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## RESTORATION AND DISPLAY OF THE MOSAIC FROM THE OLD EPISCOPAL BASILICA IN STOBI



**Keywords:** *Mosaic conservation, aerolam panels, re-laid mosaic, steel platform, air isolation.*

**Abstract:** *The paper focuses on the project for conservation and restoration of the mosaic from the Old Episcopal basilica in Stobi, which had been removed from its original position in 1991. The aim of the project was to relay the mosaic in situ in a way that will provide the best conditions for its further protection and maintenance.*

*Considering the complex conditions in which the mosaic was originally found (four meters below the ground level of the new basilica that was erected at the same place, and surrounded with the foundation walls from that basilica), we decided to build a free standing steel platform that will not affect the statics of other parts of the Episcopal complex. At the same time it will provide protection for the architectural remains discovered in the strata below the mosaic.*

*Re-laying the mosaic sections on this platform provides complete air isolation which eliminates all damages that can be caused by moisture, vegetation, microorganisms and salts. The present condition of the mosaic also allows avoiding damages caused by annual reburials of the mosaic and call for much cheaper overall maintenance.*

### Introduction

The Old Episcopal Basilica was discovered in the 1970s during the course of the American-Yugoslav project for archaeological excavations in the ancient city of Stobi. In this period the archaeologists had excavated trenches below the central and south aisle of the Basilica of the Bishop Philip, which led to the discovery of an older building, situated 4.5 meters below the basilica's floor level, decorated with floor mosaics and fresco paintings. The newly discovered

building and its function were difficult to define, and the label 'Building A' was given to it<sup>1</sup>.

Archaeological excavations in the area continued through the 1980s when another three-aisled church was discovered, assumed to be the oldest Episcopal Basilica built in Stobi<sup>2</sup>. The building in its entirety is located below the nave and partially under the south aisle of the Philip's Basilica. So far excavations have revealed the central and north aisle as well as part of the south aisle (Fig.1 – 2), showing three different building phases and reconstructions dated to the fourth and beginning of the fifth century<sup>3</sup>. All the walls in the church, including the ceilings in the side aisles were painted in four distinct phases, while the mosaic decorations in the nave<sup>4</sup> were laid in three different phases<sup>5</sup>. The mosaics from the first and second

<sup>1</sup> J. Wiseman, Dj. Mano-Zisi, Excavations at Stobi, 1973-1974, *Journal of Field Archaeology* (1974), Vol. 1, No. 1/2, 117-148; J. Wiseman, Dj. Mano-Zisi, Stobi: A City of Ancient Macedonia, *Journal of Field Archaeology* (1976), Vol. 3, No. 3, 283-293; J. Wiseman, Stobi in Yugoslavian Macedonia: Archaeological Excavations and Research, 1977-78, *Journal of Field Archaeology* (1978), Vol. 5, No. 4, 395-413.

<sup>2</sup> B. Aleksova, The Old Episcopal Basilica at Stobi, *Archaeologia Jugoslavica*, Vol. XXII-XXIII, Beograd 1982-83, 50-62.

<sup>3</sup> In its first building phase the church has measurements of 30 meters in length and 17.5 in width. In the second phase, the eastern walls of the aisles as well as the presbytery with the apse were demolished for the purpose of extending the size of the church 5 meters eastward. The last phase shows that the collapsed apse was used as material for supporting the new altar screen and is resting below the mosaics laid in the last phase. The third building phase did not create enlargement changes, but slight inner reconstructions such as enhancement of the stylobats.

<sup>4</sup> The floors of the side aisles were covered with pink mortar.

<sup>5</sup> M. Tutkovski, Paintings in the Old Episcopal Basilica

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phase were laid in opus tessellatum, while the third phase is a combination of opus sectile and opus tessellatum<sup>6</sup>.

The Old Episcopal Basilica was functioning until the third quarter of the fifth century, when it was completely dismantled and the foundations for the new monumental basilica of Philip, the bishop of Stobi, were laid at the same place, on the same level.

