



A MANUAL FOR THE REHABILITATION OF MINOR ARCHITECTURAL HERITAGE

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Abstract

Apart from works of a monumental character, the architectural heritage includes all built works of a minor character. Through their composition, arrangement, and relationships they offer monumental value expressed by an overall dimension, the unity and homogeneity of their architecture, and their morphology. However, the minor buildings are subject, daily, to repair and restoration operations by a workforce (very often) uninformed, which can compromise their conservation in the rule of the art. Hence the interest in an operational instrument for ensuring respect for their physical consistency and authenticity. Therefore, it provides the preservation of disappearing know-how: the manual of traditional architecture rehabilitation.

It is a practical tool implemented in Italy since the 1960s and experimented in Algeria through the permanent plans for safeguarding and enhancing protected sectors. This contribution is an excerpt from academic research presented at EPAU as part of a magister carried out within the framework of Algerian-Italian cooperation in historic sites and monuments preservation and enhancement.

Methodologically, the rehabilitation manual is made by an inventory of the constructive and decorative elements of traditional architecture, in historic centers. The knowledge acquired is organized into synoptic charts that can be used primarily to document the local traditional architecture of a city. It also helps the specialists and laypeople to succeed in any historic building intervention.

1. Introduction

Architectural heritage emerges as a specific category among the immense and heterogeneous categories of historical heritage: buildings, masterwork, and all other works and products of traditional know-how. Apart from works of a monumental character, the architectural heritage also encompasses all the built works of a minor character. Through their composition, arrangement, and reciprocal relationships, they offer a monumental value to the place through their overall dimension, the unity and homogeneity of their architectures, and their morphology, as, the historical, cultural, and architectural stratification of their urban structure. In effect, the built works of a minor character remained, for a long time, a victim of negligence in the operations of enhancement and urban development. They are often the subject of general indications relating to the useful surface, the volume, the cadastral aspect, and the distribution of the interior spaces. These indications are subjected to the simple controls of the graphic elaborations, omitting the true and effective value of the minor architecture expressed by the material substance of its constructive elements: materials and processing technique.

Therefore, many floors in good condition are sacrificed without real necessity based on static considerations insecure towards the quality of traditional structures. In addition, doors and frames, neat and of precious species, are replaced by materials of dubious duration, due to lack of expert labor in the repair; cornices, ornaments, and other decorative elements are eliminated as soon as they are affected by degradation, for fear

of the economic burdens relating to restoration and maintenance works (De Marco, 1994). Indeed, the material substance of the historic building is the place where its so-called "aesthetic" value materializes, expressing its architectural, and historical value. It constitutes the expression of a language defining "a close link between the substance and the appearance of the building" (Marconi, 1999).

Moreover, architectural restoration, as an intervention instrument, focused on the architectural heritage of monumental character, through rules such as:

- Minimal intervention,
- Reversibility,
- Physical and chemical compatibility,
- Distinction between new and old interventions.
- Authenticity and contemporary expression.

The break between traditional know-how and modern technologies has also caused a failure in rehabilitation management and an insufficiency regarding the interventions on minor architecture. Indeed, the interventions that aim for minor architectural heritage enhancement have caused the degradation and often the alteration of its material substance.

The interest in the material consistency of minor architecture, its constructive elements, and the whole materials in which its specific value resides, was started in Italy in 1960 during a study on the town of PESARO. It was developed by creating a control and management instrument for safeguarding interventions: the Manual of Traditional Architecture Rehabilitation. It has been tested in three Italian cities: in 1989 in Rome, 1990-92 in Castello, and 1997 in Palermo. Its objective was to respond to the urgency of remedying the disappearance of the elements and techniques of the constructive artisanal tradition.

A first experience in an Algerian town was attempted within the framework of a magister in the preservation and enhancement of monuments and historical sites: " The manual of rehabilitation as an instrument for preserving the architectural and urban quality of a historic center: the case of Miliana" (Menouer, 2000). Other experiences within the framework of the safeguarding plan of the Casbah of Algiers, Tenes, Dellys, etc followed it.

The instrument is based on active conservation, aiming to keep what is worthy and allow modification. It presents an opportunity to rediscover a vanished artisanal architectural lexicon (terminology, materials, and traditional techniques of the art of artisanal construction). To ensure effective integration of interventions, without being too conservative (refusing the modifications of the old one) or too fanatic avant-garde (encouraging a city without historical continuity and an architectural past), the instrument should not prescribe what not to do, but, rather, suggest how to do (Giovanetti, 1990).

