AN ANALYSIS SYSTEM REGARDING DAMAGES AND TRANSFORMATIONS TO OLD FORTIFICATIONS. THE POSSIBLE RECOVERY OF THE CITADEL IN MESSINA

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ABSTRACT

Many monuments, memories of a past rich in history and culture, over the years have suffered important alterations caused by man’s necessities and accidental events. In the optics of the maintenance, it is important to safeguard the essence of such monuments to preserve the historical memory and the identity of them and to strengthen their role as a resource.

The choices of intervention have therefore to be founded on a plurality of analysis and factors, on both traditional and innovative operational procedures, involving numerous disciplines and competences; they have to be preceded by an accurate phase of knowledge, constituted by analyses that investigate the characteristics of the buildings and of the context.
If then the knowledge framework enriches of further data related to brutal transformations, a special care must be kept while organizing the information system to exactly frame the found problems.

This is the case of the Citadel in Messina, imposing eighteenth-century fortification, designed by Carlos de Grunembergh and built by the Spanish to control popular rebellions. After resisting to the time, today it is neglected and, till some years ago, used as refuse disposal site, loosing the monumental and functional characters for which it had been built.

The study aims to propose an examination of the monument, analyzing morphological, historical, technological information, in relationship to the transformations, the changes of use destination and the damages caused by them.
In summary the study applies analytical criterions to the information acquired to verify, to the goals of the intervention, the possibilities of reuse of the monument.

INTRODUCTION

The Architecture can be considered “field of rules and techniques, studies and measurements, relieves from the truth and conceptual rethinks. This relationship with the reality is neither linear nor metric but suddenly it enlightens the space with a possibility that the architect must section and investigate. Every revealed form and every offered material hide a plot of criteria, of geometries, of relationships, that in turn suggests other forms, almost in the proliferating construction of a catalogue that is contained with difficulty. So an idea of architecture is born and is clarified that is first of all fan of alternatives, field of variations, range of syntactic combinations” [1]; such combinations, such scenarios of intervention are the set of the possible interpretations among the two extremes of maintenance and transformation, so as Ungers suggests, that is as giving up the ideal project [2].

The intervention of recovery, in its more general meaning, is a set of actions, techniques and analysis, directed to assure the efficiency and the length to the buildings in the time, in operation to the resources and the performances expressed by the built environment. The latter is a complex system that needs a plurality of readings, through “quantitative methods and qualitative criterions typical of the sciences” [3] that allow to plan different hypotheses of intervention, suitable to the
actual contexts.
A particular case is that of the numerous monuments that characterize our cities and that, because of natural or anthropogenic damages, have lost the image in which the society identifies itself. It’s especially in these cases that the choices of intervention have as principal objective to protect those elements that make every place an unicum, that define therefore its identity but also its memory.
“ The characters of the urban place constitute the distinctive element of it, a quality typical of the environment, that distinguishes and differentiates it from the others” [4]. Such identity characters derive from a set of factors, partly attributed to the physical component, partly induced by the natural site, partly heritage of the culture of the place.
In 1952, when the first definition of the elements of city was proposed, the requirement was to meet the needs of the society half-way and, in the same time, the lack of a vital and essential quality for the comfort emerged: the identity. The study [5] recognized in the historical buildings, in some parts of its, this identity and suggested that a community must “be constituted by series of elements of association” [5] expressed through the mobility of the society. It is the first example of identity applied to the project, from which derived the concepts of street, district and city. The most important assertion of this theory concerns the activities: any combination of activity could delineate identity characters linked to ways of life.
In 1956, at the 10° CIAM of Dubrovnik, scholars tried to show the necessity of a specific and recognizable form for every type of activity, therefore a code and possibly a codified idea of the identity of the place tied to it.

