

URBAN RESTORATION OF HISTORICAL CITIES

Giorgio Monti

*Sapienza Università di Roma, Facoltà di Architettura, Via A. Gramsci, 53 - 00197
Roma, Italy*

Giuseppe Scalora

S&F Open Studio, Via del Colle Temenite, 7 - 96100 Siracusa, Italy

Keywords: Historical city centers, Conservation plan, City fabric, Authenticity, Identity, Seismic amelioration

Contents

1. Introduction
 2. A Methodology for Urban Restoration
 - 2.1. The 'Form' of a City
 - 2.2. Authenticity and Identity
 - 2.3. Levels of Investigation
 - 2.4. The Continuous Building System (CBS)
 - 2.5. The Minimal Intervention Size (MIS)
 3. Case Study No. 1: the Town of Paganica near L'Aquila, in Italy
 - 3.1. Introduction
 - 3.2. The Town of Paganica
 - 3.3. Program and Objectives
 4. Case Study No. 2: the Town of Gaeta near Roma, in Italy
 - 4.1. Introduction
 - 4.2. Recognizing the Continuous Building System (CBS)
 - 4.3. Real Estate Unit (REU), Building Unit (BU) and Structural Unit (SU)
 - 4.4. The Minimal Intervention System (MIS)
 - 4.5. General Criteria for the Building Intervention
 5. Case Study No. 3: the Isle of Ortigia near Siracusa, in Italy
 - 5.1. Introduction
 - 5.2. The Archetypal Urban Pattern at the Giudecca
 - 5.3. Arrangement of Blocks at the Giudecca
 - 5.4. The Block 74 at the Giudecca
 - 5.5. The Critical-conservative Restoration Project of Block 74 at the Giudecca
 - 5.6. The Seismic Assessment
 - 5.7. Seismic Strengthening
- Conclusions
Glossary
Bibliography
Biographical Sketch

Summary

This chapter deals with the study of historical urban fabrics for restoration, by first showing the underlying principles and then showing some case studies. The

methodology presented starts from the interpretation of the *form* of the city, shedding light on the complex logic/aesthetic relationships in the urban spatiality. The approach is one of authentic urban restoration, comparable, in terms of both conceptual rigorousness and care for the built environment, to the projects of architectural restoration. The final aim is to develop a *macrodesign* strategy to define different levels of *transformability* of the historical built environment, with the possibility of a more precise intervention at the scale of the building *microdesign*. This is obtained through a set of prescriptive rules and of *performance-based* criteria and directions, 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.

1. Introduction

Worldwide, there is a growing awareness of the necessity to consistently operate on the Cultural Heritage represented, beyond the single monuments, by the historical centers containing them, in order to invert the current trend that brings them down to an unavoidable physical degradation and to an unstoppable depopulation. Intervention strategies that aim at healing these situations must cope with a series of requirements that, appearing as antagonist, render the task particularly arduous. One should think, for example, of the urgent necessity of improving the overall safety of an urban fabric, and to the equally irrevocable desire to recover and to respect the cultural heritage that every urban fabric brings in itself, as material testimony of a unique and unrepeatable history. Whichever operation of restoration is undertaken, even if local, on a single building unit, it must be balanced between multiple requirements, of structural, formal, architectonic and functional nature, in order to arrive at producing “possible” design actions, respectful of the *authenticity* and the *identity* (we will get back to these concepts later) of the places, at the same time satisfying the safety requirements. Thus, if one wants to proceed in this direction, it is not admissible anymore to concentrate one’s design efforts on just a single portion of the historical urban fabric, as it happens through the usual professional bids dealing with single real estate units, since the same concept of *identity of the place* sends back to a value *diffused* over the entire fabric. The designer should be able to capture exactly this, in order to integrate his/her own interventions within the fabric. An awareness should be developed, by which every part of the fabric cohabits and interacts with the others, in a dialectic exchange that is not only structural (the flow of forces within the resisting walls), but is also and above all of formal and spatial nature, tied to the modalities of development and transformation in the course of the centuries.