### Previous interventions

Following the discovery of the Old Episcopal basilica, measures of preventive mosaic conservation were taken by way of edging repairs and filling the lacunae for basic protection and partially cleaning the mosaic's surface<sup>7</sup>. The mosaic remained in such condition over the course of the following years, until the project for its restoration and archaeological excavations below it was conducted. In 1991 the mosaic was lifted from its original position<sup>8</sup>, while the process of cleaning the reverse side of the mosaic sections took place in 1998. In the meantime, trench excavations on a smaller scale were conducted, detecting remains from older buildings below the mosaic<sup>9</sup>, and during this period the complete frescoes from the north aisle were uncovered, and partially from the south aisle.<sup>10</sup> These were the last activities concerning the Old Episcopal Basilica, leaving its condition unchanged for over 20 years.

### Archaeological excavations

In 2010, NI Stobi began a long-term project aiming for complete archaeological investigations, conservation, restoration and presentation of all parts and elements of the Episcopal basilicas and the baptistery. Namely, in the period of 2010-11 restoration work was done over sections of the wall paintings<sup>11</sup>,

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in Stobi: Analyses of the Technical-Technological Characteristics, *Folia Archaeologica Balcanica*, Vol IV, Skopje 2018, 377-405.

<sup>6</sup> Section of the floor where mosaics were laid in opus sectile, has only the impressions of tiles in the mortar as an indication of their presence.

<sup>7</sup> During this period the massive covering construction was built over the nave of Philip's Basilica, which also serves to protect the mosaic from the Old Episcopal Basilica.

<sup>8</sup> In the detachment process the mosaic was faced with organic adhesive and hemp cloth.

<sup>9</sup> B. Aleksova, *Loca Sanctorum Macedoniae: The Cult of Martyrs in Macedonia from the 4th to the 9th Centuries*, Skopje 1997.

<sup>10</sup> The frescoes covering a surface of 100 m<sup>2</sup> were detached from the walls of the basilica in 2004.

<sup>11</sup> M. Tutkovski, Conservation and Restoration of the Wall Paintings from the Episcopal Basilica, *Early Chris-*

and in 2012 archaeological excavations began in the area below the mosaic level in the nave of the church (Fig.3). The main objective was to gain understanding of the elements needed to create a strategy for re-laying and final presentation of the mosaic.

With the archaeological project of 2012, the area below the mosaic was completely excavated with the exception of a small area in the west part of the nave, excluded for the purpose of allowing future revision excavations. Analyzing the results of the excavations showed the following elements having an impact on the ensuing restoration processes:

Over the course of the excavations it was established that the northern half of the nave is constantly exposed to sources of moisture, detected through all the layers from the most upper down to the bedrock (Fig.4);

Few older architectural constructions were detected, which are difficult to define at this point of the investigations in order to receive proper valorization;

The natural unlevelled surface of the terrain marks a decline from 1 meter below the mosaic level on the west, up to 3 meters on the eastern end.

### Re-laying the mosaic sections

The archaeological excavations provided the information needed to devise the final project for presentation of the mosaic, which posed the problem of determining the most suitable method of re-laying the mosaics to their original position. Analyses testing few distinct methods were made, the results of which will be shortly summarized.

The method of re-laying the mosaic sections directly into fresh mortar was immediately dismissed, due to lack of descriptive, technical and photo documentation of the mosaic detachment in 1991, making this method unattainable. Instead, we decided to place the mosaic sections on supporting panels, composed of aluminum honeycomb core between thin layers of fiber glass impregnated with epoxy resin – Aerolam<sup>12</sup>. A thin layer of epoxy resin was spread over the panels, and a layer of crushed stone was added for a firmer grip to the mortar in which the mosaics were to be laid. The mortar applied to the mosaic sections was created using a formula obtained by testing and analyses of the mortar originally used as mosaic bedding layer<sup>13</sup>. Following this process, in 2013 the

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*tian Wall Paintings from the Episcopal Basilica in Stobi*, Stobi 2012, 37-40.

