

Martin Müller

Research of historic buildings by “the reverse project” method

ANNOTATION

The author compared his own geodetic survey of the Romanesque church of St. John the Baptist in Hostivař with earlier published groundplans of this building. By conversion of the survey into period units of measurement (the Bohemian ell) he attempted to reconstruct the Romanesque project. This method signed as the “reverse project” also includes an attempt to reconstruct a possible way of marking out the Romanesque church. The positive result indicates a possibility for the further research of heritage buildings.

SUMMARY

Large differences between the available groundplans of the Romanesque church of St. John the Baptist in Hostivař led to a requirement of a new geodetic survey, which was realised in 2010 during an investigative archaeological excavation.

The realised geodetic survey was used for a new “method of a reverse project”, composing of: 1. exact geodetic survey (**Fig. 1**), 2. conversion to a historic unit of measurement of the period (Bohemian ell, Vienna ell), 3. an average of measurements and comparison with the whole numbers of the historic units (**Fig. 2**), 4. reconstruction of “the project” in historic units (**Fig. 3**), 5. comparison of “the reverse project” with the survey from the phase 1 (**Fig. 4**), 6. revealing geometric regularities of the project with the aim to find a simple way of marking out the building (**Fig. 5**). The reverse project of the groundplan of the church at Hostivař is the second application of this method; the first was a Mannerism building of the Large Grote in the Valdštejnský palace garden in Prague (Čiháková/Müller 2009).

Comparison of the up to date survey with the ancient length measuring unit Bohemian ell indicates that the church in Hostivař was projected and built in the Romanesque period using either the Bohemian ell (0,5914 m) or the Roman foot (0,296 m), which is almost the exact half of the Bohemian ell. The church was projected in the whole or half measurement units (**Fig. 2**) and the building realisation was very accurate for its period. Average of the measured data and its comparison with presumed proportions in whole ells (the reverse project) shows, that in straight lines the deflection from the projected value did not reach 1% in a single case of the length considered. The width of the nave wall compared to the presumed 2 ells is wider by 5 cm (the deflection 4, 24% is probably caused by modifications and plaster layers). Larger deflections in the wall width compared to the presumed project occur in the apsis walls only (**Fig. 7**). The author attempted to reconstruct the way of marking out the Romanesque building of the church in Hostivař. Within marking out the apsis he speculates between two basic versions: marking out both faces of the apsis with 1 centre of S1 (**Fig. 6 A**), or each face with its own centre – the outer one S1, the inner one S2 (**Fig. 6 B**), in that case the walling would not be equidistant. The existence of two centre points is indicated by the deflection, which could be caused by a mistake during marking out the apsis (**Fig. 6 C**).

“The reverse project “ in period units of measurements (Bohemian ell), its conversion into the current survey in the same scale and the attempt to define the marking out the building as well as recreation of the original project is a method, which can greatly contribute to the understanding of the architects intentions, and to reveal later non-organic building modifications; it can help to reconstruct the unpreserved parts of the building as well as to correct our knowledge of the use of the ancient measuring units. In the case of post medieval buildings the use of a certain measuring unit may be even a chronological criterion (metre was introduced in Central Europe as late as 1871). This was proven on a series of three archaeologically excavated malt ovens. The earliest of them, demolished in 1725, has internal diameter of 1 Bohemian ell, while the other with 1 Vienna ell thus belongs to a context of the large reconstruction of the brewery sometime after 1765, when it was gifted by another neighbouring building one year after the introduction of the Vienna ell into the Bohemian lands. The third malt oven has internal diameter of an exact 1 metre.

Inaccuracy in the exact survey of historic buildings often leads to idealisation of its depiction or pointless yield to the metric system with rough rounding of the measurements. Rounding within the metric system may lead to a

significant distortion and misinterpretation of the original intention of the architect. Therefore it is important not to yield to simplification from the start, but to record and depict the exact measured state of the building.

The author aimed to suggest that even such a non-destructive method as an exact survey can bring worthwhile information concerning the appearance of an historic monument, its development and the period of its origin. The aim was also to emphasize the importance of an exact survey rather than relying on earlier surveys (Fig. 7). An example of three malt ovens mentioned in the text is remarkable even from general point of view since it proves human dependence on valid units of measurements. This observation may lead to reflection whether the data measured during the field work do not carry, apart from the surely important number, also other information not visible at the first sight.

Fig. 1. Prague – Hostivař, the church of the Beheading of St. John the Baptist. Groundplan survey, 2010.

Fig. 2. Prague - Hostivař, the church of Beheading of St. John the Baptist. Numeric parameters of the church groundplan in metres, Roman feet and Bohemian ells.

Fig. 3. Prague - Hostivař, the church of the Beheading of St. John the Baptist. “The reverse project” of the church groundplan in historic units, here the Bohemian ell.

Fig. 4. Prague - Hostivař, the church of the Beheading of St. John the Baptist. Projection of “the reverse project” of the church groundplan in Bohemian ells – red line (**Fig. 3**) and the current survey in grey (**Fig. 1**) in the scale 1 : 50.

Fig. 5. Prague - Hostivař, the church of the Beheading of St. John the Baptist. Reconstruction of the marking out plan.

Fig. 6. Prague - Hostivař, the church of the Beheading of St. John the Baptist. Three ways of marking out the apsis. **6A** – a circle of the outer and inner face of the apsis from a single centre point S1; **6B** – a circle of the outer and inner face of the apsis from different centre points (S1 + S2); **6C** – a circle of the inner face of the apsis from different centre points on the edges and in the middle (S1 + S2) – a presumed reason of the irregularity of the inner face caused by an error during marking out. Grey survey 2010, red the line of the reverse project, green walling over the ideal face line, pink walling missing to an ideal face line.

Fig. 7. Prague-Hostivař, the church of the Beheading of St. John the Baptist. Comparison of the selected groundplans of the church apsis. Grey – survey of the author 2010; red – reconstructed „reversed project” by the author 2012; blue – Podlaha 1908; green – Dragoun 1990.

English by Linda and Patrick Foster