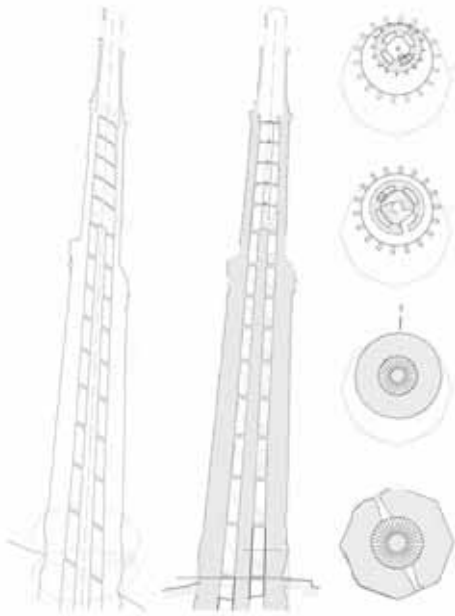


Date: nov 2002

For: UNESCO

Collaborator: M.S.Q

Description:



The tower of Jam is located on a remote spot in the Hindukush mountains of central Afghanistan, built probably in 1190. It is the only surviving structure of what is believed to be the legendary capital Firuzkuh of the Gurid rulers, destroyed by Chingiz-Khan in 1222. The site of Jam is a World Heritage Site since 2002.

This brick-structure, towering more than 60m high above present day level, leans heavily towards the Hari Rud river. A survey was undertaken under severe time constraints. Horizontal sections were made on different levels and a vertical section along the inclination axis. The outcome was the first step in the save-guarding of this monument, allowing structural engineers to make calculations on strength and stability.



The Mussalah complex at the city of Herat dates from Timurid times (15th c.). Of the original structures with at least 11 minarets, only the mausoleum of Gawhar Shad and 5 minarets remain in a precarious condition. One of them is leaning dangerously, weakened structurally and materially by eccentric overload and recent war-damage.

A similar survey was done as at Jam, allowing the assessment of the tower's stability. Immediate emergency measures have been studied and temporary works were executed in time to prevent the collapse of minaret 5.