



Research Paper

## Fortified Historical Dwelling Reevaluated in Modern Context, Gjirokastra, Albania

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**ABSTRACT:** Gjirokastra's buildings occupies a special place in the housing typology of Albanian popular dwellings in the feudal period. The "popular tower" is linked with its defensive character, therefore in many cases it takes the name of a castle or defensive tower. This paper takes in consideration a typical example of the historical fortified dwelling in a well-known city of Albania, Gjirokastra. The methodology used in order to improve the way of thinking, the way of implementing, the way of designing of the future dwellings is very related to the historical attitude of the dwelling. Based on the historical documentation, of the fortified dwelling a real analysis is performed according to the logic of modulations. The purpose of this paper is to create a methodology for future generation of architects in order to better engage in the design process, respecting the valuable architectural history. The modern dwellings of Gjirokastra historical-urban context must adapt the historical architectural elements, the historical manners of construction, the typical construction materials, the operational mode and people's lifestyle, in order to preserve the city historical values via a modern touch.

**KEYWORDS:** Architectural elements, historical preservation values, geometric ratios, modular

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### I. INTRODUCTION

#### Historical context

Fortified dwelling in Gjirokastra, is mainly built on a sloping terrain. This dwelling almost always has its own yard. The size of land that forms the courtyard is different for different types of buildings. The housing relationship with courtyard and street configuration is generally conditioned by the configuration of the lot.

There are examples of dwellings that are not limited to any facades on the street. Generally, the theme of the two courtyards is also encountered in buildings in Gjirokastra city, sometimes in rare cases even three of them, particularly in the rich houses of the area. The courtyard usually surrounds itself with high walls and heavy gates. These elements increase protection capacity. It is usually find some built structures, such as "odajashta" which are built on the courtyard [1].

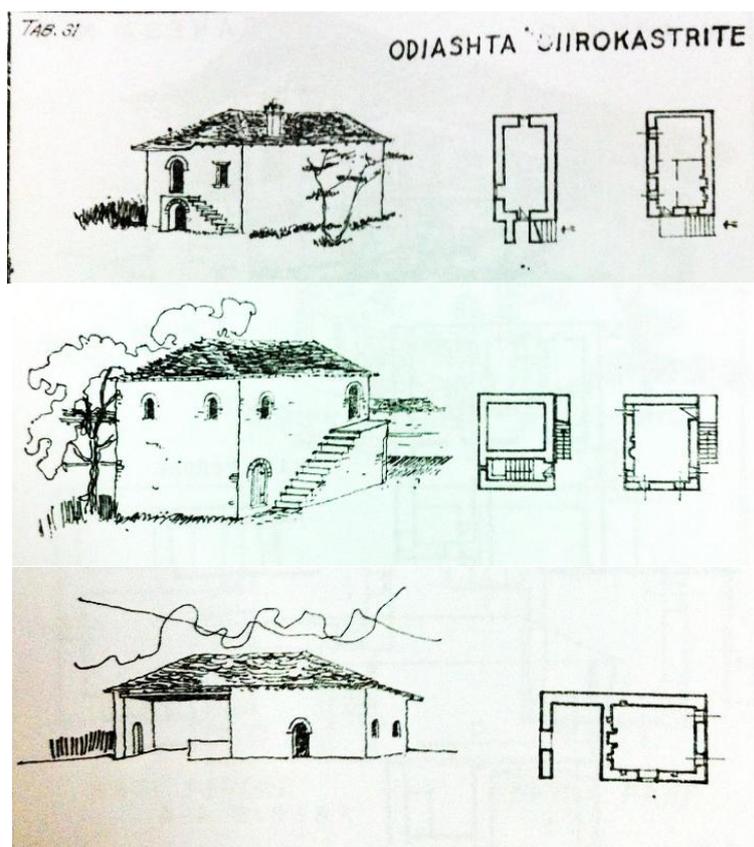


Figure 1: Odajashta in Gjirokastra, Albania [1]

Among the functions of these buildings can be mention: the living room of guests, the accommodation of servants, and the abode for the guards and warriors. When inside the built dwelling the environment of the kitchen is foreseen, the house does not overlook the courtyard. The logic of “Odajashta” followed the Gjirokastra’s buildings until the 19-th century [1].