The relationship with the history, in which Kahn singles out the product to give from to the movement, to the spaces, to technological tools, is one of the key concepts enforced in the buildings recovery, with the studies of K. Lynch about the image of the city and about the meaning of the territory, that singles out elements and keys of analysis of the place through the coding of feelings; these produce quality, positively influencing our comfort, our ability to understand.
This study is planned on these bases, embracing also part of the gestalt theories about the visual perception, for the definition of the identity of a place.
The sense of the territory becomes really the element of analysis of a place; the scale is exactly the territorial one because in it the “sensorial quality of great spaces and mass that can [...] be more effectively treated at urban or great district scale” [6] are highlighted.
If for Lynch the truest meaning of every place is the relationship with its quality of life, with a living world, then the abandoned places can throb of own life at the memory of past times, while, for someone else, they can have no meanings at all. The environment, to remark its own identity, must express values summed up in four fundamental concepts: the perception and the movement, the image of the place and the time, the landscape and the communication, the intuition of the life. In this study the attention is focused on the image of place and time, elements closer to architecture; in fact in an investigation that singles out the identities of a place, the quantitative values are given by the local factors of time and space.
Nothing new if not for the need to operate on the damages and the transformations suffered during the time. The validation of these elements is extremely complex and needs objective studies, without external influences.
In this direction the study wants to link the recognized damages with the actions that have determined them and to highlight the state in which the place is. If the analysis singles out the characters that must lead the transformations, the project of recovery must operate to preserve and maintain, to demolish and eliminate what has been added and has caused a damage, to improve the quality of the natural and built environment, carrying out interventions that range from the reuse to the consolidation of the single technical element [3].
In such context, the project of reuse becomes modification of the natural and built environment for improving its original performances in the light of the new demands, safeguarding its peculiar
characters at the same time.

The study case

The Citadel in Messina had in origin a star shaped structure with five cuneiform bastions (S. Carlo, S. Diego, S. Stefano, S. Francesco and De Grunembergh). Partially surrounded by the sea, it had a total surface of about sqm 51.000 of which about sqm 13.000 occupied by the bastions. It was built between 1679 and 1683 by the Spaniards following the anti-Spanish rebellion of the Messina’s inhabitants in 1674.

The project, committed to the military engineer Carlos De Grunembergh, proposed a system of fortifications with radial plan to be located out of the Terranova district. In 1680 the jobs started. De Grunembergh used a complex system of canals that followed the perimeter of the walls and exploited a whole of locks that were manoeuvred according to the tides [7].

Between 1860 and 1861 the Citadel was partially damaged by bombardments and in 1908 by earthquake. Between 1918 and 1950 it suffered substantial changes due to the destination as storage and to the demolition of the bastions De Grunembergh (1922), S. Carlo and S. Francesco (1930 -1950). Since the mid-Fifties to the present day, it has lost the monumental and functional characters that identified it and for which it had been built, because of new precarious buildings and of numerous changes of destination of use (such as industrial developments, of a dump and of the incinerator of the urban wastes).

Today the Citadel is in a state of total deterioration and abandonment and only forty percent of it is standing; besides other important parts are no more visible but they are burie under about two meters of rubble and debris [8].
The Citadel in Messina has lost the original identity because of numerous uncontrollable natural events and of haphazard interventions. The individualization and the recognition of its monumentality become the pivot of the study: it is a monument that must be brought back to the city, through the use of innovative techniques that interact with the preexisting structure, within a mechanism of mutual appreciation.

**ANALYTICAL METHOD**

The analysis of the building and the city as built system, start from the matter and the signs left by innumerable natural and anthropogenic actions. The aim is finding the characters that determine its identity and allow to establish the criterions of maintenance and transformation and, consequently, of intervention [4].

The most important objective is to find and to establish a careful relationship with the buildings, to define a set of new conservative and transformative actions that recover and valorise the identity characters of the place and the monument. These are “essential components of our mental structure and vital strength in the construction of the human society: therefore they cannot be eliminated without producing serious losses” [10].

