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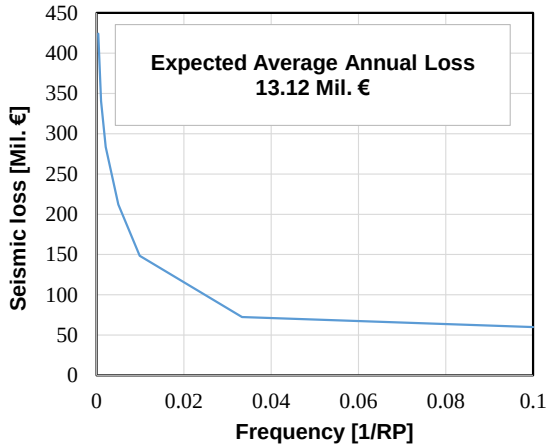
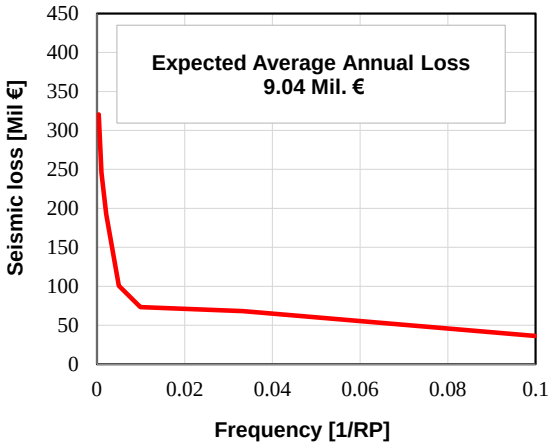
- Local intervention
- Seismic improvement
- Upgrading

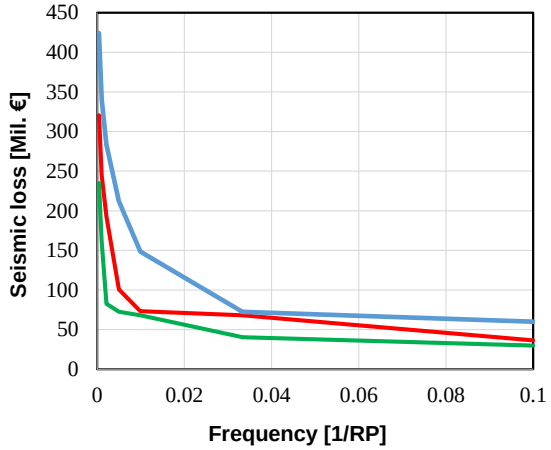
Behaviour modifier	Masonry	
		V_{mk}
State of preservation	Good	-0.04
	Bad	+0.04
Number of floors	Low (1or 2)	-0.04
	Medium (3,4 or 5)	0
	High (6 or more)	+0.04
Structural system	Wall thickness Wall distance Wall connections	-0.04÷+0.04
Plan Irregularity	Geometry Mass distribution	+0.04
Vertical Irregularity	Geometry Mass distribution	+0.04
Superimposed flors		+0.04
Roof	Weight, thrust and connections	+0.04
Retroffiting Intervention		-0.08÷+0.08
Aseismic Devices	Barbican, Foil arches, Buttresses	-0.04
Aggregate Building: position	Middle	-0.04
	Corner	+0.04
	Header	+0.06
Aggregate Building: elevation	Staggered floors	+0.04
	Buildings with different height	-0.04÷+0.04
Foundation	Different level foundations	+0.04