### Modular proportions and construction methodology

The value of modular proportions is indisputable in the architectural design process. Roman Architect Vitruvius has state three conditions for good building: 1. commodity (usefulness), firmness (solidity or strength) and delight (beauty). Proportion provides guidelines for useful spaces. They create good structural system and very good aesthetic pleasing environments. Since ancient ages the humans have experimented the proportions of built mass by using mathematical principles. Vitruvius also emphases that principles of proportion and symmetry used in architecture derive from symmetry found in shape of human body. In the other hand Le Corbusier used golden ratio for architectural proportions. He has taken the advantage of knowledge given by Vitruvius, Leonardo da Vinci’s Vitruvian Man, Leone Battista Alberti and interpreted this knowledge in new way called “Modulor”. The proportions are much involved in the design process. The role of the geometry in the design process could be traced first in Greece in their public building such as Pantheon. In ancient civilization the use of geometric ratio and proportions was an important tool in determining the aesthetic value of buildings. In the modern context the architects are more concern about space utilization, building orientation, zero energy buildings, structural designs, but the real value of architecture is based on the aesthetic aspect of dwellings [9].

Modular construction methodology is not new. Using such methods will result high quality buildings in a short amount of time. However, the construction process is complicated due to various site of construction [4]. Modular construction and prefabrication in the Architecture, Engineering, and Construction Industry is a growing trend [5]. These systems have the ability to impact many sectors and building types such as residential, multi-family dwellings, educational, correctional and high-rise [6]. Modular construction is not very feasible for every type of architectural design and building classifications, mostly the ones with little repetition, based on practices and new technologies.

Historic building construction are taken in consideration by architects and engineers related to standard performance characters. This industrialization requires special methods of production technology and particular design criteria in order to support the processes, which will be taken in consideration in the design

phase [7]. Many of the buildings that stand the test of time are characterized either as "listed", or as "historical" and constitute part of the living memory of a place at a given timeframe [8].

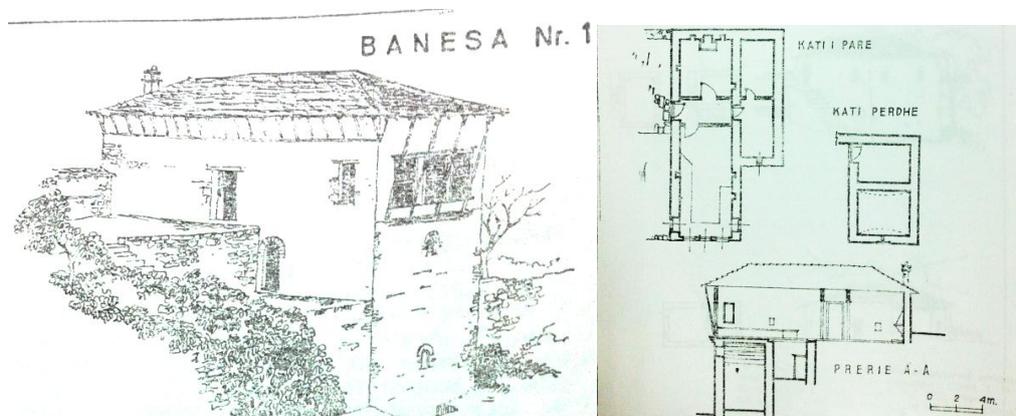
### **Buildings classification**

The fortified dwelling in Gjirokastra compared to construction with "Çardak" (another Albanian dwelling category) has a limited spread. This building appears at the end of the 19th century, and appears in its three variants:

1. Perpendicular variant,
2. One-wing variant
3. Two-wings variant

The three-store dwelling dominates in all three variants, but also the two-store dwellings are also present.

The simplest version is the perpendicular one, positioned on the sloping ground. This building is composed with entresol, and two or three floors. Two-story dwelling, has a wider spread. It is decomposing with a half floor plan or with a full floor plan.



**Figure 2:** Perpendicular variant [1]

There is the water depot on the ground floor of this dwelling, and there is a fire house and the rooms of guests on the first floor. The sanitary facilities are built laterally.

The possibility of switching from two-store building to three-store building brands is an important step towards consolidating the compositional quality of the dwellings in Gjirokatra city. This simple construction of the established height creates a unique and typical compositional volume. Ground floor serves for auxiliary facilities, meanwhile first floor is dedicated to daily life of the family and second floor for welcoming guests and for housing in the warmer seasons.

The one-wing building variant has a wider wingspan, but the two-wings option is one of the most beautiful building features in Gjirokastra. This type of building achieves a balance of distinct compositional, and a monumentality accent of the main entrance [2]. In contrast to the one-wing option, the base blocks are always positioned parallel. The three central rooms have only a connection between them. The plan development of the two-wings version is simple. The wings are not the same. On the longer side is always the guest room [1].