In this study, we point out an operational methodology involving four phases:

**I Phase - Organization and selection of the information to the goals of the data collecting**

The first and more important phase consists of selection and classification of the acquired information, necessary to identify the identity characters of the monument. The scientific base that determines them is based on the numerous and known studies about the territory. These lead to a natural selection of the information, depending on the *sense* of the territory and on its characteristics. Classical and numerous historical, geometric-dimensional, technological, environmental, social, cultural and functional analyses are inserted in a wider frame of information. This considers more aspects and directs the results of the analyses.

Then the campaign of data collecting brings to recognition and searches to different levels.

**II Phase - Systemization of the information and envisaging of the identity characters.**

During such phase the information are reduced to a system, which lead to an abacus of the characteristics of the object that notice its value. The abacus so structured allows the identification of the character features of the monument and reveals the true essence to protect and value.
III Phase - Individualization of transformations and damages
The preserved, transformed and altered characters are highlighted through the comparison between the identity characters and the state of maintenance of the monument. These, in their turn, lead to the recognition of the damages caused the system during the time.

IV Phase - Methodological foundations for the project of intervention
Once singled out the damages that the monument has suffered and the transformations that have determined them, the categories of intervention can be defined according to the types of transformation. During such phase the aim is to propose the project of recovery of the monument with a hypothesis of intervention, depending on the single recognized categories.

Figure 3: Operational methodology
RESULTS & DISCUSSION

“Being architects means to perpetuate a phenomenon verifiable only in relation to its own tradition, that is that it can not be separated from history” [11].

In this perspective the basis for an analysis of the features of a site must certainly begin from the natural characteristics of a territory: geology and topography elements, climatic and ecological aspects can be tools of environmental change and can define urban intervention, to control and modify the existing system, without destroying it.

To enable this it is important to single out the space characters and the sensorial priorities of this space, thus what first emerges.

The identifying characters of a site can then be expressed by:

- The *spatial configuration* that singles out the cornerstone elements of the territory or the buildings, whether it is an environmental system or a built system;

**Table 1:** Spatial characters

<table>
<thead>
<tr>
<th>SPATIAL CHARACTERS</th>
<th>RELATION WITH THE CITY</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPATIAL CONFIGURATION (Characters of the place)</td>
<td>The area of the Citadel is situated in the peninsula of St. Raineri, natural scenic-background of the city, even if deeply isolated by the neighbour historical city because of the presence of the railroad</td>
<td>P</td>
</tr>
<tr>
<td>SPATIAL CONFIGURATION (Morphological and Dimensional Characters)</td>
<td>RELATION WITH THE SEA</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td>The north front of the area is inside the port basin of Messina, the south front is lapped by the waters of the Straits</td>
<td></td>
</tr>
<tr>
<td>PERIMETER</td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>ARTICULATION OF THE SPACES</td>
<td>Inner works: closed plant with central fortress External works: three <em>controguardie</em> and two <em>rivellini</em> in defense of the entrance and the bastions</td>
<td>A</td>
</tr>
<tr>
<td>FORM AND DIMENSION OF THE SPACES</td>
<td>Pentagonal plant with heights variable from 7 to 12 metres and wall thicknesses between 6 and 12 metres</td>
<td>A</td>
</tr>
<tr>
<td>CONTINUITY OF THE WALL CURTAINS</td>
<td>The external works are almost intact in shape; the walls of connection among the inner works (bastion S. Diego and St. Stephen) present remarkable fragments</td>
<td>A</td>
</tr>
<tr>
<td>WAYS AND ACCESSES</td>
<td>The actual access to the area is from S. Raineri street; in origin there were two principal access: Carolina Work and Grazia Door</td>
<td>A</td>
</tr>
</tbody>
</table>

*legend*  
- **P** = preserved  
- **T** = transformed  
- **A** = altered

- The *temporal shape* through which the changes happened in time and the density of sign left by time are singled out;
Table 2: Historical characters