Ancient masonry buildings are very often complex and stratified entities, seldom built in synchronic manner, in which original portions, rebuilt or added parts, different conservation levels, different static concepts live together. It is therefore the designer’s task to reconstruct such mosaic in all of its articulation and complexity, while maintaining as much as possible an approach that happens to be flexible and permeable to information of different types: historical, documental, architectonic, technological, mechanical, trying at the same time to make the effort of widening our horizon and of extending the study, if not to the whole fabric (a task for urban planners), at least to the context neighboring the unit of interest.

The designer has to look at each building in the historical center, not only as an existing artifact to be studied *hic et nunc* in its current configuration through a purely *science-based* method (survey, measurements of the properties and design of restoration and strengthening), but also as the result of a series of constructive/destructive processes, of a sequence of modifications occurred often over very long time, which should be dealt with a *knowledge-based* approach, fully respectful of its historical/documental value. Here, a remarkable interpretative effort is required by the practitioner, even better if supported by interdisciplinary competences, as well as a capacity of collecting different information sources, in order to place them into a homogeneous vision. Though complex, such a study is always worth pursuing, because its outcomes are always a wealth of information. For example, a consequence of mechanical nature often disregarded by the professionals is that, from the data collected from a historical/documental survey and/or an appropriate “*morpho-analysis*” on site, it is possible to reconstruct the aggregation modalities of the building in the sequence they developed in time. This allows one to distinguish, among all the masonry walls constituting the building aggregate, those whose mutual constraint is one of full connection (synchronic walls, i.e., built at the same time) from those in which the constraint is of simple closeness/adjacency (diachronic walls, i.e., built at different times). It is immediately understood how this information, obtained in a fully non-destructive manner, has a fundamental effect in the structural modeling of the building, because it allows us to place the constraints in a correct way.

The usual hierarchical progression of knowledge (geometry → details → materials), underlines that, in masonry buildings, the interpretation of the structural behavior cannot close the eyes to an accurate description of its *form*, that is, the geometry of its parts and the way they are interconnected and collaborate through the constructive details. The morphological-structural organization of masonry walls *determines* the seismic behavior of the building. Only in a second phase is the information collected relative to the *matter* they are made of. It goes without saying that these observations, shared by the wisest professionals, very often clash with the economic limitations commensurate with the extension of the dwelling unit at hand, therefore, one is often obliged to deal with a local assessment of the single real estate unit, which, as such, is less representative and effective. Not to speak about the strengthening intervention in itself, which, if realized in the only portion of interest, would result in alterations of the behavior of the aggregate, with possibly negative consequences. As a matter of fact, it is well known that a local strengthening or stiffening of masonry elements tends to alter the global strength and stiffness distribution of the whole aggregate, modifying the whole earthquake behavior and amplifying the demand (either force or displacement) on the surrounding masonry elements.

An ideal way out of this apparently unsolvable problem could be that the competent Authorities issue high-definition performance-based Detailed Plans derived from multidisciplinary studies and from a methodic-systematic research, which each single professional should refer to, and which identifies the various portions of the urban fabric and the relations among them. In this way, the professionals would be forced to operate within a predefined framework, derived from a higher level study, which dictates operative criteria (and then objectives to pursue), rules and languages that all professional should follow. Thus, even if operating at different times on different

portions of the aggregate, an individual professional would design following a path previously traced by a coherent and consistent study. In this way it will be possible to manage the events – characterized by parceled out interventions on different individual portions of the aggregate – with the ideal vision of a coordinated design action extended to an entire aggregate section – within which the the professional will implicitly share manners, methods and goals. Hence, even if operating in different times and with different individuals, under the common guide of such a Detailed Plan, after the last intervention will be realized, the whole aggregate shall be endowed with a critically controlled architectural quality and with a uniform seismic resistance over its extension. The objective of the study presented here is exactly this: formulate a methodological proposal that should guide the professionals in the interpretation of the urban fabrics of historical centers. The work method looks at the form of the fabrics and on the historical and spatial correlations among the different existing signs.

