Caucasus Traditional Building Revival

Case Study Report

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INTRODUCTION

The publication *Caucasus Traditional Building Revival: Case Study Report* represents was developed in the frames of the ten months project (2024-2025) Caucasus Traditional Building Revival, initiated by the Georgian Arts and Culture Center and the Caucasus Through Time Network and implemented thanks to the support of the European Heritage Hub pilot Project co-funded by the European Union and supported by the ALIPH Foundation.

The project was a pioneering initiative aimed at promoting and preserving traditional architecture in the South Caucasus and emphasizing the use of sustainable, locally sourced materials such as loam and wood, combining historical wisdom with modern eco-conscious practices.

This very e-publication is the joint report of three small scale projects funded by the project for the stimulation of research and documentation of the traditional building techniques and sustainable materials in the South Caucasus. It incorporates cases studies from Armenia – *Investigating the Earth Heritage in Armenia: A Case Study of the Ararat Valley***,** Azerbaijan – *The Historical Urban Landscape of Ordubad: Restoration of Monuments, the Role of Gardens, and the Kahriz Water System* and Georgia - *Traditional Alizi House in Georgia*.

We hope that the publication will serve for the opening of the discourse on sustainable and traditional architecture in the SC and serve as a valuable resource for scholars.

INVESTIGATING THE EARTH HERITAGE IN ARMENIA: A CASE STUDY OF THE ARARAT VALLEY

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Introduction

Various manifestations of traditional architecture are known from different parts of the Armenian Highlands. Depending on local traditions, geographical location, and climatic conditions, architectural structures have exhibited diverse characteristics. For example, researcher Stepan Mnatsakanyan, in his book "The Architecture of Rural Settlements in Armenia", classifies vernacular architecture into three main groups based on geographical conditions: the architecture of mountainous, foothill, and lowland regions (Mnatsakanyan 1956, 91).

Thus, for example, in mountainous settlements, houses were built in terraced clusters along the slopes, spreading across rocky inclines and becoming an integral part of the landscape. The flat roofs of houses on the same level were connected, creating pathways or a "courtyard" for the residents of the upper levels (Marutyan 2001, 78). Similarly, in Syunik, people carved artificial caves (known as *քարանակ*) into relatively soft rock formations, enclosing the front sections with walls or additional rooms (Marutyan 2001, 78). Both in Eastern and Western Armenia, *գլխատուն* houses were widespread, some of which have survived to this day. These dwellings, characterized by a domed hazarašen *հազարաշեն* roof and a central *թոնիր* (underground oven), were primarily typical of foothill regions (Vardanyan 1967, 78-88; Marutyan 2001, 80-85).

In the context of traditional architecture, earthen architecture holds a distinct place. Despite the Armenian Highlands being rich in various stone materials, researchers have often overlooked the region's earthen architectural heritage.

Globally and within Armenian culture, earth has been widely used in architecture. It has been applied in the construction of defensive, residential, economic, and religious structures. In the Armenian Highlands, earthen architecture has been utilized throughout nearly all historical periods. From the Neolithic era to the 20th century, the use of earth in construction has remained integral, with some interruptions, particularly in the development of the Ararat Plain. This was

largely due to the abundance of clay soil (*կաւհող*) and the scarcity of other natural building materials (Abrahamyan 2023, 107).

The aim of this research is to study and document the earthen architectural heritage of the Ararat Plain from the 19th to the 20th centuries, highlighting its architectural features, construction techniques, and cultural significance. The research objectives include identifying three examples of earthen structures, assessing their current condition, and evaluating their architectural characteristics and significance within Armenia's cultural heritage. These structures are: the club house (House of Culture) in Getazat village, St. Hovhannes Church in Norashen village, and a residential complex from Verin Artashat village (Fig. 1).

Within the scope of this project, we have addressed the current challenges of preserving earthen architectural heritage, collected, and analyzed the limited existing professional research on the subject. Through fieldwork, material analysis, archival research, and interviews, we have examined the cultural and technical significance of these structures and explored practical solutions for their preservation.

The research findings will contribute to a broader understanding of earthen architecture and its relevance to contemporary solutions, particularly the promotion of sustainable construction methods. As part of the research, we conducted fieldwork using non-invasive methods such as photogrammetry and structural analysis to assess the condition of the buildings. We carried out in-depth interviews with residents and local government representatives to collect stories and memories about the construction and use of these structures.

Additionally, we created a GIS map to illustrate the distribution of earthen churches. For two of the structures, we performed architectural measurements, and for another two, we developed photogrammetric schematics.

Earthen Architectural Heritage of the Ararat Plain in the 19th–20th Centuries

During the 19th and 20th centuries, a new phase of earthen architectural heritage emerged and developed in the Ararat Plain and its surrounding regions, primarily shaped by the settlers of 1828. Following the Treaty of Turkmenchay in 1828, around 45,000 people from Persian-controlled territories resettled in the Ararat Plain and nearby areas. These settlers, influenced by Persian culture and the scarcity of other natural building materials in their original homelands,

primarily used earth as a construction material. Upon relocating to Armenia, they brought with them their established traditions of earthen architecture, constructing similar structures not only in the clay soil-rich Ararat Plain but also in the foothill and mountainous regions of Vayots Dzor, Syunik, and other areas abundant in stone materials (Abrahamyan 2023, 113). Until the 1950s, the settlements in the Ararat Plain were almost entirely made of earth. Not only were residential and economic complexes built from earth, but a number of churches, community buildings such as houses of culture, schools, kindergartens, and public structures of economic significance were also constructed using this material (Abrahamyan 2023, 108).

After settling in the Ararat Plain, the Persian Armenians established their settlements near rivers, streams, and water depressions, which were the main sources of water in the early stages. During the pre-Soviet period, the structure of rural settlements was almost identical across all villages. The settlements typically had one central public space, usually formed around the village church, which in the case of the Ararat Plain could be an earthen structure. However, the region also had numerous stone churches and monasteries dating from the 5th to the 20th centuries. The remaining area of the villages mainly consisted of functionally uniform production and residential complexes, where the sizes and shapes of the household plots varied significantly. Ultimately, these variations were determined by the mixed layout of village streets and shaped the overall plan of the settlement (Mnatsakanyan 1956, 21; Marutyan 2001, 74).

Today, all settlements in the Ararat Plain inhabited by Persian Armenians feature earthen structures. The primary advantage of earthen buildings is the availability of affordable materials and their ability to maintain a relatively stable temperature (warm in winter, cool in summer). Several methods of constructing earthen complexes in the Ararat Plain can be distinguished:

Semi-sunken and underground ground-floor houses,

Rammed earth buildings,

Buildings made with adobe brick,

Buildings that combine the above-mentioned types and/or other methods.

Semi-sunken and underground ground-floor houses. Ground-floor houses are structures that are either entirely or partially dug into the earth and were used for residential purposes. Ground-floor houses are among the most widely applied types of earthen architecture in the world. They have been used for thousands of years to maintain warmth. These houses were built in various

external shapes. Some of them are entirely underground, which reduces the likelihood of collapse, while internal lighting and necessary ventilation were provided through a chimney in the roof.

In the Ararat Plain, the most common type of ground-floor houses were semi-sunken dwellings. This type was often combined with the use of adobe brick or clay-mud rammed earth techniques. In the most widespread version, after digging a pit with an average depth of 1-1.5 meters and a surface area of 4 x 6 meters in flat terrain, a 1-1.5-meter-high wall made from adobe bricks or rammed earth was added, and the structure was covered with wood, straw, and earth. The result was a room with an average height of 2-2.5 meters from the ground, with natural light provided by windows opened in the above-ground sections and ventilation through a chimney. These structures typically had a flat roof. Inside, they usually featured a tonir (underground oven).

According to surveys, the use of ground-floor houses in the Ararat Plain continued until the 1950s. Today, the few remaining examples in the region are used as basements for more recently built homes, storage rooms, or for other economic purposes.

Rammed earth buildings. Another type of construction for residential-economic complexes in the Ararat Plain is the method of rammed earth with clay mixture layers. Known in French as pisé de terre or simply pisé, it has been used worldwide for ages, like many other earth construction techniques. The earth is thoroughly mixed with water to create a homogeneous moist mixture. This moist earth is poured into a form in thin layers and then rammed to increase its density. After filling about 80 centimeters, the process would be paused until it dried, after which layering or filling and plastering would continue. This method of earth architecture is among the most widespread. There are numerous examples of buildings constructed using the rammed earth method that are listed as World Heritage sites in various locations around the world.

In the Ararat Plain, this method was used not only in residential-economic complexes but also in the architecture of earthen churches (such as the second earthen church in Getazat, the Holy Mother of God Church in Mrganush, and other churches), garden fences, field huts, and other structures. The method of rammed earth with layers of clay mixture is relatively the least durable compared to other methods, which is why such structures have been less preserved. In the Ararat Plain, this technique was often combined with other methods and materials to increase the stability of the structure. For stabilization in buildings constructed using this method, wooden layer were placed in the walls, typically in two locations: one in the bottom row of the wall, and the other in the upper row or at the end of the wall. These woods were also placed above the windows. In the

village of Norashen, for one of the earthen houses built using the rammed earth method, wood was used as a stabilizing material. In this case, wood layers, placed horizontally at an average height of 1 meter, were embedded in the walls, and vertical wood stolbs were tightly placed at the corners of the walls to support the weight of the roof. In the case of the Holy Mother of God Church in Mrganush, after a layer created through the rammed earth method of approximately 60 centimeters in height, two rows of adobe brick layers follow, and the walls are built with this alternating sequence from the foundation to the top. However, the rammed earth method is considered the fastest for constructing buildings, as it does not require days of preparation for bricks to dry, making it widely used.

Buildings Made of Adobe Bricks. The method of construction using adobe bricks is considered one of the most classical options in earth architecture. It has been applied in almost all civilizations. In the Ararat Plain, churches, residential complexes, fences, and economic and public buildings were constructed using adobe bricks. To build with adobe bricks, clay mixture was first prepared, and then rectangular or square bricks were molded from the mixture. The bricks were left to dry. Once the bricks were dry, the clay mixture was prepared again, and the bricks were laid one after another using the mixture.

In the Ararat Plain, during the 19th and 20th centuries, the most common solution for residential construction was the two-room building. A classical building made of adobe bricks, i.e., a two-room house (corridor, vestibule (from the Armenian Language Dialect Dictionary 2004, 244)) with a 4 x 4-meter surface area and a main room (large tent, room (from the Armenian Language Dialect Dictionary 2012, 164)) with a 4 x 6-meter surface area, required bricks to be prepared in advance. Primarily, square (*քիթուն*) (from the Armenian Language Dialect Dictionary 2001, 193)) bricks with dimensions of 30 x 30 x 10 centimeters and rectangular (*յարմ*) bricks with dimensions of 30 x 15 x 10 centimeters were used.

First, the tools were prepared, and the mold ("կալիբ-դալիբ-կաղապար"-mold (from the Armenian Language Dialect Dictionary 2004, 346)) was created. This mold could be simple or complex and had anywhere from 1 to 12 pieces. The number of the pieces was determined by the number of rectangular bricks, meaning that a mold designed to produce one square and two rectangular bricks at the same time was considered a 4-piece mold.

Then, the clay mixture was prepared, for which a location was chosen based on where the house was to be built, or the street in front of it, or the neighboring garden. If none of these options

were available, the area near the settlement was selected, provided it had abundant clay and was not covered by buildings or crops. After selecting the area, relatively large plants were removed, and the ground was dug with shovels. Once the soil was dug up, it was watered generously, turned over, watered again, and then trampled. To make the bricks, additional materials were generally not added to the mixture, but there were some variations where substances such as chaff, sand, manure, grass, wool, and others were added.

If we present the process of building a structure with adobe bricks in terms of time, a group of about five people would need 3-4 hours to prepare the tools, mold, and clay mixture. After the mixture was prepared, it was gradually poured into the mold. One of the workers (the one pressing the mold) would remove any excess material with a long stick, smooth the surface with a wet hand, and then remove the mold. If the workers were not physically strong enough, they would make the bricks 8 centimeters thick instead of 10 centimeters to make it easier to lift the mold. After cleaning the remaining mud from the mold and re-wetting it, the process would continue. As a result, with a 4-person team and a 10-pieces mold, approximately 1,000 bricks (100 molds) could be made in one day. In total, for building a two-room house (with a vestibule and a main room) of standard dimensions, about 15,000 bricks were needed. After making the bricks, the foundation of the house was dug, filled with stone and clay mixture, and then leveled with a layer of clay mixture. After the drying of the clay mixture, the brick walls were built. Once the walls were erected, the roof was covered with logs, reeds, and clay, or logs, planks, weeds, and clay. In addition to the flat horizontal roof, a gabled roof was also used. In the case of a gabled roof, one or several columns were erected inside the room to divide it into two parts. To protect the adobe brick walls from moisture and natural elements, they were coated with plaster. The plaster was typically made by adding the same amount of chaff to the clay mixture, and later, other materials were used, primarily gypsum. To strengthen the floor, it was usually covered with a mixture of 50% clay soil, 25% chaff, and 25% manure, and later, a wooden floor was typically installed. In total, a team of five people would need about one month to build a two-room house (vestibule and main room) of standard dimensions.

Buildings with a combination of the above-mentioned types and/or other methods. One of the methods used in earth architecture in the Ararat Plain involves a combination of the rammed earth technique and the preparation of adobe bricks. In this variation, the clay mixture was prepared, and then it was allowed to harden slightly. Once it had set, the clay was cut into

brick-sized pieces using a flat, square-ended tool similar to a shovel and then laid immediately. After approximately one meter in height, the process was paused to allow the mixture to dry slightly before continuing. In the end, the excess sections were smoothed with the same tool. The result was a brick wall where the bricks were not bonded together with clay, but instead were held together by their own adhesiveness.

In addition to the aforementioned earth construction techniques, other methods and combinations of techniques were also used in smaller quantities in the Ararat Plain. Among these, it is especially important to highlight the use of fired bricks in architecture, which was applied in the buildings of the 19th-20th centuries, but only in combination with the previous techniques.

Residential Complex in the Verin Artashat Village

The largest portion of earth heritage in the Ararat Plain from the 19th to 20th centuries consists of residential complexes. These range from single-room houses to two-story residential-economic complexes. Overall, traditional Armenian dwellings, in their early stages, were one-room houses, in the second stage, they evolved into homes with temporary partitions, and by the third stage, they developed into multi-room, fully integrated complexes (Vardanyan 1959, 35). Earth-built residential-economic complexes also underwent clear development after their initial formation. These complexes in the Ararat Plain began to take shape in the 1830s, and after some development, they were built until the 1970s, with some still in use today.

In the case of the Ararat Plain, common property is generally divided into two main parts: the residential house along with the economic yard and auxiliary structures, and the garden. The residential-economic section occupies a relatively small area and is usually located on the side facing the street (Mnatsakanyan 1956, 24, 27). The earthen residential-economic complexes can be classified into two types based on their structural-functional characteristics. The first type consists of primitive earthen dwellings, which are smaller in size and were originally intended as temporary residences. After the construction of a larger residential house, these initial dwellings were repurposed as economic units. The second group includes more complex residential-economic complexes, distinguished by their elaborate structures. Particularly notable are the two-story houses with spacious wooden balconies, entrances and windows adorned with decorative trims, and other stylistic embellishments. Unfortunately, most of the houses in this series have been

abandoned (Fig. 2), gradually being demolished by their owners and replaced with stone-built houses. Even the majority of still-inhabited structures have undergone significant modifications, such as exterior stone cladding, the removal of balconies, and the addition of annexes. The main reason for this situation is the lack of restoration specialists capable of faithfully preserving these structures. As a result, houseowners are unable to carry out reinforcements and repairs in a cost-effective manner while maintaining the cultural significance of the buildings. This issue is also relevant for churches and public-industrial buildings. Another major concern is that none of these houses are registered in the official lists of monuments and therefore do not fall under state protection. As part of this research, lists of valuable examples of earthen dwellings are being compiled for submission to the relevant authorities.

To present this type of heritage, we have selected a house located in the village of Verin Artashat (Fig. 3, 4). We conducted interviews with the owner, photographed and aerially surveyed the house, and created a photogrammetric scheme of the structure. The house is situated in the northern part of the village, near the historic Dvin archaeological site. Due to the uneven terrain in this area, the house appears as a single-story structure from the street side but has two stories with spacious balconies on the courtyard side. The building measures 11 meters in length and 4.5 meters in width. Various annexes, added over different periods, surround it on the courtyard side. Stylistically, the house was built in the first half of the 20th century and has undergone at least one major renovation. In 1959, the owner, Kh. Baghdoyan, clad the street-facing façade in pink polished tuff, removed the wooden balcony on the same side, and installed a metal roof. The first floor of the house consists of two rooms, each with separate entrances facing the courtyard. The left-side room, which is smaller in size, has a single window facing the courtyard, while the right-side room has two windows facing the same direction. Wooden stairs leading to the spacious second-floor balcony are also located on the courtyard side. The main living spaces of the building are situated on the second floor. This section, consisting of a hallway and two rooms, has its main entrance opening onto the large balcony. Natural light is provided by two side windows and three windows facing the courtyard. At the far end of the hallway, there was once a small wooden balcony, which was removed when the exterior wall was clad in tuff.

In the courtyard, a small earthen dwelling still stands. After the construction of the main two-story house, this smaller structure was repurposed for economic use (Fig. 5).

Norashen's St. Hovhannes Church

Rural churches serve as classic examples of the 19th–20th century earthen heritage of the Ararat Plain (Fig. 6). Unlike residential complexes, most of these structures hold monument status and are protected by the state. However, due to the previously mentioned lack of restoration architects, their preservation remains a challenge. Nonetheless, preliminary archaeological studies have already been conducted in two earthen churches: St. Astvatsatsin Church in Masis village and St. Astvatsatsin Church in Mrganush village, prior to planned restoration efforts. These studies will be discussed in separate articles.

Earthen churches built between 1830 and the 1910s generally follow a three-nave layout, oriented east to west. They were constructed using adobe brick masonry, layers of clay mortar applied through a rammed earth method, or a combination of both. In some cases, stone was used as a foundation. The columns of these churches were made of wooden logs, which were also incorporated into the load-bearing walls or attached to them for roof support. The roofs were covered with logs, straw, and clay plaster. Fired bricks were sometimes used in earthen churches, particularly for constructing altar vaults, arched, entrance and window frames, and decorative elements around the main entrance. Additionally, the Ararat plain contains small rectangular earthen chapels with irregular layouts, though only one—St. Thaddeus the Apostle Chapel in Masis village—has monument status.

To document Norashen's St. Hovhannes Church, we have prepared architectural surveys (Fig. 7), sectional drawings, conducted interviews, and captured both ground and aerial photographs. Additionally, a photogrammetric model of the church has been created (Fig. 8). Archival research has retrieved the church's official certificate, measurement records from the 1980s, and its preservation zone documentation. A list of inscriptions on the church and surrounding tombstones—never previously studied—has also been compiled.

The church holds monument status and is thus located within a preservation zone covering 0.6 hectares, of which 0.12 hectares is designated as the monument's immediate area (Fig. 9). Additionally, a regulated construction zone of 2.43 hectares has been defined (Preservation Zone Document of Norashen's St. Hovhannes Church, Research Center for Historical and Cultural Heritage, Archive). The structure is a three-nave basilica, measuring 18.60 meters in length and 10.80 meters in width (Fig. 10). The roof, originally made of wooden logs, straw, and clay plaster,

was supported by three pairs of wooden columns and an eastern apse (Fig. 11). Apart from the prayer hall's roof, most of the church remains intact. However, the foundations and columns of the prayer hall are missing, and the southern and northern walls have tilted outward. The prayer hall itself measures 11.80 meters in length and 8.80 meters in width. The church has only one entrance, located on the western side of the southern wall (Fig. 12). To the west of the old door, the wall has been demolished in a non-professional manner, and a new entrance has been opened with a concrete frame and an iron door. On the eastern side of the prayer hall, arched niches have been opened on both the northern and southern walls, with the northern niche housing a stone baptismal font (Fig. 12). As in other examples, jars have been embedded in the upper section of the eastern wall of the prayer hall to reduce the weight on the foundation and regulate acoustics. Only a small jar in the upper part of the entrance to the southern sacristy has been preserved. On both sides of the arched apse of the altar are rectangular sacristies. In various parts of the structure, small stones with engraved crosses are embedded in the walls (Fig. 13). The church has eight windows: two on the northern wall of the prayer hall, two on the southern wall, one on the western wall, and the remaining three on the eastern wall (Fig. 14). One of the two windows on the southern wall, the western one, was demolished during the opening of the new entrance (Fig. 7), leaving only part of the external arch. The altar is 0.7 meters higher than the prayer hall and has three steps on both the right and left sides. It is covered with a beautifully crafted dome made of fired bricks (Fig. 15). In St. Hovhannes Church, fired bricks were also used for the arched vault of the altar, the entrance door frame and decorative arch, the external arches of the windows, and the arched frames of the two niches in the prayer hall. The church walls, built entirely of adobe bricks from the foundation to the top, have an average thickness of 0.95 meters. The bricks used as building materials come in two main shapes: Rectangular (19.50 × 8.50 × 4.0 cm or 20.50 × 9.0 × 4.50 cm), Square: (19.50 × 19.50 × 4.0 cm or 20.50 × 20.50 × 4.50 cm). The interior walls are coated with a 0.8 cm thick layer of chaff-based mortar, which is then finished and covered with a layer of gypsum layer (Fig. 16). In some places, decorative painted patterns are still visible on the surface. The presence of double layers of gypsum layers in certain areas also indicates that the church has undergone at least one renovation. During the renovation, the interior decoration of the church was refreshed, and three logs were added along both the northern and southern walls of the prayer hall to help reduce the roof's weight on the walls. The new entrance, with concrete-framed sections, and the 0.43-meter-high and 0.26-meter-thick concrete layer poured at the base of the exterior walls, were

added in the early 2010s. To protect the altar and the preserved brick arche from weather damage, the eastern part of the church was covered with a tin roof. In recent years, the surrounding area of the church has also been improved and landscaped.

The preserved inscriptions and monuments of earthen churches are of particular interest from the perspective of their history and dating. These inscriptions are primarily carved on finely dressed and stylized tuff slabs, and in various instances, they are placed either on the entrance lintel (such as at the earthen St. Hakob in the village of Nerkin Dvin and St. Astvatsatsin in the village of Masis) or on the right side of the altar (such as at St. Hovhannes in Norashen and St. Astvatsatsin in the village of Mrganush). In churches that were repurposed as clubs or warehouses during the Soviet years, inscriptions and images of crosses have either been erased and cleaned (as at St. Asdvadzadzin in Masis) or, at best, covered with a new layer of clay-mortar (as at the second earthen church in the village of Getazat). The inscription stone bearing the construction year of St. Hovhannes's Church has been preserved (Fig. 17). It had fallen from its original place on the right side of the altar and is now located in the south niche of the prayer hall. The upper part of the stone features a cross, with an angel depicted on each of the top two sides. Below the cross, the construction year is written as "1872 year." Below that, the construction inscription reads: "I, unworthy servent Harutun, made this cross in memory of the Christ." It is unclear why, without any reference, the authors of the 2017 document on the monument's preservation zone date the church to 1883 (Norashen St. Hovhannes Church Preservation Zone Document, "Cultural Heritage Research Center" Archive).

From the perspective of studying earthen culture and its bearers, the tomb-yard of St. Hovhannes Church in Norashen is also valuable. The tomb-yard has preserved around 17 tombstones. The first row of five tombstones contains one with an inscription, which belongs to one of the church's priests, Ephrem Ter-Stepanosian (Fig. 18). The seven-line inscription is carved on the horizontal slab of the tombstone. The inscription reads: "This is the tomb of Ephrem the priest of Ter-Stepanosian, who passed away in 1899, on December 25, at the age of 40." On the northern side of the gravestone, there is a depiction of a four-arched arcade, while the western and southern sides are empty. On the western side, a stylized cross is depicted. The second and fourth tombstones are large, rectangular, finely dressed limestone slabs that have no decorations (Fig. 19). Considering the size of the stones and their distance from the Dvin archaeological site, they were likely brought from the 5th-century construction horizon of the Mother Cathedral of Dvin.

The third tombstone is a large rectangular tuff stone with no inscription. The upper part is empty, and a checkerboard pattern was later added. The eastern side has a carved rosette. The northern and southern sides are surrounded by rosettes with empty sections for inscriptions. The western side features a stylized cross similar to the one on the first tombstone. The fifth tombstone has inscriptions on the northern and southern sides, while the eastern and western sides are empty. On the horizontal slab, a cross is depicted, and below the cross, three weathered letters, likely "A M M," are visible. The inscription on the northern side reads: «Ծն. 1887 ամի 21 մարտի,/ վախճ. 1899 ամի 22 փետրու[արի]»"Born in 1887, March 21, / Died in 1899, February 22." On the southern side: "Eternal rest / prematurely deceased Artashes H. Harutyunyan of Yerevan, student of the Yerevan Spiritual Theological School" (Fig. 20). The first սամբսոնն of the second row has all four sides empty, with a cross depicted on the upper side and an empty section for the inscription. The second tombstone has a pedestal. On the western face, there is a rosette with a five-pointed cross, while the eastern face is empty. The northern face has two separate blank sections. The southern face bears a three-line inscription: "This tomb belongs to the deceased Hambardzum Arakelyan, b. 1893, May 5 – d. 1919, May 25." (Fig. 21). The third tombstone is an uneven flat limestone slab with a hole on the eastern side, likely intended for cutting the stone. The other tombstones in this row are uninscribed. Between the first and second rows of tombstones, there is a cylindrical tuff monument (Fig. 22), which is believed to have been brought from the Iron Age burial ground of Dvin. The tombstone with the most extensive inscription in the burial ground is located beneath the church's southern wall, to the right of the entrance. The southern face of this stone bears a six-line inscription: "This is the tomb of the deceased Harutyun Babakhan, brother of Ishak Mehrab Qrtic, who passed away in the year 1875, on February 12, at the age of 30. He was affiliated with the church of the same village named St. Hovhannes. He was a devoted friend, a protector of the poor, bore the name of mercy, and left behind a legacy of good deeds. Whoever encounters this tomb, may they say 'Lord, have mercy' and remember him in their prayers near the church." (Fig. 23)[1]. By comparing the church's dated construction inscription with the inscription on this tombstone, it can be concluded that the tombstone belongs to Harutyun, the builder of the church.

