TRUE-TO-FORM SURVEY
ON THE SHRINE OF IDRIS BABA IN PÉCS*

Pécs'deki İdris Baba Türbesi Üzerine Gerçeğe Uygun Tarama Araştırması

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Abstract

The shrine (*türbe*) of Idris Baba is one of the two Ottoman mausolea which can be visited in the territory of Hungary. Today, the shrine is in good condition and following several 20th century restorations, the buildings reflect their original conditions of the Ottoman period. However, the building had several different functions which resulted in modifications in its architectural features after the Ottoman rule in the region. During the 20th and 21st centuries, survey drawings were prepared to document the characteristics of the building, however, the last, true-to-form survey and TLS-scanning resulted in detailed documentation of the structural features of the monument. The aim of this article is firstly, to describe the methodology of the applied survey and to compare it with the previous drawings of the 20th century. In addition, it aims to analyse the detailed, true-to-form survey drawings of the building which contributes to record the evidence of the architectural modifications and propose ideas about the eventuating reasons.

Keywords: Türbe/mausoleum, Hungary, Ottoman Architecture, Idris Baba, True-to-form Survey, TLS-scanning.

Öz

İdris Baba Türbesi, Macaristan topraklarında ziyaret edilebilecek iki Osmanlı türbesinden biridir. Türbe günümüzde iyi durumdadır ve 20. yüzyıldan kalma birkaç onarımdan sonra, yapılar Osmanlı dönemindeki orijinal hallerini yansıtmaktadır. Ancak yapının, bölgedeki Osmanlı yönetiminden sonra mimari özelliklerinde değişikliklere neden olan birkaç farklı işlevi vardır. 20. ve 21. yüzyıllarda, yapının özelliklerini belgelemek için rölöve çizimleri hazırlandı, ancak son, gerçeğe uygun tarama araştırması ve TLS taraması, anıtın yapısal özelliklerini ayrıntılı şekilde belgelendirdi. Bu makalenin amacı, ilk olarak, uygulanan araştırmanın metodolojisini açıklamak ve 20. yüzyılın önceki çizimleriyle karşılaştırmaktır. Buna ek olarak, mimari değişikliklerin kanıtlarını kaydetmeye katkıda bulunan yapının ayrıntılı, gerçeğe uygun tarama araştırması çizimlerini analiz etmeyi ve olası nedenler hakkında fikirler önermeyi amaçlamaktadır.

Anahtar Kelimeler: Türbe, Macaristan, Osmanlı Mimarisi, İdris Baba, Gerçeğe Uygun Tarama Araştırması, TLS-taraması.

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1. Introduction

The shrine (*türbe*) of Idris Baba is one of the two Ottoman mausolea that are still standing in good condition and can be visited in Hungary. The exact number of the mausolea erected during the Ottoman era of Hungary cannot exactly be determined. According to Ekrem Hakkı Ayverdi, there were at least 17 (Ayverdi, 2000: 84), according to Balázs Sudár, at least 18, however, it could be even as many as 22 (Sudár, 2013: 39, 70-91).

One of the still remaining shrines was erected by Yahyapaşazade Mehmed Pasha, the *beylerbeyi* (governor general) of Buda between 1543–1548 for the honored Bektashi dervish, Gül Baba in Buda (Ágoston–Sudár, 2002.; Yılmaz, 2013.). The second türbe which still can be visited is the one that was erected for Idris Baba in Pécs.

About the person of Idris Baba and the fact that over his tomb a 'dome', therefore a türbe was constructed, Ibrahim Peçevi and Evliya Çelebi provided data (Sudár, 2013: 9-10, 12). The exact date of Idris Baba's death is unknown, however, according to a legend about him, it could be 1592. This proves that his death must have happened after that, and his türbe was standing during the time of Peçevi in 1640, therefore the building was constructed between these dates, around the 1600s (Sudár, 2013: 43-44).

Figure 1: The shrine (*türbe*) of Idris Baba in Pécs. (Photograph: Authors, 2018)

The building's spatial organisation is similar to the other shrine which was built for Gül Baba in Buda, however the materials, and the design of the door and windows are different. The plan of the shrine is octagonal and it was covered with a hemispherical dome - as usual in Ottoman architecture of the 15th-16th centuries. The material of the walls is rubble stone masonry, with some layers of brick in irregular rows. The dome is constructed of limestone blocks and covered with tiles (Figure 1). Since the shrine of Gül Baba in Buda was constructed of limestone walls and a brick dome covered with lead, the difference in building materials is significant.

The building has an external wall surface of 130.3 m^2, an internal wall surface of 127.5 m^2 and a floor area of 44.69 m^2. It has windows on two levels, the lower ones are three square windows and the upper ones are three circular windows.

2. Brief History of Architectural Modifications

After the reconquest of Pécs, from 1695 on, the türbe was owned by the Jesuits and used as a chapel (Sudár, 2013: 52). Several modifications were implemented to the building. One of the most significant changes was an entrance with a pointed arched door frame, added to the west facade. Besides walling off the original Ottoman ones, the Jesuits opened large windows with semi-circular shutters on the north and south facades. The altar of the chapel was probably situated on the east wall.

After the Jesuit period, the building became the property of the city, and from 1793 on it was used as a gunpowder depot (Sudár, 2013: 57). At that time, a new door was opened on the southeast facade by closing the previous entrance and windows, and this was the case until the restoration of István Möller[1] in 1913 (Sudár, 2013: 61).

By the comprehensive restoration works of Möller, in addition to reopening the pointed arched doorway, the east and southeast windows were partially restored (from the inside as niches and on the outer facade as window frames) and the previously closed Baroque windows were reopened. However, the dome was only covered with cement, later shingled, and the building was not plastered.

In 1917, a series of survey drawings of the shrine was prepared by students under the supervision of Ernő Foerk[2]. Beginning in 1912, the Budapest Hungarian State High Construction Industry Academy announced the so-called 'Vacation Surveys' for its students with the supervision of Foerk. Between 17-29 June 1917 supported by the Hungarian state and the National Committee of Monuments ('Műemlékek Országos Bizottsága', MOB), Foerk supervised a study-tour with the aim of surveying the Ottoman buildings in Bács, Pécs and Szigetvár.