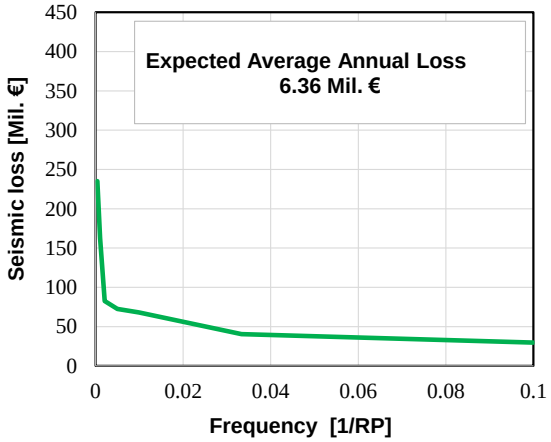


Actual condition
Expected Average Annual Loss



Local intervention
Expected Average Annual Loss





Seismic improvement
Expected Average Annual Loss

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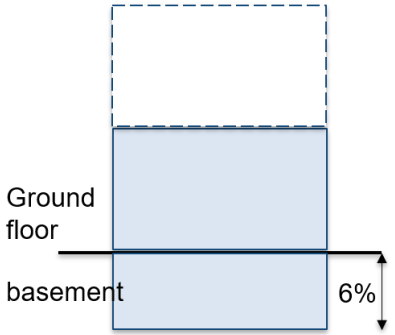
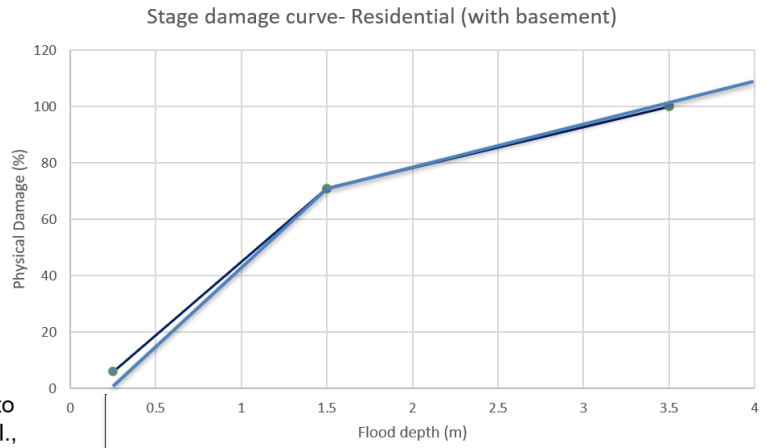
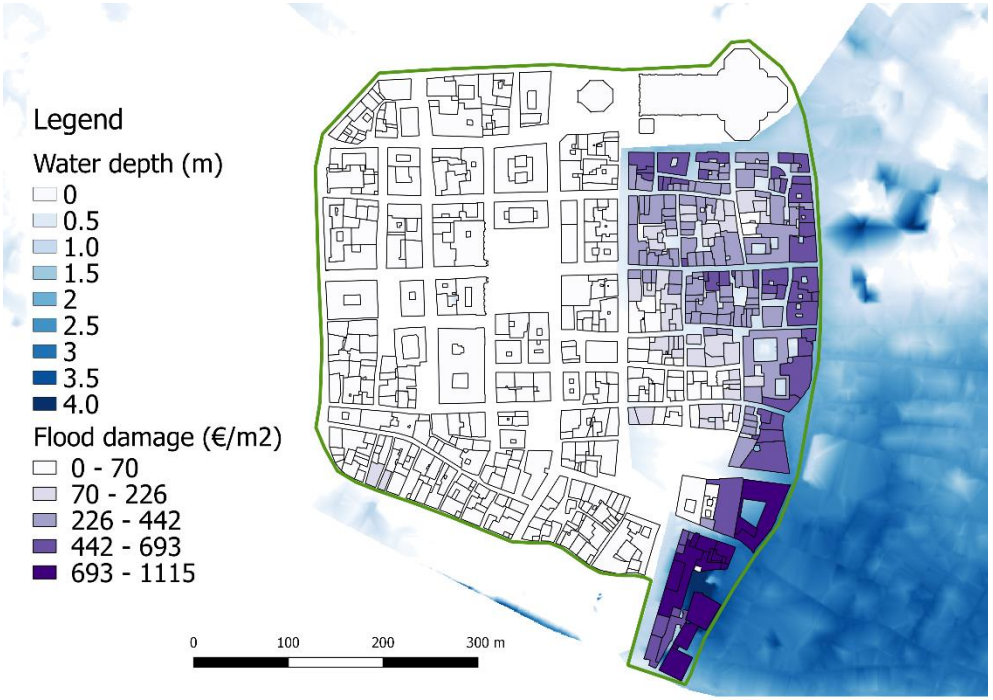


