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# CONSERVATION PROBLEMS OF HISTORICAL CHURCHES IN ELAZIĞ: SURP SIMON CHURCH

**Ayşe Gülce KARAKAYA**

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## ETHICAL STATEMENT

I at this moment declare that in this thesis study, I prepared the thesis writing rules of Gazi University Graduate School of Natural and Applied Sciences;

- All data, information, and documents presented in this thesis have been obtained within the scope of academic rules and ethical conduct,
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- All material used in this thesis that is not original to this work has been exhaustively cited and referenced,
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Ayşe Gülce KARAKAYA

29/12/2023

CONSERVATION PROBLEMS OF HISTORICAL CHURCHES IN ELAZIĞ: SURP SIMON CHURCH

(M.Sc. Thesis)

Ayşe Gülce KARAKAYA

GAZİ UNIVERSITY

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## ABSTRACT

Elazığ has been a culturally diverse city where different cultures have lived together throughout the history. Until the early 20th century, a significant non-Muslim population lived in the city alongside the Turkish community. For this reason, some of the architectural heritage left by non-Muslims in the city has survived to the present day. In this study, the current status of all the historical churches in Elazığ province is examined and some conservation problems were identified as a result. Ann overall list of these problems include as neglect, misuse, earthquake effects, property problem, vandalism. It was determined that the biggest threat to these churches, all of which were built with masonry construction technique, is the earthquake risk. Surp Simon Church constitutes the field study of this thesis since it has preserved its structural integrity despite the earthquake threat, abandonment and the fact that it has not undergone any restoration. The aim of the study is to determine the reasons why this church has preserved its structural integrity despite various threats. In this context, the architectural survey of Surp Simon Church was prepared, then a finite element model of the building was prepared using SAP2000 software, and its structural behavior under self-load and earthquake load was analyzed. As a result of the analyses; it was found that the church showed a very rigid behavior and it was determined that it meets the physical adequacy and social-environmental harmony criteria required for re-functioning and that it can be preserved and transferred to the future generations with minimum intervention.

| | | |
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# ELAZIĞDA YER ALAN TARİHİ KİLİSELERİN KORUMA SORUNLARI: SURP SİMON KİLİSESİ

(Yüksek Lisans Tezi)

Ayşe Gülce KARAKAYA

GAZİ ÜNİVERSİTESİ

FEN BİLİMLERİ ENSTİTÜSÜ

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## ÖZET

Elazığ, tarih boyunca farklı kültürlerin bir arada yaşadığı, kültürel çeşitliliğe sahip bir şehir olmuştur. 20. yüzyılın başlarına kadar şehirde Türk toplumunun yanı sıra kayda değer bir Gayrimüslim nüfus da yaşamıştır. Bu nedenle, Gayrimüslim halkın kentte bıraktığı mimari mirasın bir kısmı günümüze kadar ulaşmıştır. Bu çalışmada, Elazığ ilindeki tarihi kiliselerin tamamının mevcut durumu incelenmiş olup sonuç olarak bazı koruma sorunları belirlenmiştir. Bu sorunlar genel olarak; bakımsızlık, yanlış kullanım, deprem etkileri, mülkiyet sorunu, vandalizm olarak sıralanabilmektedir. Tamamı yığma yapım tekniği ile inşa edilmiş bu kiliseler için en büyük tehdidi deprem riskinin oluşturduğu belirlenmiş, incelenen bu kiliselerden Surp Simon Kilisesi; şiddetli depremler geçirmiş olmasına, terkedilmiş olmasına ve hiçbir restorasyon geçirmemiş olmasına rağmen yapısal bütünlüğünü korumuş olması sebebiyle bu tezin alan çalışması olarak seçilmiştir. Çalışmanın amacı bu kilisenin çeşitli tehditlere rağmen strüktürel bütünlüğünü korumasının sebeplerinin belirlenmesidir. Bu bağlamda, Surp Simon Kilisesinin mimari rölövesi hazırlanmış, daha sonra yapının SAP2000 yazılımı aracılığıyla sonlu elemanlar modeli hazırlanmış, kendi yükü ve deprem yükü altındaki strüktürel davranışı analiz edilmiştir. Yapılan analizler sonucunda; kilisenin oldukça rijit bir davranış gösterdiği görülmüş olup; yeniden işlevlevlendirme hususunda gerekli olan fiziksel yeterlilik ve sosyal-çevresel uyum kriterlerini karşıladığı ve minimum müdahale ile korunarak gelecek nesillere aktarılabileceği belirlenmiştir.

| | | |
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## SYMBOLS AND ABBREVIATIONS

The symbols and abbreviations used in this study are presented below, along with their explanations.

| Symbols | Explanations |
|---|---|
| **m** | Meter |
| **$m^3$** | Square meters |
| **cm** | Centimeter |
| **mW** | Moment magnitude |
| **kN** | Kilonewton |
| **MPa** | Megapascal |

| Abbreviations | Explanations |
|---|---|
| **A.D.** | Anno Domini (After Christ) |
| **B.C.** | Before Christ |
| **EACHAR** | Elazığ Architectural Cultural Heritage Assessment Report |
| **HCCCP** | High Council for the Conservation of Cultural Property |
| **LIDAR** | Laser Imaging Detection and Ranging |

# 1. INTRODUCTION

Cultural heritage must be conserved and transmitted to future generations as it offers insights into past ways of life and serves as historical evidence. In the conservation of cultural heritage, it is important to conserve all the values of the historical building or artifact against all threats. Türkiye has been a home to various civilizations for centuries, which has resulted in numerous cultural works that hold great value. Since the 19th century, the actions taken by UNESCO and the development of the "World Heritage" concept have been an important milestone in the discipline of conservation. In keeping with its objective, an international collaboration led by UNESCO has been established to raise awareness of the protection of universal values recognized as common heritage, to conserve those that are deteriorating and threatened with extinction, and to pass them on to the future with confidence. At the UNESCO-organized conference in Paris in 1972, the "Convention Concerning the Conservation of the World Cultural and Natural Heritage" was adopted. The convention has placed legal and administrative obligations on the state parties to document, conserve, and showcase natural and cultural heritage. In 1983, the Republic of Türkiye joined the group of states that are parties to the convention, which currently has 190 members (Bilgili, 2014).

In this context, documenting and conserving Türkiye's cultural heritage is necessary. Elazığ, located in the Upper Fırat basin within the Eastern Anatolia Region, has been ruled by various civilizations throughout history. Elazığ, which has been inhabited since the Paleolithic Age until the present day, is one of the rare cities in Anatolia that has hosted different cultures and civilizations for centuries, resulting in many cultural heritages. The Harput region, located five kilometers north of the current city center, served as the initial settlement center for Elazığ until the city was relocated to its present location in the mid-19th century. Harput's history can be traced back to the Middle Bronze Age, specifically between 2000 to 1800 B. C. The region has been under the rule of various states, including the Hurrians, Urartians, Romans, Medes, Persians, Parthians, Sassanids, Seleucids, Armenians, Byzantines, Arabs, Chubukoğulları, Artukoğulları, Seljuks, Mongols, Dulkadiroğulları, Akkoyunlular, Safavids, and Ottomans. As a result, the cultural heritage of the city is concentrated in the Harput region.

Muslim and non-muslim people have lived together in Elazığ province for years. When the population censuses are analyzed, it is seen that there is a significant non-muslim population in the region. There are important cultural heritage artifacts belonging to the non-muslim people living in the region. These historical artifacts, which are historical documents and have high architectural value, should be documented and conserved and passed on to future generations. Within this master's thesis, the geographical, historical, and architectural features of Elazığ were discussed, emphasizing the city's significant cultural heritage. A literature review was conducted on the conservation problems and conservation studies of the historical churches concentrated center of Elazığ and Harput Region. In this context, this study uses a collection of past studies conducted to give an overall inventory of these churches, which focused on the conservation and documentation of the historical churches in Elazığ Province in the historical process and the factors that caused the deterioration of the churches.

Within this study, the literature was thoroughly reviewed, inclusive of archival documents, registration documents, and photographs of each church, and a detailed literature review was made for each church. As a result of the deductions made from the data obtained as a result of these literature reviews, Surp Simon Church located in Yalnız Village of Elazığ city center is selected to constitute the field work of this study. Unlike the other, this church has preserved its structural integrity despite being abandoned for years, not undergoing restoration and being exposed to various earthquakes.

The aim of this study is to determine the reasons why this church has preserved its structural integrity unlike other churches in Elazığ. For this purpose, survey of the building was made and a finite element model was prepared and a structural analysis was carried out.

The architectural features, form, and structural characteristics of the church resemble those found in Armenian churches from the 6th-7th centuries. This study adopts an interdisciplinary approach by considering the seismic loads affecting the building in the conservation process with an integrated conservation approach. This study offers a new perspective for conservation experts, architects and engineers in the field of conservation of other churches built during this period. The structural behavior of the church was examined by modeling in the finite element

method in SAP2000. The church, which was built with masonry construction technique, preserved its structural integrity despite being located in an active earthquake risk zone. It has been stated in many sources in the literature that masonry structures showing a rigid behavior against earthquakes. Especially in the concept of re-functioning, which has an important place in the conservation of cultural heritage, it is thought that this church can be included in daily life by re-functioning with the minimum structural intervention specified by the regulations.

One of the purpose of the study is to provide a document of inventory of these churches as a contrubition to the existing literature in order to transfer these churches, which have conservation problems, to future generations. In this study, the literature about the historical churches was reviewed, the current situations and conservation problems of the churches were examined, evaluated in the context of architectural conservation and presented in a systematic way. The main purpose of this study is to document the Surp Simon Church, which is the fieldwork of the study, to examine its structural behavior and to demonstrate how it preserved its structural integrity. The contribution of the study to the literature will be the documentation of Surp Simon Church, structural analysis of Surp Simon Church and the classification of historical churches of Elazığ.

The study began with an examination of the history of the churches, architectural features of the churches, current situations and conservation problems of the churches in the region. This was done through field visits and archival research. While literature provided information on 25 churches, only 15 were identified to have survived to the present day. Only 3 of the surviving churches have preserved their structural integrity. These churches are the Virgin Mary Church in Harput region, the Surp Simon (Surp Asdvadsadzin) Church in current city center and the Toma Church in Keban District.

Elazığ is affiliated to Diyarbakır Regional Cultural Heritage Preservation Board, which was established in 1988 under the name of Diyarbakır Cultural Heritage Preservation Board Office Directorate. Since 1988, the cultural heritage of the city has been registered and documented. In the studies carried out in Diyarbakır Regional Conservation Board, registration documents of

15 out of 25 churches that need to be conserved have been obtained. The information included in the thesis is based on literature research and on-site observations.

There have been many studies on the cultural heritage of Elazığ until today. These studies generally focus on the cultural heritage of the Harput region. Researches on historical buildings in Harput region have generally focused on castles, mosques, tombs and examples of civil architecture. Studies on other churches in Elazığ have concentrated on a single building. For example, there are a few studies focusing on the Armenian Protestant Church, Palu Surp Lusavoriç Church, Surp Kevork Monastery, Tadem Venk Monastery, Virgin Mary Church. However, these studies are fragmented and there is no study that covers and classifies all the churches in Elazığ together.

The flow of the study consists of literature review, explanation of legal-administrative framework for conservation, classification of historical churches in the Elazığ province according to their construction dates and conservation status, fieldwork of Surp Simon Church (documentation-survey), and investigation of the structural behavior of Surp Simon Church under self-load and earthquake loads (Table 1.1).

Table 1.1. Thesis Flow Chart

| |
|---|
| Introduction |
| Literature Review |
| Historical Churches of Elazığ (Archive-Registration Records) |
| Surp Simon Church (Surveying / Documentation) |
| Structural Analysis of Surp Simon Church |
| Evaluation & Conclusion |

In the first part of the thesis, the conservation problems of historical buildings and studies explaining the importance of structural analysis in conservation are included. In the next stage, all the churches in Elazığ are classified according to their construction dates and conservation status and the data available as a result of the literature study are explained in detail. The Elazığ

Cultural Inventory (2009), prepared by the Elazığ Provincial Directorate of Culture and Tourism, Elazığ Archeology and Ethnography Museum Directorate, is the main source for examining the official records and registration documents of the churches. Elazığ Architectural and Cultural Heritage Assessment Report (EACHAR) published in February 2018 constitutes one of the main sources used in this study as it deals with the history, architectural features, current situations and conservation problems of 13 churches. Another source used in this study is Çapkur's master's thesis dated 2023. Çapkur referred to the historical church, which is called Surp Simon Church in the registration document, as Tadem Monastery. Çapkur carried out a study including the survey, restitution and restoration proposal of the church. This master's thesis differs from Çapkur's study in that it focuses on the structural analysis of the historic church.

In addition to literature research, observations made in the field and photographs of the churches, plan layouts, and internet resources had an important place in the compilation process. Virgin Mary Church, Surp Simon (Surp Asdvadsadzin) Church and Toma Church have survived to the present day by preserving their structural integrity. The fieldwork part of the thesis focuses on one of these three churches, Surp Simon (Surp Asdvadsadzin) Church. In this fieldwork section, the church's history, architectural features, information obtained in the field, photographs and official documents were important. The information gathered in the field, the conservation problems, the current situation of the church (survey) were digitalized. At this stage, a plan scheme of the church was drawn with the help of a LIDAR scanner (Figure 1.1).

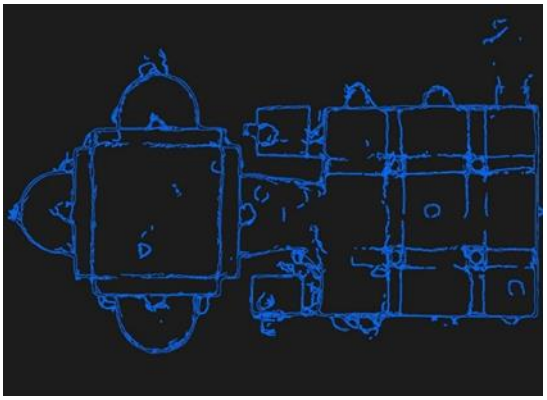


Figure 1.1. Lidarscanned plan scheme of the Surp Simon Church

However, at this stage, the part of the library adjacent to the southern façade, which is thought to have been added to the church later and to which there is no access today, could not be scanned and measured. For this reason, previous studies in the literature were consulted for this part of the church. In addition, plan and façade sketches were made by using traditional methods to verify the accuracy and precision of the LIDAR scans.

As a result of the LIDAR scanning, 2 different point cloud data were created: the interior of the church (Figure 1.2) and the exterior of the church (Figure 1.3). These point cloud data can be viewed using Autodesk RECAP PRO software.

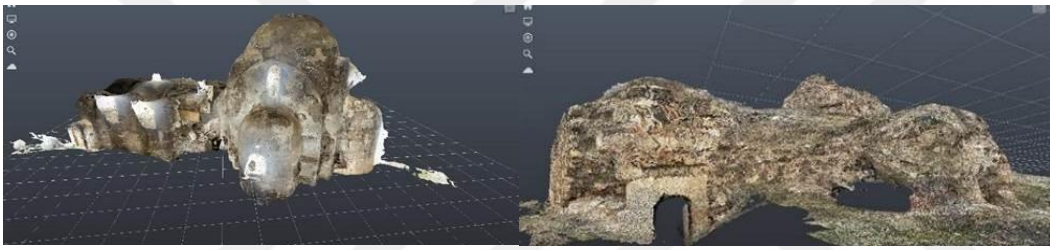


Figure 1.2. Interior Scan of the Church (Autodesk Recap Pro) / Figure 1.3. Exterior Scan of the Church (Autodesk Recap Pro)

The next step was to overlap these two point cloud data by finding an origin point common to both scans (Figure 1.4). These two overlapped point cloud data were merged into a single model. These models, converted from Autodesk Recap Pro software with “xyz” extension, were then processed in Autodesk Revit software. The survey of the church was created in this software. The plan, sections and façade sketches of the church were created at this stage. Then the facade drawings were completed using the photographs and the measurements taken in the field.

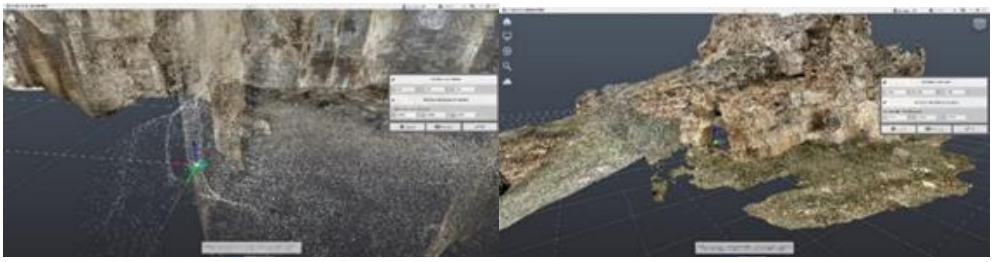


Figure 1.4. Merging Two Different Scans by Determining the Origin Point (Autodesk Recap Pro)

In the last stage of the study, a finite element model of the church was prepared using SAP2000 software in order to examine the structural behavior of the church using the models and drawings obtained. With this model, the structural behavior of Surp Simon Church, which has preserved its structural integrity although it has not been used for years, was examined under its own load and earthquake load (Figure 1.5). Since it was not possible to enter the library section and sufficient measurements could not be taken, this part could not be added to the finite element model.

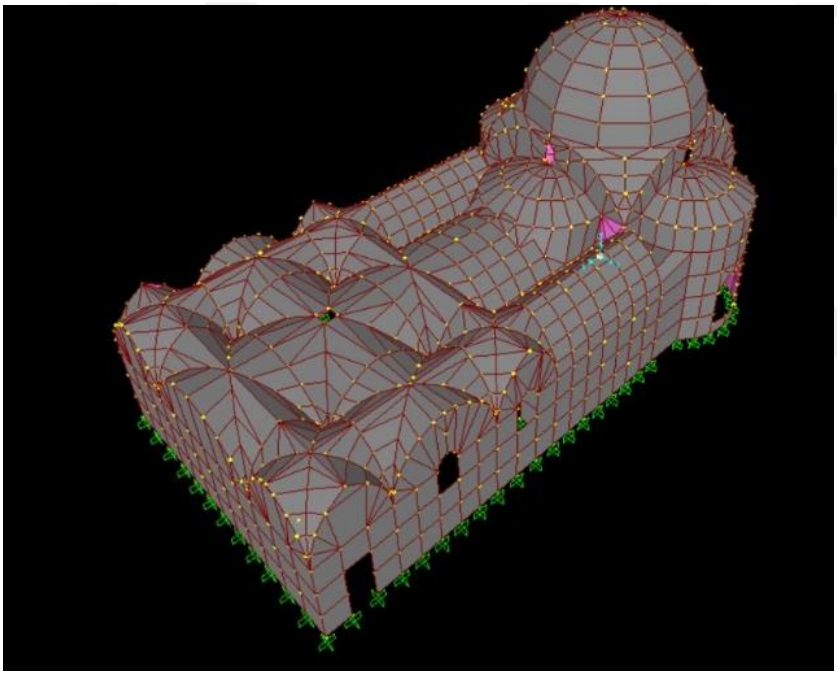


Figure 1.5. Surp Simon Church Finite Element Model (SAP2000)

# 2. LITERATURE REVIEW

## 2.1. Studies for the determination of conservation problems of historical buildings

In the conservation of historical buildings, it is essential to identify the conservation problems of these buildings. Identifying and addressing these problems makes it possible to conserve and pass on this valuable heritage to future generations. Such identification helps in taking the necessary measures to preserve the physical integrity and cultural significance of the buildings. To effectively conserve, restore, and maintain historical buildings, it is essential to carefully consider all aspects of the building's environment and the internal and external factors that affect it in order to develop a proper conservation proposal. The literature review of various studies conducted in Türkiye on the problems that cause the deterioration of historical buildings is as follows:

Bostan Güner (2019) started master's thesis titled "18th Century Istanbul Bosphorus Coastal Mosques and Conservation Problems" with the identification of the coastal mosques located in the Bosphorus and classified these mosques according to the architectural style and construction techniques of the period in which they were built. In the process of determining the conservation problems of the mosques, archive research and the old photographs of the buildings were examined. Each of the mosques was analyzed in terms of their architectural features and their current conditions. At the same time, the restorations that the buildings have undergone until today have been shown with documents such as registration documents and inventory registrations. As a result of the determinations made, the conservation problems seen in the mosques are categorized under two headings as external and internal reasons. External reasons are; problems arising from the ground, wind, rain / snow water, water, moisture and humidity in the soil, fire, legal regulations that are not intended for conservation, ownership problem, unconscious use / interventions, neglect, low number of users, inability to manage tourism activities, burglary, change of function. Internal causes are material-related causes, structural causes and unqualified additions (Bostan Güner, 2019). As a result, comprehensive restoration recommendations were made against these damages. However, no survey, restitution project or restoration project was prepared in the study, except for photography and archival research.

In the study "Classification of Çatalca Region Defense Structures and Conservation Issues",

Efeoğlu (2021) categorized defense structures in Istanbul's Çatalca district into three time periods: Roman, Ottoman, and Republican. The study reveals that city walls, bastions, and pillboxes are at risk of extinction due to various conservation problems. After conducting archival and literature research, a fieldwork was conducted to document these defensive structures. The conservation problems of these structures include external causes such as soil and ground movements, contemporary construction techniques, and the fact that the structures are no longer actively used due to changes in the political-social environment and lack of maintenance. These structures, which have been abandoned for years, are at risk of extinction due to their vulnerability to external influences. Efeoğlu has conducted plans, sections and elevations of these buildings and documented them against the threat of extinction (Efeoğlu, 2019). In the conclusion of the study, suggestions were made to deal with the problems identified during the study process.

In Özcan's (2022) study titled "Istanbul Armenian Churches Architecture and Conservation Problems", the architectural features of the Armenian churches belonging to the Armenian people who lived in Türkiye were presented in detail (Özcan, 2022). In general, the main components of Armenian churches consist of narthex, naos, bema, apse, gallery, baptistery and bell tower. Armenian churches in Istanbul are categorized under two headings: churches that have extinct over time and churches that have survived to the present day. The surviving churches are divided into three groups according to their congregations; Armenian Grogeryen Churches, Armenian Catholic Churches and Armenian Protestant Churches. In this context, each church was examined in detail under the following sections: Architectural Description of the Church, General Description and Plan Features, Facade Features, Interior Features, Known Restoration of the Church, Known Functions of the Church, Conservation Problems, Structural Problems, Material Problems, Suggestions and Evaluation. In these stages, architectural drawings, current and old photographs of the churches were used. As a result, the structural status of the Armenian churches, their conservation status, deterioration analyses and suggested interventions were categorized in a table.

The research titled "Diyarbakır City Walls Conservation Problems", conducted by Şahin Güçhan (2005) et. al. aimed to identify the existing conservation problems in the City Walls of

Diyarbakır and to evaluate the applications on the City Walls (Şahin Güçhan et. al., 2005). Unlike previous studies focused on identifying conservation problems in the field of architecture, this study addressed the conservation problems in a holistic manner by involving different disciplines such as civil engineers in the research team. In this context, the first step was to determine the current state of the building, and the following steps were to take samples of the building materials and analyze them in the laboratory. Additionally, as the city of Diyarbakır, where the historical city walls are located, is in an earthquake risk zone, the structural analysis of the earthquake resistance of the city walls was carried out by preparing a finite element model. This study distinguishes itself from others in that it takes a comprehensive, interdisciplinary approach to the conservation of historic structures. The study's conclusion presents measures and recommendations that can be taken to conserve the historical City Walls, both architecturally and structurally.

In Öztepe's (2001) study titled "The Present Situation and Conservation Problems of the Byzantine Churches in the Suriçi of Istanbul", the architecture of the churches in the Suriçi of Istanbul was classified according to their plan types as Central Plan Type Buildings, Domed Basilical Plan Type Buildings, Closed Greek Cross Plan Type Buildings, Single Nave Plan Type Buildings, Plan Type Buildings with Cisterns, Basilical Plan Type Buildings and Clover Plan Type Buildings (Öztepe, 2001). When the classification of these buildings according to their physical conditions and functions in 2001 was examined, it was seen that these churches were mostly adapted to mosque or prayer room functions. In addition to the churches that have survived to 2001, the study also provides information about other churches that are in ruins or disappeared in the 20th and 19th centuries, but can be found through literature review. The types of damage seen in these churches in Istanbul are listed as damage caused by natural disasters (earthquake), man-made damage (neglect-fire-conscious demolitions) and changes made to the churches due to change of function. The conservation problems faced by these works, which have an important place in Türkiye's cultural heritage, in 2001 are generally social insensitivity, wrong construction and rehabilitation works, improper restoration practices, static and structural problems.

In Kapoğlu's (2021) study titled "Determination of Historical Fountains in Süleymanpaşa

District of Tekirdağ and Suggestions for Architectural Conservation Problems", the conservation problems of historical fountains in Süleymanpaşa district of Tekirdağ were examined. In this context, 25 fountains in the district were classified according to their location, arch types, building materials, facade layout, function and whether they have a water tank or not, plan types, body shapes and documented by taking surveys (Kapoğlu, 2021).

Uğuryol (2020) conducted an evaluation of the conservation issues of historical gardens and architectural elements in Istanbul, with a focus on palace and pavilion gardens. The study examined 37 areas, including palace gardens, pavilion gardens, mansions, gardens belonging to public and foreign institutions, gardens of religious buildings, groves, promenades, parks, and other gardens. The conservation problems of these areas were identified as the negative effects of urbanization, improper interventions and problems arising from use, lack of maintenance and material deterioration.

Bilgili (2014) in his study titled "Conservation Problems in Cappadocia Rocky Areas and Rock-Carved Churches" examined the current situation of the rock-carved churches in the Cappadocia region of Nevşehir province of Türkiye and the causes of deterioration seen in these churches. In this context, considering the effects of geographical events in the formation of rock churches, the climate factor constitutes an important threat factor in these structures.

### 2.2. Legislation on Conservation, Restoration and Rehabilitation of Historical Buildings

Legislation on conservation, repair and restoration of historical buildings can be divided into two group as international and national legislations. In international legislation, international conventions, agreements, etc., which have been signed by the state parties and which states have responsibilities to fulfill in accordance with this signature, are "binding legislation", while other unsigned agreements, published statutes, regulations, recommendations, guidelines, directives, ethical codes, etc. are within the scope of "non-binding" international legislation (Karaoğlu et al., 2012).

As a signatory to the Venice Charter (1964), the Convention Concerning the Protection of the World Cultural and Natural Heritage (1972), Convention for the Protection of the Architectural

Heritage of Europe (1985) and The World Heritage Convention (1972), Türkiye has been issuing various laws, regulations and resolutions on protection and establishing regulatory domestic legal norms in this regard.

In this part of the study, the Athens Charter (1931), the Venice Charter (1964), the Convention Concerning the Protection of the World Cultural and Natural Heritage (1972), the Amsterdam Declaration (1975), the Convention for the Protection of the Architectural Heritage of Europe (1985), the Charter for the Conservation of Historic Towns and Urban Areas (1987), the Nara Certificate on Authenticity (1994), the Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003), the Declaration on the Protection of Architectural Heritage in Türkiye (2013), the Resolution of the High Council for the Conservation of Cultural Property dated 05.11.1999 and numbered 660 on the Grouping, Maintenance and Repairs of Immovable Cultural Assets in Türkiye, and the 2018 Türkiye Building Earthquake Regulation were examined. In the documents such as by-laws, contracts, declarations, etc. on the protection of architectural heritage, information is given about the articles that are thought to affect the relationship between structural system and architectural design.

