and sized in such a manner as to not undermine the fundamental spatial and architectural identity of the abbey. These additions

are made based on a deep understanding of the structural and material logic of the ancient structure.

The use of the former church as a meditation center is a case of a functional reinterpretation where there is a continued conceptual intention, which is linked to the original spiritual use of the structure. The original use is not superseded by a use that would appear strange or incongruous, but rather incorporates the aspects of silence and contemplation inherent in the former use. Material choice is a key area for the sustainability plan for the project. In line with the circular economy approach, reversible, demountable, and recyclable materials feature largely in the design. It would enable any future change of use without harming the existing structure, so the integrity of the abbey is maintained for the future. The architectural interventions are therefore considered temporary in the long lifecycle process instead.

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To IRAN and It's brave people who reclaim their History and their grandeur.

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