2. A Methodology for Urban Restoration

A clear *methodology* is essential when working on historical city centers, for the purpose of developing intervention strategies that are respectful of their authenticity and identity. The formidable task is: looking at a historical city, how is it possible to give its *form*, as we observe it today, a *sense*? The space of an ancient town is dense with lines, angles and crossings – *walls leaning forward and elongating their axis, walls bending at different angles and creating new intersections, walls sliding forward and causing misalignments* – that together create closely knit connections among the building cells. But what determined the inclination of a wall or the changing direction of a staircase? What about the alignments or misalignments, or the offsets and setbacks of buildings' fronts, or the discontinuity of elevations, the openings and infills on the façades, the persistence of courtyards and paths? How is it possible to understand such a conundrum of phenomena?

To answer these crucial questions, we should *critically interpret*, in a coherent vision, how the city developed starting from its establishment – its founding act – and how it continuously evolved in a complex development process, also in the aftermath of traumatic events, with a stratification of historical phases. To achieve this, we search for those physical signs that connect the 'founding' (the archetypal arrangement of the city 'below') to the 'founded' (the city 'above', as we see it today). The 'founding' transmits to the surface some characters, observable on the 'founded', such as: frontality, elongation, obliquity, rotation, translation, sliding, setback. From this way of interpreting the movement of façades and walls – the movement of buildings with respect to the street alignment – morphology assumes a new meaning. The urban fabric is not analyzed anymore as summation of individual building materials, whose final elements are the masonry cells, but as a *dynamic unity* to be interpreted in a composite way, in a spatial-temporal dimension. Each element of the architectonic space is treated as belonging to an integral *structure*, rather than as a determined, abstract, isolated portion of it: the object to be understood and interpreted *is the form*.