The early base located in the northeastern part of the church's prayer hall is also of interest (Fig. 24). This toroidal base is made of fine-grained white limestone. Bases of this type,

[1] We thank Arsen Harutyunyan for the support in reading two inscriptions.

characterized by a slab with a single shallow groove, were widely used in Hellenistic Armenia. Their rectangular slab dimensions vary, ranging from 30 x 32 cm to 70 x 70 cm (Kanetsyan 2020, 18). Similar base has been discovered in Dvin, Artashat, Vosketap, Etchmiadzin, and other historical sites, dating back to the 2nd century BCE (Kanetsyan 2020, 19). Comparable architectural details can be found in numerous other churches across the region, such as St. Astvatsatsin in Mrganush, St. Hakob in Dvin, and St. Astvatsatsin in Masis.

In general, the presence of architectural elements in earthen churches has been analyzed from two perspectives. The first concerns their practical application. Just as khachkars (cross-stones) and tombstones were repurposed as construction materials in newly built churches, early bases and other architectural details were also adapted for use in 19th–20th century earthen churches (Petrosyan 2007, 326). For instance, St. Astvatsatsin Church in Mrganush originally had three pairs of columns, with three bases still preserved at the site. Of these, two are antique, and one is medieval. One of the missing bases was replaced by a capital from the Garni Temple, which was later returned to Garni during the temple's restoration (Toromanyan 1942, 283). The second perspective considers early architectural elements that had no functional use in earthen churches. In such cases, the church functioned as a "unique open-air museum," where architectural fragments of historical interest, discovered in the surrounding area, were gathered and displayed (Petrosyan 2007, 333). Regardless of their intended function, the presence of antique and medieval anchors and other architectural details in the earthen churches of the Ararat Plain highlights the need for a comprehensive study and documentation of all earthen churches in the region.

The House of Culture of Getazat Village

In the pre-Soviet period, rural settlements typically had only one public center, usually formed around the village church, which was often the only "public" building. During the Soviet era, this center shifted, and the construction of public and cultural-domestic buildings became crucial for the architecture of rural settlements. The first buildings to be constructed included district executive committee offices, hotels, clubs, and other institutions. This construction process gained momentum in the 1930s (Mnatsakanyan 1956, p. 8). Before the construction of these new public buildings, confiscated churches and several residential houses were repurposed for community use in rural settlements. For instance, before the construction of Houses of Culture in

villages such as Getazat or Masis, the villagers used earthen churches for cultural purposes. The most common reuses of churches included storage for pesticides (e.g., the Church of St. Astvatsatsin in Mrganush) or, in the best cases, as food warehouses. Starting in 1935, many rural settlements received new urban plans, with several villages in the Ararat Valley being among the first to undergo this transformation (Mnatsakanyan 1956, p. 8). New Houses of Culture, schools, kindergartens, hotels, public-economic, and industrial buildings began to be constructed (Folian, 1933; Ghazanjyan, 1964). In the case of the Ararat Valley, most of these public buildings were initially made of earth. The most significant structures within the collective farm village's public center were the clubs, and their architectural design largely defined the character of the entire public center. The location and layout of the club became of primary importance since, as the central and defining structure of the rural public center, it had to be positioned centrally among other buildings. The club also required a well-maintained surrounding area where all artistic and aesthetic possibilities of the location could be optimally utilized (Mnatsakanyan, 1956, p. 151).

To present the House of Culture of Getazat village, we have prepared architectural measurements, conducted surveys, and collected photographic and aerial images. Additionally, we have studied the available literature and archival documents.

The monument was built in 1935, designed by architect G. Dokhsanyan (Fig. 25). The House of Culture is located at the center of the village and plays a key role in the settlement's urban layout (Fig. 26). The building is 28.60 m wide and 42.30 m long. The average thickness of walls is 0.65 m (Fig. 27/1). In terms of architectural composition and volumetric design, it belongs to the category of classical clubs built in the 1930s, designed to accommodate up to 300 people (Fig. 28). According to Soviet ideology, the overall architectural composition of clubs (Houses of Culture) had to reflect their socialist content, providing the best possible conditions for club activities. As products of their specific environment, they were designed to be simple, without unnecessary embellishments, truthfully expressing their ideological purpose while maintaining a close connection with both folk and national monumental architecture. The interior space of clubs had to be arranged in a way that ensured a logical sequence of architectural areas, integrating spatial and volumetric forms seamlessly. Each interior section of the club had to possess a distinct character (Mnatsakanyan, 1956, p. 152). Clubs played a significant role in the social life of Soviet villages. They served as gathering places for collective farmers to discuss and resolve key production issues, hosting general meetings of the kolkhoz. Additionally, clubs housed various

artistic and cultural groups, including theatrical, dance, and music ensembles, as well as other creative activities. Often, the village library was also located within the same building.

The House of Culture of Getazat village, built in accordance with local architectural traditions, is constructed from adobe bricks (Fig. 29). The building has a longitudinal axis stretching from the southwest to the northeast, featuring a complex outline and a single-story structure (Fig. 30). For construction, primarily square (26 × 26 × 7 cm, 28 × 28 × 8 cm) and rectangular (26 × 13 × 7 cm, 28 × 14 × 8 cm) adobe bricks were used. The foundations of the structure are made of rough-hewn stones. In various parts of the building, particularly around doors, windows, and load-bearing sections, a limited number of fired bricks were also used, with dimensions corresponding to those of the adobe bricks. To enhance the stability of the walls, horizontal wooden beams were embedded in different sections. The central part of the main southwest-facing façade features a recessed, niche-like entrance. The lateral sections of the façade each contain two vertically oriented rectangular windows. The façades are designed with simplicity, devoid of decorative embellishments (Fig. 31). The two main entrances located on the façade of the building lead into the vestibule. In terms of floor plan design, the vestibule serves as the central unifying space connecting the two main sections of the club—the theatrical and the club sections—around which the club rooms and the foyer are arranged. On the right and left sides of the vestibule are the kolkhoz office and the library-reading room. Later, after the construction of a new kolkhoz office, the right-side room was repurposed as the office of the Culture House director. From the vestibule, two entrances lead into the foyer, positioned between which was the ticket booth. The performance section of the club forms a cohesive architectural unit, consisting of the foyer, the auditorium, the stage, and four rooms arranged on three sides of the stage (Fig. 32). In this type of Culture House structure, the auditorium is positioned perpendicular to the building's main façade, with the foyer serving as an extension of the auditorium's shorter side (Mnatsakanyan, 1956, p. 162). The elongated foyer ends on both lateral sides with semicircular protrusions, each containing three windows that provide natural lighting. From the central part of the foyer, two entrances lead into the auditorium, with club rooms positioned on either side of these entrances. The 280-seat auditorium has a height of 5.50 meters and is illuminated by four high-set, small windows on each of the longitudinal walls (Fig. 33). The wooden flooring is absent in both the auditorium and the other rooms. Behind the stage, there are two rooms (one large and one small), with doors opening directly onto the stage. Additionally, there are rooms on both sides

of the stage, which, apart from their openings toward the stage, also have separate entrances leading to the courtyard. The auditorium itself has two entrances, each located on the longitudinal walls. All these entrances open into the village garden, with the Culture House standing at its center. This layout allows for a direct connection between the Culture House and the rural park. In the settlements of the Ararat Valley, where many club activities are held outdoors during the summer months, it is essential for the Culture House to be integrated into the club's surrounding space (Mnatsakanyan, 1956, p. 42). The village park of Getazat surrounds the House of Culture on all sides. During the Soviet period, rural parks were among the most popular recreational spaces for collective farmers. The park's proximity to the club allowed for various cultural events to be held outdoors (Mnatsakanyan, 1956, p. 51). On either side of the House of Culture main façade stood statues of Lenin and Stalin, with a tree-lined pathway between them leading from the Culture House to the central street. After Stalin's death, his statue was removed, and in its place, a memorial for those who perished in the Great Patriotic War was erected in 1985. Lenin's statue remained until the collapse of the Soviet Union, after which it was also removed. However, its pedestal still stands in its original location. Over time, additional memorials have been added to the site (Fig. 34). A khachkar (cross-stone) and commemorative plaques honoring the fallen soldiers of the First and Second Artsakh Wars have been placed alongside the Great Patriotic War memorial (Fig. 35).

The House of Culture of Getazat village underwent significant renovation in the 1970s (Fig. 27/2). During this period, a large number of new culture houses were built across the country. According to local testimonies, another culture house, similar in proportions to the Getazat Culture House and made of earth, existed in the village of Verin Artashat (Ethnographic survey, interview, 13.12.2024). The latter was demolished and replaced with a new culture house made of pink tuff, with a curved floor plan and a 400-seat audiorium, designed by the architect G. Tamanyan (Mnatsakanyan 1956, 184, 186). As a result of the renovation, a roof made of pink tuff was added to the building, and the roof of the structure was also replaced. Inside, the floor of the foyer's perimeter areas was raised, and the right-side entrance leading to the auditorium was closed off. A concrete gallery, supported by two columns and six pilasters, was added behind the auditorium for a projection room (Fig. 33). To access the gallery, stairs were added in the area where the right-side, closed-off entrance from the foyer leads to the auditorium (Fig. 36). A full cosmetic renovation was also carried out. The Getazat Culture House continued to operate with its 1970s renovation until a fire in the 2010s, which led to the abandonment of the building. During this

period, a large room located behind the stage was destroyed in the fire, and the stage area of the building collapsed. The roof of the same section also caught fire (Fig. 37). After the fire, the building's various sections continued to collapse to this day. In 2018, a monument certificate for the building was issued (Certificate of the Culture House of Getazat village, Ararat region, "Scientific Research Center of Historical and Cultural Heritage" SNCO archive). The building is currently in a state of emergency and poor condition.

Conclusion

The use of earth as a building material in the Ararat Plain dates back to the Neolithic period and has traditionally persisted into the present day. The earthen heritage of the 19th and 20th centuries represents a distinctive phase, which includes new types of residential, economic complexes, churches, and public buildings.

For the study and presentation of this phase of earthen heritage, we have highlighted one example each of residential, religious, and public structures from various settlements in the Ararat Plain. Until the 1950s, earth was the primary construction material used in architecture. From the 1950s onward, various types of stones began to be incorporated. Today, more than two dozen churches and chapels, a dozen public buildings, and thousands of residential complexes remain in the region. Unfortunately, many of these structures have not been properly studied or presented in scholarly literature. Given that earth is no longer used in contemporary architecture, the research and conservation of these earthen complexes becomes a critical professional issue, especially for the fields of public archaeology, historical architecture, and community ethnography. Such research is essential to document this unique phase of architectural culture in the new era.

Our research is based on the application of integrated methods from the aforementioned scientific fields. From the methodology of public archaeology, we have primarily used stratigraphy, mapping, epigraphy, and chronology. In terms of historical architecture methodology, we have employed the use of documents and archival materials, as well as architectural examination of preserved structures. From the perspective of community ethnography, we have utilized interview techniques, observation, and expert surveys.

Let’s summarize the results of the research in several key points: Earthen Heritage Distribution: Earthen heritage is found in settlements across Armenia's Syunik and Vayots Dzor

regions, but it is most prevalent in the Ararat Plain. As previously mentioned, this distribution is largely due to the resettlement of a significant number of Persian Armenians to these regions in the first half of the 19th century. Under the influence of Iranian culture and the lack of alternative building materials, earth became the primary construction material. This was not only cost-effective and easier to build with, but also more adaptable to the local climate.

Current State of Earthen Structures: Despite the fact that earth is no longer used as a building material in contemporary architecture, it is important to note that many earthen structures have been preserved and still hold functional significance. In the examples we studied, the structures have not been under special preservation since the second half of the 20th century and have been subjected to both natural and man-made disasters. Nevertheless, the majority of these structures remain intact and could be restored using the same methods that were originally employed in their construction. The conservation of these structures is one of our main recommendations, which should be addressed by both the Ministry of Education, Science, Culture, and Sports of Armenia and the State Agency for the Protection of Historical and Cultural Monuments, as well as local authorities.

Trend of Demolition or Covering with Other Materials: During the research, we observed a concerning trend where the owners of earthen heritage structures are demolishing or covering valuable examples of earthen heritage with other materials due to the lack of restoration techniques and practical methods. As a result, many valuable examples are being lost. To address and reverse this trend, we propose granting heritage status to certain earthen religious and public structures, as well as placing several valuable earthen residential and agricultural complexes under state protection.

Community Memory and Cultural Identity: The research, particularly interviews with local residents and observations, revealed that public and spiritual-cultural buildings (the churches and cultural centers we studied) are key elements of community memory and cultural identity. These structures are not just partially preserved architectural samples; they are also representations of the collective memory of the community. Preserving and protecting them would allow for the exploration and dissemination of the pre-Soviet and Soviet traditions, practices, and oral histories of the community. At the same time, both the church and the cultural center clearly demonstrated the community's need for these buildings to continue functioning. In the case of the church, the

community expressed a need for a spiritual center, while the cultural center was seen as necessary for the realization of recreational and cultural activities.

Promoting Ecologically Sustainable Architecture: The study of earthen heritage could also contribute to promoting the use of this eco-friendly and affordable building material in future architectural practices.

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2. Certificate of the St. Hovhannes the Baptist Church of Norashen village, Ararat Province (3.69.5), Scientific Research Center of Historical and Cultural Heritage SOE Archive.
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List of Figures

The Historical Urban Landscape of Ordubad: Restoration of Monuments, the Role of Gardens, and the Kahriz Water System

Authors: Gulnar Aliyeva, Gumru Mirzaliyeva, Nasib Zeynal

Research Methodology

1. Examination of historical records

A literature review on Ordubad's architecture was conducted, focusing on sources about Nakhchivan and Ordubad's traditional architecture.

Local studies and books were examined to understand the region's architectural identity, conservation status, and restoration processes.

2.On-site observation

Field observations in Ordubad focused on the architecture, materials, and landscape. Traditional construction techniques were documented through photos, and interviews with locals offered insights into history and restoration.

3D scans of traditional houses were made, and the kehriz water systems were analyzed for their structure, function, and preservation.

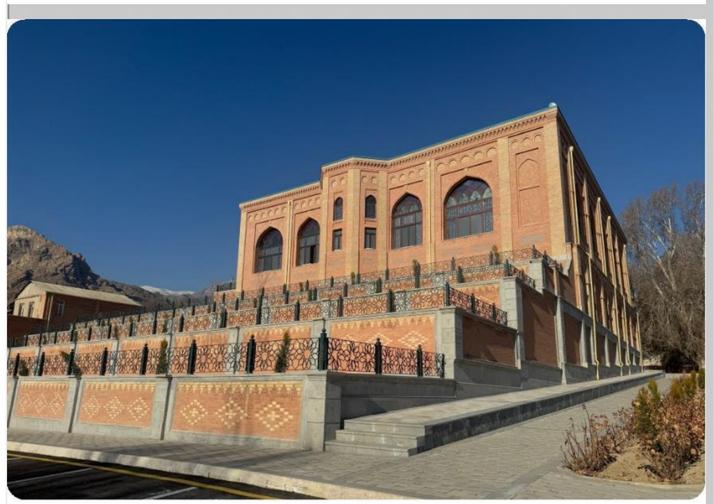
3.Documentation

The documentation was carried out under three main headings: First, incorrect restoration methods and their impacts on structures were examined.

Second, the use of gardens in historical Ordubad houses was investigated, focusing on the traditional Eastern garden concept. Lastly, the kehriz irrigation system was analyzed, including its structure, water supply, and irrigation functions.

Examples of Incorrect Restoration in Ordubad

1.Geysariyya



2.Juma Mosque

3.Ordubad Bath

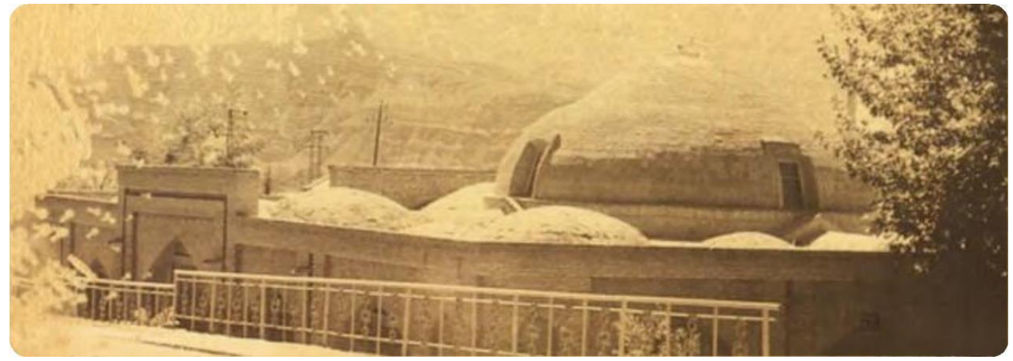
Examples of Incorrect Restoration in Ordubad

The Case of Geysariyye:

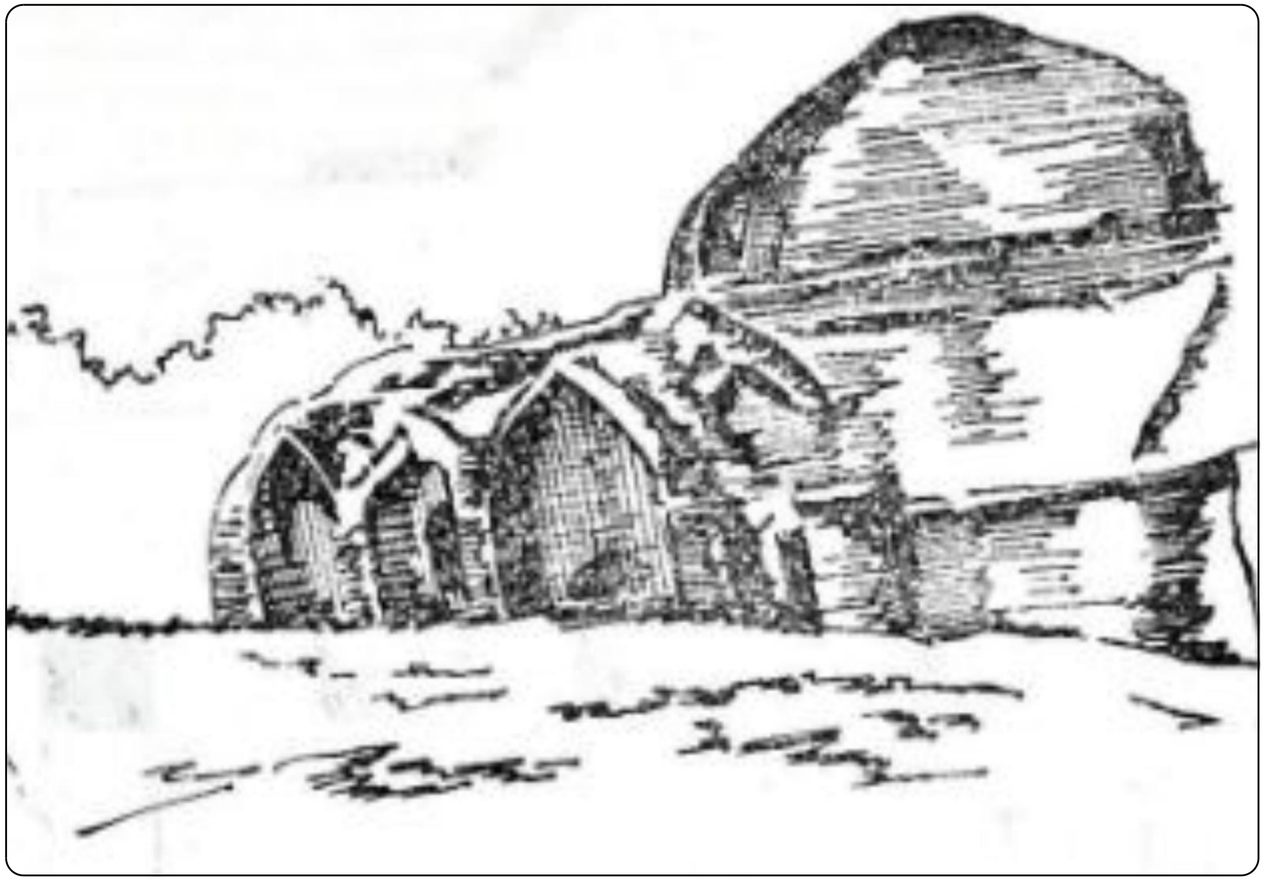
The 17th-century Geysariyye Monument in Ordubad, Nakhchivan, features a large central dome and 16 smaller domes. Built under Shah Abbas for gold and jewelry trade, it later served various cultural and commercial purposes. Restored in 1978 and 2010, it now houses the History-Ethnography Museum of Ordubad.

Over time, it served various functions:

- Zurkhaneh (traditional gym): Hosted wrestling competitions.
- Literary Assembly: In the 19th century, it was a meeting place for the “Anjumani-shuara” literary group.
- Silk Workshop: Used for silk production in the 20th century.



The form of the Geysariyya building in the 1980s.



Sketch of the building's condition before restoration, 1965.

Wrestlers' training in the Zorkhana.Lithograph by an unknown European traveler, 19th century.

Wrestlers' training in the Zorkhana. Artist: Gaspar Drouvel. 1912-1913.

Examples of Incorrect Restoration in Ordubad

The Case of Geysariyye

1. Volume analysis of the building's form before first restoration.

Main dome

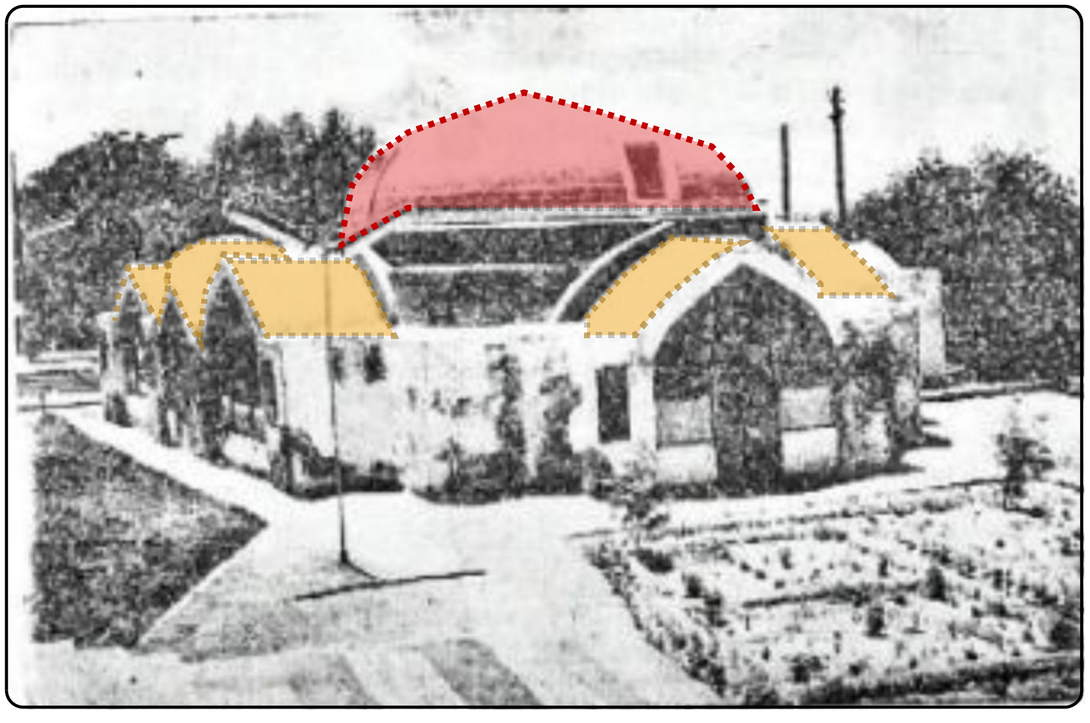
Facade contour

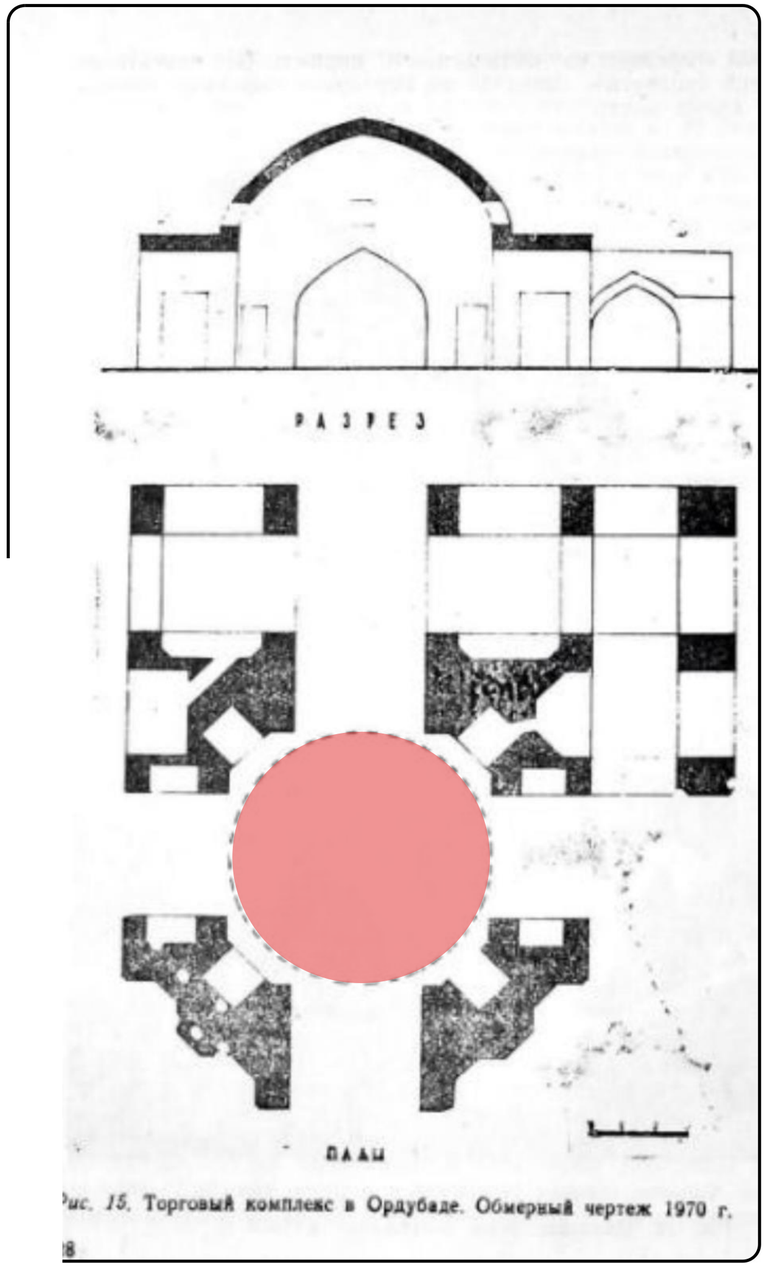
Before restoration Geysariyya building

2. Volume analysis of the building's form after first restoration.

Main dome

Small domes





As-build drawings Geysariyya (1970)

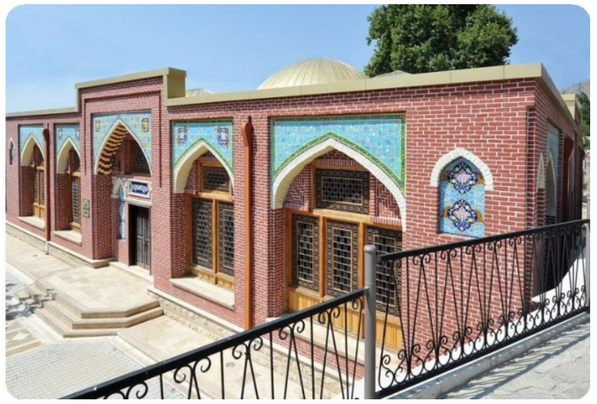
Examples of Incorrect Restoration in Ordubad

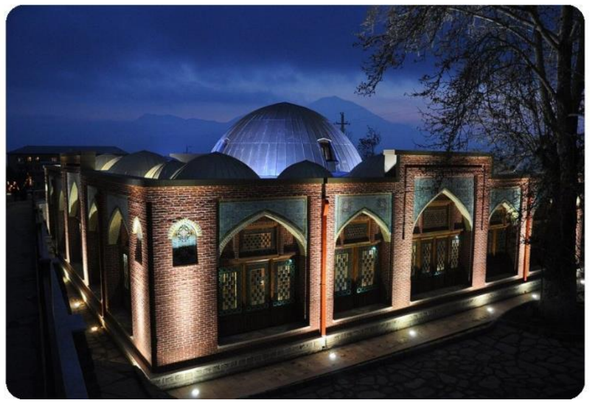
The Case of Geysariyye

The current state of the Qeysariyya building shows that it has undergone significant changes due to improper restoration. At present, major interventions have been made to its volume and façade. In particular, the building has been clad with brick facing that does not conform to its original structure, disrupting its historical appearance and material harmony.