The Athens Charter (1931) is considered to be the first serious international attempt at conservation (Emre, 2010: 66). Article 1 of the Charter states that “Above all, emphasis should be placed on continuous maintenance and consolidation efforts to restore to the monument the durability it has lost due to collapse and abrasion and its power to resist time”. It is stated that existing monuments may be given new uses that are not too different from their original function and where the necessary arrangements can be made in the building without causing significant damage. The first article of the Regulation emphasizes that monuments should primarily be preserved for their durability, regular maintenance and consolidation, and Article 5 states that “all items of artistic value and historical memory” should be preserved. According to Article 7, when it is necessary to make additions for various purposes such as strengthening, integration and reuse, the most basic condition is that the new elements should be minimal, simple and reflecting the structural order, and that the additions should be readable as different from the original. Furthermore, Article 9 of the Charter states that “If traditional construction methods cannot be used to strengthen the structural system or integrate the mass of a monument, the use

of modern techniques may be appropriate. In the same way, various sciences should be called upon to contribute to the preservation of all worn-out structures, simple or complex. Thus, unscientific methods must give way to scientific ones." During restoration, it is also recommended to collect data, document scientifically, create an archive and cooperate.

The second major conservation initiative was the Venice Charter (1964). With the Venice Charter, the issue of the conservation of the monument together with its surroundings and the concept of historical monuments as including not only great works of art but also simpler monuments with cultural significance were brought to the agenda. Article 2 of the Venice Charter states that "For the conservation and restoration of monuments, all sciences and techniques that can assist in the study and conservation of the architectural heritage should be utilized". It is stated that the use of monuments for a purpose beneficial to society facilitates conservation, but that the plan or ornamentation of the building should not be changed in such uses. According to the articles of the Regulation on repair; the purpose of repair is to preserve and reveal the "aesthetic and historical value of the monument", "any necessary additions should be distinguishable from the architectural composition", and should reflect the characteristics of the period in which it was built so as to be distinguishable from the original. The Venice Charter's 10th article also states that in cases where traditional techniques are insufficient, any modern technique can be used to stabilize the monument. It is also recommended to carry out documentation and archival work supported by drawings and photographs during the restoration phases.

The 1972 Convention for the Protection of the World Natural and Cultural Heritage emphasizes that cultural and natural heritage belongs to all citizens of the world and that it is the common duty of society to protect their "outstanding universal value". According to the Convention, each country should strive, in accordance with its own conditions, to develop scientific and technical studies and research for the protection of heritage and to perfect methods of response to threats to the natural and cultural heritage (T. C. Official Gazette, 14 February 1983).

In the Amsterdam Declaration (1975), it was stated that the economic pressure on heritage sites due to increasing population and technological developments had a negative impact on conservation, that local cultures, social, political, etc. influences were important inputs in the

decisions to be taken at the urban scale in the conservation of architectural heritage, and that an integrated conservation approach was required in this direction. In the declaration, it is emphasized that architectural heritage includes not only single buildings and their surroundings, but all urban and rural areas with historical and cultural characteristics, and that it is not sufficient to apply ordinary planning regulations and special rules for the protection of historical buildings only together without adapting them to each other. It is stated that buildings can be used with functions appropriate to their character and compatible with the requirements of contemporary life, which will contribute positively to conservation. In order to avoid costly rehabilitation in the long term, it is recommended that the architectural heritage should be regularly maintained, and that a comprehensive documentation and archiving of materials and techniques should be carried out at the same time as maintenance and rehabilitation.

According to the Convention for the Protection of the Architectural Heritage of Europe (1985), States Parties are obliged to prevent “the deterioration, damage or destruction of all protected assets”. It is also recommended to make use of the possibilities offered by new technology in the identification and recording of architectural heritage and in combating the deterioration of materials, as well as in scientific research, restoration work, heritage management and promotion methods.

According to the Charter for the Conservation of Historic Towns and Urban Areas (1987) published in Washington, D.C., “the scale, size, style, construction technique, materials, color and ornamentation of buildings, and their form, interior and exterior appearance” are the qualities that should be preserved as the historic character of the city or urban area and the material and immaterial components that make up this character. Factors that threaten these characteristics may negatively affect the authenticity of the historic city or urban area.

In the Nara Certificate on Authenticity (1994), cultural diversity and heritage diversity are emphasized, the importance of authenticity in cultural heritage conservation practices is emphasized, and it is stated that authenticity is related to both form and material. The document states that "each monument should be considered and evaluated according to the criteria that determine the cultural context to which it belongs" and that the concept of authenticity depends on the monument’s design and form, materials and objects, use and function, traditions and techniques, location and layout, spirit and expression, initial design and historical evolution.

With the “Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage” adopted by ICOMOS in 2003, which includes recommendations for conservation and repair problems for this purpose and which includes recommendations for conservation and repair problems, it was stated that there may be restoration problems that restrict the application of contemporary regulations and building standards in the structural systems of architectural heritage, and that there is a need for analysis and repair proposals in harmony with the cultural environment, the issue of repairing the structural systems of architectural heritage has gained an official and recognized status for the first time. In this document, it was emphasized that the preservation of architectural heritage in a way that reflects the characteristics of the construction technology of the period is also important for the value of architectural heritage, and that preserving only the facades of the buildings and removing the structural elements inside is contrary to the conservation criteria. It was recommended that the main goal in the restoration of architectural heritage is the preservation of the whole building, that the restoration of the structural system alone is not sufficient, and that there should be an interdisciplinary approach in the interventions to be made to the structural system of architectural heritage. Considering the function of each building, the safety and durability required by each building should be evaluated and a choice should be made between traditional and contemporary methods in a way that brings minimum intervention and is compatible with cultural values. It is important that the intervention is reversible, and that the intervention can be removed and/or replaced without damaging the building. On the other hand, it was recommended that interventions that would harm the structural authenticity of the building in addition to its cultural authenticity should be avoided, “the initial design, construction technique and historical value of the structure" should be respected and the traces that will enable it to be understood in the future should be preserved, and the structure should be repaired as much as possible instead of being completely renewed. In addition, it was stated that it is important to inspect and monitor the compatibility of the materials used in the restoration phase with the existing materials, their long-term effects and the effectiveness of the intervention, and it was recommended that these processes should be documented and preserved as part of the structural history.

In Türkiye, ICOMOS Türkiye Declaration on the Protection of Architectural Heritage was published in 2013. The declaration provides information on the principles of intervention in

architectural heritage, intervention approaches and forms, and emphasizes the importance of the concepts of authenticity and integrity in conservation. In the Declaration, technical and technological value is defined as “all of the documentary qualities related to the technical knowledge, skills, construction, materials and workmanship of the period to which the cultural property belongs”. Within the scope of documentation; it is stated in the declaration that the procedures to be carried out in terms of architectural documentation and investigation of the structural system, such as the determination of building foundations and soil properties are also within the scope of this examination. It is emphasized that the problems of the structural system and the correct intervention method for solving these problems should be determined by conducting various analysis and that the main goal is to preserve the originality and integrity of the building in all its dimensions in interventions for the protection of architectural heritage. It is stated that interventions should be carried out with removable and/or renewable techniques without damaging the original structure, as well as the suitability of new materials and techniques that must be used should be demonstrated with scientific data.

The decision of the High Council for the Conservation of Cultural Property dated 05.11.1999 on the Grouping, Maintenance and Repairs of Immovable Cultural Assets in Türkiye and dated 05.11.1999 and numbered 660, it was decided that “the spatial, formal and structural features of the building that constitute its surviving socio-cultural and historical identity, its original position in the environment, its original mass and gauge should be preserved, and the form and qualities of the intervention according to the current physical condition of the building in these processes will be determined by the conservation regional boards”, and with the same decision, it was stated that it is essential to protect the buildings without demolishing them.

In the ‘General Criteria’ section of the 2003 ICOMOS charter ‘Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage’, it is stated that the strengthening of architectural heritage requires interdisciplinary work, and in case of a change of function, conservation rules and safety conditions should be taken into account in a holistic manner. It is stated that the preservation of the structure is a means to achieve the goal of preserving the building in a holistic manner, that applications should not be made without fully determining the possible advantages and disadvantages, and that emergency measures should

be reversible (ICOMOS, 2003). In the 'Research and Diagnosis' section of the Charter, it is stated that the security levels that new buildings must meet may require extreme, sometimes unfeasible measures in terms of architectural heritage, and in such cases, different approaches to security can be developed by analyzing the conditions specific to these buildings (ICOMOS, 2003).

In the last section of the Charter titled 'Remedial Measures and Controls', the main principles for the structural repair of architectural heritage are as follows;

- Avoiding interventions that are not proven to be necessary,
- Strengthening interventions are proportionate to security objectives,
- Choosing techniques that require the least intervention and are compatible with cultural values,
- Interventions should be as reversible as possible,
- Investigation of the compatibility of new and original building materials to be used in repair,
- Care should be taken to preserve traces of the interventions so that they can be understood in the future,
- Avoid as far as possible the removal or alteration of historic material or significant architectural features,
- Determining the impact of interventions on architectural heritage through audits and monitoring during and after implementation (ICOMOS, 2003).

In addition to the principles in the legislation on protection, which are examined within the scope of the study, it would be useful to mention the "2018 Türkiye Building Earthquake Regulation", which is in force in Türkiye and determines the principles to be applied for the design of buildings under earthquake effect. The purpose of the Regulation is defined as; "to determine the necessary rules and minimum conditions for the design and construction of all public and private buildings and building-type structures to be rebuilt, altered or enlarged, and for the evaluation and retrofitting of the performance of existing buildings under earthquake effect" (T.C. Official Gazette, March 18, 2018). The first section of the "2018 Türkiye Building Earthquake Code" titled "general provisions" states that "...the evaluation and retrofitting of registered buildings and monuments of historical and cultural value under earthquake effect is

outside the scope of this code" and the fifteenth section titled "special rules for the evaluation and retrofitting design of existing building systems under earthquake effect" states that "...the evaluation and retrofitting of registered buildings and monuments of historical and cultural value is outside the scope of this section".

It is seen that the principles emphasized in the legislation on the protection of historical buildings and the earthquake regulations in force in Türkiye are not in harmony; registered buildings and monuments with historical and cultural value are excluded from the scope of the earthquake regulations, and that there should be a balance between the improvement of seismic behavior and the protection of the existing texture and architectural and cultural value. Main points of these legislations have shown in Table 2.1.

Table 2.1. Main points of legislations

| Name of the Legislation | Main Points |
|---|---|
| Athens Charter (1931) | • Emphasizes continuous maintenance and consolidation to restore the durability of historical buildings that have lost their resilience due to decay and wear.<br>• Suggests that existing buildings can acquire new functions that are not significantly different from their original purpose without causing significant damage.<br>• States that modern techniques can be used where traditional construction methods cannot be used. |
| Venice Charter (1964) | • Highlights the importance of preserving the surroundings of historical buildings in addition to the buildings themselves.<br>• Defines historical monuments as including not only great works of art but also simpler structures with cultural significance.<br>• Recommends the use of modern techniques when traditional methods are insufficient. |

Table 2.1. (continued) Main points of legislations

| | |
|---|---|
| Convention Concerning the Protection of the World Cultural and Natural Heritage (1972) | • Emphasizes that cultural and natural heritage belongs to all citizens of the world and that it is the common duty of society to protect their "outstanding universal value."<br>• Encourages each country to develop scientific and technical studies and research for heritage protection based on its own conditions. |
| Amsterdam Declaration (1975) | • Notes that economic pressures, increasing population, and technological developments negatively impact heritage preservation.<br>• Highlights the importance of considering local cultures, social, and political influences in conservation decisions at the urban scale.<br>• Stresses the need for an integrated conservation approach and the regular maintenance of architectural heritage |
| Nara Certificate on Authenticity (1994) | • Emphasizes cultural and heritage diversity and the importance of authenticity in heritage conservation.<br>• Defines authenticity in relation to both form and material, suggesting that each monument should be evaluated within its cultural context. |
| Principles for the Analysis, Conservation, and Structural Restoration of Arch. Heritage (2003) | • Recognizes that there may be restoration challenges that restrict the application of contemporary regulations and building standards in structural systems.<br>• Stresses the need for structural system repairs to be in harmony with the cultural environment and emphasizes the importance of preserving the whole building and avoiding interventions that harm its structural authenticity |

Table 2.1. (continued) Main points of legislations

| | |
|---|---|
| ICOMOS Türkiye Declaration on the Protection of Architectural Heritage (2013) | • Provides information on intervention principles and approaches for historical buildings.<br>• Highlights the significance of authenticity and integrity, defining technical and technological value as encompassing all documentary qualities related to the technical knowledge, skills, construction, materials, and workmanship of the period. |
| 2003 ICOMOS Charter 'Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage | • Avoiding interventions that are not proven to be necessary, Strengthening interventions are proportionate to security objectives,<br>• Choosing techniques that require the least intervention and are compatible with cultural values,<br>• Interventions should be as reversible as possible,<br>• Determining the impact of interventions on architectural heritage through audits and monitoring during and after implementation (ICOMOS, 2003). |
| 2018 Türkiye Building Earthquake Regulation | • Determines principles for the design of buildings under earthquake effect.<br>• Excludes historical and culturally valuable buildings from the scope of the regulation, indicating the need for a balance between seismic improvement and the protection of architectural and cultural value. |

## 2.3. Studies on the importance of structural analysis in the conservation of historical buildings

Developing an integrated approach to conserving historical buildings is crucial. Sustainable conservation is achieved by taking into account the structure's history, architectural elements, and its environment to gather qualified data during the conservation process and develop restoration proposals. The collaboration between architecture and structural engineering disciplines have great importance in conservation process. While the aesthetic and architectural value of the historical building falls within the purview of the discipline of architecture, the area's ground properties, the building's structural behavior, the structural material properties, and the building's potential response to potential risk-loads are part of the research area of structural engineering. When considering a historical building holistically, the main stages of architectural conservation include research into architectural history, determination of aesthetic value and architectural features, documentation, survey preparation, and development of restitution-restoration proposals. In the integrated conservation approach, the building's strengths and weaknesses can be monitored using up-to-date engineering applications and technological tools. The preservation of safety and durability in historical buildings is the expertise of structural engineers. By identifying and eliminating structural problems, the building's sustainability is ensured. These professionals work in collaboration with architects to ensure that the historic building meets modern safety standards while preserving its original character and aesthetics.

Can and Ünay (2012) stated that the structural performance of historical buildings is related to their behavior in the face of usage loads acting on the structure as a result of the structure's own static weight caused by gravity, wind, earthquake, ground movements and load changes caused by the physical environment. Damages to building materials and structural elements over time and human interventions are factors that directly affect the structural capacities of historical buildings. Measures for the conservation and restoration of these buildings include not only the elimination of problems at the scale of materials and architectural elements, but also the restoration or, if necessary, the strengthening of the structural system that keeps the building standing.

The most important stage of structural analysis of historic buildings and monuments is numerical modeling. Casalo and Sanjust (2009) defined numerical modeling as the conversion of structural system elements made of different materials and with variable cross-sectional geometry into mathematical terms accurately and harmoniously according to the basic rules of mechanics (Casalo and Sanjust, 2009).

Finite element analysis method is generally used for structural analysis of historical buildings and monuments. This calculation method starts with the preparation of a numerical (mathematical) model of the entire structure or a specific part of it. This process is called decomposition of the structure. During the decomposition, the structure is divided into elements in a way and number suitable for the purpose of the calculation method. At this stage, it may be necessary to define the structural system elements that make up the structure by dividing them into smaller parts (Can and Ünay, 2012). These elements represent geometric shapes, usually triangles, quadrilaterals or tetrahedrons for three-dimensional problems. Each element is represented by equations that approximately describe the behavior of the structure.

The finite element method is a tool that helps to perform structural analysis, ensure safety, preserve the original design and develop cost-effective solutions in the conservation and restoration processes of historical buildings. This method contributes to the sustainable conservation of historic buildings, while at the same time helping to transfer cultural heritage to future generations.

Can and Ünay (2012) state that in order to determine the structural performance and strength of historic buildings, a systematic study should be carried out in accordance with the following steps:

1. The current condition of the structural system of the building should be carefully observed and the condition of the structural system, cracks, material deterioration, excessive deformations and support collapses should be determined.
2. Detailed surveys should be provided for numerical modeling and structural analysis. However, these should include not only architectural details and decorative parts, but also cross-sectional dimensions and material properties of the structural elements.

3. The values of the environmental effects and loads acting on the structure should be precisely calculated and accurately applied during the analysis.
4. The interaction between the elements forming the structural system and the load transfer mechanism at the joints of the elements should be carefully examined.
5. A numerical model of the structure should be prepared in accordance with the above mentioned items and calculations should be made under all possible load cases and other environmental effects. Since the numerical model exhibits the basic structural behavior of the structure, a calculation should first be made under its own weight and constant loads. The weak points of the structural system of the building can be easily identified as a result of vertical load analysis.

The main studies on the importance of structural analysis in the conservation of historic buildings in Türkiye and in the world can be summarized as follows:

Can and Ünay (2012), in their study titled “Numerical Analysis Methods for Determining the Earthquake Behavior of Historic Buildings”, point out that restoration, architectural history and engineering disciplines alone are not sufficient to prevent and repair damages in historic buildings. Since these disciplines have different working and research methods, the importance of the cooperation of these disciplines in the conservation of historical buildings is emphasized. This article aims to ensure that the numerical models and calculations developed by structural engineers are easily understood by architects, restoration experts and architectural historians and to explain the basic principles that should be considered when numerical modeling of historic buildings. In this context, in the first stage, it is very crucial to investigate the history of the building for an accurate and reliable structural analysis. The structural behavior and performance of historic buildings and monuments are determined by numerical analysis in three stages. First, a numerical model of the structure is prepared. Then, numerical analysis is performed against the loads and other effects determined by an appropriate analysis method. The most crucial step in determining the structural behavior and performance of the building is the evaluation of the calculation results. The relatively less detailed modeling of the entire structure is called “macro model”, while the detailed modeling of the parts of the structure that show more critical structural behavior is called “micro model”. Two factors that are important in the modeling phase are explained as follows:

- Material Behavior (Elasticity: the ability of materials to return to their original shape as a result of the withdrawal of the loads applied on them / Plasticity: the inability of the material to take its original shape when the loads acting on the material are removed)
- Behavior of Finite Elements Used in Numerical Modeling (Can and Ünay, 2012).

Yazgan and Ünay (2019) in their study titled "Numerical Modeling And Structural Analysis of Bursa, Yenişehir Sinan Paşa Külliyesi İmareti" is an important study that shows how inappropriate conservation interventions to historical buildings can have negative effects on the structural behavior of the building. The Imartehane section of the Sinan Paşa Complex, which has typical Ottoman Period characteristics dating back to the second half of the 16th century in Bursa province, is discussed, and the effects of man-made interventions and additions on the structural performance of the structure are analyzed by using a numerical model representing the pre-intervention state of the structure. According to the results obtained; although the imaret structure of the complex is a highly resistant structure against earthquake and other loads if it is not exposed to any interventions and additions, it faces the risk of partial or complete collapse even in a low-force seismic movement due to the damages observed in the present day.

Kucukdoğan et al. (2010), in their study titled "Seismic Assessment of Monastery of Stoudios (Imrahor Mosque) in Istanbul", examined the oldest surviving Byzantine religious structure, the Church of Hagios Ioannes Prodromos. The building was subjected to many earthquakes, fires and other minor disasters over the sixteen centuries, resulting in significant damage and partial destruction of some of its parts. This study aims to assess the seismic resistance of the monastery against future excitations (Kucukdogan et al., 2010).

The finite element model of the structure was developed with SAP 2000 using 3255 nodes and 3043 shell elements. The material properties of the building were obtained through literature studies on Byzantine masonry masonry and the values recommended for masonry masonry in the Turkish Earthquake Code, since no testing or material sampling for material characterization was possible due to the legal status of the building. Since it is known that the building has been affected by many severe earthquakes and is already damaged, it is considered necessary to strengthen the walls in order to maintain the current condition of the building.

Usta and Bozdağ (2021), in their study titled “Earthquake analysis of the historical Başdurak mosque”, selected a historically important masonry historical Başdurak Mosque located in Konak, Izmir. The selected historical mosque was modeled using SAP2000 finite element software in accordance with its architectural dimensions. The seismic evaluation of the historical masonry mosque was conducted by performing dynamic analysis of the structure in three-dimensional time domain (Usta and Bozdağ, 2021). The earthquake motion to be applied to the structure was applied in two different directions, X and Y directions. The seismic performances of this historic masonry building were determined for various earthquake levels. As a result of the analysis, displacement, stress (tensile and compressive) and base shear force values were analyzed. According to the minimum and maximum values of the displacement, stress and base shear results, it was concluded that the relative displacement values calculated for the main body and minaret part of the mosque structure are within acceptable limits.

Şeker et al. (2015) in their study titled “Investigation of the Structural Behavior of the Historic Erzurum Lala Pasha Mosque by Finite Element Method”, Lala Pasha Mosque, one of the most important historical monuments of Erzurum, is analyzed and the structural performance of the mosque is investigated statically and dynamically by finite element method. In order to obtain information about the general behavior of the mosque, the material properties given in the literature and the formulas given in the earthquake regulations were used in the analyses. According to the static analysis, the critical locations of the mosque are the main dome and its pulley and the bearings of the suspension arch system carrying the dome, and according to the dynamic analysis using the time domain method, the critical locations of the mosque are the lower sections of the main support legs, window edges and small domes. It was also determined that the last congregation part is the most important part that may be damaged in an earthquake. Armağan Korkmaz et al. (2013), in their study “Investigation of Earthquake Behavior of Historic Churches in the Case of Van Akdamar Church”, investigated the earthquake behavior of the historic Akdamar church in Van province, which is located in the 1st degree earthquake zone in the earthquake map of Türkiye (Armağan Korkmaz et al., 2013). The historical church was modeled with SAP2000 finite element program. Momentum data of the Van earthquake that occurred on 23.10.2011 were applied to the structure. Linear analyses were performed in

time domain and the maximum stress, displacement and base shear force values of the structure under the earthquake effect were obtained.

Demircan et al. (2017) carried out a parametric study of the Tbeti Monastery in Şavşat District of Artvin province, which has been included in the historical heritage list of Türkiye, in their study "Analysis of the Historical Şavşat Tbet Monastery with Finite Element Method" (Demircan et al., 2017). The church was modeled with SAP 2000 software, the structural behavior of the monastery under its own weight and dynamic loads was determined and the results obtained were used to provide information about the safety of the structure. Modeling and calculation parameters can be listed as follows:

- The entire structure is suitable to be defined with three-dimensional (SOLID) elements.
- The material properties of the structural elements were selected by taking into consideration the values recommended for masonry structures in the Earthquake Code in force and studies produced as a result of previous studies for similar structures.
- Modulus of elasticity and unit weight assumptions were made assuming that the stone masonry structural elements, together with mortar, exhibit a single material property. Two different basic loading conditions were applied on the model, considering the forces caused by the ground motion defined by the constant loads and the earthquake spectrum.

In the analysis of the effects obtained as a result of the structural analysis, it was observed that the compressive and shear stress values recommended for masonry structures in the Turkish Earthquake Code were not exceeded in the structural elements of Tbet Church.

### 2.4. Seismicity of Türkiye

Türkiye is located in a region where the African plate and the Eurasian plate collide. Earthquake activity is quite common in regions with such plate boundaries. The geological structure of Türkiye is complex and seismically active as a result of this plate collision.
Major fault lines such as the North Anatolian Fault (NAF) in the west of the country and the East Anatolian Fault (EAF) in the southeast. These faults are important active faults that can

cause large earthquakes (Figure 2.1). There is also a region along the southern coast of Türkiye where it collides with the Mediterranean plate. This collision leads to submarine faults and can cause seafloor earthquakes.


Figure 2.1. Türkiye Earthquake Risk Map (Source: AFAD, Access Date: 12.04.2023)

Türkiye has experienced many major earthquakes throughout history. Some of these are:

1. 1999 Izmit Earthquake (Gölcük Earthquake): On August 17, 1999, this earthquake hit the Marmara region and was one of Türkiye's most devastating earthquakes in the last century. With a magnitude of 7.4, it killed thousands of people and caused extensive material damage.
2. 1976 Van Earthquake: On November 24, 1976, this earthquake in Eastern Anatolia was very destructive with a magnitude of 7.5 and killed thousands of people.
3. 1939 Erzincan Earthquake: The 1939 earthquake in Erzincan was one of the largest earthquakes in Türkiye's recent history. With a magnitude of 7.9, this earthquake caused a major disaster.

In recent years, Türkiye has been frequently shaken by earthquakes. Important earthquake events in recent years:

1. 2020 Elazığ-Sivrice Earthquake: On January 24, 2020, this earthquake in Elazığ was quite destructive with a magnitude of 6.5. It caused many deaths and damage.
2. 2020 Izmir Earthquake: This earthquake, which occurred on October 30, 2020 in Izmir, was extremely effective with a magnitude of 6.9. It caused collapse of buildings, loss of life and destruction.

3. 2011 Van Earthquake: This earthquake, which occurred in Van on October 23, 2011, was highly effective with a magnitude of 7.2. It caused many deaths and damage.
4. 2023 Kahramanmaraş-Elbistan Earthquakes: The 2023 Kahramanmaraş earthquakes or 2023 Türkiye-Syria earthquakes were two earthquakes with magnitudes of 7.7 Mw and 7.6 Mw that occurred nine hours apart on February 6, 2023, with epicenters in the Pazarcık and Elbistan districts of Kahramanmaraş, respectively. They caused numerous deaths and damage.

Elazığ where the fieldwork was carried out in the study is within the impact areas of the 2020 Elazığ Earthquake, the 2023 Kahramanmaraş-Elbistan earthquakes and the 1939 Erzincan earthquake. In addition to these severe earthquakes, the city experiences frequent earthquakes due to its location on active fault lines.

# 3.HISTORICAL CHURCHES OF ELAZIĞ

## 3.1. Physical and Geographical Characteristics of Elazığ

Elazığ is located in the Eastern Anatolia Region of Türkiye with a surface area of 8,445 km². According to the data of Turkish Statistical Institute ("TÜİK"), the population of Elazığ in 2022 was announced as 591 thousand 497. According to the Earthquake Risk Map of Türkiye, Elazığ province is located very close to the Eastern Anatolian Fault Line and the Northern Anatolian Fault Line and the city center is in the 2nd degree earthquake risk zone.

According to the earthquake risk map of Ankara Earthquake Research Department, the districts of Karakoçan, Palu, Kovancılar, Arıcak, Maden, Alacakaya, Sivrice in Elazığ are first degree earthquake zones (Figure 3.1).