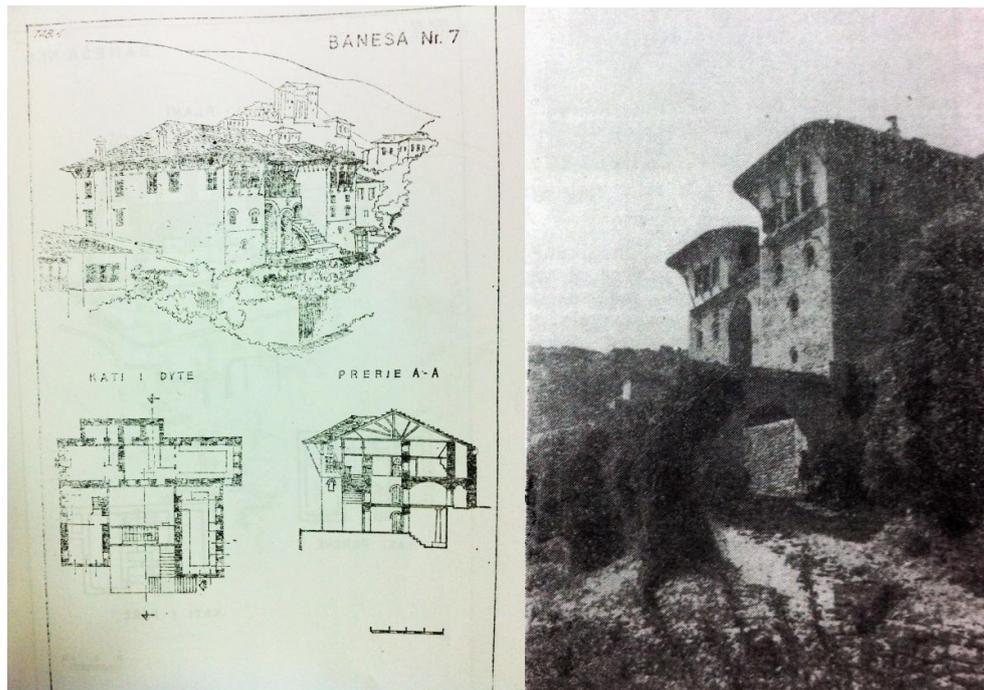


Figure 3: Two-wings variant [1]

## II. CASE STUDY, FORTIFIED DWELLING, GJIROKASTRA, ALBANIA

The traditional house studied in Gjirokastra city is a dwelling that develops into a central connecting nucleus. The services are inserted in the back of the building, closing the volume. The porch is limited on three sides.

The building is equipped by two types of stairs, internal and external ones, that lead to the intermediate floor. This is one of the characteristic of this dwelling typology [3]. This category of dwelling is spread not only in Gjirokastra but also in Berat, Kruje and Skopje.

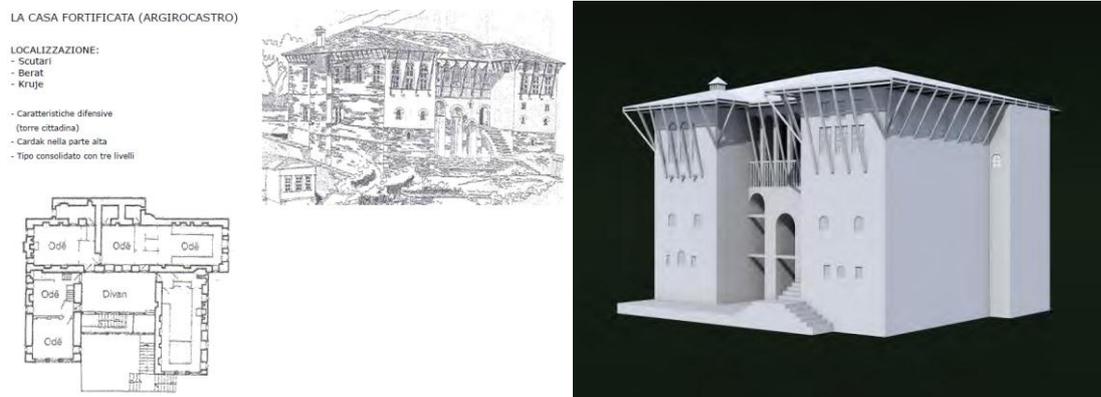
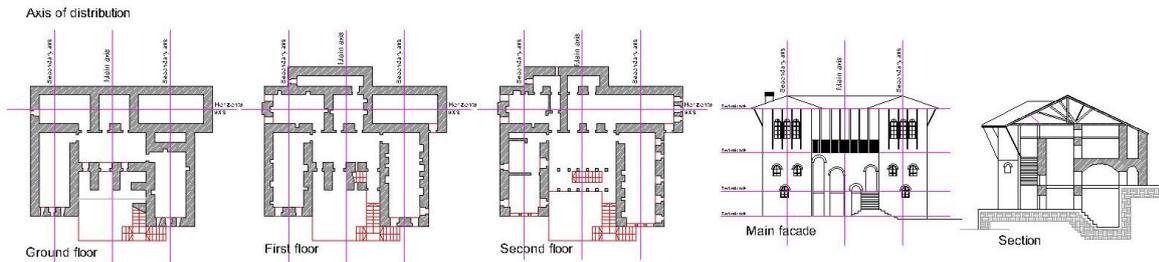