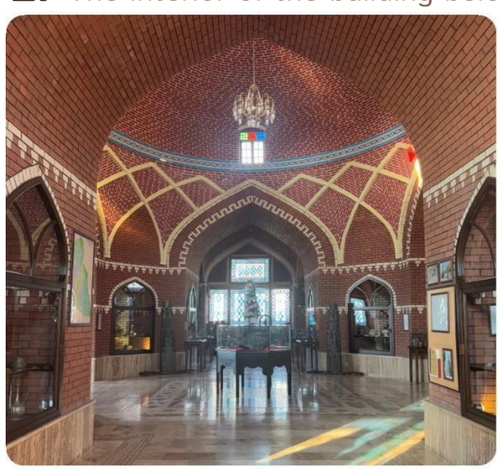
Moreover, since Qeysariyya is located within the historical urban fabric, preserving the surrounding green spaces, paving materials, and open areas is crucial. Unfortunately, these aspects have not been considered, causing the building's surroundings to lose their visual and functional authenticity.

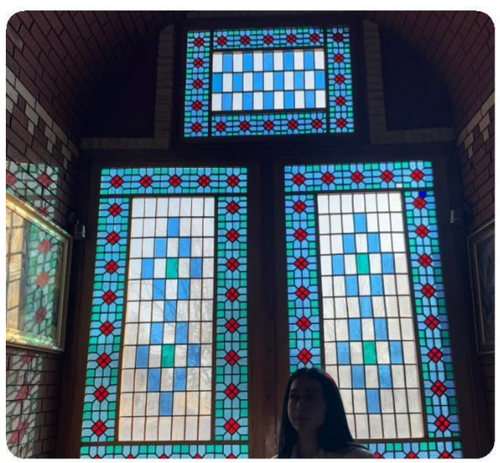
1. The current façade appearance of the building below

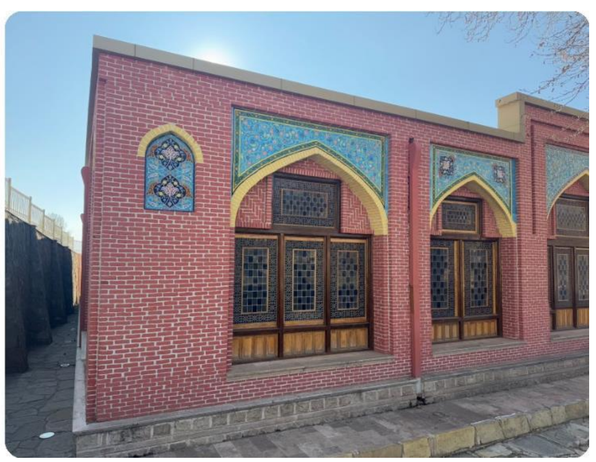




2. The interior of the building below

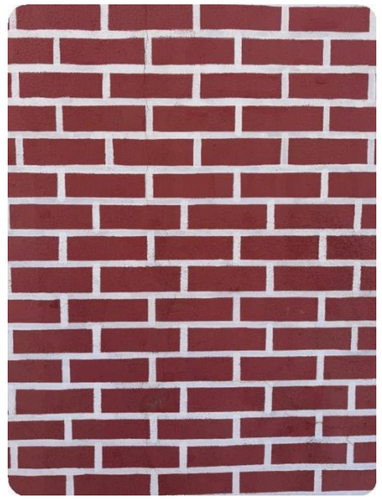


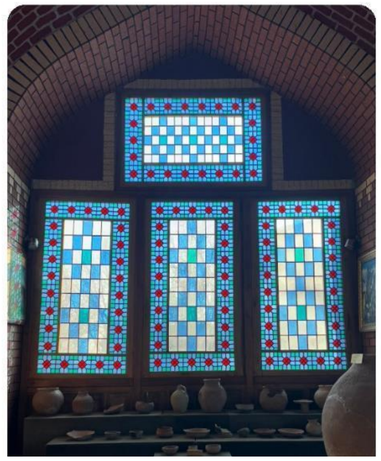


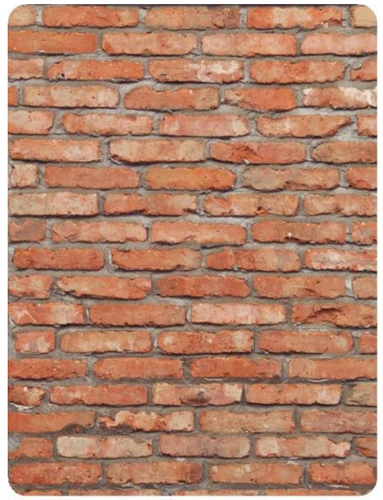


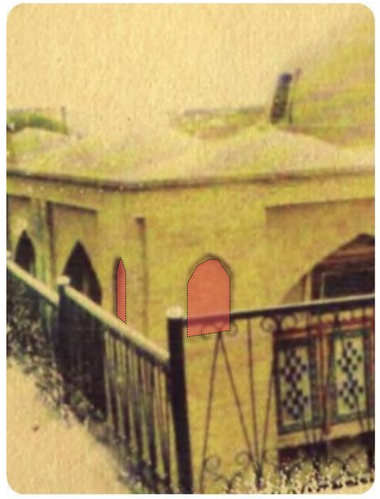
Examples of Incorrect Restoration in Ordubad

The Case of Geysariyye









1.

The building was originally constructed with fired brick, but decorative facing brick was used during restoration. This has significantly damaged the building's overall historical appearance.

The façade niche has been decorated with modern tiles, though pre-restoration images show it empty. Whether this is characteristic of Ordubad architecture remains under study.

The shebeke (or stained glass vitrage) was not restored in accordance with the traditional Azerbaijani pattern.

4.

Decorative brick

inappropriate decor

The use of MDF

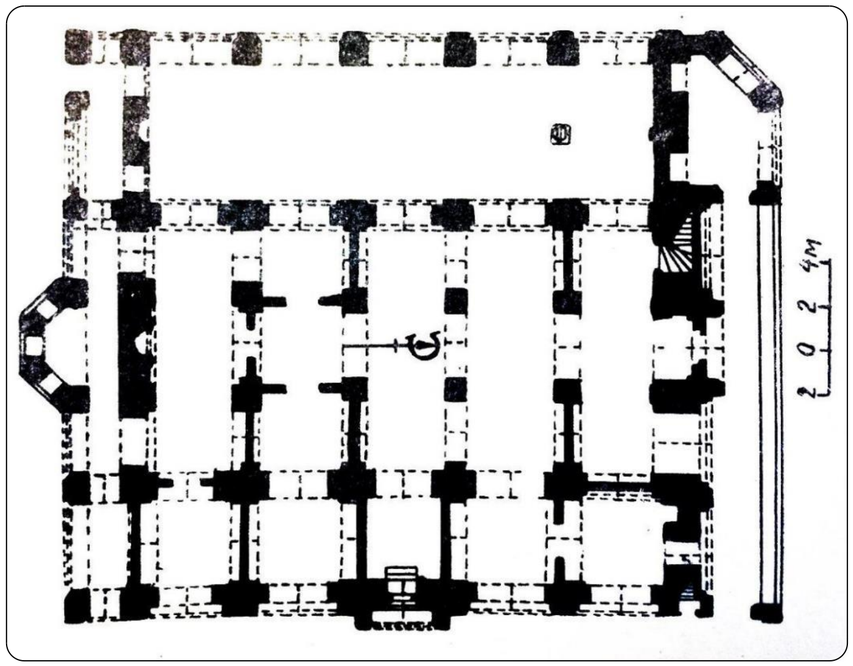
The wrong approach in the interior design has damaged the building's historical integrity and visual identity.

Examples of Incorrect Restoration in Ordubad

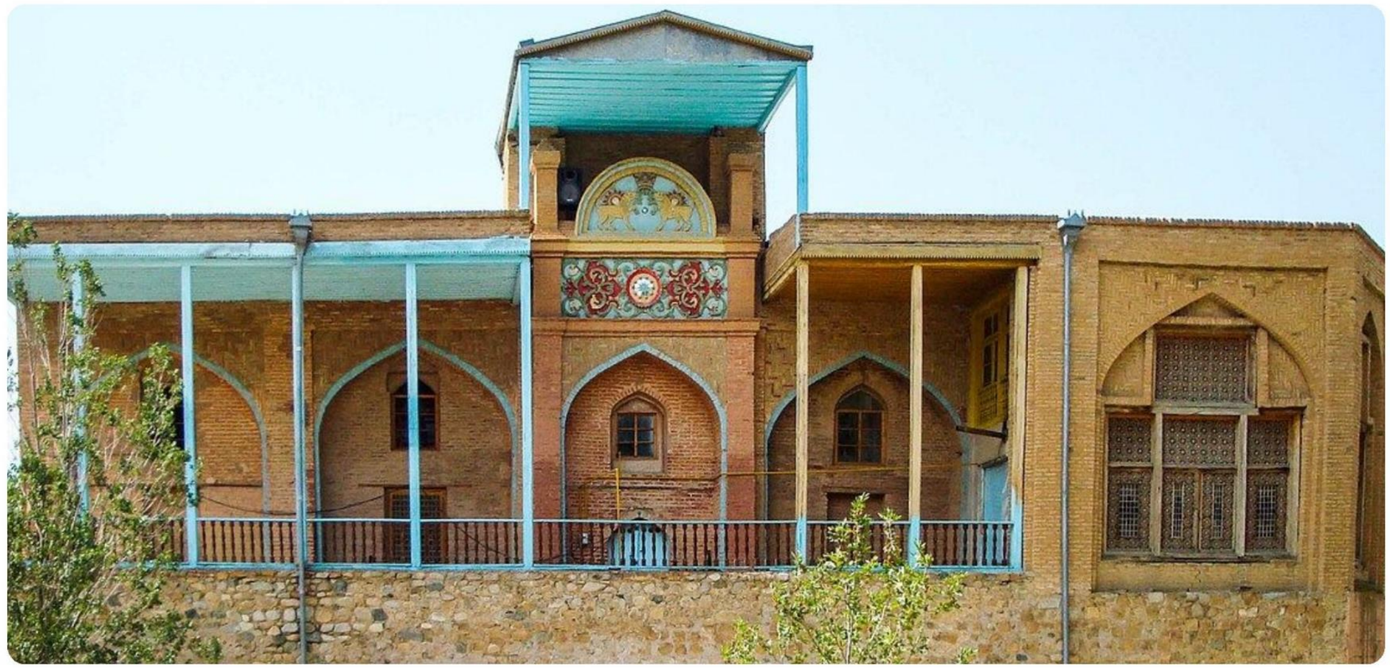
The Case of Juma Mosque:

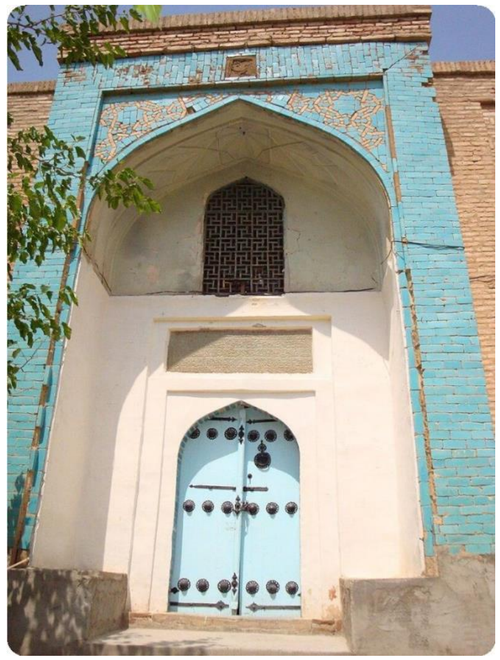
The Ordubad Juma Mosque, shaped by multiple construction phases, took its current form in the early 17th century. An inscription on the eastern gate records Shah Abbas I's 1604 decree for its construction. The mosque's oldest part is the three-nave central prayer hall, built on a sandstone-clad rock, giving it a grand presence despite its moderate height.
Except for the domed central hall, the roof is flat. The façade, characteristic of 17th-century Safavid architecture, features deep arched niches within rectangular frames. The walls are made of sandstone and faced with baked brick.

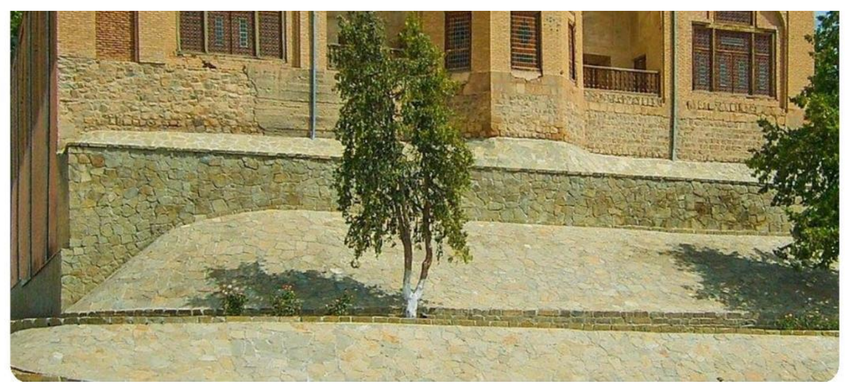
1. Floor Plan of the mosque



2. The mosque before restoration







Examples of Incorrect Restoration in Ordubad

The Case of Juma Mosque:

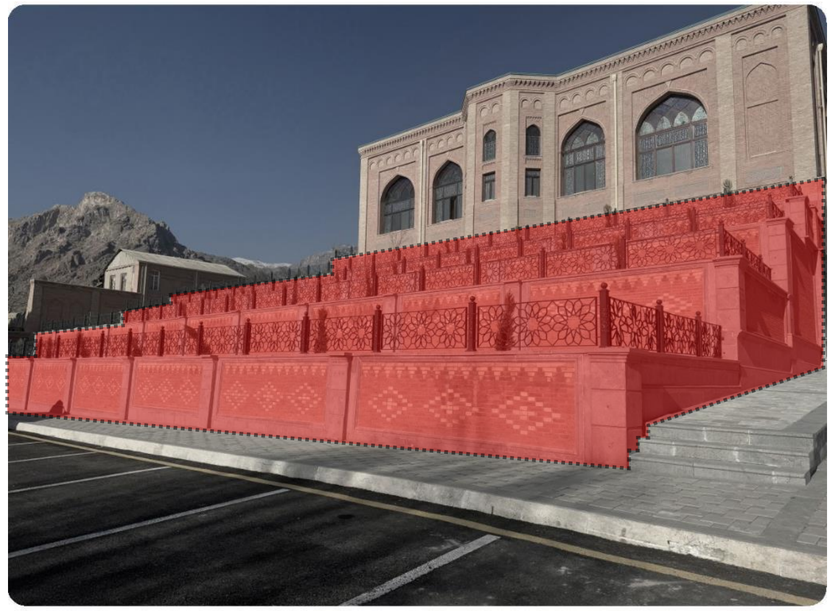
1. The condition of the structure before the last restoration

In the condition of the Ordubad Juma Mosque before the last restoration, we can see how the building impacted the landscape without the influence of the additional volume.

2. The current condition of the mosque

The Juma Mosque, located on the main street of Ordubad at a higher elevation, is a monument that significantly impacts the cityscape. The terrace-style extension added during the recent restoration, which serves no functional purpose, has a catastrophic effect on the volume of the structure.

The volume of the added structure

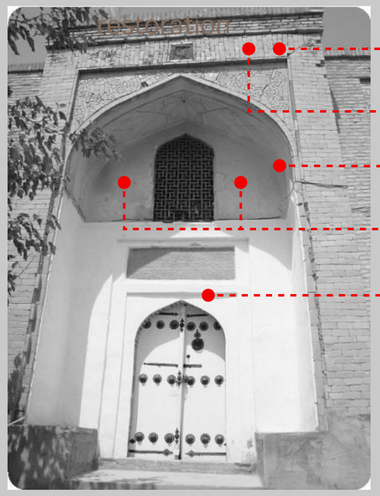


Examples of Incorrect Restoration in Ordubad

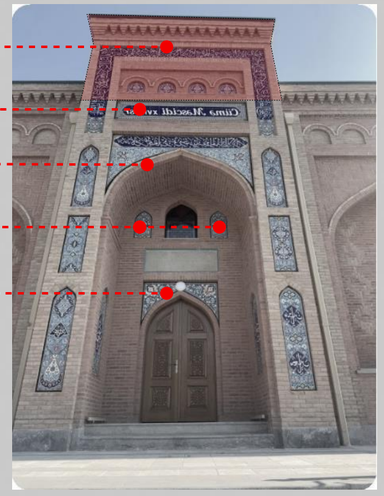
The Case of Juma Mosque:

1. Differences in the entrance portal

Before restoration



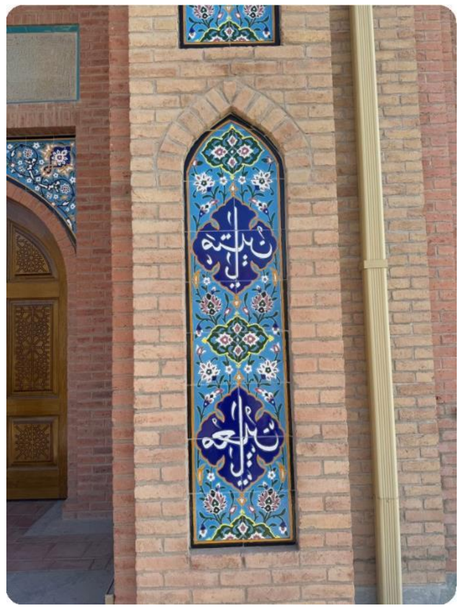
After restoration



- In the pre-restoration image, the portal appears smaller. During the restoration, it was elevated.
- In the pre-restoration photo, there are no niches on either side of the window opening above the door.
- The inscription "Cümə Məscidi" is in Latin script, while the writings on the plaque are in Arabic.
- A modern ceramic detail is present above the door, and the materials used in the portal are different overall.

2. Mistakes made during the restoration process

1



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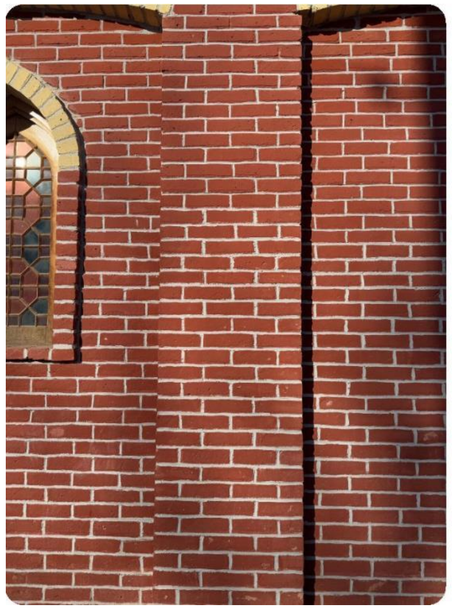

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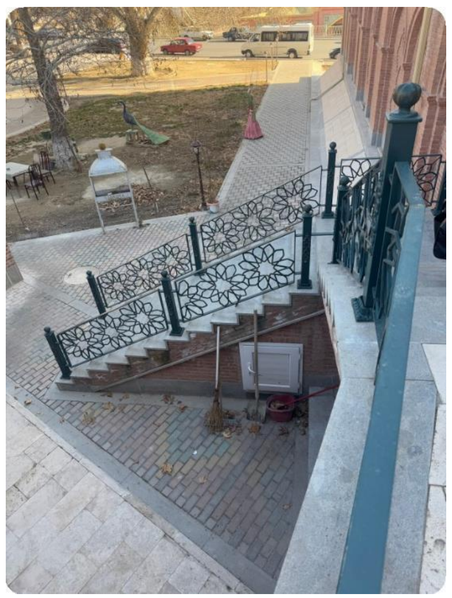


5

6

1. Facade decoration incompatible with Ordubad architecture
2. The Shabaka has been made using an incorrect technique
3. Brick was used as cladding instead of a structural element
4. A completely incompatible grille element
5. Use of incorrect facade material
6. Technical factors causing visual pollution

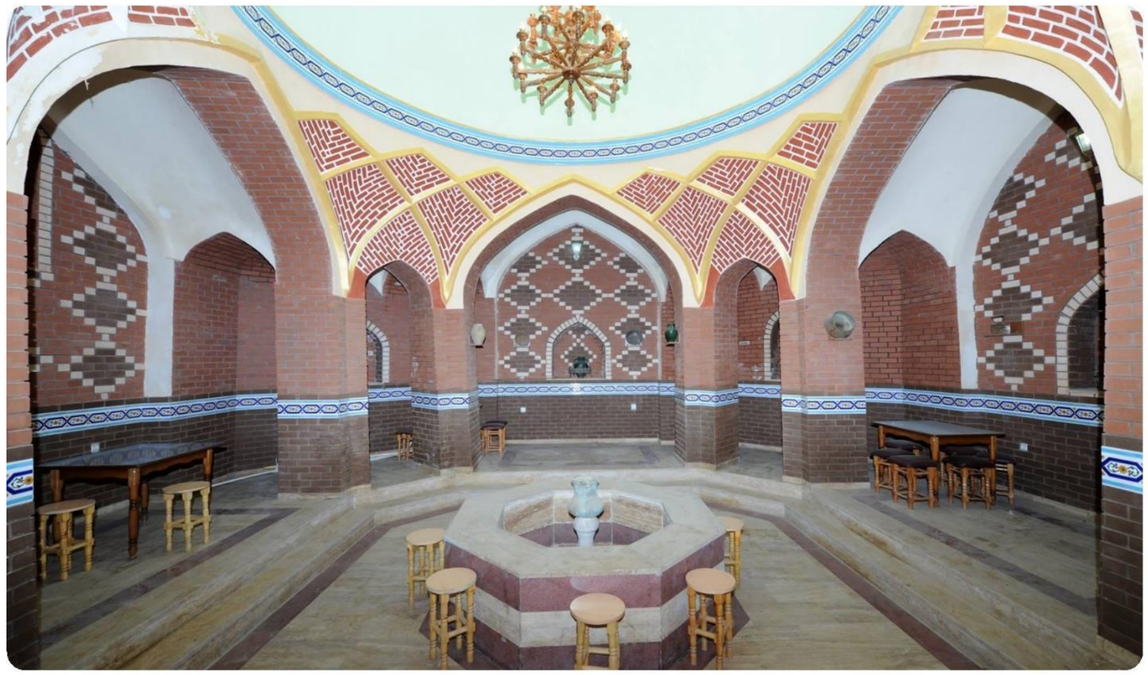
Examples of Incorrect Restoration in Ordubad

Ordubad Bath house:

A historical architectural monument built in the Oriental architectural style in the 18th-19th centuries in the city of Ordubad.
The total area of the hamam is 483 m², with walls 1 meter thick.During the restoration of the Ordubad hamam, similar mistakes observed in other historical monuments were repeated. Key issues include the use of decorative facing bricks, the replacement of original materials with inappropriate modern alternatives, and alterations to the overall volume of the structure. These changes have compromised the architectural authenticity and historical identity of the hamam.
Discussions with local residents revealed that the hamam originally contained small private cabins, which were removed during the restoration process due to modifications in the building's layout. As a result, the historical functions and traditional usage of the hamam have been entirely lost. This approach to restoration has not only affected the architectural integrity of the monument but has also diminished its social and functional significance.

