

**“From Material to Structure”
 MECHANICAL BEHAVIOUR AND FAILURES
 OF THE TIMBER STRUCTURES**



01 MECHANICAL FAILURE AND INAPPROPRIATE MATERIALS



05 REPAIRATION OF TIMBER TRUSSES



02 FRACTURE CAUSED BY LONGITUDINAL STRESS



06 VENTILATION AROUND THE SUPPORT OF TRUSSES



03 CRUSHING CAUSED BY BIOLOGICAL ATTACK (FUNGI)



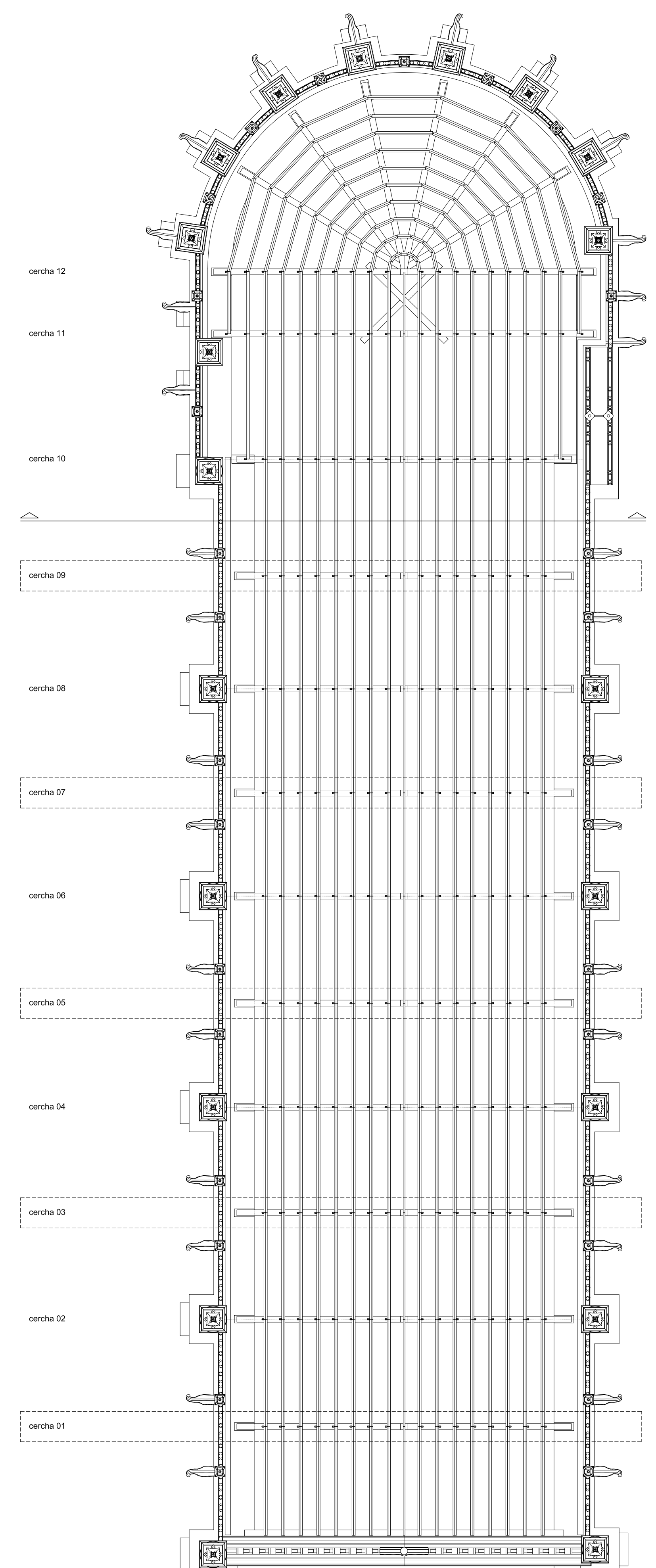
07 TIMBER STRUCTURE REPAIRED



04 BIOLOGICAL DEGRADATION: INSECT'S ATTACK



08 NEW POSSIBILITIES OF INSPECTION AND MAINTENANCE