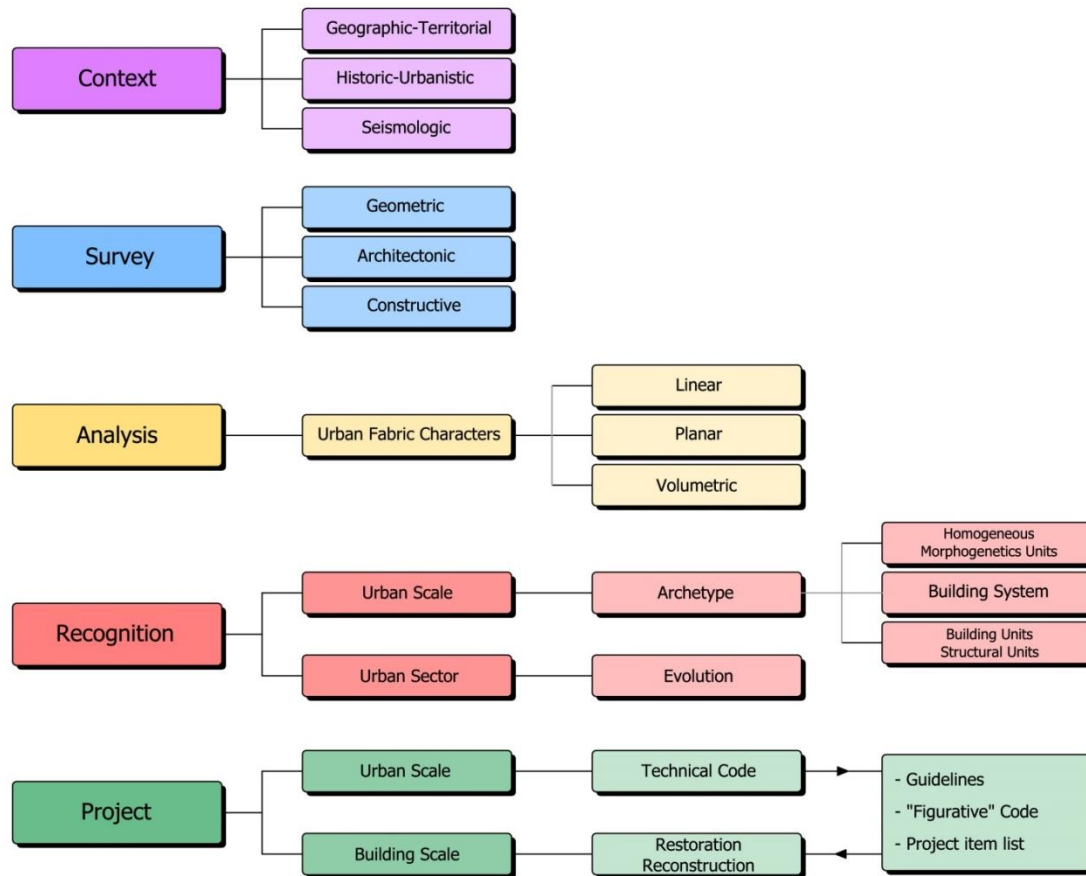


Figure 1. Methodology for Urban Restoration

2.1. The ‘Form’ of a City

We mean by ‘form’ the result of a shaping and development process, which, being dynamic, includes the time of production (in the medium-long term) and the transformation action (in the short term). The meaning of *form* is not to be mistaken for the aesthetic (outward) one of ‘*aspect*’. The form is born and develops through a complex net of transformations that arrive at an outcome – which is essentially unique – whose content expresses the relationships between ‘what is beneath’ and ‘what is above’, between the unity of the historical center seen in its entirety and the multiplicity of all objects contained therein.

2.2. Authenticity and Identity

Every object/*opus*, even a ruin, refers to an origin, be it a place, a time or a maker. This idea of an origin – and of the relative criterion of preservation of the original – leads to the notion of *authenticity* – and to the corresponding principle of respect for authenticity, which inspires preservation and restoration. Authenticity should be looked for through objective and rationally verifiable methods (*e.g.*, through scientific analyses, historical studies, archival/documentary searches, etc.). From the technical standpoint, authenticity is meant to identify either the effective conservation state of the *opus* or

how much of the original material structure still survives. This causes *precise points in time and space* to play their role in a broad sense.

In contrast to authenticity, when speaking of *identity* of an object/*opus* one refers to an ensemble of characters that, though linking the thing's intrinsic value to an origin, express the condition and the measure of time. The formation of the identity of historical cities constitutes a long process that initiates in the first phases of the urban development, settles in the long duration time, then remains relatively stable (unless traumatic changes occur). The value of a town lies, in fact, just in its architectural monuments or in its sculptures, but is most of all expressed by the vitality of its urban fabrics, generating, through their streets, their *piazze* and their inner courtyards, a singular and unrepeatable atmosphere, *both physical and psychological*. If *authenticity*, traditionally, implies a concept of truth related to either a standard, a type, a category, a process, or a program (aesthetic, functional, signifying, etc.), *identity*, rather, leads to a concept related to the dynamics of things and to the web their interconnections.

2.3. Levels of Investigation

The investigation process of a historical city can be developed through the identification of different information levels, relying on a detailed survey. In particular, the investigation is carried out on the following levels:

- *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 stratigraphic studies);
- *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);
- *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. This study favors the comprehension of the creation and transformation process of blocks, lots, built parts and free portions with respect to the phases of their use;
- *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. This helps in identifying the walls as to their construction synchrony and then to define their degree of connection; and in identifying probable damage mechanisms, as in the case of two misaligned fronts;
- *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. That allows us to distinguish cells with respect to the saturation processes of the open settlement spaces;