The survey program contained 20 buildings and details from various cities of Hungary (Budapest, Eger, Érd, Pécs, Szigetvár, Bács, Temesvár). The drawings were made by 2nd and 3rd year students of the Academy. Professor Ignác Kúnos, the eminent scholar of Ottoman language and Turkish literature, was also involved in the

survey. Some Ottoman inscriptions on the tombstones in Temesvár were registered by Semih Rüstem, who could write in Ottoman, and were translated to Hungarian by Kúnos. This proves the interdisciplinarity of the program. As an introduction, a summary text was also published by Foerk, which gives a brief functional typology of the Ottoman buildings. Despite his Turanian ideological approach, Foerk evaluated the Ottoman era by the examination of the monuments themselves, instead of by written sources. (Foerk, 1918).

The drawings of Idris Baba's türbe have been made by Foerk's student, János Sinogli. His drawings serve as important sources regarding the colorful history of the building (Figure 2). Two plans, three sections and the West elevation of the octagonal türbe have been documented. However, at that time the building was not identified as Idris's tomb, therefore as a title, only 'türbe of Pécs' was written (Kovács–Fehér, 2019).

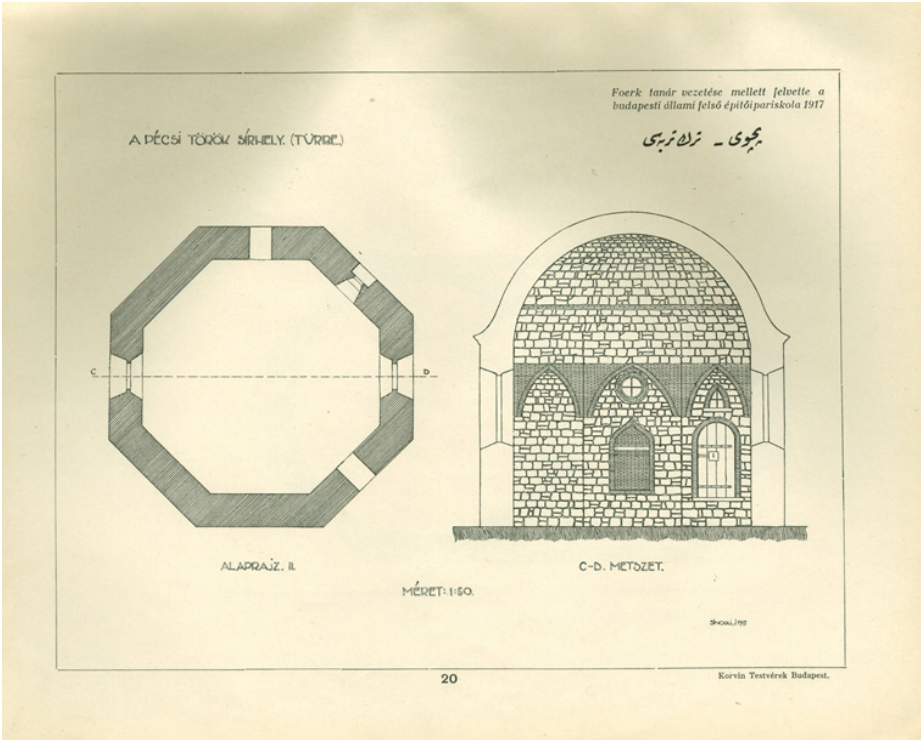

Figure 2: The survey drawing with the title of 'Turkish Tomb in Pécs (*Türbe*)' drawn by János Sinogli under the supervision of Ernő Foerk in 1917. (Source: Foerk, 2018: 20)

The result of the survey program of Ottoman buildings, as well as the activity of the Turkish students, has drawn the attention of the diplomatic representatives of the Ottoman Empire, and counsellor general Ahmet Hikmet and Abdüllatif Efendi visited the Academy in March 1918. The Yearbook has mentioned them as '*Achmet Hikmet török főkonzul Ő Exellentiája és Abdul Latif török főpap*' [His Excellency Achmet Hikmet Turkish Consul General and Abdul Latif Turkish 'Pontifical'] who were 'excessively interested in the situation of the Turkish youths' (Schoditsch, 1918: 8). The official visit has been recorded in the aforementioned yearbook of the institute. The occasion of the visit was probably the presentation of the Ottoman survey program by Ernő Foerk. According to the diary of Foerk, it was on 13 March 1918 (MMA MÉM MDK Archives, Diary of Ernő Foerk: 73).

At that time the building was owned by the Children's Hospital of the Baranya County Council (Sudár, 2013: 67). On 21 October 1955, the management of the Children's Hospital informed the Secretariat of the Council of Architecture (Építészeti Tanács) that the monumental dome of the türbe on the hospital's territory had leaked from the West side. The response letter of 11 December 1949, following the notification, obliged the hospital to repair the problematic parts of the monument, which had been used as a medicine and rolls warehouse, on the basis of Decree-Law No. 13 of 1949. In 1960, a joint plan for the restoration and tourism development of the monument was prepared by the Tourist Office of the City of Pécs and the National Inspectorate of Monuments. According to the decision on 19 August 1960, the monument together with a defined area was taken and assigned to the Tourist Office of the City of Pécs for touristic use.

In 1960, architect Ferenc Erdei made a survey on the problems of restoration of the türbe. A decision of 25 January 1961 placed the monument and the adjacent parts of the area under the management of the Pécs Municipality Tourist Office, and the Children's Hospital left the monument. In the same year, the restoration of the building began with the archaeological research of Győző Gerő and Mária Sándor (Gerő-Sándor, 1960). Prior to research, the plaster was removed from the interior and exterior surfaces of the walls, and the windows became clearly visible. During the research, all the detected, historical Ottoman windows were re-opened. Their inner surface of the frame was plastered and covered with whitewash. Also, the Ottoman doorway with straight lintel was plastered. According to the research report, fragments of inscriptions were found in the masonry filling of the original entrance. The doorway may originally have had a simple wooden or stone frame.

