1. Introduction

The medieval Castle of Fossa (AQ). Analysis and restoration project
Caterina F. Carocci; Fabrizia Campisi; Irene Tranchina
University of Catania, Department of Architecture, Italy

The castle, which is situated on the upper edge of the old city centre of Fossa, was characterised even before the earthquake by an advanced level of degradation with specific points of instability in the walls. Therefore, the earthquake of 2009 had a serious impact on an already vulnerable structure and made it necessary to evacuate the residents of both the Castle and the entire historical centre. The study of the Castle originated as part of the largest analysis framework carried out following the seismic event of 2009 by a group of researchers from the University of Catania for the preparation of the post-earthquake Reconstruction Plan. In this context, the Castle buildings represent one of the keystones of the reactivation of the historical centre, which was heavily damaged and evacuated after the earthquake. Its position makes it not only a point of reference for the city centre but also characteristic of the surrounding countryside of which it is an important element in the panorama which includes the Ocre castle which overlooks it and the Benedictine Monasteries of Santo Spirito and Sant’Angelo. The methodology used in the study of the Castle can be summarised in three phases of in-depth analysis. The first phase involved carrying out the fact-finding analysis through a geometric-architectural survey and research based on historical documents from published works and archives. This phase was followed by the identification of the signs and traces of historical or recent transformations and the reconstruction of the phases of the evolution of this historical monument from the first structures to the current damage caused by the earthquake. The last phase of analysis started from the critical areas (structural vulnerability and missing extrinsic elements) and the strong points (historical value, urban and territorial contextual value) which resulted from the preceding analysis. These points were placed at the heart of a projectual consideration, which originates in the previsions of the Reconstruction Plan for the historical centre of Fossa. The results of this consideration are summarised in this paper.

2. The Castle and the Fossa urban nucleus

The Fossa settlement is part of the system of ancient centres which look down on the valley of the river Aterno and which contributed to the building of the city of L’Aquila. The name of the town derives from its position next to the sinkhole which is characteristic of the lower side of Mount Circolo. The urban structure has developed longitudinally around the old road which presumably connected the two benedictine monasteries of Santo Spirito and Sant’Angelo and which followed the crest immediately below the Castle (Fig.1). At the end of the seventeenth century, Fossa was identified as part of the Roman city of Aveia Vestinorum; the archaeological site (which has only been partly excavated) is partially to be found below the current historical centre and in the plain which it overlooks. Fossa was mentioned for the first time in 1204 by Innocent
III in a papal bull and developed without overlapping (except partially) the ruins of the Roman city lower down the hill.

The building of the Castle itself was due to ‘incastellamento’, a process with both defensive and territorial aims which was pursued by the monastic and lay feudal lords in the large mountain areas of Abruzzo. Like many others, the Fossa Castle is situated on a steep incline and consists of a trapezoidal walled enclosure, which surrounds an area of 1,675m² and includes three quadrangular towers. The circular look-out tower is situated on its own inside the perimeter and at its highest point. The main entrance is made up of an ogive-shaped gate in the lowest side of the walls while a secondary access which was used by the buildings constructed at a later date is situated in the southern side of the walled enclosure and is accessible via a series of steps. Another two, older entrances are located in the highest sides of the walls and are out of use today. In the lower part of the enclosure, a number of houses have been built against the walls and merge both with the quadrangular towers and the residential context immediately below. The outstanding characteristics of the Fossa Castle are the good level of conservation of the elements, which identify the original defensive system (the ogive-shaped gate with the remains of the system for closing it; the towers, the embrasures etc) and the presence of the above-mentioned layers of construction, which have transformed it into a small village. The upper floors of the buildings are residential in function but the ground floors house stables and working storehouses, which makes them similar to the houses in the historical centre of Fossa. However, they differ in the size of the walls and the height of the floors, which here are consistently lower, presumably due to the restricted nature of the available area. Additional constructions are also present in the eastern part of the enclosure but in this case the buildings are located below the north quadrangular tower and are in contact with both the internal and external face of the walls (Fig.2).

3. Transformations, neglect and seismic damage: the fact-finding analysis

3.1. The historical centre of Fossa

Fossa, like most of the historical centres in the Aterno valley before the 2009
earthquake, was in a situation of neglect which was due to the attraction of the main town in the province and to the demand for living standards which are different from those offered by the old buildings of the historical centres. Despite the gradual abandonment and the lack of maintenance of both the private buildings and the public spaces immediately before the earthquake, the historical centre was marked by a substantially integral general appearance. The damage caused by both the earthquake of April 2009 and the consequent landslide on the slopes of Mount Circolo rendered 90% of the buildings impracticable but still allowed a conservative recovery of the whole urban area and the individual buildings as the collapses were limited to a few sporadic cases and the volumes were generally complete.

