



RESTAURO MONUMENTALE E ARCHITETTONICO
CONSOLIDAMENTO STRUTTURALE

PATRIARCHAL BASILICA IN VENICE SAN MARCO



RESTORATION OF THE CRYPT

RESTORATION OF THE CRYPT OF THE S. MARCO BASILICA

At the end of 1985 the Procuratoria of S.Marco (office in charge of the conservation of the Basilica) assigned us the works of rehabilitation and recovery of the suggestive Crypt, which was subject to continuous flooding and heavy condensation of internal humidity on walls and floors: the first case due to water infiltration through micro and macro porosities inside the wall mass and cracks in the floors; the second to the limited thermal inertia of the walls impregnated by water.

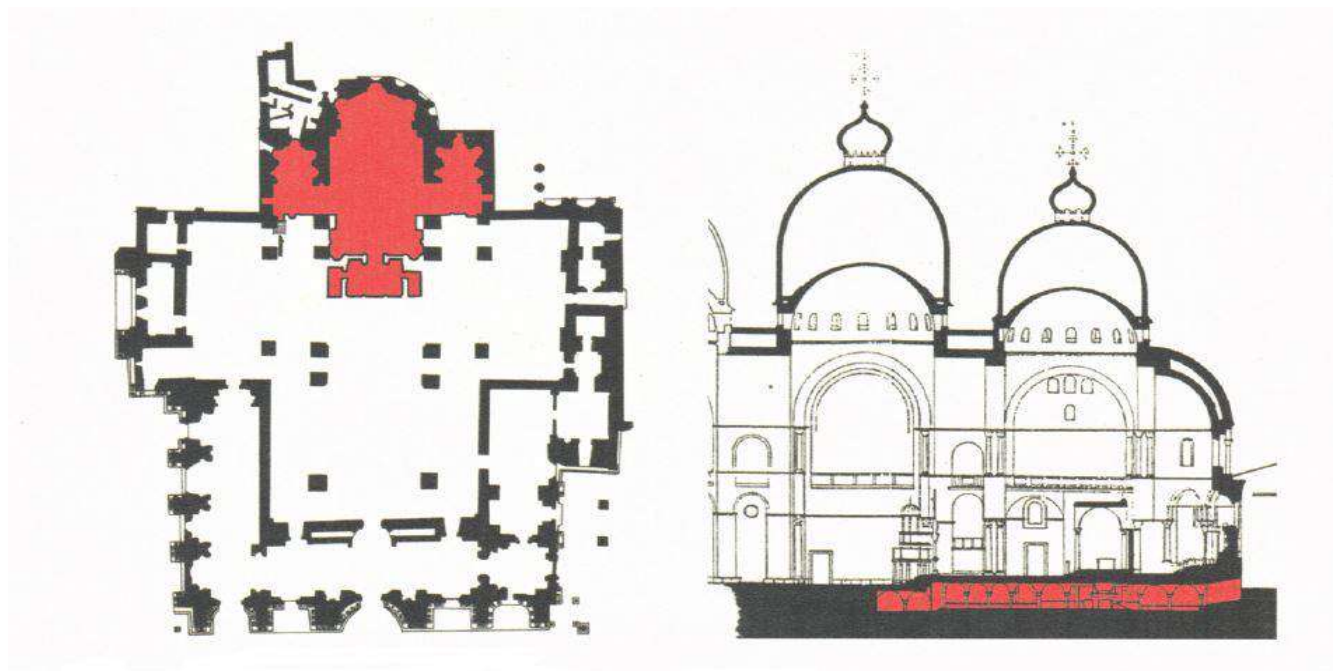
These, in fact, formed at the base by blocks of stone and brick in elevation, have a thickness that can reach 1.80 mt. and are buried for about 2 mt. The floor level is less than 34 cm. on the medium sea level.

The unusable situation of the crypt go back to a long time ago, so much so that at the end of the 16th century it was decided to abandon it by blocking the entrances.

