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The “Handbook for the Recovery of Modernist Building” is looming as the final outcome of a research project still in progress that will fit within that current international that deals the recovery of the modern and in particular of the dwellings’ requalification and of their tissues. It is about one of the most significant themes of our time for quantity and for quality and, despite this, it occupies a marginal space in the most recent analysis, partly because of the great complexity of the issue.

The context chosen for Developing this research coincides with Carbonia and its nearby villages, Bacu Abis and Cortoghiana, whose architectural heritage is currently invested by specific challenges of recovery and reuse, the peculiarity of which also lies in the character autarkic that recovery demanded the strengthening and modernization of the instruments. For this reason, from about ten years, the administration, availing itself of cooperation of a multidisciplinary research group of the University of Cagliari, coordinated by Prof. Antonello Sanna, has defined a comprehensive strategy of intervention capable of dealing the complexities related to the recovery of this context. Into this framework it inserts the “Handbook” that configures itself as one of the means of implementation put in place to give back to these places the ability to tell their story.

Testimony of value and undisputed interest of the modern architectural culture, made in Sardinia between the two wars, Carbonia is a foundation town, a company town, and as such is configured through the serial repetition and potentially indefinite of few building types. Its achievement is a result of the autarkic policy that emphasizes the particular tendency of Italian architecture to oscillate between the reference to foreign models of the beginning of the century and the preservation of local characters.

The phases of construction of the “coal town” are two. The first starts in 1937, when the massive coal deposits in Serbariu were discovered, and is based on a project designed to serve a population of some 12,000 inhabitants. inaugurated in 1938 it included buildings dedicated to the miners solved with articulated two–storey four-family dwellings, composed by the aggregation of a module-accommodation of three rooms, replicated symmetrically on the ground floor and further doubled at the first floor; the entrances to the flats on the upper floor are made independent by two staircases that generally characterize the lateral sides of each building unit. Seven different architectural solutions were designed following these characteristics, a sort of local version of typical English cottage, a symbol of preindustrial and rural houses.

The lodgings for unmarried workers make an exception. “Authentic domestic monuments, these complexes represent in fact a substantial change in scale compared to the garden city types, their urban dimension is enhanced by the provision in pairs along the main streets leading to the mining”.

But not only.
This is the only residential type of Carbonia signed by the Trieste architect Gustavo Pulitzer, a refined interior ship designer, author with Cesare Valle and Ignazio Guidi also the first urban layout. The second phase starts at the end of 1938. The project this time is “the big Carbonia”, destined to 40-50,000 inhabitants. In this occasion two new types of two-storey four-family dwellings were introduced to increase the density of existing isolates and to realize new ones at the foot of Monte Rosmarino. While the semi-intensive and intensive dwellings, designed from the roman architect Eugenio Montuori, find place in the south margins. Over a little more than a year on a heath deserted, an immense experimental construction site starts and ends, a consciously pioneering experience, and in this sense truly modern, fully consistent with the building production system in Italy, still deeply attached to traditional techniques, ie low rate of industrialization and high composition of the labor force.
Young professionals almost all in their thirties, coming in part from the school of Trieste and in part from that roman are forced to confront by the need to define solutions of synthesis between the “modern” conditions of their cultural positions and the limits imposed by autarky, moreover, emphasized by scarce resources and by the difficulty to supply of the materials. The result is a modernity “without avant-garde” that entrusts itself to the minimalism of the details, to the rigor and to essentiality of signs and that looks for an typically italian balance between the building’s masonry in elevation and the introduction of reinforced concrete.

In a framework like this one understands why the investigations on the construction of the buildings has emerged that show why that the arched floor of the first realized building types is made of cement bricks produced on building site and it transfers its load to the trachyte masonry through a reinforced concrete curb; the use in the second phase of construction to a more convenient reinforced concrete and hollow tiles mixed floor composed from prefabricated beams; in the building type “B1” the septa in trachyte engraved by arches made of ashlars blanks that support the scale and a thin gallery in reinforced concrete, or the presence in some houses of type “O5” of a load-bearing framed structure inserted inside the load-bearing masonry.