In several places, traces of wooden beams were visible. The windows decorated with a recessed arch facet with ogee arch were considerably small, almost regular squares. There were no overhead windows but small circular openings above them. The research report stated that in the Baroque period, presumably by enlarging one of the windows, an altar chamber was built in the shrine. At that time the Gothic

pointed arched stone doorframe and the present entrance were placed. To the left of the Christian door, there is the original Ottoman entrance. From the Baroque filling masonry of this former, several fragments of Ottoman gravestones have been excavated. After the opening of the türbe's floor, an excavation was carried out in the building between 1 and 11 November 1961 to excavate the tomb of Idris Baba. During this excavation, the skeleton of the dervish was found. The tomb was dug into the rock and partly into the topsoil above. The excavation firstly led to the identification of the soil layers in the inner area of the shrine, which consisted of "driftstone, sand fill, yellow sand, dark brown tamped earth with fragments of cup-pebble, light brown earth, lime-strip, mortar-loam rubble, lime-strip rock". The tile fragments in the soil indicate the original roofing material as tiles. The excavation clearly revealed the solution of openings and structures from the Ottoman construction period, but no intact opening frames were found.

The project for the restoration of the türbe was designed by the architect Károly Ferenczy in August 1961, based on the projects of István Cseh and Ferenc Erdei, at the same time as the construction work was started (Ferenczy, 1961). Considering the existing condition and the results of the archaeological research, the restoration work included the installation of a red conical tiling on the hemispherical dome. The exterior facades were left unplastered. The openings were finished in the original layout and form, with wired glass set into the masonry openings. Small solid bricks were used to close the windows which were not the original Ottoman ones. Based on the assessment in the plans, the research and excavation have resulted in a credible reconstruction of the Turkish state of the türbe, at least in theory (Ferenczy, 1961). The structural design and dimensions of the door and window openings and the fact that the interior walls were originally plastered and whitewashed could be established with complete authenticity. The walls were probably decorated with painted inscriptions, judging from the fragments recovered. The original restoration project would have included whitewashing in the interior facade, but this was not carried out. The floor is now covered with concrete.

In the former survey, the designers pointed out that the lack of direct study of the Turkish monuments made it difficult to carry out a detailed restoration from a theoretical and methodological point of view. For this reason, the project did not include the restoration of the dome, the reconstruction of the entrance door, and the complete reconstruction of the window structure.

During the years of 2020-2021, heritage conservation and preservation works were carried out on the türbe by the cooperation of the Gül Baba Heritage Foundation and the NÖF (National Heritage Conservation Development Nonprofit Ltd) which manages the building as a property of the Hungarian state.

3. The Methodology of the True-To-Form Survey and the TLS Scanning Applied on the Building

In 2018 a thorough architectural survey and scientific research of the shrine of Idris Baba was carried out by the authors. For this documentation and research, true-to-form survey methodology was applied. True-to-form survey means that all the measurements and data of the buildings are recorded in a coordinate system that is independent from the building itself. In Turkey, the methodology is also known as an analytical survey. For the data acquisition phase of the survey of the shrine, a Leica total station and a Leica BLK360 laser scanner were used. Data processing and the final drawings were created with Autodesk Recap Pro and AutoCad software. Based on the true-to-form survey drawings and the overview of the historical sources and archives, the periodization of the building could be completed in detail.

The survey of historic buildings always played a key role in architectural education and monument preservation in Hungary. From the establishment of the Royal Joseph University in 1871, Imre Steindl, the first professor of the Department of Architecture, followed the educational model of his Vienna master Friedrich von Schmidt. One of the main principles of this educational model was to learn, examine, draw, and measure historic buildings during summer survey camps. As a result of these regularly organized summer programs between 1874 and 1882, the Association of Architectural Students of Technical University under Steindl's leadership published the survey drawings of several Hungarian monuments with the title of '*Magyarországi Műemlékek*' (Monuments in Hungary) in 1878 (Magyarországi Műemlékek, 1878). The method of survey meant carefully constructed manual drawings reaching especially sophisticated structural and esthetical standards in the details. Despite the virtuosity of the drawing technique, the accuracy of these surveys can be questioned, because the drawings rarely represented the real state of the buildings or ruins. Often substituted versions or even modifications in a purist manner were drawn instead (see Fehér, 2017).

The approach to survey has changed radically in the next few decades. Breaking away from purist principles, István Möller applied surveys interpreting the buildings in their real state, taking into account all the historical layers. His scientific approach in surveys served his research on monuments, prepared prior to his restoration projects. In 1910 Möller was sent by the MOB to maintain and restore the gunpowder store of the city of Pécs (the former shrine of Idris Baba), he created several survey sketches, that now serve as important graphic sources for the research and periodization (MMA MÉM MDK Archives, Notes of István Möller: 303/2).

Möller often involved his students in his survey and restoration projects, like Kálmán and Géza Lux, Károly Csányi, or Ödön Dümmerling, who adopted and followed his principles. Ernő Foerk, who led the student summer camp in 1917 for the survey of 20 Ottoman monuments, including the shrine of Idris Baba in Pécs, was also Möller's student.

During the last two decades the methodology of monument survey has been radically renewed by the application of the so-called true-to-form survey. With this method, all the dimensions and data regarding the geometry and the physical state of the building are recorded in an absolute coordinate system that is independent of the building. By this approach, idealization, abstraction, or preliminary conceptions regarding geometry can be avoided. The true-to-form survey also means the systematic examination of the building structures, and to record on the drawings each sign of historical constructions, modifications, and distortions. In this manner, conclusions about the history of construction can be drawn on a firmer basis, in a non-destructive way.

Several tools can be applied to create an absolute coordinate system for the true-to-form survey. The manual way for establishing an independent coordinate system is hanging a cord net stretched on the building, but it is less and less used since digital technologies revolutionized the operation (about the methodology of traditional survey methodology see Hajnóczi, 1956). True-to-form survey also demands a careful drawing technique. An essential part of the process is the production of site drawings, which must be sufficiently accurate and detailed to be able to record graphic and textual observations regarding the state and history of the building (e.g. materials, cracks, associated structures, technical parameters, etc.). This meticulous work provides a unique opportunity to thoroughly learn and understand the building with non-destructive analysis. The traditional true-to-form survey with manual drawing was complemented by digital and laser-based survey technologies in the last two decades. With proper site drawings, the absolute coordinate system can be easily provided by a laser total station for instance. The on-site manual drawing also can be worked out in a preliminary determined digital coordinate system. In most of the cases the final drawings are created with CAD programmes, based on the on-site sketches, notes and data recording.