1. Facade views of the Ordubad hamam after restoration below.

2. Interior views of the Ordubad hamam after restoration.



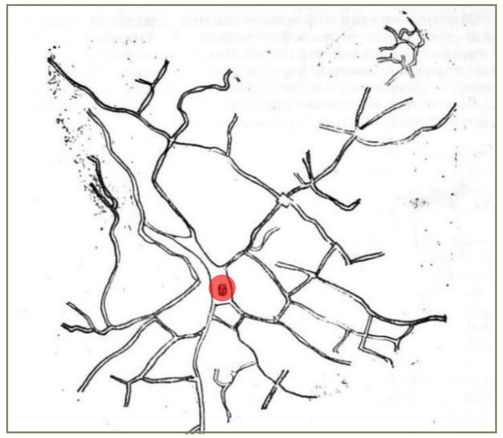
Garden Usage of traditional Ordubad house

Garden Usage of traditional Ordubad house

Understanding of urban values at the Heritage Site

Urban texture of Ordubad

neighborhood

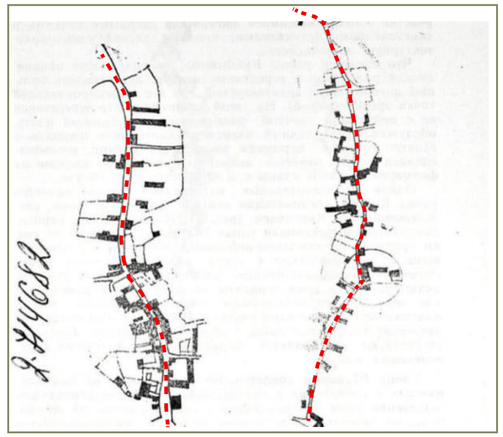


Urban pattern, organic mahalla structure

Mosque in the center of mahalla

The city formed by the structure of neighborhoods in Ordubad shows a natural organic type of spread. The main reason for this type of formation is caused by underground water resources. Another important factor that forms the structure is the house unit.

center

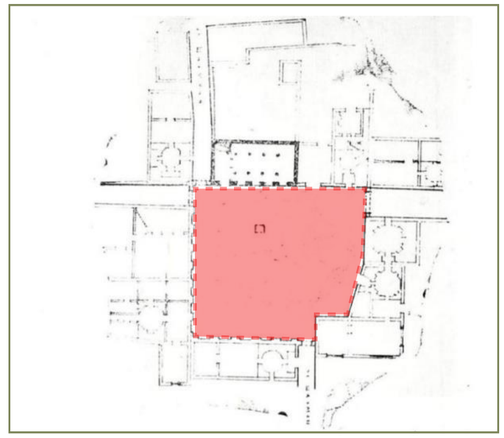


Spine type development and fortification of old street

1. Main streets

The main public buildings are distributed along the main streets. The reason for this type of devolopment is that Ordubad was a well-known trade town in the Middle East.

square

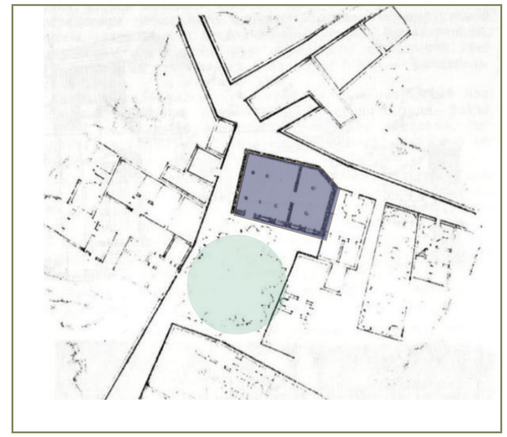


Considering border of neighborhood square

Plan of Ser Shekher quarter

House modules combined with their own inner gardens create small squares similar to home gardens in neighborhoods.

ensemble



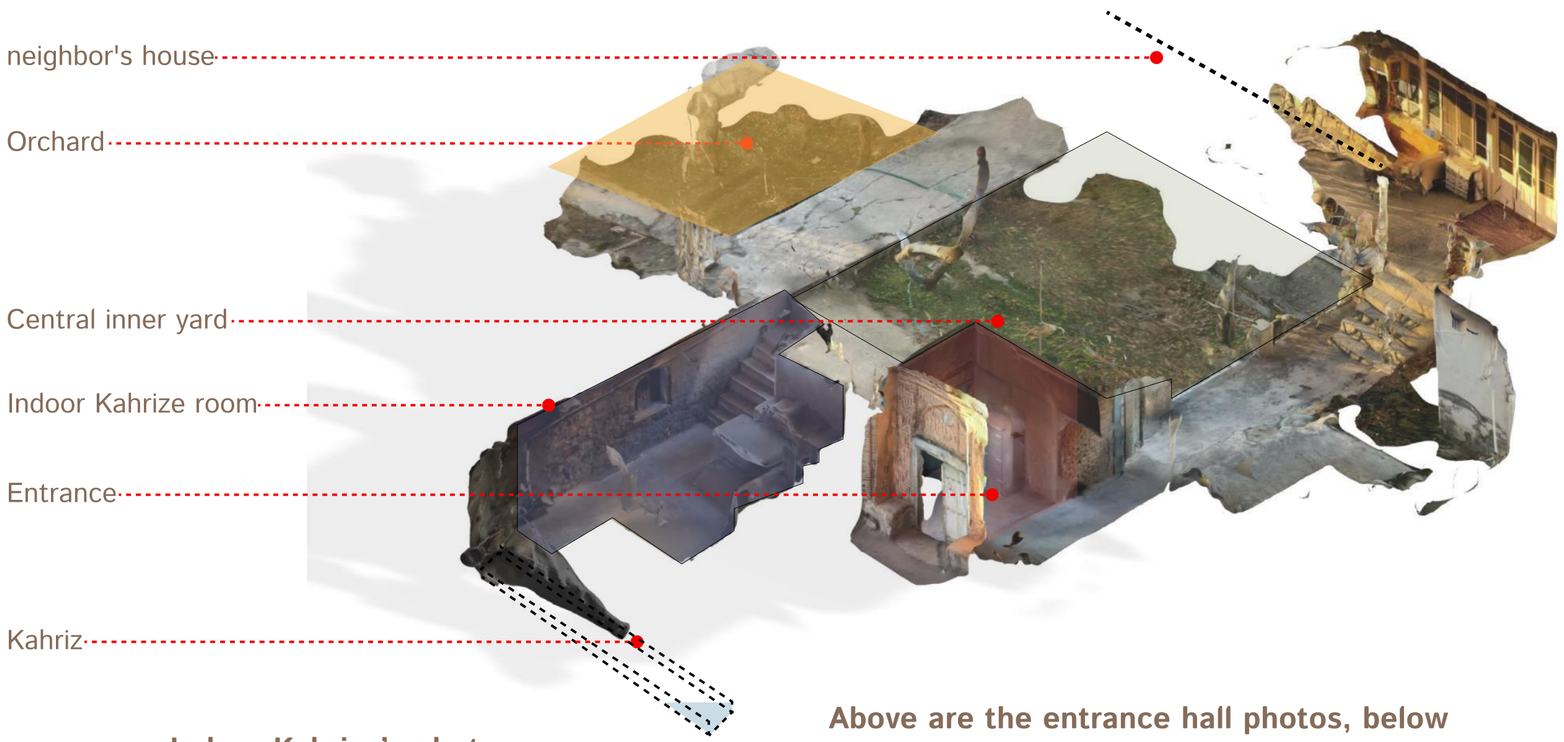
Eastern ansamble
Considering square, mosque, 100 years old plane tree combination

Plan of Mingis quarter center

The combination of mosque, square, spring and plane trees, which are the characteristic urban ansamble in our historical cities like Sheki and Ganja.There are located in front of mehelle mosques or bathhouses with combination of springs and plane trees.

Garden Usage of Traditional Ordubad House

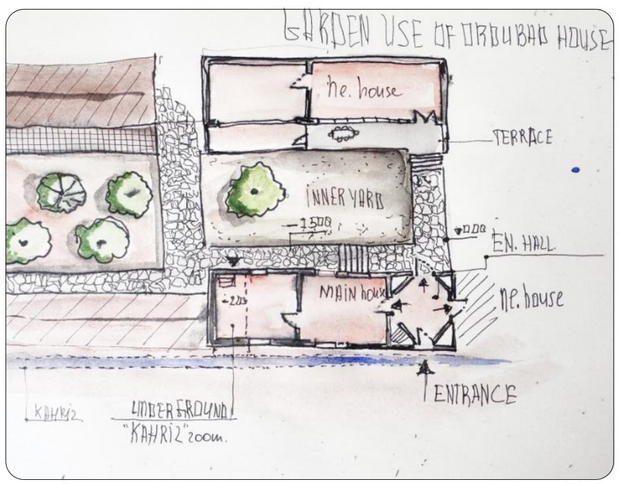
The first house example



In Ordubad residences, a shared entrance leads to the same garden, fostering strong familial and neighborly ties. In the first example, the kahriz system is not only essential for water supply but also plays a crucial role in cooling the house naturally and irrigating the garden.

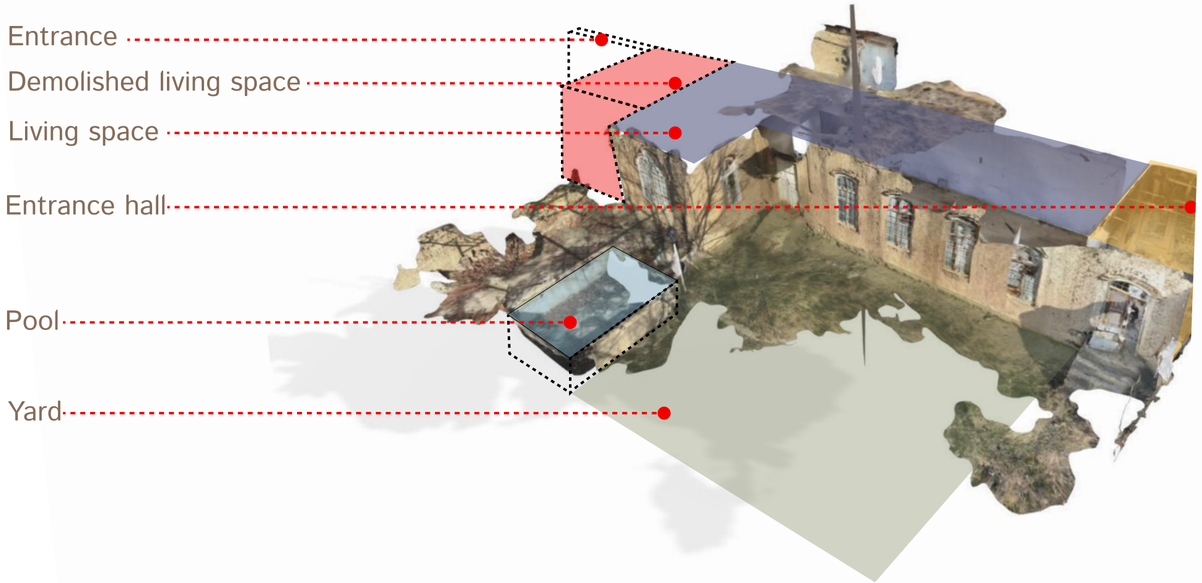
Indoor Kahrize's photos

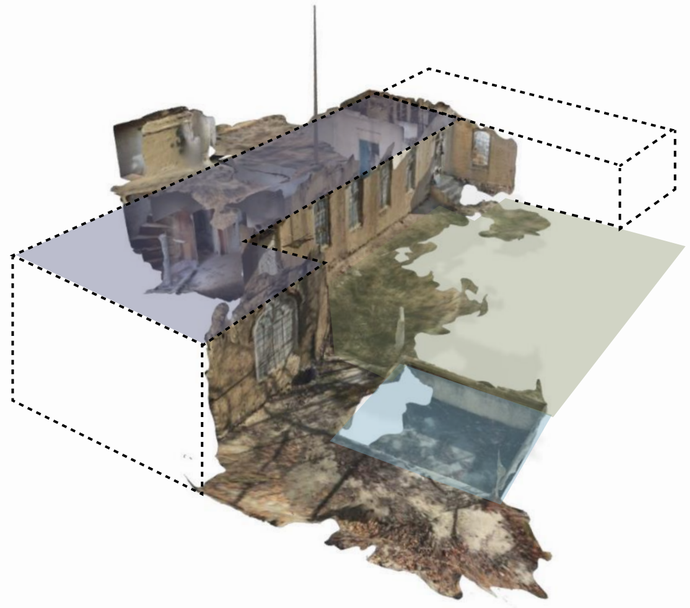
Above are the entrance hall photos, below are the indoor garden images



Garden Usage of Traditional Ordubad House

The second house example

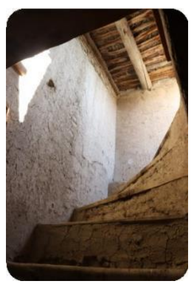


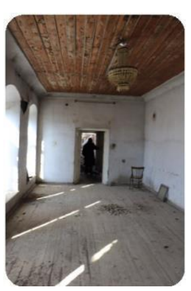


Old pool photo

Facade photos

İnterior photos





Sketch of floor plan

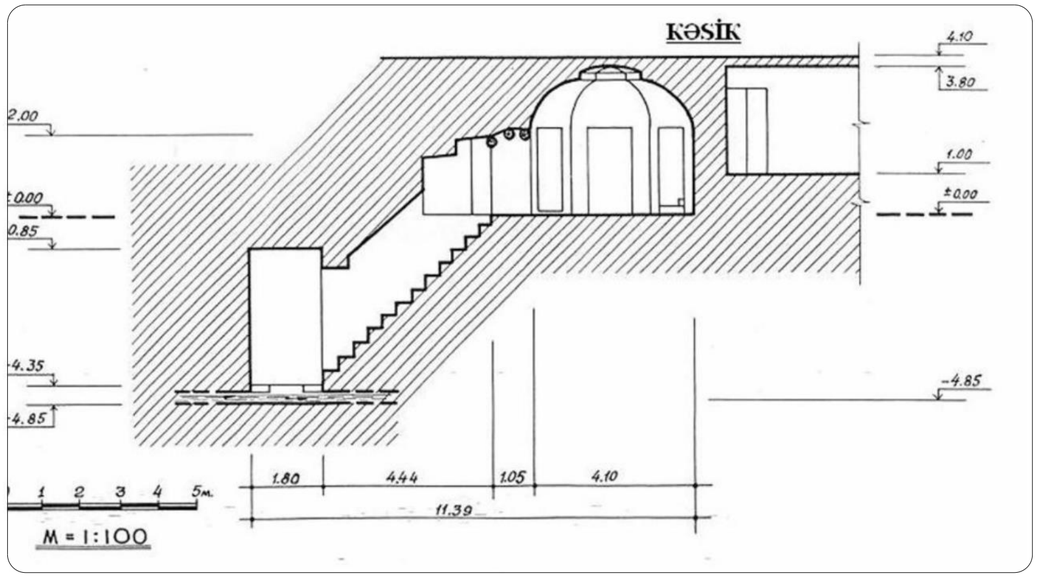
Current status of the kahriz system in Ordubad

Unterstanding of urban value of kahriz in Ordubad

Urban elements at the above and below ground (Kahriz and fontain)

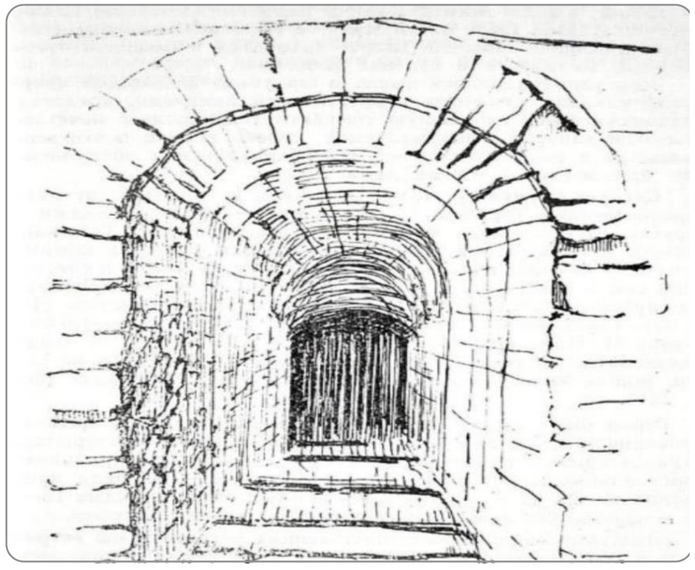
Kahriz water supply system of Ordubad

Kahriz is a system for transporting water fro an aquifer or water well to the surface, through a underground aqueduct. In the territory Azerbaijan, there are many kahriz belonging to th ancient and middle ages. The obtained historic facts allow us to attribute the history of thes water systems to 2000-2200 years ago. Accordin to the data of 2019, there are 36 kahriz and 56 wells in Ordubad. Kahriz water systems, which ar still working today, should be protected as the mai lifeblood of the city, as well as springs, which ar located in the main mahalla squares.

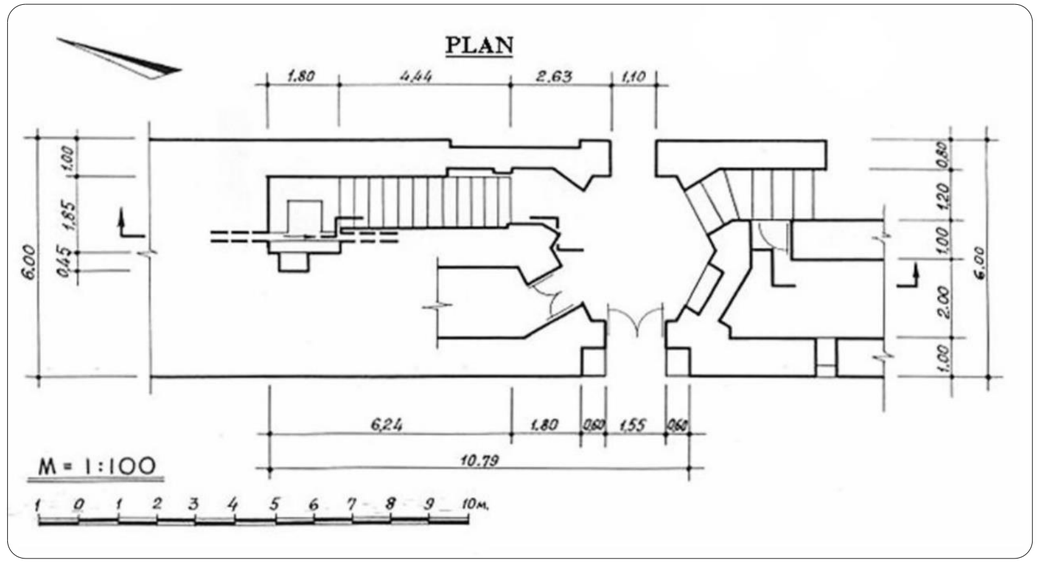


Kahriz tunnel

Kahriz cheshme



Sketch of the Ordubads Kahriz entrance



Plan and section of Abbasbay Kahriz

Kahriz cheshme

Kahriz gırkhpilla

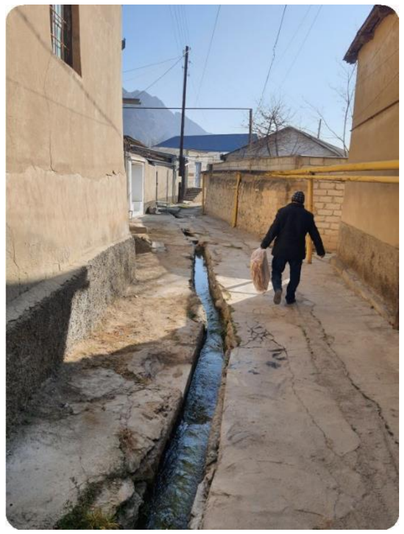
Current status of the kahriz system in Ordubad

Kahriz water supply and some disturbution points

Currently, the Kahriz system

The Kahriz water system in Ordubad was observed, focusing on its functionality and current issues. Water flow continues along the Kahriz, with distribution points partially visible along the main street connecting historical neighborhoods.
In the Sərşəhər neighborhood, a Kahriz point in front of the mosque serves as a key distribution site, where locals collect water daily. In Mingis, the Kahriz is located below the mosque, requiring access via steps, but due to lack of maintenance, the water flow has stopped.

Similarly, the Qırxayaq (Qırxpillə) Kahriz in Angach faces maintenance issues, disrupting its function.
Kahriz access points are mainly in neighborhood squares, with main pipelines running along major streets. Some structures are beneath houses or pass through yards. Despite its age, the Kahriz system remains a crucial source of clean water for Ordubad's residents.



The Kahriz lines along the main streets between neigherborhoods

A distribution point of the kahriz water supply system

The Kahriz line that flows under the residential house

A Kahriz access point covered with an iron lid on streets with vehicular traffic

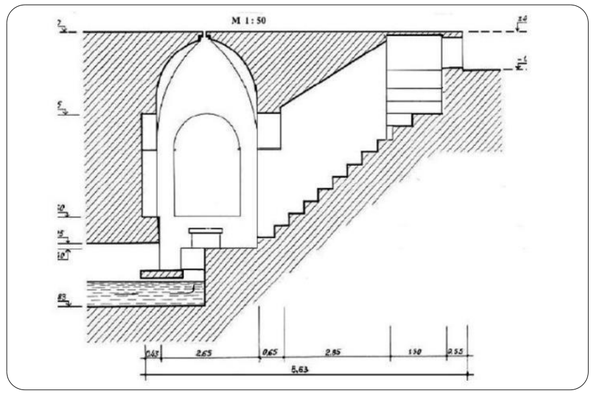
Current status of the kahriz system in Ordubad

Kahriz point at the Ser-Shahar Mosque

In front of the Sərşəhər Mosque, two different typologies of the Kahriz system can be observed. One of them is an access point known as Qırxpillə, where a stairway leads down to a deeper section of the Kahriz. The other is an above-ground typology, functioning as a fountain. This fountain also serves as a junction and distribution point, where pipelines from the upper neighborhoods converge, and water is further distributed to the lower neighborhoods.

During the site visit, it was noted that this location is one of the most frequently used water sources by the residents of Ordubad. Additionally, due to its architectural typology, the Sərşəhər fountain is a favored attraction for visitors.

This Kahriz access point was in good technical condition, requiring only regular annual maintenance. It is actively used by the local community, and when major issues arise, the residents themselves take the initiative to resolve them.



Sersheher QırkhpillaSection and plan

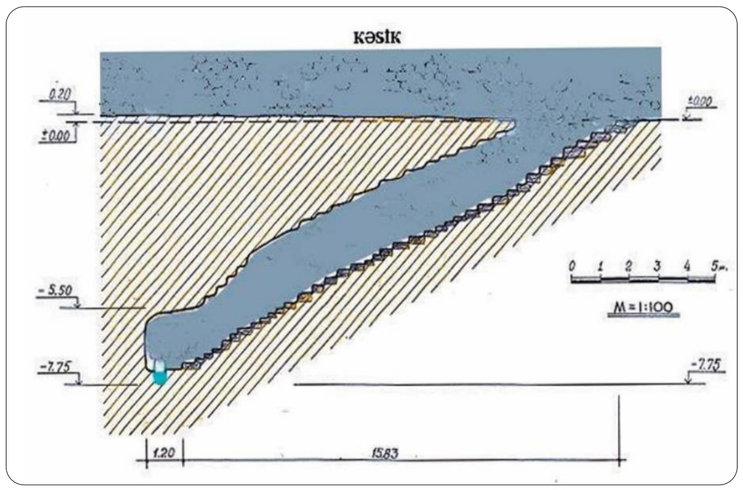
Sersheher Cheshme

Current status of the kahriz system in Ordubad

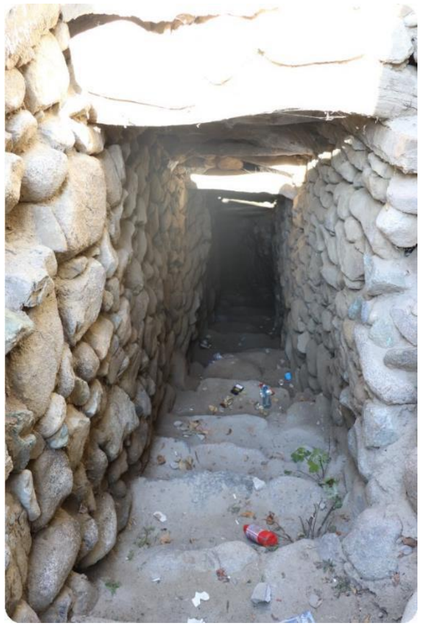
Gırkhayag kahriz

The Qırxayaq Kahriz is located in the Əngis neighborhood of Ordubad, at an approximate depth of 8 meters. Unfortunately, during the winter months, it remains neglected due to the migration of local residents to Nakhchivan city center and Baku. However, upon the community's return in the summer, the Kahriz undergoes cleaning and is restored for use.

The overall condition of the Kahriz is assessed as good; however, waste disposal by children at the staircase section has been observed. Additionally, partial blockage and malfunctioning of the system in certain sections lead to water shortages in the lower-lying neighborhoods. To prevent such disruptions, regular and continuous maintenance is essential.



Section sketch of Gırkhayag kahriz



The current condition of the Gırkhayag kahriz

Current status of the kahriz system in Ordubad

Kahriz point at the Mingis neighborhood of Ordubad

The Mingis Kahriz, located in the Mingis neighborhood, is situated at a depth of approximately 17–18 steps. Due to its position between two residential houses, it is not immediately recognizable as a Kahriz; however, it was identified using a map. The system remains actively used by the local community.

However, since it is currently winter, maintenance of the Kahriz has been incomplete, leading to a weakened and eventually halted water flow. Despite this, the overall condition of the Kahriz is assessed as satisfactory. Surveys conducted among neighboring residents revealed that the local community actively participates in its cleaning and maintenance. This cleaning process is observed as a significant communal event.

The current condition of the Mingis kahriz

Conclusion

The cultural heritage of Ordubad reveals its true value not only through individual buildings but through their integration within the broader urban context and their functional roles in daily life. This study has shown that several significant historical structures have suffered from inappropriate restoration practices, where original materials and traditional techniques were neglected, compromising architectural integrity.

In contrast, traditional garden houses—many of which have not yet undergone major interventions—offer valuable opportunities for sustainable preservation. Their spatial organization, integration with nature, and deep connection to local ways of life make them essential elements worth protecting.

Lastly, water infrastructures such as the kehriz (qanat) systems should not only be appreciated as historical feats of engineering but also as ecological and cultural assets with relevance for contemporary urban planning. A sustainable conservation strategy for Ordubad must approach its buildings, landscapes, and infrastructure systems as an interconnected whole.

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TRADITIONAL ALIZI (ADOBE BRICK) HOUSE IN GEORGIA

Authors: Nino Kordzakhia. Conservation Architect, Nato Tsintsabadze. Conservation Architect

Introduction

The current Report on Traditional Alizi House in Georgia has been prepared within the Project Caucasus Traditional Building Revival implemented by GACC and CTTN with the support of Europa Nostra's pilot project European Heritage Hub co-funded by EU and ALIPH Foundation.

The main objectives of the study are: to review resources on Alizi Traditional House in Georgia, to evaluate state of traditional Alizi houses through reconnaissance field visits in Eastern Georgia Regions, to study building technology through documenting selected samples and to assess its relevance to climate change adaptation challenges, and finally to elaborate on conservation strategy for this vernacular architectural typology in Georgia.

Study is based on several field visits in Easter Georgia, namely villages: Ruisi, Garejvari, Patara Garejvari in Kartli Region, and villages: Iliatsminda, Qvemo Magaro, Zinobiani in Kakheti Region.

