1. Introduction

The energetic theme determined a turning point in the housing sector, in order to optimize the use of resources. Hence, the need to cover buildings with materials accustomed to reduce the consumptions of use and the consequent reduction of CO₂ gas in the air. The growing sensibility towards the energetic-ambient theme made a higher public interest towards green-buildings, which puts an accent on so called “passive” energy techniques and disposals and natural safe materials. New sector laws are determining a transformation in new buildings, even for mass housing which standardize minor cities outskirts. New buildings – ordinary residential houses, but not only – constructive practice was still linked to very few technical solutions, made by even limited ability masters, scarcely interested in green-buildings and energy savings. On the contrary, in some sectors, the law obligations are seen as a chance of changing design and practice, with a process involving biocompatibility, reuse of resources, minimizing wastes, energy efficiency. It seems that the idea of quality, characterization, and intervention specificity comes slowly out instead of concepts like quantity, abuse, “standardization”, (a never ending repetition of few elementary constructive techniques); therefore quality is a long term winning element and also in short time becomes a means of saving.

Restoration and reuse of historical buildings are excluded by the energy laws. As regards the themes enhanced before, historical buildings can teach us a lot and, at the same time, some new “bio-compatible” techniques and materials can bring us solutions able to respect the historical essence of buildings, optimizing comfort and energy efficiency. Few words have been said about concept of compatibility of materials on site, of experimentation, reversibility, attention to transformation of interior micro climate.

In restoration-reuse sector, the debate on higher level, University activity, does not find a wide executive diffusion. Few are the significant cases, often limited to either “monumental” architectures, or buildings with important decorative parts. Rare are also the examples in the minor architecture heritage, or generally in not-monumental buildings, considered without an “historical value”, thus subjected to often mutilating manumissions. “The historical separation between scientific thought and technical action is losing its own distinctive limits; even the big dream of a disciplines organized world, of a technologically configured future, leaves its place to a daily learning philosophy, where every building-the-after security is lost, but the not-destroying-the-before carefulness still remains”.

What is recently happening is a paradox.
While new solutions are being searched, to improve “the after” – only the after will be able to demonstrate if the different choices will be good – the carefulness the not-destroying-the-before carefulness is dangerously decreasing - the before, on the contrary, can already demonstrate the goodness of the choices made.

We are thus witnesses of the ongoing destruction of historical early green building materials (wattles, lime plasters, seasoned wood, clays, hand-forged terracotta etc.), of the cancellation of building techniques, made with the logics of resources recycling, minimizing waste, optimizing energy savings solutions. A the same time, new materials, techniques and devices - similar or worse than those destroyed in historical building interventions – are being used.

We must remember that mankind history is made in connection to the past. Historical buildings are an everlasting important heritage from different points of view.

It’s obvious that the past is not full of only positive examples. From that we can even learn important lessons on compatibility and durability of interventions that can also make terrible results.

We do think that respect and above all comprehension of historical building heritage, even the “minor” one, (often the one with maximization of materials reuse) are fundamental not only for the inside cultural values, but even for their being a laboratory to find green building solutions, to test the on site quality of the materials and to find “ad hoc” solutions for heritage, as regards the concepts described.

Among these concepts, we must not forget how the transformation of the interior microclimate, inside an historical building, could cause new decays (for instance an extreme humidity for woods and decorated surfaces, less porous walls etc.).

We think that there are numerous points of contact among the more advanced green building and energy saving concepts and a correct restoration and reuse of heritage practice; at the same time, historical buildings, profoundly studied, can determine new ideas to better build new constructions.

We can think to a new way of conceiving restoration, a “green restoration”.

For all previously written, we share the idea of improving energy efficiency in historical buildings, protected or not, but we think that their historical value is the one to be saved the most.

We also consider that the improvement should bring, when it is possible, maximization of use of local techniques and materials, also to reduce consumptions, waste and CO₂ gas emissions, due to the intermediate phases of processes and transportation, not only the moment of performance.

In the past, this goal was reached by means of a use of largely available resources, found next to the place of construction and with easy ways of transport, often reusing waste materials, even if there were usually economical and practical reasons.

We must consider also the durability of the energy efficiency interventions, above all for the outside structure, particularly the covering of walls, roofs, ceilings etc. and the tested techniques.