And even more we can understand why in the refectory of lodgings for unmarried workers we can find a double row of reinforced concrete pillars place by side the exterior masonry able to create new opportunities for fruition and articulation, while very thin reinforced concrete trusses support the hipped roof made of “marsigliesi” roof tiles. On the other hand the need to counteract the thrust of the vaults becomes the occasion to disarticulate in a modern way the masonry box in the lateral heads of the two-storey four-family dwellings, while very small lights of transverse walls that support the vaults necessarily condition the internal distribution.

So it is the constructive detail, the space chosen by designers to experiment with innovative aspects and to introduce a more distinctly modern structure within the masonry box. This constant mingling between building consistency and formal expression, this hidden modernity has meant that the central idea of the “Handbook” consists in the development the historical-anatomic survey of the most significant building objects through the relation design-building-modification. It is about a detailed reading and integrated strained to grasp the intrinsic characteristics of each building type, and especially to highlight the way in which the construction affects the definition of the architectural expression.

The first step therefore coincided with the acquisition of all the documents found in the archives: building plans, building journals, specifications, photos of building site, and so on. The gaps left from the critical analysis of this material have been filled by the directly surveying of buildings more preserved. The acquired data are then played through the instrument of the re-drawing, which is configured as a further research phase, an opportunity to discover and reveal at the same time the specificity of each building type, which is disassembled and reassembled piece by piece until the cut of the opening, to the design of the gutter, to the type of architraves and to the roofing solution,
Fig.3 - Datasheet from the “Handbook for the Recovery of Modernist Building”
to structures and connections between walls and horizontal elements. The second step coincided with the careful study of building materials also through an assessment of the causes and of the state of decay so that we can identify weaknesses and the strengths of the individual choices of detail. This part of the research is carried out by the Department of Mechanical Engineering, Chemistry and Materials (DIMCM) and is focused on the analysis of the materials used and in particular on the study of mortars, concretes, stones, plasters and cements. In fact, as a result of heterogeneous solutions, a synthesis of modern and traditional materials, which sometimes coexist in an entirely experimental, these building objects require the identification of the degradation’s causes linked to the realization that does often recourse to solutions not always tested.

The observation of the building over time, his way of aging and the pathologies that are investing it are a further opportunity to highlight specific aspects and new elements. For example, accurate laboratory analysis has emerged that the cements used for workers’ houses are of such quality that their use today would not be sustainable, even compared to the economies of urban scale interventions. It is therefore proceeding to locate a “mix design” of the dough compatible with the original compounds and the functions they perform. But not only. The research on the state of degradation and the nature of the materials has also led to the identification of the points of extraction of the materials and to the discovery of the headquarter of cement’s production. The first is found in quarries located around to Carbonia and the second in Cagliari. You can then find no great difficulty materials with the same characteristics as the original ones.

“The more “autarkic” and “traditional” elements, ie the entire wall box, are recoverable with maintenance operations or at most with canonical forms of stitch- and-unstitch, making readable the element perhaps more decisive of Carbonia, grounded in the relation between the trachyte basements, that unify the entire building and the city’s urban landscape, and the vertical walls plastered that define pure blocks and free of surges. This aspect is integrated with the extreme compositive cleanliness of the outside stairs and the gutter’s detail, always contained in a simple and linear profile cementitious. And the recovery of the gutter and roof hides the first open questions related to the constructive fragility of the roof structure in the minimal houses of Carbonia”. It is in fact about situations which in most cases require an intervention of restoration (or replacement) of the original elements rather than a philological recovery. “Operation exquisitely design then, that may also entail the elaboration of new constructive solutions, while remaining firmly based on the historical and philological knowledge of the original architectural characteristics and aiming at their complete preservation. (Operation, moreover, sophisticated and difficult that would require the commitment of experienced designers, normally no passionate instead about interventions of outcome invisible like these)“.

