

Roof truss



Variant: Reconstruction by Katarzyna Prokopiuk

Working state

Volpa Synagogue had a complex mansard timber roof truss with additional support from wooden posts. The three-story construction was developed in a way to leave enough space for the decorative vault, also three-story high. On the supports encompassing the walls was laid a horizontal grate with an outer rectangular and inner octagonal outline. The inner beams of the grate were the foundations of the first tier of joists, on their caps were laid the foundations of the second tier of joists, its pillars were additionally supported by diagonal "legs" embedded in the upper ring of the walls. On the joists' foundations, perpendicularly arranged, horizontal beams formed the gallery of the vault. The roof truss was supposedly first built in the first half of the 18th century and later repaired in 1903.

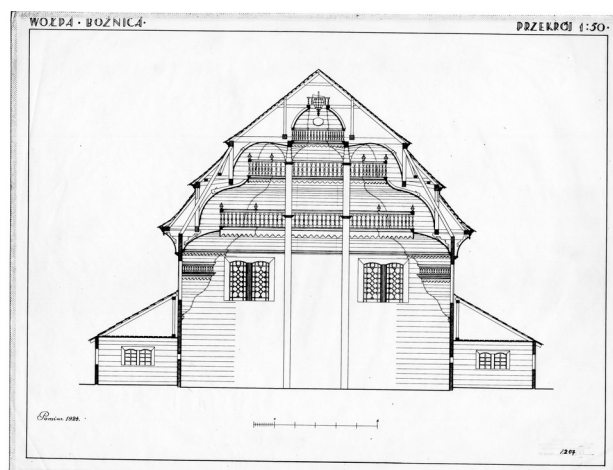
The reconstruction of the roof truss was a difficult process due to the lack of reliable sources depicting the truss in 3d. In some cases it was impossible to understand the spatial relations of beams without seeing how they were connected. The basis of the reconstruction were cross and longitudinal sections of the building published in Kazimierz and Maria Piechotka's book, which ensured the correct placement of the most important beams. For smaller beams and connections that weren't clear in direct sources, a 3d drawing of the Grodno synagogue's roof truss was used as a reference. For the sake of better understanding of the structural system, especially in 3d print, the reconstruction doesn't include wooden planks that attached the vault to the main roof construction. In the model for 3d printing the beams are rescaled to make the printing process possible.

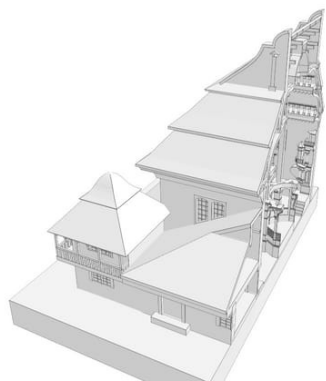
Reconstruction



**Fig. 124** Volpa Synagogue section with roof truss

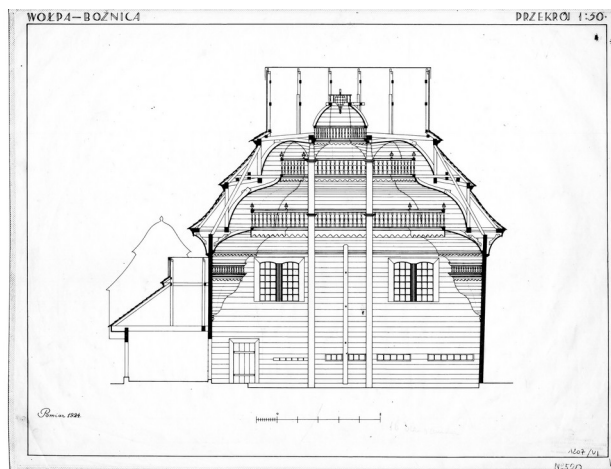
Sources



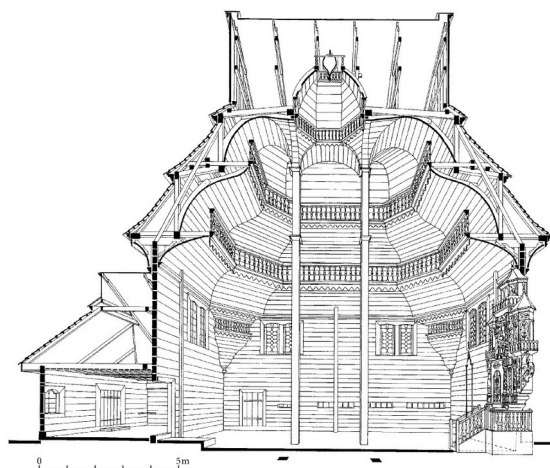


**Fig. 125** Volpa Synagogue with roof truss - model for 3d printing

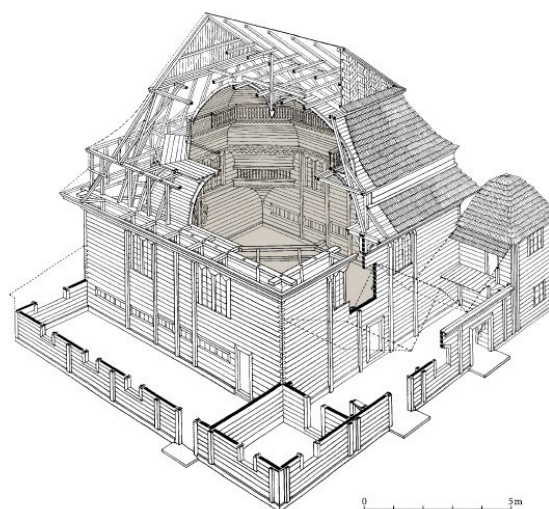
**Fig. 3** Volpa Synagogue - N-S section



**Fig. 4** Volpa Synagogue - W-E section



**Fig. 44** Volpa - perspective section



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**Fig. 128** 3d section of the synagogue in Grodno