Laser scanning certainly meant the revolution of monument survey. Laser scanners create digital point clouds by recording large amounts of data (coordinates and other features of points) in a relatively short time on the spot. After accurate data processing, sections can be generated from the point clouds (Figure 3), which can reveal objective information about the geometry and hidden evidence (e.g. former deformations of the building) of construction history in a non-destructive manner. Laser scanning cannot detect any traces behind the surfaces, but by its accuracy, such details can be observed, that are not visible to the naked eye. For instance, by the exact survey of the 3D geometry of the building, non-visible distortions and deformations of the structure can be detected, which can refer to former modifications or different construction periods.

The technology and approach of true-to-form survey are especially evaluated in the research of historical buildings, monuments, and represents the important

source of Building Archaeology ("Historische Bauforschung (see Mader, 1989; Schuller, 1990; Mezős, 2008; Halmos-Marótzy, 2010; Krähling-Fehér, 2019). From the most important survey and research projects of the Department of History of Architecture and Monument Preservation of Budapest University of Technology and Economics first and foremost the true-to-form survey and 'Bauforschung' of the Marionett Opera and Orangerie of the Eszterházy Palace of Fertőd (Hungary) is to be mentioned (Krähling et al, 2006a; Krähling et al, 2006b). Following the tradition of summer survey camps, the department usually organises summer programs for students with survey experience. Among others, the true-to-form survey and scientific research of the building parts of the Cathedral of Alba Iulia (Romania) (Halmos-Marótzy, 2015; Halmos-Marótzy, 2018), several Romanesque churches of Burgundy (France) (Daragó-Bakonyi, 2011; Daragó-Bakonyi, 2015a; Daragó-Bakonyi, 2015b), the medieval Tour d'Argent of l'Isle-sur-la-Sorgue (France), the Historical Building of the Transylvanian Ambassadors in Istanbul, the White Tower ('Fehér torony') of the Royal Castle of Esztergom and the Cistercian Abbey of Bélapátfalva can be mentioned. Similar to the shrine of Idris Baba, the true-to-form survey of the shrine of Gül Baba and the canopy shrine of Ilok (Croatia) were also carried out with laser scanner by Gergő Máté Kovács.

For the true-to-form survey of the shrine of Idris Baba, the independent coordinate system was provided by the total station and the laser scanner (Figure 3), while the final drawings were created with CAD programs. The combination of the data from the two laser based equipments resulted in a firm base for the survey drawings. The total station can record individually selected points on the building, while the laser scanner can collect huge amounts of data without selection. This means that individual points cannot be identified in point clouds, so the application of discrete points measured by the total station was especially useful for further photogrammetry, which was additionally used for the more detailed facade drawings.

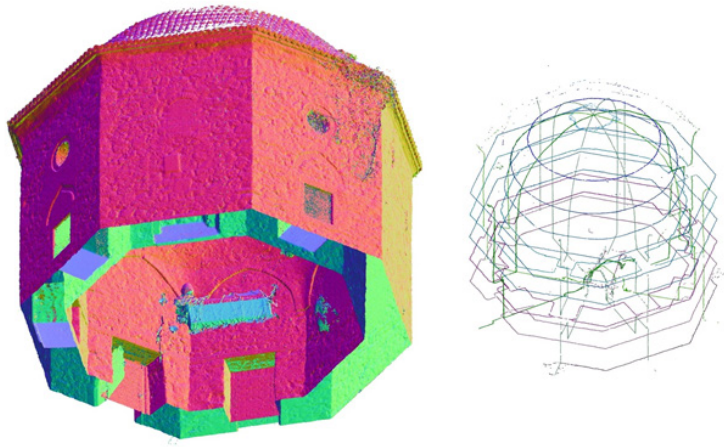

Figure 3: Point cloud of the shrine of Idris Baba with generated horizontal and vertical sections. (Source: Authors)

Compared with the former survey drawings of the shrine, the true-to-form survey of 2018 can be considered as the most detailed and accurate one so far. The first survey was carried out by Möller in 1910, who drew sketches and took notes about the most important measurements (MMA MÉM MDK Archives, Notes of István Möller: 303/2). In 1917, under Foerk's supervision János Sinogli created esthetic drawings of the shrine, with valuable information about the number and shape of the windows and the entrance, but without accuracy. These drawings are more idealised, concerning for instance the wall texture (Foerk, 2018: 20; MMA MÉM MDK Plan Collection, 13212). Later, in 1942 Gyula Gosztonyi surveyed the building (MMA MÉM MDK Plan Collection, 4681). He distinguished the main modifications of the 17-18th and 19-20th centuries in the wall texture of the inner and outer facades, and he drew quite detailed sections with periodization, however, the stones and ashlars were not represented. The survey drawings for Ferenczy's restorations in 1961 were similar to Möller's pragmatic sketches, with the accurate measurements of the relevant details (MMA MÉM MDK Plan Collection, 14807, 17758). During the survey and research of 2018, the facades of the shrine were drawn stone by stone, with the exact masonry texture. This allowed us to identify the borders of modified surfaces during the different periods of the building in accordance with the archives and historic sources. By the examination of the wall textures (Figure 4-11), the proper graphic image of each different period could be individually represented (Figure 12).

4. The Description and Results of the Survey in 2018

By the detailed investigation of the true-to-form survey, several architectural details, which were observed, could be juxtaposed with the modifications known from the history of the shrine.

