

Designing a Sundial with Period Techniques

An Introduction to Geometric Construction as a Medieval Tool

Examples

Acknowledgements

Equatorial_sundial_by_József_Mérő,_Érd.jpg

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zellige.png

From “Zellige shapes study - The geometry, symmetry and proportions of each shape”. Sandy Kurt. Creative Commons - Attribution 4.0

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threeconstructions.png

From "Pastophorium in the Church of St. Catherine in Handlova in the Context of the Morphology of Gothic Pastophoria of Slovakia". Zuzana Grúňová

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Figure from Budaházi F, Halmos B. The Geometric Construction of Hexagonal ApSES in Mediaeval Hungary. *Építés – Építészettudomány*. 2024;52(3-4):213-233. doi:10.1556/096.2024.00119 downloaded from <https://akjournals.com/view/journals/096/52/3-4/article-p213.xml>. 06/29/2025 CC BY 4.0



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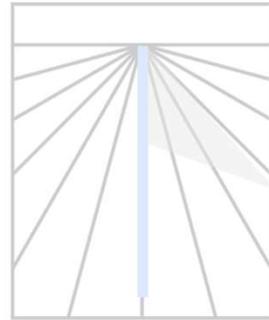
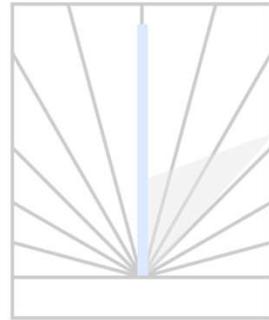
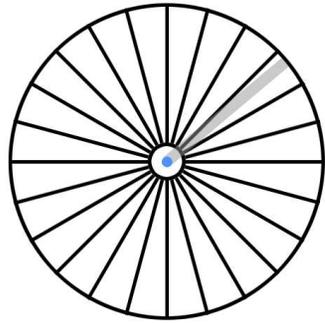
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This is a handout for my class “Designing a Sundial with Period Techniques” first given at Pennsic University 2025

Copies of this handout is available on my website at www.astrolabeproject.com

Version 1 – May 2025

Types of Sundials

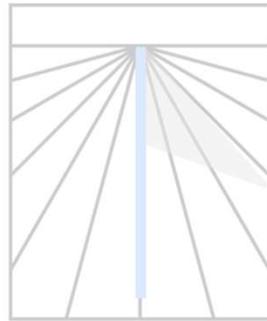
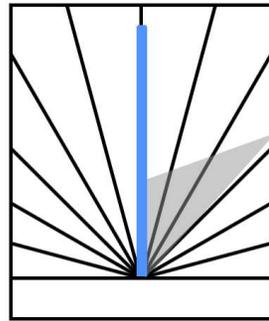
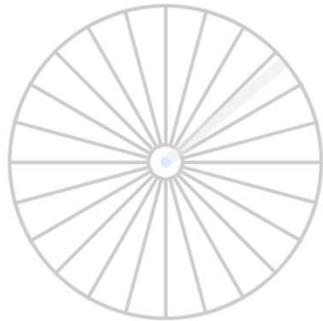


Equatorial

Usually circular, with the gnomon being a perpendicular rod in the center. The rod is oriented to point at an angle equal to the latitude, that is, parallel to the Earth's axis. Because of its orientation, the hour lines are equally spaced at 15-degree angles.



Types of Sundials

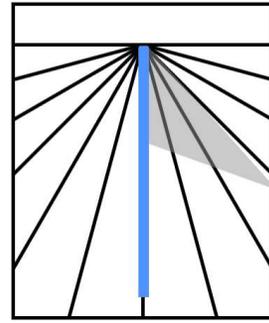
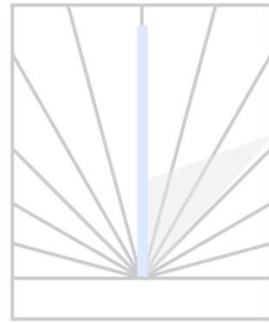
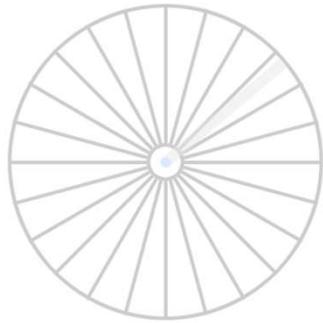


Horizontal

The most familiar type of sundial. This sundial lays flat, with the noon line oriented to the north with the gnomon pointing north at an angle equal to the latitude.