Figure 4: Fortified dwelling [1]

The dwelling with two wings is the most advanced type of popular housing in Gjirokastra. The building has mainly defensive character for this reason it is named either tower or castle. It is mainly built on sloping ground. The longitudinal axis of the building remains perpendicular to the plane of the rocky ground.

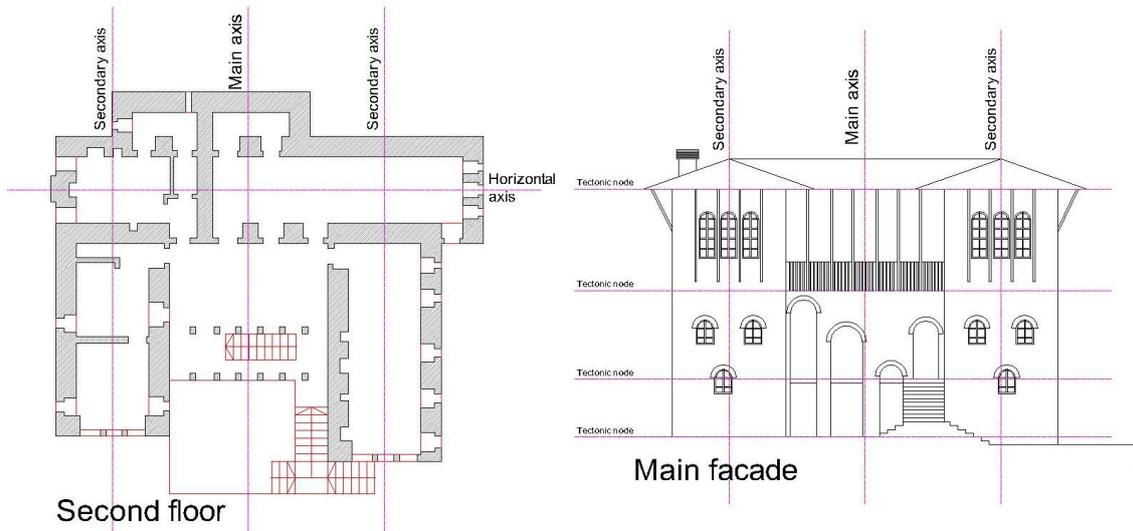


**Figure 5:** Fortified dwelling in Gjirokastra, source: Klodjan Xhexhi

The dwelling sizes of such category generally is variable. The relationship of the dwelling with the courtyard and the road network is conditioned by the configuration of the plot and the operational mode. Plot configuration is very important in defining the size of the dwelling.

There are examples of buildings that are not limited to any facade with the street for safety reasons. The same principle is also implemented in the design task. The new building is positioned in the center of the courtyard. Mainly the courtyard is surrounded by high walls and a heavy double door. The entrance to the courtyard is provided laterally to the main road. This is another point that has been addressed in the proposed project. The building is characterized by a closed character which reinforces the idea of defensive attitude.