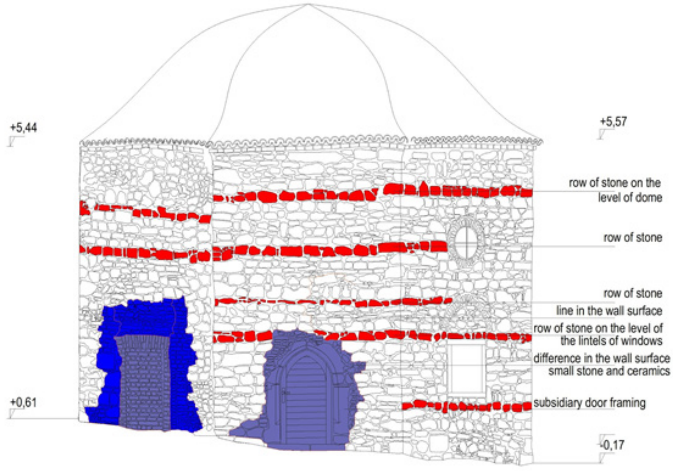

Figure 4: Analysis of the west facade. (Drawing: Authors. Red: Ottoman stone rows; blue and purple: structures added after the Ottoman times.)

On the west facade (Figure 4) there is the entrance with a pointed arch in stone framing, opened by the Jesuits when they converted the building into a chapel. The Gothic stone frame was used secondary in the shrine. Its origin is totally obscure. Around the portal, the boundary between the former Ottoman masonry and the material of the subsequently built opening is sharply demarcated. Above the entrance, there is a series of levelling stones running in front of the wooden lintel beams across the entire facade. In addition, three sharply contrasting wall parts of coursed stone and bricks are visible on the facade, the uppermost of which extends at the inner shoulder height of the dome. This wall is located at the height of the bracket of the brick-lined vault visible on the inner facade and supports the dome. The profile of the cornice crowning the facade needs to be restored.

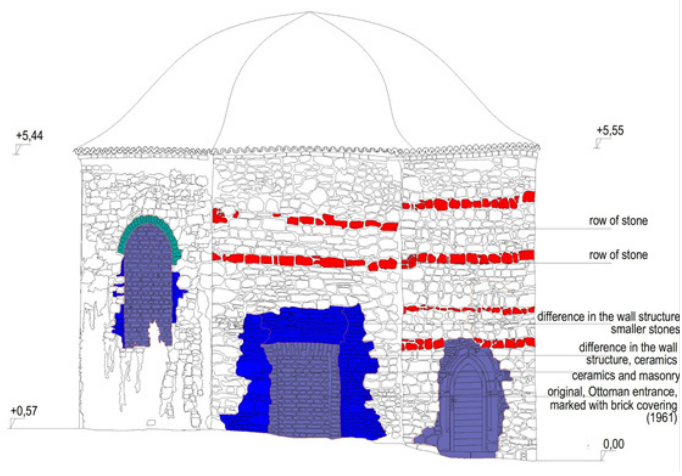

Figure 5: Analysis of the northwest facade. (Drawing: Authors. Red: Ottoman stone rows; green, blue and purple: structures added after the Ottoman times.)

According to Győző Gerő, the original, Ottoman-era entrance door was on the northwest facade (Figure 5). Therefore, during his restoration works in the 1960s, this surface was marked with a small solid brick wall. The flat arch of the door is horizontal and is faced with small bricks in front of wooden lintels. On each side of this brick surface, there is a sharply defined contour. This may have been created to fill a gap left by the removal of a possible front roof, or a small portico. Therefore, according to the wall structure, there might have been a front roof, however, further research is required to support this assumption. The question of a possible front-roof over the entrance door, which could also be based on Balkan or Anatolian analogies, could be clarified by archaeological excavation of the ground in front of the facade if any foundations are found.

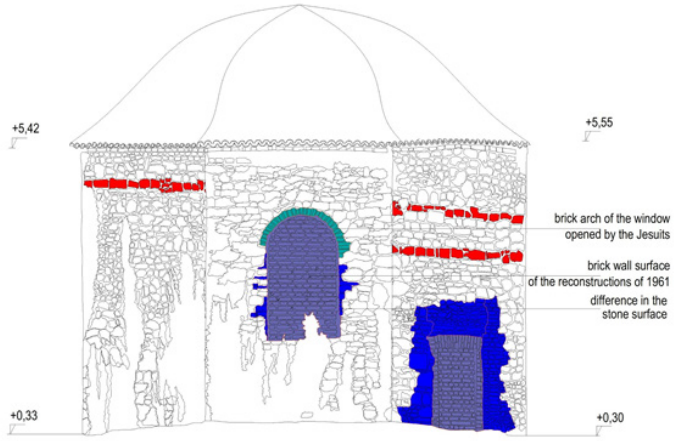

Figure 6: Analysis of the north facade. (Drawing: Authors. Red: Ottoman stone rows; green, blue and purple: structures added after the Ottoman times.)

On the north facade (Figure 6), there is a former semi-circular arched window closed with small solid bricks. This window was opened when the building was a Jesuit chapel. On two sides, the gap between the Ottoman-era masonry and the brick infill is marked by a replacement of the rubble stone. The upper brick arch of the formerly walled opening can also be observed.

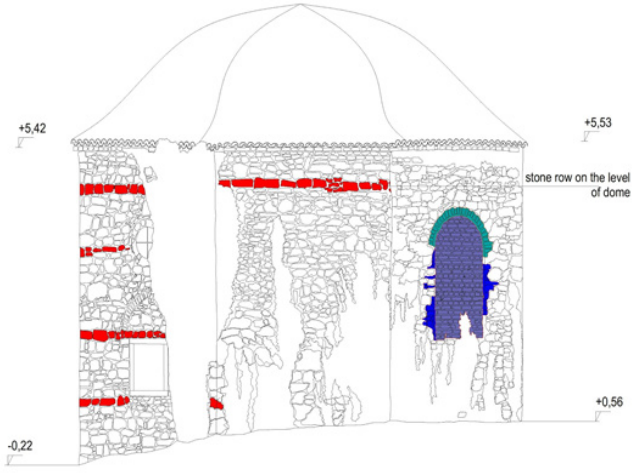

Figure 7: Analysis of the northeast facade. (Drawing: Authors. Red: Ottoman stone rows; green, blue and purple: structures added after the Ottoman times.)

