A Restoration Story

Şeyh Süleyman Masjid

(Turkey-Italy Collaboration of Restoration Approach)

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MËD-ART

transnational cooperation for cultural heritage preservation

Şeyh Süleyman Mescidi Restorasyonu ve Eğitim Projesi

Restoration of Şeyh Süleyman Masjid and Training Project

T.C.

Başbakanlık

Vakıflar Genel Müdürlüğü

Directorate General of Foundations

assorestauro

associazione italiana per il restauro architettonica, artistica, urbano

italian association for architecture, art and urban restoration

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Architectural Approach and Design of the Restoration Project of
The Şeyh Süleyman Masjid

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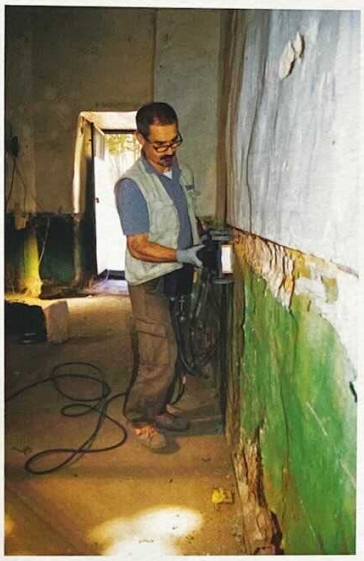


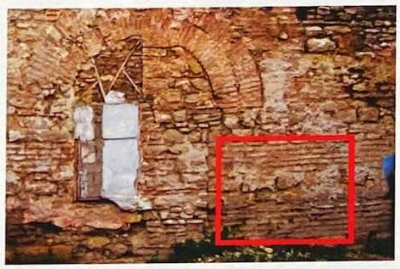


Figure 1.
Photogrammetric drawings of the building.

Figure 2.
The georadar implementation to define the gaps on the walls and plastered surfaces.

Figure 3a-3b.
Site works before the laboratory examinations.

The Şeyh Süleyman Masjid, which is located on block 2426, 42 parcel of Sinanağa Quarter in Fatih is in the area of 1st Grade Conservation Region according to the Conservation Map of Fatih. The survey, restitution and restoration projects for restoration of the building were first approved by the Conservation Committe on April 2nd, 2007.

The restoration works of the building were started with the collaboration of the Directorate General of Foundations (VGM), Assorestauro, ICE and Emiglio Romagna depending on the protocol inbetween those institutions where technological potentials of the two countries were shared. The project (Istanbul Province, Fatih Municipality Zeyrek Şeyh Süleyman Masjid (Restoration) Implementation Works) was involved in the MED ART 1 organization as well and was completed on November 7th, 2016 while the construction started on September 25th, 2013. The building, which has features of several different eras, is one of the important buildings in 'Zeyrek World Heritage Site'.

The site implementations started after Reskon Architecture Restoration Tourism LLC. got the tender of 13.09.2013 and by the control of VGM. First of all the building was revised at a site meeting, which has been witnessed several changes from 2007 till 2013. Following this, the existing projects were revised depending on the recent analyses in the building under the control of the Italian experts and the experts of the VGM.

In order to direct all the steps systematically, supervisors from both VGM and Assorestauro were assigned. A collboration with all related-actors was carried out firstly with the Turkish Scientific Committte (Prof. Dr. Nevzat İlhan, Prof. Dr. Zekai Celep, Hayri Fehmi Yılmaz) and Consultancy Committee (Deputy General Manager Ali Hürata, Director of Art and Construction Works Department Suat Faruk Giray, Manager of the 1st Region of the era İbrahim Özekinci, Civil Engineer Fikret Kuran, Architect PhD. Olcay Aydemir, Architect Muradiye Şimşek, Architect PhD. Andrea Griletto, Architect-Engineer Nicola Berlucci), controllers of the VGM (Architect PhD. Olcay Aydemir, Civil Engineer Ömer Faruk Sert, Civil Engineer Özgür Özyurt, Archeologist Murat Sav, Mechanical Engineer Hasan Yalın, Electrical Engineer Yılmaz Günay)

For projects revisions Italian experts were assigned and other experts were later joined to the group in order to organize the material analyses and structural researches. The

Figure 4. Examination of the micro cracks with camera.