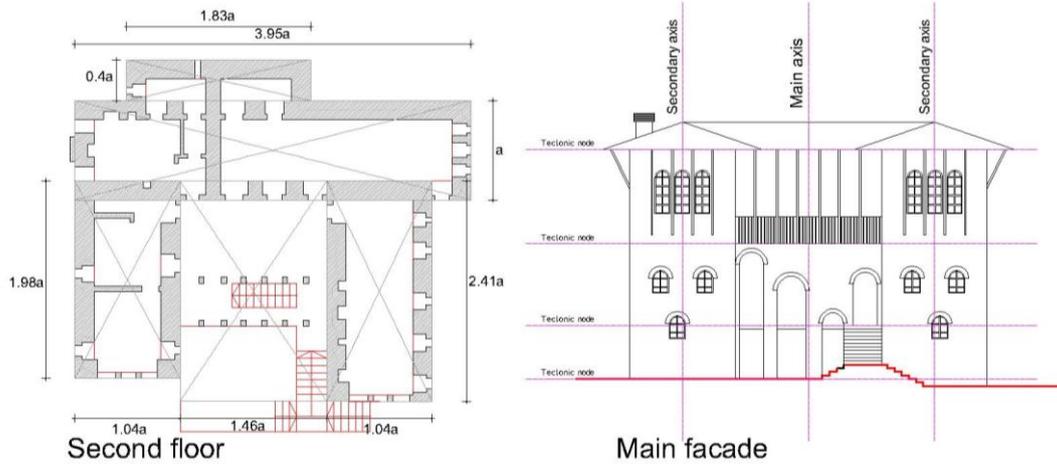
In the entrance of the dwelling stone tiles are usually placed. In the new proposed dwelling, such elements are provided in the same area. There are three distribution axes vertically and one horizontally, which are also implemented in the new designed dwelling.



**Figure 6:** Fortified dwelling in Gjirokastra; Distribution axes; source: Klodjan Xhexhi

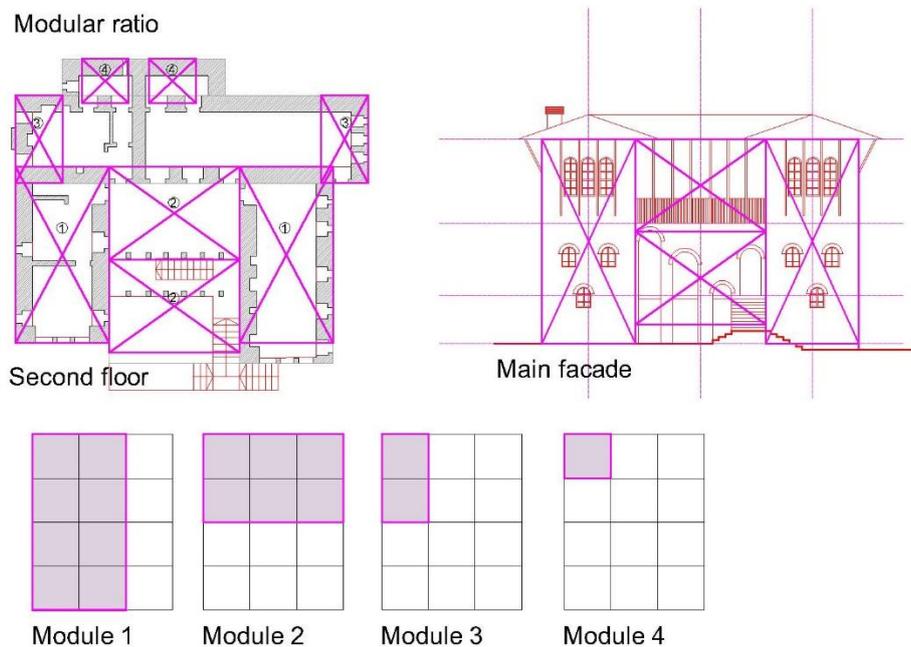
The compositional principles are simple. A repeating module was found, which is also implemented in the design concept of the new designed building. This module is used in plan and also in the façade, providing a good point of support in relation to the existing building. The new designed building is developed in three levels.

The compositional principles (proportions)



**Figure 7:** Fortified dwelling in Gjirokastra; Principles of composition; source: Klodjan Xhexhi

Modular ratio



**Figure 8:** Fortified dwelling in Gjirokastra; Modular proportions; source: Klodjan Xhexhi

The first floor of these historical dwellings usually functions as a warehouse and water storage, while the other floors are intended as living areas. The first floor is used for housing in the winter season, while the second floor is used for housing in the summer and as a guest room too.