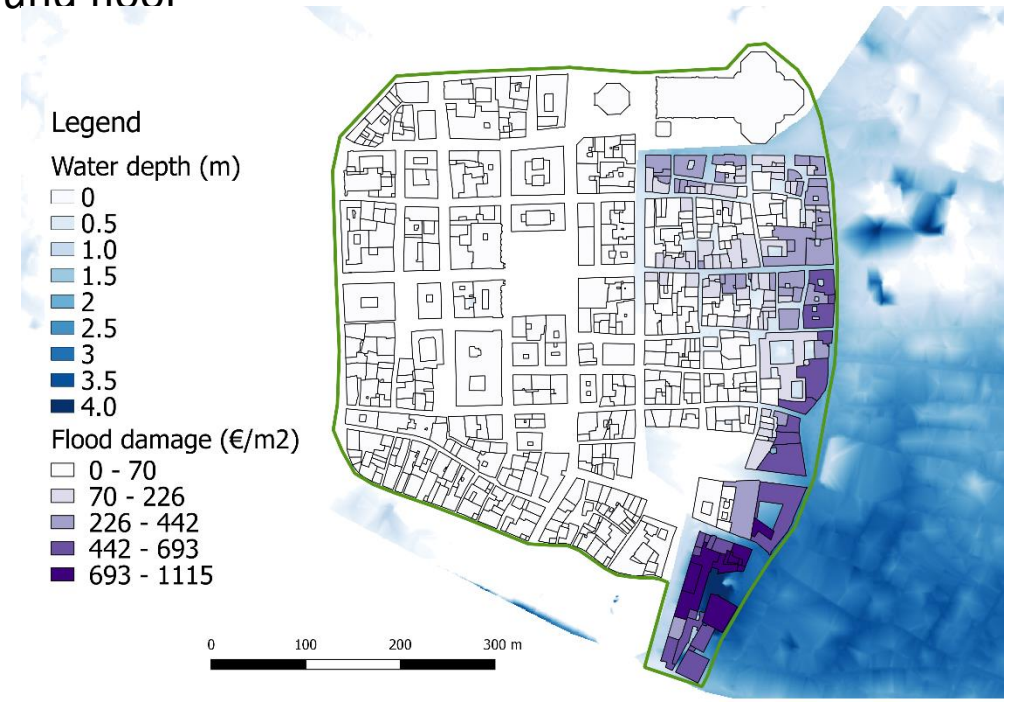


Basements are affected for low H due to possible backwater effects (Arrighi et al., 2013)