<sup>12</sup> Aerolam panels are 1 inch thick (2.54 cm). Thickness including the mosaic is 5.54 cm.

<sup>13</sup> The new mortar consists of 1 part lime, 1.5 part sand, 1.5 part crushed brick and small amount of white cement (10%).

mosaic sections covering an area of around 160 m<sup>2</sup> in their entirety, were placed on aerolam panels.

Simultaneously, options were examined on creating the supporting structure which would be placed inside the basilica for re-laying the mosaic panels. After reviewing the benefits and drawbacks of the traditional usage of a concrete slab, the possibility of constructing a free standing steel platform having the role of supporting the mosaic came into consideration.

Placing a concrete slab in the nave of the basilica means that the entire area under the mosaic, measuring around 300 cubic meters, would have to be filled with dirt and gravel, compacted layer by layer. This process is required in order to create firm support for placing the massive concrete slab<sup>14</sup> which covers an area of 180 m<sup>2</sup>. In our case, the use of this method has many disadvantages which could prompt serious negative consequences, such as:

The architectural structures beneath the mosaic would be sealed, and therefore destroyed;

The filling layer and the concrete slab will create pressure on one of the walls of Philip's Basilica and possibly affect the building's statics;

The concrete slab cannot prevent intrusion of moisture, which in turn means there would be no way to prevent the occurrence of ice, vegetation, microorganisms and salts;

The need for annual reburial of the mosaic would remain, leaving the surface vulnerable to new damages;

The entire process is not reversible;

At least 6 months would be necessary to finish this task;

High cost of the project (24.000 €)<sup>15</sup>.

On the other hand, the freestanding platform would be positioned over piers dug into bedrock, therefore leaving the surrounding buildings undisturbed, which is one benefit among others provided by the use of this method rather than using a concrete slab (Fig.5):

The architectural structures under the mosaic would remain preserved and presented at the same time;

The platform would not affect the surrounding structures;

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<sup>14</sup> Instead of a concrete slab, there is the alternative of using a support composed of hydrostatic mortar (lime, sand and crushed brick), however, its use will result with the same drawbacks, with the exception of handling the emergence of salts.

<sup>15</sup> The costs have been calculated based on our previous experiences with similar projects.

By way of allowing air circulation, all sorts of damages that are caused by humidity, vegetation, microorganisms and salts would be prevented;

Annual reburial would not be necessary<sup>16</sup>;

The process is completely reversible;

Low cost of the project (12.000 €).

The analyses made pertaining all aspects of restoration, presentation and further maintenance on the mosaic have shown that the latter method would prove more applicable to this project, namely, placing the mosaic sections over a free-standing platform.

### **Constructing the platform and re-laying the mosaics in situ**

The platform has three constituents: concrete bases, primary and secondary construction. The concrete bases carry the primary construction, built from steel profiles in  $\Pi$  shape, over which the secondary construction shaped as a steel grid holds the mosaic sections. Prior to assembling, all the steel components were covered in double layers of anti-corrosion varnish, to which another layer was added after the construction was finalized.

The task of installing the platform began by digging and laying concrete foundations, which measure 100x100x100 cm<sup>17</sup>. Cast iron reinforcement bars were installed inside the concrete piers, having horizontal steel plates placed over them and secured with bolts (Fig.6). In this way, the entire construction above the concrete bases has the attribute of being detachable, thus remaining fully within the principles of reversibility. The vertical beams (10x10cm) are welded to the steel plate, bearing the horizontal beams (20x10cm) which in turn are the base of support for the secondary construction.

The secondary construction is in the shape of a grid with rectangular sections measuring 69 x 69 cm. It is built up of 9 rows of steel profiles (10x5cm), placed in line with the axis of the basilica. All of them are welded to the bearing partition of the primary construction, and have smaller steel profiles (4x4cm) attached in between and creating the grid. There were additional smaller profiles welded as well (10x5cm)

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<sup>16</sup> In the course of the winter months, the mosaic floor would be covered with plastic sheets, with the sole purpose of protection in the event of leakage from the roof.