1. "Alizi" (Adobe Brick) Architecture in Georgian Resources

Alizi (Adobe brick) structures have a long-standing history in Georgia, dating back to the 6th– 4th centuries BC, as evidenced by preserved archaeological sites. Most historical and scientific sources related to adobe structures focus on ancient monuments and archaeological findings, highlighting early typologies of human settlements constructed with clay earth, similar to archaeological sites found throughout the Caucasus region and all over the world.

The article "Alizi – History, Treatment, Conservation" by conservation expert Nino Erkomaishvili[2], published online in 2018, is the only Georgian-language text that addresses adobe brick structures from a conservation perspective. The author provides a comprehensive overview of Alizi archaeological sites in Georgia based on scholarly publications and beyond.

The article highlights some of the earliest examples of Alizi settlements from the 6th–4th centuries BC, such as Arukhlo Gora, Shulaveri Gora, and Khrami Did-Gora. These settlements feature round chambers with domed or spherical roofs, often built using plano-convex adobe bricks - similar to construction methods found in other regions of the ancient world, including Egypt and Mesopotamia. The sizes of the bricks vary: 30x20x8 cm, 30x15x8 cm, 25x15x17 cm, with some larger bricks measuring up to 45x20x25 cm. Clay mortar was used during this period, and archaeological reports indicate no timber structural members were found.

Sites associated with the Kura-Araxes culture, dating to the 4th–3rd centuries BC, such as Berikldeebi, Amirani-Gora, Samsvile, and Qvatskhelebi in Eastern Georgia, represent the next stage of development, featuring rectangular chambers and standardized brick sizes (e.g., 36x18x9 cm).

The author notes the reappearance of Alizi bricks during the Classical era, particularly at the Samadlo and Nastakisi archaeological sites. These examples illustrate the multi-functional use of Alizi, including square bricks measuring 50x50x11 cm or 50x22x11 cm. Adobe bricks were also used between the 2nd–1st centuries BC and the 1st–2nd centuries AD in sites such as the Acropolis of Mtskheta (featuring Alizi walls on stone foundations, with bricks sized 52x52x12 cm),

[2] "ალიზი - ისტორია, მოვლა, კონსერვაცია", იბერია-კოლხეთი, საქართველოს კლასიკური და ადრემედიევური პერიოდის არქეოლოგიურ-ისტორიული კვლევანი, ტ.*14. 2018* წ.

Samtavro, Sarkineti, Urbnisi, and Dedoplis Mindori (50x50x12 cm).

In Western Georgia, adobe architecture from the 2nd–1st centuries BC was preserved at the Vani archaeological site (dating to the 4th–3rd centuries BC). However, due to a lack of conservation efforts, much of this has since deteriorated.

The article offers valuable insights into the technical characteristics of adobe bricks, principles of their conservation, and international conservation practices. It also includes several case studies detailing past attempts at conserving and treating Alizi archaeological sites in Georgia.

"Resources for Local Industries and Craftsmanship in Georgia", the five-volume series, edited by Ivane Javakhishvili, represents one of the most important sources of information on Georgian ethnography and intangible cultural heritage[3].

In 1935, Ivane Javakhishvili initiated and organized extensive field studies across various regions of Georgia. These studies aimed to document traditional knowledge and practices related to local industries, craftsmanship, rural life, and cultural peculiarities. A team of 23 experts - including scholars, ethnographers, museum curators, and postgraduate students - traveled through different parts of Georgia, collecting oral histories and transcripts from locals using structured questionnaires.

The project took years to complete and to secure funding for publication. It was not until 1976 that the first volume, focused on Construction and Furniture, was finally published. This volume covers the following regions: Kakheti (including Kiziki, Inner Kakheti, Outer Kakheti, and Ertso-Tianeti), Tusheti, Pshavi, Khevsureti, Khevi, Kartli, Meskheti, Javakheti, Imereti, Racha, Kvemo Svaneti, Samegrelo, Guria, Adjara. It provides vast information on different typologies of vernacular architecture and only gives description of Alizi preparation in Kartli and Kakheti Regions.

"Alizi" (Adobe Brick) Preparation in Kiziki, Kakheti (Signagi Municipality) Source: Sandro Mestiashvili, 43 years old, Village Nukriani[4] For making Alizi, a yellow, clay-rich soil called "Akalo" is selected. In Georgia, "Akalo" typically contains little to no gravel, which is preferred, and even if it does, that's acceptable. A pit is dug into flat ground to create a mixing area called a "Kalo", where the "Akalo" soil is combined with water using shovels.

[3] მასალები საქართველოს შინამრეწველობისა და წვრილი ხელოსნობისათვის. ტომი 1. აკად. ი.ჯავახიშვილის საერთო რედაქციით 5 ტომად, „მეცნიერება", 1976.
[4] P.84

A traditional additive called “Bze” - the chaff and fragments of wheat heads left after threshing - is then added to the well-mixed clay. It’s better if the chaff is not too fine. Two kalo pits require one cartload of bze.

After the bze is added, the mixture is trampled and mixed using horses. Two horses could prepare enough Alizi before midday. The ready clay mixture is carried to the drying area by four people, while two others are responsible for molding.

For shaping the bricks, the clay (called “Lapi”) is cut and pressed into rectangular wooden molds. Both the mold and the clay are regularly moistened during the process. The bricks are left to dry in the sun for three days, then flipped and dried for another two. Afterward, they are stacked in a crisscross or “drawer-drawer” arrangement for curing.

Typical brick sizes include: Small Alizi: 27 x 13.35 x 13.35 cm; Large Alizi: 35.5 x 17.5 x 17.5 cm.

“Alizi” in Ruisi, Kareli Municipality, Shida Kartli Sources: Petre Egnatashvili, 80; David Kavelashvili, 80[45]

"First, we shovel the soil, then wet it, add the bze, and mix it by foot. For molding, we pack the mud into a wooden mold that’s divided by a plank to make two bricks. The mud is pressed in by hand and leveled. After that, the plank is removed. The bricks are left to dry in the sun. Once fully dried, they are stacked and left to cure further."

If Alizi bricks were left outside, they would be coated with a layer of mud, so in winter, only the coating is damaged, not the bricks themselves. Some people stored bricks indoors for protection.

The informant emphasized that while anyone can try building simple structures—like ovens or pigsties, only a trained mason, skilled in using levels and measuring tools, can build a proper house.

Interviews conducted by the study team during field visits to the same villages and surrounding areas confirmed that, although Alizi preparation is no longer practiced by local residents, a surprisingly accurate knowledge of the techniqueы till exists. Some individuals recall it from their childhood, while others have inherited information from their parents. In the case of Ruisi, it was particularly interesting to learn that locals consider the soil in nearby Urbnisi to be

[5] მასალები საქართველოს შინამრეწველობისა და წვრილი ხელოსნობისათვის. ტომი 1. აკად. ი.ჯავახიშვილის საერთო რედაქციით 5 ტომად, „მეცნიერება”, 1976. P. 233.

ideal for Alizi production - so much so that each household could source suitable soil directly from its own yard. A 1935 record also notes that there was no need to search for clay-rich soil in the area, as it was naturally abundant.

To date, no academic study or dedicated research has been conducted on Alizi traditional houses in Georgia. Furthermore, no Alizi dwellings are currently listed in the National Heritage Register.

However, this study has identified several emerging initiatives that aim to explore the traditional practice of Alizi construction, examining its potential for adaptation and reinterpretation within the context of contemporary building practices.

2. Field

As part of this study, two Eastern Georgian regions, Kartli and Kakheti, were visited. Surprisingly, despite the simplicity of their typology, Alizi dwellings preserved in these regions exhibit notable variations not only between regions but also from village to village, especially in Kakheti. These differences reflect unique local characteristics in building technology, design, and cultural identity. (see Photo-recording of Adobe brick structures)

2.1. Kartli Region

In the villages of Ruisi, Garejvari, and Patara Garejvari, a substantial number of one- and two-story traditional Alizi houses have been preserved. Many two-story buildings are constructed using a combination of adobe brick, river stone, and burned brick, sometimes incorporating all three materials. A number of these homes also feature 20th-century extensions made from cement blocks. It is common to find a single-story auxiliary adobe-brick structure adjacent to the main building. These are most likely earlier dwellings that were repurposed as secondary buildings after newer residential blocks were constructed.

Mixed building materials. Ruisi.

In older structures, interior partitions are sometimes made with timber planks finished with an Alizi coating. Most Alizi walls are built with three rows of Alizi bricks (typically 27x17x8 cm or 33x17x8 cm), bound with mud mortar and finished with Alizi plaster. The houses generally follow a simple quadrilateral floor plan, typically comprising two enfiladed rooms. The structures are straightforward, without wooden frameworks in the walls. Timber is used primarily for the floors and ceilings. Roofs are gabled timber structures, covered variously with tin, tiles, or fiber cement sheets. The attics feature relatively steep pitches, with an inclination of 30–40%. Almost all houses include wooden balconies or galleries adorned with decorative openwork.

Patara Garejvari

In buildings where Alizi is used on the ground floor, the foundations are constructed with river stone to minimize the effects of rising damp. Most Alizi houses are scattered throughout the historic urban fabric of these villages and are in poor physical and structural condition— often abandoned or neglected. In many cases, Alizi was later used on second floors or side walls as an infill material during repairs in the 20th century. Only a few traditional Alizi houses remain in use and are actively maintained. These structures do not have basements, which sets them apart from other older vernacular typologies in Eastern Georgia, such as the Darbazi.

2.2. Kakheti Region

Iliatsminda, Qvemo Magaro & Zinobiani in Kakheti Region were visited during the study. Zinobiani village is located on the Alazani Plain, in the Kvareli Municipality of the Kakheti region, Georgia. It is known as the only settlement in Georgia where the Udi people, believed to be descendants of the

ancient Caucasian Albanians, reside. Zinobiani was founded in 1923 by migrants from Azerbaijan who fled ethnic conflict. The village was named by Zinobi Silikashvili, a prominent Udi public figure who led its establishment.

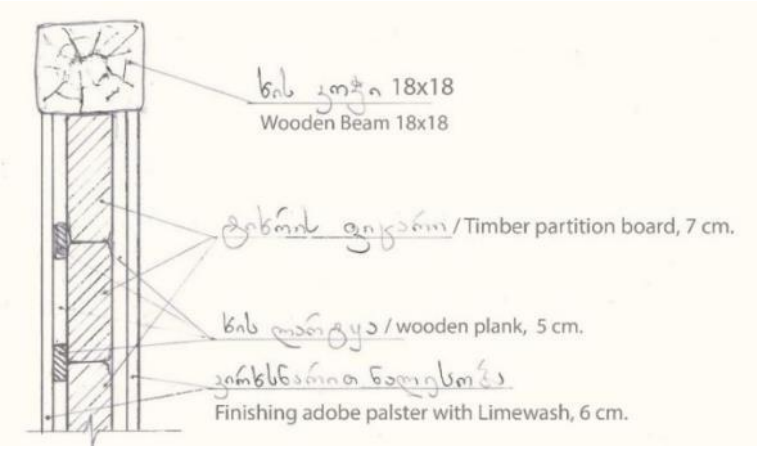
The Udi people have managed to preserve their language, regional Christian practices, and distinct cultural identity. However, due to globalization and their drastically reduced numbers in Georgia[6], the Udi cultural identity is at risk of disappearing.

In response to this threat, the younger generation of Udis has launched various initiatives and projects to raise awareness about Udi culture and heritage. One key focus of their efforts has been the only surviving traditional dwelling from the early 20th century in Zinobiani.

Dimitri Barkhudarashvili Traditional House in Zinobiani

[6] "*According to the 1989 census, the number of Udis in Georgia was estimated at 93 people. At the beginning of the 21st century there were about 50 Udi households in the village, or about 300 people.*[2] *According to the 2002 census, out of 412 villagers, Georgians made up 49%, Udis - also 49% or 203 people.*"

The house belongs to Dimitri Barkhudarashvili. A small, one-story residential house, built with timber and adobe blocks (24 x 8(9) x 12 cm.) and roofed with ceramic tiles, stands on a low platform made of flat and river stones. In plan, the rectangular building is divided into two halves: one half is made of adobe brick and built on a foundation of river stone, while the other half is made of wooden framework with infill of boards. The entire structure was originally plastered and whitewashed with lime, including wooden part, although much of the plaster has now fallen off.



The façades clearly reveal the orderly rows of adobe blocks made from clay-rich earth mixed with plant-based additives, as well as the walls constructed from massive wooden posts and thick planks. Door and window openings, framed with wooden surrounds, are present on all sides. Two of the house's façades are topped with gabled ends covered in wooden planks, each featuring a door at the center that provides access to the attic. The gable roof's wooden structure consists of beams and rafters, forming an arched, bow-like framework that supports the ridge beam mounted on top. The ceramic tile roofing is laid over purlins. The interior space of the building is divided into two sections. The first is a living room, enclosed by walls built with adobe blocks, while the second is a utility/storage area framed with wooden posts and planks. The two rooms, which are nearly equal in size, are connected by a double-leaf wooden door set within the partition wall.

The attic, which forms a single open space, mirrors the footprint of the ground floor exactly. Its plank-covered walls, the roof's supporting framework, and the ceiling beams rest on the massive ground-floor walls and the wooden load-bearing structure. (see measured drawings).

Four samples of alizi were taken for laboratory testing: two samples from interior and two samples of Alizi Brick.(Annex1)

Sample 1. Interior: The average grain size of the deposit shows a filler-to-matrix ratio of 3:2, with a particle size distribution ratio of 1:18:13 (water, binder, aggregate).

Sample 2. Interior: fine -grained deposit shows a filler to matrix ratio 1:1, with a particle size distribution 1:19:22 .

Sample 3. Mud brick sample: medium-grained shows a filler to matrix ratio 3:2, with a particle size distribution 1:15:10. The Disintegrated material does not react with hydraulic acid, which exclude the presence of carbonate in it.

4. Loose sample of brick: medium-graine deposit shows a filler to matrix ratio 2:1, with particle size 1:9:6.

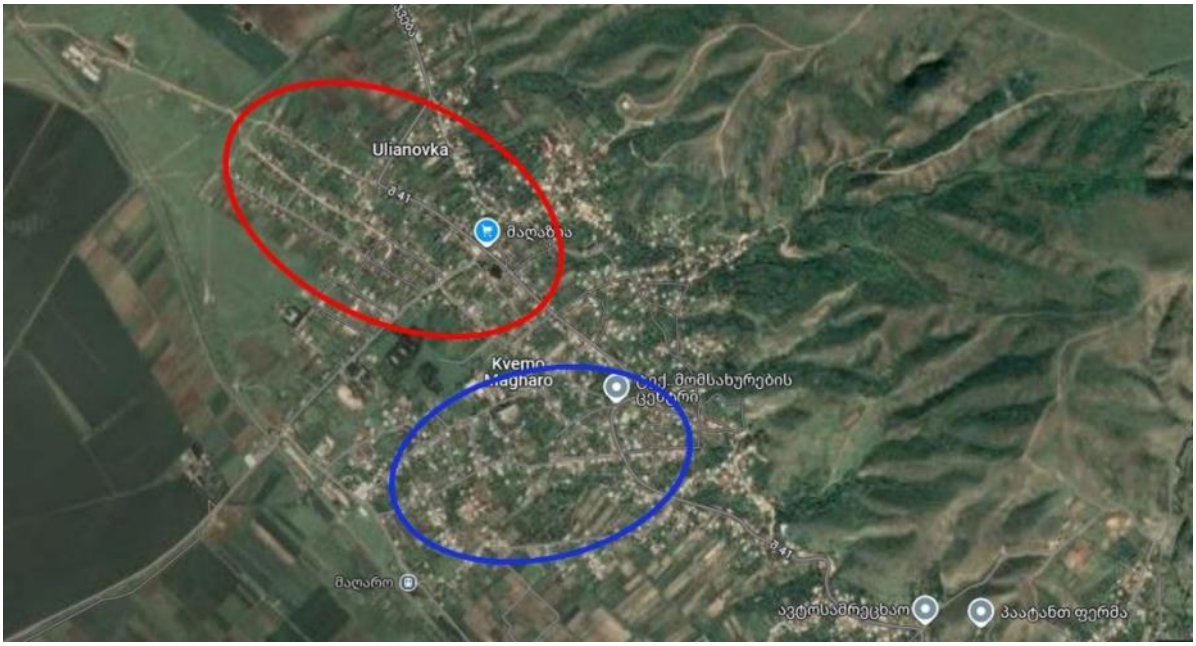
All four samples are alizi. There are light differences between them; Sample 1 has the largest amount of relatively well-preserved filler. The feldspars in the filler of the remaining samples are strongly clayey. Samples 1-4 and samples 2 – 3 shows more or less similarity. The presence of carbonate in the samples can only be explained by surface treatment (0,1 mn thick coating with sanding/painting).

The Zinobiani Alizi house is not a typical Georgian adobe dwelling in many respects, although it does share some similarities with auxiliary old buildings found in the Kartli and Kakheti regions.

Attic Zinobiani House

Iliatsminda and Qvemo Magaro. Signagi Municipality

The villages of Iliatsminda and Qvemo Magharo are located next to each other with no visible borders separating them, yet they differ significantly in settlement layout, plot divisions, and the types and scale of preserved adobe structures. Qvemo Magharo features a typical medieval, irregular street network and contains a number of remaining adobe houses, most of which are either ruined, abandoned, or repurposed as storage spaces or barns. Adobe brick is also commonly used as infill material in other traditional houses in the Kakheti region, where burned brick and river stone are often used in masonry. In Qvemo Magharo, only one small functioning house with a large canopy remains, showing some similarities to the Zinobiani site.



Village Iliatsminda formerly known as Alexeevka and later in Soviet period Ulianovka was founded by Molokans, a religion minority, breakaway group from the Russian Orthodox Church relocated from Russia, Saratov Guberniya, in 1850s. Molokans, as other Christian Sects from Russia, settled in Georgia as part of a larger migration encouraged by the Russian Empire. Molokans lived in Tbilisi, Kartly and Kakheti districts. Former Alexeevka was one of the notable Molokan settlements in Georgia. Molokan communities were known for their simple lifestyle, strong communal values, and pacifist traditions focused on agriculture, primarily wheat farming and cattle breeding, rather than the viticulture that is dominant in Kakheti. Under Soviet rule many were integrated into collective farming (kolkhozes), and Soviet policies led

to cultural assimilation. However, the Molokans still managed to preserve some of their religious customs. After the collapse of the Soviet Union, many Molokans in Georgia emigrated to Russia, or even further abroad to the U.S., Canada, and Australia. As a result the village was largely abandoned or repopulated by other ethnic groups. There are only a few Molokan Families in Iliatsminda today and several community groups in Tbilisi.

Iliatsminda

Iliatsminda has preserved a significant portion of the vernacular adobe houses, maintaining an historic urban-rural fabric. Unlike neighboring medieval villages, Iliatsminda features a regulated urban planning system with parallel streets and long land plots between them. Each household consists of a main prolonged rectangular building and auxiliary structures located deeper into the yard, such as a bath, barn, and other outbuildings. Houses have such a specific attribute of Molokan's lifestyle as a Russian stove (Pechka). The land plots are also divided by adobe brick walls. The houses face the street with narrow façades often with pediments and are typically elongated, rectangular enfilades, often with a wooden balcony system, sometimes on the main façade and sometimes extending from the courtyard as well. (see Measured Drawings of elevations of Romanoz Kandashvili house in Iliatsminda) The houses are usually one or two stories.

Main building material of Iliatsminda is adobe brick and timber. Brick size varies 30x13x15, 28x13x11. There are some structures with adobe mixed with stone and brick.

Foundation is not deep and usually with stone. Gabled high pitched roofs with 30-40 degree angle are arranged with wooden framework. Wooden beams are used for inter-floor and roof framework. No wooden members are used for the wall. Adobe walls are laid down with three line of adobe brick and equals 45-46 cm. Coating is randomly preserved at the lower parts of the wall. Wooden Balconies are decorated with openwork of traditional Georgian pattern.

Wooden openwork of Iliatsminda Balcony

Majority of Adobe traditional houses are in vulnerable condition and lack maintenance. There are well maintained houses too, even if with some modern extensions, sometimes adobe walls are rendered with incompatible cement mortar creating a false image of modern building.

Apart from dwellings, a former school building from adobe brick is also preserved in Iliatsminda. This building is distinguished with its size, large rooms and interior details decoration elements of Georgian tradition.

Former Adobe School Building in Iliatsminda

There are several inspiring and positive examples of restoration initiatives in Iliatsminda, many of which have been introduced by foreigners who appreciate the region's traditions. One such example is the restoration work carried out by Michael Hanson from the UK. Several years ago, Hanson purchased a house in Iliatsminda and undertook the restoration process himself, adopting a hands-on approach that emphasized learning through direct experience.

Michael Hanson's House

Hanson incorporated sustainable and traditional methods into his restoration efforts. He repurposed old bricks, giving them a second life in his project, and also experimented with making new mud bricks using earth sourced directly from his own courtyard. This approach not only preserved the authenticity of the original structure but also promoted environmentally friendly building techniques.

Hanson's dedication and expertise have extended beyond his personal project. Drawing from his experience, he has successfully organized several workshops for individuals interested in restoration and traditional building techniques. These workshops provide a valuable opportunity for participants to learn practical skills, explore sustainable restoration methods, and gain a deeper appreciation for historical architecture. Michael has also contributed to the rehabilitation of another authentic household belonging to Jacob Treguboff, an American whose ancestors came from Iliatsminda. With Michael's assistance, Jacob has restored several auxiliary adobe structures in his courtyard, including a traditional pechka (oven). He plans to establish a hospitality business in Iliatsminda and host summer schools in the future.

Jacob's House

The village Iliatsminda holds strong potential and resources to become a subject of urban conservation efforts.

3. Sustainable Principles

Iliatsminda, with its preserved adobe urban fabric - despite its vulnerable condition due to lack of maintenance and improper treatment - effectively illustrates the environmental, socio-economic, and cultural qualities associated with sustainable adobe (earth) construction traditions.

Natural and Local Materials

Clay-rich soil, aggregates, and timber are all locally available and renewable resources.

Low-Energy Manufacturing Process

The production of adobe bricks does not require high-temperature processes, resulting in significantly lower carbon emissions.

Energy Efficiency in Buildings

Adobe's thermal insulation properties help regulate indoor temperatures, reducing reliance on artificial heating and cooling. This creates a naturally comfortable living environment, cooler interiors in hot weather and warmer spaces in winter.

Reusability

Alizi bricks can be reused for the repair of other structures. They decompose naturally without polluting the environment, making them highly eco-friendly.

Cost-Effectiveness

Since mud bricks are made from locally available materials, they are more affordable than industrially manufactured alternatives. Construction with adobe typically requires less specialized labor and eliminates transportation costs.

Minimal Environmental Impact

Adobe construction has a significantly smaller carbon footprint compared to modern building materials.

Health Benefits

Mud bricks are non-toxic and contribute to better indoor air quality.

Resilience

In earthquake-prone regions like Georgia, the flexibility of adobe buildings allows them to absorb shocks more effectively, reducing the risk of catastrophic collapse. They are also easily repairable using the same materials, ensuring longevity.

Socio-Cultural Value

Preserving Alizi constructions through the continued use of traditional knowledge empowers local communities and strengthens cultural identity.

By combining energy efficiency, resource conservation, and a minimal environmental footprint, adobe buildings embody the core principles of sustainable architecture.

The residents of Iliatsminda demonstrate an awareness of the sustainable principles associated with Alizi houses. They acknowledge the strong energy efficiency and durability of the structures, even after nearly a century of minimal maintenance. However, they also point out that frequent maintenance is necessary, particularly the annual reapplication of finishing plaster, which is the most effective way to prevent deterioration of Alizi walls.

4. Initiatives Toward the Adaptation of Alizi Structures

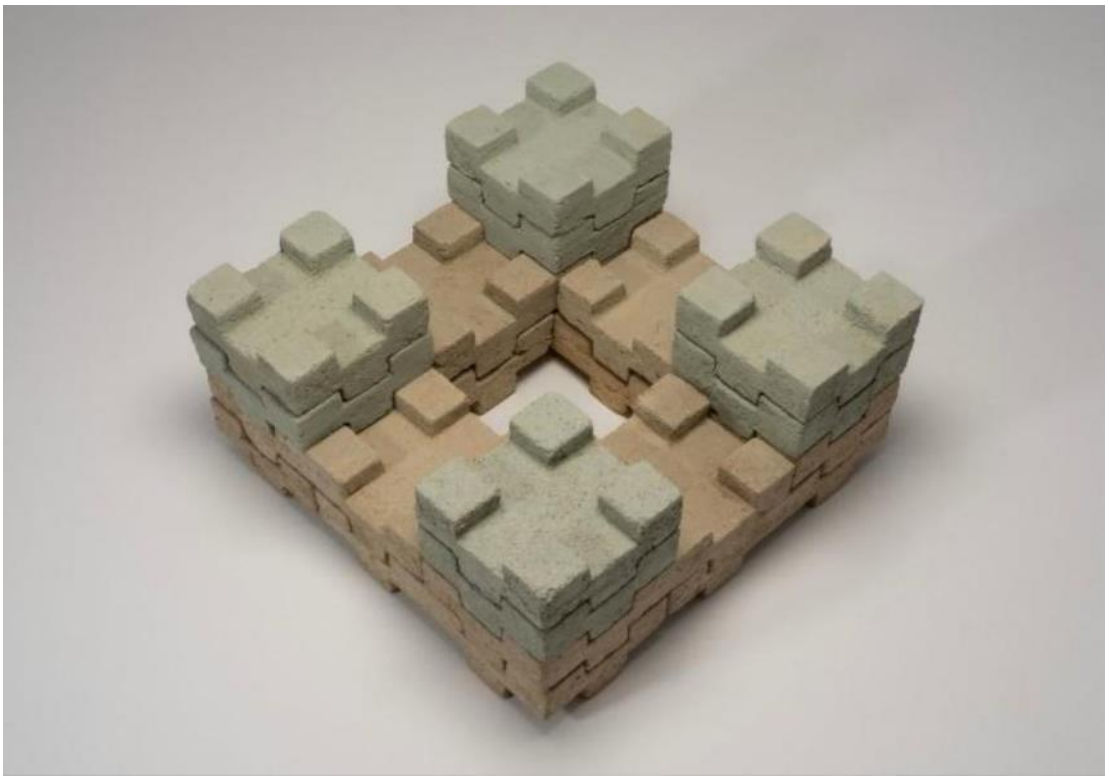
New European initiatives aimed at harnessing traditional knowledge for sustainable development, including within the construction industry, have sparked both international and local interest in exploring adobe (mud brick) technology, due to its clear eco-friendly characteristics. Georgia has seen a number of noteworthy endeavors in this direction.