Figure 5. During the trainings at site for the VGM staff and other attendants.

following steps were taken by the mentioned experts:

1- Repreparation of previous projects in terms of photogrammetry which had some measurement mistakes (Figure 1).

2- Determination of structural anomalies of different periods in the building and surroundings in order to define the possible layers of the building belongings to different periods (Figure 2).

3- All the layers of the building (frescoes, plaster, wall ect.) were observed typologically and chronologically by taking samples. The mentioned examinations were carried out in the laboratories in Italy (Figure 3a-3b).

4- Interpretation of the cracks, gaps and materials to define the strcutural problems (Figure 4).

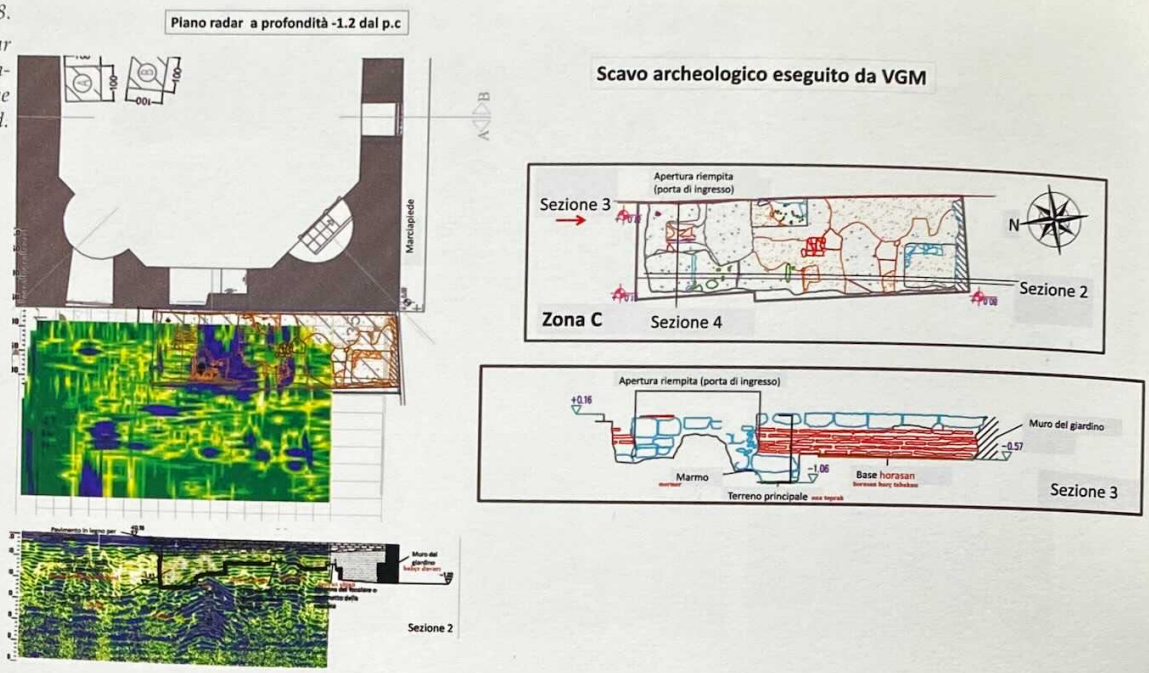
During all the mentioned works, traininhs have been organized both for the VGM stuff and experts from other institutions of Istanbul at the Fatih Sultan Mehmet Vakıf University. The examinations, which had been carried out by Italian experts, were presented to the attendants (Figure 5).

- Italian teams which worked at site and gave lectures of the trainings:
- Laser scanning works (Companies Geomar, Geogra, Tryeco).
- 3D GPR-Radar works (SOING)
- 3D ERT- Electrical Tomography Implementation (SOING)
- Measurement of environment vibration to make dynamic analyis (SOING)
- Analyses of material and deterioration

Figure 6.
3D modellings of the building.

Figure 7.
Analytical survey of the building.

Figure 8. The geo-radar implementations in the courtyard.