<sup>17</sup> The platform is placed over 11 concrete foundation piers, with the northeast corner of the structure placed directly on top of the apse from the first building phase. In a similar fashion, profiles of the secondary construction are situated over the compacted earth layer which originally supported the mosaic.

to the southern and northern edges of the structure for the purpose of following the outer preserved contours of the mosaic (Fig.7).

The entire bearing structure was constructed in two parts (eastern and western), created identically and with the use of the same materials. The need for creating the bearing structure in two parts is due to adequate presentation of the three different phases of the mosaic, namely, the original leveling of the mosaics from the first and second phase shows a downward inclination of 30 cm from west to east, while the third phase mosaic descends 5 centimeters in the opposite direction. Therefore, dividing the entire supporting structure into two parts proved necessary, as to providing proper installation as well as presentation of all the mosaics in their original position (Fig.8).

The platform construction was finished in 12 days, after which steps were taken for re-laying the mosaic. The mosaic sections (70 in total) were placed over the secondary construction, followed by attaching and retouching the joints, as to blend them into achieving the authentic look (Fig.9). Retouch was made using the same mortar applied as mosaics backing, and the tesserae used originate from the mosaic itself<sup>18</sup>. The parts where opus sectile impressions were preserved in mortar were covered with ribbed plastic-coated

metal sheets, which were bolted to the steel construction (Fig.10) and covered with gravel with similar coloration to the original mortar imprints. The same gravel was used for filling the smaller lacunae in the surface of the mosaic, as well as the area between the two apses from the basilica. This concluded the planned restoration activities on the mosaic from the Old Episcopal Basilica (Fig.11-12).

### **Final Considerations**

A short period of time has passed since the final restoration processes<sup>19</sup>, which does not allow deducing any relevant conclusions yet, however, to the present time (September, 2019) there have not been any negative or unexpected occurrences observed. The air isolation provides complete protection from the detrimental effects of moisture, and in addition to this the space between the mosaic and the bedrock allows air ventilation and eliminates dampness of the soil and the older walls. For the time being, the application of this method has proved successful, bearing in mind the further need for monitoring in the event of detecting certain weaknesses of this yet, experimental technique for re-laying mosaics in their original location.

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<sup>18</sup> Part of the tesserae used were discovered already detached during excavations, while the rest fell off during the process of restoration.

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<sup>19</sup> The project was concluded in October, 2014.

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## РЕСТАВРАЦИЈА И ПРЕЗЕНТАЦИЈА НА МОЗАИКОТ ОД СТАРАТА ЕПИСКОПСКА БАЗИЛИКА ВО СТОБИ

### Резиме

Овој труд ги елаборира конзерваторско - реставраторските активности кои беа преземени на мозаикот од наосот на Старата епископска базилика во Стоби во текот на 2013-14 година, со посебен акцент на процесот на враќање на мозаикот во неговата оригинална местоположба.

Реставраторските активности започнале уште во 1991 година кога мозаикот бил разделен на 70 сегменти (со вкупна површина од 160m<sup>2</sup>) и изваден од оригиналната местоположба, а во 1998 година било извршено и отстранување на оригиналниот малтер од задната страна на мозаичките сегменти. По завршувањето на посочените активности, мозаичките сегменти биле депонирани во складишните простории на археолошкиот локалитет Стоби каде што остануваат сè до 2013 година, кога започна проектот за финална реставрација и презентација на мозаикот од наосот на Старата епископска базилика. Во рамки на овој проект беше предвидено поставување на сите мозаички сегменти на нови *aerolam* носачи изработени од алуминиумско саќе со двостран премаз од *фиберглас* импрегниран со епоксидна смола. Поставувањето на мозаичките сегменти на *aerolam* паноата беше завршено во текот на 2013 година, а во 2014 започна процесот на враќање на мозаикот во наосот на Старата базилика. По деталната анализа на предностите и недостатоците на сите применливи методи за враќање на мозаикот а притоа имајќи ја предвид и комплексната теренска и археолошка ситуација на просторот каде што треба да се врати мозаикот, одлучивме да изградиме слободно стоечка челична платформа која ќе има функција на носач на мозаичките сегменти. Челичната платформа која се состои од примарна и секундарна конструкција беше поставена на бетонски стопи кои беа вкопани во здравицата под нивото на мозаикот.