Types of Sundials

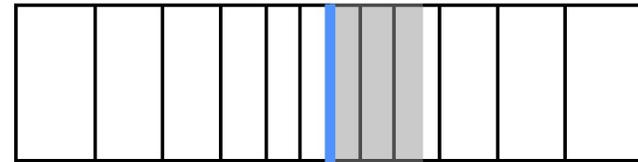
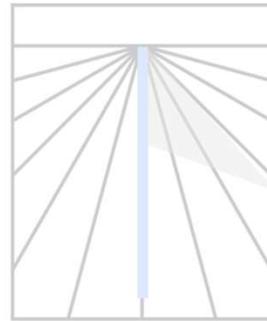
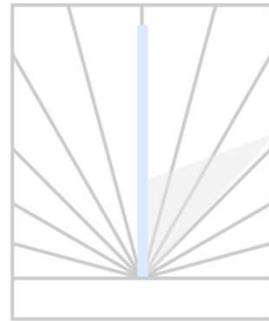
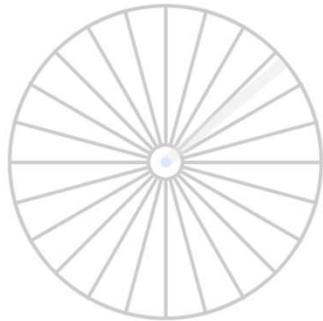


Vertical

Similar to the horizontal dial, but this one is designed to be placed vertically on a wall. The dial faces south with the gnomon at an angle equal to 90 degrees minus the latitude.



Types of Sundials



Polar

A polar sundial is oriented so that it faces south and is tipped to an angle equal to the local latitude. The gnomon, in this case, is a blade perpendicular to the face of the dial.