(Companies Leonardo, Ferrari Restauri, Mapei)

- Researches on frescoes (Nicola Restauri)
- Analyses of structrural system (Dott. Ing. Alessandro Bozzetti, S.P.C.srl)
- Analyses of humudity problems (Domodry)
- Energy saving systems (YES-CO)

Using the laser scanning technology, a 3D model of the building was created in which every detail of the building either interior or exterior could be seen (Figure 6). Sections of several axises could be examined. Depending on the information got from those data, analytical survey drawings were detailed (Figure 7). Having benefits of this sort of method, documenting of historical buildings were revised and detailing of 2D documents in relation with 3D drawings were discussed. It is stated that current projection systems and tender documentation need to be improved accordingly.

During the radar implementations, an archeological area of 4 m x 7,5 m was discovered in the courtyard of the masjid (Figure 8). The location of the well, of whose existence was known but could not be detected because of the floor coverings was also revealed. It was understood thta the crack on the east wall was not a structural crack but was occured because of the junction of two different wall textures (Figure 9).

The electrical tomography implementation (ERT) showed that the foundations of the building are positioned 4 m below the ground level (Figure 10). It was understood that the water storage under the crypt was carved into the rock. Also the existence of the archeological area in the courtyard was determined by ERT. The data of ERT and radar confirmed each other on this issue.

Many studies on different issues about the building were carried out such as projection of material and deterioration, survey of the structural system, modelling, projection of reinforcement suggestions, climatization, water drainage and humudity balance of the building (Figure 11-12)

The revised projects, which had been prepared in Italian were presented to the VGM both in 2D and 3D. The translations to Turkish

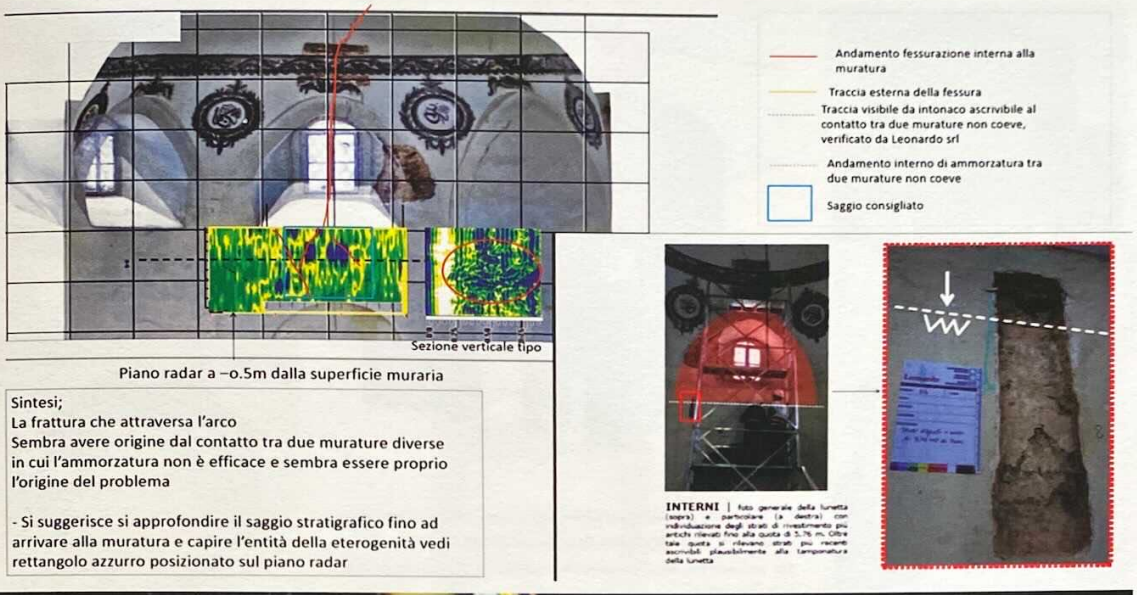


Figure 9.
The geo-radar implementation which defines the hidden gaps on wall behind the plasters.

Figure 10.
ERT implementation surrounding the building.

were done and the projects were sent to the Directorate of Istanbul Regional on August 1st, 2014. The projects were modified as 'for construction' projects and were presented for the approval of the Conservation Committee with the translated reports.

