

Structural and architectonic re-use of buildings in the Fortress of Fenestrelle

by Bonnardel Alberto & Simeoni Piero

Tutor : Maria Ida Cametti

Co –tutors : Giacomo Donato and Giuseppe Lacidogna

The fortress of Fenestrelle with its 1,3 KM² of extension it is the biggest alpine fortress in Europe . Our interest for this building derives from its architectural value , from the ruin status of the most part of its buildings but also from the conviction that it is possible to re-use some of its parts and this would be very positive for the "alta Valle Chisone".

This building includes three fortresses (San Carlo , Tre Denti , Delle Valli), three redoubts (Carlo Alberto , Santa Barbara , Delle Porte) and two places used by soldiers who put their munitions (Dello Scoglio , Ospedale) connected among them by a covered staircase (4000 steps) that is unique of its kind.

The fortress was begun in 1728 (drawings of "First" engineer Ignazio Bertola of S.M.and thanks to the King of Sardinia Vittorio Amedeo II, who obtained the "alta Valle Chisone" with the Treaty of Utrecht in 1713 and who decided to strengthen the defensive system along this valley.

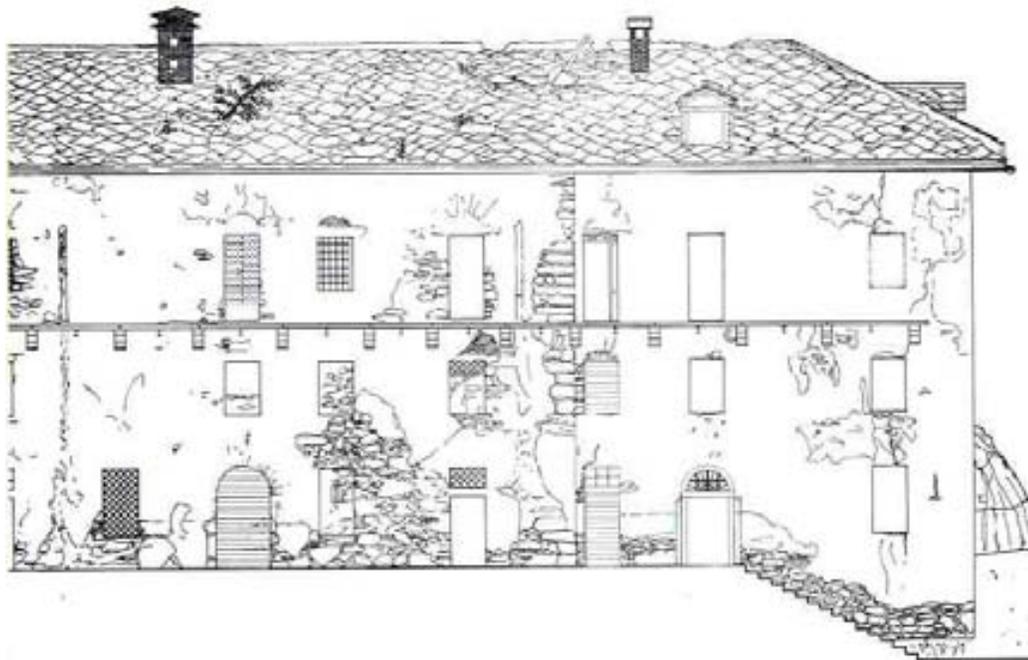


Fig. 1

The Fortress of Fenestrelle was not only a war building but a shelter for dissidents and insubordinate soldiers .

With Napoleone it became the ninth french bastille where the Cardinal Bartolomeo Pacca , Secretary of State of Pope PIO VII was imprisoned . During the restoration and the seventeenth century other important men were imprisoned in this fortress: carbonari, mazziniani, garibaldini, neapolitan soldiers, pope's troops, idealist, opposers of the monarchy.

At the end of the nineteenth century the fortress was trasformed in a big artillery store and after that, in a prison again but it was less and less used until 1946 when , at the end of the war , it wasn't used any conger and for good abandoned .For more than 40 years the fortress of Fenestrelle was methodically emptied out . From 1990 many volunteers of the " *Associazione Progetto San Carlo*" - *Fortress of Fenestrelle* decided to re-launch the fortress from the historical and cultural point of view.

In the mean while the national institutions (the district , the province , the alpine community and the town council) collected some money and now they are working to "recover " it .

In our historical research we found unpublished documents and listed the most important historical events of this fortress , in particular we analysed two buildings the fortress of San Carlo , the "First" Quarter and the former corps of engineers' store.

As there was lack of detailed planimetries , we used the surveys identifying the franework and the ruin status.

The architectural survey was made using both traditional instruments (the plumb-line , the "metric small whell", triplimeter, etc...) and the electro-optical instruments (the laser-meter , "teodolite" and "stadia"); the graphic draft was completed using photos

Then we studied the different ruin tipologies that we found in these two buildings.

Because of ruin and of lack of upkeep for many years , the roofing and the drain systems were damaged and there were drippings of rain waters along the walls that damaged the wooden beams (beam heads 's deterioration).