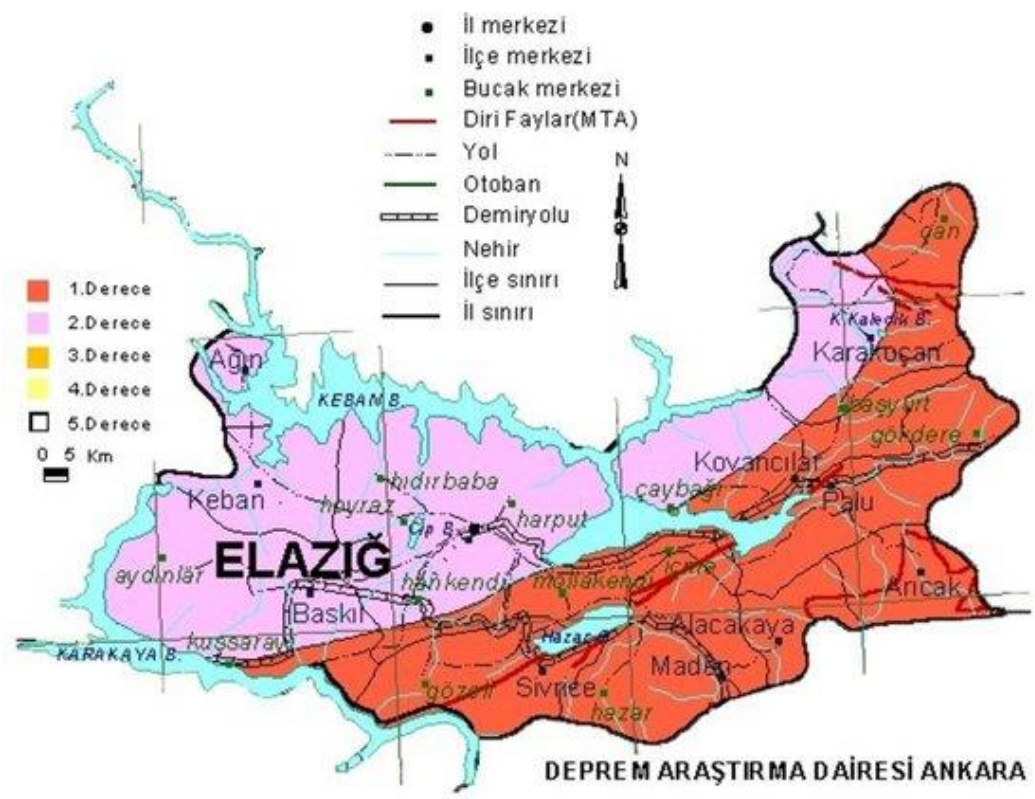



Figure 3.1. Earthquake Risk Map of Elazığ Province (Source: Ankara Earthquake Research Department, Access Date 12.04.2023)

### 3.2. History of Elazığ

The region known as Harput, located 5 km north of the current city center (Figure 3.2), served as the first settlement area of Elazığ in ancient times. Harput was a ancient city dating back to the 4th century B.C. and came under Ottoman rule during the period of Yavuz Sultan Selim. In the mid-19th century, this mountainous city started to move to the valley. Consequently, the rulers of that time began administering the city from a region called Mezra instead of Harput. When Mezra became the administrative center of the city, initial official and administrative buildings were constructed here. Subsequently, new buildings were built according to the needs of the city and the public. Transfer and migration activities from Harput to the new city commenced in 1834 under the administration of the governor Mehmet Reşit Pasha. In the subsequent period, this migration accelerated and almost the entire population of Harput settled in Mezra. In 1867, the newly established city of Mezra was renamed Mamuretülaziz in reference to Sultan Abdülaziz (Çelikdemir, 2019: 425). Harput was previously a sanjak under the Diyarbakır Governorate until 1775 when it became a sanjak under the Maden-i Hümayun Emanet. As of 1845, Harput became a province that covered Maden-i Hümayun, Dersim and Behisni sanjaks. However, in the mid-19th century, Harput's significance declined as the population moved to the valley of Mezra, where Elazığ is located today (Çakmak, 2006).

Figure 3.2. Harput's Location in Relation to the Current City Center (Source: Google Earth, Access Date: November 2023).

The censuses of Harput, which were conducted during its time as a sanjak under the Diyarbakır Governorate from the Ottoman rule until the mid-19th century, provide valuable information about the city's demographic structure. The first census of 1518 shows that 3775 Muslims and 2287 non-Muslims lived in Harput, 4729 Muslims and 3630 non-Muslims in 1523, and 7247 Muslims and 6190 non-Muslims in 1566 (Table 3.1). Harput had a population of more than 13 thousand in the census of 1566, which was the last census organized in the 16th century, but a significant decrease in population is observed in the census of 1691, which was organized at the end of the 17th century. According to the census, the city had 2,109 Muslims and 1,812 non-Muslims residing in it. (Ünal, 1989).

Table 3.1. Population of the city of Harput according to the censuses (Ünal, 1989).

| | 1518 | 1523 | 1566 |
|---|---|---|---|
| MUSLIM POPULATION | 3775 | 4729 | 7247 |
| NON-MUSLIM POPULATION | 2287 | 3630 | 6190 |
| TOTAL | 6062 | 8350 | 13437 |

The first settlements in Harput in the pre-Islamic period were formed around churches. The first inhabitants of the city during the Roman and Byzantine periods were mostly Assyrians and Armenians (Sevin et. al., 2011). Indeed, the Polish Simeon, who came to Harput in the early 17th century, mentions that there were approximately 100 Armenian houses and three churches in the city (Uzun, 2016).

The construction in the historical Harput settlement area gradually shifted towards the center of today's Elazığ between 1850-1900, forming the foundations of today's Elazığ city. Due to this change of location, many religious, public and civil architectural structures were built in the center of Elazığ.

Based on the findings from the research, a total of 15 churches located in Elazığ province have survived and are listed in Table 3.2, categorized by their locations. Nevertheless, there are different internal and external threats for each of these churches.

Table 3.2. The existing churches examined within the scope of the thesis.

| Location | Churches that survived until present day |
|---|---|
| City Center | Armenian Protestant Church |
| | Surp Simon Church |
| | Surp Kevork Monastery |
| Harput | Virgin Mary Church |
| | Surp Garabed Monastery |
| | Surp Hagop Church |
| Palu | Surp Lusavoriç Church |
| | Kindik Church |
| | Surp Boghos Vank Church |
| Kovancılar | Ekinözü Church |
| | Kovancılar Church |
| | Hoşmat-Çakırkaş Church |
| Keban | Toma Church |
| Ağın | Küşne Church |
| Baskil | Muşar Mountain Church |
| Sivrice | - |
| Arıcak | - |
| Alacakaya | - |
| Karakoçan | - |
| Maden | - |
| 15 churches that survived to the present day. | |

Within the scope of the study, it was determined in the literature studies that there are 10 historical churches that have not survived to the present day in Elazığ province (Table 3.3).

Table 3.3. Churches found in written sources.

| Location | Churches that could not survived until present day |
|---|---|
| City Center | - |
| Harput | Mar Şamun Church |
| | İğdeli Church |
| | Protestant Church |
| | Syriac Church |
| | Catholic Church |
| Palu | Surp Sahag Bartev Church |
| | Surp Giregos Church |
| | Surp Sarkis Church |
| | Surp Asdvadsadzin Monastery |
| Kovancılar | - |
| Keban | - |
| Ağın | - |
| Baskil | - |
| Sivrice | Surp Nişan Church |
| Arıcak | - |
| Alacakaya | - |
| Karakoçan | - |
| Maden | - |
| 10 churches have not survived to the present day. | |

In the study, a literature review was conducted using different sources. During this process, it was observed that historical churches were mentioned with different names in different sources. For this reason, the names of the churches examined in the study were used as registered in the registration documents in the Elazığ Cultural Inventory. Table 3.4, lists the names of the same churches in different sources.

Table 3.4. Names and locations of the churches

| Name of the Church According to Elazığ Natural and Cultural Heritage Inventory Registration Document | Name(s) of the Church in Other Sources | Location |
|---|---|---|
| Virgin Mary Church | Harput Syriac Ancient Orthodox Virgin Mary Church<br>Assyrian Church (Tanoğlu, 2013)<br>Yakubi Church (Tanoglu, 2013)<br>Surp Asdvadsadzin Church (Source: EACHAR, 2018) |  <br>Source: Google Earth Pro (Access Date: October 2023) |
| Church Remains No. 4 | Surp Hagop Church (Source: EACHAR, 2018)<br>Surp Agop Church |  <br>Source: Google Earth Pro (Access Date: October 2023) |
| Kızıl Church | Surp Garabed Monastery (EACHAR, 2018)<br>Sürp Karabet Church (Sunguroğlu, 1958) |  <br>Source: Google Earth Pro (Access Date: October 2023) |

Table 3.4. (Continued) Names and locations of the churches

| | | |
|---|---|---|
| Arpacı Flour Factory | Armenian Protestant Church |  Source: Google Earth Pro (Access Date: October 2023) |
| Surp Simon Church | Tadem Monastery (EACHAR, 2018)<br>Surp Asdvadsadzin Church |  Source: Google Earth Pro (Access Date: October 2023) |
| Surp Kevork Monastery | Surp Hulvenk Church<br>Khule Vank Church<br>Saint Georges Monastery<br>Sağır Monastery |  Source: Google Earth Pro (Access Date: October 2023) |
| Küşne Church (Ağın) | Surp Asdvadsadzin Church (EACHAR, 2018) |  Source: Google Earth Pro (Access Date: October 2023) |

Table 3.4. (Continued) Names and locations of the churches

| | | |
|---|---|---|
| Ekinözü Church | Surp Gatoğige Church (EACHAR, 2018)<br>Katolikos Church |  <br>Source: Google Earth Pro (Access Date: October 2023) |
| Toma Church | Kallar Mahallesi Church (EACHAR, 2018)<br>Çarşıbaşı Church<br>Virgin Mary Church |  <br>Source: Google Earth Pro (Access Date: October 2023) |
| Surp Krikor Lusavoriç Church | Keklikdere Church (EACHAR, 2018) |  <br>Source: Google Earth Pro (Access Date: October 2023) |
| Kindik Church | Kindik Rock North Front |  <br>Source: Google Earth Pro (Access Date: October 2023) |

Table 3.4. (Continued) Names and locations of the churches

| | | |
|---|---|---|
| Surp Boghos Vank Church | Yeşilbayır Church<br>Vank Church (EACHAR, 2018) |  <br>Source: Google Earth Pro (Access Date: October 2023) |
| Kovancılar Church | Keğahayyats Surp Asdvadzadzin Church (EACHAR, 2018) |  <br>Source: Google Earth Pro (Access Date: October 2023) |
| Hoşmat (Çakırkaş) Church | Surp Asdvadzadzin Kilisesi Church (EACHAR, 2018) |  <br>Source: Google Earth Pro (Access Date: October 2023) |
| Muşar Mountain Church | Mor Ahrun Monastery (EACHAR, 2018) |  <br>Source: Google Earth Pro (Access Date: October 2023) |

### 3.3.Architectural features of historical churches

In order to understand the churches to be explained in this study, it is necessary to recognize the architectural spaces of these religious buildings. The churches examined in the study are mostly Armenian churches. Most of the churches reflect the church architecture of the Byzantine Period.

Before mentioning about Armenian churches, it is essential to elucidate some of the concepts embedded in the church names. The term “Vank” (Venk), frequently encountered in Armenian church architecture, is of Armenian origin and signifies a large monastery (URL 1). The term “Surp” within church nomenclature denotes “Saint”. A distinctive architectural feature in Armenian churches, setting them apart from others, is the “jamatun”. The incorporation of jamatun extensions onto the western facades of churches is observable from the 10th century onward, gaining prominence particularly in the 13th century. The term “jamatun” translates to “church house” and was utilized as a gathering place and for funeral ceremonies (URL 2).

In church architecture, there are a number of special sections and elements where religious rites are performed, worship is held and the congregation gathers. These sections and elements are:

1. Narthex: The narthex is defined as “the entrance to the main area of the church” (Sözen and Tanyeli, 1994). It is a section near the entrance of the church and fulfills various functions such as gathering the congregation, keeping the registers or welcoming the priest or pastor at the entrance. The narthex is also a kind of transition point to the interior of the church.

2. Naos: Originating from the Greek “naeion”, the act of sheltering, naos corresponds to “cella” in Latin (Sözen and Tanyeli, 1994). In Christian architecture, it is the area reserved for worship (ESA, 1997). The main spaces extending between the entrance and the apse in the naos are called naves (ESA, 1997). In basilical planned buildings, the naos is organized with naves.

3. Nave: These are the sections that make up the main space inside the church. The nave is

usually covered with a high ceiling and represents the main area where the congregation sits and services are organized. The aisles are the corridors surrounding the nave and are often narrower.

4. Bema : In the early Christian and Byzantine churches, the sacred area in front of the apse where the clergy stood and the public was not allowed to enter (Doğan, 2002).

5. Apse: The apse is a semicircular or polygonal section usually located in the eastern part of the church. The apse is the most sacred area inside the church and is usually covered with a half dome or vault. This section marks the main pediment of the church and the most sacred area of the church.

6. Gallery: In churches, the gallery (gynekaion) is the part that overlooks the main nave, is located above the narthex or the side naves (Karaca, 2006), and in some examples functions as a women's area (Sözen and Tanyeli, 1994). The gallery is accessed from the interior by stairs. Depending on the direction of the gallery, the gallery stairs may be located in the naos, narthex or within the north and south thick walls of the naos.

7. Transept: Located perpendicular to the nave of the church, this section gives a diagonal shape to the main structural design of the church. The transept can enhance the symmetry of the church and is used for religious ceremonies.

8. Bell Tower: Many churches have a bell tower in or near the courtyard. This tower is used to signal the church's religious announcements, times of worship and special ceremonies.

9. Baptistery (Baptisterium): Some churches have an area set aside for baptisms. This area is used for the baptismal pool and for receiving candidates for baptism.

10. Pastophorion: A term used during the Byzantine Empire and later in the Eastern Orthodox Church. Pastophorion refers to a special room or storage space, usually in churches or monasteries, used to store the vestments and liturgical items of priests, monks

and religious officials. It is a room where liturgical vestments, sacred books, objects for the use of priests and other items necessary during religious ceremonies are stored.

### 3.4.Churches in the Harput neighborhood

Harput Neighborhood, the old city center of Elazığ city is the area where the first non-Muslim settlements in the city were located. There are 3 churches that have survived to the present day in this neighborhood. These churches are Virgin Mary Church, Kızıl Church and Surp Hagop Church. Virgin Mary Church is actively used today. The east, north and south walls of Kızıl Church are partially standing, while the west wall has completely collapsed. Only the ruins of the Surp Hagop Church remain today. However, it is stated in the literature that the Surp Hagop Church was a very magnificent church in history (Figure 3.3).

Apart from these churches, Sunguroğlu explained the other churches in Harput as follows: İğdeli Church in the Gürcübey neighborhood, the Protestant Church built by the Americans in 1909 in the Şehroz neighborhood, the Catholic Church built by the French in the castle square, the Assyrian Church and Mar Şamun Church in the Süryani neighborhood, and the Sinabut Church in the Sinabut neighborhood (Sunguroğlu, 1958: 347, 348, 349).

Figure 3.3. Harput in the 1800s (Source: Elazığ Travel Guide 2019)

#### 3.4.1. Virgin Mary Church

The Virgin Mary Church is an ancient church located in Harput, 5 km north of Elazığ, under the

block where the castle is standing, the back wall of which is adjacent to the castle. The church's coordinates are situated at a latitude of 38 degrees 42 minutes 12 seconds North and a longitude of 39 degrees 15 minutes 30 seconds East. This church, unlike the other churches examined in this study, is not an Armenian church, but a Syriac church. It is the oldest dated church located in the area. According to the 2009 Elazığ Cultural Inventory Document, on 09/04/1982, the "Church of the Virgin Mary" was registered as a monumental structure with decision number S-3562.

The church is situated on the east side of Harput Castle, which is on the east side of Harput Neighborhood. The western wall of the church is made up of the rock on which the Harput Castle sits. The church walls, excluding the western wall, have a rectangular design and consist of rubble stones. The roof of the church has a flat terrace roof (Figure 3.4-3.5).

Figure 3.4. General View of Virgin Mary Church Before Restoration (Source: https://harput.web.tr/harputun-tarihi-eserleri/harput daki-kiliseler/meryem-ana-kilisesi/, Access Date: 20.10.2023)

Figure 3.5. General View of Virgin Mary Church After Restoration (Source: https://harput.web.tr/harputun-tarihi-eserleri/harput daki-kiliseler/meryem-ana-kilisesi/, Access Date: 20.10.2023)

Although Tanoğlu states that the church was built 179 A. D., later studies have confirmed that these dates are incorrect. It is said that the churches were once temples and were converted into a church by the Jacobite Christians (Tanoğlu, 2013). This church is also referred to as: Yakubi, Kızıl Church, Virgin Mary and Assyrian Churches (Tanoğlu, 2013). İshak Sunguroğlu (1958) referred to this church as the "Yakubi Church" in his book titled *Harput Yolları*.
The church continues to be used with the same function today and has an active congregation. Although there has been a significant decrease in the non-Muslim population of the region, there are still 2 churches in Elazığ that continue their religious functions. The first of these churches is the Virgin Mary Church in Harput neighborhood and the other is the Mor Gevargis Church in Rızaiye neighborhood in Elazığ city center.

The building, which was dated to 179 A.D. due to a misread inscription by Sunguroglu, is dated to the Byzantine period, 6th century A.D. by E. Danık (Çakmak, 2006). In the registration document of the building, the construction date is stated as 4th century A. D., but according to Çakmak (2006) this information is not correct.

The registration document in the Cultural Inventory describes the architectural features of the church as follows: "The eastern wall of the rectangular structure is carved into the rock upon which the castle is built. The other walls are constructed with rubble stones. The projecting apse is covered by a half dome, while the remaining parts are vaulted (Figure 3.6). The vaults are supported by three pointed arches, and the side walls feature niches with round arches and piers. There are chambers on both the right and left sides of the apse, along with three small windows—two above and one below. The arches are adorned with cut stone, and the vaults are constructed with bricks. An inscription is located on the upper part of the eastern entrance door within the interior". Historical records indicate that the building underwent restoration in 1179, during the reign of Fahreddin Karaarslan, an Artuqid Sultan.

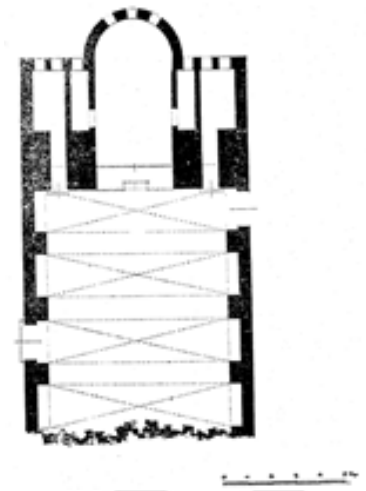


Figure 3.6. Restitution Plan of the Virgin Mary Church (Sunguroğlu, 1958)

The exterior of the church is exceptionally well-preserved and remains in excellent condition. Conversely, the interior floor has incurred significant damage, and the church's inscriptions have been entirely obliterated (Figure 3.7). Notably, the naos, bema, and pastaforium cells are still intact, while the narthex extending towards the north has not survived to the present day (Çakmak, 2006).

Figure 3.7. Interior of the Virgin Mary Church (Source: https://harput.web.tr/harputun-tarihi-eserleri/harputdaki-kiliseler/meryem-ana-kilisesi/, Access Date: 18.10.2023)

### 3.4.2. Surp Hagop Church (Church Remains No. 4)

Following the literature review, the structure, originally identified as Surp Hagop Church, has been officially registered as “Remains of Church No. 4” in the cultural inventory records. Situated in the historically known Şehroz Neighborhood in Harput, the church is located at 38°42’15.07” North latitude and 39°14’53.56” East longitude.

Two registration documents exist for Surp Hagop Church. The first registration, bearing the date 09/04/1982, is numbered A-3562, while the second registration, dated 30/05/1985, is denoted as decision number 1089 by the High Council for the Conservation of Cultural Property. The historical records suggest that the church was one of the most impressive churches in the region during the 19th century when it was actively in use. Aksın (1999) mentions that the church had a capacity of 500-600 people and was granted permission for restoration in 1859. Unfortunately, it was slated for demolition in the early 20th century.

Surp Hagop Church in the Şehroz neighborhood stands partially preserved. The north and south walls are mostly intact, and the east wall is partially preserved. However, the west wall of the church has been entirely obliterated due to the sloping terrain. It is evident that the church, constructed with rubble stones, followed a basilica-style floor plan with three naves (Çakmak, 2006). Unlike the churches in the lower neighborhood where Armenians resided for centuries, Surp Hagop Church, a more recent addition, was characterized as a domed structure supported by four robust walls (Figure 3.8). When Srvantsdyants visited Harput in 1878, he noted that this church was in good condition (Bardizaktsi et al., 2010).

Figure 3.8. 19th Century Harput and the Surp Hagop Church (Hayg, 1959)

Sunguroğlu (1958: 343) reported that the church in the Şehroz neighborhood stands out as the largest in Harput in terms of size, location, and congregation (Figure 3.9). The church features two levels of windows and a basement. In its close proximity, there were two Armenian schools, one of which was the Garmir College" (Sunguroğlu, 1958).

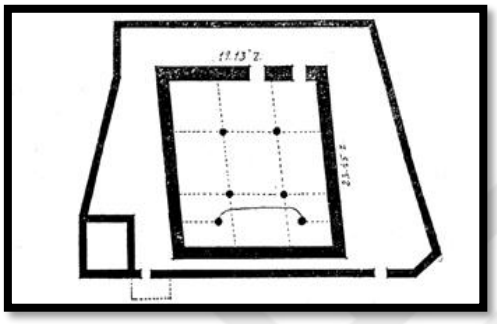


Figure 3.9. Surp Hagop Church Restitution Plan (Sunguroğlu, 1958)

From the remaining walls of the structure, it is evident that the church had a rectangular plan. The partially standing north-south walls are constructed from rubble stone (Figure 3.10). Traces of the foundation of the east wall are still observable. The north wall includes a wide arched entrance on the lower level and an arched window on the upper level. The south wall exhibits two arched openings on the lower level and three arched windows on the upper level. The roof covering of the building has been entirely lost. The foundation of the west wall is also absent.

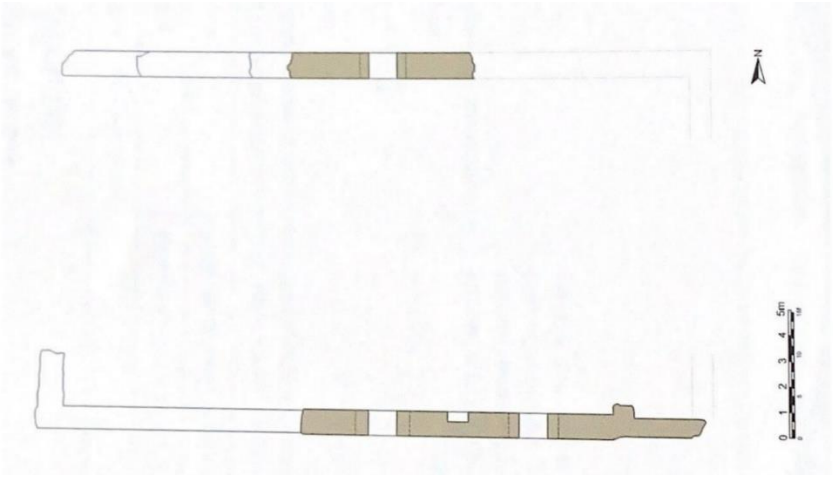


Figure 3.10. Plan Survey of Surp Hagop Church (Source: EACHAR, 2018)

Currently, the church stands near the residential area to the west of the main road, situated on a sloping terrain below the road level. Only a small portion of the walls still stand, and the north wall has collapsed more than the south wall. The walls have suffered from severe deterioration and corrosion.

The remaining part of the church, much of which has collapsed, is vulnerable to human and natural destruction (Figure 3.11-3.12). Since the north and south walls are not connected to each other, their structural balance is fragile and there is a risk of complete collapse.

Figure 3.11. Current Status of Surp Hagop Church (Source: https://harput.web.tr/harputun-tarihi-eserleri/harputdaki-kiliseler/surp-hagop-kilisesi/, Access Date: 10.09.2023)

Figure 3.12. General View Surp Hagop Church (Source: https://harput.web.tr/harputun-tarihi-eserleri/harputdaki-kiliseler/surp-hagop-kilisesi/, Access Date: 10.09.2023)

### 3.4.3. Kızıl Church (Surp Garabed Monastery)

The Kızıl Church is located in the Harput neighborhood, north of the Harput Castle and northwest of the Virgin Mary Church. According to the information given by Sunguroğlu (1958), it was built in 1910 to replace a church that was destroyed in 1850. Church is located at 38°42'17.38" North latitude and 39°15'27.93" East longitude. There are 2 registration documents regarding the Kızıl Church. The first of these; High Council for the Conservation of Cultural Property dated 09.04.1982, numbered A-3562 decision. The 2nd registration of the church was made by the High Council for the Conservation of Cultural Property on 30.05.1985/1089. The church, which is registered as the Kızıl Church, is referred to as "Surp Garabed Monastery" in EACHAR (2018).

The building is an Armenian Catholic church. According to the Cultural Inventory Registration Document, the church site belongs to the Elazığ Special Provincial Administration. Kızıl Church is located in the Aşağı Neighborhood and is the second oldest church in Harput (Figure 3.13). It was built twice in the past. According to Hayg (1959), the second construction of Surp Garabed was realized with a decree in the 1870s. According to Sunguroğlu (1958), the first church, located in the Gürcübey neighborhood in the east of Harput, was demolished in 1850 with a license from the local administration, and the construction of a larger stone church was started with the inclusion of some Armenian houses around it. After the declaration of the Constitutional Monarchy, a domed and larger church was built together with the adjacent school and priest houses (EACHAR, 2018).

In the 2009 Elazığ Culture Inventory Registration Document, the organization that should be responsible for the maintenance of the building is stated as the General Directorate of Foundations. Sunguroğlu (1958) refers to the Kızıl Church as "Sürp Karabet Church".

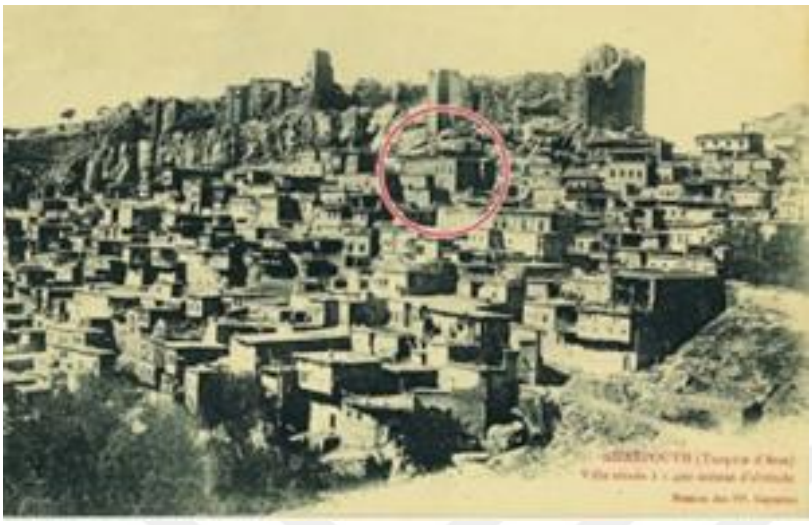


Figure 3.13. The Kızıl Church in the 1900s (Source: Anonymous)

The walls of the rectangular church are built with rubble stones. The western wall was completely destroyed and most of the north-south walls were demolished. The east wall is standing. The upper cover is completely destroyed.