Emblematic in this regard the renovation of the OND, designed by Gustavo Pulitzer in 1937, it is about an operation that has required different designing approaches. The large room formerly used as a local of leisure was retur-
ned to the initial spatiality, but with the different function of council room, the existing fixtures and the plaster of porch of facade were the subject of a philological recovery, while the gutter has been subjected to an intervention of restoration. And just the process and outcomes of this last intervention allow to illustrate closely and by means of an up now acquired experience one of the possible designing paths that the “Handbook” intends to support.

As first thing has been completed an historical-anatomical study of materials, an investigation about their degraded condition, and the identification of invariant elements including through the re-drawing that has highlighted the evolution that the gutter’s detail has undergone during the time: from the phase of the concept to that of the construction. At the time of construction of the building had been stretched between the trusses in a reinforced concrete a structure of hollow flat “Perret” tiles that has not stood the test of time, who succumbed because to its small size and the low margins of recovery compared to the process of degradation of the iron and brick.

At a later time, the structure of hollow flat tiles “Perret” has been replaced with a reinforced concrete and hollow tiles mixed floor with stronger thickness and more consistency. This choose has made vain the function of the gutter as the latter remained at the original height. In addition this inconsistent change has altered the original configuration and compromised the building’s legibility.

The gutter in fact plays an essential role in the architectural plan. The limits imposed by the autarchic policy had forced the designers of the time to use almost exclusively the gable roof covered with a layer of roofing tiles. A “domestic” image that is at least partially corrected by the cutting visual and by the shadow that the gutter draws on the facade. It is about a compositive expedient that appears more clear in the case of the lodgings for unmarried workers, where Pulitzer has designed a gutter very sticking out, about 60cm, from the line of the façade obtaining the outcome that looking the roof from below or foreshortening it seems a flat surface.

Understood the role that this element plays within the architectural expression it is then proceeded to its reconstruction in respect of the original design but at a different height, compatible with the now acquired structure and with the position of the roof as a result of changes undergone over time. It is about therefore of restoration action that “highlights the aptitude of the recovery of the modern to expand the concept of maintenance up to understand the” compatible replacement “of structural parts, even at the expense of the expression “sincere”, privileging the tectonics of the building as a whole”.

In this context we can understand why the “Handbook” does not intend to provide a catalogue of solutions or to foreshadow possible projects but rather confine itself to establishing a knowledge platform oriented to guide the designer towards the recognition of invariant aspects of the buildings, to the understanding of original architectural expression. And on the other hand in a framework like this it is understands the need to complete the search path with the introduction of recovery interventions already made, as is the case of the OND, as able to illustrate design paths possible, and to indicate a possible mediation between a strictly philological and intervention more explicitly amending.
Fig. 4 - Recovery design of Dopolavoro. The evolution in time of the gutter: from the original design to recovery's intervention.
On the other hand the recovery of dwellings implies a greater degree of complexity. The difficulty of mediating instances between “philological”, technologies and the current housing market it adds to one linked to the mixed ownership, more and more often sold in favor of families. “Under these conditions, not only the ability to direct intervention by the public authorities weakens, but the size of the intervention is such that to make it impossible find adequate resources to realize a restoration operation widespread public.

For this reason, with the collaboration of local authorities, it intends to place side by side the “Handbook” to the activity of a Laboratory of Urban and Architectural Quality, ie a operational research facility, conceived as a place in which it is possible to coordinate policies urban of regeneration of the city of foundation, experience of actual cases and the guidelines detected by the “Handbook” also in order to update, or to supplement the standard. “The aim of the Laboratory is to coordinate the projects and the recovery interventions on public assets, making the scientific’s monitoring of building sites, and activating the participatory comparison with the private initiative. There is, therefore, developing and implementing a comprehensive strategy, aimed at a flexible recovery able to face the big problems influenced by comparing and by coexistence between dwelling’s contemporary cultures and building types of the Existenzminimum”.

Notes

1 A. Sanna, Tipi e caratteri dell’abitazione razionale: il laboratorio Carbonia, Cagliari, CUEC, DIARCH, 2004, pp. 76.
3 Ibidem, pg. 1711.