First of all, the reinforcement project was presented to the Conservation Committee on 20.08.2014. Afterwards, the revised roof project was presented on 23.09.2014 and the frescoe projects and reports on 16.09.2014. The revised reinforcement projects were presented considering the revised structural analyses on 17.11.2014. Briefly, all the revised projects which were approved by the Scientific Committe were approved by the Conservation Committee as well on 04.06.2015 with the approval number 3585 except for the toilets and fountain projects. Comprehensive site implementations started after this approval.

The building has an octoganal plan scheme with four main arches and four lateral niches. The original entrance of the building on one of the lateral niches had been changed with one of the other niches opposite the altar probably to create space for the pulpit. During the restoration period, the material analyses showed that the original entrance was changed in the Ottoman Period. Depending on this data, the restitution projects were revised according to the latest era modification depending on the approval of Consultancy and Scientific Committees (Figure 13).

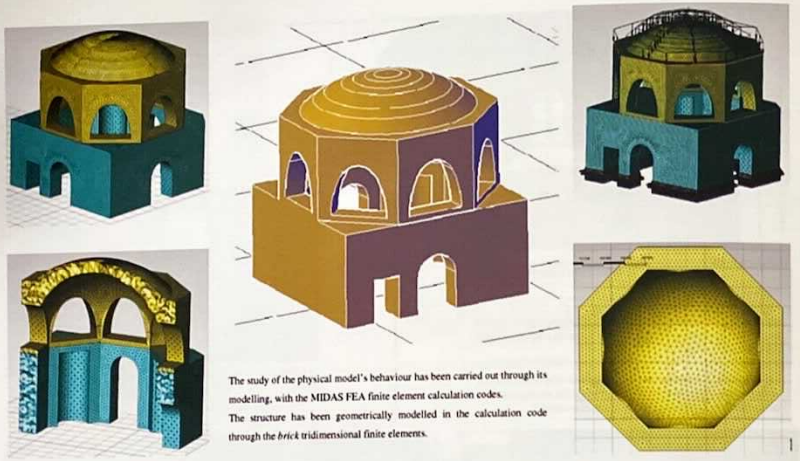


Figure 11. Structural modelling of the building.

Figure 12. View of scaffolding of the masjid.

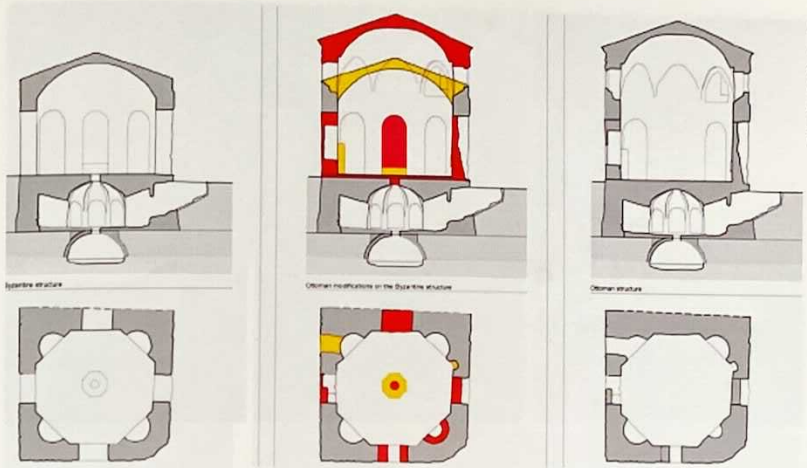


Figure 13. Steps on the evolution of the building: Original Byzantine Era, repairs, Ottoman Era.

Figure 14. Exterior view of the niche which the original entrance is positioned.

Figure 15. Original flooring plan of the central hall.

Since it was understood that the previously mentioned annexes belong to the Ottoman Era depending on the historical researches and material analyses, the restoration project in which the annexes are protected (the existing entrances and windows) were revised (Figure 14).

After removing the concrete floor covering in the masjid, the surviving original Byzantine flooring, which did not seem in good condition was revealed. It was reported by archeologist Zanini that, this original and octagonal planned flooring had been designed as a central hall in order to reach the water necessary for the baptism. The area was cleaned and protected originally. The relation of this octagonal scheme with the crypta could not be explained. The crypta (grave), which had stayed closed before the restoration, was designed to be visited by protecting the original interior features after the restoration (Figure 15).