Во однос на традиционалниот метод кој подразбира поставување на бетонска плоча која треба да ја има улогата на носач на мозаиците, поставувањето на челичната платформа има големи предности:

1) Архитектонските структури кои се откриени под мозаикот ќе бидат сочувани, а во исто време и презентирани;

2) Платформата не извршува никакво влијание на околните градби;

3) Овозможува целосна воздушна изолација која ја спречува појавата на сите оштетувања од влага, вегетација, микроорганизми и соли;

4) Нема потреба од годишни препокривања на мозаикот;

5) Процесот е целосно реверзибилен;

6) Периодот за изградба на челичната платформа е многу пократок во однос на бетонската плоча;

7) Трошоците за изведба и одржување се многу пониски.

По изградбата на челичната конструкција, мозаичките сегменти беа вратени во оригиналната местоположба за само два дена, по што започна процесот за поврзување и ретуширање на споевите со цел да се долови автентичниот изглед на мозаикот.

Од финализирањето на реставраторските процеси на мозаикот е изминато релативно кратко време и заради тоа не може да изнесуваме релевантни заклучоци, но, сепак, треба да се каже дека до овој момент (септември 2019 г.) не се забележани никакви негативни и/или неочекувани последици. Воздушната изолација обезбедува комплетна заштита на мозаикот од штетните влијанија на капиларните и атмосферските води а опасноста од појава на вегетација, микроорганизми и соли е целосно отстранета. Освен тоа циркулацијата на воздух помеѓу мозаикот и здравицата овозможи целосно сушење на влагата од почвата и од постарите сидови. Засега може да се каже дека примената на овој метод е успешна, но, се разбира дека редовното одржување и мониторингот треба да продолжат со цел да се откријат сите евентуални пропусти и недостатоци на овој експериментален метод за враќање и презентирање на мозаици во оригиналната местоположба.

