I. Introduction

This 3D attempt at reconstruction of a bathing place – balneum – is based on the in situ preserved architectural elements in the northwest part of Building 2 in the village of Mošnje, Slovenia. A settlement complex with four buildings in its area was excavated in 2007. The bathing area was located in the western part of Building 2 and consisted of three rooms in a row (Room 1-apodyterium, Room 2-tepidarium/frigidarium and Room 3-caldarium/sudatorium) with two-way communication. Judging by the mixed debris, as well as missing parts of the decoration and architectural elements, certain pieces had been removed in the past, thus making the reconstruction of floor and wall decorations a difficult task.

II. Method

The 3D reconstruction of balneum rooms is based on metrical surveying of the in situ preserved architectural elements, which were measured with the Leica TCR803 total station, and georeferenced with the GNSS-Leica GS09 GPS system. The data were processed with the AutoCAD 2010 software. The representation of the rooms was designed using the 3D ArchiCAD 12, 3D rendering in Artlantis 3.0 and Adobe Photoshop 2010 software tools.

1. Attempt at reconstruction of architectural elements in the bathing rooms

Fig. 1. A precise 3D reconstruction was made using the 3D ArchiCAD software.

Fig. 2. 3D cross section of architectural detail, with features how reconstruction was made, Room 3 (Caldarium).

2. Anastylosis of wall paintings and mosaics

2186 pieces of wall plaster were found in the debris layer in the bathing rooms. With the help of analogies, 155 of them could be used for the anastylosis of wall decoration. The first two rooms featured white polished plaster and red intonaco (Fig. 6 and Fig. 7), painted with red. In Room 3, the discovered pieces of white polished plaster and red intonaco, painted with red, featured a black line. The preserved fragments of wall plaster in the Room 3, indicate the panel painting. The wall is vertically and horizontally divided into three parts (Fig 3).

Fig. 3. Anastylosis of north wall, Room 3. Only 20% of the floor mosaic has been preserved in pieces (168 pieces) found in the debris, which made the reconstruction a demanding task. In some pieces of the mosaic, the foundations (rudus, nucleus) were entirely preserved. The reconstruction attempt shows black-and-white figural mosaics/5 black dolphins on white background, framed by alternating black-and-white bands, followed by a thicker black edge (Fig. 4). The anastylosis is based on Roman proportions, the proportions of the preserved pieces of the mosaic, and on analogies.

Fig. 4. Anastylosis of mosaics floor, Room 3.

III. Conclusion

The attempt at 3D reconstruction of the bathing rooms was made using the ArchiCAD 12 software and was based on architectural surveying of the in situ preserved remains. All architectural elements found in the debris layers were used in the reconstruction. The geometrical model contains all architectural features in detail. The result is a precise 3D reconstruction of a Roman balneum. The reconstruction presents our understanding of classical Roman construction in different representative cross sections, enabling an interpretation of individual architectural elements. Processing/rendering the textures with Artlantis 3.0 and drawing the interior decoration using Adobe Photoshop 2010 enabled a more realistic virtual reconstruction (Fig 6-Fig 8). Making use of all the measurement proportions given by the preserved pieces of wall and floor decorations, this architectural and stylistic reconstruction enables us to create a temporal and spatial framework for the rare Roman country bathing place discovered in the area of Slovenia.

Fig. 5. Cross section of balneum rooms.

Fig. 6/Fig. 7. Virtual reconstruction, R 1 and R 2.

Fig. 8. Virtual reconstruction, Room 3 (Caldarium).

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Keywords — Roman period, 3D reconstruction, 3D rendering, anastylosis, private Roman baths/balneum, black-and-white mosaic, painted wall plaster.