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A METHOD FOR URBAN RESTORATION APPLIED TO ORTIGIA (SICILY, ITALY)

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Abstract: *This paper represents a contribution to the study of the urban fabrics of Ortigia, Sicily, though the reflections reported herein go beyond the single case at hand, however significant, and express methodological considerations of more general nature. The application of an innovative structuralist and interpretative method has allowed to achieve remarkable results in the interpretation of the form of the polis, shedding light, in a more systematic and critical way, on the complex logic/aesthetic relationship between philosophical theory and urban spatiality.*

The methodological and operational final aim is to develop a macrodesign intervention strategy to define different levels of transformability of the historical built environment, envisaging and spurring the possibility of a more precise final formulation of the art, at the scale of the building microdesign, through a system of prescriptive rules and of performance-based criteria and directions (with a look at the aims rather than at the means), derived by the critical reading of the architectures observed in their process, by the problematic interpretation of the complex relationships of the built environment, and by the evaluation of the present conditions of preservation and use of the physical objects.

The paper also presents a case study carried out by the authors, under the auspices of the local administration, on a building block located in the Giudecca quarter in the Ortigia island in Sicily. It represents the application of the methodology presented.

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1. A METHOD FOR CONSERVATION OF HISTORICAL TOWNS

The complexity of urban fabrics in historical towns is generally determined, starting from its founding act, by a continuous evolutionary development process, also following traumatic events, such as earthquakes or invasions, which produces a complex stratification of historical phases.
In such a perspective, *the urban form is the result of a forming and development process, which, being dynamic, includes the time of production (in the long term) and the transformation action (in the short term).*
Understanding of the *form* is neither achieved by shedding light on the matter needed for the physical reality, nor by enumerating each single segment of the urban fabric or all block's cells with the relevant dwelling typologies, but by *critically interpreting* – in a coherent vision – how the city developed starting from its establishment.
This means that the built environment, due to its specificity, uniqueness and *ambiguity*, cannot be reduced to an empiric description of the observable *things* – without thus denying the regulatory and systematic character of the analytical experience.
Thus, restoration policies cannot concern just the single buildings or the single monuments, but must develop taking into consideration the aesthetic dimension, the issue of town planning and environment requalification, controlling/monitoring the relationships between the old functions and the new ones.
The ultimate end of our actions is that of revealing the identity of the sites and of preserving the specific *long duration* characters of the *form*, by warranting its physical preservation through 'critical-conservative restoration' and, where necessary, 'seismic amelioration'.

1.1 Conservation through the analysis of the 'form'

These latter considerations constitute the underlying cultural and technical grounds for the application of the *structuralist method* in the effort of a hermeneutic contemplation aiming at the interpretation of an historic city.
The term *structure* is here used to introduce a formal and relational analysis method, whose main aim is to determine the system of correlations among the elements (in a first instance, the spaces and the buildings), rather than the 'things' as single or singular objects, as well as to know the different phases of the mutation/transformation process.
In particular, the process is recognized as the progressive and dynamic transcription of spaces and architectural volumes in the 'form', and it is investigated starting both from an *archetype*, which influences through time the movements plot and the possible morphological variations of a site, and from the 'motion' of users/customers – in and out those spaces.
The false confrontation between a realistic approach to structure and a conceptual one dissolves however as soon as we understand the relationship between a *synchronic reception* (systematic investigation) of the object and *diachronic oscillation* (historical evolution) of the aggregation/mutation process.
The synchronism appears through the arrangement of thickness, through the corners on which the wall decomposes or breaks, through the sliding and rotation of the volumes of different size and form; diachronicity appears through depth, can be perceived through the shadow of the external walls and the positioning of staircases.

1.2 A work method for the historic town

The cognitive investigation of the structure is to be carried out by continuously looking for a *critical* convergence between the data extracted/deduced from the *logical-formal* analysis of the urban space, and those verified/obtained through the multi-scale explorations of inductive type. In this way the methodological and operational limitation of an exclusively sectorial reading is abandoned; instead, a multidisciplinary and integrated, *i.e.*, *holistic*, approach is developed.
In particular, the investigation is carried out on:

- The level of the *relationships between the processes of aggregation and organization of urban fabrics* (organized through the distribution of lots and building types) and the evolution of the street system (obtainable through archaeological and stratigraphical studies);
- The level of the *main events* (or sequences of events: earthquakes, plagues, wars, invasions, laws, rules, etc.) that have had an impact of the morphological aspects of the historical built environment (obtainable through historical and document sources);
- The level of the *relationships of the system of routes and empty spaces*: analysis of street morphology (course, width, turning point in the layout, and misalignments of the building fronts), identification of the characteristics as to the arrangement, dimensions and hierarchy of the courtyards (next to street or internal, with direct entrance or through a lobby, in a lateral or central position with respect to the lot front), location of the stairs within the courtyard;
- The level of *walls*. Wall system: alignment of walls; verification of orthogonality with respect to the street course; identification of prolongations, rotations, intersections and sliding of the wall axes;
- The level of the *cells*. Cell system: for each level "recognition" of the basic types, i.e. of the elementary spatial relationships, and analysis of formal qualification of the single building cells;
- The level of the *differential elements*. Cell system: for each level the ratios of regularity, repetition, modularity, etc.;
- The level of the *linguistic characteristics*. Formal coherence of the fronts: form and position of the holes on the front walls (axiality, symmetry, repetition and rhythm);
- The level of *type structuring*. The critical-processive reading of the building types allows to recognize the type characters and the distributional and spatial relationships recurring within the urban fabrics, as well as to detect the formal structures persistent at the various layers of the building;
- The level of *construction lacks* and of *seismic weaknesses*: misalignments and tapering of walls, thin walls or walls falsely resting on the underlying floor, elevation misalignment between adjoining floors, etc;
- The level of the *identification of stair type*. The reading of the different placement of stairs in the urban fabric, within the single cell walls and outdoors in the collective space of the courtyard;
- The level of the *formal interpretation of the fabric*, and therefore the historical-morphological recognition of the individual building systems in the structure/entirety of the settlement space and the identification of the ties that each building established with the others.

Thus, in a 'structuralist' analysis of the fabrics, we refer to the *Continuous Building System*, that is, a multiplicity/aggregation of buildings characterized, from the morphological and spatial standpoint, by continuity, or at least contiguity, of just the vertical walls.
The physical and spatial organization of the continuous building systems is in turn characterized by more or less *complex and ambiguous* parts, inter-correlated according to the settlement configuration of the context/*entirety* they belong to.
In particular, the concepts of:

a) structural unit, and
b) building unit,

are dealt with in detail in [1], in terms of their Definition, Development, Recognition.

1.3 Intervention system

Booklets, technical studies concerning various application sectors, treatises, manual, practice codes, guides, technical specifications, building regulations and guidelines, international recommendations (whose coverage is supposed to be universal) certainly contribute to improve the knowledge of the construction heritage, enriching the lexical and syntactic knowledge of the building industry and developing a background rich with historical, technical and formal suggestions. However, at the same time they can lead to schematic interpretations that are harmful for knowledge and preservation.
Here, the methodological and operational final aim is to develop a system of *prescriptive rules* and of *performance-based criteria* and directions (with a look at the aims rather than at the means), derived from:
a) the *critical* reading of the architectures observed in their process,
b) the *problematic* interpretation of the complex relationships of the built environment, and
c) the evaluation of the present conditions of preservation and use of the physical objects.
It appears useful and appropriate to the contents and to the normative language elaborated to create "*guides*" to show the cognitive paths developed during the experiments conducted on the building fabrics, and "*illustrated rules*", whose function is to describe the transformation frameworks and the allowed interventions, that the users of the plan will be able to get and critically interpret to draft their design for the licensing procedures.
According to this method of ruling the *conservation* processes of the historical built environment, the *minimal intervention system* represents the minimal operating dimension for a building project.
The identification of the *minimal size of the intervention* cannot be indicated *a priori*, but has to be determined, *case by case*, by the designer in charge, based on the contingent system and the foreseen interventions, the degree of spatial and relational complexity of the building in the urban fabric, and the criterion minimizing the fragmentation of the direct interventions.
As to the seismic performance, if of importance, we require the identification of a more extended aggregation system, allowing for simultaneous interventions with a system approach on a number of buildings which are individual but structurally interdependent. This represents the most effective operating dimension to develop and qualify the formal, constructive, and structural relationships of the buildings both between them and with the open areas.
The minimal intervention system may concern the single real estate unit or the building unit it belongs to, or a more or less extended portion of a building aggregate.

This approach considers two different situations:

1. the synchronic intervention, *from sky to ground*, on the set of building units making up the building, *e.g.* in the case of a seismic improvement project;
2. the partial intervention on single building units, and in this latter case interventions are allowed that are coherent with the morphological, architectural and constructive characters of the building, *e.g.* in the case of planned maintenance interventions.