- *Linguistic characteristics*. Formal coherence of the fronts: form and position of the holes on the front walls (axiality, symmetry, repetition and rhythm). The analysis of the shape and position of the holes on the fronts allows us to determine the weak areas in the transmission path of stresses, as well as to detect the changes over time;
- *Type structuring*. The critical-evolutionary reading of the building types allows us 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. Developing the abstract layout schemes of the Type in a precise environmental context provides a relevant element of reflection, to interpret and understand the system of historical structuring of building aggregates, the “deformations” and the “violations” with respect to a “pure” or basic form, the crossings and the plot of spatial connections among the single building cells and the elements constituting the buildings, their chronologically subsequent stratification;
- *Construction lacks and seismic weaknesses*: misalignments and tapering of walls, thin walls or walls falsely resting on the underlying floor, elevation misalignment between adjoining floors, etc. Such informative layer provides indications both to look for possible damage sources related to vertical loads and seismic events, and to refine the interpretation of the growth mechanisms of the urban fabric detecting the presence of building violations and unauthorized developments;
- *Identification of stair types*. 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, contributed to identify the relationship between the built environment, the street front and the courtyard (or the pertaining area) of the buildings;
- *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.

2.4. The Continuous Building System (CBS)

The aim is to abandon the single-building approach in the restoration and structural improvement of the fabrics, especially if anti-seismic oriented, and to adopt one in which each single building is related and integrated with a more articulated and extended system. Here, we refer to the *Continuous Building System (CBS)*, 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 CBS is in turn characterized by – more or less complex and ambiguous – *parts*, inter-correlated according to the configuration of the context they belong to, which are:

- a) a Building Unit (BU), and
- b) a Structural Unit (SU).

Before dealing with each of them in detail, it should be underlined that:

- a) A BU may coincide with a single SU (*e.g.*, in-line houses produced by aggregating elementary bordering rows and by subsequent synchronous stratifications; buildings obtained by complete fusion of adjoining and individual buildings, and then with a substantial change of the original structural configurations; single architecturally closed building, expression of a unitary design and realization unchanged over time also from the constructive and structural viewpoint);
- b) A BU may be made up by a number of mainly individual SUs, distinguishable either by their development and morphogenetic mechanisms at the block scale, or by their type and constructive characters, or by their building age (*e.g.*, aggregation of mature serial houses through holes on the common wall, with a number of floors equal to the present one, and keeping the original elevation of floors, and architectural, formal and techno-constructive characters).

The following sections deal with the BU and the SU in terms of: Definition (the way they are treated in this work), Development (the way they develop within the fabric), Recognition (the way they can be identified in the fabric).

2.4.1. The Building Unit (BU)

Definition: The BU is defined as that part of the CBS made up of the aggregation of cells – sky to ground – that expresses its own typo-morphological, architectural and spatial individuality.

Development: The BU expresses the physical and formal result of the relationship between the urban context and the building type. The morphological richness of the historical built environment arises from their multiple combinations through time and space. In such a perspective, the type characterizing the built entity is overcome by the *form* it gets in the ‘slow’ production of the architecture.

Recognition: Each BU is then characterized by its present level of structuring and formal evolution in relation both to the morphology and architectural coherence of its *figure* (the façades) and to its *form* (the geometric-building structuring developed in a place through time in the three spatial directions). A BU is recognizable “case by case” on the basis of its original configuration, typically coincident with an elementary single-cell type for the serial buildings, and of the critical interpretation of its process mechanisms of growth and transformation.

The knowledge of the architectural and formal characters of the BUs must always come first and direct the structural and earthquake-resistant design of the building systems, in an inseparable connection between geometrical/spatial configurations and physical/structural ones, between preservation of the morphological and constructive characters and performance of the materials.

2.4.2. The Structural Unit (SU)

Definition: The SU is defined as that part of the CBS made up of the three-dimensional aggregation of cells inter-linked in elevation and in plan by a

common and identifiable settlement and constructive process of development and organic growth or of extended and extreme building transformations.