On the northeast facade (Figure 7) a sharply horizontal levelled row of stones extends at the inner shoulder height of the dome. The dome is supported by pointed arches in each corner in the interior. From the exterior, the facade is partially covered with vegetation.

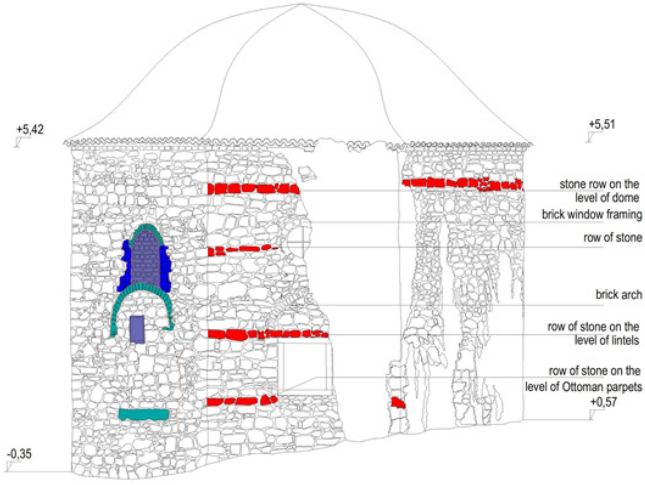

Figure 8: Analysis of the east facade. (Drawing: Authors. Red: Ottoman stone rows; green, blue and purple: structures added after the Ottoman times.)

On the east facade (Figure 8), a horizontal stone row can be detected which indicates the parapet of the Ottoman-period window, as well as the stone row which is running in front of the wooden lintel above the windows.

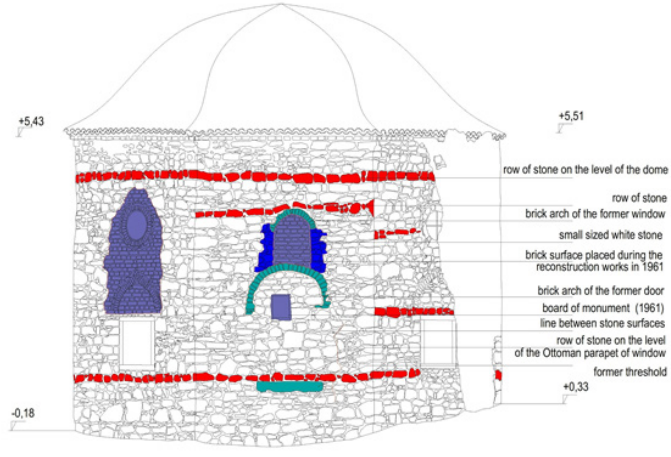

Figure 9: Analysis of the southeast facade. (Drawing: Authors. Red: Ottoman stone rows; green, blue and purple: structures added after the Ottoman times.)

On the southeast facade (Figure 9), a relatively wide stone can be seen which was the threshold of the doorway, when the building was used as a gunpowder store. Above it there is the small solid brick arch, which was the frame of a window when it was used as a Jesuit chapel. The geometry of the lintel of this small upper window allows the assumption that in the Jesuit period, or even already in the Ottoman era, there could be a circular window. By the survey and other Ottoman shrine examples, it cannot be ruled out, that the arch could be the upper frame of an Ottoman window, but it can also be assumed, that the window was opened in one of the later periods. It is possible that the current shape of the window (which is now walled off) with a semi-circular arch was created by István Möller in 1913.

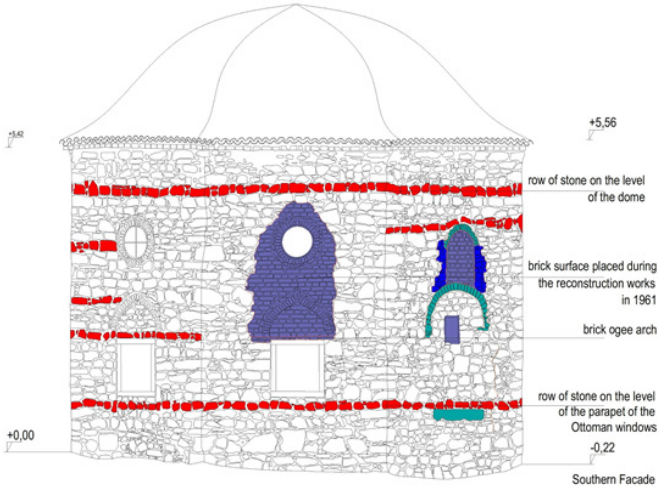

Figure 10: Analysis of the south facade. (Drawing: Authors. Red: Ottoman stone rows; green, blue and purple: structures added after the Ottoman times.)

On the south and southwest facades (Figure 10-11), the lower leveling stone row forming the parapet of the Ottoman-period windows can be observed. Above the Ottoman ones, the window of the Jesuit chapel has been covered with small solid bricks during the 1961 works. The profile of the cornice crowning the facade is partially visible and needs to be restored.

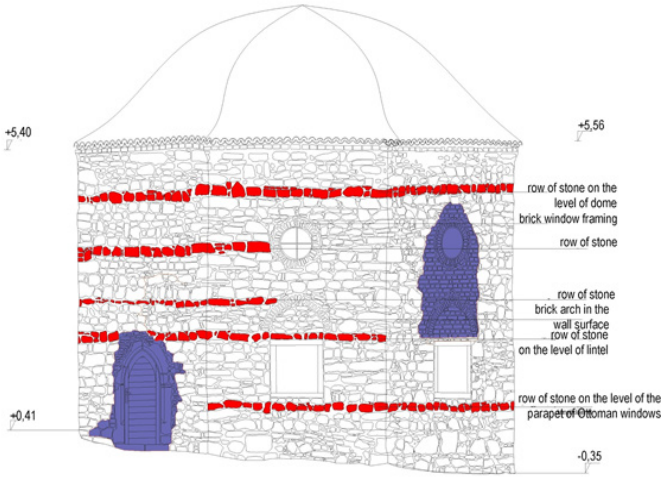

Figure 11: Analysis of the southwest facade. (Drawing: Authors. Red: Ottoman stone rows; blue and purple: structures added after the Ottoman times.)