IDAAF Architects

At the 2022 Tbilisi Art Fair (TAF • Tbilisi Art Fair), IDAAF Architects presented the exhibition “Alizuri – New Design and Perspectives of Use in Modern Construction.” This project emerged from extensive studio research focused on Alizi technology, Georgian colored earth, the architecture of Lazuri houses, and their collective aesthetic. The work included experimental and laboratory studies on new modular forms, with results expected to be showcased at the Venice

Biennale in 2025.

“IAM and IAS are two modular adobe bricks created at Idaaf Architects studio as a response to environmental challenges. Made in adobe-the material well known to the world and Georgian vernacular architecture, these two universal forms fit together easily, require no fasteners or fillers. It allows easy construction of exterior double and interior single partition walls, where door and window openings are easy to arrange. Its colors are natural from the soils that are obtained from the regions of Georgia. The IAM and IAS bricks are a modern continuation of Georgian Architectural tradition of Adobe, the most ecological building material that we believe can benefit the whole world.



The 'Alizi' installation is a concise representation of how these two bricks seamlessly merge to create a structure.”[7] Installation Measurements: L72 x W72 x H45 cm; IAM Bricks: 8 Piece; [Beige Soil from Kartli region]IAS Bricks: 8 Piece; [Green Soil from Kartli region]

Earthen Architecture in Georgia: The Work of Givi Jakeli

Givi Jakeli is currently Georgia’s leading specialist in the field of earth construction for

[7] Extract from abstract. Source: Nana Zaalishvili. IDAAF Architects

sustainable architecture, with many years of practical experience. Under his leadership, earthen wine cellars and residential houses have been built across various regions of the country using this technology. He collaborates with the international association CRAterre-ENSAG, based in Grenoble, France—a partnership that has significantly contributed to building the capacity and knowledge of local craftsmen and volunteers.

Gremi Vine Cellar

Near the historic Gremi Castle, architect Gocha Gigiashvili has built an experimental vine cellar using clay earth "panels." Inspired by the pioneering work of Givi Jakeli, the project draws from the Alizi tradition and serves as a modern interpretation of earthen architecture in Georgia.

This initiative was truly international in scope: French experts from CRAterre-ENSAG, invited by both Givi Jakeli and the property owner, collaborated on the project. The team experimented with different proportions of clay earth and gravel based on earlier research. They constructed pressed adobe walls using timber molds. These earthen walls were then used as infill within a structural framework of brick and metal. The project also incorporated a variety of materials: some walls include wooden boards, while others integrate stone.

Gremi Wine Cellar

These initiatives reflect a growing awareness within the expert community of the value of traditional knowledge and the urgent need to adapt and evolve such knowledge for future sustainability.

5. Conservation Strategy for the Alizi Traditional House in Georgia

The review has revealed that, although the Alizi Traditional House typology lacks academic research and is not sufficiently protected under Georgia's conservation framework, there are several individual and private initiatives aimed at learning about, preserving, and using the cultural values embodied in these houses. The typology is gradually fading in prominence compared to other iconic vernacular dwellings such as Darbazi, Oda, Machubi, and Tsikhe-Sakhli. However, it holds specific importance for the cultural diversity of Georgia and serves as a valuable resource for the development of local heritage. In some regions, it also represents a strong identity marker for minority communities.

The building materials and construction techniques of the Alizi Traditional House offer a rich body of knowledge that is highly relevant for sustainable development today. Further study, documentation, and inclusion of this typology in research on Georgia's vernacular architecture are essential. Numerous Alizi houses across different regions deserve recognition and protection. Strengthening their official recognition within Georgia's heritage conservation framework would help raise awareness of their sustainable qualities and potential for future development.

It is recommended to list the Zinobiani Traditional House as a heritage site. In accordance with local legal procedures, a specific identification (ID) form has been completed. ID includes descriptions of the site, information on the owner, location and values to be protected. This, along with measured drawings (see measured drawings.), provides sufficient documentation for the listing process. To strengthen the case and align with the principles of the Faro Convention, an application will be submitted by the local organization Saqartvelos Udiebi. The organization also plans to undertake the restoration of the house.

Additionally, it is recommended to apply urban conservation tools available in Georgia to preserve the village of Iliatsminda. This would require a comprehensive inventory of the settlement, identifying historic and traditional structures, mapping key cultural values, and registering the site as an urban heritage area. Such steps would empower local authorities to pursue urban revitalization initiatives and inspire the local community to continue and expand

current efforts to preserve traditional dwellings in Iliatsminda.

Unlike archaeological adobe structures, the repair of traditional adobe houses does not require extensive laboratory testing or interdisciplinary research. Instead, it relies on traditional knowledge and hands-on skills to carry out effective repair and maintenance.

The conservation of adobe vernacular houses follows core conservation principles:

- Prevent deterioration through regular maintenance.
- Avoid the use of incompatible materials (e.g., cement mortar, oil based paint, etc.).
- Ensure technical compatibility and reversibility to preserve original materials.
- Limit interventions to a minimum to maintain authenticity.
- Develop knowledge and skills that uphold the authenticity of the maintenance process.

The ideal approach would be to undertake a case study restoration of a traditional Alizi house in Iliatsminda, actively involving local community members and building on the existing in-situ experience.

The former school building in Iliatsminda represents the best candidate for such a showcase restoration. It should be officially listed as a heritage asset. Since it is publicly owned, it would be eligible for public funding to support its rehabilitation.

As part of this initiative, a simple and practical handbook should be developed to guide the maintenance and repair of traditional Alizi houses.

Traditional Alizi (adobe brick) House in Georgia
Photo-recording of Adobe brick structures in villages Zinobiani, Iliatsminda, Kvemo Magharo, Ruisi, Patara Garejvari

ყვარლის მუნიციპალიტეტი, სოფელი ზინობიანი, დიმიტრი ბარხუდარაშვილის საცხოვრებელი სახლი Kvareli Municipality, Village of Zinobiani, Dimitri Barkhudarashvili's dwelling

ყვარლის მუნიციპალიტეტი, სოფელი ზინობიანი, დიმიტრი ბარხუდარაშვილის საცხოვრებელი სახლი
Kvareli Municipality, Village of Zinobiani, Dimitri Barkhudarashvili's dwelling









სიღნაღის მუნიციპალიტეტი, სოფელი ქვემო მაღარო
Sighnaghi Municipality, Village of Kvemo Magharo










სიღნაღის მუნიციპალიტეტი, სოფელი ქვემო მაღარო
Sighnaghi Municipality, Village of Kvemo Magharo









სიღნაღის მუნიციპალიტეტი, სოფელი ილიაწმინდა Sighnaghi Municipality, village of Iliatsminda









სიღნაღის მუნიციპალიტეტი, სოფელი ილიაწმინდა Sighnaghi Municipality, village of Iliatsminda









სიღნაღის მუნიციპალიტეტი, სოფელი ილიაწმინდა Sighnaghi Municipality, village of Iliatsminda









სიღნაღის მუნიციპალიტეტი, სოფელი ილიაწმინდა Sighnaghi Municipality, village of Iliatsminda









ქარელის მუნიციპალიტეტი, სოფელი
რუისი Kareli Municipality, Ruisi Village









ქარელის მუნიციპალიტეტი, სოფელი
რუისი Kareli Municipality, Ruisi Village









ქარელის მუნიციპალიტეტი, სოფელი
რუისი Kareli Municipality, Ruisi Village









ქარელის მუნიციპალიტეტი, სოფელი
რუისი Kareli Municipality, Ruisi Village









გორის მუნიციპალიტეტი, სოფელი პატარა გარეჯვარი Gori Municipality, village Patara Garejvari










გორის მუნიციპალიტეტი, სოფელი პატარა გარეჯვარი Gori Municipality, village Patara Garejvari









გორის მუნიციპალიტეტი, სოფელი პატარა გარეჯვარი Gori Municipality, village Patara Garejvari









Inventory Card of the Dimitri Bardukhashvili traditional house

საქართველოს კულტურის, ძეგლთა დაცვისა და სპორტის სამინისტრო

კულტურული მემკვიდრეობის უძრავი ობიექტის/ძეგლის სააღრიცხვო ბარათი

№

1. სახელწოდება/Name

საცხოვრებელი სახლი / Residential house

2. ადგილმდებარეობა / მისამართი / Location and Address

2.1 ზუსტი მისამართი / Precise address	
ადმინისტრაციული ერთეული (ავტონომიური რესპუბლიკა, ქალაქი, დაბა, სოფელი) / Administrative unit	სოფელი ზინობიანი / Village Zinobiani
ქალაქის რაიონი / City, Municipality	ყვარლის მუნიციპალიტეტი/ Kvareli Municipality
ქუჩა (ქუჩები) / Street	
შენობის № / Building #	
2.2 გეოგრაფიული / მდებარეობა / Geographical location	
ისტორიული მხარე / Historival part	კახეთი / Kakheti
გეოგრაფიული ერთეულის სახელწოდება / Name of geographical unit	ალაზნის ველი, მდ. ავანისხევის (ალაზნის მარცხენა შენაკადი) მარჯვენა სანაპირო / Alazani valley, Right bank of the river Avaniskhevi (left tributary of the river Alazani)
ისტორიული დასახლების სახელწოდება / Historical name of the setllement	საფელი ზინობიანი (ყოფ. ოქტომბერი) ჭიკაანის თემი/ Village Zinobiani (former Octomberi), Tchikaani community
მანძილი და მიმართულება უახლოესი დასახლებული პუნქტიდან / Distance and direction from nearest settlement	ყვარლის სამხრეთ-აღმოსავლეთით 12 კმ, სოფ. ჭიკაანიდან 2,5 კმ. ჩრდილო-

	აღმოსავლეთით / 12 km South-Easch from Kvareli, 2.5 km Northe-East from village Tchikaani

3. სახეობა / Type

არქიტექტურის/Architectural	✓
არქეოლოგიური/ Archaeological	
საინჟინრო/ Engineering	
მემორიალური/Memorial	
ქალაქთმშენებლობის (ურბანული)/ Urban	✓
საბაღე-საპარკო ხელოვნების და ლანდშაფტური არქიტექტურის/ garden-park art and landscape architecture	
მონუმენტური სახვითი ხელოვნების/Monumental visual art	
პალეოგრაფიული/ Paleogaohic	
ეთნოგრაფიული/ Ethnographic	
მეცნიერების, ტექნიკისა და მრეწველობის განვითარებასთან დაკავშირებული ძეგლი Site connected to the development of science, technics and industry	

4. თარიღი (პერიოდი, საუკუნე, ზუსტი თარიღი)/ Date (period, century, precise date)

XX ს. 1920-იანი წლები/ 20th c. 1920-ies	

5. სტატუსი და კატეგორია / Status and category

5.1. სტატუსი/Statuse	თავდაპირველი/initial	არ აქვს/no
	ამჟამინდელი/ current	არ აქვს/no
5.2. სტატუსის მინიჭების თარიღი/date of status granted	თავდაპირველი/initial	
	ამჟამინდელი/ current	
5.3. სტატუსის მიმნიჭებელი ორგანიზაციის დასახელება / name of status granting entity	თავდაპირველი/initial	
	ამჟამინდელი/ current	
5.4. დოკუმენტის № / # of the document	თავდაპირველი/initial	
	ამჟამინდელი/ current	
5.5. კატეგორია / category	თავდაპირველი/initial	
	ამჟამინდელი/ current	
5.6. კატეგორიის მინიჭების თარიღი / date of the granting the category	თავდაპირველი/initial	
	ამჟამინდელი/ current	
5.7. კატეგორიის მიმნიჭებელი ორგანიზაციის დასახელება / name of category granting entity	თავდაპირველი/initial	
	ამჟამინდელი/ current	
5.8. დოკუმენტის № / # of the document	თავდაპირველი/initial	
	ამჟამინდელი/ current	
5.9. რეესტრის № / # of the registry	თავდაპირველი/initial	
	ამჟამინდელი/ current	
5.10. რეესტრში შეტანის თარიღი/ date of the register entry	თავდაპირველი/initial	
	ამჟამინდელი/ current	

6. ფუნქცია / Function

დასახელება / Description	თავდაპირველი/ Initial	ამჟამინდელი/ current
6.1. რელიგიური/religious		
6.2. სათავდაცვო / defencive		
6.3. საერო / secular	საცხოვრებელი/Residential	სამეურნეო/ household

7. მოკლე დახასიათება/ Short description

ხითა და ალიზის ბლოკებით ნაშენი, კრამიტით გადახურული, პატარა ზომის, ერთსართულიანი საცხოვრებელი სახლი ფლეთილი და რიყის ქვით მოწყობილ დაბალ ბაქანზეა აგებული. გეგმაში მართკუთხა შენობის ერთი ნახევარი ალიზისაა და რიყის ქვის ცოკოლზეა ამოყვანილი, მეორე კი ხის. ნაგებობა მთლიანად შელესილი და კირის ხსნარით იყო შეთეთრებული, თუმცა ამჟამად ნალესობის დიდი ნაწილი ჩამოყრილია. ფასადებზე კარგად ჩანს თიხით მდიდარი მიწისა და მცენარეული დანამატებით შედგენილი ხსნარით დამზადებული ალიზის ბლოკების მწყობრი რიგები და ხის მასიური სვეტებისა და სქელი ფიცრებისგან შედგენილი კედლები. ყველა მხარეს ხის ზღუდარით დასრულებული კარ-ფანჯრის ღიობებია. სახლის ორი ფასადი შეფიცრული ფრონტონით სრულდება, რომლის შუა ნაწილში სხვენში შესასვლელი კარია ჩასმული. ორქანობიანი სახურავის ხის კონსტრუქცია კოჭებისა და ნივნივებისგან შედგება, რაც მშვილდა ფორმის, რკალურად გადაყვანილ კონსტრუქციას და მასზე დამონტაჟებულ თავხეს ეყრდნობა. კრამიტის ბურული ლარტყებზეა მოწყობილი.

ნაგებობის შიდა სივრცე ორ ნაწილადაა გაყოფილი. პირველი - საცხოვრებელი ოთახი, ალიზის ბლოკებით ამოყვანილი კედლებით, ხოლო მეორე - ხის სვეტებითა და ფიცრებით შემოსაზღვრული სამეურნეო სათავსო. თითქმის თანაბარი ზომის ორი ოთახი, ხის ტიხარში მოწყობილი ორფრთიანი კარით უკავშირდება ერთმანეთს. სხვენი, სადაც ერთიანი სივრცეა, ზუსტად იმეორებს მიწისპირა სართულის კონტურს. მისი შეფიცრული კედლები, სახურავის საყრდენი კარკასი და კოჭები, პირველი სართულის მასიურ კედლებზე და ხის მზიდ კონსტრუქციაზეა დაფუძნებული.

A small, single-storey residential house, built with timber and adobe blocks and roofed with tiles, stands on a low platform made of flat and river stones. The rectangular building plan shows that one half is made of adobe blocks erected on a river stone base, while the other half is wooden. The structure was entirely plastered and whitewashed with lime mortar, although much of the plaster has now fallen off. On the façades, the orderly rows of adobe blocks—made with clay-rich earth and mixed with plant-based additives—are clearly visible, as are the walls composed of massive wooden columns and thick planks. On all sides, the door and window openings are finished with wooden frames. Two façades of the house end with gabled roofs clad in wooden boards, each with an attic entrance door located in the center of the gable. The gable roof's wooden structure consists of curved beams forming an arch-like shape, supporting the framework upon which the tile roofing rests. The tiles are arranged over dense wooden laths.

The interior space of the building is divided into two parts. The first is a living room with walls made of adobe blocks; the second is a utility/storage space enclosed with wooden posts and planks. The two rooms—nearly equal in size—are connected by a double-winged door set into the wooden partition. The attic space, with a unified layout, mirrors the floor plan of the ground level. Its boarded walls, roof support framework, and beams are based on the massive walls of the first floor and a wooden load-bearing structure.

9. ფიზიკური მდგომარეობა/ Physical condition

9.1. ზოგადი შეფასება (კარგი, საშუალო, ცუდი, ძალიან ცუდი, დანგრეული)/ General assessment (good, average, poor, very poor, destroyed)

შენობის მდგომარეობა ცუდია სიძველის, მოუვლელობის, მზის ზემოქმედებისა და სახურავის დაზიანების გამო.

The condition of the building is poor due to age, neglect, exposure to sunlight, and damage to the roof.

9.2. მდგომარეობის მოკლე აღწერა / Short description of the condition

როგორც ფასადებზე, ისე ინტერიერში ნალესობის დიდი ნაწილი ჩამოყრილია. კრამიტის ბურული, ხის

დეტალების უმეტესობა და სახურავის ხის კონსტრუქცია ამორტიზებულია. სახურავის განაპირა ნაწილებში აზბესტის გოფრირებული ფილებია (ე.წ. „შიფერი“) გამოყენებული. ამჟამად, ეს ერთსართულიანი ნაგებობა დაზიანებული და უფუნქციოა, ძირითადად სამეურნეო ინვენტარის საწყობად გამოიყენება. As on the façades, much of the plaster has fallen off in the interior as well. Most of the wooden elements of the tiled roof and the wooden roof structure are deteriorated. Corrugated asbestos sheets (commonly known as "shifer") have been used on the outer sections of the roof. Currently, this single-storey structure is damaged and non-functional, and is mainly used as storage for household or agricultural tools.

9.3. დაზიანების გამომწვევი მიზეზი / Reasons of the damages

ბუნებრივი/Natural	კლიმატური პირობები/Climat conditions
ადამიანის ზემოქმედება / human impact	მოუვლელობა / neglection
სხვა კონკრეტული მიზეზი/ other resons	სიძველე / aging

9.4. მოსალოდნელი საშიშროება და ჩასატარებელი ღონისძიებები / Anticipated threads and necessary works

დაზიანებული სახურავი მთელ შენობას უქმნის საფრთხეს. აუცილებელია დაუყოვნებლივ შეკეთდეს ამორტიზებული ბურული, რომლის ხის ძველი, დაზიანებული ელემენტები უნდა შეიცვალოს ანალოგიური ფორმის და კვეთის დეტალებით. იდენტური ფორმის და ზომის ბრტყელი კრამიტით უნდა განახლდეს ბურული. კედლები უნდა შეილესოს როგორც ფასადებზე, ისე ინტერიერში. აღდგენა-რესტავრაცია ესაჭიროება კარ-ფანჯრის ალათებსაც. The damaged roof poses a threat to the entire building. It is essential to promptly repair the deteriorated roofing, replacing the old, damaged wooden elements with components of identical shape and profile. The tiled roofing should be renewed using flat tiles of the same form and dimensions. The walls need to be plastered, both on the façades and in the interior. The door and window frames also require restoration and repair.

10. მითითება კულტურული მემკვიდრეობის ობიექტის/ძეგლის შესახებ არსებულ დოკუმენტაციასა და ბიბლიოგრაფიაზე / Reference to Documentation and Bibliography on the Cultural Heritage Object/Monument

პასპორტი/ სააღრიცხვო ბარათი /Passport, inventory card	
გრაფიკული მასალა/ Graphic documentation	
ფოტოები / Photos	
ბიბლიოგრაფია / Bibiolgraphy	„უდიები“ ალ. ქავთარაძე, 2022 წ. / Udies, Al. Kavtaradze, 2022

11. მითითებები კულტურული მემკვიდრეობის ობიექტთან/ძეგლთან დაკავშირებულ სხვა ობიექტის/ძეგლის სააღრიცხვო დოკუმენტაციაზე / References to the inventory documentation of other objects/monuments related to the cultural heritage object/monument

დაკავშირებულ უძრავ ობიექტთა/ძეგლთა პასპორტები/სააღრიცხვო ბარათები /Passport, inventory card of the immovable objects/monuments	
ობიექტში/ძეგლში დაცული კულტურული მემკვიდრეობის მოძრავ ობიექტთა/ძეგლთა პასპორტები/სააღრიცხვო ბარათები / Passport, inventory cards of the movable objects preserved in the pbject/monument	
სხვა დოკუმენტები / Other documents	

12. დამატებითი ინფორმაცია/ Additional Information

აღსანიშნავია, რომ ნაგებობა აზერბაიჯანის ტერიტორიიდან გადმოსახლებული უდიების ფაქტიურად ერთადერთი, შედარებით სრულად შემორჩენილი, ავთენტური საცხოვრებელი სახლია სოფელ ზინობიანში. ძალიან ღირებულია მისი ტიპოლოგია და ფასადების არქიტექტურული დამუშავება. ასევე საინტერესოა საცხოვრებელი სახლის სტრუქტურის ინდივიდუალური გადაწყვეტა, გამოყენებული სამშენებლო მასალა და მშენებლობის ხარისხი. შენობა მნიშვნელოვანია საქართველოში მაცხოვრებელი უდიების ისტორიის, კულტურის და ყოფა-ცხოვრების წესის შესწავლისა და პოპულარიზაციისთვის.

It is noteworthy that this building is practically the only relatively well-preserved, authentic residential house of the Udi people who resettled from the territory of Azerbaijan, located in the village of Zinobiani. Its typology and the architectural treatment of the façades are very valuable. Equally interesting is the individual design of the residential house's structure, the construction materials used, and the quality of the building. This structure is important for the study and promotion of the history, culture, and way of life of the Udi community living in Georgia.

14. ბარათის შემდგენელი / Card compiler

არქიტექტორ-რესტავრატორი ნინო კორძახია / Nino Kordzaia, architect restorer

15. სააღრიცხვო ბარათის შედგენის თარიღი / Date of the compilation of inventory card

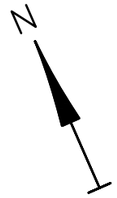
07.02.2025

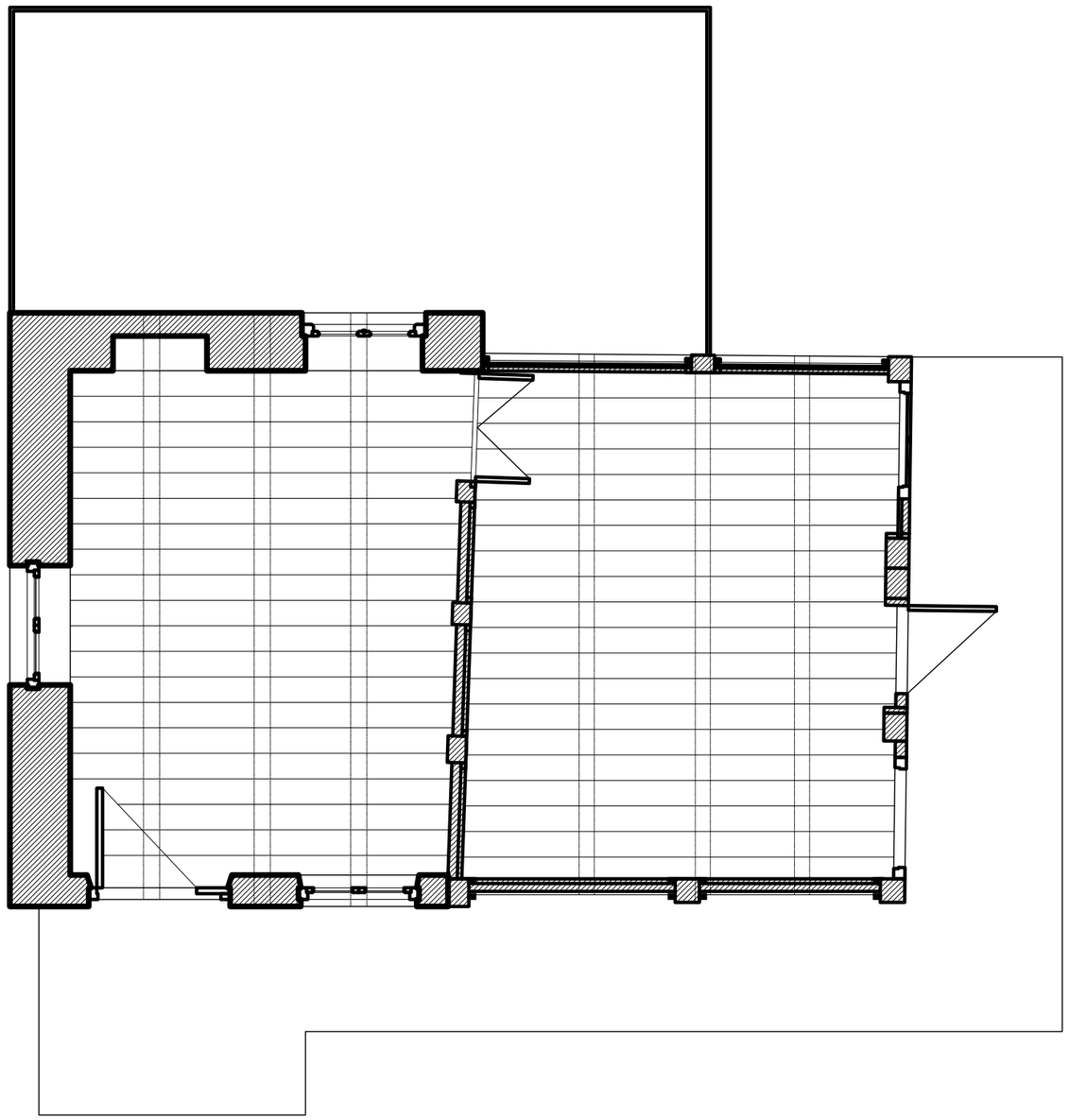
Measured Drawings of Dimitri Bardukhashvili traditional house in Zinobiani.

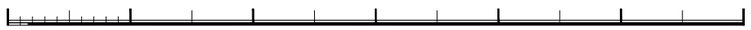
Village Zinobiani, Kvareli Municipality.

Dimitri Bardukhanashvili House.