Development: Each single SU expresses physically in the space the mediation between *structural* and *architectural* needs of the BU. The SU has gravity loads flow, more or less direct, from sky to ground, and mechanical behavior characterized by a more or less marked connection. Such connection may have been achieved deliberately bearing in mind causes or more easily effects of static (e.g., foundation settlement) or dynamic (e.g., earthquakes) phenomena, or due to observance of the rule of art (walls connection, rotation of floor orientation, spreading of the roof pressure on the top of the wall), and the resorting to special solutions (iron ties, wall anchors connected to floor beams, wall anchors connected to iron or timber ties embedded in the masonry transverse walls).

Recognition: The identification of the characters and of the behavior of the SU takes place through the recognition of, respectively: a) the form of the building and of its relative position in the CBS (morphogenesis); b) the quality and the effectiveness of the spatial connections between adjoining cells, with special care to the context and the juxtaposition and overlapping mechanisms.

The historical analysis of the BU, thanks to the archaeological, archive-literature, and morphological-structural tools, shall recognize the building phases, in order to estimate the load changes on the SU, the efficacy of the connections between walls, and in order to highlight the main building interventions performed on the edifice. As a rule, the SU shall be bounded either by adjoining buildings – identifiable either by aggregation/arrangement rules on the scale of the CBS or by their morphological and formal characters –, or by construction bodies built according to different constructive and structural types or at different times, or finally by open spaces and structural joints. Further elements to consider for the qualification of the SU are: a) the overall evaluation of the spatial-formal and technological-constructive aspects of the BU; b) the survey of the conservation state of materials; c) the historical analysis of the crack pattern and the evolutionary study of displacements and deformations.

A BU may be recognizable as:

- a) single SU (*e.g.*, house in line produced by aggregating elementary bordering rows - or pseudo-rows - and by subsequent synchronous stratifications; building obtained by complete refurbishing of adjoining and individual BUs, and then with a substantial change of the original structural configurations; single architecturally closed BU, expression of a unitary design and realization unchanged over time also from the constructive and structural viewpoint);
- b) made up by a number of mainly individual SUs distinguishable within the building by their development and morphogenetic mechanisms on the scale of the continuous building system or by their type and constructive characters or by their building age (*e.g.*, aggregation of mature serial houses through holes on the common wall, with a number of floors equal to the present one, and keeping the original elevation of floors, and architectural, formal and techno-constructive characters).

-
-

TO ACCESS ALL THE 61 PAGES OF THIS CHAPTER,
Visit: <http://www.eolss.net/Eolss-sampleAllChapter.aspx>

Bibliography

Bonamico S, Tamburini G (1996). Centri antichi minori d'Abruzzo. Recupero e valorizzazione. Editore Gangemi, Roma, Italy (in Italian). [A survey of various historical centers in the Abruzzo region, with applied regeneration and valorization policies]

Braga F., Monti G., Scalora G. (2006). A method for urban restoration applied to Ortigia (Sicily, Italy). FACH Conference on the Construction Aspects of Built Heritage Protection, Cavtat, Croatia, 14-17 October. [A case study in the Giudecca district of Ortigia, Sicily, Italy]

Braga F, Monti G, Scalora G (2006). A conservation plan method for historical city centres. 5th International Seminar Structural Analysis of Historical Construction (SAHC), New Delhi, India, 6-8 November 2006. [A summary of a methodology for the study of historical centers]

Braga F., Monti G., Liberatore D., Scalora G. (2006). Survey and restoration: the case of the block between Vicolo II and Vicolo III at the Giudecca of Ortigia, Sicily. 5th International Seminar Structural Analysis of Historical Construction (SAHC), New Delhi, India, 6-8 November 2006. [A case study in the Giudecca district of Ortigia, Sicily, Italy]

Brandi C (1977). *Teoria del restauro*. Einaudi, Torino, Italy, (in Italian). [A fundamental work that outlines the thoughts of Brandi and his concept of restoration]