We have also to consider that many parts of the buildings had been taken away handrails, doors, floors, beams and attics, these last ones wery important to assume the static balance of the buildings in particular of the former corps of engineers store .We have analytically and graphically determinated the barrelvault "pushes" to the bombs thicness (95 cm.) of the "First" Quarter and of the done vault of the former corps of engineers' store.

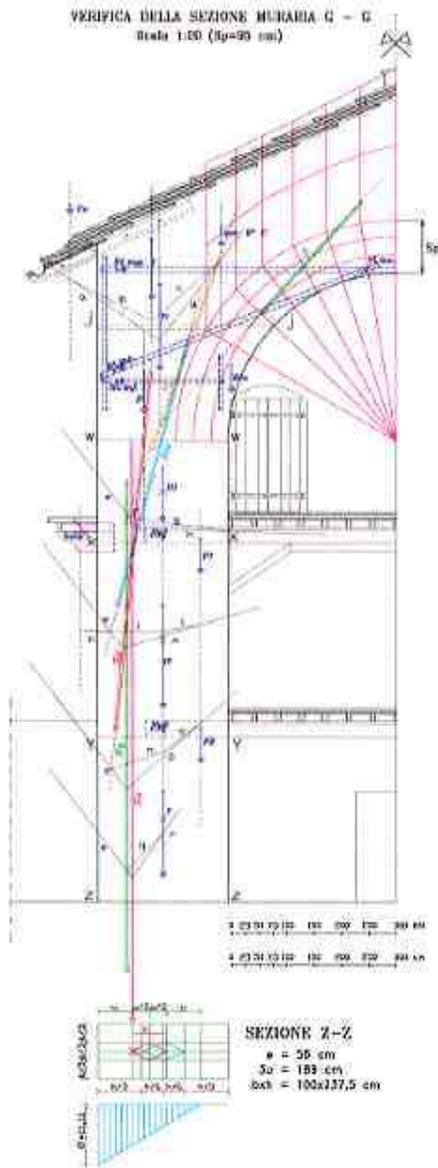


Fig.2

We carried out a tension analysis of the most significant points of the walls of the buildings measuring the values of each floor and at foot .These values are too high if compared to the normal site but not too worrisky for walls on rock as in our case.

As Fenestrelle has been identified as seismic area $S=9$, we analysed the seismic element that is very interesting if we consider the sizes of the "maschi murari". The wooden attics will be strengthened and the "locali controterra" too because these buildings will be probably used in 2006 because Turin (that is to say alta Val Chisone) will be chosen for the Winter Olympic Games.

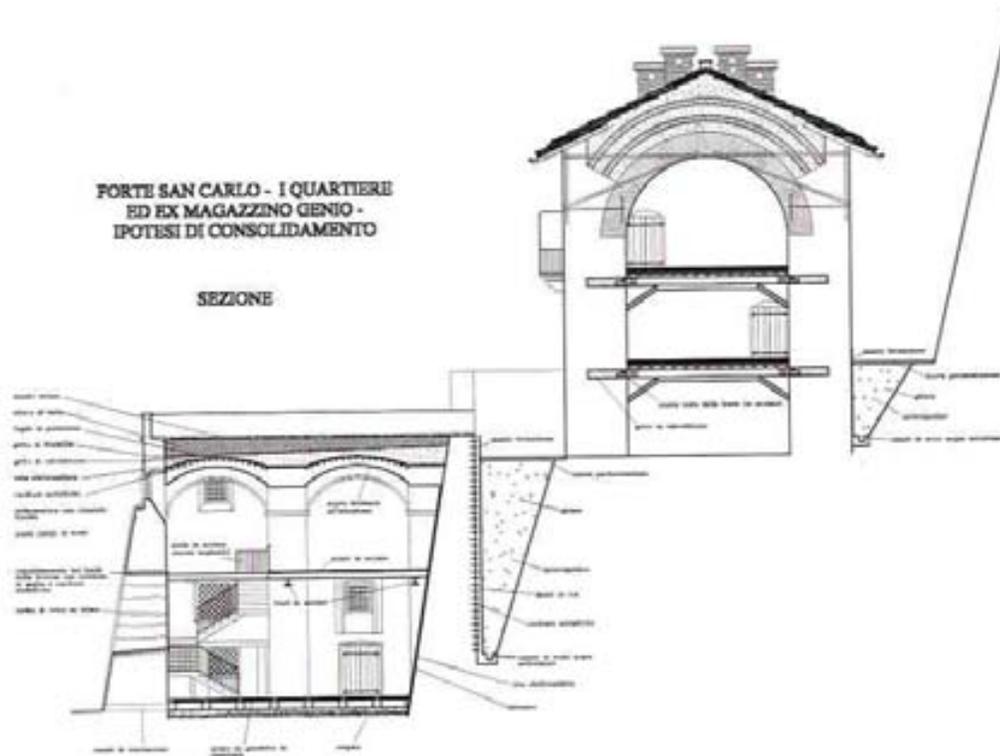


Fig. 3