<table>
<thead>
<tr>
<th>HISTORICAL CHARACTERS</th>
<th>REALIZATION OF DE GRUNEMBERGH PLAN (1679-1683)</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHAPE DURING THE TIME (Historical Characters)</td>
<td>THE CANALS AND THEIR RELATION WITH THE SEA</td>
<td>A</td>
</tr>
</tbody>
</table>

- The *visibility* thought as a method of representation of the site, through which tri-dimensional characters are singled out to analyse and underline what is visible from far away and bi-dimensional, carrying out a reverse process from particular to general (sketching general characters such as the site skyline, the landscape, the built environment, the land extension, in relationship with the surrounding elements);

Table 3: Overall characters

<table>
<thead>
<tr>
<th>OVERALL CHARACTERS</th>
<th>TRIDIMENSIONAL</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISIBILITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- The environmental qualities: if Lynch interprets this element as *visual intrusion*, more recent studies lead to think the environmental qualities as a set of natural elements surveyed as
warm sites, cold sites, with wind presence, sunny, with glare, sheltered or exposed to rain, noisy, artificially lit, well aired [12];

- The natural and plant characters: understood not only as the never anthropized portion of territory but also as those areas where the human work is integrated and radicated. They are of relevant significance in a urban study scale and according to the size of the studied area they can refer to a territorial division in homogenous sectors or to a horographic and plant study;

**Table 4:** Environmental characters

<table>
<thead>
<tr>
<th>QUALITY OF THE ENVIRONMENT</th>
<th>ENVIRONMENTAL CHARACTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>VENTILATION</td>
<td>Prevailing winds: north-east wind, east wind, south wind, libeccio</td>
</tr>
<tr>
<td>CIRCULATION OF THE AIR</td>
<td>Grazing (north-east wind, east wind, libeccio) Frontal (south wind)</td>
</tr>
<tr>
<td>SOLAR EXPOSURE</td>
<td>Prevailing exposure: south, south-east, south-west</td>
</tr>
<tr>
<td>ILLUMINATION</td>
<td>Inner rooms poorly lit also as a consequence of walled up frames</td>
</tr>
<tr>
<td>NOISINESS</td>
<td>High noise levels due to the presence of near industrial settlements</td>
</tr>
<tr>
<td>ATMOSPHERIC AGENTS</td>
<td>Average annual precipitations: 69 mm</td>
</tr>
</tbody>
</table>

- The technological characters, deriving from the used building techniques, from the original materials and from the study of the technical elements (masonry, vaults and openings);
- The details and surfaces that according to the site can trace elements of urban landscaping, characterization of the built environment or the finish of a surface (for example the finish of a frontage, the material type, its modulation, the full/empty ratio, the profile in relation to the context);

**Table 5:** Technological characters

<table>
<thead>
<tr>
<th>DETAILS AND SURFACES</th>
<th>TECHNOLOGICAL CHARACTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORIGINAL MATERIALS</td>
<td>Calcarenite, metamorphic rocks, mortar</td>
</tr>
<tr>
<td>ORIGINAL CONSTRUCTIVE TECHNIQUES</td>
<td>Stone filled masonry</td>
</tr>
<tr>
<td>TECHNICAL ELEMENT: MASONRY</td>
<td>Stone filled masonry mainly built with irregular stones (limestones and big river pebbles) and mortar</td>
</tr>
<tr>
<td>TECHNICAL ELEMENT: VAULTS</td>
<td>Barrel vault cast in work, with irregular stones and mortar</td>
</tr>
<tr>
<td>TECHNICAL ELEMENT: FRAMES</td>
<td>Access portals to the curtains material: blocks of calcarenite typology: round arch External frames - gunners material: blocks of calcarenite typology: round arch</td>
</tr>
</tbody>
</table>

- The human activities, often neglected, lead to reflection and in depth examination to single out their characteristics and the density; that is a contemporary analysis of the environmental system. The spatial behavior that relates both to the people’s attitude inside
the site and to its perception is embedded in them. It is a sort of territorial behavior where the meeting, the relation, the stop places emerge.

