

# The Reconstruction of the Medieval Unit of length Based on the Sizes of Contemporary Round Churches

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## SUMMARY

There was an independent unit of length in Hungary between the 11th and 16th centuries, the so called royal fathom – the etalon of that was kept in Székesfehérvár. The etalon of this unit was lost, only a cord was found in 1960-ies, representing the original length, which is about 3.126 metres. The 1/10 part of the fathom is the royal foot and the 1/16 part of the fathom (the royal span) was published in statute books. Unfortunately, the metric size of royal span can be measured very indefinitely.

In our paper we want to demonstrate that the contemporary length unit was used for building churches at that time because the sizes of the buildings correspond to an ancient unit. Especially the round churches (rotundas) are interesting from this point of view. The main question is to choose the right building and the right measuring technology. We need a continuous, adjusted control survey network based on direction and distance measurement both inside and outside the building. The measures of buildings can be obtained by precise methods, for example the radius of the circle with adjustments.

After constructing the floor plan, we match standard building measurements to the former units of length. We try to make a floor plan that is similar to what the original could have been where standard measures were probably given in integer multiples of the foot or span.

We precisely measured seven Hungarian medieval rotundas situated at five Hungarian, one Slovakian and one Slovenian settlements. The floor plan was used to recalculate the size of the royal unit in metres. We got 3.186 metres for royal fathom from all sizes as weighted mean. Our assumption and the reconstruction method to obtain conversion factors were thus confirmed.