PREVIOUS STATE

REFORMED STATE

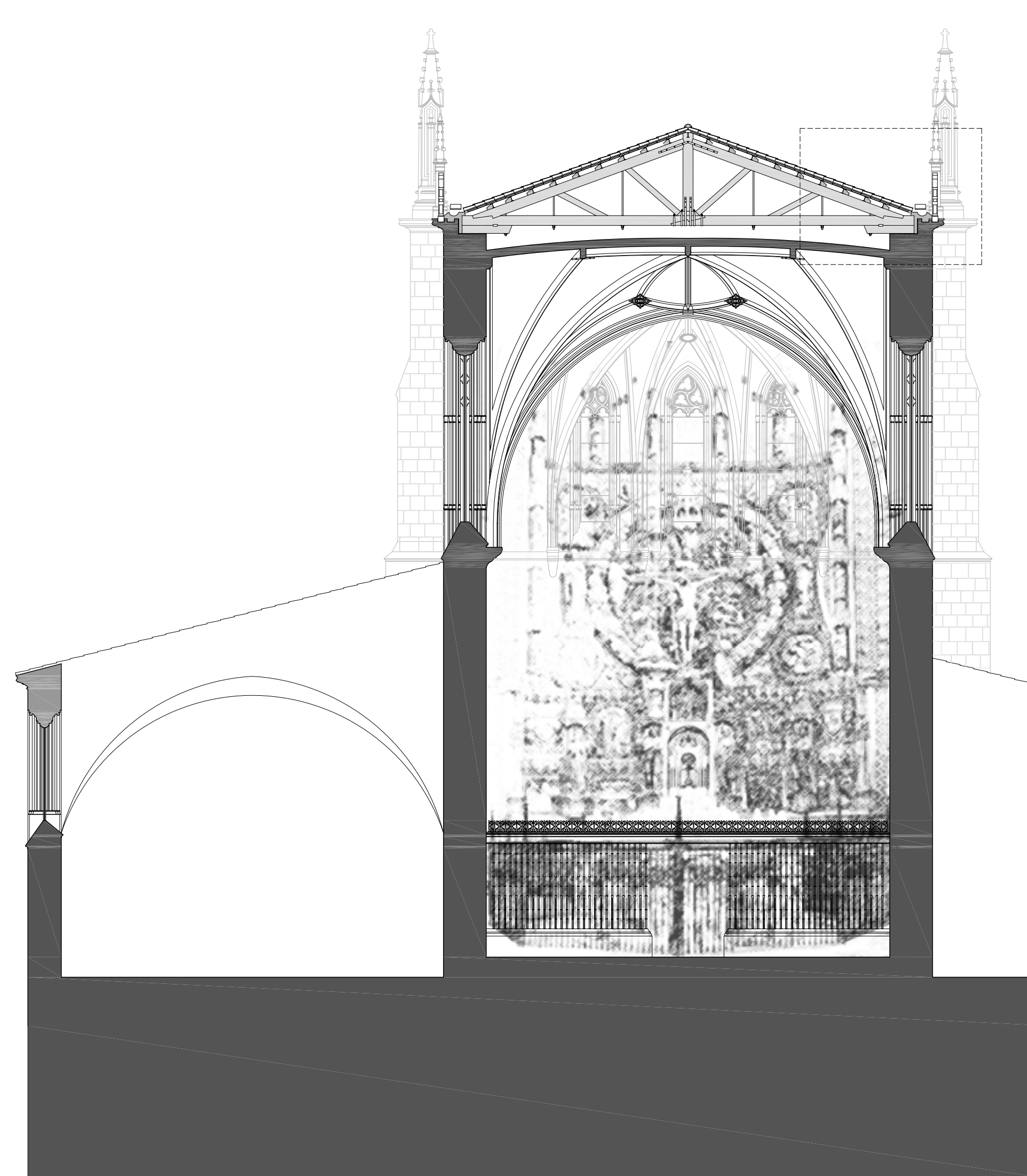
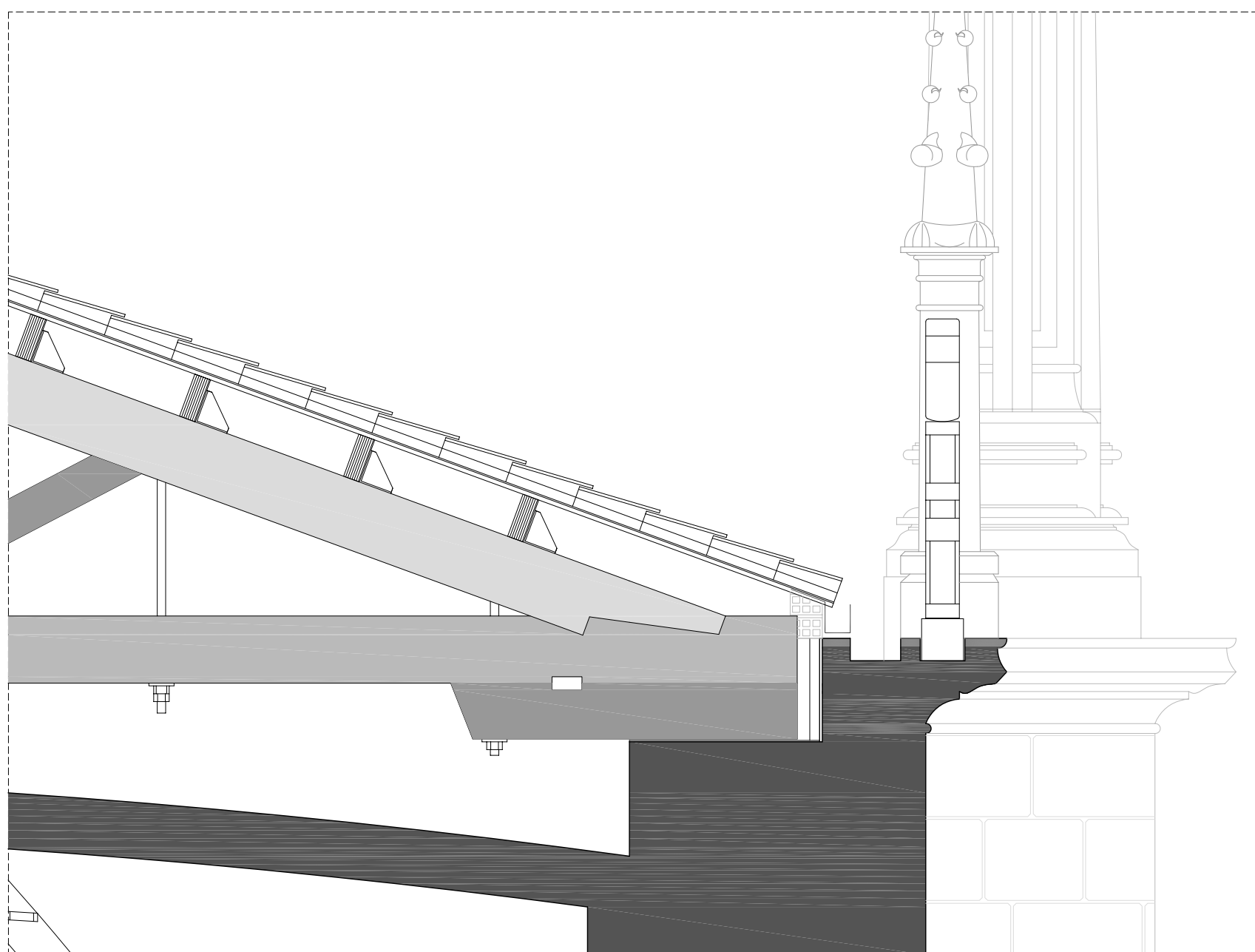
RESTORATION OF THE CHURCH ROOF OF CARTHUSIAN MONASTERY OF S^a MARIA DE MIRAFLORES, BURGOS (SPAIN)