Caniggia G (1981). *Strutture dello spazio antropico*. Alinea, Firenze, Italy. [A philological approach to the development of the residential architecture of historical centers, contributing to the inclusion of the "minor" architecture in the historical-artistic heritage]

Caniggia G., Maffei G.L. (1979). *Lettura dell'edilizia di base*. Marsilio, Venezia, Italy, (in Italian). [An essential reading about the analysis of city fabrics]

Centofanti M, Colapietra R, Conforti C, Properzi C, Zordan L (1992). L'Aquila città di piazze: spazi urbani e tecniche costruttive. Editore Carsa, Pescara, Italy, (in Italian). [A case study in L'Aquila, Italy]

Giuffrè A (1993). *Sicurezza e conservazione dei centri storici – Il caso Ortigia*. Laterza, Bari, Italy, (in Italian). (The first code of practice for historical centers, assuming a paradigmatic value for many seismic improvement interventions)

Liistro M, Scalora G (2006). *Il nuovo Piano Particolareggiato di Ortigia. Schema di Massima*. Siracusa, Italy, (in Italian). [The particular plan of Ortigia, Sicily, Italy]

Monti G, Scalora G, Sorrentino L (2007). Conservazione dei centri storici: un'esperienza ad Ortigia. Wondermasonry 2. Workshop on Design for Rehabilitation of Masonry Structures, Lacco Ameno, Italy, 11-12 Ottobre 2007, (in Italian). [Conservation strategies applied at Ortigia, Sicily, Italy]

Monti G, Scalora G (2008). Conservation of Historical City Centres: a Knowledge-Based Method for the Interpretation of Urban Fabrics. REHABEND Conference, Technologies for rehabilitation and management of architectural heritage, Valencia, Spain, Oct 6-9. [A synthesis of the method for interpreting urban fabrics]

Monti G., Scalora G. (2009). A program for Urban Regeneration and Seismic Safety of the Town of Paganica after the Aquilan Earthquake. REHABEND Conference, Technologies for rehabilitation and

management of architectural heritage, Bilbao, Spain, Oct 29-30. [A case study in Paganica after the L'Aquila earthquake, Italy]

Monti G, Moore RV (eds) (2009). *The regeneration of the historical city center of Gaeta, Italy*. Rome: A4Z. [A concrete example of the recovery of an earthquake-prone area in conditions of physical, social and economic degradation]

Ranellucci S (ed) (2004). *Manuale del recupero della regione Abruzzo*. DEI, Roma, Italy. The manual examines in detail the traditional construction methods adopted in the Abruzzo region. It is an important textbook both for knowing the regional building heritage and for operating in the conservation sector. [Manual for the regeneration of the Abruzzo region]

Scalora G (2003). *I tessuti urbani di Ortigia. Un metodo per il progetto di conservazione*. Ente Scuola Edile Siracusana, Siracusa, Italy, (in Italian). [An innovative design methodology of historical fabrics through the enunciation of new hermeneutical categories. The case study is that of the Giudecca district of Ortigia, Sicily, Italy]

Scalora, G, Monti G. (2010), *Conservazione dei centri storici in zona sismica. Un metodo operativo di restauro urbano*. Academia Universa Press, Milano, Italy, (in Italian). [A critical method of urban restoration based on the idea of a city as an organic system. It includes several design applications on important Italian historical centers: Ascoli Piceno, Gaeta, Ortigia, Paganica]

Scalora, G. (2013), *Itinerari per la Conoscenza del Paesaggio Urbano. Percezione e Narrazione degli Spazi*. LetteraVentidue, Siracusa, Italy, (in Italian). [The creative relationship established between the designer and the user of public spaces. It is an urban planning proposal through the realization of an "urban film" assembled by sequences]

Scalora, G., Monti, G. (2013), *Città Storiche e Rischio Sismico. Il Caso Studio di Crotona*. LetteraVentidue, Siracusa, Italy, (in Italian). [It is shown how the natural risk factors of an area can be transformed into opportunities for urban regeneration by actively involving the inhabitants of the area]