The architectural construction of the Şeyh Süleyman Masjid has similarities with many other baptisteries in terms of Byzantine Era flooring design and four niches formation re-

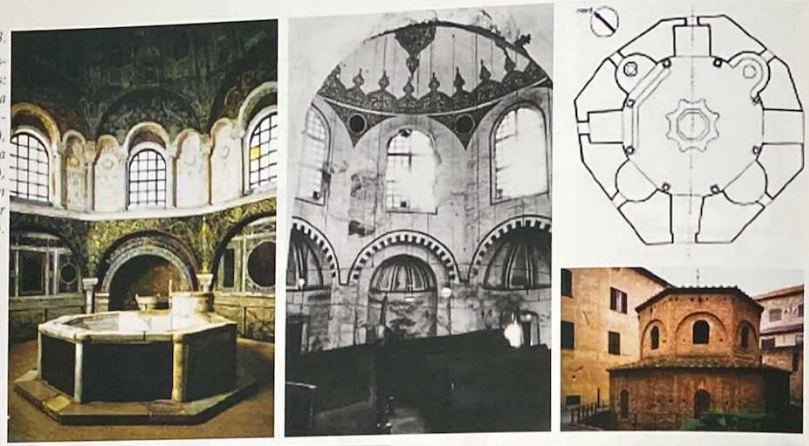


Figure 16-17-18. Similar baptistery examples: the Ravenna Neonian (interior view), the Hagia Sofia (interior view), Albenga (plan and exterior view).

Figure 19. The tessera pieces of the dome filling.

Figure 20. The raised dome with the amphoras.

minding of four entrances. In other buildings, there exists a constructive arch in order to carry the tambour. Some examples are seen on the photographs below to compare with: The Baptistery of Ravenna Hagia Sofia, the Ravenna Neonian Orthodox Baptistery and the Albenga Baptistery in Italy (SV) (Figure 16-17-18).

In the Ottoman Era, the dome was filled and arised (Figure 19-10), thus the building had a new elevation. The building had modifications in accordance with a tekke firstly and then with a masjid in terms of altar, niches and frescoes depending on the Islamic rules. The frescoes and the lettering at lower levels were cancelled by painting over and renewed partially untill the arch level. All the mentioned layers were revealed during the restoration and protected.

A new ablution place was built as a later addition. A concrete wall was built in the latest 50 years instead of a wall constructed with rubble stones which could be seen on old photographs

Figure 21-22. View of the walls before restoration and after scapering.

Figure 23-24-25. The condition of wall; in original, during the 20th century and after the restoration.

(on left hand side). Furthermore, the windows were placed with concrete frames. During the restoration period, the mentioned wall was rebuilt in original style (Figure 23-24-25).

