

LEGENDA

-  PASSING THROUGH CRACKS (VISIBLE ON BOTH SIDES OF A WALL) >1cm
-  NON PASSING THROUGH CRACKS (VISIBLE ON ONE SIDE OF A WALL) >1cm
-  PASSING THROUGH CRACKS 1mm-1cm
-  NON PASSING THROUGH CRACKS 1mm-1cm
-  PASSING THROUGH CRACKS <1mm
-  NON PASSING THROUGH CRACKS <1mm

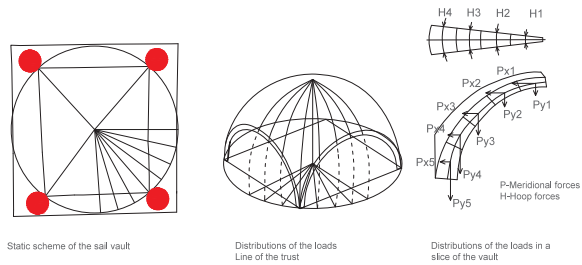
The tower is composed of 4 floors and has already been partially restored. Because of this restoration we couldn't see any visible cracks in the first three floors even if we suppose that a lot of cracks are inside the structure. In fact the action of restoration with new plasters hides the superficial cracks.

The ground floor presents a masonry barrel vault that doesn't present any visible cracks. The first floor was restored and refurbished as bathroom, created with new partitions and systems. Also this floor doesn't present any cracks.

The same condition is presented in the second floor. Instead the third floor presents a different situation, masonry walls have many cracks due to the dismantlement of the sail vault, which operation is not documented in the restoration of the castle. Probably, the vault was removed at the same time, then the buttress was added (during the changes in 1717), because of the structural problems. This action of dismantlement left many track on masonry and this floor wasn't restored.

On the masonry we could analyze many cracks of different typologies and dimensions. Most of the cracks in this floor are directly related to the problems of the load of the vault on bearing walls. Cracks are mainly concentrated in the corners, on which the vault was supported.

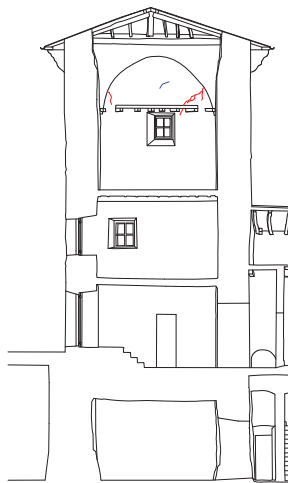
STATIC SCHEME OF THE SAIL VAULT



The main stress concentration was in the corners of the third floor of the tower. Some of the existing cracks on the last floor of the tower could be result of this vault presence. We could look at the series of passing through cracks in the corners of the walls. Another one, such as significant vertical crack in the middle of the wall could be the result of the vault dismantlement or the progressive process of the tower declination.

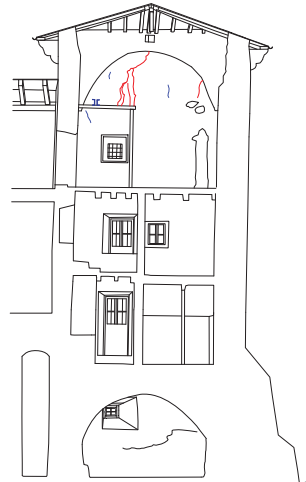


THIRD FLOOR PICTURES



GROUND FLOOR

On this wall we could see two deep cracks in the corners on which the vault was endorsed. The one on the right is particularly deep and is passing through the wall. These could be accentuated due to the progressive out of plumb of the tower.



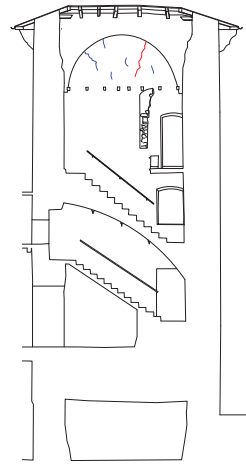
GROUND FLOOR

This wall presents a series of non passing and passing cracks that follow the same direction and the typical cracks on which the sail vault was endorsed. One of this crack is really deep and with a complex morphology made of divided cracks that start from big one. Also in this case the direction is due to the progressive displacement and rotation of the tower. Also in this floor the intervention to put two C shape beam and wooden beams could have damaged the structure and increased cracks on the wall.



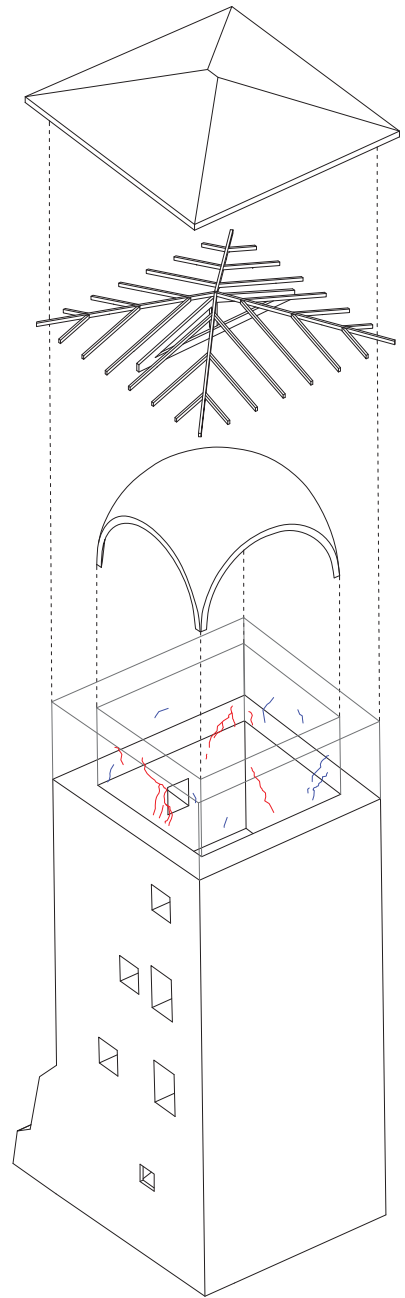
GROUND FLOOR

This wall presents a series of non passing cracks that follow the same direction and the typical cracks on which the sail vault was endorsed. This direction is due to the progressive displacement and rotation of the tower. On this floor two C shape beam and wooden beams were also put to create a new space.



GROUND FLOOR

This wall presents a series of non passing cracks, differentiated by dimensions and shape, with one big passing crack. This one is due to the action of dismantlement of the sail vault. Also in this case the direction is due to the progressive displacement and rotation of the tower. Also the interaction among adjacent building could have created cracks on this wall of the tower.



FIRST FLOOR AXONOMETRIC VIEW OF CRACK PATTERN