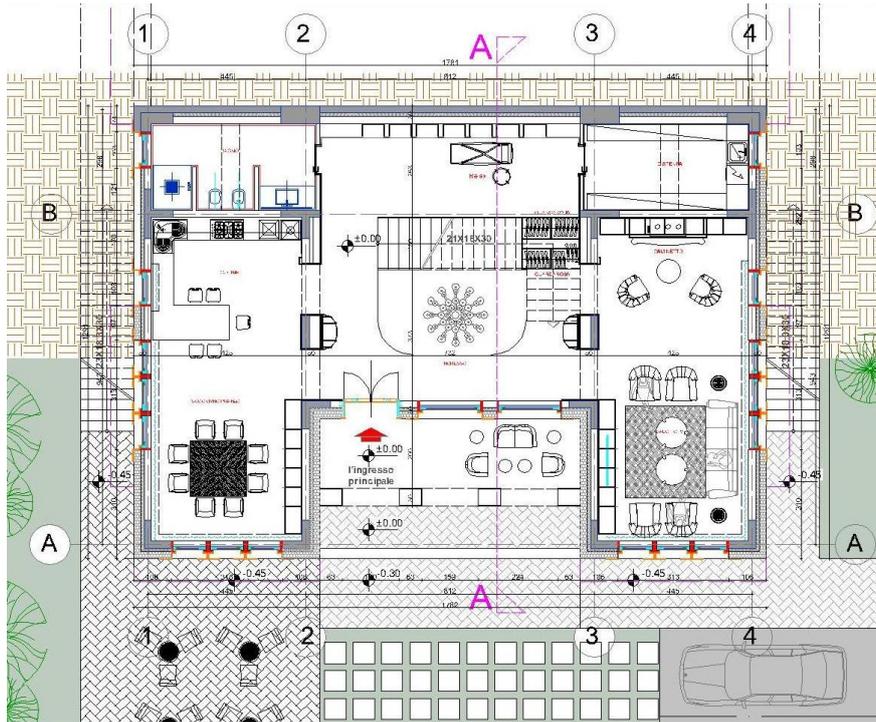


Figure 9: Ground floor (proposed plan) source: Klodjan Xhexhi