comparison between current vulnerability and protected underground floor



losses for the 200 year flood with mitigation measures



losses for the 200 year flood with mitigation measures and retention basins

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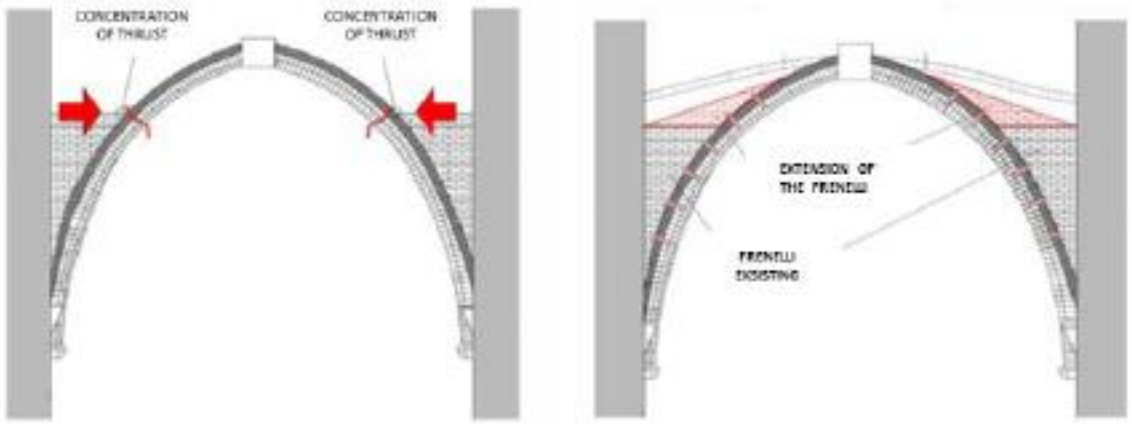
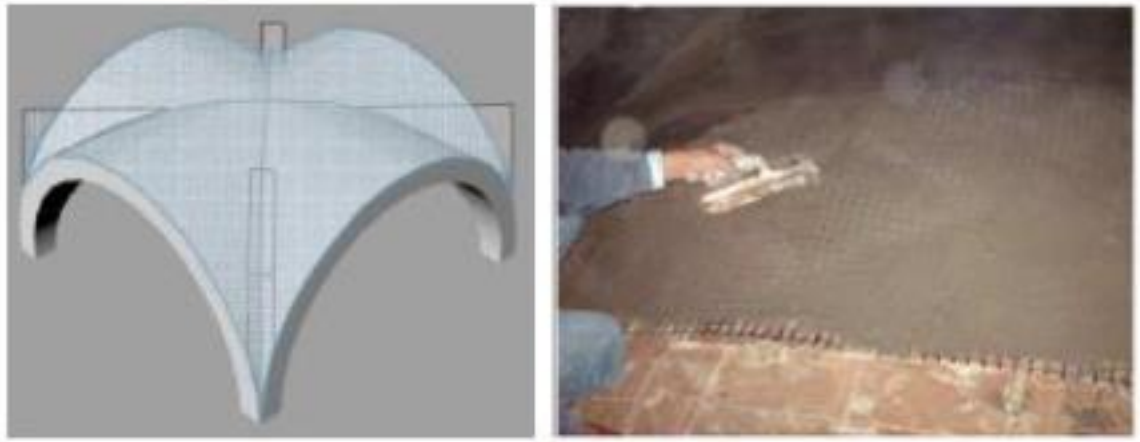
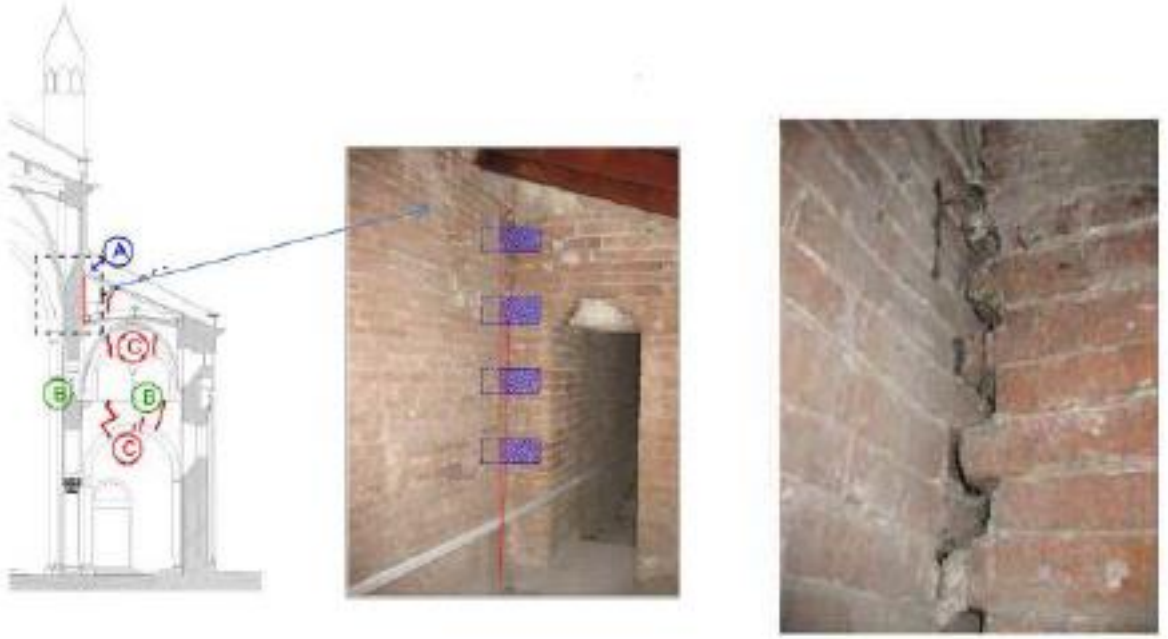




Interventions for strengthening the vaults: a) extension of the “frenelli”; b) layer of lime added with eco-pozzolana and reinforced with carbon-fiber mesh

Consolidation of the decorated plaster with using compatible pigments



Connection of the orthogonal walls

Nell’ambito della riduzione delle azioni si evidenzia in particolare l’inserimento di dreni. Questi consentono di mitigare l’effetto di spinta e l’effetto dilavante dovuto all’accumulo di acque. Questo tipo di intervento risulta sempre opportuno nel caso le mura svolgano anche il ruolo di sostegno.

Non tutte le sezioni si presentano in condizioni critiche, il presente contributo consente di classificare le sezioni individuando quelle maggiormente bisognose di intervento e di ottimizzare quindi le risorse economiche.