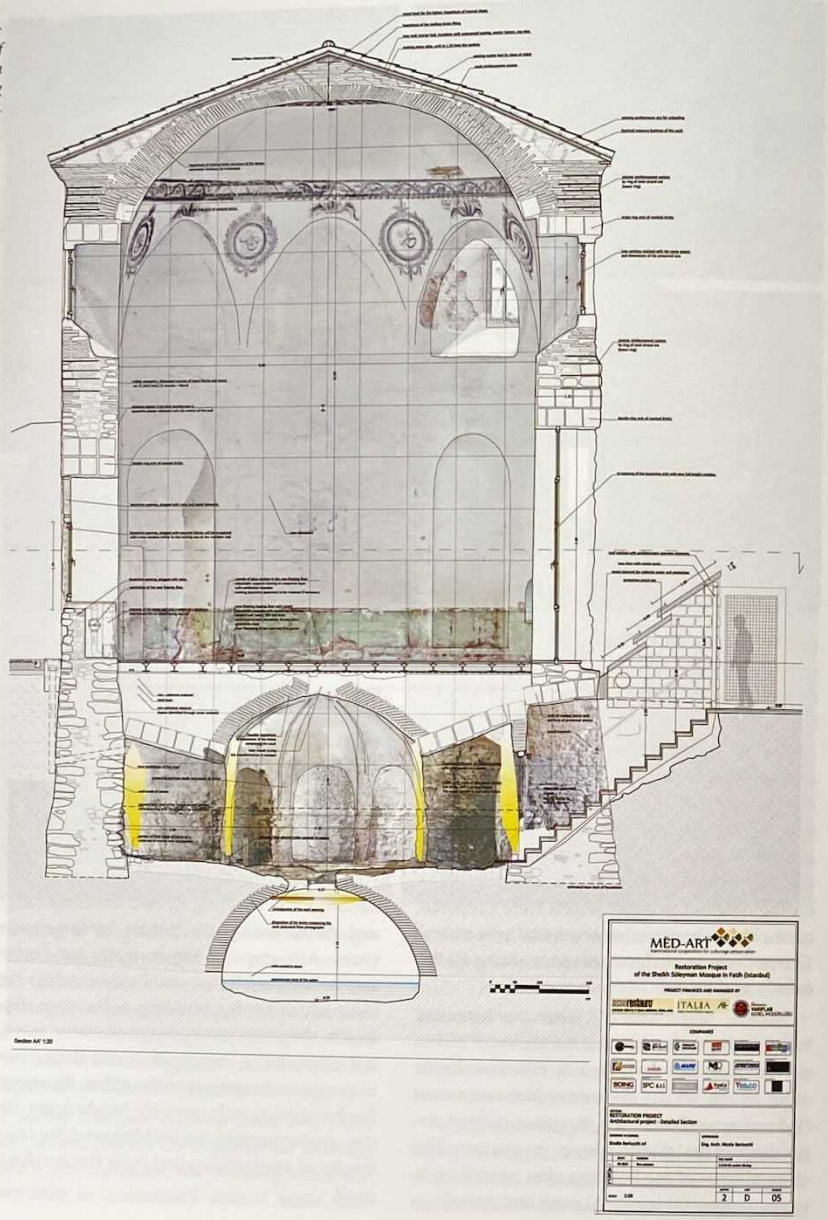
The Şeyh Süleyman Masjid is a building which has its own features and the traces of the past as well. It has been an opportunity that the interventions carried out till present did not demolish the traces of past. Each touch of restoration has been carried out depending on the detailed projects which were prepared after comprehensive analyses and researches. The projects were docmented including all the details and reports of those researches.

All the steps starting from the historical background to the chemical formation of different era mortars were carefully taken on site. In other words, all the implementations were carried out according to the diagnosis defined depending on the 'clinical history' of a patient. The original view of the building after restoration is a conclusion of this special work and period.

The best way of implementation of a restoration project is reflecting all the results of the analyses to drawings and charts in different scales and in detail with great care (Figure 25). Computerized axial tomography of the roof, walls and flooring of the building is reflected on the drawings. This sort of qualified project is a very good example for the following restoration projects and implementations.

As a conclussion, detailed and deep examination of the building helped understanding and documenting the history of thousands years. All steps of the research are necessary as it is for all successful projects. Having information on the building is the first step and is very important; usage of every material needs to be known. It is not acceptable to complete the project in the office. Knowing the building is only possible by studying on site, understanding the building and the continuity of the building just from the building itself.

Figure 26.
A section of detail which shows building examination.



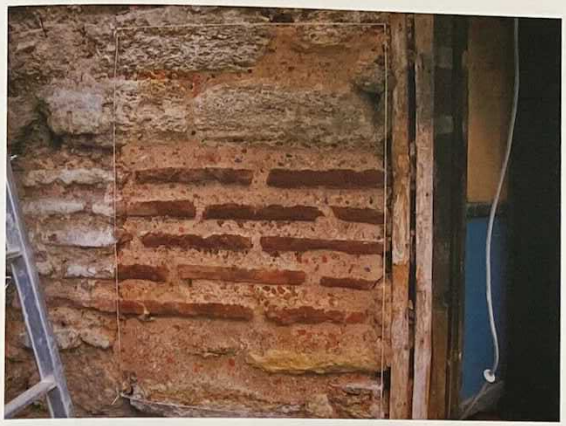


Figure 27-28. Detailed views of the surfaces (Befire the restoration and after the sample implementation).

In order to understand the need of the building and to define the construction steps, the surfaces should be observed very well. The saying 'To know is to conserve'could be a slogan which summarizes this period.