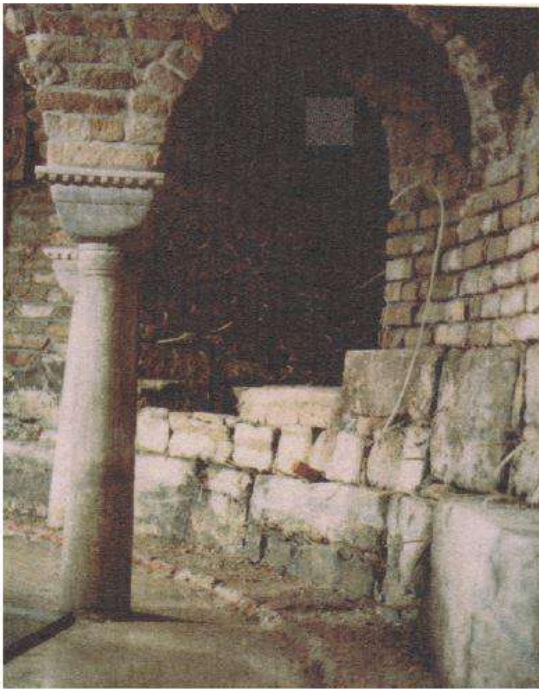
At the end of 1800 an attempt was made to recover the sacred environment by means of a concrete slab (perhaps the first use of cement in Venice) on a layer of clay and pozzolan.

The intervention obtained a good result, without however completely restoring the environment. Subsequently a new attempt was made by applying a cement plaster on the walls in an attempt to stop the water. Unfortunately, water continued to percolate between the discontinuities of the different structures (floor / wall and column base conjunction) and from cracks in the concrete slab.

Cement-based plasters, by nature compact and waterproof, have favoured the condensation of the humidity in the environment.



(Section of the Basilica with the identification of the crypt)



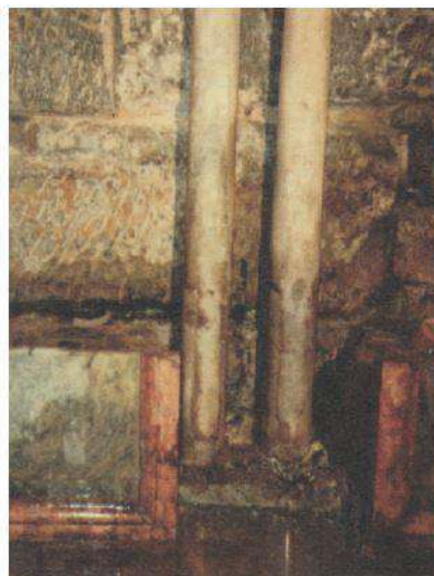
(Photos of the walls of the Crypt taken during the water drainage and dehumidification phases)

The intervention we were going to start would have followed tests carried out by us in the year 1972 in a section of masonry subjected to sensitive infiltrations. In that year we were consulted by the Procuratoria to evaluate the possibilities of an intervention with the technologies that we were using in the field of counter-thrust waterproofing on internal surfaces of underground structures.

The tests were focused in an attempt to form a waterproof diaphragm in the walls internal section, taking advantage of the their considerable thickness, by injections of the existing micro and macro cavities,

ways of passage of the water, using materials at that time innovative such as synthetic resins. The intuition proved successful. The start of the work consisted in the fine-tuning and the experimentation of new materials available on the market in the meantime and the refinement of the most suitable methodologies and equipment for the purpose. The initial phase also served to understand how and where to carry out the injection campaign and for establishing the absorption of resin per cubic meter of masonry, which was impossible to establish before starting the work.