The surviving part of the church, a large part of which has been demolished, measures approximately 15 × 18 meters. Church has three apses, two side cells are quite small and close to square (Figure 3.14). There are indications that it may have had five naves. It is an original example of Armenian church architecture. The outer length of the east wall is 18 meters, the surviving part of the north wall is measured to be about 11 meters, and with the traces on the ground, it is observed that it continues for about 15 meters. The wall thickness is 90 centimeters in the side cells (north and south walls) and 70 centimeters in other parts (EACHAR, 2018).
The walls are masonry rubble stone and the wall corners are smooth cut stone. The roof cover is completely destroyed, but there are traces that the upper cover was domed in the apses. The arch faces are cut stone. The exterior walls were built with masonry rubble stone as in the interior and the corners are smooth cut stone. No plaster remains were found on the exterior.

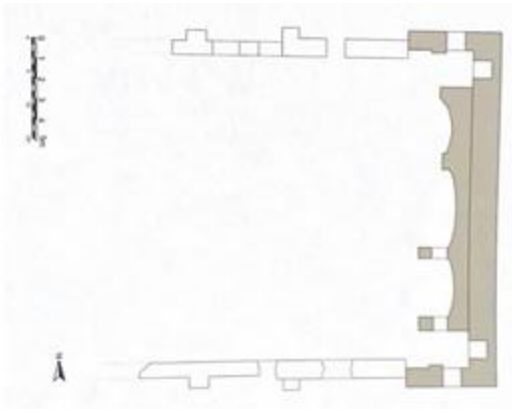


Figure 3.14. Kızıl Church Plan (Source: EACHAR, 2018)

The smooth cut stone and rubble stone were used in the construction of the building, and the east, north, and south walls are still partially standing (Figure 3.15). However, the west wall has been demolished. Information about the ends and upper floors of the north and south walls is not available. The upper cover of the dome was entirely demolished, except for the beginning stone rows. It is not possible to read the plan scheme clearly. Material loss and deterioration in almost all parts of the church are quite extensive. Although the eastern wall and side cells remain standing as a whole, there is serious deterioration in the masonry stone walls. The north and south walls have suffered greater material loss than the east wall. Since the building has been largely demolished and no conservation measures have been taken around it, it is completely open to human and natural destruction and is at high risk. The walls are more deteriorated due to material loss than serious structural problems. The ground is covered with overgrown weeds. The church has been vandalized in the last few years.

Figure 3.15. Kızıl Church (Source: Author's Archive, 01.02.2023)

## 3.5. Churches Located in Elazığ City Center

### 3.5.1. Armenian Protestant Church

The Elazığ Armenian Protestant Church is situated on a land of roughly 10,000 square meters, in the Rızaiye district of the city center of Elazığ, at 38.67'72" North latitude and 39.22'43" East longitude. Although the Cultural Inventory registrations indicate that the building was constructed in the late 19th century, the oral information obtained by Yeğin and Öztürk from the officials of the Armenian Patriarchate of Istanbul and the late Armenian Patriarch Masrup Matrupyan specifies that the church was built by Armenians residing in Elazığ in 1904.

Although originally a Protestant Church, the High Council for the Conservation of Cultural Property decided to register the church as the "Arpacı Flour Factory" on June 10, 1977, with reference number A-606. The church has lost its religious function today as there is no users left in the city. After the Relocation and Settlement Law (1915), the church, without an active community, has been used as a barn, a flour factory and a parking lot, which are not related to its religious function and are incompatible with the architectural value of the church. According to Yeğin and Öztürk (2022), the church acted as a flour factory until the year 1990. Official documents confirm that an individual currently owns the church. Currently, the space within the church's perimeter walls and surrounding areas are still being used as a parking lot.

The church has a basilical plan type. It was later used as a flour factory and therefore some changes and additions were made. The garden is entered through a door made of smooth cut stones with two arched pillars. The church building inside the garden has a rectangular plan measuring 17.50 x 25.08 m. (Figure 3.16). The church is described in the Elazığ Culture Inventory as follows: "The main entrance of the building is on the east facade with a triangular pediment. The other walls are similar and the pediments are reinforced with wooden beams. The apse of the building was completely destroyed. The narthex is entered through a large door made of cut stones with round arches. There is a window on two short walls, one on each side. The naos is entered through a door made of smooth cut stones with round arches and half piers. The naos is divided into three longitudinal naves with four columns. The columns are wooden, plastered and have stone column bases (but cannot be seen today). The roof was placed on these

columns. On the two long walls of the naos, there are symmetrical and pointed arched windows, three at the top and bottom. There is also an arched window on the pediments. The long walls are supported by two half piers. The walls of the naos are divided into panels in a thick strip of 50 cm with brown and dirty yellow colors. At the end of the left long wall of the naos, there is a niche with flat arches and half piers made of cut stones. The apse arch, which has been completely destroyed, is made of cut stones and two buttresses are painted with paint. There are three round holes at the top and two windows with round-pointed arches on either side".

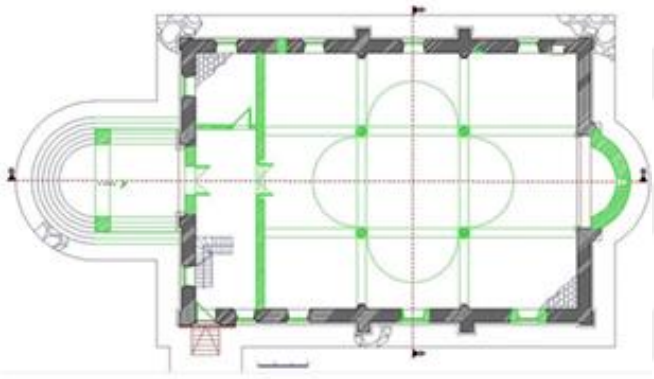


Figure 3.16. Armenian Protestant Church Ground Floor Plan Restitution (Öztürk, 2022)

The naves on the north and south facades of the church have symmetrical windows. There are triangular pediments on the north and south façades of the church and as seen in the old photographs of the church, the roof is located on these pediments (Figure 3.17).

Figure 3.17. General View of Elazığ Armenian Protestant Church (Anonymous)

When the historical photographs of the church are examined, the bell tower, skylight and the upper cover of the church, which have not survived to the present day, can be seen (Figure 3.18).

Figure 3.18. Historical Photograph of Elazığ Armenian Protestant Church (Anonymous)

The church located in the center of Elazığ province is under the threat of extinction due to various reasons. At present, there are only the body walls of the building and the structural elements such as the bell tower, roof, floors, etc. have completely disappeared (Figure 3.19).

Figure 3.19. Current Situation of the Armenian Protestant Church (Author's Archive, 2023)

Inventory documents indicate that the church has 2 storeys and there is a staircase in front of the apse on the eastern façade. However, neither the staircase, the floor nor the apse arch have survived to the present day. The fact that the upper cover and other elements of the building

have disappeared has made the building more open to external influences. In addition to the fact that the church is completely open to external influences, the additions and subtractions made in order to be used for different functions have also caused deterioration in the church. For example, today it is used as a parking lot and vehicles are parked inside the body walls of the church, causing deterioration on the entrance door. One of the reasons why the floor of the building has not survived to the present day is the constant entry of vehicles into the church (Figure 3.20). Another factor that threatens the extinction of the Armenian Protestant Church is the earthquake factor. The area where the building is located is very close to the "Eastern Anatolian Fault Line", one of Türkiye's active fault lines. There are also cracks in the walls and deterioration on the walls due to vandalism.

Figure 3.20. Situation of the Church in August 2021 (Google Earth Pro)

### 3.5.2. Surp Kevork Monastery (Surp Hulvenk Church-Şahinkaya)

Surp Kevork Monastery is situated in the Şahinkaya neighborhood, located 7 kilometers northwest of the city center of Elazığ. Based on information gathered from literature studies, it is considered to be the third oldest church in Elazığ province. According to the Elazığ Cultural Inventory Registration, this church was registered as a 3rd-degree monumental building under the name "Surp Kevork Monastery (Sağır Monastery)" on February 13, 1986, with the decision number 1838. It is mentioned that the ownership of the church is attributed to an individual, and the organization responsible for its maintenance is the General Directorate of Foundations (Şener, 2009). Surp Kevork Monastery is known by various names in different sources, such as

Sağır Monastery, Surp Hulvenk Church, Khule Vank Church, and Saint Georges Monastery.

According to the literature, it is evident that the monastery was once a complex with a church and various structures surrounding it. However, only the church has managed to survive to the present day, with no traces of the other structures. Although the registration document states the construction date as 1061, a review of literature suggests that the church dates back to a much earlier period (Figure 3.21-3.22). The monastery is mentioned in the Elazığ Cultural Heritage Assessment Report (2018) as follows: “The monastery is known to have existed in the late Middle Ages (1328-1498) (Thierry, 1990-1991: 225-251). In the 15th century, the monastery became an important scriptorium. A book written in 1444 by Kevork the Great, the archbishop of the monastery, mentions that the monastery was abandoned during the reign of Timurlenk (1336-1405), after which the monks restored it and utilized the 1.6-hectare land. Following the death of Kevork the Great, a mausoleum chamber was constructed in his memory in the pastoforion cell in the northeast of the church. The church underwent restoration in 1514 and 1615 in the jamatun (parish house) section. After 1895, the monastery was repurposed as an orphanage. It was well-preserved alongside its fruit gardens throughout the first half of the 20th century” (Thierry, 1990-1991: 225-251).

Figure 3.21. Surp Kevork Monastery (Hayg, 1959: 859)

Figure 3.22. Khule Village and Surp Kevork Monastery in the center (Hayg, 1959: 857)

An additional square jamatun section and a tomb room were constructed to the west of the rectangular church, forming a complex. The church takes the form of a domed basilica with a cross plan, and both the jamatun and the church were built on a land extending in the east-west direction. The central part of the church features an upper covering supported by four free columns with pointed arches. The entrance to the building is through the southern facade (Gürsul and Yeler, 2023). The internal dimensions of the structure measure 6.30 × 18.10 meters. There is a window opening along the axis of the apse in the east. The building incorporates a total of eight columns, six of which are monolithic and cylindrical, while the other two have square sections and are constructed using rough stone and mud mortar (Figure 3.23).

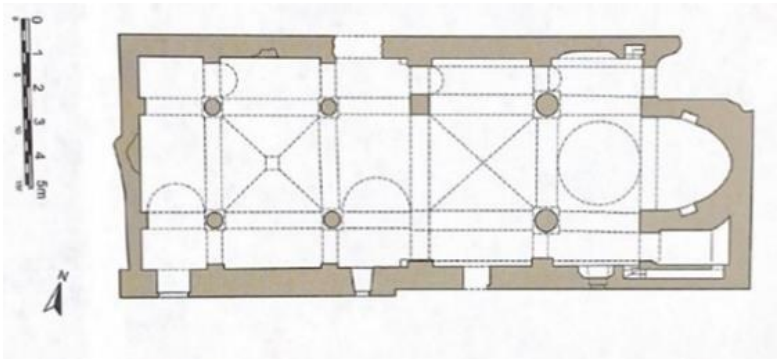



Figure 3.23. Current Plan of Surp Kevork Church (Source: EACHAR, 2018)

The jamatun section opens to the exterior via a single door in the southwest room. The lime plaster on the interior walls is adorned with painted decorations. It can be deduced from the trace on the ascending body wall and the difference in roof heights that the church structure comprises two distinct units (Figure 3.24).

Figure 3.24. Elevation Difference of the Surp Kevork Church (Author's Archive, 2023)

Both the monument registration document and T.A. Sinclair's archival drawings of the building complex indicate that the church originally had two storeys and was surrounded by various structures belonging to the monastery complex. However, today, only the church has survived (Danık, 1999: 70-71).

The church's architectural plan has endured over the years through various restoration efforts. Unfortunately, there is insufficient information available about its immediate surroundings. The masonry stone walls of the church have undergone deformations due to natural and physical deterioration. One of the supporting columns is completely shattered, and the connection between the beam and arch is fragile. This has caused the building to shift, resulting in severe cracks in the ceiling and walls. Likewise, the south wall of the structure has vertically separated on both sides (EACHAR, 2018). The interior walls of the abandoned church have suffered significant damage due to human activity (Figure 3.25).

The church, in its current structural condition, is highly vulnerable to damage in natural disasters such as earthquakes and floods due to the weakened state of its walls and roof. Furthermore, it remains susceptible to potential human-inflicted harm.

Figure 3.25. Deterioration of the Surp Hulvenk Monastery due to vandalism (Source: https://arkeofili.com/elazigdaki-1000-yillik-hulvenk-kilisesi-10-yildir-tahrip-ediliyor/, Access Date: 02/11/2023)

## 3.6. Churches in the surrounding districts of Elazığ city center

### 3.6.1. Küşne Church (Surp Asdvadsadzin Church - Ağın)

It is situated in the south of Beyelması village in the Ağın district of Elazığ province. Medieval sources provide no information about its history. According to EACHAR (2018), the building belongs either to the period between the seventh and 13th centuries of the Middle Ages or to the late medieval period. The shape of the apses and their alignment with the main space suggest a late medieval dating for the building.

It is a rectangular building with three apses to the east (EACHAR, 2018). Externally, the church features a rectangular layout measuring approximately 17 × 10 meters (Figure 3.26). The main space's long side walls incorporate arches, suggesting the possibility of a roof with a single opening due to their spanning of a wide area.

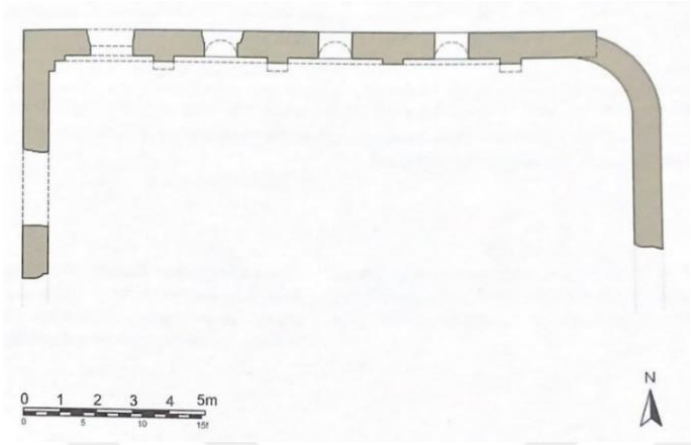



Figure 3.26. Plan of Küşne Church (EACHAR, 2018)

The church was constructed using traditional Armenian architectural methods. Smooth-cut sandstone blocks were used for all the recessed columns, arches, as well as the window and door openings. The remaining portions of the structure, including the vault, were constructed using rough masonry, a characteristic feature of rural architecture (EACHAR, 2018).

Only the northern wall, extending up to the beginning of the vault, has been preserved. The western wall and the apses are partially preserved. The remnants of the south wall can be found below ground level. The building is exposed to external elements that could lead to deterioration (Figure 3.27).

Figure 3.27. Current Situation of Küşne Church (Source: http://www.agin.gov.tr/kusne-kilisesi, Access Date: 05.11.2023)

### 3.6.2.Ekinözü Church (Surp Gatoğige Church - Kovancılar)

The church is located in Ekinözü village in Kovancılar district of Elazığ province. The property was registered as ‘Ekinözü Church’ with the decision of the High Council for the Conservation of Cultural Property dated 15.02.2006 and numbered 584. The church is referred to as ‘Surp Gatoğige Church’ in the EACHAR (2018). The registration document states that the church belongs to the ‘Halil Bey Foundation’. It also states that the organization responsible for the maintenance of the church is the ‘General Directorate of Foundations’.

According to the priest Natanyan, who was sent to the region in 1878, the village of Ekinözü had 180 households and 1436 inhabitants, while the Armenian population in 1914 was recorded as 1648 (207 households). According to Natanyan, there were two imposing masonry Armenian churches in the region, one of which must have been the Keğahayyats Surp Asdvadsadzin (Virgin Mary) Monastery, and the other was the Surp Gatoğige (Ekinözü) Church (Bardizaktsi et al. 2010, 121). The church is a masonry building with a rectangular plan (Figure 3.28-3.29).

Figure 3.28. Historical Photograph of Ekinözü Church (Source: Ananoymous)

Figure 3.29. Ekinözü Church West Facade General View (Çapkur, 2023)

The church consists of a rectangular plan and a single space with a half-dome apse, measuring approximately 12.75 × 9.30 meters (Figure 3.30). On both sides of the apse, there are rectangular vaulted cells with arched entrances. Arches resting on circular columns protruding from the side walls support the vaulted upper cover. There is an arched entrance in the center of the north wall with arched windows beside it. The walls of the masonry structure are constructed using cut stone. In the center of the east wall, there is a half-domed apse (EACHAR, 2018). On the north and south walls of the main space, there are two recessed columns formed by circular projections from the wall. The column heights are approximately 1.70 meters. When examining the exterior, you can observe the windows of the two side cells on the east façade. On the two corners of the west wall, the upper-end or floor-level moldings are preserved. The central axis of the entrance has an arched entrance and arched windows on both sides. It is evident that the exterior walls are unplastered.

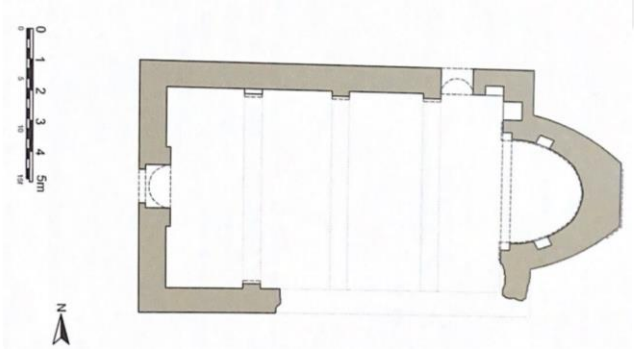



Figure 3.30. Plan of Ekinözü Church (EACHAR, 2018)

Despite some collapses, the plan scheme remains sufficiently legible. The floor level cannot be observed. Except for the partial dome and arches over the apse, there is no information available on the upper cover. The church faces significant structural problems on almost all of its walls. There is substantial material loss on all walls, along with serious structural cracks starting from the upper part of the arches and extending upward on the walls. There are structural cracks and separations at the joints of the wall, material losses in the doors and windows, and cracks in the lintels of the west wall windows. Issues related to vegetation on the upper cover of the apse and the presence of microorganism formations, which are commonly found in the stone material, have been observed. The church is also highly vulnerable to human and natural damage (EACHAR, 2018).

### 3.6.3.Toma Church (Kallar Neighborhood Church - Keban)

The church is located in Kallar neighborhood in Keban district of Elazığ province. According to the 2009 Elazığ Cultural Inventory Registration, it was registered as a 3rd degree monumental building with the name “Kilise (Church)” with the decision dated 13/02/1986 and numbered 1838. It is stated that the ownership of the building belongs to Keban Municipality. The function of the building in 2009 was stated as “warehouse” (Elazığ Culture Inventory, 2009). In EACHAR (2018), the church is referred to as the Kallar Neighborhood. Kevorkian and Paboudjian referred to the church as the “Cathedral of the Virgin Mary”.

Kevorkian and Paboudjian stated that the population of Keban in 1914 consisted of 53 households, a total of 265 Armenians, 24 Orthodox Armenians, 300 Turks and 299 Kurds, and that the most beautiful monument in the center was the Cathedral of the Virgin Mary with the adjacent school. According to the 1896 Mamüratül-aziz Vilayet Salnames, a building called Toma Church is mentioned in the Kallar Neighborhood, with 95 households, all of them non-Muslim (Bayındır, 2012). However, the ethnic affiliation of the building is unclear.
The church has a rectangular plan, interior dimensions of about 14.5 × 20 meters, with three naves and three apses, and the naves are separated by four stone columns with a diameter of 35 cm (Figure 3.31).

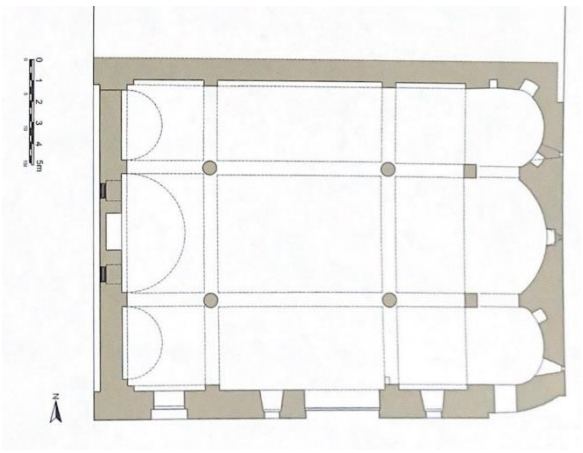


Figure 3.31. Plan of Toma Church (EACHAR, 2018)

The width of the central apse and nave is about nine meters and is higher than the naves, which are about 3.6 meters wide. The central apse is covered with a half dome and the side naves with a barrel vault. The height of the space is about 8.50 meters. The keystone of the arches connecting the columns is about 7 meters above the ground. The walls are built of masonry rubble stone; the window and door edges, arch stones and corners of the building are smooth cut stone. the roof cover is earthen roof (Figure 3.32). The stone masonry wall surfaces are plastered on the inside and there are also traces of very deteriorated frescoes. The columns separating the naves consist of two cylindrical block stones with imposts on top.

Figure 3.32. General View of Toma Church (Source: https://elazighaberkent.com/meryem-ana-kilisesi-turizme-kazandiriliyor/ , Access Date: 05.11.2023)

The church has largely preserved its structural integrity, but there are some deterioration and conservation issues due to years of disuse. The deterioration of the building is described in the EACHAR as follows:

“There is a row of shops adjacent to the north wall of the church. The main entrance door and west windows on the west façade are below the elevated road level and have been closed. On the south façade of the building, a 3.5-meter wide door was opened for use in later periods. The floor levels cannot be observed precisely due to the interventions. There are serious material deterioration due to moisture throughout the building. Saltation problems caused by cement-based plaster are observed. The frescoes have been destroyed and only a few traces of them can

be observed. The roof is covered with grass. The church, which was used as a warehouse and garage by the municipality in the past, is currently empty".

### 3.6.4. Surp Krikor Lusavoriç Church (Palu)

Surp Lusavoriç Church is located in the Çarşıbaşı neighborhood of Old Palu. The church was registered as a 1st Group building as "Surp Krikor Lusavoriç Church" on 13.02.1986/1838 by HCCCP (High Council for the Conservation of Cultural Property) and on 30.03.2012/446 by Diyarbakır Regional Board for the Protection of Cultural Assets. The church is an Armenian Catholic church (Aytaç, 2020). Surp Lusavoriç Church is located at the coordinates 38° 41'55" North latitude and 39° 57' 27" East longitude. There is no information on the ownership of the church in the inventory document. The organization that should be responsible for the maintenance of the building is indicated as "General Directorate of Foundations".

As in many parts of Anatolia, it is known that many cathedrals, monasteries and churches were spread around the Palu Castle in the old city of Palu. Among them are the churches of Surp Sahag Bartev, Surp Giregos and Surp Sarkis, Surp Asdvadsadzin Monastery and Surp Krikor Lusavoric Church (cathedral) (Figure 3.33), only the Surp Krikor Lusavoric Church has survived to the present day.

Figure 3.33. Surp Lusavoriç Church (Şedele, 1985)

T.A. Sinclair dates the church to the early 19th century (Sinclair, 1989: 122). The height of the dome pulley and the size of the windows on the east-west facade also support this date in terms of architecture (Aytaç, 2020).

The church was built as a single space and covered with a dome. Although the dome has collapsed today, the octagonal pulley carrying the dome is still standing. Together with the apse adjacent to the square section, the church measures 11.60 × 20.60 meters. This space, which is thought to have been built in the same period with the church, is 4.30 × 5.30 meters in size. The building was built with masonry rubble stone; cut stone was used in some parts of the façade and on the piers carrying the square space. Brick and stone alternation is also used on the walls.

The walls and pillars bearing the dome and arches are made of stone; the dome and arches are made of brick. The square main space is covered with a dome. There are semicircular arched windows on each side of the dome arch. The transition to the dome is provided with pendentives. There are traces of plaster on the exterior walls, although few. The upper cover has disappeared. The body walls are largely destroyed. The wall of the west façade is completely destroyed; there are traces of the walls continuing to the west in two directions. The drawings of Spor (2020) show the current situation in 2020 and the restitution plan (Figure 3.34-3.35).

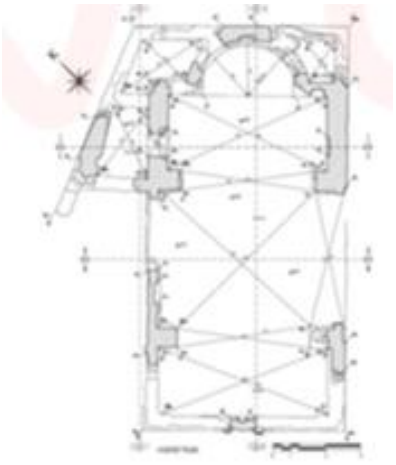


Figure 3.34. Surp Lusavoriç Church Survey Plan (Spor, 2020)

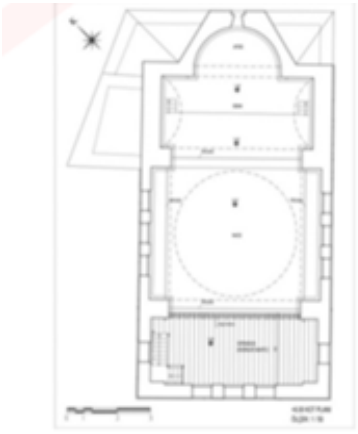


Figure 3.35. Surp Lusavoriç Church Restitution Plan (Spor, 2020)

The part on the south wall of the building with upper and lower floor window openings has been demolished. The lower floor openings cannot be read on the south wall, while the upper floor windows are preserved. The west wall is completely destroyed. On the west wall, the wall remains of the north and south walls can be observed. The protruding apse is partially destroyed (Figure 3.36). Although the wall of the apse is preserved, there are large-scale holes. Only the octagonal dome cover and the windows on the octagonal dome cover have been preserved and the dome has completely collapsed. In the interior, the plaster, writings and drawings on the walls have been severely destroyed. Material losses, corrosion and moisture-related problems are observed.

Figure 3.36. General View of Surp Lusavoriç Church (Source: https://tr.pinterest.com/pin/420242208969026242/, Access Date: 05.11.2023)

### 3.6.5. Kindik Church (Palu)

The church is situated in Palu district, Elazığ. It is located in the Aşağı Neighborhood of Old Palu, on the northern side of an area known as Kindik Rock. According to an information signboard erected by the Palu District Governorship in 2014, the church, known as 'Kindik Rock North Front', has its origins dating back to the Early Byzantine period, and it is believed to have been constructed between 476 and 1453. Over time, the church was repurposed as a masjid or a mosque. The building has been officially registered as 'Kindik Church' by the Diyarbakır Regional Board for the Conservation of Cultural and Natural Heritage. The church is situated on the north side of Kindik Rock. Its dimensions are specified differently in various documents. The cultural inventory registration document from Elazığ Culture Inventory in 2009 states its measurements as 11.5 x 13.91 meters x 5.15 meters, while the Elazığ Cultural Heritage Assessment Report in 2018 indicates measurements of 16 x 11 meters. The church has a rectangular plan in the east-west direction (Figure 3.37). Although there is no longer a ceiling, it is evident that the room spaces were once vaulted. The structure was originally built as a masonry stone building with a vaulted roof, which has since been demolished.