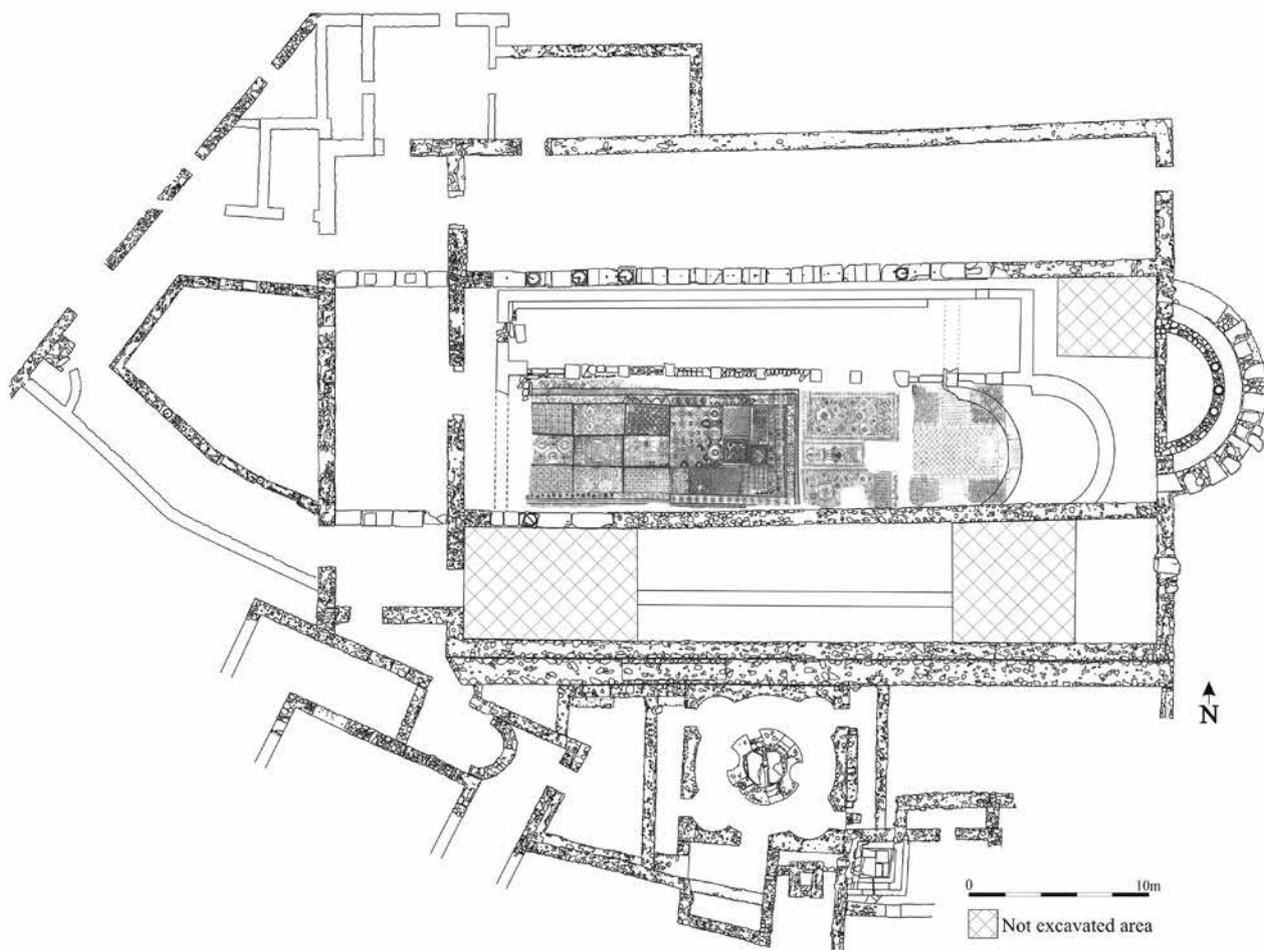


Fig.1 Ground plan showing two basilicas at different levels  
 (Drawing by: F. Hemans, T. Mitrova, interventions - M. Tutkovski)

Сл.1 Основа на двете нивоа на епископските базилики  
 (Цртеж: Ф. Хеманс, Т. Митрова, интервенции - М. Тутковски)

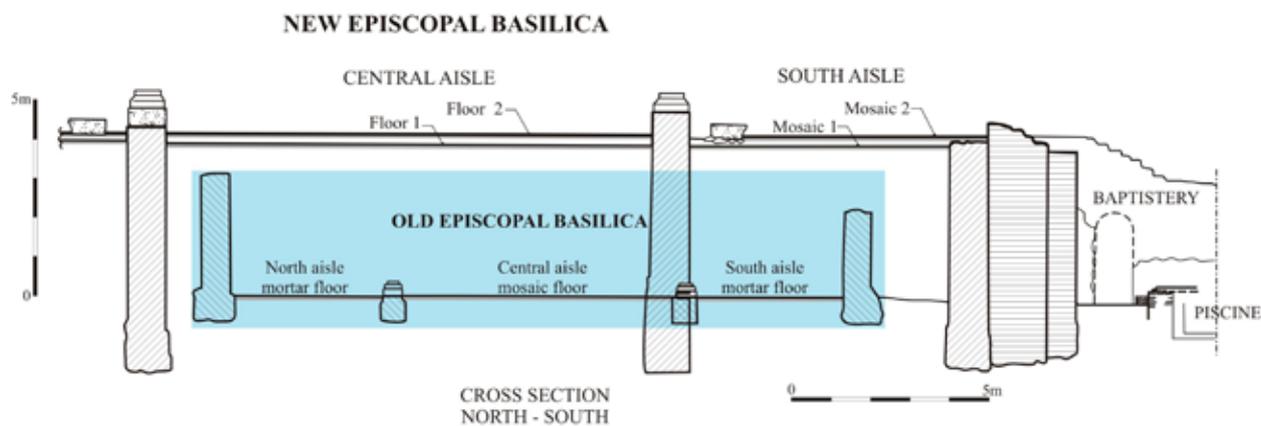


Fig.2 Cross section of the Episcopal basilicas  
 (Drawing by: F. Hemans, T. Mitrova, interventions - M. Tutkovski)