Originally the building dates from year 1401 when King Enrique III orders to build it as a rest and hunting lodge. In 1441 his son Juan II donates it to the Carthusian monks to found a monastery of the same Order, with the intention to turn it into a Royal Pantheon. A voracious fire destroyed it in 1452, and its reconstruction was entrusted to Juan and Simon of Cologne, architects of the Burgos Cathedral, who initiated work in 1454 and they finalized them in 1484. Queen Isabel la Católica brought the best architects, sculptors and painters of the time: Simon of Cologne, Gil de Siloé, Pedro Berruguete, etc., becoming one of the most notable groups of late XV century gothic art. It has valuable stained glass windows with which the great development of this Renaissance art begins in Spain and constitutes a reference of the Flemish representation system in glass windows.

The church has a single nave and a polygonal apse with starred vaults. Its roof had undergone an unfortunate restoration in the middle of the s. XX and at the present time it presented serious degradation in the main segments.

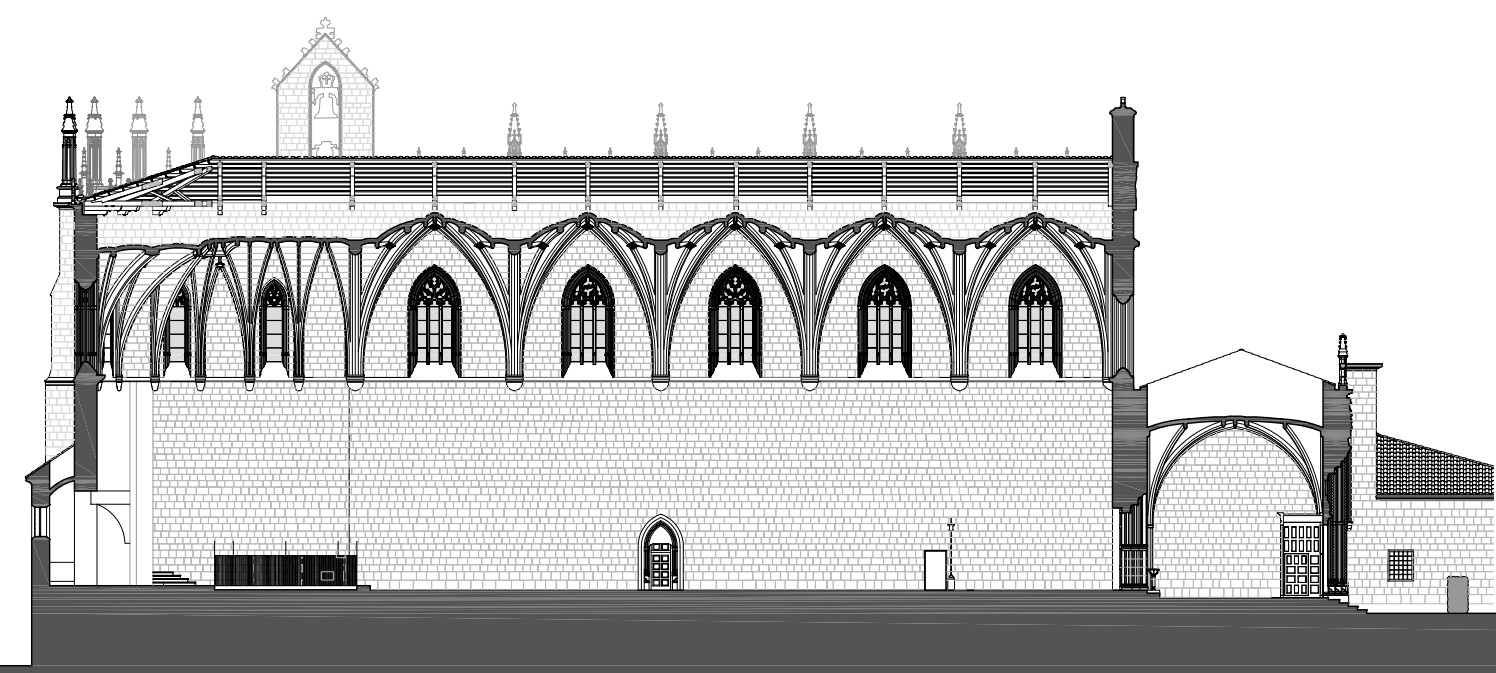
The restoration work has had two main goals:

- The roof of the church, affected by dampness and with serious problems of degradation in its wood structure and in the roof board, as well as the system of drainage and water evacuation.
- The south façade's and apse's stained glass windows, that needed an urgent intervention to stop their progressive decay, introducing a protection system that safeguards the historical stained glass windows in the future.



RESTORATION OF THE CHURCH ROOF OF CARTHUSIAN MONASTERY OF SANTA MARIA DE MIRAFLORES, BURGOS (SPAIN)

main architect: luis-alfonso basterra
 collaborating architect: gamaliel lópez
 architectural technician: fernando gonzález
 constructor: trycsa, s.a.
 developer: Junta de Castilla y León



SPAIN, 2004-2006