The restoration project should not compete with the importance of the building, it shloud be more modest than the building. The designer of this sort of project could accept staying background and should achieve being a 'conservator' who takes part in carrying the building from past to present.

The project period started by interpreting the old photographs and the written sources of 1900. The incompatible interventions of recent years were considered as important period documentation.

The restoration has not been one which defines an unknown period (Byzantine or Ottoman) or a hybrid character which has ever been existed.

The projects was realized with the support of experts from Assorestauro and the VGM. During the entire period, having the benefits of all skills has been the goal in order to remove the incompatible annexes and to make the building survive at the end of the period.

Figure 26 shows a few photos of Med Art Project's long working period. Med Art Project interpreted on every probable intervention during the projecting period in order to prevent any changes of implementations. A multidiciplined project is an ideal one on which historical, structural, electro-mechanical, lighting and archeological data could be seen together rather than just architectural data.

Restoration project should usually be directed in a way to give and check information on other diciplines and to form relation inbetween. For instance; the projects on archeology, history of art, laboratory data, lighting and electricity should be designed in accordance with architectural project and with same importance.

As mentioned in this essay and understood from the projects and charts of the essay, there is a collaboration of all experts and support of Med Art behind the great success of the project. Each information on the project has been reached by the experts and as seen from the graphics, a sort of x-ray view of the building has deen created (Figure 27-28). The texture of rubble wall was not indicated by the AutoCAD hatch commands, instead they totally indicate the real texture composition of the building. They have been formed depending on the physical observation and survey methods (Figure 29a-29b).

Figure 29a-29b.
The model of the building before restoration and view after restoration.

Figure 30-31.
Raised flooring project and implementaion.

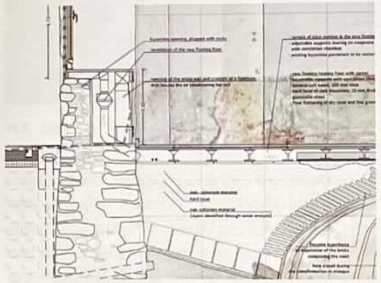


Figure 32-33.
Lighting model of the building and implementation.

Approaches on energy saving should be another focus of a modern current restoration project. A demontable platform was designed in order to install the heating system for this building by using rised flooring (Figure 30-31). Although exhibition of original Byzantine flooring was proposed underneath the rised floor, it could not be realized because of the size of the room, thus the original flooring was left underneath covered. As for the lighting of the interiors, an optional LED system was proposed to lighten the dome effectively (Figure 32-33).

The heating and cooling system solutions were studied by mechanical engineers. A raised floor installation under the decorative carpet was developed which spreads the heat via radiation and saves 74% more energy compared to an electrical heater (Figure 34) and 15% more energy compared to a standart air conditioner.

Entrance to the grave has been designed with contemporary materials and in a modern form which functions in accordance with the current demands (Figure 35).

Figure 34.
View of the surface of the raised flooring.

Figure 35.
View of the new entrance of the crypta on east facede of the building.

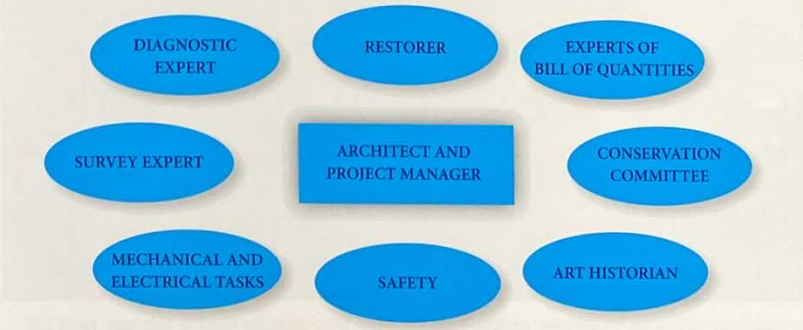


Figure 36.
Architect acts like an orchestra chief.

The project has been an example in terms of reflecting the changes during the implementations and designing accordingly after the whole period which lasted approximately three years. As conclusion, a real and conservative restorastion project has been realized within respect to the building and the history of the building as well.

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