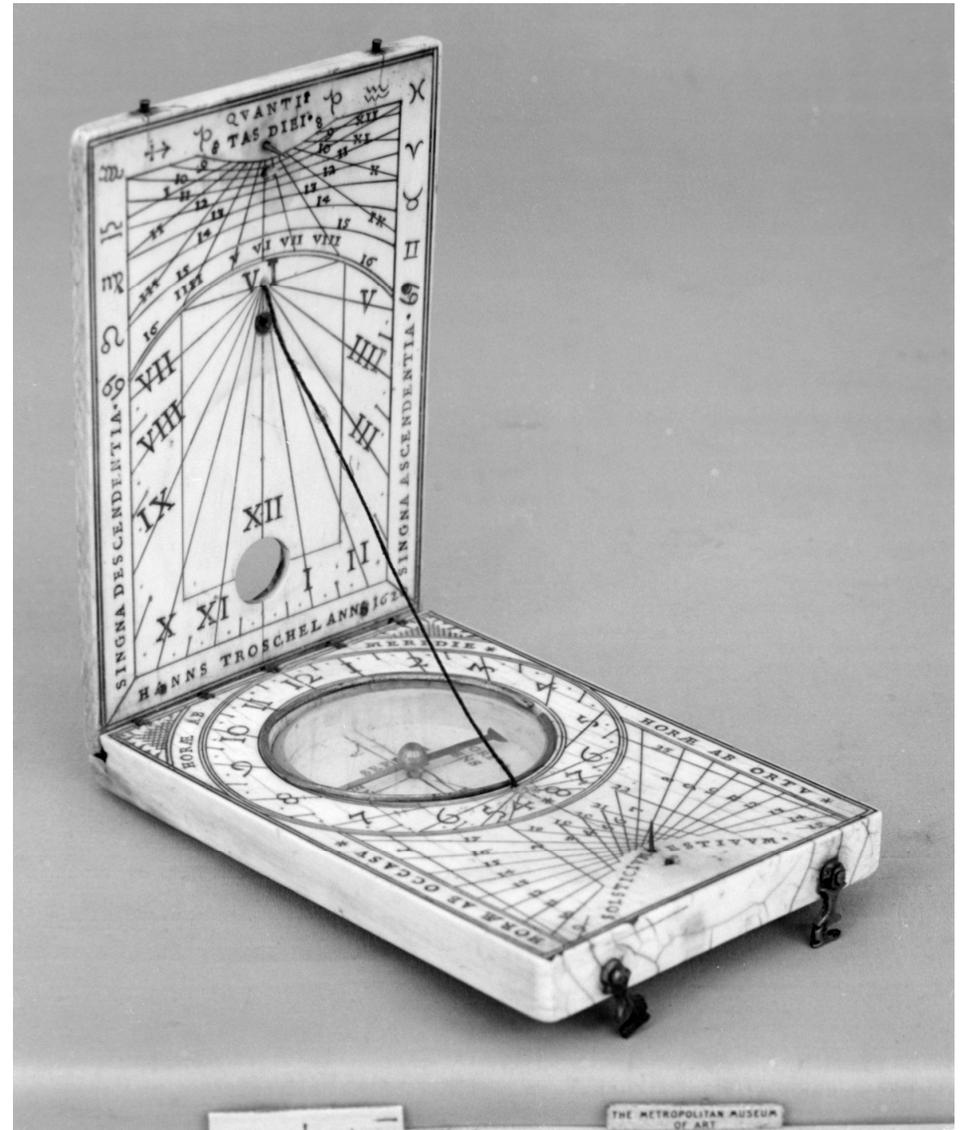


Types of Sundials

Diptych Sundial

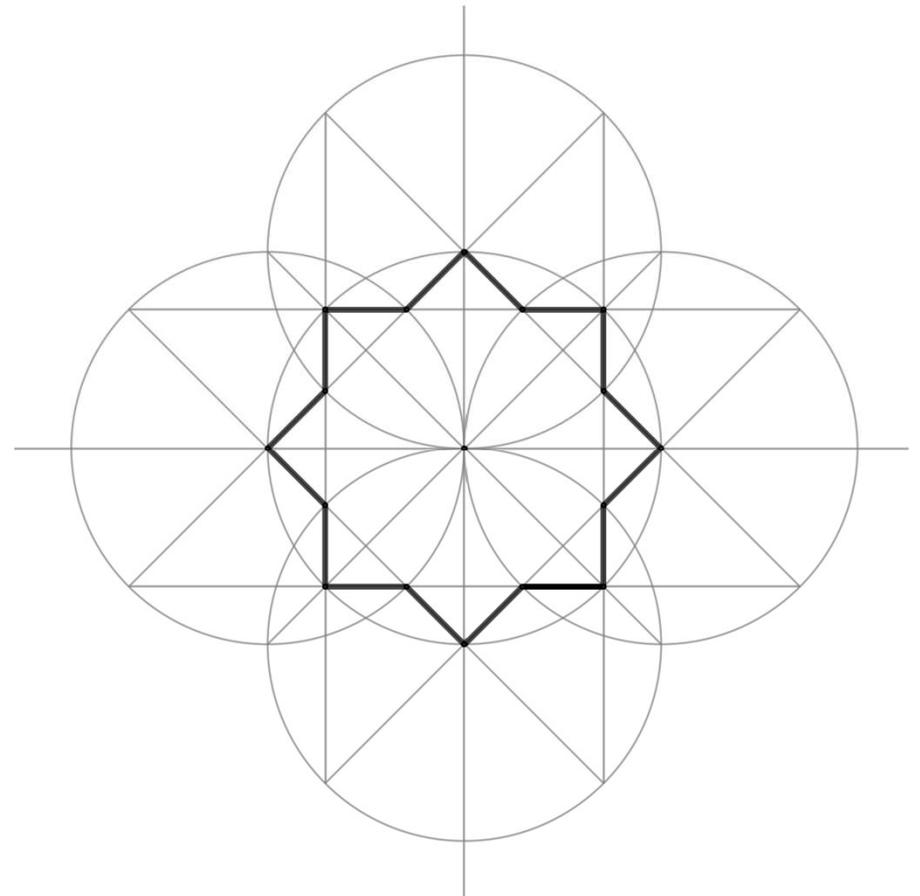
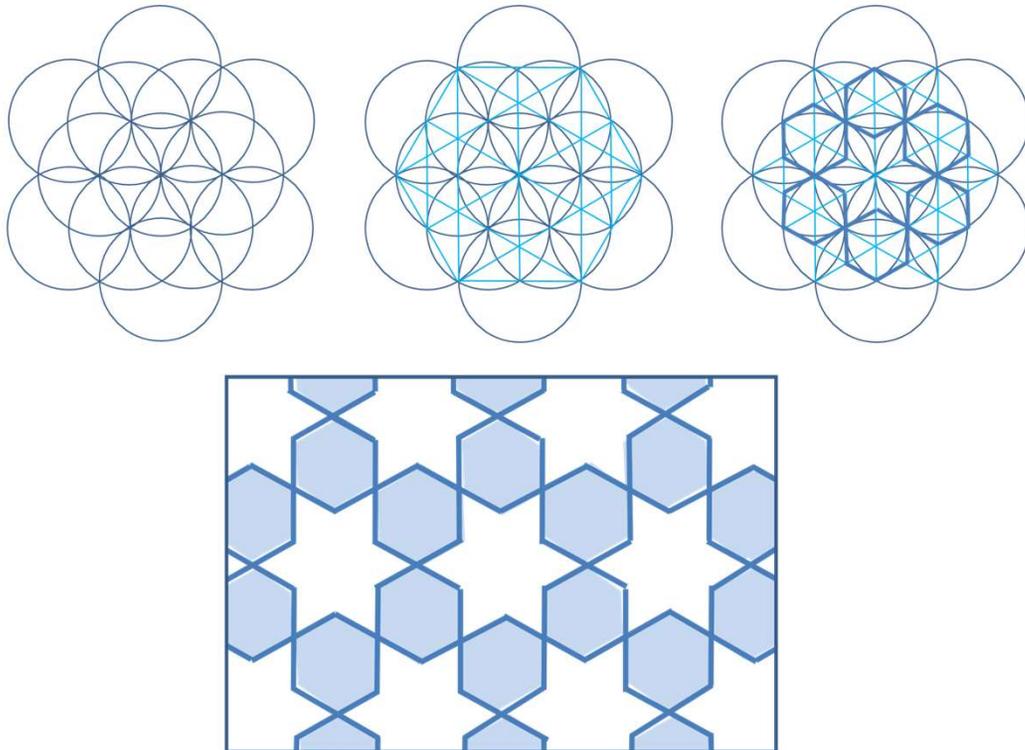
Sundials can be combined. This pocket sundial combines a horizontal and vertical dial. The string serves as the gnomon for both, and there is a compass to allow it to be oriented properly north.