2. Material and Method

2.1 Permanence of the old structure in the current fabric in Miliana

Any historic urban establishment is made up of several stratifications. The whole constitutes a composite landscape produced by various forms of buildings that are superimposed on each other over time. The physical support of the place determines the starting conditions with which the successive operations of implantation and transformation conform. In some cases, the first strata have a distant origin. Their traces, found in the current urban fabric, are recognized as a permanence of the place. The layers constitute an ensemble of identifiable transformations adapted to each other but without completely modifying the context. To illustrate the proposed approach, an experimental study was carried out on one of the three-thousand-year-old cities of Algeria: the town of Miliana, located on the heights of Zaccar (the Tellian Atlas), and recognized as a historic city classified as a protected area in 2019.

Through, the study of the stratification of the urban fabric in Miliana, it was possible to identify its invariant elements and their organizing elements. The affirmation of the urban value of a stratification process depends on the synchronic recognition of the various construction methods that, through time, overlap in the same place. This process allowed for defining the most stratified urban part. This entity was the object of the authenticity degree's evaluation of its built to recognize the one who bears the local traditional architecture of the one who has been highly modified and therefore not constituting a reference "Figure 1". The historic building of this category was subject to another survey campaign on the scale of constructive detail to recognize its architectural lexicon.



Figure 1. Stratification of the old structure in Miliana (Menouer 2000)

2.2 Identification of historical and physical Consistency

The recognition and reintroduction of the architectural lexicon of historic buildings is the primary objective of the Rehabilitation Manual. It is presented as a summary of all the materials and techniques for implementing the art of artisanal building (Farina, 1984). It is also presented as an instrument of control and management of any intervention on the minor historic building, within the framework of a projection perspective responding to two contemporary trends:

- The irresistible need for historical identity claimed by cultural goods;
- The need to re-establish the lost links between progress, technology, and traditional know-how.

The architectural identity of the historic building is identifiable and readable by the specific relationship of the building with the evolution of forms and architectural signs that register and describe the reality of physical space throughout its historical evolution. Its recognition requires a long process of identification, evaluation, and classification of (Spigai, 1989):

- The constructive and formal typology of its physical consistency,
- The characteristics of its architecture resulting from the historical and cultural stratification of the place,
- The traditional art of building in its cultural area.

3. Results

3.1. Evaluation of historical and architectural authenticity at the scale of the building

The evaluation of the historical-architectural authenticity of the urban fabric makes it possible to compare all of its architectural characteristics to establish a hierarchy of its existing buildings according to this character, and therefore deduce from it the structure supporting its architectural identity. The assessment study of the architectural authenticity of the historic building is established according to the purpose and practice of the conservation interventions to be undertaken. It is based on historical-graphic backgrounds as instruments of indirect analysis and on the survey and photogrammetry as instruments of direct analysis “Table 1”.

The table below (Table 1) has been developed in two phases: first a systematic survey of all the buildings in the historic center of Milana (263 buildings). In the second phase, each building was subjected to a numerical evaluation according to the criteria of historical value, architectural and aesthetic style as well as the typology of the building (Spigai, 1989). The process allowed us to define six (6) building authenticity degrees. Only recognized buildings of first and second degree were considered for the recognition of the constituents of the local traditional architecture of the city.

Table 1. The degree of authenticity of the old building in Miliana (Menouer 2000)

N° of block	Historical value	Architectural identity	Total	Degree of authenticity
N°12	2	2	4	5 th
N°13	6	5	11	1 st
N°14	3	2	5	4 th
N°15	1	1	2	6 th
N°16	3	2	5	4 th
N°17	3	2	5	4 th
N°18	1	1	2	6 th
N°19	2	2	4	5 th
N°20	3	2	5	4 th
N°21	3	2	5	4 th
N°22	5	4	9	2 nd
N°23	3	2	5	4 th
N°24	3	3	5	4 th
N°25	3	2	5	4 th
N°26	5	4	9	2 nd
N°27	3	3	6	3 rd .
N°28	5	4	9	2 nd
N°29	3	2	5	4 th
N°30	2	2	4	5 th
N°31	4	1	5	4 th
N°32	1	1	2	6 th