Scalora, G. (2015), *Architettura e paesaggio. Le trame connettive del progetto*. Libellula Edizioni, Tricase (Le), Italy, (in Italian). [A possible planning path so as to make each place become a singular and privileged one]

Scalora, G., Pirrera, G. (2016), *Infrastrutture verdi e partecipazione sociale. Un metodo bio-ispirato di rigenerazione urbana*. Libellula Edizioni, Tricase (Le), Italy, (in Italian). [A manifesto for the collective right to the territory. The bio-inspired design stands out, which dynamically combines urban drama and neuroscience]

Biographical Sketch

Giorgio Monti has graduated in engineering in 1986 at Sapienza University of Rome, Italy, he has obtained a Master of Science at the University of California at Berkeley, USA, in 1993, and a PhD at the Sapienza University of Rome in 1994. Since 2001 he has been Full Professor at Sapienza University of Rome. His scientific activity addresses the topics of: modeling and analysis of reinforced concrete structures under seismic excitation, assessment of existing structures, strengthening techniques for structures with innovative materials (FRP), strategies for the preservation of historical city centers, and reliability analysis of structures and infrastructures in seismic zones. In these fields he has produced more than 360 publications, of which more than 80 in peer-reviewed international journals, and 6 books. He is an active member of national and international committees for the development of normative document on seismic design, and assessment and rehabilitation of buildings and bridges, by means of innovative techniques. Since 2005 he has been National Coordinator of a Civil Protection program in Italy on "Assessment and Risk Reduction of Buildings in Seismic Zones". He takes part to scientific exchanges with Institutions in Europe, China, and the USA. He is the coordinator since 2008 of Working Group 4.4: "Computer-Based Modelling and Design" of *fib* Commission 4 'Modelling of Structural Behaviour and Design'. He has substantially contributed to the writing of EN1998 Part 3: "Assessment and retrofitting of Buildings". He participated in the Commission that issued the new Italian Seismic Code and he is in the Coordinating Group that produced the new Italian set of codes on the use of Fiber Reinforced Polymers. He is currently coordinating Action Group 8 of *fib* for writing the new Model Code 2020.

Giuseppe Scalora graduated with honors in engineering from Sapienza University of Rome, Italy. His research focuses primarily on issues of urban restoration and landscape sustainable and resilient, both in a theoretical and methodological application, having played an active role in various public projects of recovery and rehabilitation of buildings and historical settlements. In recent years, he has developed studies in the field of aesthetic perception, aligning its academic activity in the design, with insights and realizations in various cities of Sicily, Campania, Marche and Abruzzo. In Syracuse he has consulted for the new detailed plan of the historical center (Ortigia island) and for the design of public actions for the recovery of Giudecca and Graziella quarters. In 2011-2012 he worked with Sapienza University on the plans for the reconstruction of 23 historical centers damaged by the earthquake of 2009. In these areas he took part in scientific and cultural exchanges with public institutions in Europe, China and the USA. He published in 2003 “The urban fabric of Ortigia. A method for the conservation project,” in 2013 “Routes to the knowledge of the urban landscape. Perception and narrative spaces”, in 2015 “Architecture and landscape. The connective textures of the project”, in 2016 with Gianluigi Pirrera “Green infrastructure and social participation. A bio-inspired model of urban regeneration”. With prof. Giorgio Monti drew up in 2010 the book “The conservation of historical centers in seismic areas. An operation method of urban renewal”, and in 2013 “Historical cities and seismic risk. The case study of Croton”. He is also the author of articles and chapters in books and national and international journals. He has taught “History and recovery of historic buildings” at the Master of Science in Architecture, School of Architecture and Design at the University of Camerino. Among the awards, in 2014 he obtained the 2nd Prize “PAN (Landscape, Architecture, Nature) Ardito Desio”. He is also the author of chapters and articles on national and international books and magazines.