It is believed that the building was later repurposed as a mosque ('masjid'), with an additional room constructed parallel to the north wall. Given its location, there is a high probability that it was originally a part of a monastery complex. Unfortunately, the apse of the church is no longer visible. The building was constructed using smooth cut stone, and traces of plaster can be found on both the interior and exterior wall surfaces. Remnants of the vaulted upper cover can be observed on the north wall. On the east wall, there are two wide arched openings made of cut stone. These openings lead to an area on the east side of the building covered with a barrel vault in the north-south direction. On the entrance wall to the north, there is a door with a flat lintel, flanked by windows on either side.

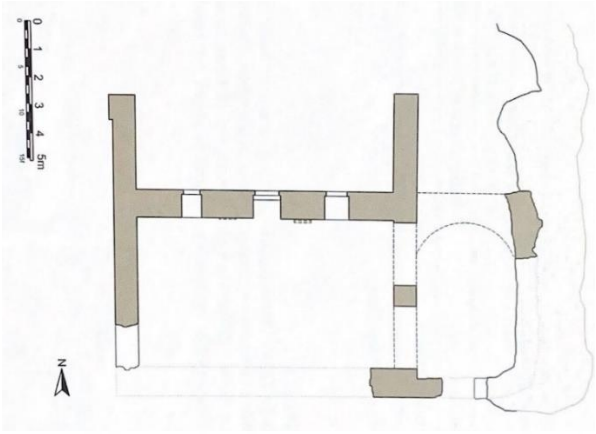


Figure 3.37. Plan of Kindik Church (EACHAR, 2018)

The semi-open space walls on the east and west sides of the church have been partially preserved, but the vaulted upper cover has collapsed (Figure 3.38). Additionally, the south wall and most of the west walls inside the building are completely destroyed. All of the walls exhibit structural cracks, severe collapses, material losses, and stone discharges. Furthermore, the entire floor is covered with rubble. The church is located to the north of Kindik Rock in a remote and inaccessible location, reachable only via a narrow pathway. Despite its historical significance, the church has suffered extensive damage, rendering it vulnerable to destruction from both natural and human factors.

Figure 3.38. General View of Kindik Church (Source: https://mapio.net/pic/p-8537099/, Access Date: 25.10.2023)

### 3.6.6. Surp Boghos Vank Church (Palu)

Surp Boghos Vank Church is located 1 km east of Nipşi village in Palu district, in the area of Amarat Gardens, which is called Çınar by the local community. The Diyarbakır Regional Board for the Conservation of Cultural and Natural Heritage registered it under the name of Surp Boghos Vank Church, with the decision dated 22.03.2003 and numbered 3118. The church is mentioned as the Yeşilbayır Church and the Surp Boğos Vank Monastery in the Elazığ Architectural Cultural Heritage Assessment Report (2018) (EACHAR, 2018). “Vank” is an Armenian term for “monastery”, indicating that the structure may have served as such. Later, it was used as a residence, which is why inappropriate interventions were made to the church building.

The church has a rectangular plan and measures 30 × 12 meters. There is the main entrance to the west and another entrance to the north, which was probably opened later. Next to this door is a fountain with a height of 3 meters (EACHAR, 2018). The monastery building was constructed of rubble stone with cut corner ends and wooden walls. Window frames and door lintels are also made of wood. The adobe roof carried by wooden beams has been largely destroyed. To the right of the fountain, there is a single room with a door to the south, which is estimated to have been built later. One of the most important features of the monastery complex is the pool structures in the garden. The pool, which is 1.70 meters deep, has a rectangular form and was built with large cut stones.

Based on the plan, it is evident that the church was later used as a residence. The primary entrance is located on the west, while another door was added to the north at a later date. The building’s function has resulted in a level of material deterioration that can be remedied with minor interventions. Nevertheless, major interventions and unsuitable uses have been observed (EACHAR,2018). The changes made to the church and the pool situated at the front are improper, and the whole garden is used in a very careless and unconscious way.

The uncontrolled changes brought by the owner of the building in line with its new use may cause damage to the original building. The trees have suffered severe damage due to a fire.

### 3.6.7. Kovancılar Church (Keğahayyats Surp Asdvadsadzin Church-Kovancılar)

It is located in the present-day village of Ekinözü, formerly known as Havav (Habab) in Kovancılar district. The monastery is located in the southwest of the village of Ekinözü, in a high and sloping position reached by a pathway. It was registered under the name "Church" with the decision of the Inventory for the Protection of Natural and Cultural Assets dated 05.07.2007 and numbered 1175, but it is referred as "Keğahayyats Surp Asdvadsadzin (Virgin Mary) Church" in the EACHAR (2018). There are walls and a church belonging to the monastery. There is a water source about 50 meters to the southwest and gravestones beyond it.

The monastery and the church, which have traditional and Armenian architectural features, were built using spolia stones, simple and unornamented. The walls of the monastery were built of rubble stone and surround a sloping area measuring approximately 45.60x30.40 meters (Figure 3.39). No traces of plaster were found. The entrance gate with wooden beams is located near the east of the south wall.

The dimensions of the church located near the eastern wall of this walled settlement are approximately 9.15x13.07 meters (EACHAR, 2018). The church has a square plan and three apses. Unlike the walls of the monastery, the church is built of cut stone, with traces of plaster and the use of spolia stones. On the inside of the west wall of the monastery, there are traces of a roof of unknown period running along the wall. According to the information received from the locals, there was a pool in the courtyard of the monastery, no trace of which can be found today.

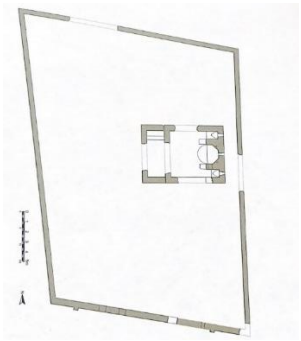


Figure 3.39. Plan of Kovancılar Church (EACHAR, 2018)

The walls of the monastery are still standing but do not provide information about the general structure (Figure 3.40). The plan of the church is approximately recognizable. There are significant structural problems in the monastery walls and the church as a whole. The entire wall texture and the stones close to the ground are melting due to the moisture rising from the ground. In other parts, there is significant loss of material and weathering of the stones. The building is structurally at risk due to the collapse of many parts (EACHAR, 2018).

Figure 3.40. General View of Kovancılar Church (Source: https://www.collectif2015.org/tr/100Monuments/Le-monastere-de-la-Sainte-Mere-de-Dieu-a-la-Delectable-Vue/, Access Date: 05.11.2023)

### 3.6.8. Hoşmat (Çakırkaş) Church (Surp Asdvadzadzin Church - Kovancılar)

Hoşmat (Çakırkaş) Church is located in Hoşmat (Çakırkaş) neighborhood in the Kovancılar District of Elazığ Province. It was registered under the name “Hoşmat (Çakırkaş) Church” with the decision of the Inventory for the Protection of Natural and Cultural Assets dated 08.10.1997 and numbered 1992, but it is referred as “Surp Asdvadsadzin Church” in the EACHAR (2018). There is no exact information on the construction date of the church, but the EACHAR (2018) states that the architectural features of the church are similar to the Byzantine Period churches of the 12th-13th century.

It can be assumed that the plan of the church consists of four large columns and a dome covering system (5.5 × 5.2 meters). The church measures 13.5 × 10.4 meters from external to external (Figure 3.41). The plan scheme of the church indicates the cross plan type. Although this type of plan is unusual for Armenian architecture, it is much more usual for the Middle Byzantine period (EACHAR, 2018). The round dome has collapsed at the base and the collapsed fragments are stuck in the ground in large blockages. In the surviving part of the church, four walls are connected by arches in the main domed section. Wall plasters are relatively preserved only in the eastern part. The main entrance door is said to be in the west (it does not exist today) (EACHAR, 2018). The preserved parts consist of four structural elements, the transition under the dome and the rubble wall fillings of the apse.

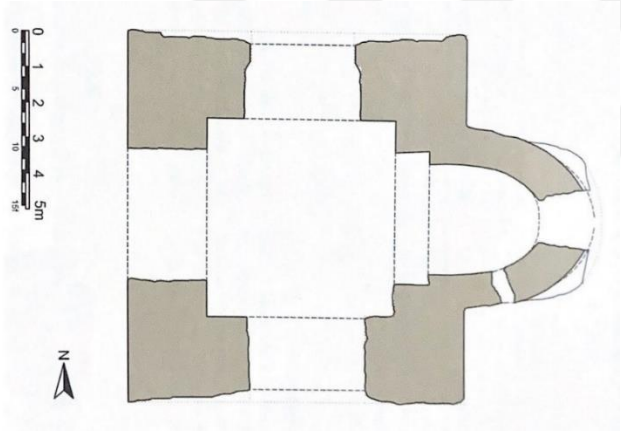



Figure 3.41. Plan of Hoşmat (Çakırkaş) Church (Source: EACHAR, 2018)

The door to the south of the semicircular apse has been preserved; most probably there was a pastophorion behind this door. Dating between the 11th and 13th centuries, the Church of Hoşmat (Çakırkaş), with its Byzantine architectural plan, architectural details and construction techniques, is a work of frontier culture and typical of the geography of the area around Harput in the Middle Ages. Today the church is completely abandoned. Almost every stone block has been damaged by vandalism, climatic conditions or treasure hunters. There are traces of paint on the walls due to vandalism. The stones and the rubble fill of the main structure have been severely damaged. Three of the main arches are barely preserved and are at risk of collapse. The gravestones scattered on the land around the site indicate that the area was also used as a cemetery.

### 3.6.9. Muşar Mountain Church (Mor Ahrun Monastery -Baskil)

It is located in Suyatağı Village of Baskil District of Elazığ on Mount Muşar, which is also known as Mount Abdülvahap, Mount Kilise, Mount Musiro or Mount Mukaddes (Figure 3.42-3.43). It was registered under the name "Muşar Mountain Church" with the decision of the Inventory for the Protection of Natural and Cultural Assets dated 23.06.2000 and numbered 2417, but it is referred as "Mor Ahrun Monastery" in the EACHAR (2018). The church sits largely on the rocks. It is thought that the church was first built as a church but then used as a watchtower. It is possible to say that the construction technique of the church differs from the Armenian Church architecture. The findings unearthed during the excavations carried out during the construction of the Karakaya Barrage show that various communities lived in this mountainous region (EACHAR, 2018). Although there is no exact information about the construction date of the church, the fact that the church is dedicated to Mor Ahrun indicates that this church is an Assyrian Church. As St. Mor Ahron is an Assyrian seer, the monastery is an Assyrian monastery. It is known to have been functioning until the 18th century. The only information on the construction date of the building can be found in İshak Tanoğlu's article dated 2019. According to Tanoğlu, Mor Ahrun, to whom the church is dedicated, was born in 219 AD in Şanlıurfa and the building should have been constructed in 329 AD. Today the church is in a restorable and visitable condition. It is about 17 meters long, 6.5 meters wide and 7 meters high.

Figure 3.42. Muşar Mountain Church (Mor Ahrun Monastery) (Source: https://www.haberturk.com/mar-ahron-manastiri-koruma-altina-aliniyor-2544673, Access Date: 08.10.2023).

The church is located in a high-altitude location, dominating the region. It is thought that it was also used as a watchtower due to the 2-storey high towers protruding in the form of circular towers, which are thought to have been added later to the plan scheme of the church. The Murat or Aratsani River, encircles this mountain on three sides. The building extends from west to east and merges with the rocky top of the mountain on the south side (EMKMDR, 2018).

The entrance of the church is from the west and the church has three sections and two storeys. Smooth cut stones were used for the arched entrances and other parts were made of unshaped stones and mortared. There are two small vaulted structures about 36 meters north and 35 meters south of the church.

It is approximately 17 meters long and 6.5 meters wide (EACHAR, 2018). There is an entrance door in the west in a long wall with a false arched design. At the entrance from the west, there is a hall (cell) of 5 x 2 meters, probably with a vaulted ceiling, and from there, through an arched doorway, one enters the vaulted-roofed Naos (place of congregational worship). The side walls of the Naos have 3 false partitions (Figure 3.43). From here you pass to the 3rd section, the place of worship administration. This section has a protruding cylindrical projection to the east with three windows. On the second floor on this structure there are rectangular prism niches and windows (observation points) on the smooth walls. The north wall of the second floor was completely destroyed and the other walls were partially destroyed. The ceiling is also completely destroyed. There are half-cylindrical projections (towers) in four places.
The transverse narthex provides access to the long vaulted main space (12.76x6.45 m) with apses at the eastern end (3.10 m wide; 2 m deep). On the north and south walls of the main space, there are three recessed columns of different cross-sections, each carrying the large vaulted cover of 5.71 meters in height.

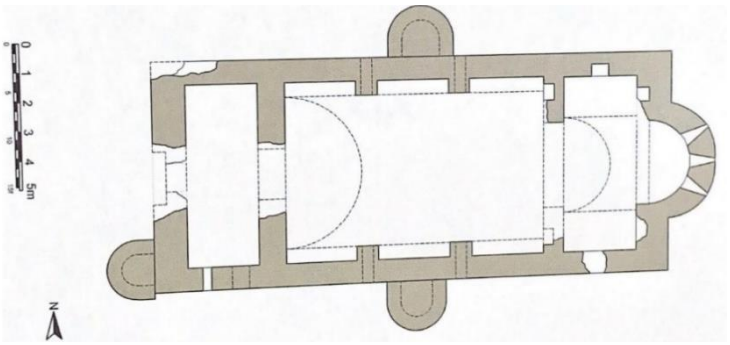



Figure 3.43. Muşar Mountain Church Plan Diagram (Source: EACHAR, 2018)

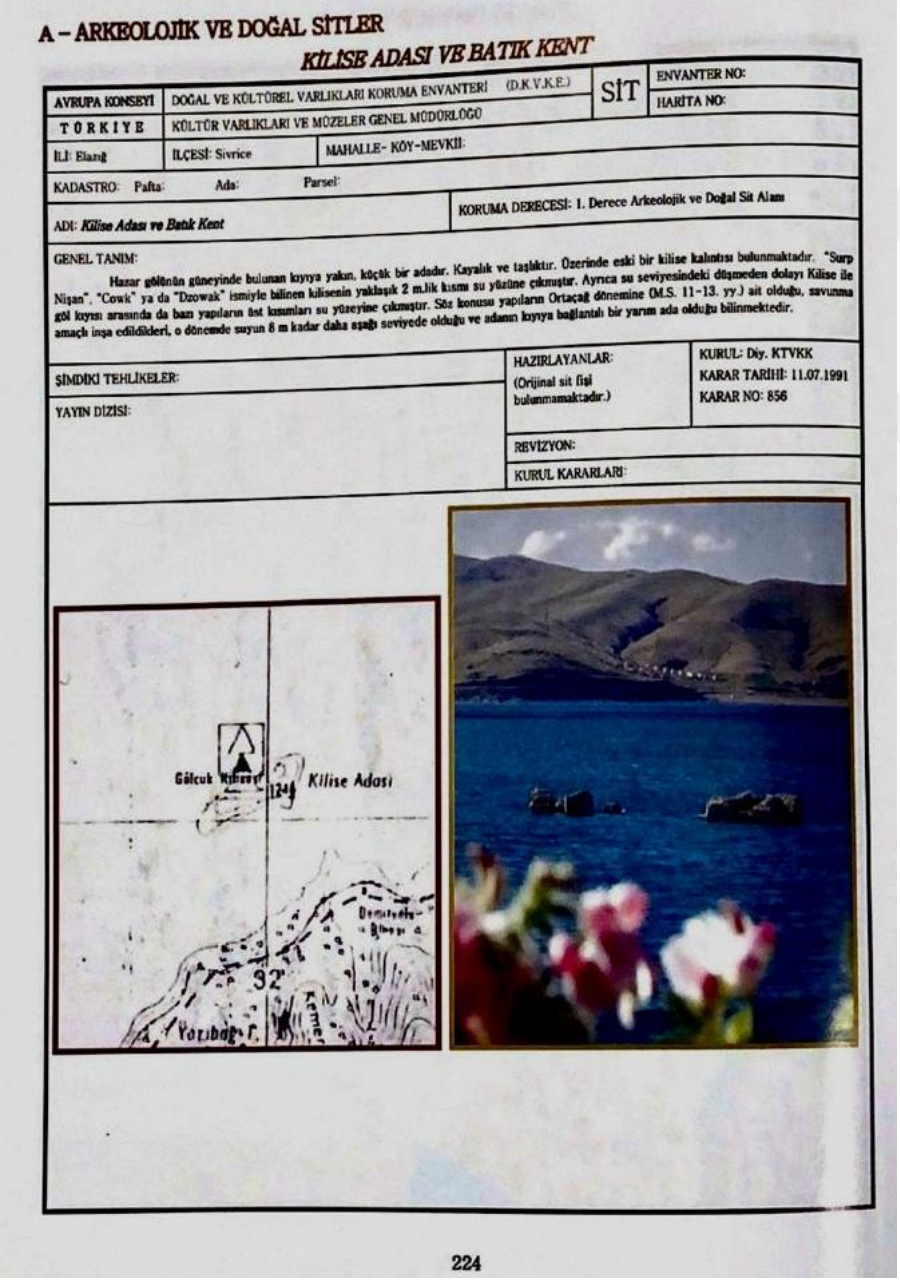
This monumental castle-church structure is in a state of partial ruin. The roof covering over the upper floors and the narthex is missing. A large part of the vault, many parts of the towers and body walls are holed, ruined and destroyed. There are large pits on the floor of the church and the podium of the apse has been completely destroyed.
In order to prevent further destruction of the walls, it is necessary to reinforce the walls with supports as soon as possible.

### 3.7. Churches mentioned in written sources but not reached to the present day

As a result of the literature review, it was determined that there are several churches that are mentioned in written sources but have not survived to the present day. Although mentioned in written sources, there are 10 churches that have not survived to the present day and 5 of these churches are located in the Harput Neighborhood. The churches in the Harput Neighborhood that have not survived to the present day are Mar Şamun Church, İğdeli Church, Protestant Church, Assyrian Church and Catholic Church (Sunguroğlu, 1958). There are also 4 churches in Palu district that have not survived to the present day. These churches are Surp Sahag Bartev Church, Surp Giregos Church, Surp Sarkis Church and Surp Asdvadsadzin Monastery.

In addition to these churches, the Elazığ Culture Inventory mentions the remains of a church on a small island near the coast in the south of Hazar Lake in Sivrice district (Figure 3.44). This church ruin was registered with the name “Church Island and Sunken City” with the decision dated 11/07/1991 and numbered 856. Approximately 2 meters of the church known as “Surp Nişan”, “Cowk” or “Dzowak” has come to the water surface. As the water level decreased, it

became evident that there were other structures around the church. It is known that these structures belong to the medieval period (11-13th century A. D.), that they were built for defensive purposes, that the water was about 8 meters lower at that time and that the island was a connected island to the coast (Elazığ Culture Inventory 2009).



A – ARKEOLOJİK VE DOĞAL SİTLER

KİLİSE ADASI VE BATIK KENT

| | | | |
|---|---|---|---|
| AVRUPA KONSEYİ | DOĞAL VE KÜLTÜREL VARLIKLARI KORUMA ENVANTERİ (D.K.V.K.E.) | SİT | ENVANTER NO: |
| TÜRKİYE | KÜLTÜR VARLIKLARI VE MÜZELER GENEL MÜDÜRLÜĞÜ | | HARİTA NO: |
| İLİ: Elazığ | İLÇESİ: Sivrice | MAHALLE- KÖY-MEVKİİ: | |
| KADASTRO: Pafta: | Ada: | Parsel: | |
| ADI: *Kilise Adası ve Batık Kent* | | KORUMA DERECESİ: I. Derece Arkeolojik ve Doğal Sit Alanı | |

GENEL TANIM:

Hazar gölünün güneyinde bulunan kıyıya yakın, küçük bir adadır. Kayalık ve taşlıktır. Üzerinde eski bir kilise kalıntısı bulunmaktadır. "Surp Nişan", "Cowk" ya da "Dzowak" ismiyle bilinen kilisenin yaklaşık 2 m.lik kısmı su yüzüne çıkmıştır. Ayrıca su seviyesindeki düşmeden dolayı Kilise ile göl kıyısı arasında da bazı yapıların üst kısımları su yüzeyine çıkmıştır. Söz konusu yapıların Ortaçağ dönemine (M.S. 11-13. yy.) ait olduğu, savunma amaçlı inşa edildikleri, o dönemde suyun 8 m kadar daha aşağı seviyede olduğu ve adanın kıyıya bağlantılı bir yarım ada olduğu bilinmektedir.

| | | |
|---|---|---|
| ŞİMDİKİ TEHLİKELER: | HAZIRLAYANLAR: (Orijinal sit fişi bulunmamaktadır.) | KURUL: Diy. KTVKK KARAR TARİHİ: 11.07.1991 KARAR NO: 856 |
| YAYIN DİZİSİ: | REVİZYON: | |
| | KURUL KARARLARI: | |



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Figure 3.44. Surp Nişan Church Inventory Registration Document (Source: Elazığ Cultural Inventory 2009)

### 3.8.Evaluation of churches' current situations

The data on the construction dates of the churches found as a result of the literature review are shown in Table 3.5.

Table 3.5. The construction dates of the churches, according to the literature

| Name of the Church | The Construction Date of the Church, according to the Literature |
|---|---|
| Virgin Mary Church | Byzantine period, 6th century A. D. |
| Surp Hagop Church | Although there is no certain information about the date of its construction, it is stated in the literature that it was restored in 1859 and was the most magnificent church in the region in 1878. |
| Kızıl Church | The Kızıl Church was built in 1910 on the site of a church that was destroyed in 1850 (Sunguroğlu, 1958). |
| Armenian Protestant Church | 1904 (Yeğin and Öztürk, 2022) |
| Surp Simon Church | 6th-7th century A. D. |
| Surp Kevork Monastery | 6th century (Pontioğlu, 2018) |
| Küşne Church (Ağın) | Either belongs to the medieval period between the 7th and 13th centuries, or to the late medieval period (EACHAR, 2018) |
| Ekinözü Church | No information was found. |
| Toma Church | In 1896 the church is known to have existed, but the date of construction is not clear. |
| Surp Krikor Lusavoriç Church | In the mid-XIXth century (Aytaç, 2020) |
| Kindik Church | Early Byzantine Period |
| Surp Boghos Vank Church | No information was found. |
| Kovancılar Church | No information was found. |

Table 3.5. (Continued) The construction dates of the churches, according to the literature

| | |
|---|---|
| Hoşmat (Çakırkaş) Church | The architectural features of the church are similar to the Byzantine Period churches of the 12th-13th century (EACHAR, 2018). |
| Muşar Mountain Church | 329 A.D. (Tanoğlu, 2013) |

As a result of the literature review, it has been found that some of the examined churches have been used for various purposes over time, causing damage to the architectural integrity of the buildings. Such functions include flour mills, barns, parking lots, mosques, residences, warehouses, garages, and watchtowers, all of which are often inappropriate for the architectural conditions of the building and have led to the destruction of the churches (Table 3.6).

Table 3.6. Churches used in different functions

| Name of the Church | Other Functions Used in |
|---|---|
| Surp Kevork Monastery | Orphanage |
| Armenian Protestant Church | Flour Factory, Barn, Parking Lot |
| Kindik Church | Mescid |
| Surp Boghos Vank Church | Housing |
| Toma Church | Warehouse, Garage |
| Muşar Mountain Church | Watchtower |

One other problem that comes up in the conservation of churches is the problem of ownership. Some of the churches in Elazığ Province are under private ownership and for this reason there are difficulties in taking conservation measures. Property owners' inappropriate interventions in historical churches can lead to substantial damage (Table 3.7).

Table 3.7. Ownership status of churches according to inventory documents

| Name of the Church | Ownership Status |
|---|---|
| Virgin Mary Church | General Directorate of Foundations |
| Surp Hagop Church | There is no record of ownership of the building. |

Table 3.7. (Continued) Ownership status of churches according to inventory documents

| | |
|---|---|
| Kızıl Church | General Directorate of Foundations |
| Armenian Protestant Church | Private Ownership |
| Surp Simon Church | Private Ownership |
| Surp Kevork Monastery | Private Ownership |
| Küşne Church (Ağın) | There is no record of ownership of the building. |
| Ekinözü Church | Halil Bey Foundation |
| Toma Church | Keban Municipality |
| Surp Krikor Lusavoriç Church | There is no record of ownership of the building. |
| Kindik Church | There is no record of ownership of the building. |
| Surp Boghos Vank Church | Private Ownership |
| Kovancılar Church | Ministry of Treasure of the Finance |
| Hoşmat (Çakırkaş) Church | Hoşmat (Çakırkaş) Municipality |
| Muşar Mountain Church | There is no record of ownership of the building. |

As a result of the literature review, it was seen that 3 of the churches in Elazığ province preserved their structural integrity. These churches are the Virgin Mary Church in Harput, Surp Simon Church in the village of Yalnız in the center of the city and Toma Church in Keban District. Among these churches, the Virgin Mary Church continues to be used with the same function and has undergone some restorations. Although there is information about the possibility of restoration of the Toma Church in the news dated 2018 and 2022 in internet sources, it is not known whether it has been implemented or not. There is no information in the literature on whether the Surp Simon Church in the center of Elazığ province has been restored or not. However, when the current condition of the church is examined, it is thought that it has not been restored. It is interesting that the church, which has been abandoned for years, has been able to preserve its structural integrity despite various threats of extinction. In this context, determining the architectural features and structural behavior of the church is important in terms of determining the reasons how the church has survived against so many threats. In the next part of the thesis, “Surp Simon Church” was analyzed as a field work.

# 4. FIELD WORK: “SURP SIMON CHURCH”

## 4.1. History of Surp Simon Church

Surp Simon Church is situated at the coordinates 38° 34’ North latitude and 39° 10’ East longitude in Yalnız Village, part of Elazığ city center. In other sources, Surp Simon Church is also referred as Tadem Monastery and Surp Asdvadsadzin Church.

While registration documents mention the structure as a monastery, only the church structure has endured to the present day. The first written record of this monastery dates back to 1628. According to these records, the administrative center of the Archdiocese of Harput was relocated from Surp Kevork Monastery in Hulvenk (Şahinkaya) to Surp Simon Church (Tadem Surp Asdvadsadzin Monastery). Until 1915, the monastery held administrative authority over nine villages in the region and served as a significant pilgrimage site and a place for circumambulation. Although the precise construction date of the church is unknown, according to Thierry it was built in the 6th-7th centuries.

Surp Simon Church holds great historical and cultural significance for Elazığ. Initially registered as a 1st Group monument by the Diyarbakır Regional Board for the Protection of Cultural and Natural Assets on 25.07.2019, this registration was later updated with a new decision on 03.03.2020. The area, also known as the locality of Venk, is situated close to the village of Tadem (Tadım), which served as the administrative center of the 4th Armenian Province during the Byzantine Empire. Consequently, Surp Simon Church and its surroundings have a crucial role in Elazığ’s history. The church is located 8.85 km from the city center of Elazığ, 1.5 km from the center of Yalnız Village, 4 km from the village of Tadem (Tadım), the administrative center of the 4th Armenian Province, and 9.95 km from Şahinkaya Village, where Surp Kevork Monastery, one of the first churches in the region, was active during the same period as Surp Simon Church (Figure 4.1).