Plan / Sale 1:50







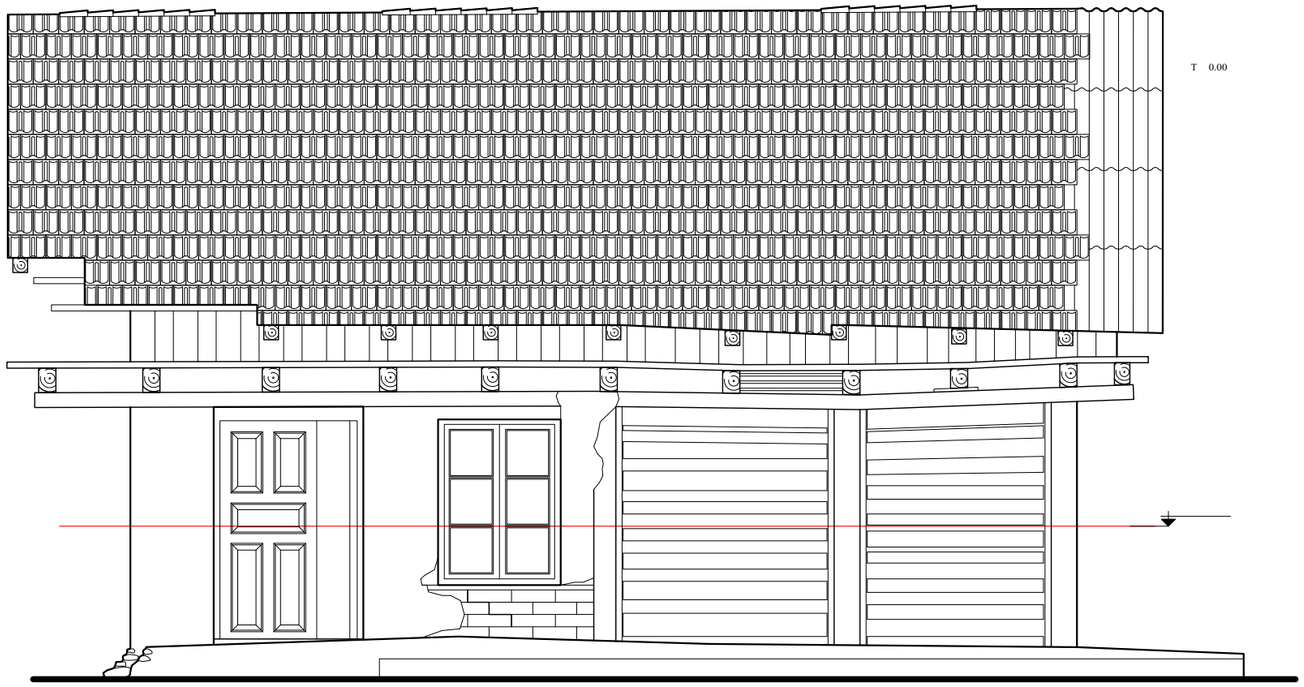
Village Zinobiani, Kvareli Municipality.

Dimitri Bardukhanashvili House.

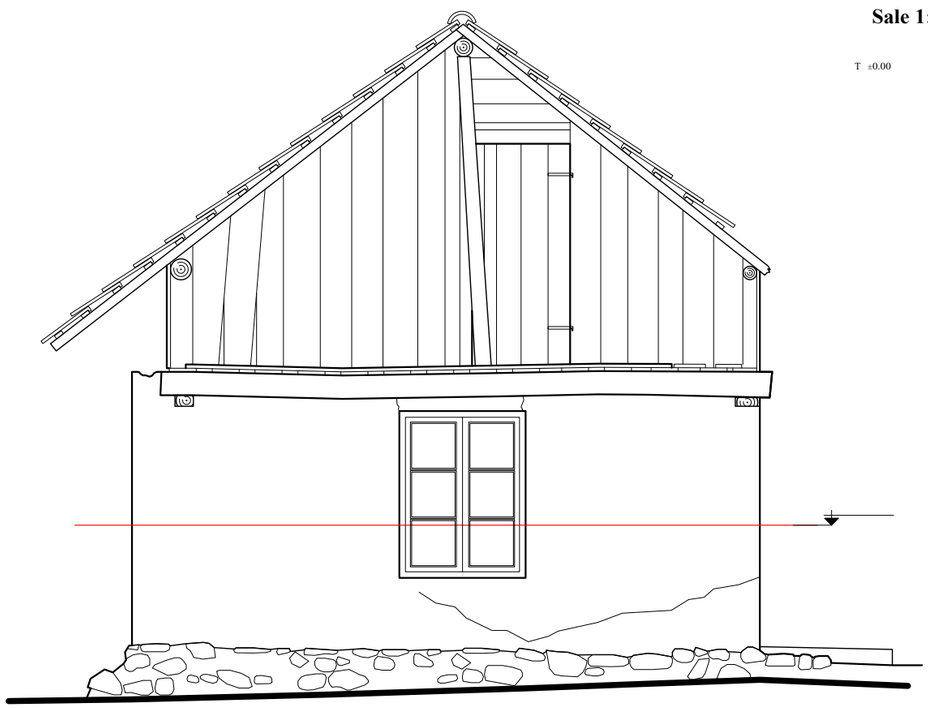
South-west Elevation

North- west Elevation

Sale 1:



South-west Elevation



North-West Elevation

1 0.5 0 1 2 3 4 5

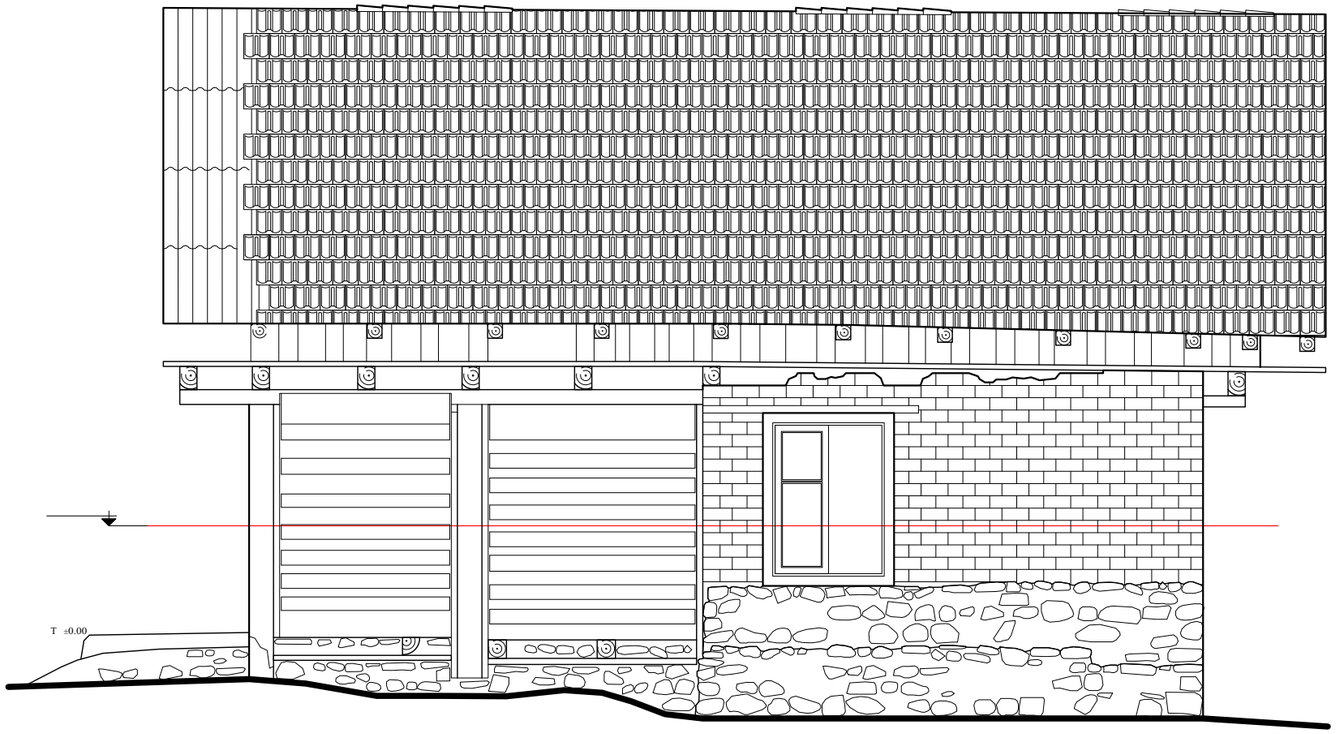
Village Zinobiani, Kvareli Municipality.

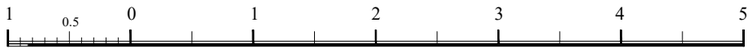
Dimitri Bardukhanashvili House.

North-East Elevation

South-East Elevation

Sale 1:50

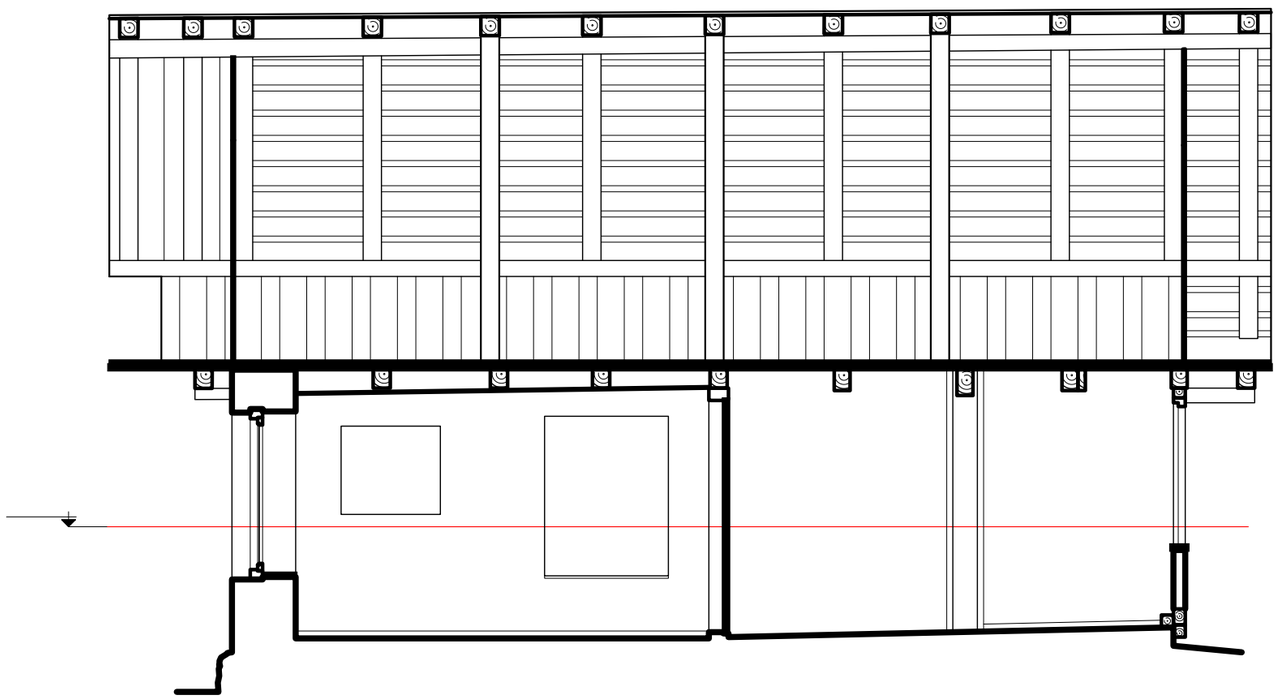


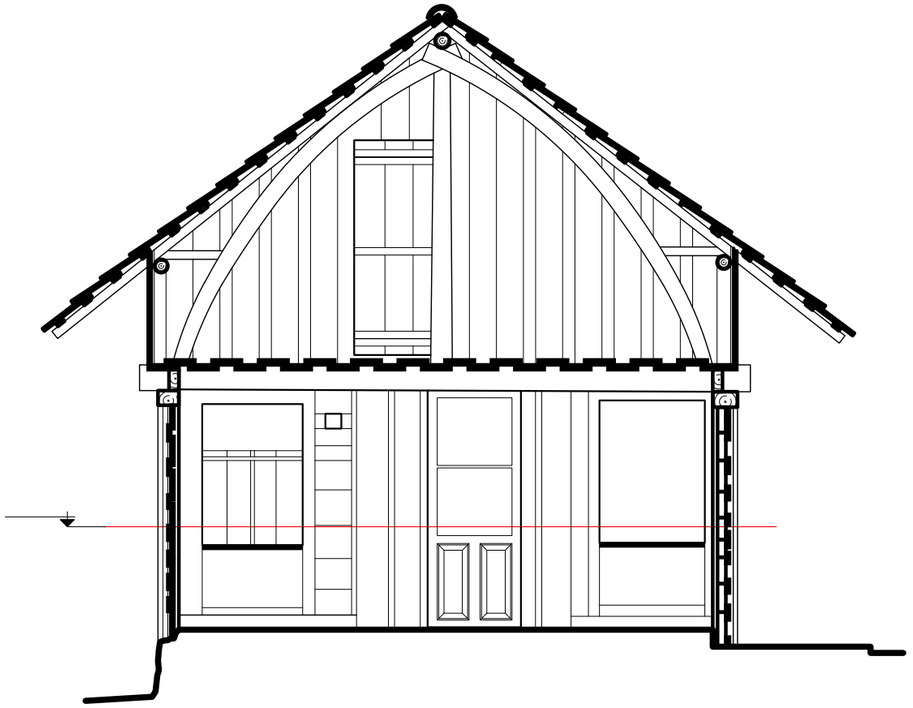


Village Zinobiani, Kvareli Municipality.

Dimitri BardukhanaSection 2-2

Sale 1:50





Section 1-1

1 0.5 0 1 2 3 4 5

Village Iliatsminda, Signaghi Municipality Romazon Kandashvili House

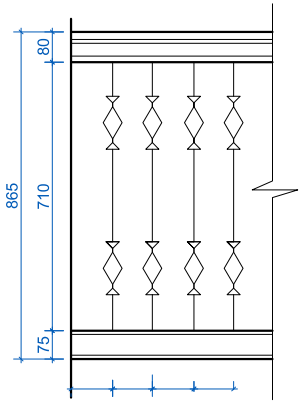
North Elevation
scale 1:50

Measured Drawings of elevations of Romanoz Kandashvili house in Iliatsminda

1 0.5 0 1 2

aivnis Wvirulis
detali m1:10

Wooden Openwork
scale 1:10



110 105 110 105

Village Iliatsminda, Signaghi Municipality Romazon Kandashvili House

East Elevation scale 1:50

T 0.00

1 0.5 0 1 2

Village Zinobiani, Kvareli municipality

Dimitri Barkhudashvili House

Plan

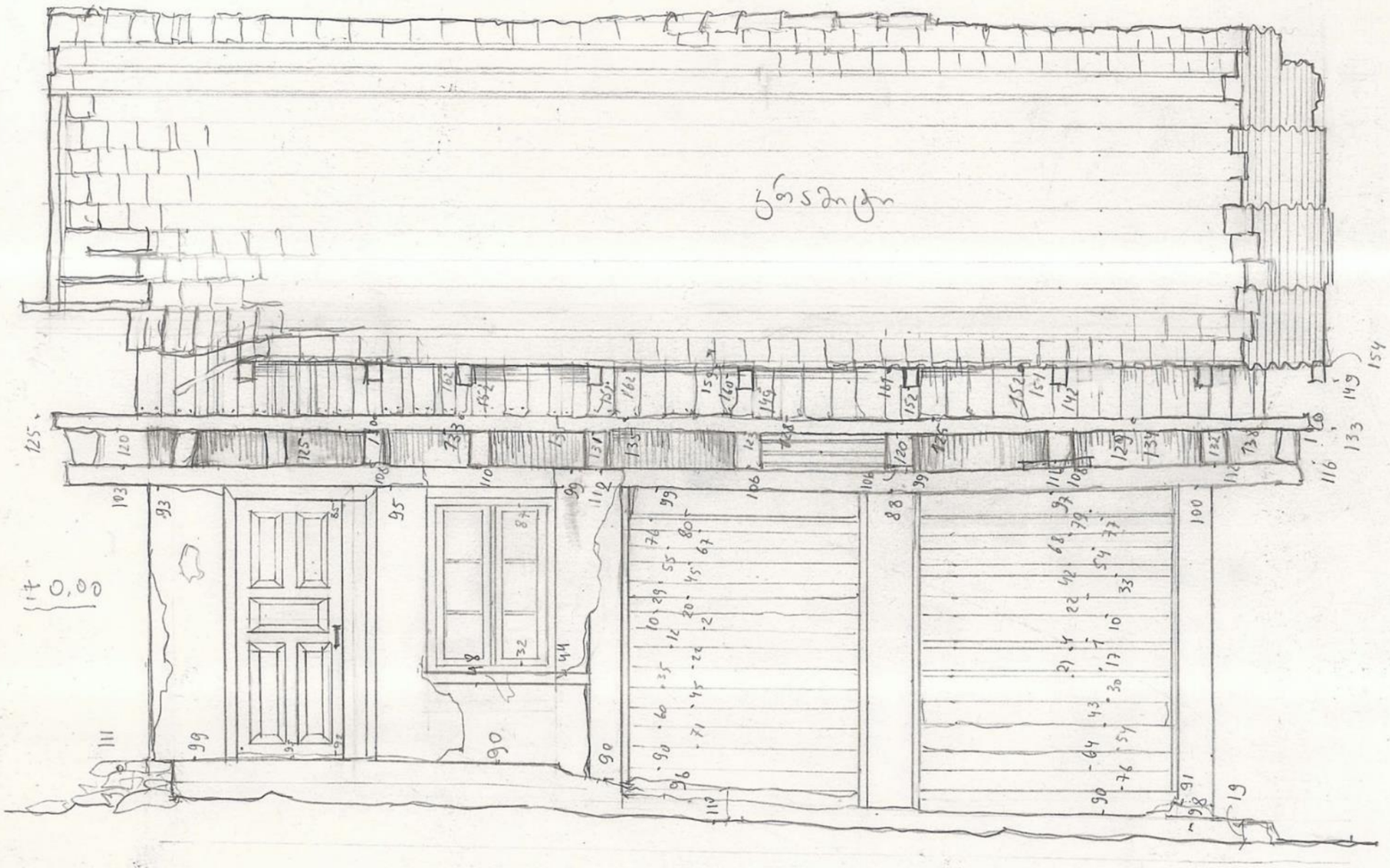
Alizi bricjs 24x8(9)x12

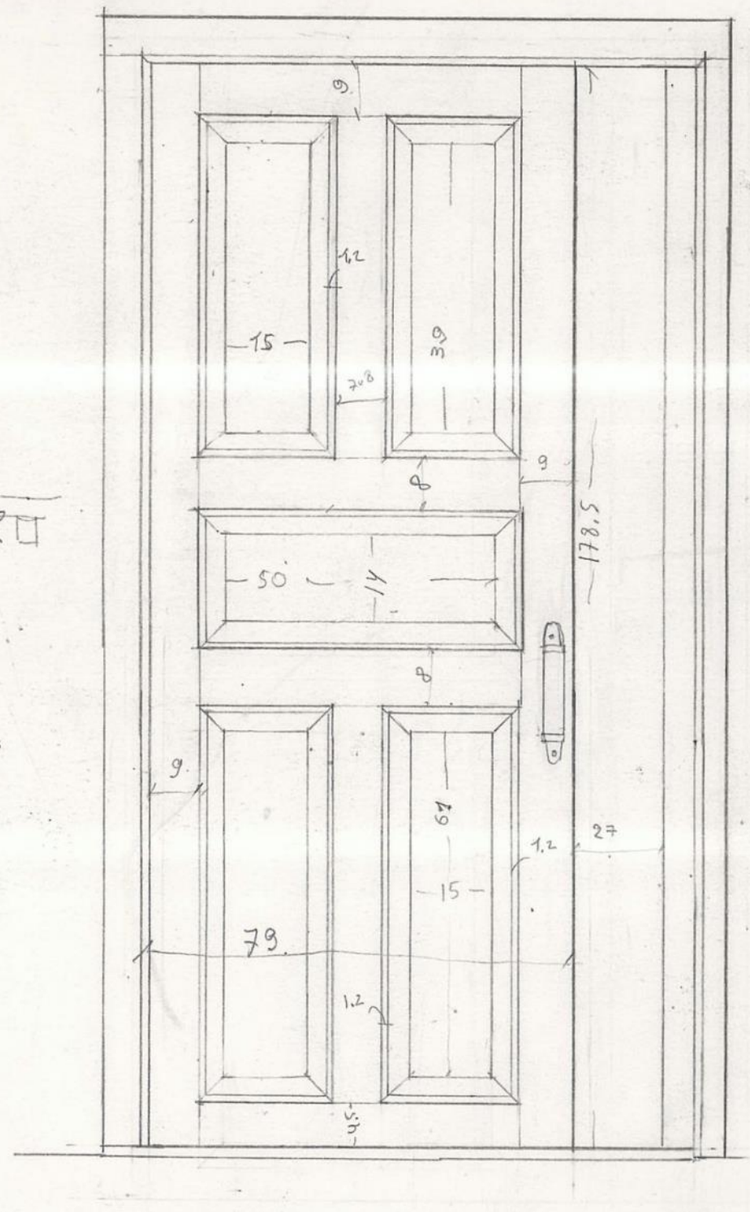
კვარლის მუნიციპალიტეტი, სოფ. ზინობიანი

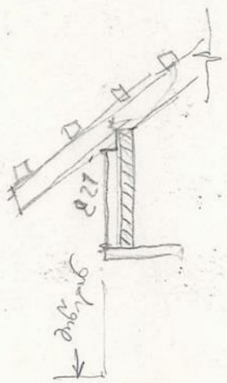
დიმიტრი ბარხუდაშვილის საცხოვრებელი სახლი