3.2 Recognition of valuation of historical and architectural authenticity on the constructive scale

The in-depth reading of the constructive lexicon, linked to the recognition of the formal and constructive values of the architectural works (recognized by the first and the second degree of authenticity), constitutes an important part of the operations of the rehabilitation and conservation of the historical construction, its characteristic elements and its constructive logic. These values are not necessarily products of artistic intention, often, linked to singular monuments. In Miliana, the traditional architecture is characterized by particular constructive care, expressed through the choice of building materials and their implementation technique thus offering specific features:

3.2.1 Basement

The basement is an essential element of historic buildings in Miliana. It is marked by a boss overflowing from the outside surface of the wall or by an intermediate cornice, protruding a few centimeters, separating it from the rest of the elevation wall.

3.2.2 The central body of the facade

The central body of the façade is superimposed on the basement. It is organized into two levels maximum (a ground floor and a first floor). The additional levels are generally contemporary elevations. Originally, the façade body is designed as a unit. The distinction between the two levels is expressed by strips or dividing cornices of fifteen to twenty centimeters (15 to 20) in height.

3.2.3 Features and Texture

The implementation of materials and features, they offer, arrange the surface of facades by some moldings, profiles, and changes of materials and decorative elements. They allow the introduction of an order of a scale higher than the simple additive texture of the materials. This means that the economy in the materials and their implementation does not exclude the decorative effect of the surface structure and architectural elements. Especially when they are chosen, dimensioned, and assembled with sensitivity, imagination, and intelligence. At Miliana, their features elements are:

- Bay frames: molded doors and windows,
- Cornices on the berries,
- Dividing cornices (strips between the ground floor and the first floor)
- Crown cornices constituting the upper horizontal limit of the facade,
- Angle chains, made of cut stone, plaster or brick while taking the texture of the stone. They represent vertical lateral boundaries to urban facades.
- Texture of the wall surface, through horizontal streaks executed in the plaster of the facade.
- Finishing elements: such as window grilles, balcony railings, guardrails, consoles, etc.

3.2.4 Tiled roof

Generally, the roof of the historic building at Miliana is on two sloping slopes of between five and thirty degrees (25 and 30°). It is a constructive element, which has undergone continuous maintenance through the frequent replacement of the roofing tile. In Miliana, the roof is never used.

3.3 Evaluation of historical and architectural authenticity on the constructive scale

Operationally, recognizing the architectural lexicon of historic buildings endowed with historical-architectural authenticity is based on breaking down its architectural text into simpler constructive elements according to specific criteria. The content of the architectural text can be broken down, according to a semiological study (Levy, 1979). These less usual criteria specify the intrinsic and hidden character of the constructive element of historic buildings (Spigai, 1993). These criteria are cultural, symbolic, and metaphorical and relate to the deep content of architecture and construction. As part of the proposed experimental study, the decomposition of the architectural lexicon of the historic building of the city of Miliana revealed physical structures of various characters named « segments » (Spigai, 1993). They designed a set of elementary signs perceptible to our senses, read by measuring techniques or devices, able to synthesize the typical characters of the form or substance of expression to define these characters “Figure 2”:

The tectonic character: an ensemble of primary and essential components of the construction, which is formed by the constructive elements: pillar, wall, floor...
 The plastic character relates to the physical matter of the components: stone, clay, iron, and glass (the materials)
 The chromatic character: concerning the mainly exterior elevations, which influence the urban environment and the visual memory of the city and the historic center in particular.

ILOT N°28 PARCELLE N°02		L'ELEMENT ARCHITECTURAL	ETAT DE CONSERVATION				RECOMMANDA- TIONS GENERALES
			Bon	moyen	délabré	Altéré ou substitué	
SOUBASSEMENT							
C O R P S D E L A F A Ç A D E	Appareillage		+				. Nécessite le comblement des lacunes et des couches de revêtement (protection).
	Crépiage + Peinture				+		Nécessite: . la consolidation, . le décapage et le remplacement, . le complément.
	Chaîne horizontale			+			Nécessite la réintégration d'une partie restreinte (coudre et découdre).
	Chaîne verticale						
CHAMBRANLE DES OUVERTURES						+	Nécessite: . le décapage du revêtement délabré, . la reconstruction du chambranle, . la reconstruction de l'encadrement des baies de l'étage, . la démolition des ajouts.
B A L C O N	Appui		+				Nécessite un nettoyage et une couche d'antirouille.
	Plancher				+		Nécessite le remplacement des planches de bois.
	Balustrade		+				Peut faire l'objet de référence pour remplacer la balustrade du balcon de droite.