In the fact-finding stage of the analysis for the Reconstruction Plan, a systematic investigation which extended to all the buildings was carried out through in-depth analyses of the types of construction, of the changes in the urban structure, of the local architectural vocabulary and the identification of the damage mechanisms activated by the earthquake and their causes (Fig.3). This post-earthquake survey was accompanied by an investigation of the archives, which was carried out both in the L'Aquila State Archives and in the Historic Archives of the Municipality, which are kept in the Fossa Town Hall. These investigations resulted in an in-depth knowledge of the historical centre and its historic architectural features. The choices made in the Reconstruction Plan were based on the conservation of these features.

3.2. The Castle
It must be observed that the situation of the Castle before the earthquake was also characterised by a general abandonment and neglect of both the parts in private hands (the residential buildings) and the public property (the enclosing walls, the circular tower and the internal areas which have not been built on). In this context, the earthquake merely highlighted the weakest parts (by causing their collapse): these are characterised by a high level of damage and instability. The fact-finding analysis started from information from the whole architectural structure of the historical centre and proceeded by becoming more and more in-depth. In particular, a significant part of the fieldwork was dedicated to surveying the entire fortified monument and the buildings included within its walls. The survey was also extended to the linear block situated immediately below the Castle as it was felt that this block was a particularly good example as regards the buildings included within it and the typology of the aggregation and finally as one of the oldest examples of the formation of the city.

The drawings of the whole complex at scale 1:100 and its important details at scale 1:20 permitted the realisation of the findings and interpretation through the indirect information taken from the sources (Fig.4). Specifically, the areas of reconstruction which were observed during the on-field survey phase were identified through documents found in the Soprintendenza BAP Archive in L'Aquila. This partially finished reconstruction involved the enclosure walls (parts of which had probably collapsed) and the reconstitution of the cylindrical volume of the tower. In addition to this public work,
a number of private transformational projects were observed in the complex. The most violent are those on the side of the valley: the building of steps in reinforced concrete and a large section of concrete plaster, which covers the bare stonework.
Following the source analysis and the direct comparisons, the formation process of the castle from the first fortified structure to the current situation was reconstructed by gradually identifying the additional blocks placed inside or outside the walls with the connection to the buildings of the urban centre. Physical traces were identified and linked to specific historical phases through both the identification of stonework techniques and inscriptions found on the ashlar masonry. This identification and dating phase was accompanied by the recognition of the areas of change, disrepair and incongruous transformations. These were mapped to be used in the interpretive reflections in preparation for the design choices. The conclusion of the fact-finding phase showed that, in terms of the conservation needs and with regard to the overall condition, the situation after the earthquake was not substantially different.
from the situation before the earthquake. However, in some cases existing problems became critical (series of cracks which became more serious, the collapse of already crumbling elements etc) and others worsened significantly (the collapse of the upper quadrangular tower).

4. The Reconstruction Plan
The historical and environmental importance of Fossa (both the actual historical centre and the surrounding area) placed the character and values recognisable in the urban landscape and the historical constructions at the heart of the choices in the Plan.

The prime necessities for the reconstruction of the historical centre, which suffered severe damage but was free of collapsed buildings, were identified as the conservation of the historical and cultural importance of the context but at the same time the indispensable revision of the distribution and improvement of the quality of the residential buildings.

To this end, the reconstruction plan puts forward transformational models, which are compatible with the types of historical building while allowing the possibility of renewal with regards to the architectural and constructional qualities of the buildings.

The Plan intervention categories regulate the restructuring of the housing by allowing, for example, both horizontal and vertical fusion through the introduction of internal connections and the availability of the lower floors for residential use.

The opening of sites for repair and seismic improvement throughout the while urban fabric gives the Reconstruction Plan the responsibility for safeguarding the urban and architectural history of Fossa. The strategies, which aim to improve the historical centre present condition, are present in the “Cores of urban renewal” (one of which is the Castle) and they represent the design aspects of public interest which will determine to a large extent the success of the reconstruction.

The parameters of the “Castle’s core of urban renewal” are directed at the conservation of the monumental portions and the recovery of the residential buildings. A partial change in the function of the latter is possible with contingent and controlled changes to the spaces within the enclosure (designed to facilitate public use by improving the access to the gardens) and the installation of compatible public functions. Particular care has been taken in the identification of the techniques to be used in the reconstruction, integration and restoration of the walled structures and the finishings.

5. The Castle project
5.1. A strategic enhancement project
The project develops the theme identified in the Reconstruction Plan for the “Castle’s core of urban renewal” by including a larger part of the urban context. This solution comes from the conviction that the Castle - thanks to its position, conformation and size - can become the centre of the requalification of the value system present in the area by becoming the headquarters of a body which manages the sites of cultural interest across a number of Muni-
cipalities (a list of sites present only in the Fossa territory includes the Santa Maria ad Cryptas church which was built on the remains of a previous ninth-century temple identifiable in the Roman-Byzantine hypogeum; the Vestina Necropolis which extends over 5000m² and where about 6000 tombs dating from the ninth to the first centuries BC have been found; and the remains of the Roman city of Aveja).