Table 6: Characters of activity

<table>
<thead>
<tr>
<th>Activity (Characters of use)</th>
<th>OF THE PAST</th>
<th>Recent</th>
<th>Characters of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>OF THE PAST</td>
<td>Fortification with defensive purpose</td>
<td>T</td>
<td></td>
</tr>
<tr>
<td>Recent</td>
<td>Industrial activity, dump</td>
<td>T</td>
<td></td>
</tr>
</tbody>
</table>

- The *representation of the environment* through images of various origins that show the site, putting in evidence so far hidden aspects or negative features of the site: damages and transformations, misuse, neglect and damage both social and of the buildings.

Table 7: Characters representative of the environment

<table>
<thead>
<tr>
<th>Character Represented of the Environment</th>
<th>Images</th>
<th>Volumetric Drawings</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A study of this type hence becomes a fundamental analytic tool within the building life-cycle, that takes into account its historical, architectural, cultural and social value in relation to the city. These information lead to several technical decisions, justified not only by architectural needs but also social, cultural and economical [13].

It is possible to single out then, through the characters of the site, minor aspects, forgotten, given for granted and hence non visible.

It is from such a valuation that it is possible to single out the changes that in time have happened and define misuse, with its consequent damages.

In the Messina citadel case strongly emerges that the demolition of ample portions of the complex have destroyed its uniqueness but not its monumental and cultural value. The damages have been several and relevant and the original configuration is lost due to the way it has been used and the sediments that have covered it. The incinerator, the landfill, the presence of a traveller’s settlement, have radically changed its conformation. Despite its star shape does not appear obvious to the untrained eye, from the air it can and must be still recognized as such.

The study has put into account all the variables and has singled out the alterations and changes from the original configuration, an added value to the plan that distinguish it as a sensitive element.
The recovery plan of the Citadel is based on the recognition of the damages and of a past that has determined its destiny, and chooses ways of acting as a consequence of the type of damages. If on one hand the productive and industrial past has greatly troubled its configuration, caused demolitions and damages, on the other hand it becomes a notable element of the plan: the metal materials, memory of the productive past, will define again the curtains and the volumes.

The important elements for the planning choices are:

- The restitution of the buildings to the population, making it again a focus for the new cultural resources of the city. For this reason the majority of the spaces has been turned into a museum and an exhibition space.
- The respect of the original shape of the plant for the development of new buildings, favouring compact volumes to remind of the original shapes of the ancient monument.
- The predominant material of the remains is the local yellow calcarenite, that characterizes the whole environment of warm colours and opaque and sandy textures. The materials chosen for the intervention aim to maintain this environment playing with the natural tones of wood and COR-TEN steel for the rebuilt parts, memories of an industrial past.
- Since the area of influence of the Citadel includes also areas outside the surrounding wall, the port crux, the adjacent areas and the roads network are planned again, in synergy with the urban planning tools in force and, in particular, with the port redevelopment.

**CONCLUSIONS**

The recovery of the Citadel becomes possible when we value correctly the damages that time and human action have produced. Without taking into account the relation between the monumental characters of this heavily altered site, its recovery would have been an empty exercise, missing the added value that the analysis on the identifying characters have determined. The transformations and the alterations of the monument have produced reflection that values the past history of the site and directs the hypotheses of rebuilding. The plan becomes an absolutely feasible exercise, a sensitivand tangible proof of how to intervene without forgetting the past and its worthiness.
Figure 5: Tridimensional drawing of the project of Recovery

ACKNOWLEDGEMENTS

The bidimensional and tridimensional drawings are made by Aldo and Luca Tringali. The project of Recovery of the Citadel in Messina is an extract from the degree thesis of Aldo and Luca Tringali with the title: DUMP - ETHIC CITY. La cittadella di Messina: da discarica a centro culturale. Ipotesi progettuale e tecnologica. Supervisor prof. Fernanda Cantone, University of Catania, Faculty of Architecture, academic year 2008-09.

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