In other words, the individuality and the specificity of the handwork (also considering its state of conservation) prevail on the intervention category.

2. APPLICATION OF THE METHOD TO ORTIGIA

In occasion of the drafting of the new Detailed Plan of Ortigia, the trial of the developed method has involved, in this first phase, the Graziella and Giudecca quarters. More detailed information can be found in [2]. New applications of the method are currently under way in Gaeta (Italy) and Ping Yao (China).

2.1 A brief history of Ortigia

Ortigia, off the coast of Siracusa (presently linked by three 80 meter bridge-causeways), in Sicily (Figure 1), is one of the first Greek settlements in Italy, founded in 700-600 BC.
With a complex urban setting, it is a unique laboratory for archaeologists, historians, architects and engineers, because its buildings are an astounding mixture of construction techniques representative of the various dominations that haunted it over 26 centuries: the Greeks (650-212 BC), the Romans (212 BC-410 AD), the Goths (410-565), the Eastern Roman Empire (565-878), the Arabs (878-1086), the Spanish (XII-XVII c.), the Kingdom of Naples (XVIII-XIX c), until it became part of unified Italy in 1860.

Figure 1: The island of Ortigia, opposite Siracusa, in Sicily.

In addition to a history of multiple cultural occupations, Ortigia has an intense seismic history. In recent times the following notable seismic events are documented:
1542, Dec 10, MCS IX, Atenaion (now Siracusa Cathedral) columns were displaced 70 cm;
1693, Jan 11, MCS X, in Val di Noto, 4000 casualties were recorded in Sicily;
1908, Dec 28, MCS X, in Messina, 75,000 casualties and 300,000 homeless;
1968, Jan 15, MCS IX-X, in Belice, 300 casualties and 80,000 homeless.

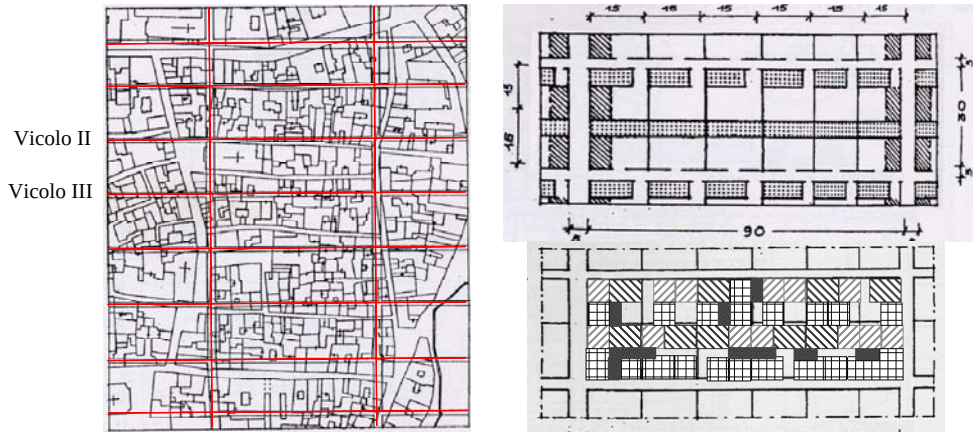

Figure 2: Left: Present Giudecca's urban structure overlaid on original Greek plan. Right, top: *Insulae* orientation of lots. Right, bottom: example of aggregation and saturation of spaces (*insulisation* of courtyards, *tabernisation* of fronts, *closure* of accesses).

All of this resulted in a city fabric that is now extremely articulated and stratified, both in plan and elevation, resulting in a sort of time-space conundrum. Yet, in the current *form* of the city we can still discover and recognize the original archetypal planning scheme drawn by the ancient Greeks: the formal structure of the original town is visible today in the configuration of the Giudecca, where the E-W alleys (*stenopoi*) demarcate the rectangular blocks (*insulae*), as shown in Figure 2.