German, Nuremberg, 1620, Hans Troschel the Younger
Metropolitan Museum of Art

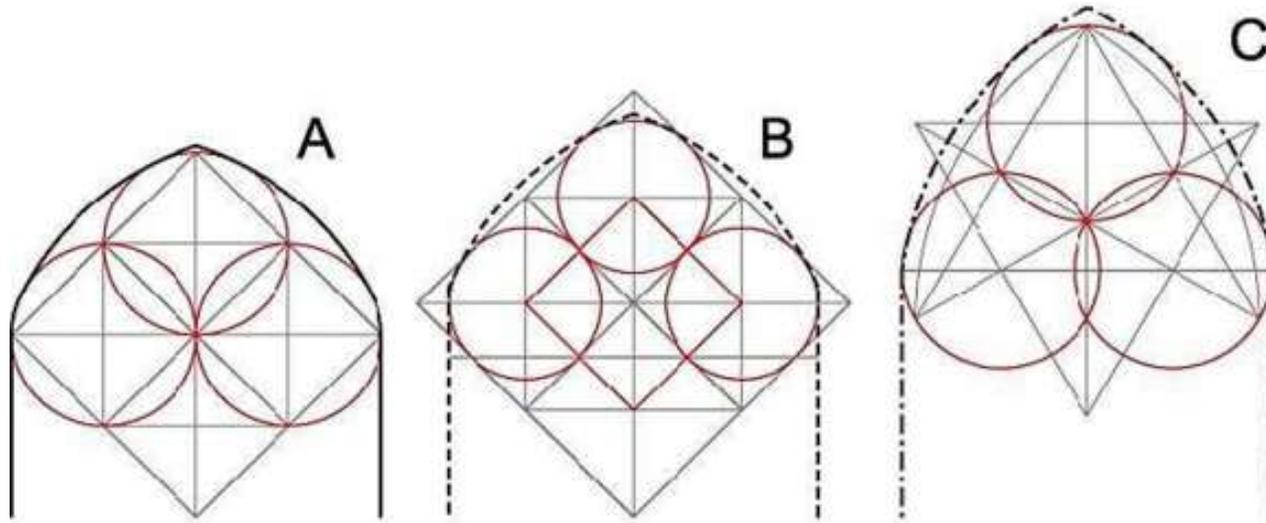


Geometric Construction

Geometric construction was used extensively to design tiling patterns for decoration.