Сл.2 Пресек на Епископските базилики  
 (Цртеж: Ф. Хеманс, Т. Митрова, интервенции - М. Тутковски)



Fig.3 Old episcopal basilica before archaeological excavations in 2012. Blue line is showing the original location of the mosaic floor (photo: M. Tutkovski)

Сл.3 Старата епископска базилика пред археолошките ископувања во 2012 год. Сината линија ја означува оригиналната местоположба на извадениот мозаик (Фотографија М. Тутковски)



Fig.4 Situations during the archaeological excavations – views from south (photo: M. Tutkovski)

Сл.4 Археолошки ситуации за време на ископувањата - погледи од југ (Фотографија М. Тутковски)

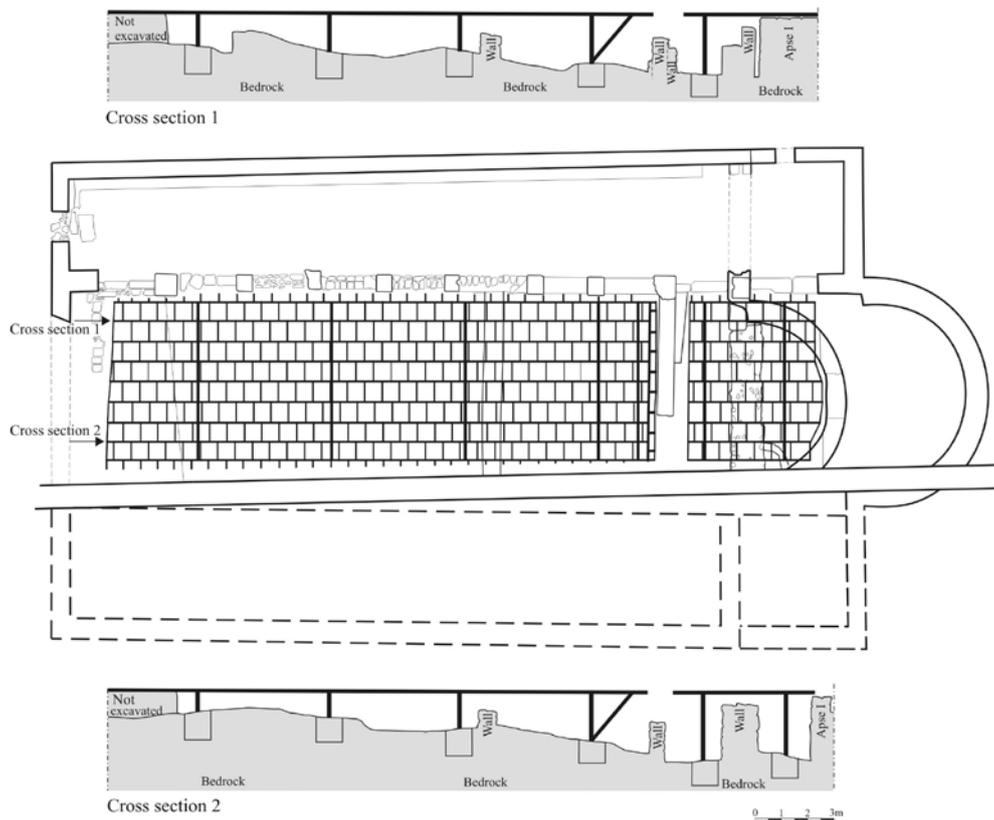


Fig.5 Ground plan showing the steel platform with cross sections (Drawing by: M. Tutkovski)  
 Сл.5 Основа и пресеци на челичната платформа (Цртеж М. Тутковски)



