

# FEASIBILITY STUDY OF LEONARDO DA VINCI'S BRIDGE PROPOSAL OVER THE GOLDEN HORN IN ISTANBUL

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## *ABSTRACT*

This thesis investigates the feasibility of a masonry arch bridge proposed by Leonardo da Vinci (1452 -1519). Leonardo wrote a proposal in 1502-1503 for a masonry bridge spanning over the Golden Horn in present-day Istanbul, Turkey. The design was a response to an invitation by the Sultan Bayezid II (1447-1512) to construct a bridge connecting Galata and Istanbul. Had Leonardo's design been constructed, at a span of roughly 280 meters, it would have been the one of the longest spans in the pre-Industrial world.

This thesis examines Leonardo's proposal, assesses the proposed location and geometry, and determines the feasibility of the design through a structural analysis. As the proposed bridge is a masonry structure, the most critical structural factors include geometric stability and the response to support displacements. Both of these factors are tested through analytical means and a 3D physical model supported by moveable abutments. The combination of the initial stability, the kinematic mechanism under spreading supports, and the geotechnical conditions demonstrates the bridge's feasibility.