Geometric Construction



Geometric construction was also used to lay out the design for construction of buildings. Here we have an example of three gothic arches.

From: Budaházi F, Halmos B. The Geometric Construction of Hexagonal Apses in Mediaeval Hungary. *Építés – Építészettudomány*. 2024;52(3-4):213-233. doi:10.1556/096.2024.00119

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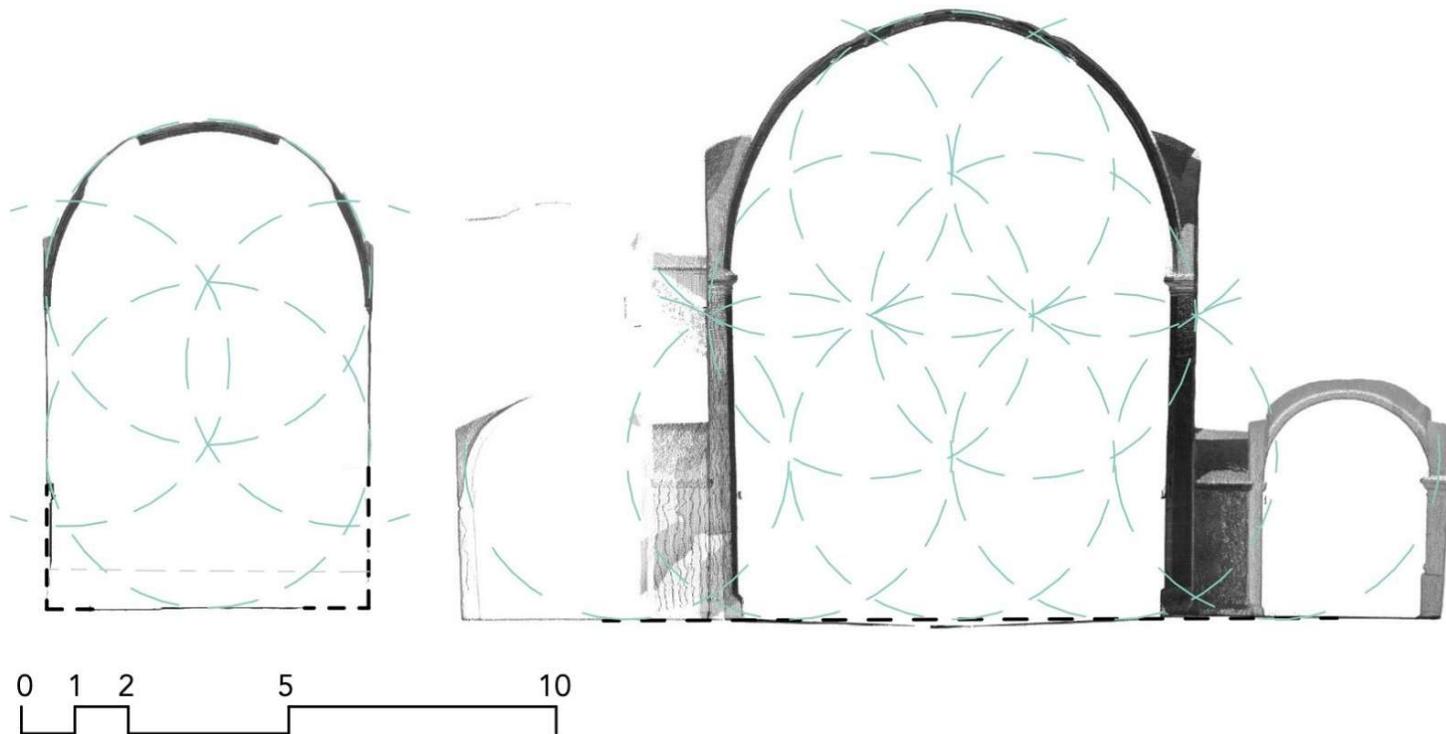
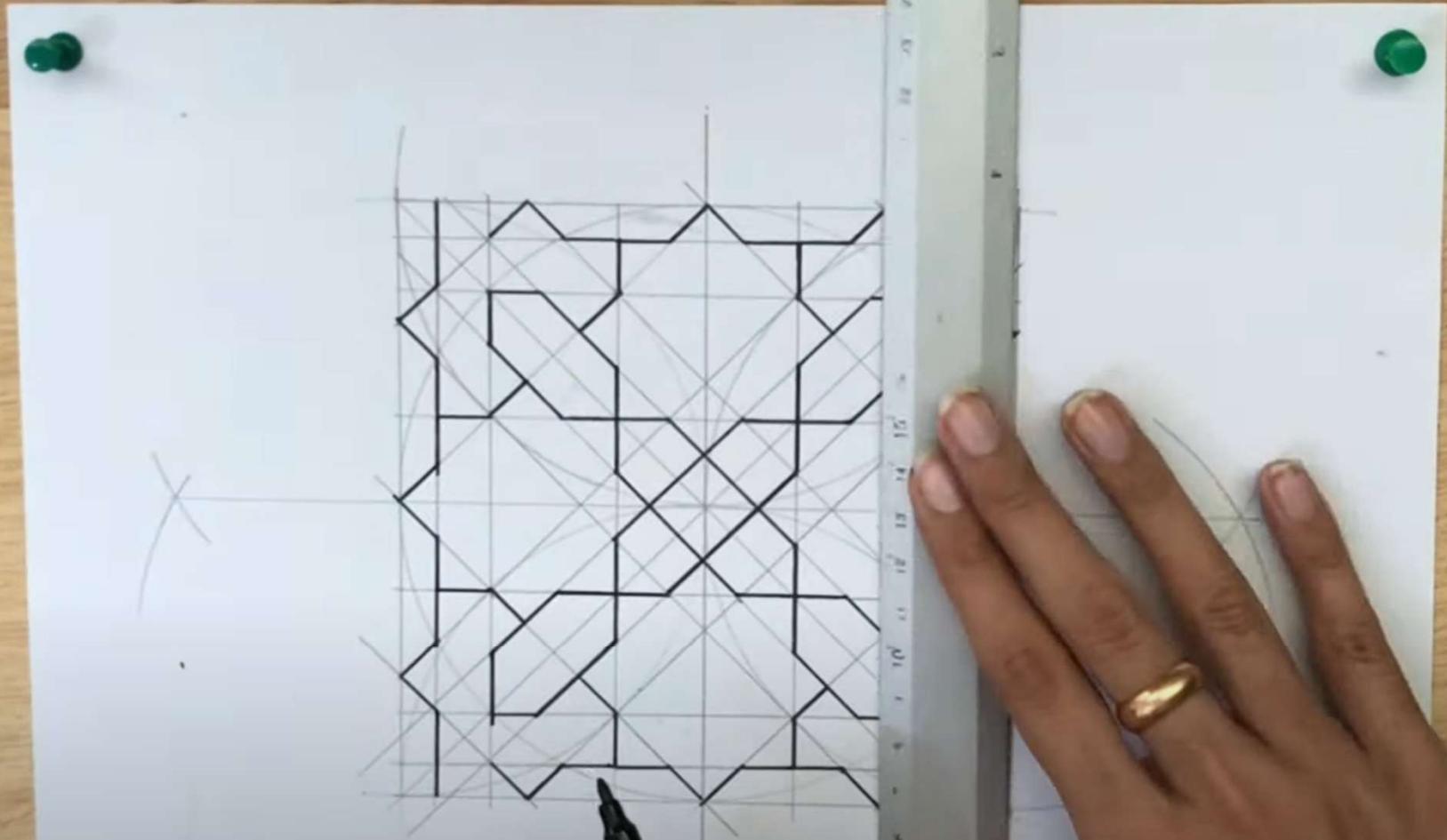


Figure 7. Section of the choir (C1 – on the left) and the nave and aisles (C2 – on the right) of the fortified church of Cincu. On C1 the light grey horizontal dashed line indicates the elevated floor level of the apse



4:25 / 5:55



HD



Islamic Geometric Pattern



Eman Zainab
2.78K subscribers