Village Zinobiani, Kvareli municipality

Dimitri Barkhudashvili House



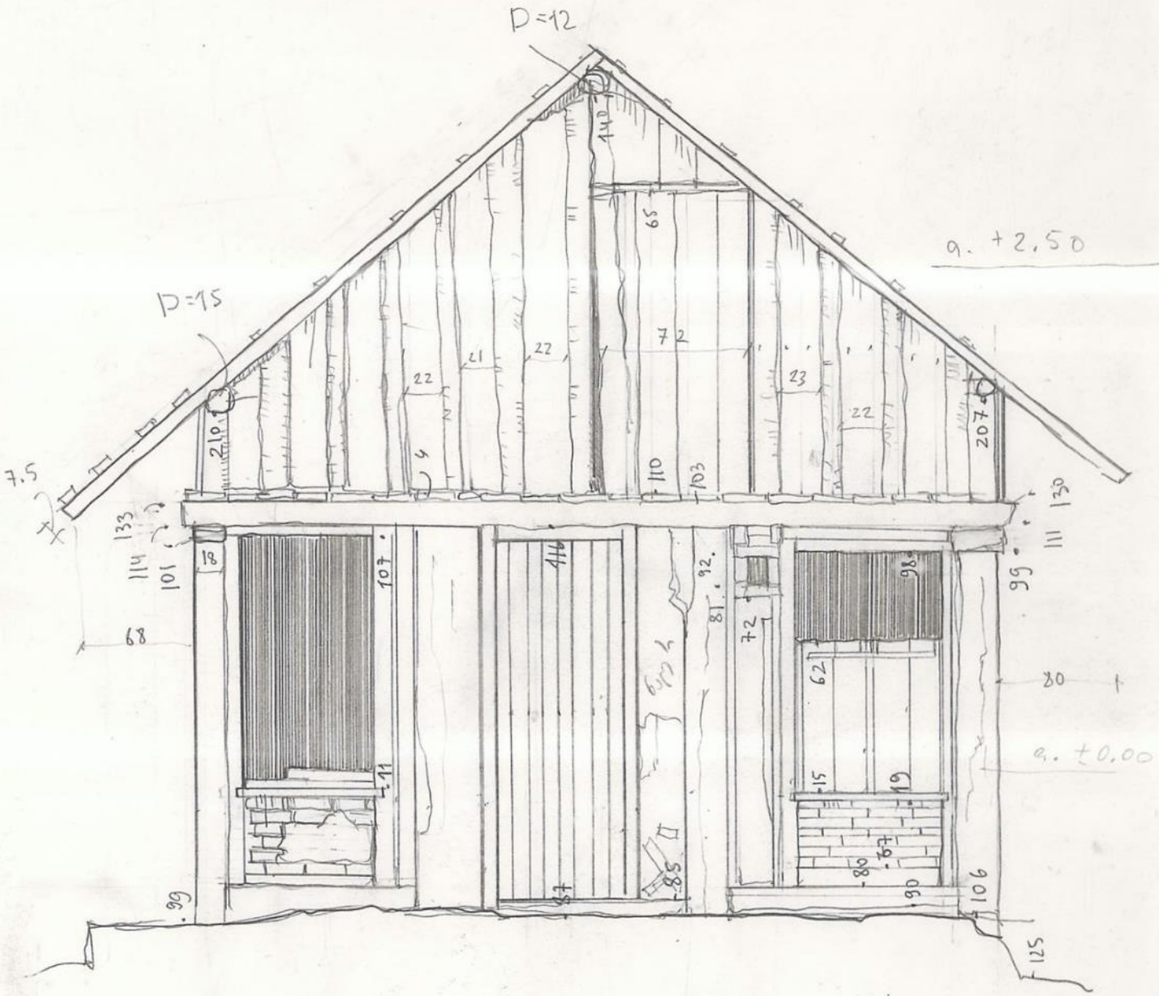




Village Zinobiani, Kvareli municipality

Dimitri Barkhudashvili House

სამხრეთ-აღმოსავლეთის ფასადი



ჩრდილო-დასავლეთის ფასადი

Field Sketch Records

Village Zinobiani, Kvareli municipality

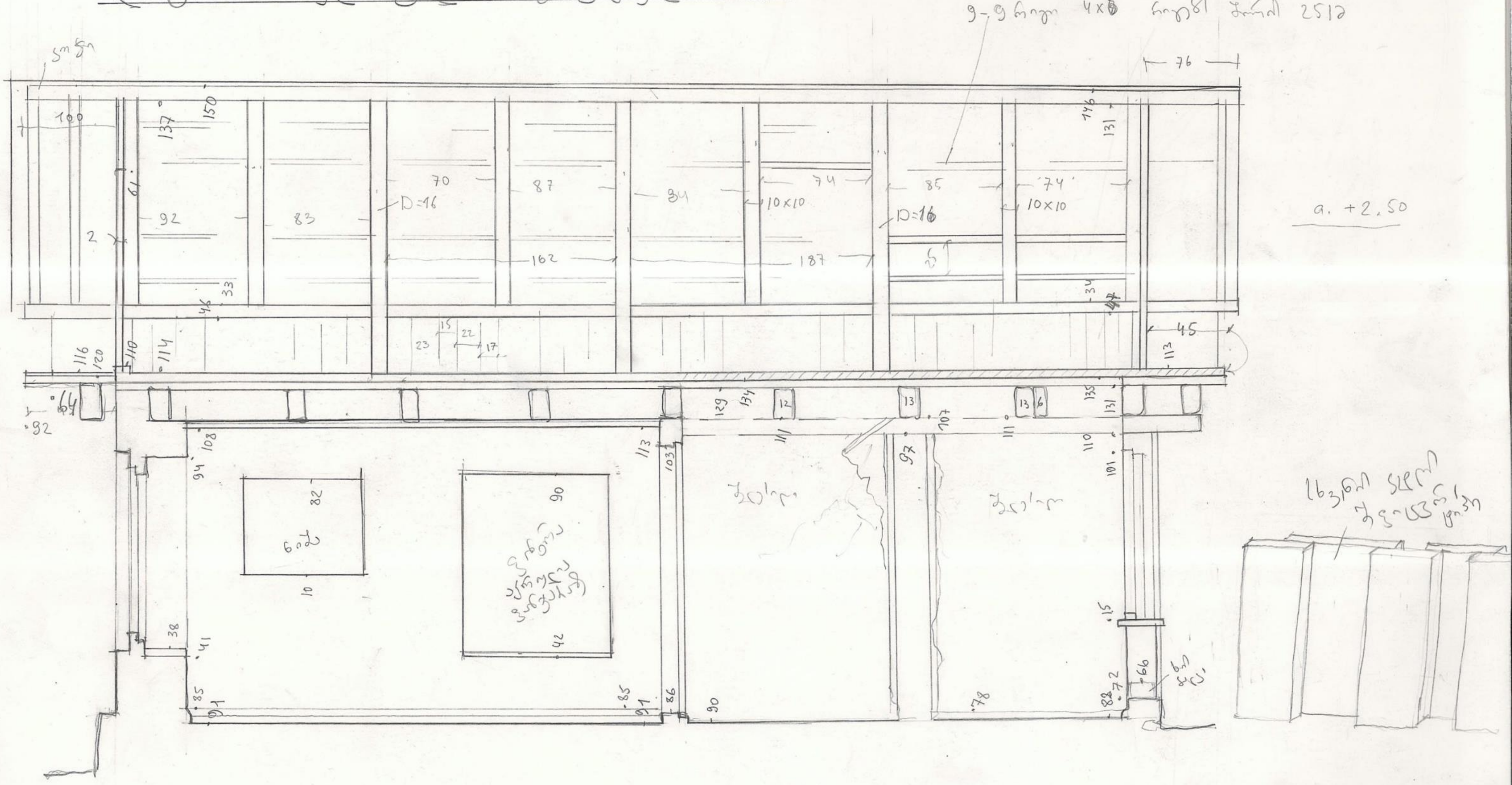
Dimitri Barkhudashvili House

ყვარლის მუნიციპალიტეტი, სოფ. ზინობიანი

დიმიტრი ბარხუდაშვილის საცხოვრებელი სახლი

Village Zinobiani, Kvareli municipality

Dimitri Barkhudashvili House



ჭრილი 1-1

ხის კარი N2

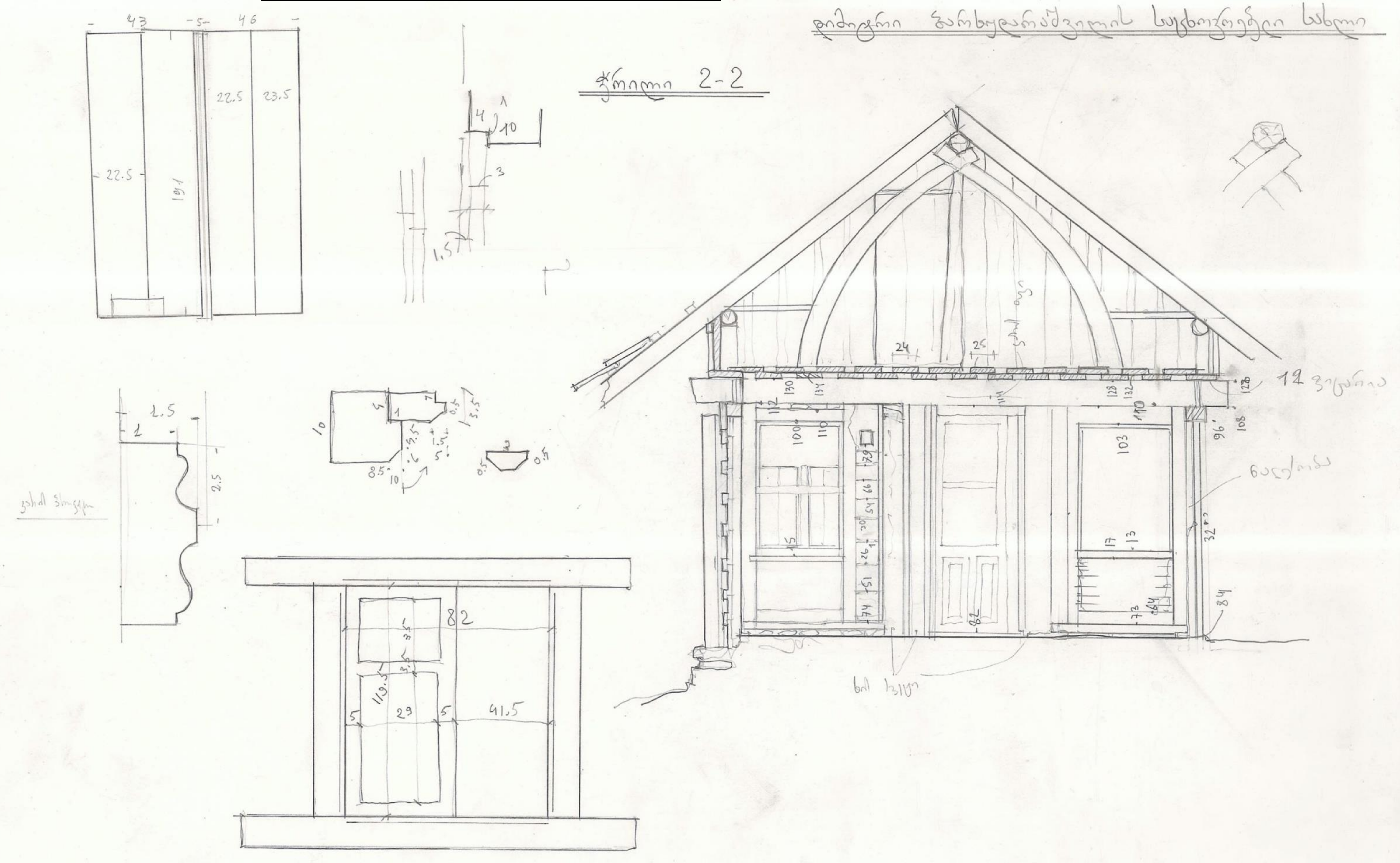
Village Zinobiani, Kvareli municipality

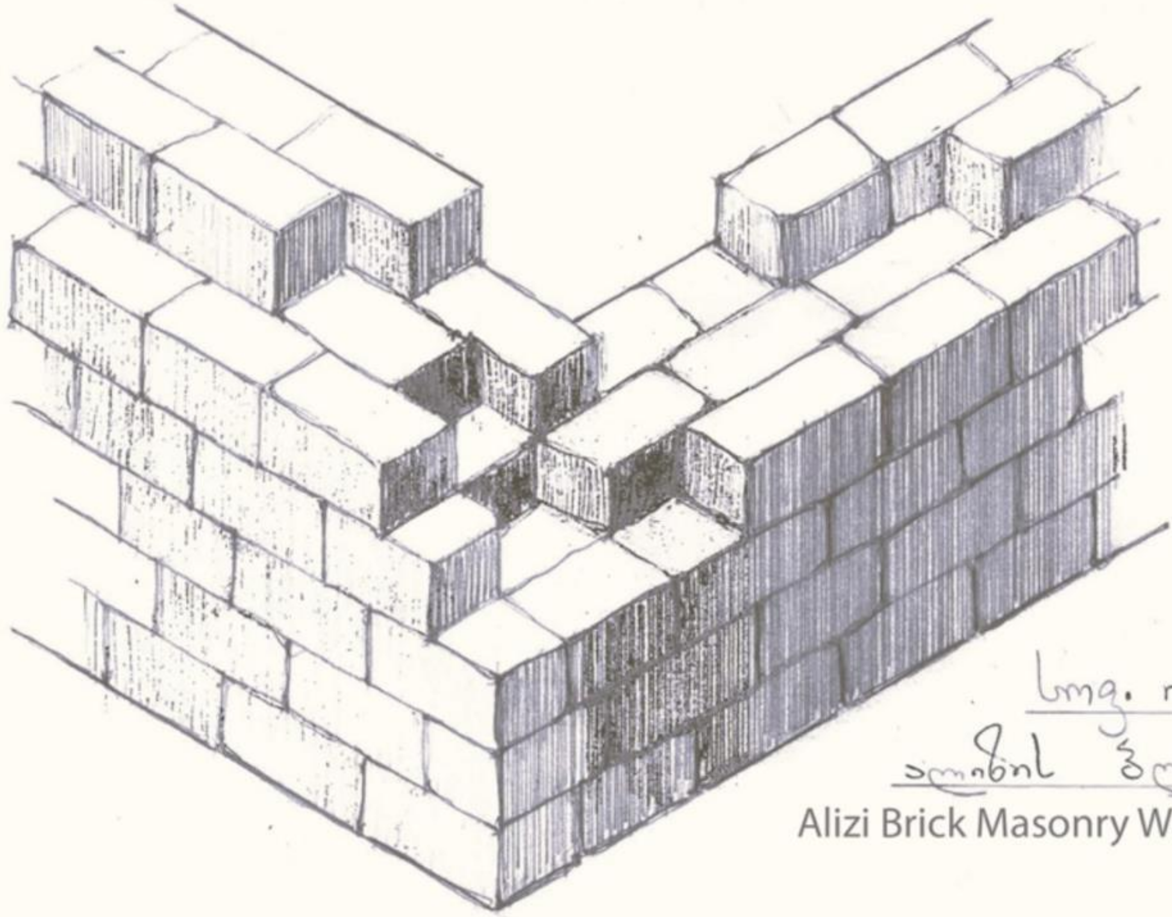
Dimitri Barkhudashvili House

ყვარლის მუნიციპალიტეტი, სოფ. ზინობიანი

დიმიტრი ბარხუდაშვილის საცხოვრებელი სახლი

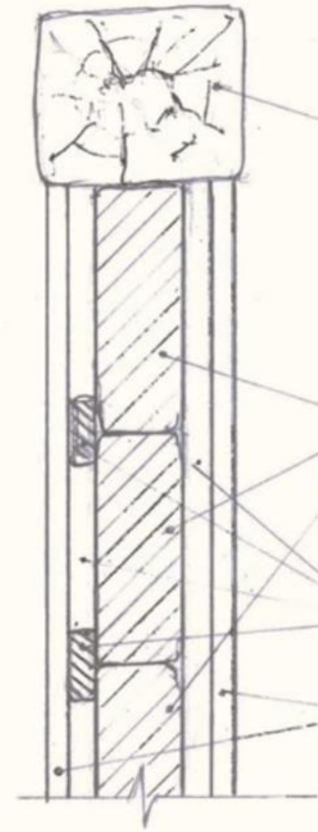
ჭრილი 2-2





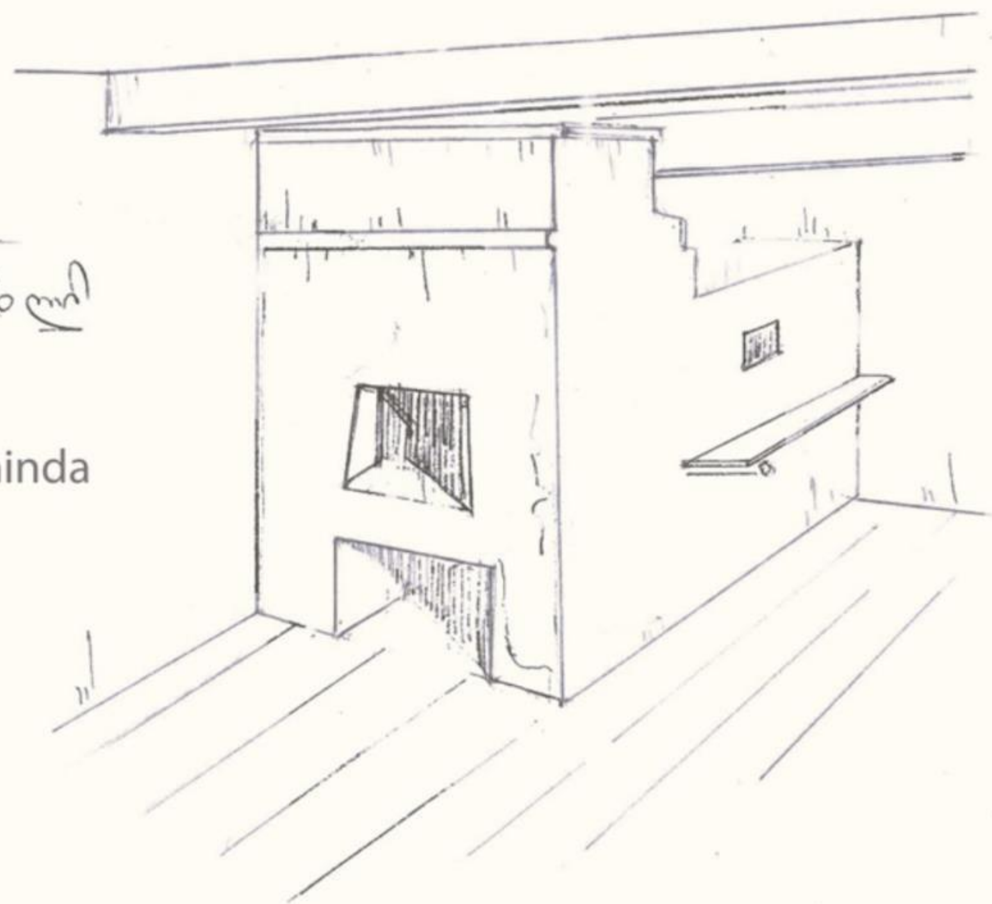
სოფ. ილიაწმინდა
ალიზის ბლოკების წყობა
Alizi Brick Masonry Wall . Iliatsminda

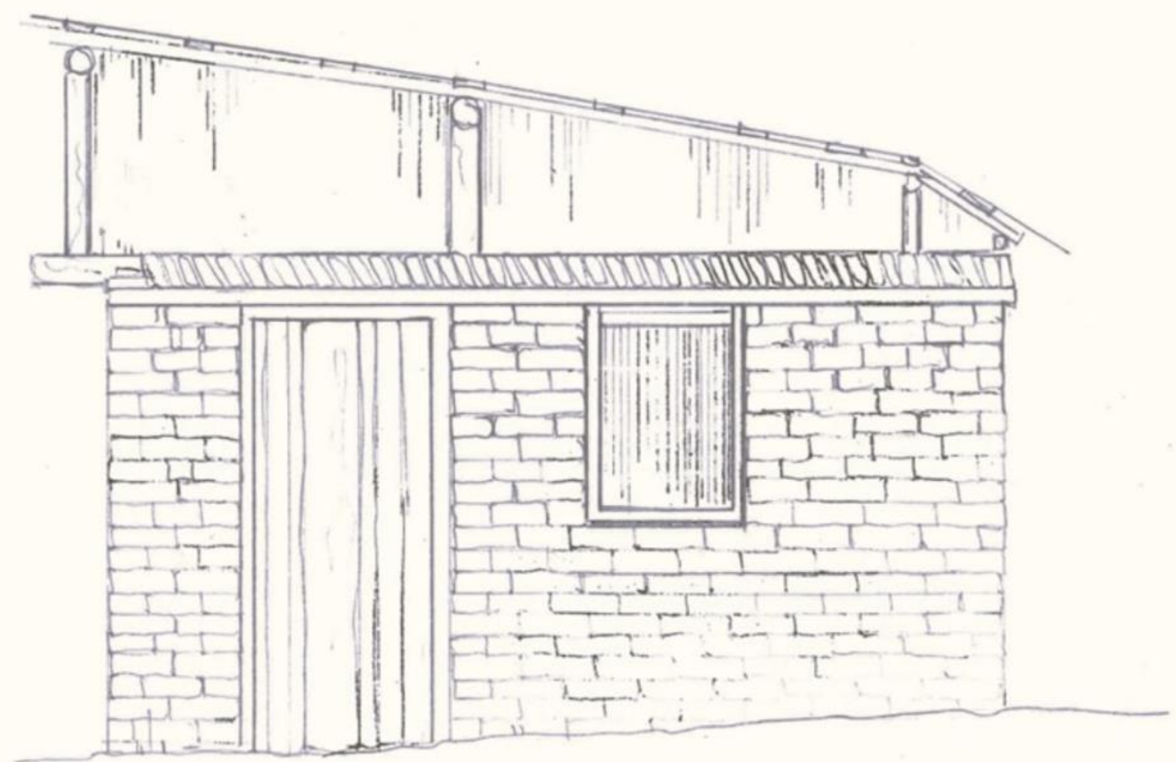
სოფ. ზინობიანი, საცხოვრებელი
სახლის კედლის ჭრილი
Wooden Partition From Zinobiani



სოფ. პატარა გარეჯვარი
სამეურნეო ნაგებობა
Alizi Axilary Structure in Patara Garejvari

სოფ. ილიაწმინდა
საცხოვრებელი სახლის
ღუმელი
Alizi Russian Stove In Iliatsminda





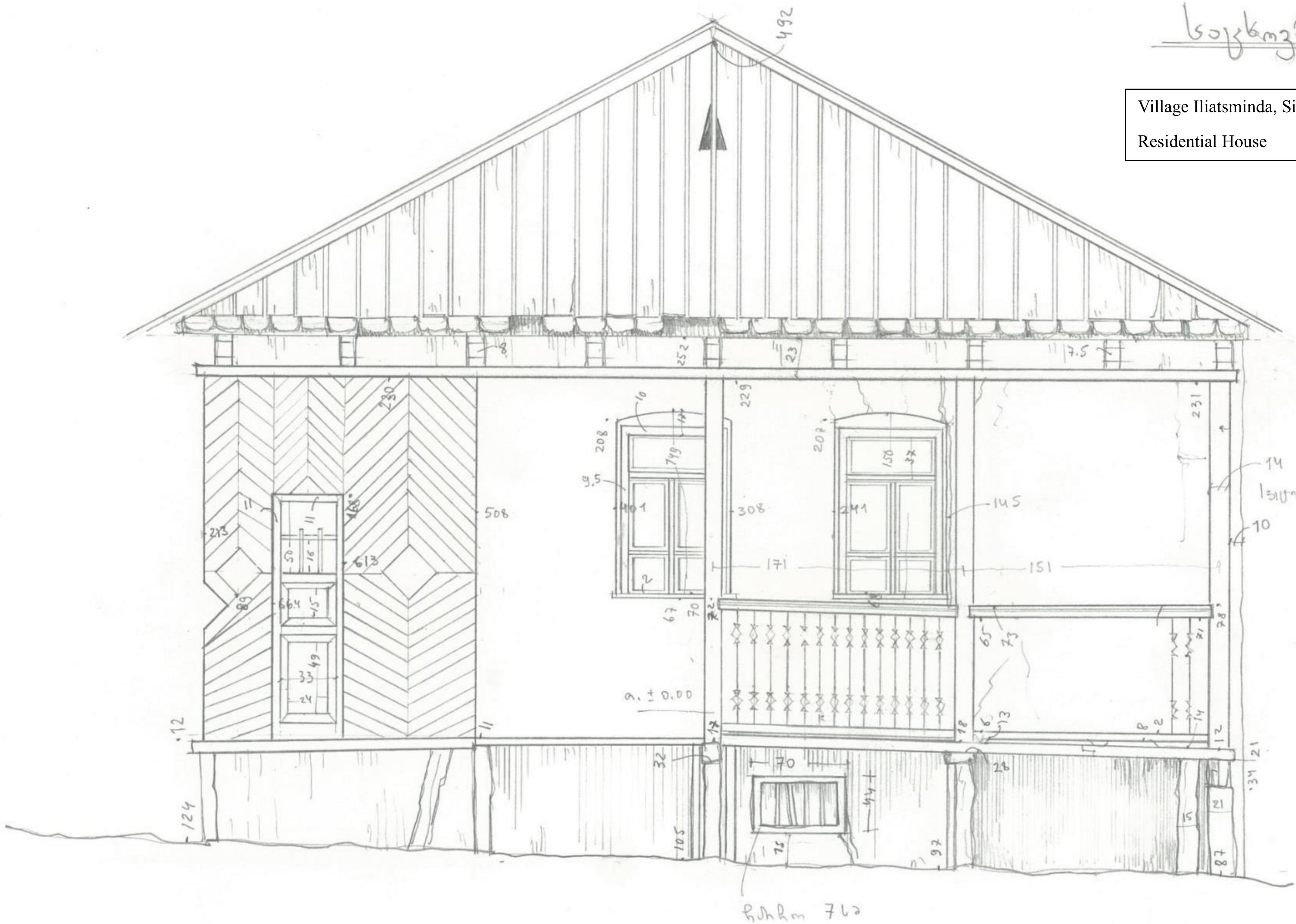
24.10.2024

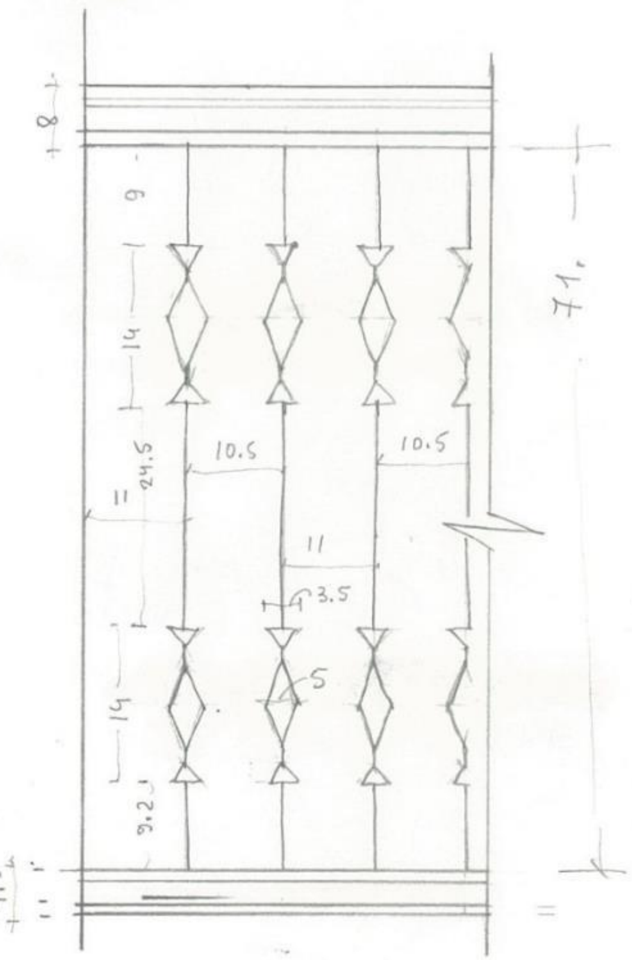
სიღნაღის მუნიციპალიტეტი, სოფ. ილიაწმინდა

საცხოვრებელი სახლი

Village Iliatsminda, Sighnaghi municipality

Residential House





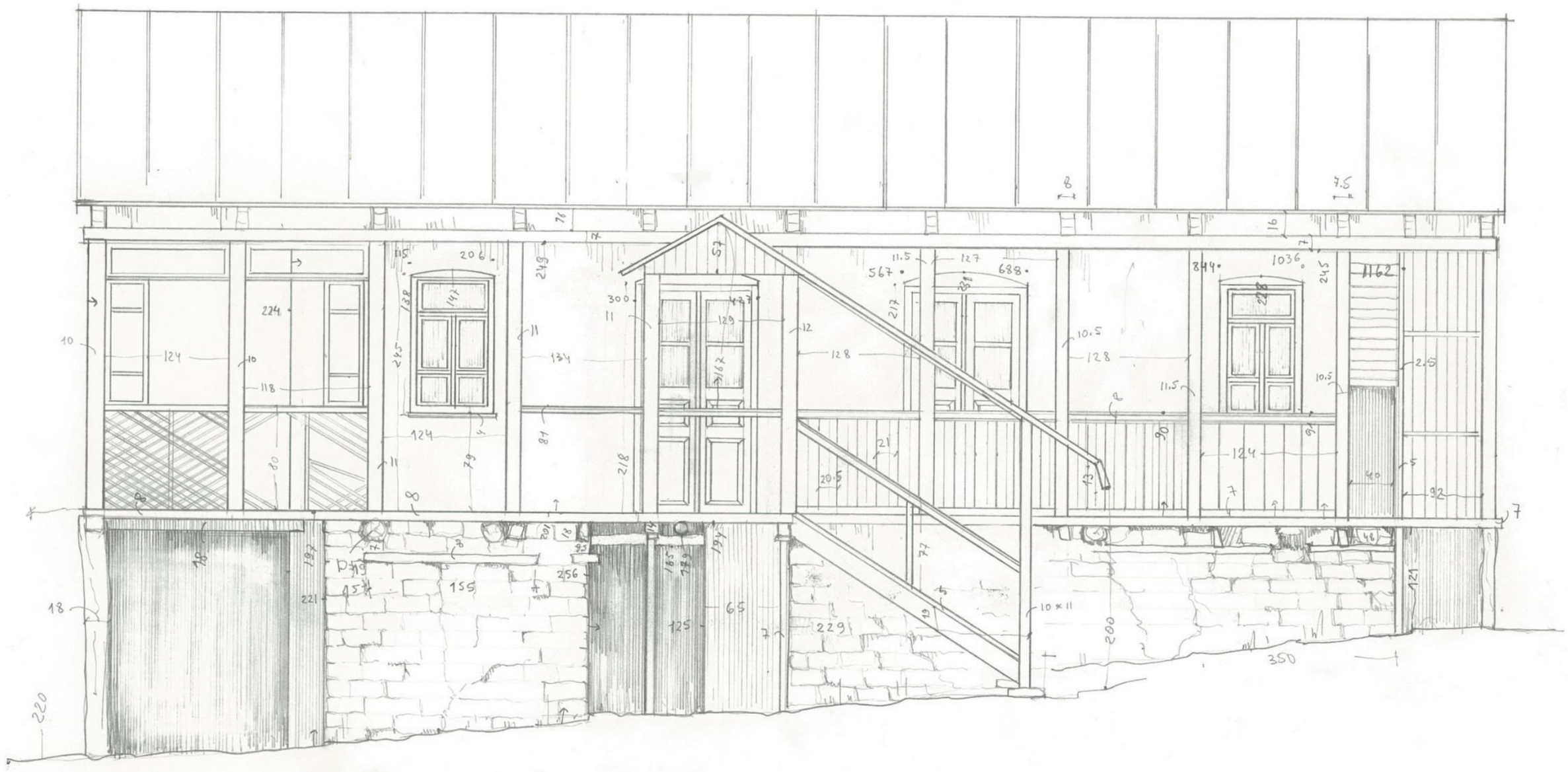
74 სმ × 11 × 2.5

ჭვირული

24.10.2024

Village Iliatsminda, Sighnaghi municipality

Residential House



24.10.2024

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