Figure 2. Constructive elements of the old building in Miliana (Menouer, 2000)

In a conservation project, the most important thing is to seek organic knowledge, integrated into the historic building to develop the systematic instruments of the intervention process. These become, later, a range of possibilities provided by the vocation of the existing structure of the place and its cultural area. In this sense, the typological constraint (developed after the classification of survey data) becomes an instrument of control either of the requirements of conservation or of the methods of intervention for conservation (repair, substitution, etc.).

3.4 The manual as a cognitive instrument: crowning cornices

The rehabilitation manual is designed as a detailed repertory of the elements of the constructive craft tradition taken in a local context. It is a way to reconnect with the rule of the art of building a place. It is a knowledge instrument based on the site documents, technical literature, and drawings made in situ. The acquired knowledge is organized in abacuses expressing the material and dimensional values of the constructive element: materials, the technique of their implementation, and historical nomenclature (Giovanetti, 1996). It is important to specify that there is no pre-established model of identification sheets. The form and content of the sheet depend on the level and purpose of the analysis undertaken.

In the case of Miliana, the proposed study focused on the crowning cornice and revealed twenty-four (24) types. Their classification depends on the construction materials: solid brick, channel tile, and terracotta slabs. It also depends on the use of materials and their arrangement “Figure 3”.

Through their indications, abacuses also have a guide’s role in consolidation, repair, restoration, reintegration, or partial or total substitution interventions of the constructive elements. They make it possible to develop a range of alternative intervention proposals, they are intended for technicians and workers, those who do not accept the idea of traditional structure destruction, and residents to manage routine repair operations. These interventions become rehabilitation operations or minor restoration. They are proposed for conservation providing. They provide, therefore, interventions that do not transform but, on the contrary, preserve the image of the historic building and respect its constructive and architectural structures.

