CORBERA D’EBRE. BEST PRACTICES OF STRUCTURAL MEMBRANES


The completion of the ruins of the Corbera d’Ebre hilltop roofless church is an outstanding example of recovering the use of the building while preserving its architectural character. The roof was destroyed during the Spanish Civil War (1936-1939). Its ruins remained as a memorial. Nevertheless, the lack of protection exposed the church to 75 years of deterioration and limited severely its use. For this reason, a new transparent ETFE roof was envisaged, instead of rebuilding the previous one.

The idea of being transparent came from the need to maintain as far as possible the character of the ruin preserving the feeling of being outside and keeping it open to the sky and illuminated by the sunlight. And the idea of being light (made of ETFE instead of glass) was intended to affect as little as possible the existing walls.
The membrane rests on the tubular arches. Valley cables stretch it and provide double curvature. Confusions between the added parts and the old ones are prevented by the gap left between the frame and the supporting walls together with the steel painted in white. The old supporting walls were topped with a reinforced concrete ring. In this way, a series of gusset plates could be anchored into the ring. They support the structure of the roof. It consists on a frame made of cold-formed U steel channels subdivided by tubular arches and valley cables.

1 CHS Ø101,6x3,6 mm. 2 CHS Ø76,1x3,25 mm. 3 Ø10 mm. 4 Tube cap (end plate). 5 Gutter: channel 400 x 180 x 6 mm. 7 Aluminium extruded section. 8 Longitudinal steel flat plate receiving threaded rods 10. 9 Gusset plate. 10 Threaded rod to tighten the ETFE foil. 11 Keder rail. 12 Bottom plate anchored to the concrete ring. 13 Adjustable plate to support the gutter. 14 M12 threaded rods anchored to the wall. 15 Reinforced concrete ring (Courtesy of F.Vizoso).