2.2 The critical-conservative restoration project of block 74

Block 74 of Giudecca was identified for possible restoration. The block has irregular plan with longitudinal length of about 67 m, and lays on a slight slope between the Vicoli (alleys) II and III (Figure 2). The east end of the block faces Via Alagona, while the west end is adjacent to the church of St. Philip (denoted by a cross, not included in the project). The block width varies between 14 and 18 m and encloses five courtyards of different size. The block has elevations from one to four stories.
Notice in Figure 2 that the present Giudecca Vicolo II is almost coincident with the original Greek *stenopos* (grid superimposed on the present plan), while Vicolo III has been pushed about ten meters North of its original location, signifying that at some indefinite time, possibly after a seismic event, *insulae* owners of the North side of block 75 (directly below block 74) moved the street North, invading the South courtyards of the Southern *insulae* of block 74. Thus the Vicolo was irregularly moved and the new Vicolo became curved.
The changes, the persistence and the differences have been analyzed and interpreted that have characterized the *gradual growth* of the two fabrics considered, designating and specializing the processes and the principles of transformation of the built environment.
This investigation has therefore *revealed* that:

1. the specific characters of "substratum" of the two areas have been conditioned by the different orientation of the leading routes, by the dialectic between "main type" and "synchronic changes of iso-orientation" (fabrics in a closed series with iso-

oriented lots), by the relationship between the building front and the pertaining area, by the access system to the courtyards and to the building units and by the original dimension of the enclosures;

2. the characters common to the growth and physical transformation processes of the historical built environment: enlargement of the front through incorporation or fusion of adjoining buildings or through separation of multi-cell building types into basic units, horizontal and vertical additions, ranking of entrances, transformation of an entrance into a window and vice versa, introduction, suppression or relocation of internal and external stairs, creation of floors, development of holes, balconies and terraces, introduction of decorative elements such as stringcourses, cornices and frames of doors and windows, etc.);
3. the parasitic characters hampering a coherent and organic reading of fabrics and buildings are generally represented by the obstruction of courtyards, raisings, non-integrated or disharmonic additions, also reducing performance, functional capabilities, static capacity and environmental features of continuous buildings.

Figure 3 : Examples of analysis identifying: courtyards (top left), original cells (top right), insulizations (bottom left) and tabernizations (bottom right).

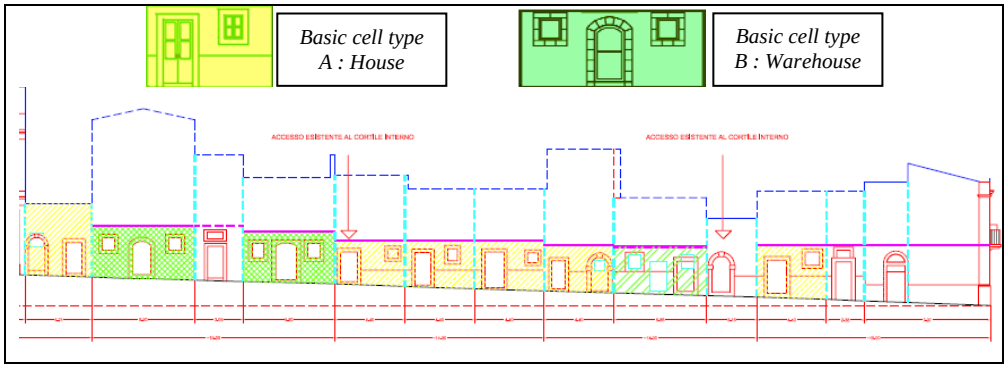

Figure 4 : South elevation: example of typological reading for the recognition of basic cells (above: left, house; right, warehouse; white cells are saturations of former passageways).

Figure 5 : Current state of South elevation (top) and proposed project (bottom).

The application of the methodology in [1] and summarised above brought to the recognition of the constructive sequence both in plan (Figure 3) and in elevation (Figure 4). This was also based on the identification of two archetypal houses (Figure 4): one consisted of a single door and window and was used for housing only; a second archetype, consisting of one arched door with flanking windows on each side, was a warehouse, used for storage.
Figure 5 shows a design example aiming at re-composing the elevations. This is achieved either suppressing wall openings based on morphology coherence with the architecture of the building unit, and with the established facade configuration aspects. Also, new openings have been inserted based on internal space organization. Finally, demolition of superfetations that are precarious, recent, and extraneous to the formal structure of the texture (and to a "mature" evolutive process) is envisaged.

3. CONCLUSIONS

The critical-conservative restoration of block 74 represents the minimal operational dimension where one can effectively develop and qualify the – constructive, functional, and formal – relationships among buildings and spaces.
Within the block, the residual empty spaces of the courtyards have been re-configured, the provisional volumes have been demolished being contradictory with the real ever-changing form, walls and building cells have been rebuilt or requalified, with a caring look at the *permanent*, through a critical eye and modern sensitivity.
The *form* of the block was also referred to in the anti-seismic design (not presented here), which, for different states and collapse modes, has aimed at activating material resources within the whole fabric, distributing the seismic forces over the whole spatial set of cells.

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