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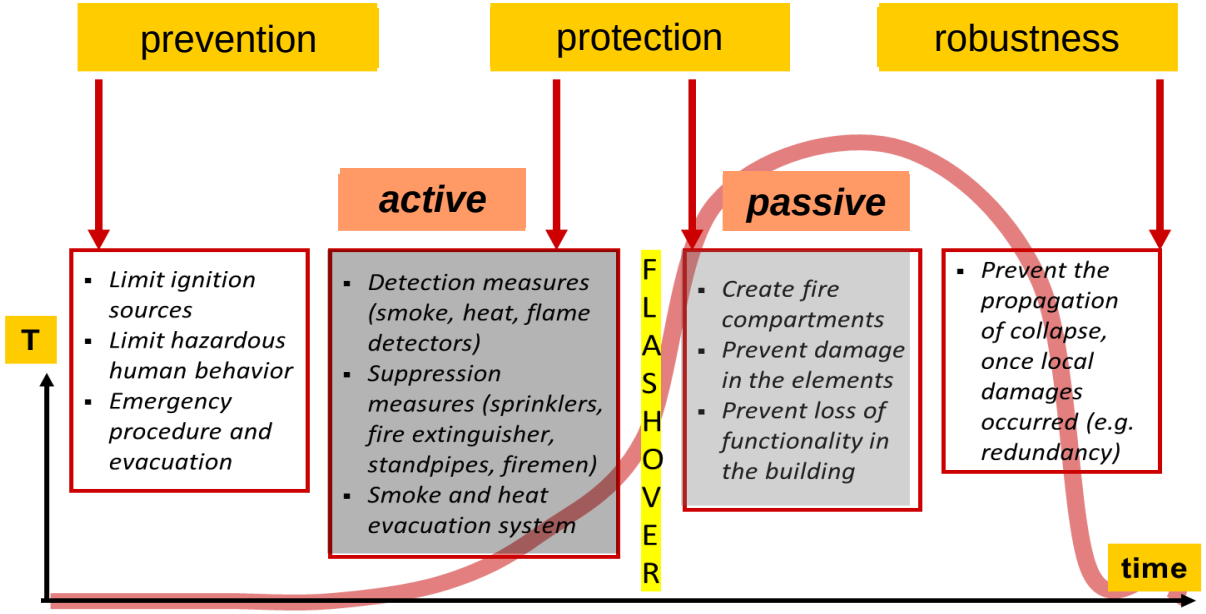

Effective fire mitigation measures in different phases of the fire development process

The installation of sprinkler automatic fire suppression system with an activation temperature of 60°C is considered as mitigation measure for fire risk. The effect of the sprinklers is shown by comparing (Figure 1) the fire development at the same time step as obtained without sprinklers and with them. The main effect of installing the sprinklers is then decreasing the air temperature around the structural elements and confining the fire extension.