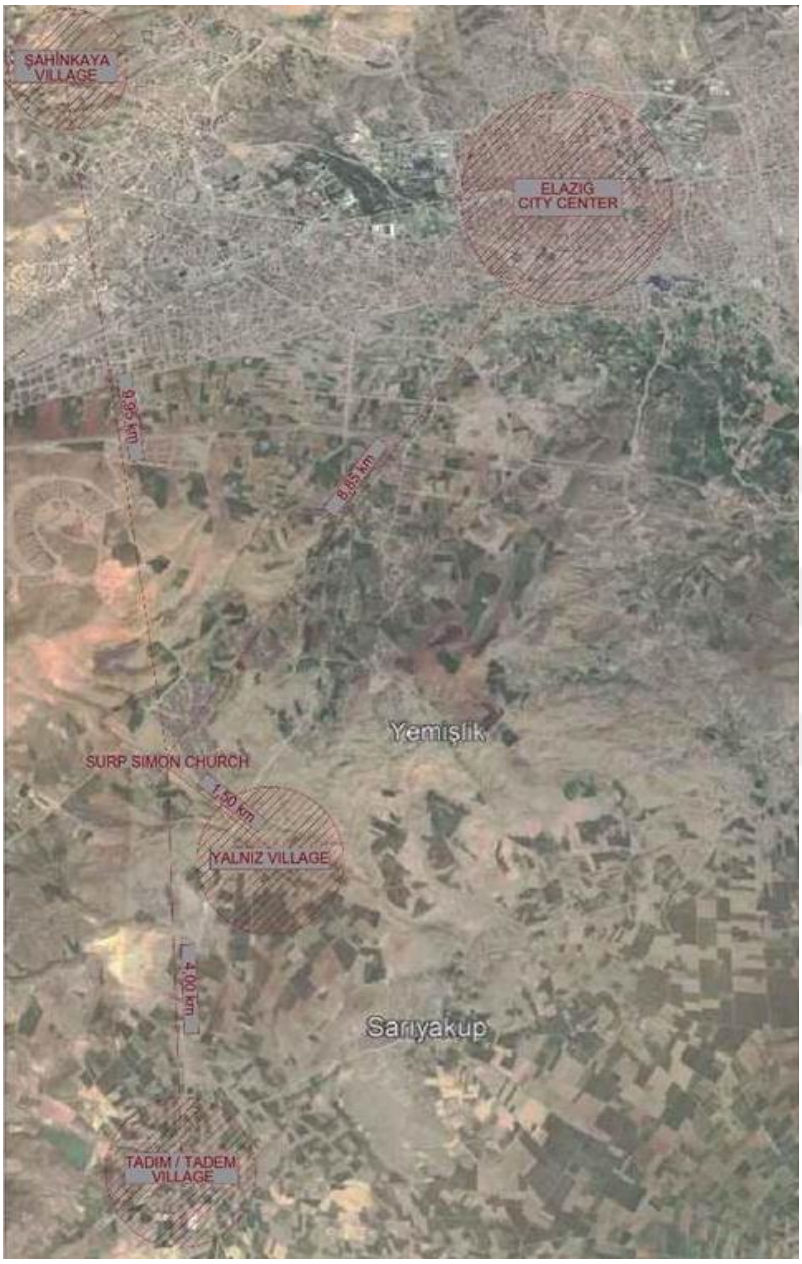


Figure 4.1. Location of Surp Simon Church

The site of Surp Simon Church is located 1.5 km northwest of Yalnız Village on the connection road to Elazığ City Center. There are approximately 15 houses near the church (Figure 4.2). There is no trace of any vehicular or pedestrian road accessing the church. Although the church is registered as a 1st degree monumental building, there are no information signs around the church and no dividing elements indicating the land boundary. The registration document of the church states that the land belongs to private property.

Figure 4.2. Surp Simon Church's surroundings

The Surp Simon Church stands out architecturally as a highly impressive structure (Figure 4.3). The church has a clover plan and a dome on top. While this architectural style has roots in Armenian architecture dating back to the 7th century, the jamatun (congregation house) section, an addition to the eastern side of the church comprising four monolithic columns, belongs to a later period. Adjacent to the jamatun section on the south side, there is a later-added space. In the interview conducted by Çapkur (2023) with Alin D. Pontioğlu, it is stated that this section was used as a scriptorium (library) in Armenian churches.

Figure 4.3. General View of Surp Simon Church (Source: Author's Archive, February 2023)

## 4.2. Architectural features and survey of the Surp Simon Church

The structure, which is mentioned as a monastery in the literature, has only the church building remaining to this day. The plan of the church are noticeable. The church has an east-west-oriented plan and consists of three main parts: the naos section (church), the jamatun section and the library section. From the naos section, the first worship area is reached through a vaulted passage to the jamatun section. The top of the naos section is covered with a dome. The jamatun serves as the first congregation area with the entrance. Here, there are cross-stone motifs (khachkars), niches, and a baptismal niche on the walls. In the southern part of the church, adjacent to the jamatun section, there is a library (scriptorium) used as an independent space. The naos section of the church resembles Armenian architecture from the 6th-7th centuries. The jamatun section, is a space that forms the entrance part of the church and serves as the first congregation area, reflecting the characteristics of Armenian architecture from the 16th-17th centuries. The naos section, which has a clover plan dated to the 6th-7th century, consists of a dome placed with an octagonal pulley on a square plan. The naos section, which is a smaller space compared to the jamatun section, was built in a clover plan. The sections protruding outwards in the east, north and south directions constitute the three branches of the clover plan scheme; the entrance section extending towards the west forms the fourth branch of the clover (Figure 4.4). The naos section is composed of a square plan, measuring 5.08 m by 4.70 m, with two semicircles added, each with a radius of 1.41 m. At the eastern end of the clover plan, the apse is located in the section protruding outwards (Figure 4.5).

Figure 4.4. Ceiling of the Naos (Source: Author Archive, February 2023)

Figure 4.5. Apse of the Church (Source: Author's Archive, February 2023)

The apse on the east side of the church is in the shape of a semicircle with a radius of 1.42 m. There is a arched window in the apse and the walls are built with cut stone. But the keystone of this arched window does not exist today. The upper cover of the naos is a dome. The dome height from the center is 7.43 meters. The outer surface of the dome is conical. The load of this dome is transferred to the floor through the pendentives located at the corners. The windows on the pulley of the dome provide natural light to the interior. The parts protruding outward from the clover plan are covered with half domes that are lower than the central space. The vaulted central passage on the west side of the naos connects the naos to the jamatun section. (Figure 4.6).

Figure 4.6. Transition from Naos Section to Jamatun (Source: Author's Archive, February 2023)

The jamatun section, which is stated in the literature to have been added to the naos section in the 16th-17th centuries, is entered through the southern entrance door, which is still recognizable even though a part of it remains under the ground. This entrance door was built using cut stones. The jamatun section is separate from the naos, the main place of worship, and is an area where the congregation usually gathers. It has a rectangular plan and measures 6.8 m x 6.57 m internally. The jamatun section is divided into 3 naves by 4 monolithic columns (Figure 4.7). It is separated by 12 arches carried by four columns. The columns are cylindrical columns with truncated pyramidal imposts, reflecting typical Armenian architectural features. Today their sections have been weakened by vandalism, and some of them are blackened due to the burning of fires in the jamatun. There is a skylight above the central nave of the jamatun and the naves surrounding the central nave are covered with cross vaults. This skylight measures 53 cm x 57 cm. On the interior walls of the jamatun, 16 earthen pots were embedded in the wall with mortar. There are 2 windows opening to the outside only on the south wall of the Jamatun. However, the soil accumulated on the upper cover of the library section, which was added to this south wall later, covers some of these windows. There are two baptismal niches and carved cross motifs (khachkar) stones on the north wall. There is also a loss of material on the north wall and this loss can be perceived from both the interior and exterior. There are two baptismal niches on the north wall.

Figure 4.7. General View of Jamatun Section (Source: https://gelaziz.com/amp/gelaziz/surp-simon-kilisesi/, Access Date: 11.11.2023)

On the eastern side of the jamatun, symmetrical pastophoriums (preparation rooms) on both sides flank the barrel-vaulted passage connecting the naos to the jamatun. Although these preparation rooms were inaccessible during the survey, Çapkur (2023) reported that they were vaulted. On both sides of the north wall of the jamatun, the pastophorium measures 1.2 m x 1.59 m, while on both sides of the south wall, the pastophorium measures 1.52 m x 1.6 m (Çapkur, 2023). Simple cross motifs on both sides of the walls of the pastophoriums have been noted.

Another section, inaccessible during the survey, was added to the south facade of the church at a later date. The architectural period of this section couldn't be determined, but Çapkur mentioned in an oral interview with architect Alin D. Pontioğlu that it functioned as a scriptorium (library) for writing bibles. Thierry (2000) referred to this section as the "library" in his study, a designation retained in this thesis. The library section is adjacent to the south facade of the jamatun, where the entrance door is located. Çapkur (2023) measured the interior dimensions of this section as 3.12 m x 4.54 m. Presently, some part of the library section is buried underground. This section, with a vaulted upper cover, has accumulated a substantial amount of soil on the roof, rendering the vaulted upper cover invisible from the outside. Inside the library section, it is reported that an arch passes through the center, two niches exist, and it has a vaulted cover (Çapkur, 2023). The library was constructed with rubble stone masonry, experiencing material losses, one on the west wall and three on the south wall (Figure 4.8). When analyzing all parts of the church, it can be concluded that the library section is under the most imminent threat of extinction. The plan and architectural survey drawings of Surp Simon Church shown in between Figure 4.8 and Figure 4.19 (Figure 4.9 and Figure 4.19).

Figure 4.8. Library Section Material Losses (Source: Author's Archive, February 2023)