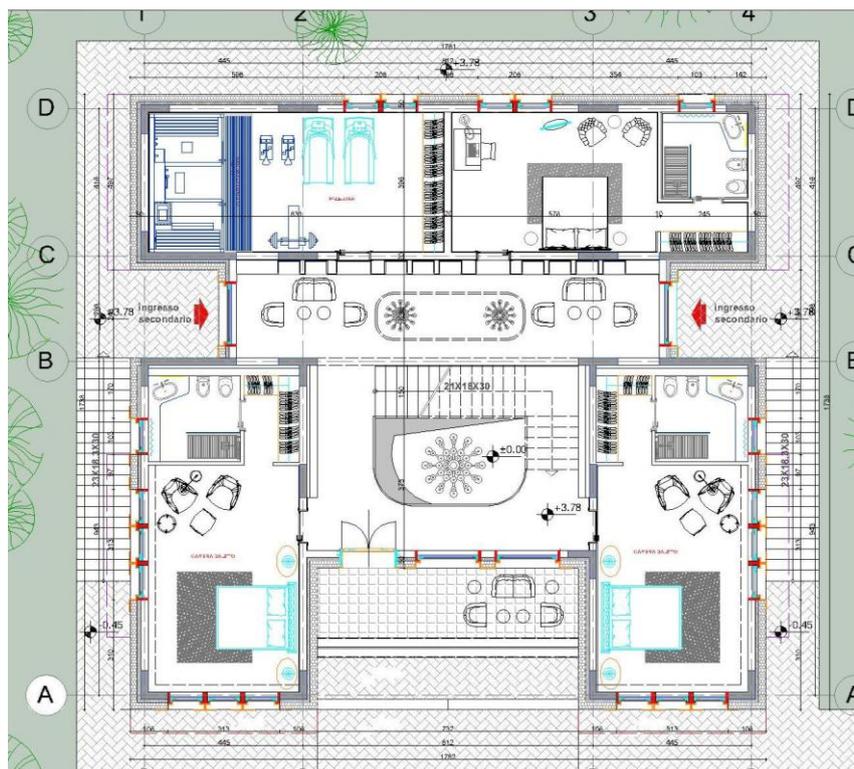
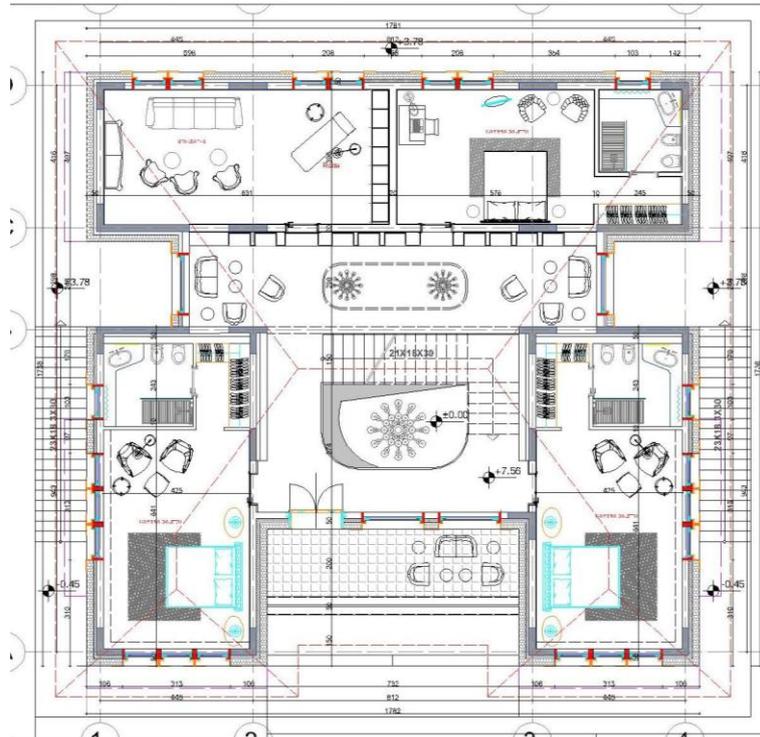
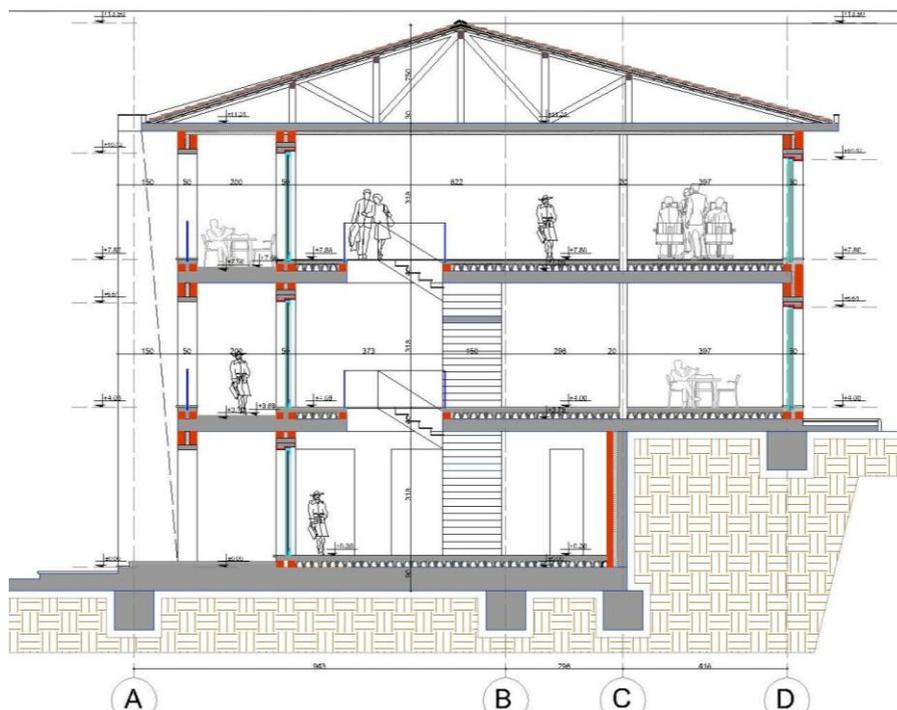