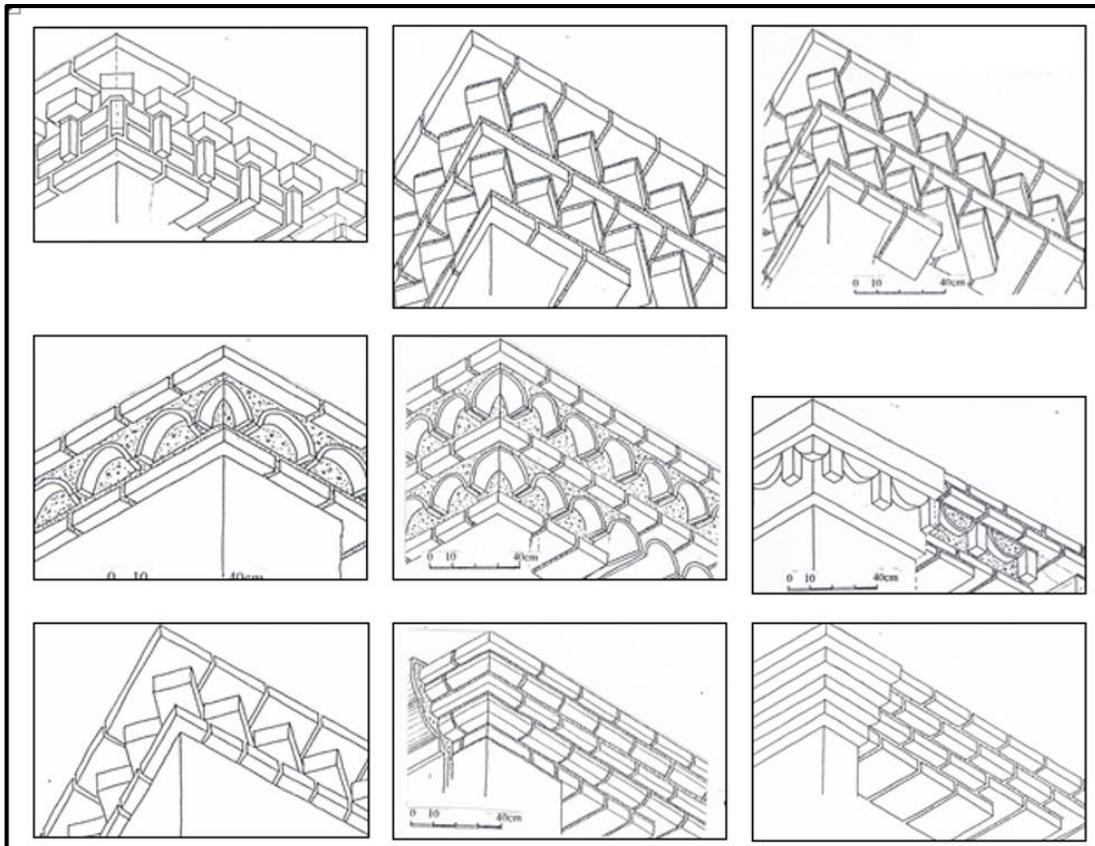


Figure 3. Typology of crowning cornices in Miliana (author)

4. Discussion:

4.1 The operational role of the manual

The operational aspect of the abacus is illustrated through the proposal for a rehabilitation project for the facade of a minor building in the historic city of Miliana. The project is developed in five steps (Marconi, 1997):

- inventory of structures: a preliminary step to identify the static state of the structure: gaps, cracks, additions to masonry, crumbling of the coating, alteration of certain parts, etc.
- Definition of demolition-reconstruction interventions constitutes the second step of the rehabilitation project: construction of gaps, demolition of additions, etc.
- The structure project, a step illustrating the role of abacuses previously developed and used at this level to specify, exactly, the materials and the reintegration techniques, and repair ... to be undertaken to carry out the recommendations of the architectural project (Figure 04).

