FEATURE OF TECHNICAL SERVICE

Subject	Executive design of the extraordinary maintenance works for the static conservative restoration of the Dittaino bridge located at km $43 + 270$ of the S.S. 192 and redevelopment of lateral protection barriers.			
Carried out by	SGAI srl di E. Forlani & C.			
Client	ANAS S.p.A.			
Service length	2020 - 2021			
Value of works	€ 5'687'000,00			
Categories value	S.06	€4'404'000,00	V.02	€1'283'000,00

Actual bridge

Graphic render of the intervention





BIM methodology

The use of innovative instrumentation, such as BIM modeling in REVIT has allowed the client to investigate in greater detail the proposed design solution, also evaluating its compliance with the interference present on site and related to the type of work on which the intervention is carried out.

3D REVIT model (Autodesk)



Degradation: Longitudinal profile



DITTAINO BRIDGE – Design issues and their resolution

The study area is located in the municipality of Catenanuova in the free municipal consortium of Enna in Sicily. The bridge that crosses the Dittaino stream is made up of 5 arches, four piers and two shoulders; at the ending of the shoulders there are the embankments for the access to the bridge supported by wing walls which develop parallel to the road. The total length is about 118 m, the net span of the arches is about 19 m, the width of the cross section is equal to 9.5 m. The bridge was built in several phases and is composed of: a central arched part and two side parts in reinforced concrete enlargement. The original project documents were not available so it was necessary to proceed with targeted investigations to reconstruct the geometry, the mechanical parameters of the materials and their state of conservation and construction details. For this purpose the followings tests were carried out: concrete core extractions to be subjected to crushing tests and on which to determine the depth of carbonation, pull-out tests to determine the strength of the concrete, pacometric tests to identify the reinforcements, relief operations for reconstruct the geometry of the work, extraction of steel bars to be subjected to tensile and mass tests. Due to the consistency of the planned interventions and the significant deterioration and decay of the mechanical characteristics of the materials, the safety assessment was submitted and several types of interventions were studied: extraordinary maintenance for static conservative restoration, redevelopment of lateral protection barriers, rectification of the road on the Enna side, protection works of the piers and sizing of a threshold to avoid undermining the foundation, sizing of the platform drainage works. Given the important road connection function carried out by the bridge, traffic will be maintained in an alternating one-way during the implementation of the interventions, while an alternative road system is envisaged for heavy traffic.