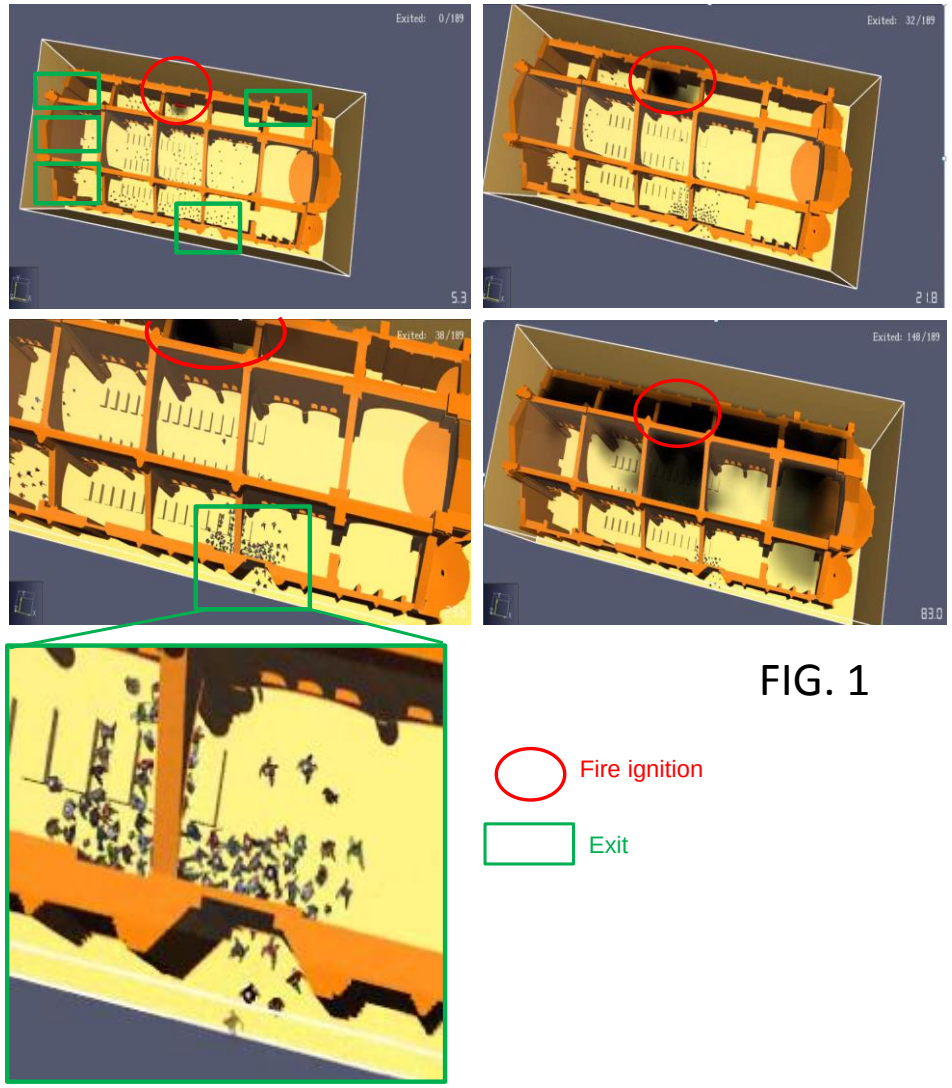

FIG. 1

POLIBA-DICAR

The analyzes conducted in the previously described phases have made it possible to construct a detailed picture of the characteristics of both the phenomena of instability and the context within which they developed. In order to contain and mitigate the analyzed Risks, a monitoring system of the entire area of the Municipality of Craco and, specifically, of the investigated structure and a hypothesis of intervention of arrangement and consolidation of the land have been designed, in order to preserve and make it safe the Norman Tower. Based on the design idea developed in [38] the areas on which it was deemed appropriate to provide for the installation of a monitoring system are those indicated as:

- Area of the historical center
- Convent area

The plans in Figs. 1-2 show the arrangement of the equipment and perforations to be made.

From a general point of view, a master acquisition unit (UMP) was planned to be installed in the Convent area, which is also the most suitable place for the installation of a weather station connected by cable. The weather station allows you to have a series of continuous data relating to temperatures and rainfall, such as to be able to make precise correlations with any displacements recorded by the kinematic monitoring system.

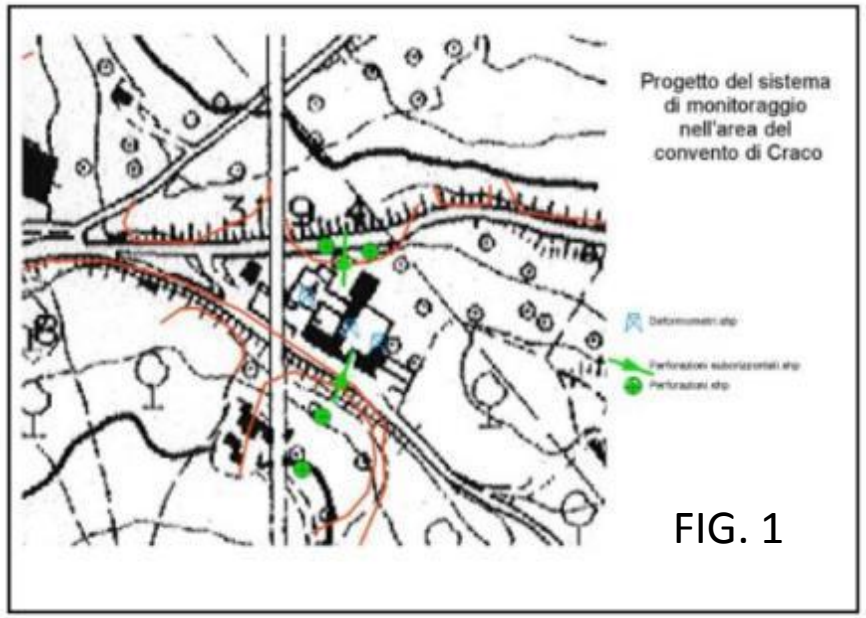

FIG. 1

FIG. 2

SITO·HISTORIC-ARCHEOLOGIC·MONITORING·SYSTEM·OF·*CRACO*			
EQUIPMENT	**NUMBER**	**SURVEYS**	
		NUMBER	**TOTAL·METERS**
Piezometer	6	6	120
Crack·placement·sensor	8		
Inclinometer	6	11	290
Extensometer	3	3 (sub-horizontal)	110
Meteo·station	1		

EQUIPMENT FOR KINEMATIC MONITORING OF THE TWO SECTORS OF THE HISTORIC CENTRE AND THE CONVENT OF CRACO