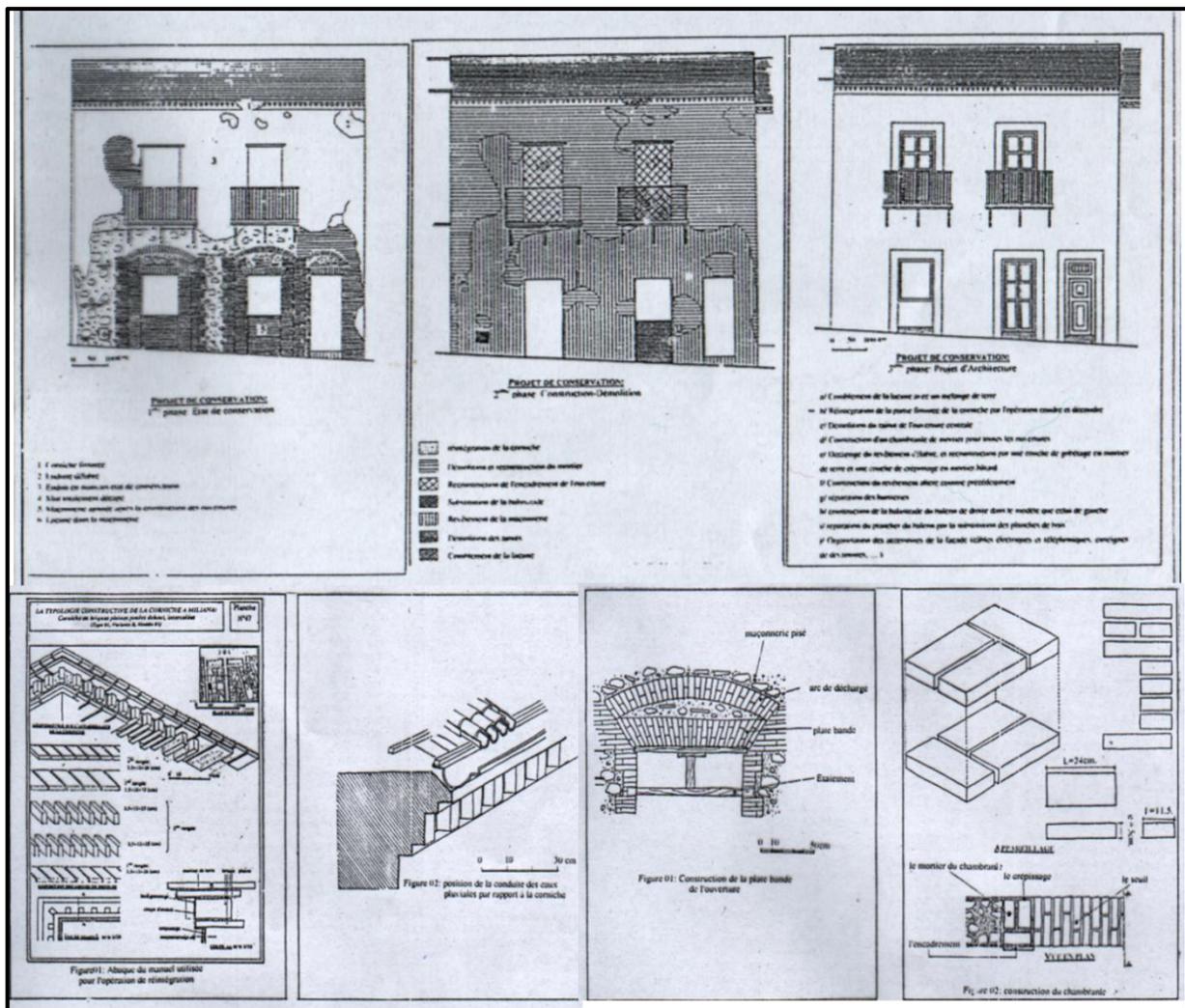


Figure 4. The operational role of the rehabilitation manual in Miliana (Menouer, 2000)

4.2 Valuation of traditional know-how

Until now, the need to conceal the means of reinforcement so as not to alter the appearance and character of the buildings has justified the use of innovative technologies that allow invisible reinforcements to be made but, generally, irreversible, incompatible, and of reduced duration, preserving the appearance and not the structure of the building. The use of traditional techniques has never been excluded. The charter of restoration alluded to the use of innovative technologies in the one case where traditional technologies did not give reliable

enough results. The exaggerated use of innovative technologies in the building sector in general and in the field of restoration in particular has caused a decline in traditional know-how, which was not only considered outdated but also incorrect, if not erroneous. However, in light of the experience of the manual of rehabilitation, the traditional techniques are recommended, not only as simple improvements of static conditions but also, as adequate solutions in many cases of ordinary pathology.

Therefore, the manual of rehabilitation is an opportunity for the traditional know-how revaluation which is only possible after careful historic building studies, it is to be distributed in schools, universities, and especially in rehabilitation and restoration projects. Nevertheless, the operation of conservation of the minor historic building should not be a consequence depending on the cultural personality of the designer, but rather, consequences depending on the knowledge of the characteristics of the historic architecture that constitutes a constructive culture still livable and capable of protecting and preserving the architectural and town-planning quality of historic centers. Thus, mastery and professional qualification should not only mean learning new technologies but also, the rehabilitation of an essential historical professionalism that cannot be substituted within the framework of the conservative restoration.

The continuity of the traditional construction process can also be a guarantee for small and medium-sized industries and for building cooperation, which can find a specific field of activity to ensure the perpetuation of a constructive school through the creation of institutes and laboratories for learning constructive techniques, and the promotion of craft trades.

5. Conclusion

In conclusion, we must say that the development of the rehabilitation manual of a historic city is based on the recognition of the constructive techniques inherent in its traditional architecture. Its success depends on various factors, including the awareness of stakeholders and occupants of the old building to the heritage dimension of its material consistency (local authorities, specialized technicians, simple bricklayers, owners, and inhabitants). Given its contextual character, it is necessary to create structures able to follow the study and implementation of the rehabilitation manual at the level of each historic site because each demolition, repair, or other is an opportunity to penetrate the physical consistency of the old building and therefore discover new data that can feed it.

In addition, the popularization of the rehabilitation manual and the knowledge it contains makes it possible to carry out the necessary repairs while respecting the physical consistency of the building. It constitutes the very source of recognition of minor architecture as a heritage in its own right.

In the context of this article, the interest in the rehabilitation manual development was oriented towards a constructive element namely the cornice. It becomes imperative to complete the work by considering other constructive elements such as the floors, the frames of the openings, the walls, the earthenware, the stuccos, etc., which makes it possible to envisage several future researches.

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