Figure 10: First floor (proposed plan) source: Klodjan Xhexhi



**Figure 11:** Second floor (proposed plan) source: Klodjan Xhexhi



**Figure 12:** Section (proposed dwelling) source: Klodjan Xhexhi

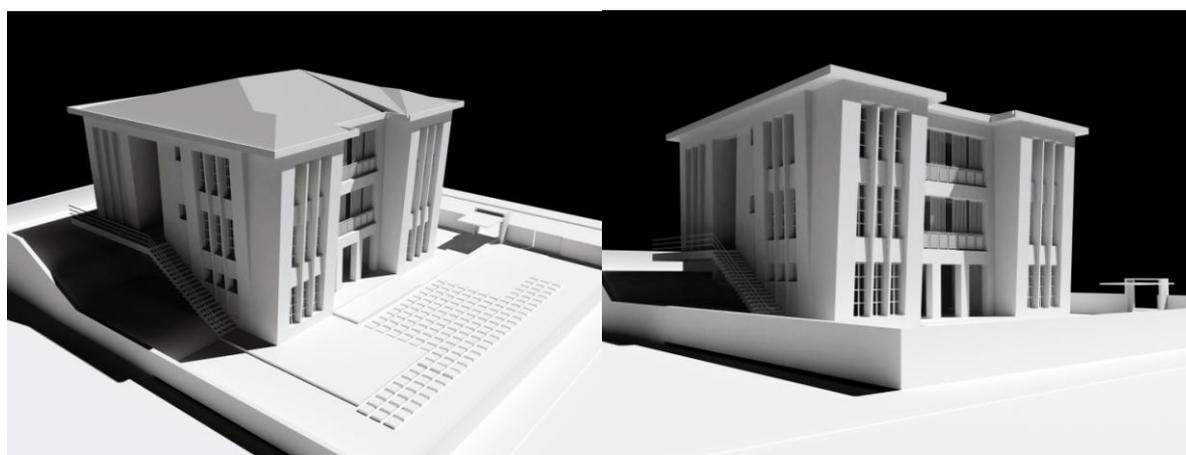
Characteristic of these historical dwellings is the use of stone walls, combined with wooden elements for greater stability. Mainly ground floor of these typology of dwellings performs in this way. The other floors have a lighter structure of wood and other materials, willows and mud bricks or stone masonry, with a single entry from the street.

The proposed design intends to preserve the external stone cladding tradition. Thermal insulation is provided on the inside of the exterior walls in order to preserve the façade and its natural characteristic elements.

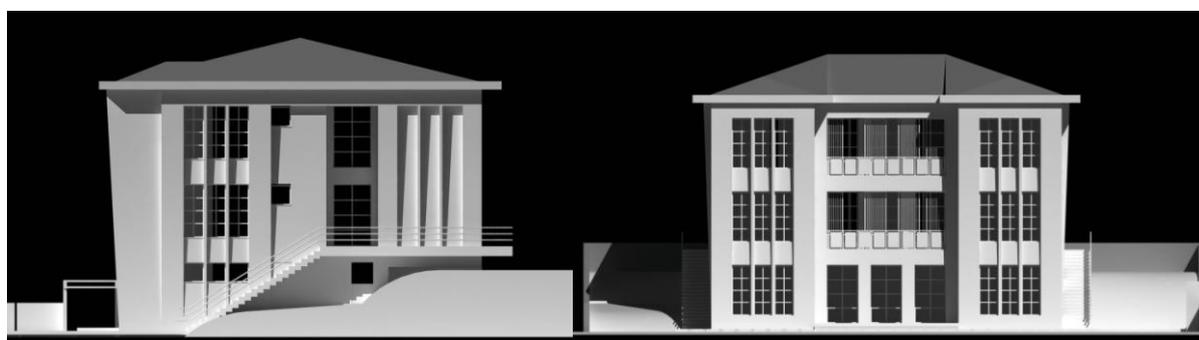
The cracks in the wall for the wardrobes and cabinets are borrowed from the traditional model creating a variation of the elements built in natural materials (wood). The fire chamber is one of the main focal of interest of the whole dwelling. This chamber is always positioned laterally.

The technology of cracks in the floor for ventilation and technological purposes is borrowed from Ancient Roman culture and is implemented in the new designed dwelling.

The inclined elements that hold the weight of the roof are used in the new construction as one of the most important elements in the architectural composition. According to the accurate historical analyze, the inclined elements are embedded only on the second floor. They also carry the weight of the cantilevered roof. The revised proposal borrows such elements creating a dynamic façade, implementing them as the main compositional factor of the revised façade. These elements are prolonged and protrude from the ground up to the third floor, creating a shaded and interesting space during the summer season and further strengthen the verticality of the building. The external staircase disappears, living a single vertical connection in the main core of the dwelling (a floating stair in the central atrium). In the proposed design both of the wings get the same aesthetic impact, same size, and equal level of importance.



**Figure 13:** Renders (proposed dwelling) source: Klodjan Xhexhi



**Figure 14:** Side façade, main façade (proposed dwelling) source: Klodjan Xhexhi

### III. CONCLUSIONS

The logical connection between the historical values of the buildings should be present in the modern design process, as part of the historic core of the city of Gjirokastra. The modern design process should be inspired by the historical values, the use of the traditional materials, the construction technics, the operation mode and people's lifestyle. The next generation of architects should be aware of the historical architectural values, should be well informed and respect the history of their own country. The historical dwellings are part of the living memory of a place at a given timeframe and they should never be neglected.

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