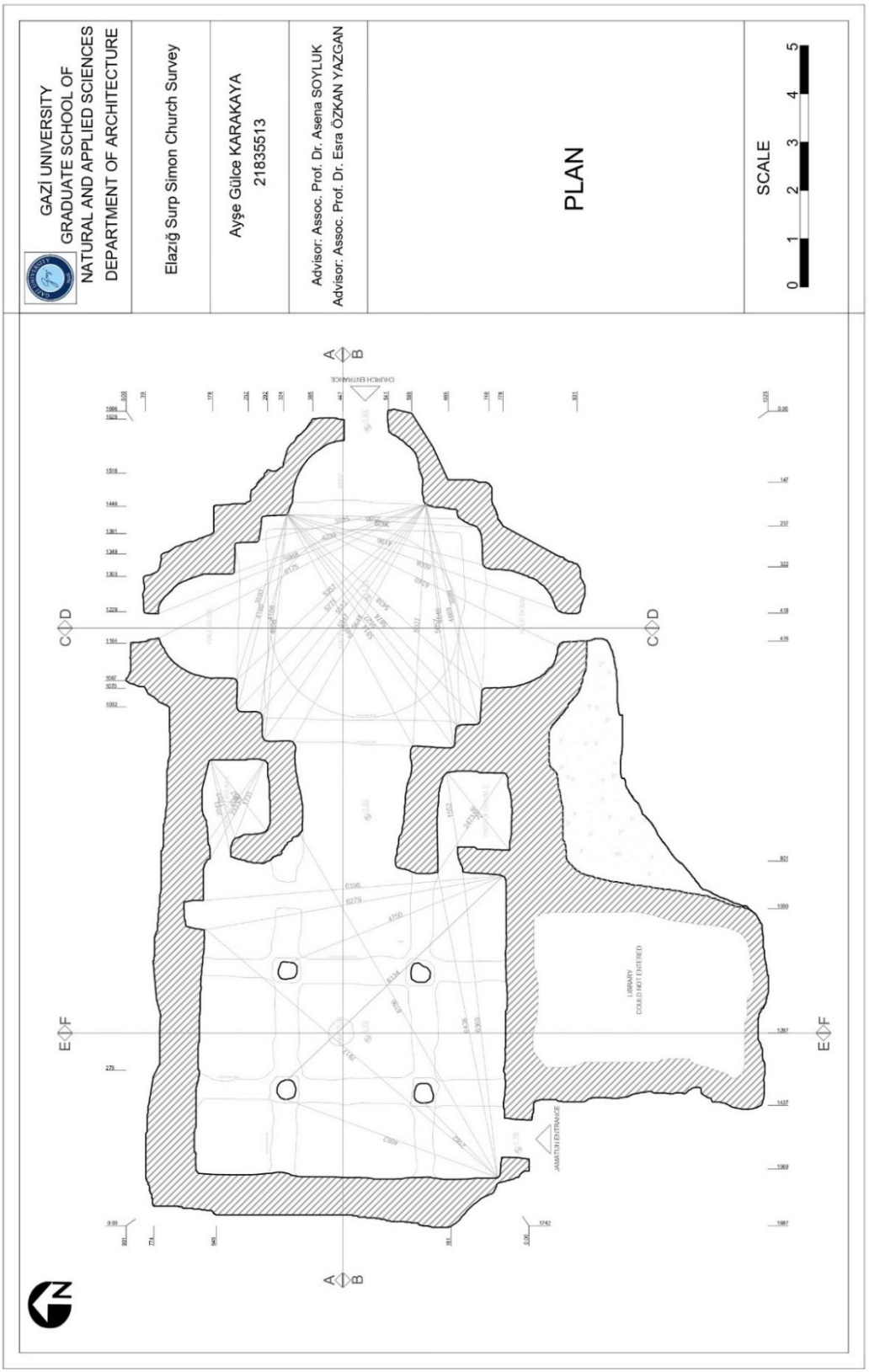


Figure 4.9. Surp Simon Church Plan

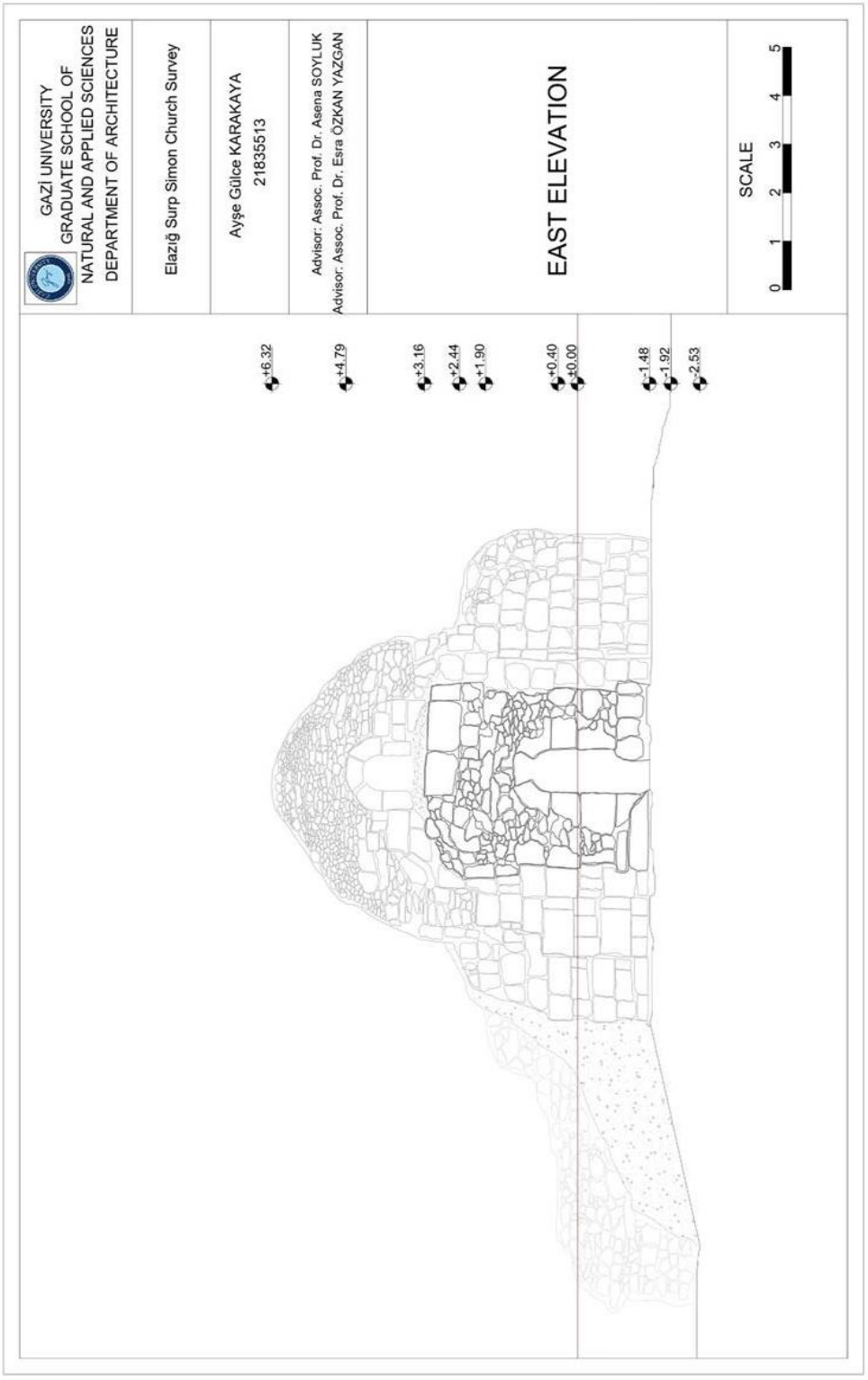


Figure 4.10. Surp Simon Church East Elevation

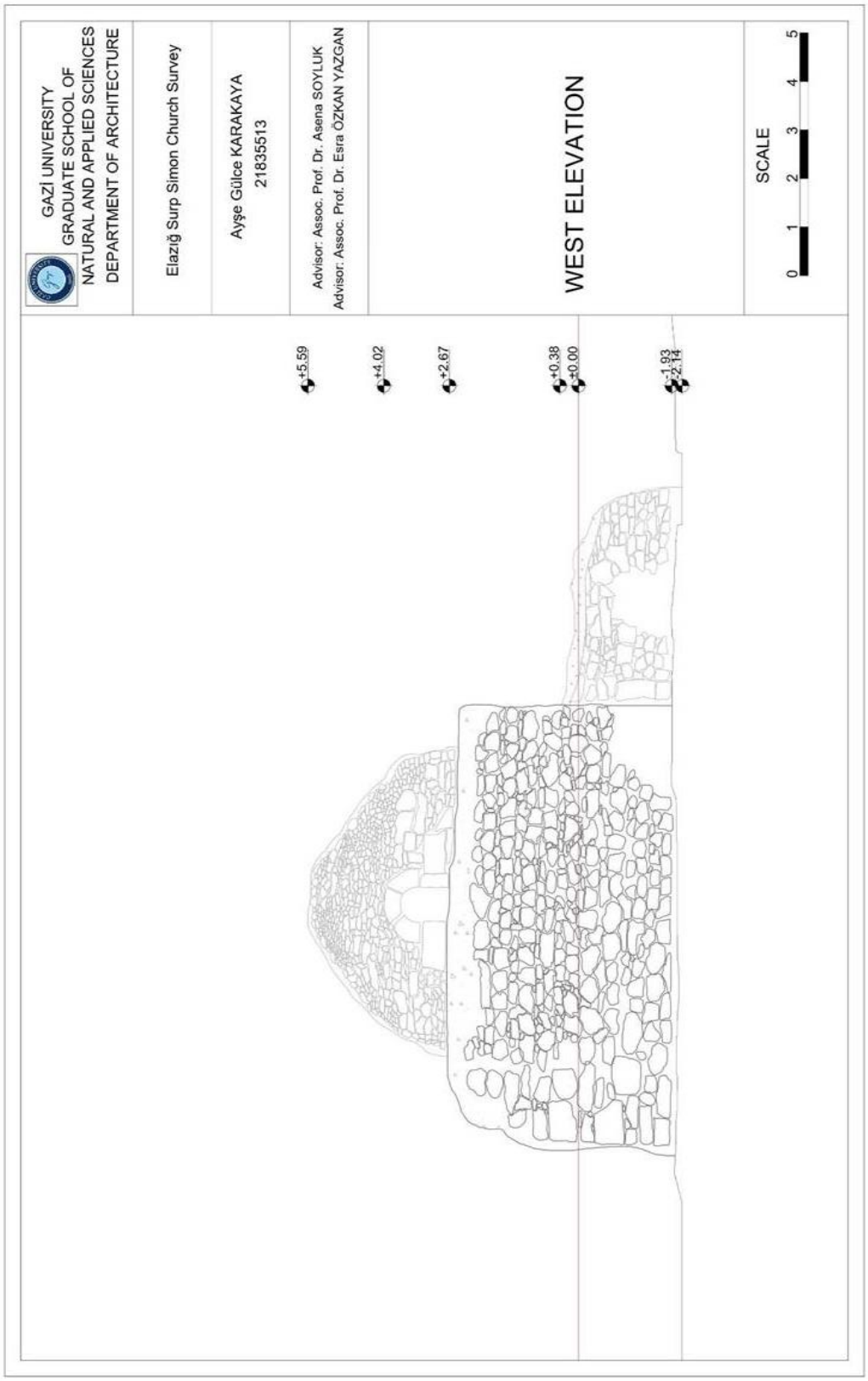


Figure 4.11. Surp Simon Church West Elevation

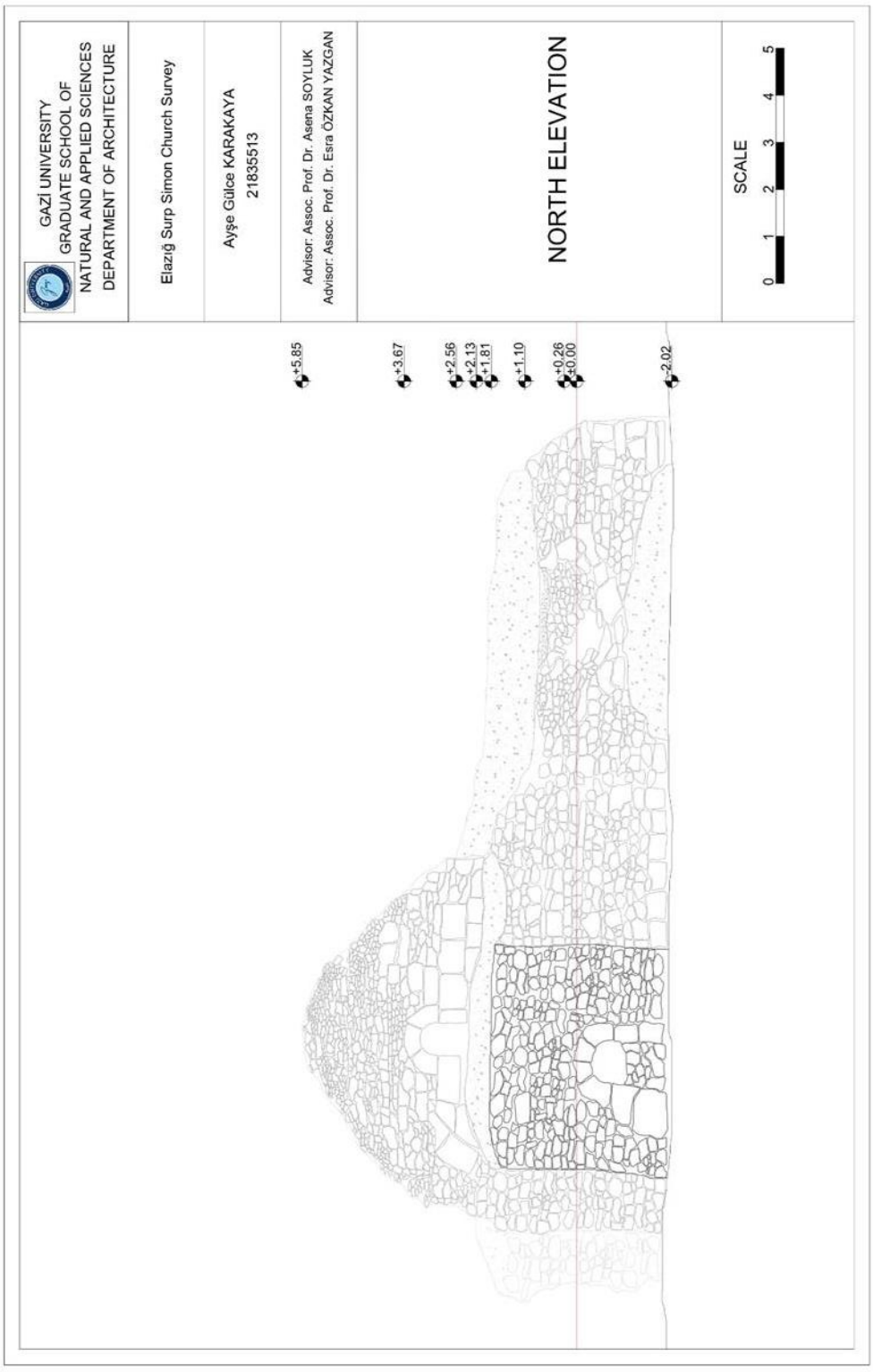


Figure 4.12. Surp Simon Church North Elevation

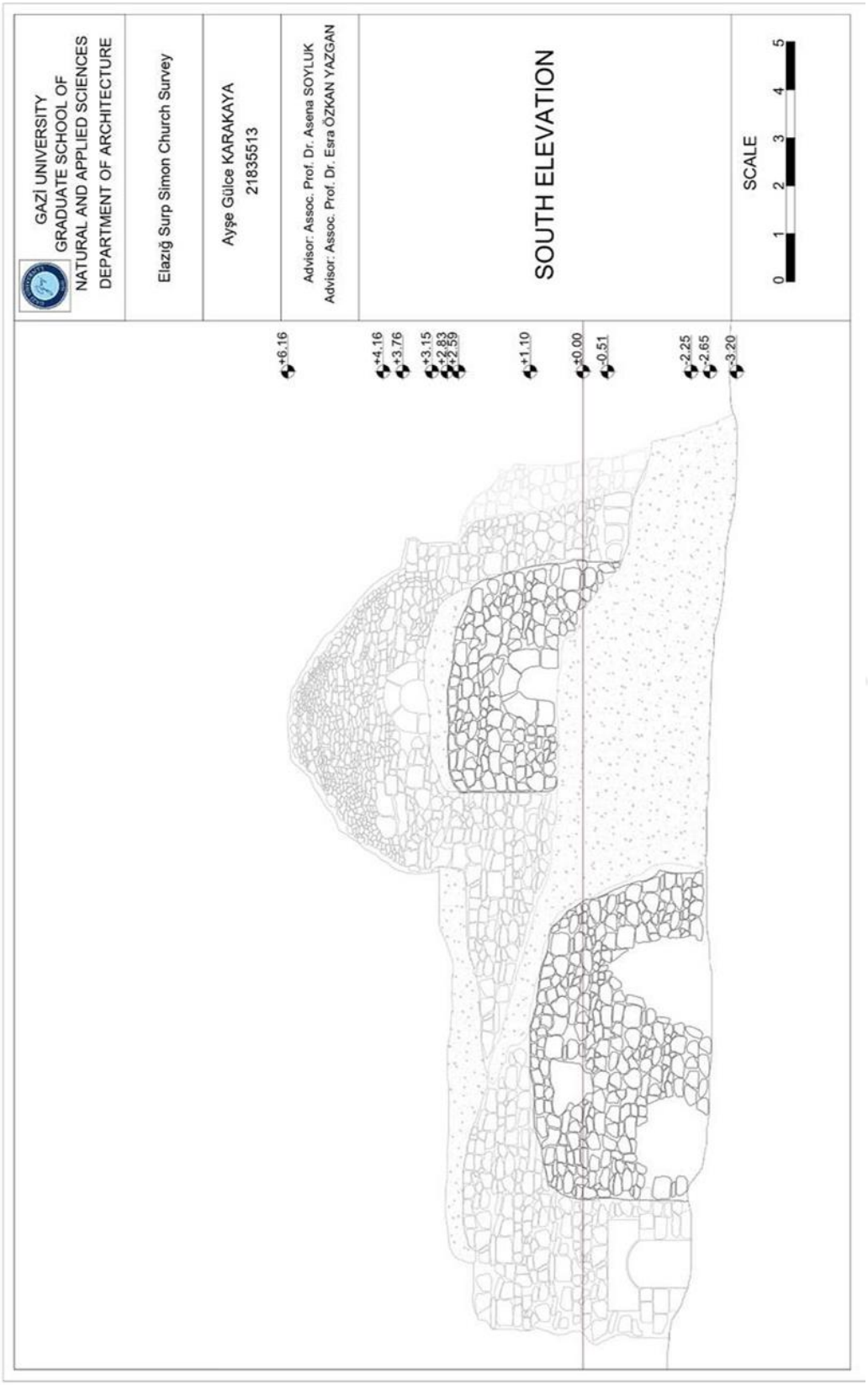


Figure 4.13. Surp Simon Church South Elevation

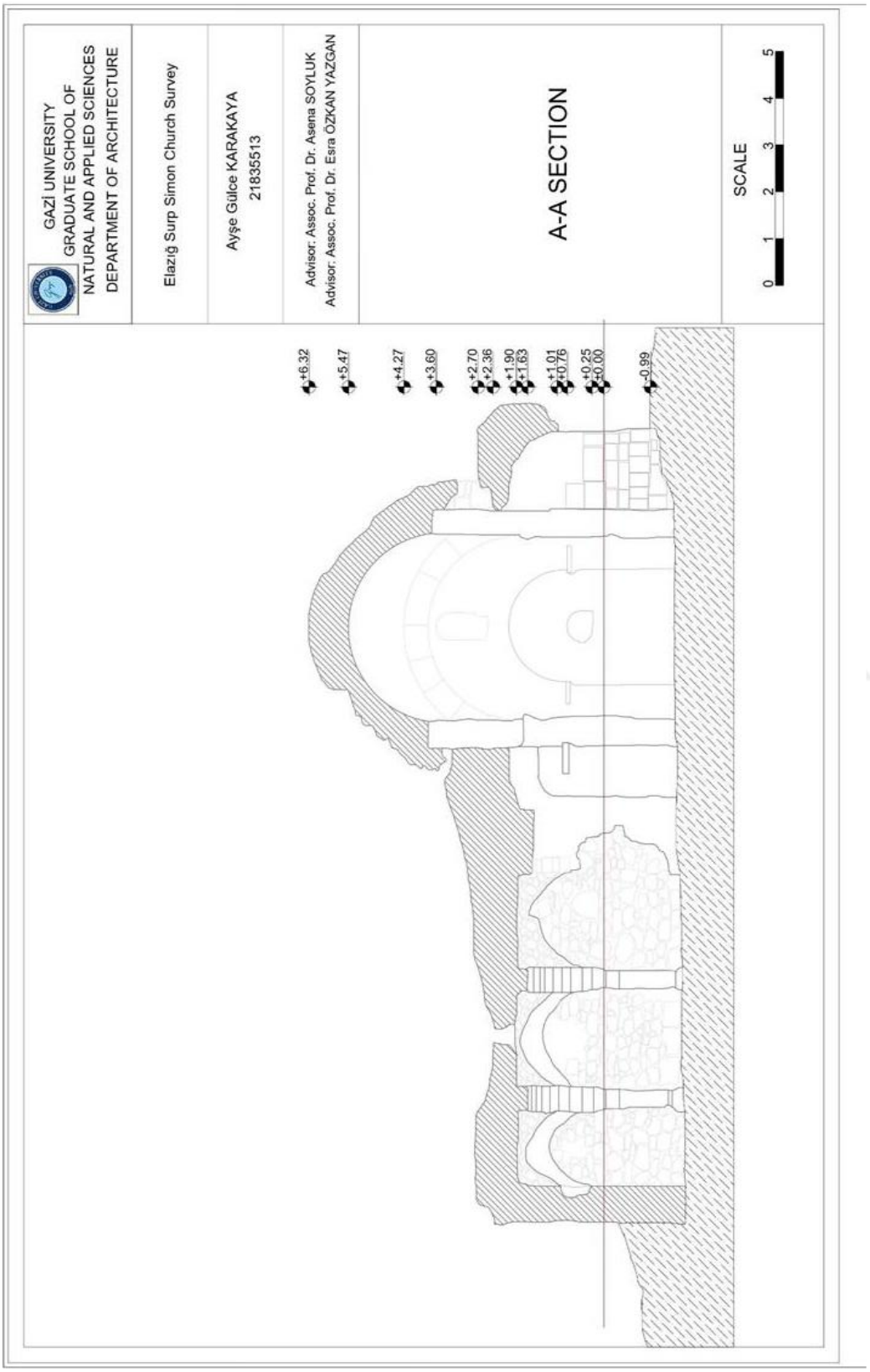


Figure 4.14. Surp Simon Church A-A Section

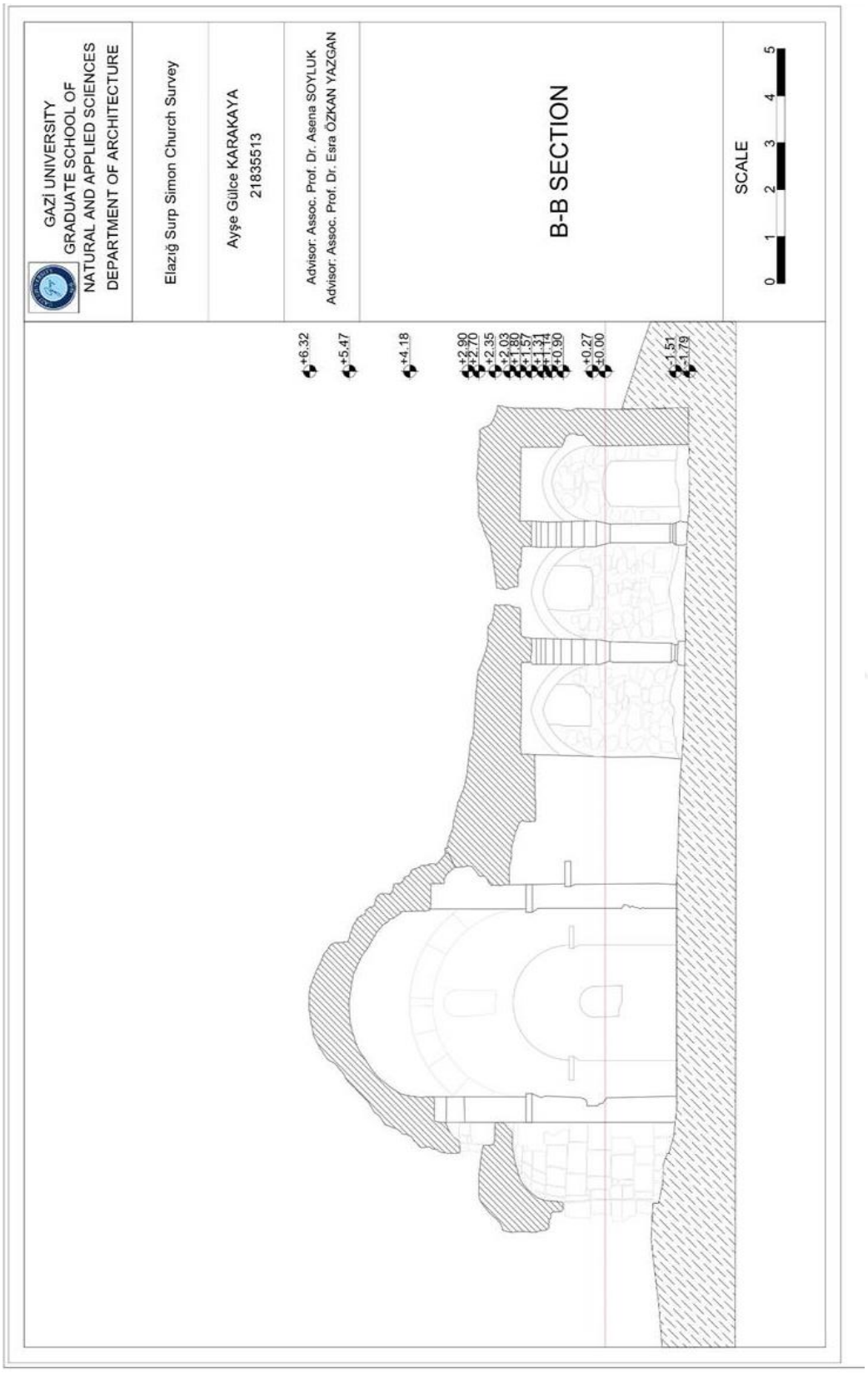


Figure 4.15. Surp Simon Church B-B Section

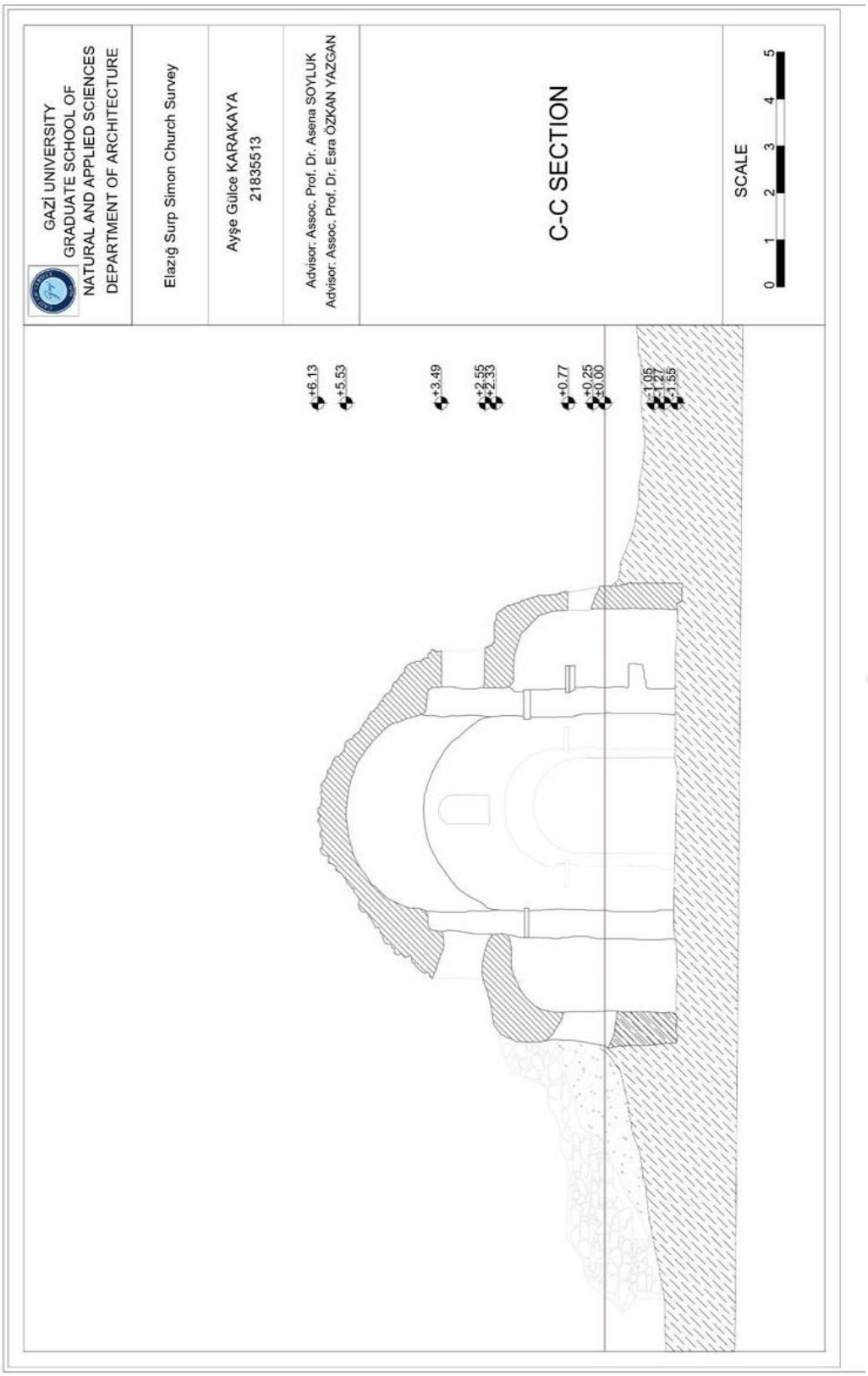


Figure 4.16. Surp Simon Church C-C Section

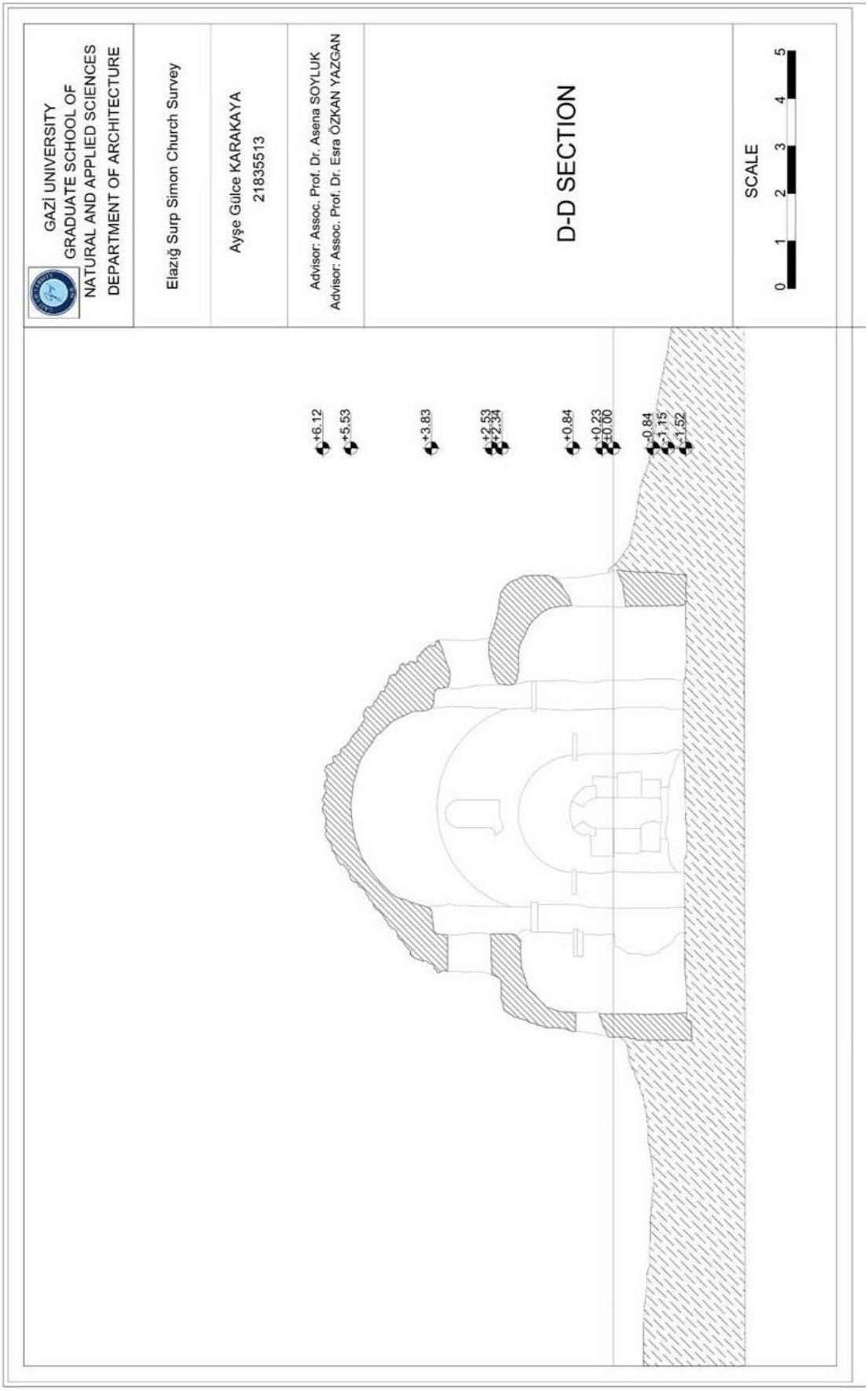


Figure 4.17. Surp Simon Church D-D Section

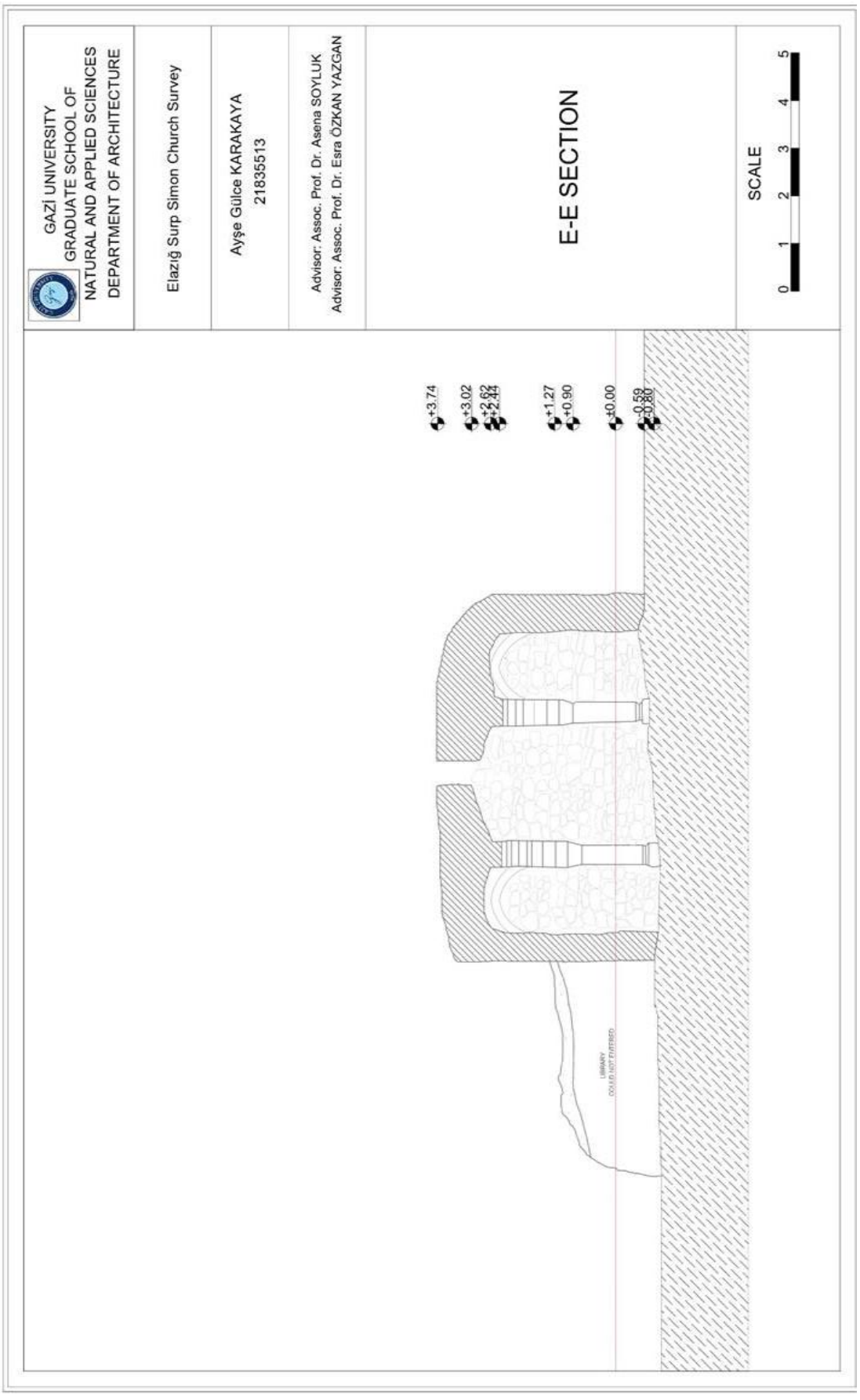


Figure 4.18. Surp Simon Church E-E Section

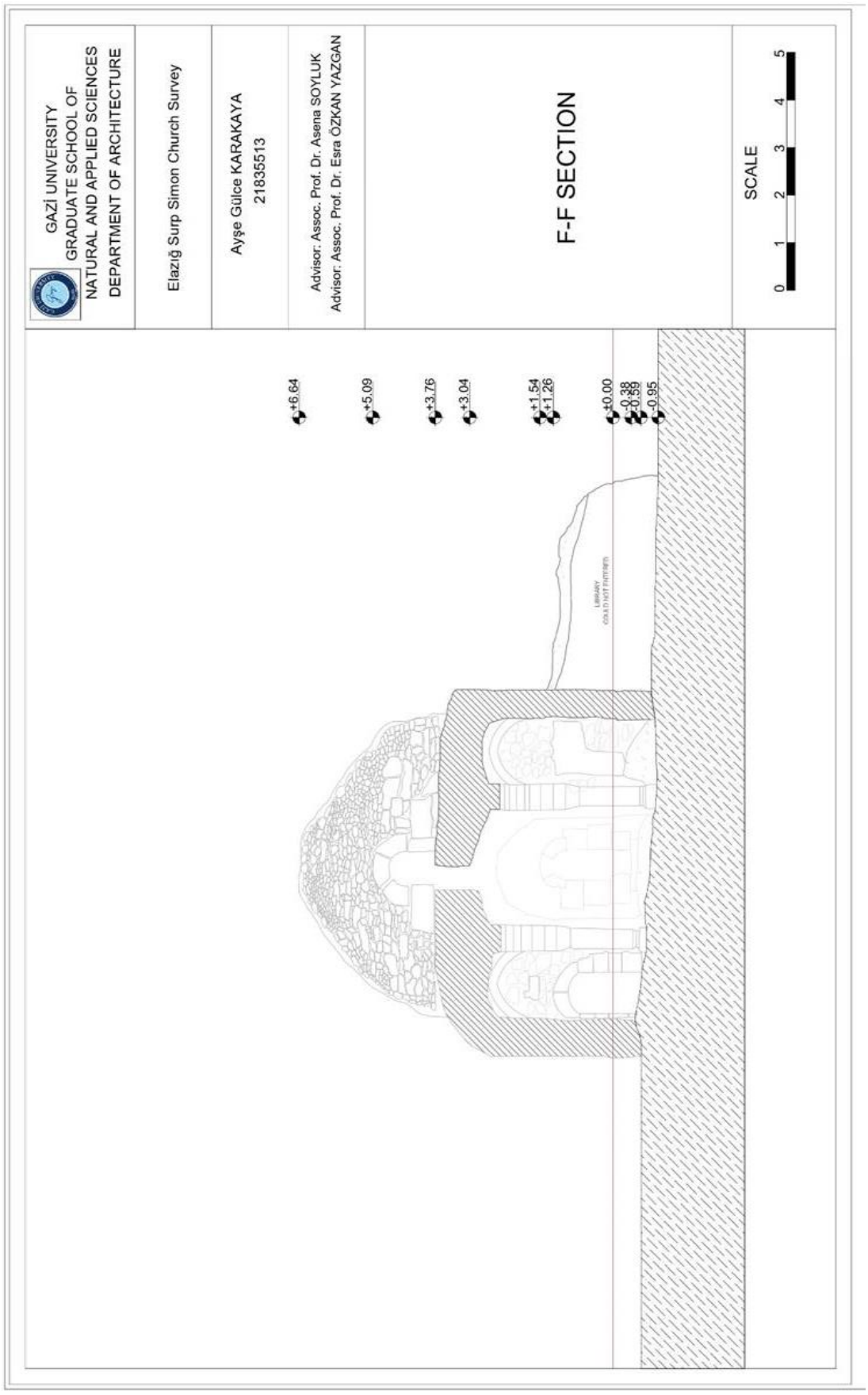


Figure 4.19. Surp Simon Church F-F Section

Upon analyzing the current condition of the church, it is evident that the original building plan has been preserved. The surrounding soil level has risen, leaving the jamatun entrance door at a lower level. Various parts of the structural system, consisting of masonry stone walls, show damages, likely caused by natural or artificial factors.

The library section adjacent to the south wall of the jamatun, is notably damaged and at a high risk of collapse. A thick layer of soil has accumulated on the church's roof, imposing additional loads on the building's structural system.

In the jamatun section, columns are broken at their bases, diminishing their bearing capacity. Cracks are visible in certain wall areas. The structure is susceptible to both human-induced and natural deterioration. Despite years of abandonment and various threads, the church is noteworthy for preserving its structural integrity, experiencing only minor losses. Evidence of man-made vandalism is present on the interior walls, likely resulting from inscriptions (Figure 4.20).


Figure 4.20. Damages observed on walls due to vandalism (Author's Archive, 2023)

The church's jamatun section has four columns. Human-induced sectional weakenings are observed at the bases of these load-bearing elements (Figure 4.21).

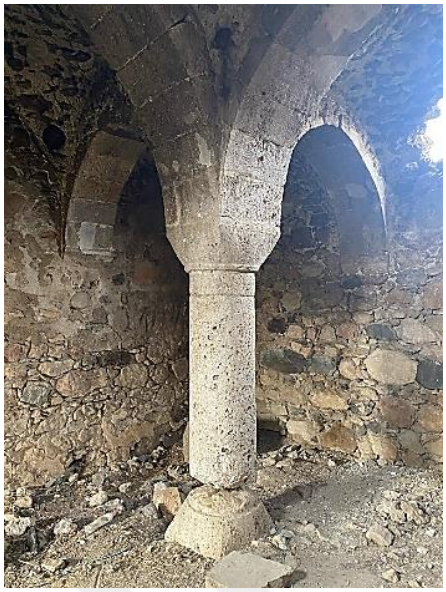

Figure 4.21. Sectional weakenings observed on the columns (Author's Archive, 2023)

The northern facade of the church has material loss on the rubble stone section. There is also material loss on the western facade, but this damage is not perceptible from the interior. Breakages and dislocations are present in the cut stones, rubble stones, and thin-cut stones on the facades of the structure. The keystone of the arched window on the eastern facade has disappeared (Figure 4.22).

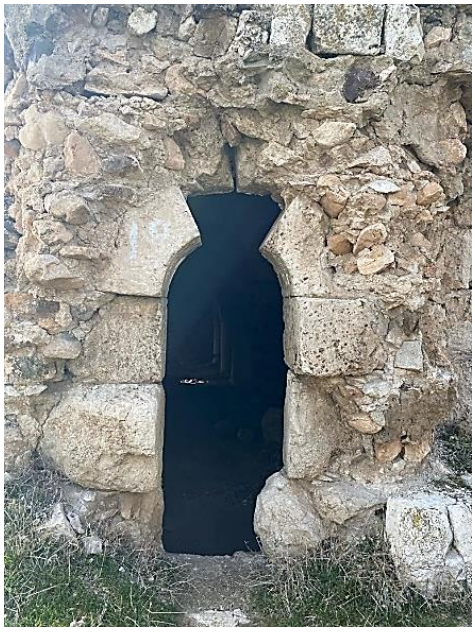

Figure 4.22. Arched Entrance Door on the Eastern Facade (Author's Archive, 2023)

Due to the burning of fire inside the church, there are darkening on the walls, load-bearing columns, and arches. Accumulations of soil and vegetation are present on the top covering of the church. With the rise in ground level in the area where the church is located, a part of the church is buried in the soil (Figure 4.23).