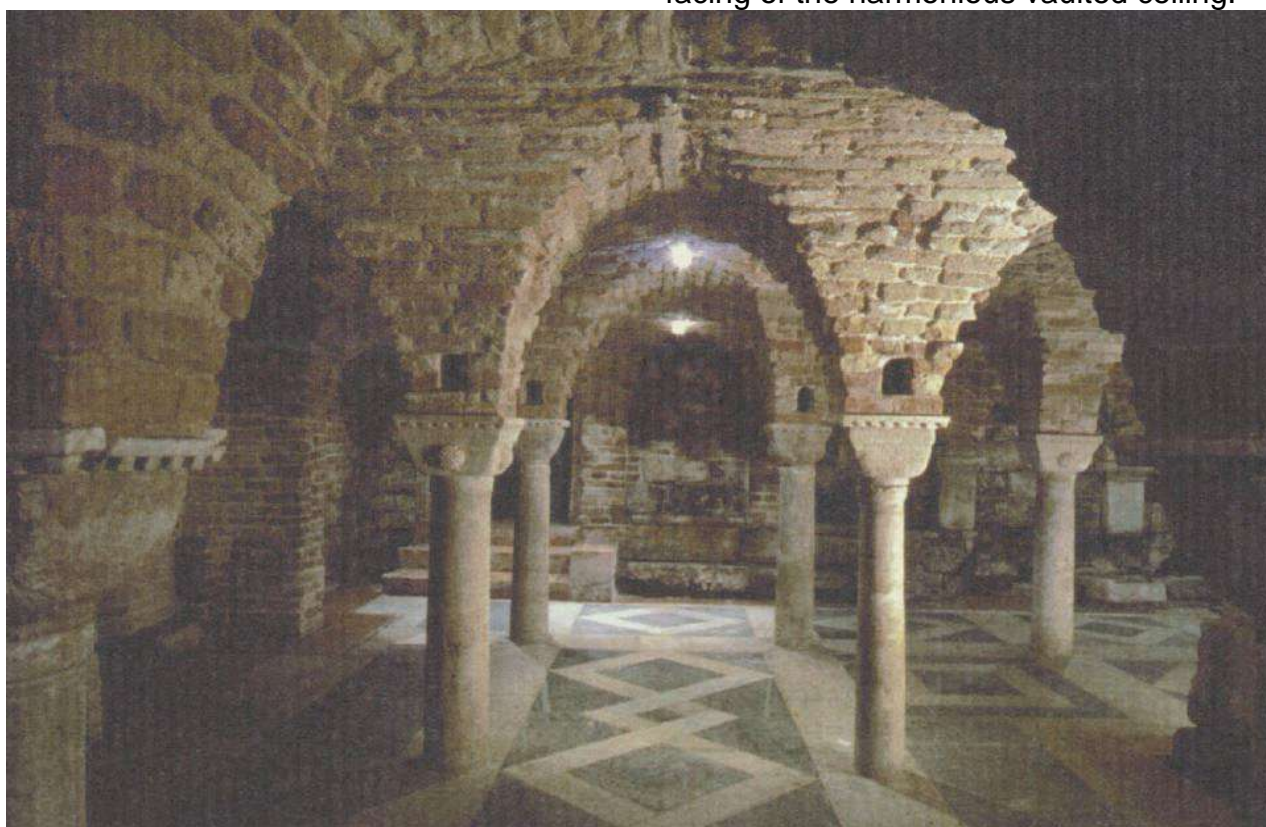
(Detail of two marble columns and coring operation to perform the resin injection in depth)



Once completed the various tests, the final project for the entire intervention could be drawn up.

Works lasted about 8 years and situations other than those known were faced and overcome, but not entirely unpredictable thanks to the initial experiments.

As we continued with the work, we became increasingly aware of the validity of the project, so much so that it was decided to remove the bench that surrounded the base of the walls, together with other structures built for the sole purpose of containing the water pushed by tides. In addition to the waterproofing of the floor and walls, we also carried out the restoration of the wall facing of the harmonious vaulted ceiling.



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