The identification of sites of interest is accompanied by the identification of activities which are present in the area and which can be included in the circuit outlined by the strategic project. In fact, this project calls for the organisation of the existing activities with promotion of complementary and compatible activities to create a cultural and natural tourist network. In this framework, the project confirms wherever possible the location of the activities, which existed before the earthquake or rethinks their location based on the results of the analysis of the architectural heritage of the historical centre.

Specifically, the buildings which were unused before the earthquake or those in which the previous functions will not continue (the Town Hall is an example) can be chosen to house the offices of the aforementioned network. In this way, the project combines a privately-managed reconstruction of the residential structure with a public reconstruction under the auspices of the Municipality for which it anticipates the uses, management and maintenance of the architectural heritage over time.

The role of the Castle complex is central to the strategic enhancement project for the historical centre and the aim of exploiting the cultural sites present in the area. This role is entirely dedicated to public use and includes differentiations, which depend on the functions assigned to the Castle spaces and those of the connected block (Fig.5).
5.2. The Castle restoration project

The project focuses on both the architectural restoration of the Castle, with the aim of ensuring the conservation of its parts (the enclosing wall and the towers, the old residential buildings which back onto the walls, the terraces etc.), and the recovery of the buildings situated in the block immediately below and which will be given public service functions. The key points of the project are identifiable in the choice of compatible functions, in the improvement of access and extent of use of the sites, and in the definition of criteria for conservation work based on the specific conditions of the buildings.

Within the overall framework for the system of cultural tourism proposed by the strategic project, the protected buildings, which are included in the fortified enclosure, become a museum through the realisation of a tour, which also includes the areas without buildings which will become gardens. The circular tower in particular will again be a lookout point on the valley with the introduction of an internal staircase. The buildings which back onto the lowest part of the walls will house public services connected to the system of cultural sites across the area: specifically, the headquarters of an association which manages the sites and a small Castle Museum. The quadrangular tower and the buildings which back onto the north-west part of the walls will become guestrooms and a small restaurant which can periodically use the garden in front. Finally, some of the buildings in the block will be residential while others (in a different position with respect to the tour of the historical centre) will be public and linked to cultural tourism (location of the tourist office and a local periodical which already exists). An important part of the consideration of the project is dedicated to rethinking the access and external routes to the Castle either on foot from the historical centre or using the road above, which provides access to emergency vehicles and a disabled car park. The project also includes the recovery of the Castle’s oldest access points (which are currently inaccessible) by providing paths and steps, which are able to overcome the steep incline.

The work criteria adopted by the restoration project for the buildings in the Castle complex follow those indicated by the Reconstruction Plan and are defined with reference to the state and configuration of the buildings precisely identified in the fact-finding phase. The project starts from the precise identification of the previous work carried out on the fortified sections of the walls and the recent transformations of the buildings internal to the enclosure. The design choices are based on this interpretation of the critical points (updated to include the earthquake damage) and include the contingent techniques aimed at conserving the buildings and highlighting the historical construction process of the current palimpsest of layers (Fig.6). The work involves the rebuilding of collapsed portions of walls and horizontal elements (the northern quadrangular tower and some buildings), the consolidation of the insecure elements, the removal of the incongruous elements (such as the external steps and the areas of plaster finishing from the valley façade), and the conservation of the surfaces and tops of the walls. Finally, the project also outlines the technical work to be done on the areas inside the enclosure, which will become the public garden. Specifically, it calls for the renovation of the pre-existing terra-
Fig. 6 - Conservative and maintenance problems affecting ancient masonry of the monument and project criteria

6. Conclusions
The synergy of both the town planning provisions in the Reconstruction Plan for the historical centre of Fossa and the detailed analysis of the Castle is intended to conserve and enhance the area of the buildings and the wider territory of which it is a part. In this context, the Fossa Castle restoration project is one of the key points for the recovery of the historical centre and in particular for the return of the inhabitants who were evacuated after the earthquake in April 2009. In fact, the experience of various post-earthquake reconstructions has shown that the successful completion of the Reconstruction Plan cannot be based solely on projects of recovery and antiseismic improvements for the groups of private buildings. The Plan must be part of a wider and more cogent process of work on the buildings and the socio-economic activities in the area. The study presented here implies this very vision: it aspires to reactivate the functioning of activities and initiatives which already existed before the earthquake and to favour the beginning of new activities within a sustainability framework for both the natural and man-made environment of which Fossa and its Castle are essential elements.

Notes
2 The University of Naples-“L’Orientale”, scientific responsible Prof. F. Pesando, is in charge for the excavation of Aveia-Fossa from 2007.
3 For the post-earthquake condition of Fossa historical centre, cfr. Piano di Ricostruzione di Fossa, Comune di Fossa-Università di Catania, www.comunedifossa.it (Sisma e Ricostruzione, Piano di Ricostruzione).
5 Progetto per la salvaguardia della parte alta del paese e consolidamento delle mura
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