Figure 4.23. Burials observed in ground level in the area (Author's Archive, 2023)

Upon examining the photograph shared by Thierry, who visited the church in 2010, it is observed that the cut stones forming the apse walls are in quite good condition (Figure 4.24).

Figure 4.24. Surp Simon Church in 2010 (Thierry, 2010)

While the cut stones appear to be in quite good condition in 2010, the cut stones on the exterior facade of the eastern side, where the apse is located, have deteriorated by 2023 (Figure 4.25).

Figure 4.25. East Facade of the Church (Author's Archive, 2023)

While there is material loss on the wall forming the western facade of the structure, this loss is not visible on the interior facade (Figure 4.26).

Figure 4.26. West Facade of the Church (Author's Archive, 2023)

The ground level has significantly risen on the southern facade of the church, and there are also accumulations of soil on the top covering of the church. There are material losses on the northern facade of the church, and these material losses can also be observed in the interior (Figure 4.27).

Figure 4.27. North Facade of the Church (Author's Archive, 2023)

### 4.3. Structural analysis of Surp Simon Church

Finite element method is the most frequently used method for determining the behavior of historical buildings under static and dynamic loads and determining the stresses of structural elements (Soyluk, 2010). In this method, it is possible to use various structural element models (frame, shell, solid, etc.) together, and three-dimensional analysis of the structure can be performed with convergence criteria. The analysis of Surp Simon Church by finite element method was performed using SAP 2000 computer software. The finite element model of Surp Simon Church is composed of 1395 joints, 1528 shell and 16 frame elements. The structural elements in the finite element model of Surp Simon Church consist of main dome, half domes, barrel vaults, cross vaults, columns and pendentives. During the modeling phase, the "library" part, which could not be entered and measurements could not be taken, and information about the upper cover could not be obtained, was not included into the model. The building was constructed using rubble stone, brick, cut stone and lime mortar. The vaults, arches, skylight, barrel vault, dome, pendentives and half domes used while preparing the finite element model of the church are shown in Figure 4.28.

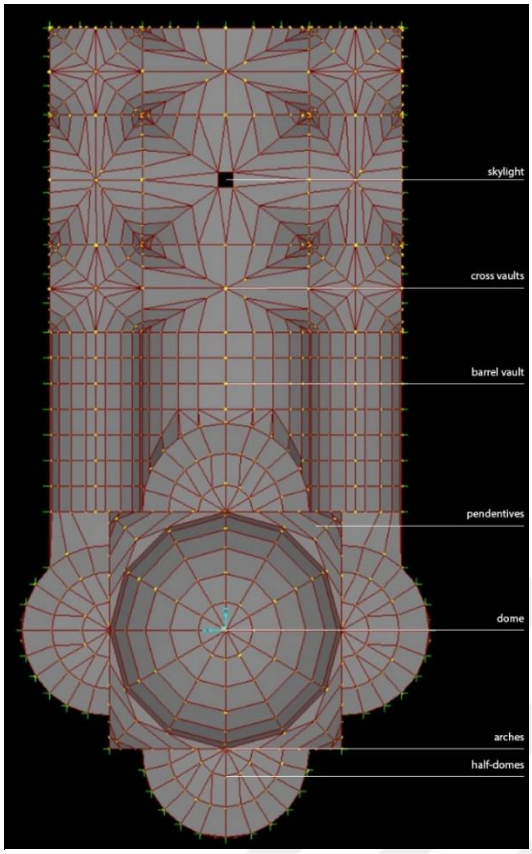


Figure 4.28. Elements used in the finite element model of the church

Since it was not possible to take samples from the historical church and carry out material tests, material properties were obtained from the study of Arıoğlu et al. (1999). Table 4.1 shows the elements and material properties used in the finite element model.

Table 4.1. Material properties and elements used for the finite element model

| | Type of Element | Modulus of Elasticity E (kN/m2) | Specific weight (kN/m3) | Poisson's Ratio | Element thickness (m) |
|---|---|---|---|---|---|
| Arches | Frame | 450 MPa | 18 kN | 0.2 | 0.3x0.5 m |
| Dome | Shell | 1200 MPa | 20 kN | 0.2 | 0.4 m |
| Column | Frame | 450 MPa | 18 kN | 0.2 | 0.4 m |
| Half-Dome | Shell | 450 MPa | 18 kN | 0.2 | 0.55 m |
| Vault | Shell | 450 MPa | 18 kN | 0.2 | 0.4 m |
| Pendentive | Shell | 450 MPa | 18 kN | 0.2 | 0.4 m |
| Structural Wall | Shell | 450 MPa | 18 kN | 0.2 | 0.45m-1.3 m |

The general view of Surp Simon Church prepared with the finite element method is shown in Figure 4.29.

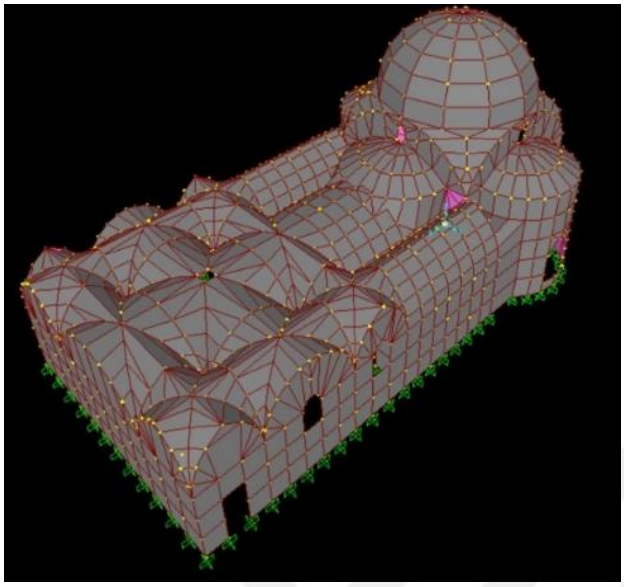

Figure 4.29. Surp Simon Church Finite Element Model 3D View (SAP 2000)

The top view of Surp Simon Church in the finite element model is shown in Figure 4.30.

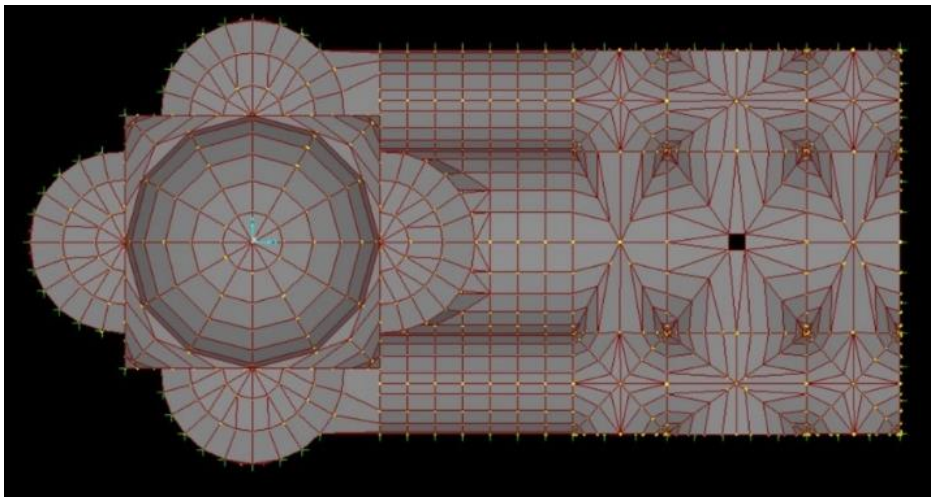

Figure 4.30. Top View of Surp Simon Church (SAP 2000)

The views of the East Facade and North Facade of Surp Simon Church in the finite element model are shown in Figure 4.31.

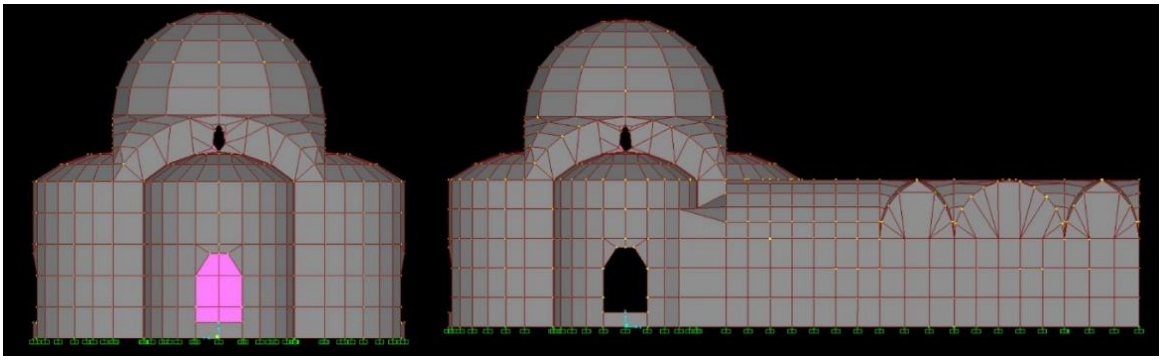

Figure 4.31. Surp Simon Church East Facade and North Facade Views (SAP 2000)

According to the results of the structural analysis, the first six mode shapes and periods of the Surp Simon Church are shown in Table 4.2 Mode 1 shows displacement in y direction, Mode 2 shows displacement in x direction, Mode 3 shows torsion, Mode 4 shows compression in x direction, Mode 5 shows expansion in y direction and Mode 6 shows compression in y direction (Figure 4.32-4.37). Since the values obtained from the modal analysis are less than one second, it is understood that the structure shows a very rigid behavior.

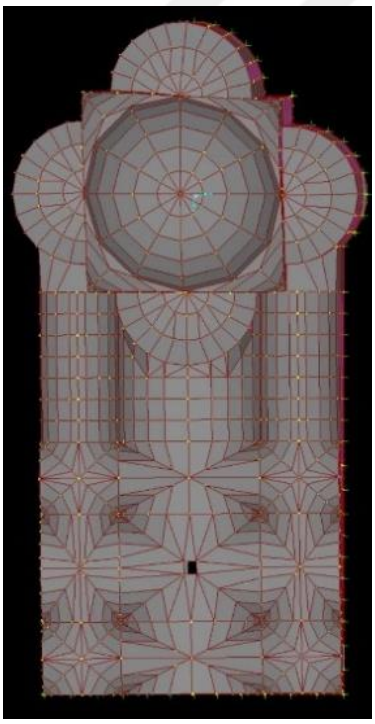

Figure 4.32. Mode 1

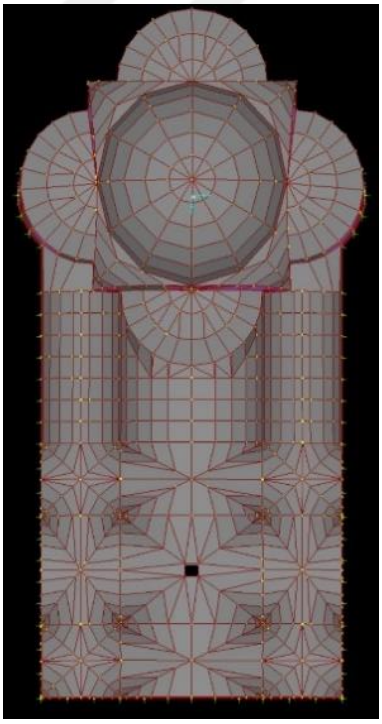

Figure 4.33. Mode 2

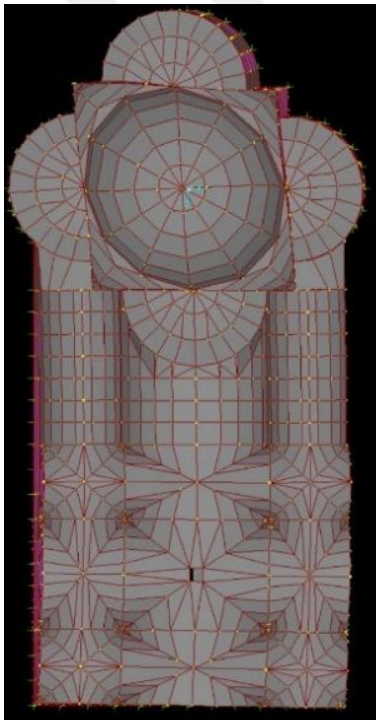

Figure 4.34. Mode 3

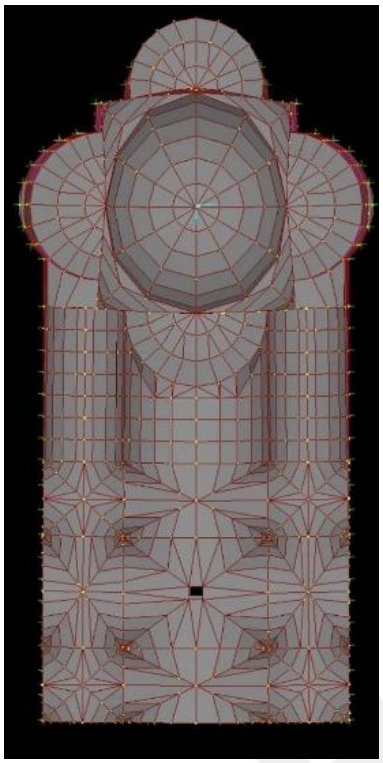

Figure 4.35. Mode 4

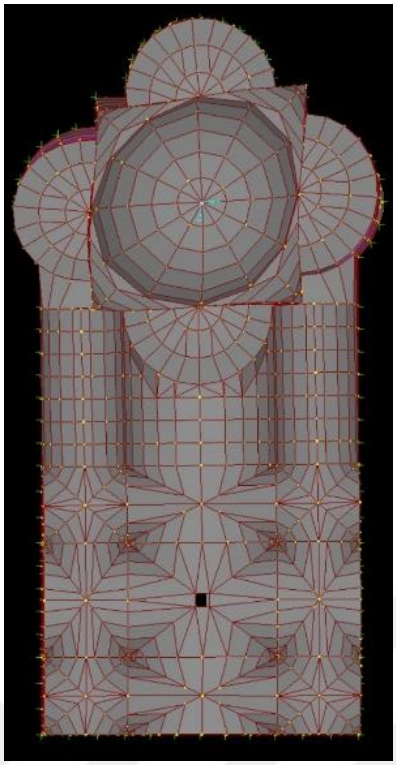

Figure 4.36. Mode 5

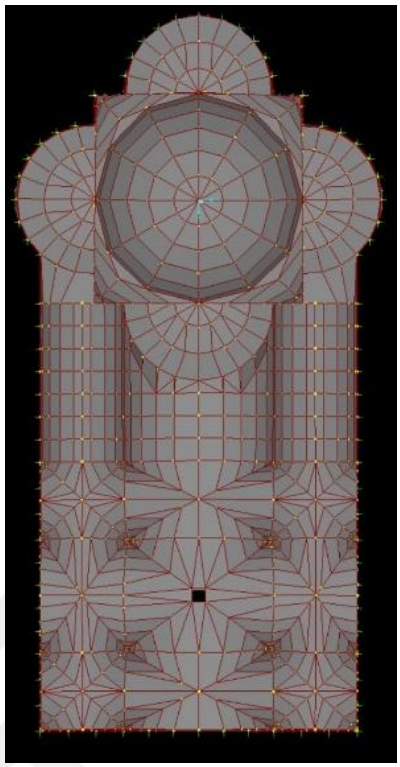

Figure 4.37. Mode 6

Table 4.2. First six modes

| **Mode** | **Period (Sec)** |
|---|---|
| Mode 1 (displacement in y direction) | 0,150 |
| Mode 2 (displacement in x direction) | 0,119 |
| Mode 3 (torsion) | 0,106 |
| Mode 4 (compression in x direction) | 0,086 |
| Mode 5 (expansion in y direction) | 0,078 |
| Mode 6 (compression in y direction) | 0,077 |

The behavior of Surp Simon Church under its own weight (G) was analyzed and the displacement values of the dome, half domes, barrel vault, cross vaults, skylight are given in Table 4.3.

Table 4.3. Displacements due to G load

| Type of the Structural Element | Displacement Value (cm) |
|---|---|
| Dome | 0,13 cm |
| Half-Dome | 0,14 cm |
| Barrel Vault | 0,09 cm |

Table 4.3. (Continued) Displacements due to G load

| | |
|---|---|
| Cross Vault | 0,13 cm |
| Cross Vaults at the Corners of the Jamatun | 0,05 cm |
| Cross Vaults near the Walls of Jamatun | 0,05 cm |
| Skylight | 0,2 cm |

In order to assess the earthquake behavior of Surp Simon Church, in addition to its own weight, a horizontal load of 0.4 times its own weight was applied to the structure and the x-direction displacement values of the dome, half domes, barrel vault, cross vaults and skylight are given in Table 4.4. Under the earthquake load in the X direction, tensile stresses are observed in the vault on the west wall of the jamatun and on the edges of the naos windows. Weaknesses are observed in the pendentives where the load of the dome is placed in the naos. Tensile stresses occur in the window openings facing the library on the south façade. On the other hand, the skylight and half domes in the jamatun show a very rigid behavior.

In order to see the earthquake behavior of Surp Simon Church, in addition to its own weight, a vertical load of 0.4 times its own weight was applied to the structure and the displacement values in the y direction in the dome, half domes, barrel vault, cross vaults, skylight are given in Table 4.4.

Table 4.4. Displacements due to G+EQX and G+EQY load combinations

| Type of the Structural Element | Displacement (in x-direction) Value (cm) | Displacement (in y-direction) Value (cm) |
|---|---|---|
| Dome | 0,13 cm | 0,28 cm |
| Half-Dome | 0,11 cm | 0,26 cm |
| Barrel Vault | 0,08 cm | 0,23 cm |
| Cross Vault | 0,09 cm | 0,21 cm |
| Cross Vaults at the Corners of the Jamatun | 0,08 cm | 0,14 cm |
| Cross Vaults near the Walls of Jamatun | 0,07 cm | 0,14 cm |
| Skylight | 0,08 cm | 0,18 cm |

Under the earthquake load in the Y direction, tensile stresses occur in the cross vaults in the jamatun, the upper covers of the pastoforions, and the upper covers of the half domes. In the naos, compression stresses occur on the parts where the dome meets the pendentives and on the skylight of the jamatun. On the east façade, tensile stresses occur in the 1-1 direction on the apse arch and pendentives (Figure 4.38-Figure 4.41) Tensile stress was also observed in the cross vaults of the jamatun. The fact that the displacement values in the y direction are higher than those in the x direction shows that the church is more vulnerable to earthquakes in this direction. Maximum stresses of the openings of the church is given in Table 4.5.

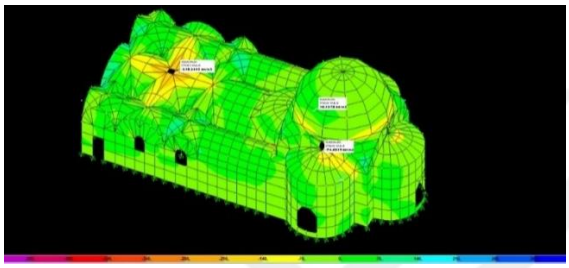

Figure 4.38. Stress Diagram (G+EQx) S11

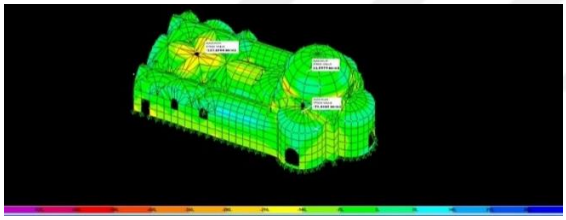

Figure 4.39. Stress Diagram (G+EQx) S22

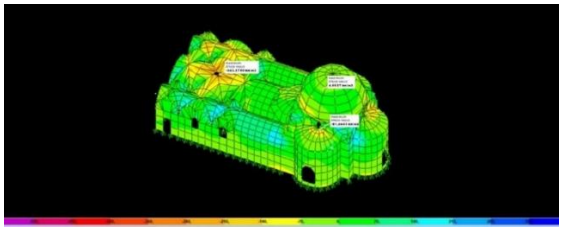

Figure 4.40. Stress Diagram (G+EQy) S11

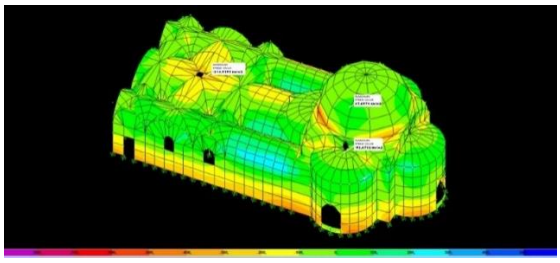

Figure 4.41. Stress Diagram (G+EQy) S22

Table. 4.5. Maximum Stresses in the Openings of the Church

| Stress | Dome | Half-Dome | Skylight |
|---|---|---|---|
| G+EQx S11 | 10,5578 kN/m² | -74,4839 kN/m² | -218,2403 kN/m² |
| G+EQx S22 | 22,5979 kN/m² | -75,4465 kN/m² | -227,6504 kN/m² |
| G+EQy S11 | 4,5537 kN/m² | -81,4441 kN/m² | -242,3750 kN/m² |
| G+EQy S22 | 47,6974 kN/m² | -92,6732 kN/m² | -214,5195 kN/m² |

The naos part of the church built in the 6th-7th century shows different structural behavior than the part built in the 16th-17th centuries. The naos part shows a more rigid behavior than the jamatun part. As a result of the analyzes, it was determined that the structure was strained in these sections due to the formation of different tensile stresses in the openings of the structure, as seen in previous scientific publications. It was determined that stress accumulations occurred on the upper parts of the vaults in the jamatun section and on the northern wall of the jamatun. In the naos section, sensitivities were observed at the points where the main dome connects with the pendentives. The building has a very rigid behavior in general. The identified weaknesses do not threaten the structural integrity of the church.

# 6. CONCLUSION

Historical buildings should be preserved and passed on to future generations due to their architectural, cultural and aesthetic values. Türkiye, which has been home to various civilizations for centuries, has many valuable cultural heritage elements and historical buildings. However, these heritage assets may face the threat of extinction due to various reasons. Regulations also state that in order to minimize these threats, historical buildings should be examined in detail, the factors that threaten them should be determined, and they should be documented against the threat of extinction. The Athens Charter (1931) and The Venice Charter (1964) state that modern technologies can be utilized where traditional methods are insufficient.

Within the scope of this study, historical churches, which are cultural heritage elements left in the city by the non-Muslim minority living together with Muslim people throughout history in Elazığ province, were examined in terms of their history, architectural features and conservation status. As a result of the researches, it is concluded that there are 15 churches that have survived to the present day in Elazığ and 10 churches that have not survived to the present day despite being mentioned in written sources. Except for 3 of these churches, all of them have lost their structural integrity and are under the threat of extinction. The main factors that pose a threat of extinction for these buildings can be listed as abandonment-neglect, being located in the earthquake zone, lack of active users, significant damage to the buildings due to reuse attempts that are not suitable for the architecture of the building, and property problems.

As a result of the examinations, Surp Simon Church located in Yalnız Village of Elazığ city center differs from the other churches examined in the study because it has preserved its structural integrity despite the threats mentioned. For this reason, “Surp Simon Church” was chosen as the field work of this thesis.

The naos part of the Surp Simon Church, which was built in the 6th-7th century, has a clover plan. According to the literature the rectangular jamatun part, was added in the 16th-17th centuries to the naos part. The naos part of the church is covered with a dome. The jamatun section has a 12 cross vaulted upper cover carried by 4 columns. The dimensions of the

building are approximately 16 m x 9 m and there is also a library section that was added later to the jamatun section. However, this part could not be entered and measurements could not be taken.

In the study, the Church was analyzed with an integrated approach in order to conserve the church and transfer it safely to future generations. In this context, after conducting the necessary literature review on the church, on-site examinations were carried out. The current situation of the church and the factors that pose a threat to its conservation were determined. LIDAR scanning was carried out in the area and point cloud data were obtained to prepare the surveys of the church. In addition to the obtained point cloud data, photographs taken in the area, registration documents belonging to the church, and previous scientific publications on the church were also utilized at this stage to confirm the accuracy of the documentation. The earthquake risk poses a structural challenge to historical buildings built with the masonry construction technique. Considering the destructive earthquakes that have occurred in Elazığ in recent years, it is remarkable that this church was able to preserve its structural integrity except for minor damages. In this context, determining the structural behavior of the church, analyzing its strengths and weaknesses, determining which parts will behave how under different loads, in short, determining the structural behavior of the building under its own load and under earthquake load is a step of the integrated conservation approach that is adopted in this study. For this purpose, a finite element model of the church was prepared using SAP2000 software and the structural analysis of this structure was carried out. The finite element model of Surp Simon Church is composed of 1395 joints, 1528 shell and 16 frame elements. The structural elements in the finite element model consist of main dome, half domes, barrel vaults, cross vaults, columns, arches and pendentives.

The building was constructed using rubble stone, brick, cut stone and lime mortar materials. Since it was not possible to take samples from the historical church and perform material tests, material properties were obtained from the study of Arıoğlu et al. (1999). Since the values obtained from the modal analysis are less than one second, it is understood that the structure shows a very rigid behavior. The naos part of the church built in the 6th-7th century shows different structural behavior than the part built in the 16th-17th centuries. The naos part shows a more rigid behavior than the jamatun part. As a result of the analyzes, it was determined that the structure was strained in these sections due to the formation of different tensile stresses in the openings of the structure, as seen in previous scientific publications. It

was determined that stress accumulations occurred on the upper parts of the vaults in the jamatun section and on the northern wall of the jamatun. In the naos section, sensitivities were observed at the points where the main dome connects with the pendentives. The building has a very rigid behavior in general. Although the identified weaknesses do not threaten the structural integrity of the building for the time being, considering the seismicity of the Elazığ region, it is important to make the necessary reinforcements. According to the structural analysis, the reason why the church shows better structural behavior compared to other churches is its architectural difference from other churches. In the Surp Simon Church, which was built with the masonry construction technique; the lightness of the structure, the roof covering form used, the wall thicknesses, the ability of the domes to transfer their loads to the ground properly, the composition of building elements such as arch-vault-dome and the smaller size of the church compared to other churches are the main factors of the preservation of the structural integrity of this church today. Legal documents on the preservation, maintenance and restoration of historical buildings set out some basic principles. In line with these principles, the Surp Simon Church was documented with sensitivity. In addition, the structural behavior of the building was determined before a possible threat was encountered by making use of modern technologies. For this reason, the results of the study provide information on which considerations should be taken into account during the restoration phase of the church. Considering the current situation of the church, it is thought that the deterioration and damages seen in the structure can be eliminated with the minimum intervention principle determined in the regulations. Surp Simon Church, which has an important place in the cultural heritage of Elazığ province, needs to be conserved and passed on to future generations. The current conservation problems of the church are the soil layer accumulated on the upper cover, the uncertainty of the boundaries of the land where the church is located, the traces of writing and paint seen in the interior and the deficiencies in the flooring, which can be easily solved. The fact that the church shows a very rigid behavior structurally suggests that the church can be included in daily life with minimum intervention. In conclusion, as a part of the cultural diversity and heritage of Anatolia, which is home to many cultures, the evaluation of the church discussed in this thesis from a comprehensive perspective has contributed to the inventory of the building. It is important to transfer historical buildings, especially those under earthquake risk, to future generations through multidisciplinary studies. In future research, it is necessary to develop detailed restoration proposals in order to re-functionalize such buildings and bring them to the society.

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