As far as the historic sources about the southwest facade are concerned, there is a quite interesting postcard from about 1936, showing the outer southwest wall and the inner side of the East wall (Zemplén Museum, Szerencs, 0171156). On the one hand, the interior photo represents an altar, which is in accordance with the inscription of the postcard: 'Pécs. Chapel of the State Children's Home'. On the other hand, the photo of the Southwest facade shows a niche on the wall with an ogee lintel, but without any parapet. The photograph is especially confusing, as in the examination of the masonry texture of the façade, no signs of a former door can be observed. The wall texture is entirely homogeneous below the parapet of the current window. The function and time of creation of the door-like niche of the photograph are also obscure because all the rest of the archive photos of the building from the era before 1945 shows the facade as rubble masonry with a smooth surface, articulated only by the brick ogee arch (but not like a niche), and the upper circular windows. Another graphic representation of the door-like niche can be found in one of the figures of Pál Zoltán Szabó's book with the title of 'Turkish Pécs. 1543-1686' (Szabó, 1941: 33). The figure represents an artistic ink drawing of some Ottoman monuments of Pécs. The accuracy of the image can certainly be questioned, however, the representation of the door-like niche cannot be accidental.

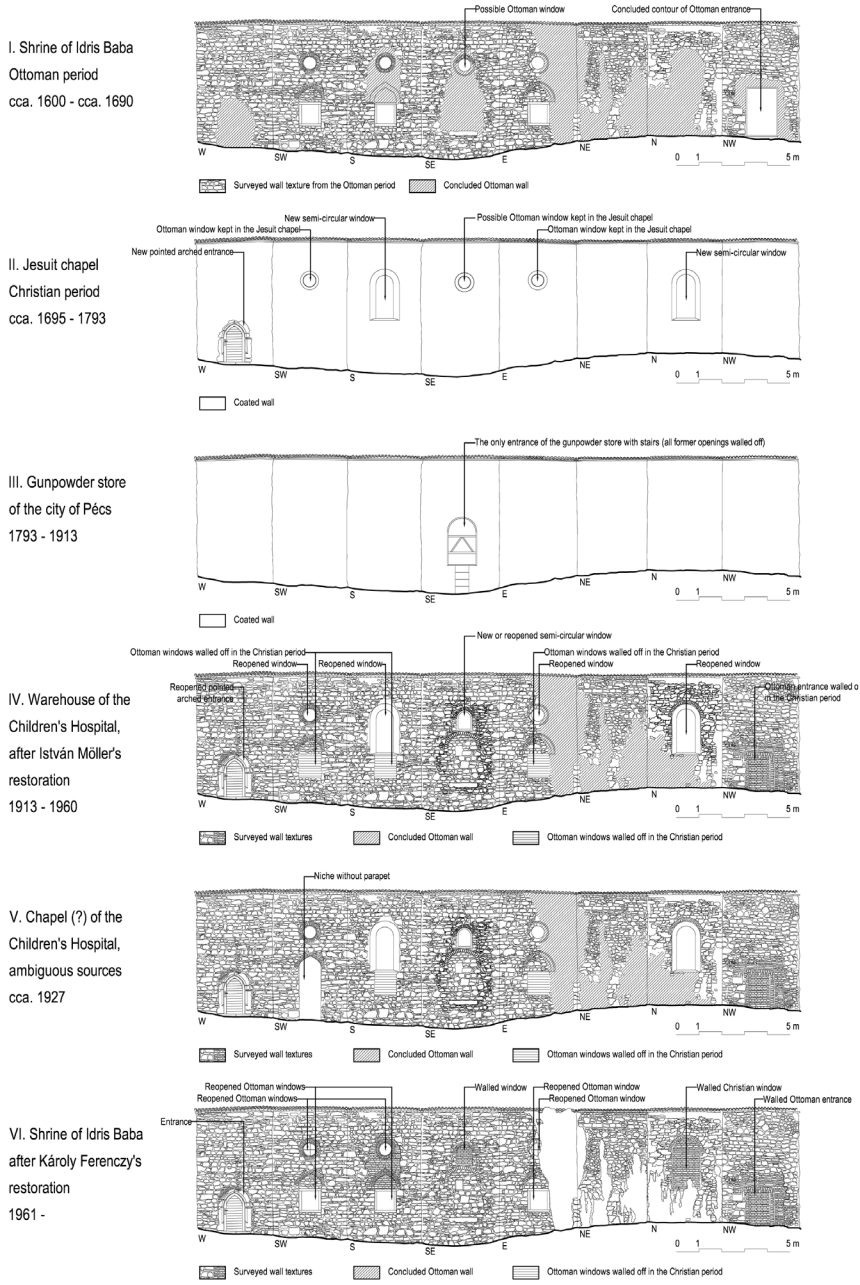

Figure 12: Different periods of the shrine during its history, on the basis of the survey of 2018 and the archive sources (Source: Authors)

During the true-to-form survey of 2018, a detailed plan and a cross-section of the building were drawn. Inspecting the plan and the cross-section, the units of a historical Ottoman measurement can be detected, which is the unit of the **arşın**.