This consideration cannot be denied when we face buildings with more than a
century long life materials. Considering the entity of the historical ancient heritage is therefore appropriate activate an experimentation and research (also at Universities) of materials, technologies and techniques, through pilot “green-restoration” interventions, to define evaluation standards of compatibility characteristics (even the environmental ones) in the restoration-reuse of historical buildings. The idea of an extended compatibility, from the respect for historic features to environment is the origin condition of “green-restoration”. Like the two faces of the same medal. It will be fundamental to define an evaluation protocol for energy and environmental performances for historical buildings, considering the pre-existing solutions behaviour and the essential value of conservation of historical features; all this will be able to set guidelines and operative references.

2. Examples to think about
A first example for a consideration about “green-restoration” could be an ancient foundation building in San Pietro all’Olmo, near Cornaredo (Milano). In this case, also before the coming of law D. Lgs. 19/12/2005 n°192 and the other energy saving laws of Lombardia Region, a requisite of a stricter link among themes of conservation and restoration on one hand and those of energy waste and green-building solutions on the other was conceived.
The building, a former canonical-house of the first half of the XIXth century, consists of a two floors principal long unit, facing a small square, and a minor unit on the backside, a small building that was used as a equipment shed and former grass stock.

Before the restoration, the building was almost completely abandoned, except a small portion sited on the left part of the ground floor, for a spare time club.

The reuse intervention foresaw the transformation of the building into a separated Town Hall and small specialized library.

The smaller building, on the contrary, is a storehouse with some rooms, like the multifunctional one, for meetings and images and movie projections.

In this store house, the exterior brick framework, on the west side, has been kept, preserved and reuse with a shading function.

Even historically, it was built to let air and light pass in a tolerable quantity, preventing direct sun rays in summer months.

At the present time, it is a shelter for the big window, which is as wide as the entire wall, made with an interior space of 12 millimetres.

Instead of the first hypothesis of demolition, an anticipating motivation to maintain the historical witness prevailed, also augmented by its shading function. About the multifunctional room, there was the necessity to open new windows on the east wall; they were made as vertical cuts, turning the wider portion of the windows from the exterior to the interior, creating lateral spaces, for two needs:

1) not to distinguish the existence of the windows from outside, thus emphasising the idea of the vertical cuts;
2) to give a shadow for the windows, protecting them from a direct sunlight.

Both the vertical windows and the brick grid are features able to reduce the solar emission heating in the hot season.

The energy necessity for the summer cooling is strongly influenced by shading elements.

Further, the legislation force designers to set in efficient shading systems for glass surfaces, as blinds, curtains, plants etc.

In consideration of ambient comfort, at the entrance of the building, two doors were put to create a thermo filter zone, between outside and inside.

In this building the reuse was pursued, maximizing the historical respect and the conservation of the many existing elements which had, and still have, waste decreasing tasks, even if not systematically, and interior comfort increasing purposes.

All these elements were kept entirely, even if with some changes.

It is the case of the wood windows in poor conditions, which were maintained and conserved, putting double glasses inside of them.

Further, unfilled wall portions were used to let new technical element pass through them.

Even the wood roof was conserved and coated, as well as doors and wattle ceilings and their filling materials.

These ones have also the role to transmit a minor heat flux if put above not heated rooms; their maintenance influenced the structural intervention of strengthening of the ceilings, imposing to work from above.
This necessity turned into a chance to change the releasing sub-system of the winter heating and thus determined the heating generating system. Specifically, the removing of the recent floating floor left a quote difference space which were used, opting for a radiant panels system with a more efficient condensation tank. Certainly, the intervention was not the best possible one in consideration of the energy performance levels imposed by the legislation to new or not historically and artistically important buildings; however, a sure improvement on this side was reached, in compatibility with the building, its essence, its qualities, its materials, its limits and choices. The designers mentality got adequate to the opportunities brought over by the construction, not the vice versa. At present, the writer is designer and director of the works in progress, for the conservation and reuse of a church and canonical house near Senna Lodigiana (Lodi). It is a pilot “green-restoration” project, on which a standard of evaluation of bio-compatibility performance in historical buildings is being setting up. It is one of the first cases all over the country. This could be the subject for a next article.
Notes
arch. M. Jadicicco Spignese was a member of the design team for the restoration and structural strengthening of the ancient origin building near Cornaredo (Milano), reused as a civic library, here referred to as an example of “green-restoration”. Design 2001; end of works 2004; inauguration 2005.
He is the designer and director of works of the restoration, conservation and reuse of a church and its canonical house in Corte Sant’Andrea, near Senna Lodigiana (Lodi). Design 2011-12; starting works june 2013.

References
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