Fig.6 Constructing the steel platform (photo: M. Tutkovski)  
 Сл.6 Изградба на челичната платформа (Фотографија М. Тутковски)

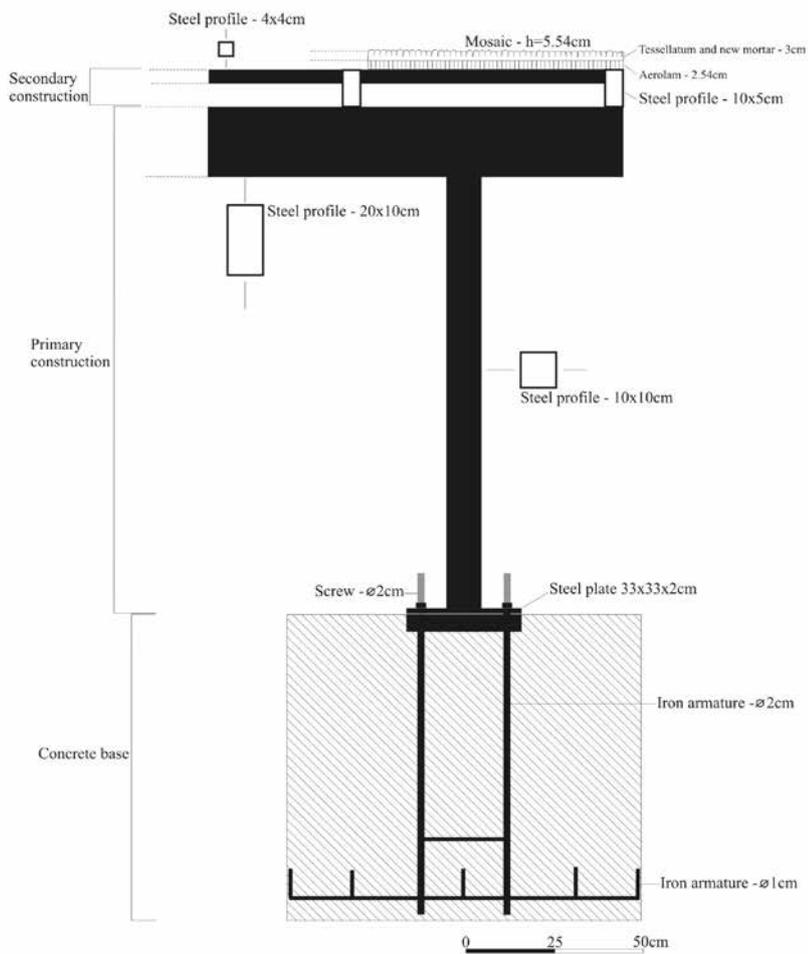


Fig.7 Cross section of the steel platform components with re-layed mosaic – detail (Drawing by: M. Tutkovski)  
 Сл.7 Пресек на компонентите од челичната платформа со поставен мозаик (Цртеж М. Тутковски)



Fig.8 Completed steel platform (photo: M. Tutkovski)  
 Сл.8 Финален изглед на челичната платформа (Фотографија М. Тутковски)



Fig.9 Re-laying the mosaic panels in situ (photo: M. Tutkovski, M. Filova)

Сл.9 Враќање на мозаичките сегменти во оригиналната местоположба  
(Фотографии М. Тутковски, М. Филова)



Fig.10 Covering the areas with ribbed aluminum sheets (photo: M. Tutkovski)

Сл.10 Покривање на површините со ребрест алуминиум (Фотографија М. Тутковски)



Fig.11 Final view of the Old episcopal basilica with re-layed mosaics (photo: M. Tutkovski)

Сл.11 Финален изглед на Старата епископска базилика со вратените мозаици  
(Фотографија М. Тутковски)



Fig.12 Orthophoto of the mosaic in the central aisle (photo: M. Tutkovski)

Сл.12 Ортофотографија од мозаикот во централниот кораб на Старата епископска базилика  
(Фотографија М. Тутковски)