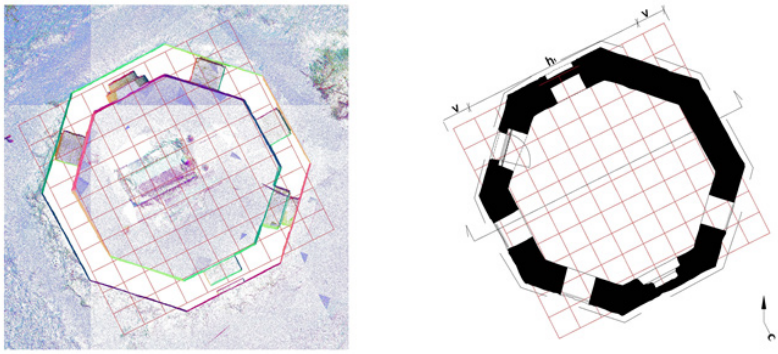

Figure 13-14: The plan of the shrine of Idris Baba: the horizontal orthogonal photo based on the point cloud generated by TLS scanner, and the survey drawing based on the point cloud with a modular grid system of the "*arşın*" unit. (Survey and drawing: Authors, 2019)

During the classical era of the Ottoman architecture, the 16th century, the "*arşın*" unit was a characteristic feature of Ottoman architecture. This unit was represented by a modular grid system that was recorded in the sixteenth-century plan versions of the türbe at Çorum (Necipoğlu-Kafadar, 1986.) The examination of the two türbes in the territory of Hungary that survive today in good conditions, reveals that their dimensions were determined following the arşın units (Kovács-Rabb, 2020). According to the survey of the TLS-scanner, the modular grid system based space, determined by the arşın module can be accurately identified to the surveyed plan of the türbe of Idris Baba (Figure 13). The contours of the interior conform with a modular grid system of 8 x 8 arşıns, demonstrating that its interior was determined in the arşın system (Figure 14).

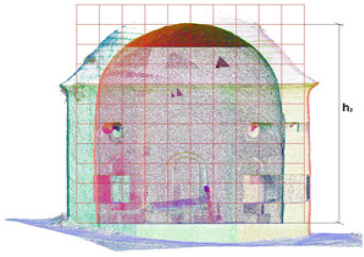

Figure 15: The section of the shrine of Idris Baba: the horizontal orthogonal photo based on the point cloud generated by TLS scanner with a modular grid system of the *arşın* unit. (Survey and drawing: Authors, 2019)

The thickness of the wall construction of the *türbe* is 1 *arşın* 4 *parmak*s and the vertical dimensions of the building reveal that, in the case of Idris Baba, the height of the interior at the highest point in the symmetry axis (h_2) is 10 arşıns (Figure 15). (Table 1).

Table 1: The representative dimensions, and the construction material of the türbe of Idris Baba.

Characteristic	cm	arşın
the horizontal dimensions measured at the level of the lower window line (h_1)	610 – 615	8
the vertical dimensions of the interior measured on the symmetry axis of the dome. (h_2)	756 – 759	10
thickness of the wall (v)	86 – 89	1 1/6 (1 arşın 4 parmaks)
material of the wall	rubble stone wall with irregular arrangement, and surface	

Consequently, it can be assumed that the dimensions of the türbe were determined according to these units during its construction. Thus, the use of arşın units in structural and spatial dimensions, which can be observed in the true-to-form survey, can be correlated with written commands, drawing documents, and architectural units used in the area of Ottoman-dominated Hungary. Therefore the 15th and 16th century buildings were constructed at the peripheries of the empire, in the territory of Hungary, the shrines followed the official Ottoman standards in their plans, since they were mainly constructed by local material and local masters, while the construction details often differed.

5. Conclusion and Directions of Further Research

The shrine of Idris Baba in Pécs is one of the two, still standing Ottoman mausolea in the territory of Hungary. After the Ottoman era in Hungary, several modifications were fulfilled in the building both in its general architectural features and in its details. However, during the 20th century, as the result of the different monument preservation activities, the building regained its general Ottoman character again.

As it was described above, several detailed surveys of the building have been examined, providing an accurate picture of the features through the several modifications of the building. The surveys have implemented different methodologies, and as a result, the traces of the several transformations could be identified. Besides this, a number of questions could emerge providing further information about the possible original architectural features of the building. These aspects shall be researched in an interdisciplinary way - with the involvement of archaeology and building archaeology - analysing the stone material as well as excavations in the surroundings. The analyses

shall be concerned with the original shape of the Ottoman entrance. As an important feature in relation to the entrance, the possibility of the existence of a front roof (son cemaat yeri) could be analyzed, since according to the wall structure the existence of it cannot be precluded, but a detailed excavation of its environment could verify it if any foundation could be found. The analyses have clarified the original Ottoman parapet of the windows, therefore during a monument preservation project, its original space could be restored. On the top of the dome, the 'alem' should also be reconstructed. Since the use of the unit of 'arşın' had been analyzed on the building, during a possible restoration project, this unit could be applied.

The detailed true-to-form survey drawings of the building contribute to record the marks of the architectural modifications and propose ideas about the eventuating reasons. With the comparison of the graphic documentation and analyses with the written sources, a complex historical chronology can be set up for the modifications in the structure. This can serve as a basis for restoration works and complex monument preservation projects.

Endnotes

[1] István Möller (Mór, 9 April 1860 - Budapest, 30 September 1934), architect, architectural historian, head of the Medieval Department of the Royal József Polytechnicum, architect and a full member of the National Committee for Monuments, member of the Hungarian Academy of Sciences. Möller studied in Vienna and Karlsruhe. A key figure of the "second phase" of Hungarian monument preservation, his work consisted of the preservation and restoration of the most important buildings of the Hungarian medieval built heritage, notably the Church in Zsámbék, the Cathedral of Gyulafehérvár and the restoration of the Vajdahunyad Castle, but he also worked on the preservation of several Ottoman monuments, including the Gül Baba türbe in Buda, or a building, related to the Hungarian history in Turkey: the dining hall of Ferenc Rákóczi II in Tekirdağ. See more: Fehér – Halmos 2016., Gyetvainé Balogh 2010., Sarkadi 2010., Fodor-Kovács-Kövecsi-Oláh, 2018.

[2] Strongly inspired by the the approach of Friedrich Schmidt and Imre Steindl, Foerk has started his career at Joseph Polytechnicum, and at Building Industry Academy (Építőipariskola), which has later become the Budapest Hungarian Royal National High Construction Industry Academy (Budapest Magyar Királyi Állami Felső Építőipari Iskola). At the same time in 1911 he became the member of the National Committee of Monuments (Műemlékek Országos Bizottsága, MOB). His most significant publications had a close connection to his educational activity, presenting the survey of several historical monuments. Besides the survey program in the territory of Hungary, Foerk has participated in study tours in the Balkans. The tours were organised officially by the Hungarian Academy of Sciences. The main organiser was Pál Teleki, who was the essential member of the Turanian Society's vice-presidency.

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