

Provisions of urban reconstruction in general plan of Leningrad development in 1966: ideas and results

Andrey Vaitens^{1,*}, *Olga Pastukh*¹, *Viktor Volkov*¹, and *Sergey Mityagin*¹

¹ Saint Petersburg State University of Architecture and Civil Engineering, 2-nd Krasnoarmeiskaia St. 4, 190005, St. Petersburg, Russia

Abstract. The analysis of the results of reconstructive design in Leningrad in the 1960s and 70s is summarized in order to use this experience in modern conditions for the renovation of residential quarters of the historical centre of St. Petersburg, as well as to solve the problem of renovation of historical quarters at the city, quarter and object levels. The problems of design and implementation are considered: historical blocks do not meet modern standards of living, insufficient intra-block insolation, lack of sufficient landscaping and Parking spaces, residential buildings that form blocks are overpopulated. The General plan for the development of Leningrad in 1966 indicated the need for protective zoning of the historical centre.

1 Introduction

It is difficult to underestimate the significance of the General plan of Leningrad in 1966 in the development of the city on the Neva during this period. This was of great significance in terms of reconstructing the architectural and urban heritage. As you know, Leningrad has a purely Leningrad-specific character. The planning structure of Saint Petersburg began to take shape in the XVIII century. During the XX century, several official town planning documents were developed, especially the master plans of 1935, 1966, and 1987. It was in the General plan of 1966 that measures for the protection of architectural and urban heritage were defined for the first time in the post-war period. This was important for the protection of the architectural and urban planning heritage of Leningrad, as it contained instructions on the need to create protection zones (PZ) and building regulation zones (BRZ) [1].

Prior to this, there was no such zoning in previous master plans. Based on this master plan, two areas of implementation were implemented: defining the boundaries of protected zones and transforming groups of residential blocks and blocks in the historical center of Leningrad (conducted by LLC "Lennigradostroitelstvo" under the leadership of the candidate of architecture A.V. Makhrovskaya). This area of reconstruction has been further

* Corresponding author: gvolia@yandex.ru

developed. In the 1980s, the boundaries of the protection zone (PZ) and the development regulation zone (DRZ) of were clarified.

The formation of historical residential blocks at the end of the XVIII and throughout the XIX century was carried out in several stages, the most valuable fragments went to the main thoroughfares of the city and were formed first (Fig.1).

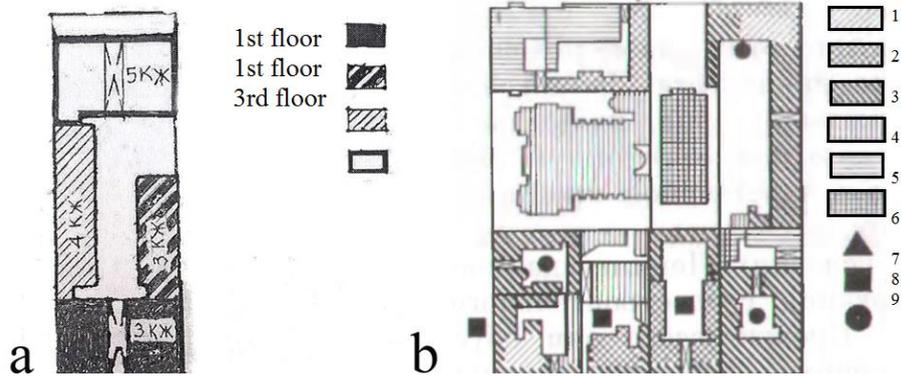


Fig. 1. a - formation of block building (planning structure of historical center); b - scheme of security zoning (at block level).

In the 1960s, the scientific Department of the Institute of Leningrad city Planning under the leadership of A.V. Makhrovskaya developed a method for reconstructing residential quarters of the historical center of Leningrad [2].

The problem of reconstruction of blocks was considered in a broad urban planning aspect and combined techniques for updating the layout and development of residential blocks with measures to protect the unique planning structure and architectural landscape of the city. The project of reconstruction of residential quarters was based on the ideas of urban transformation and improvement of the historical architectural and planning structure of residential quarters in the Central part of the city.

Main provisions of the "methods of reconstruction of residential areas" (1969) reconstruction of residential areas that have historically developed in the Central districts of the city is an essential part of citywide efforts to improve the living conditions of the population and improve the urban structure of Leningrad. When reconstructing residential blocks, it is necessary to comprehensively address social and urban planning issues.

The border of the old quarters is the border of Saint Petersburg on the threshold of the twentieth century. these include: island areas-Vasilievsky island (Eastern part), Petrograd side (Zhdanovsky and Petrogradsky districts), right – Bank territories of Vyborgsky and Kalininsky districts adjacent to the Neva river, on the left-Bank territories-Oktyabrsky, Kuibyshevsky, Dzerzhinsky, Smolninsky districts and Northern territories of Frunzensky and Leninsky (now Admiralteysky) districts [3].

In the 1960s, as experimental blocks for reconstruction, the designers chose the most problematic sections for Leningrad at that time: blocks along Ligovsky Prospekt, blocks along Moskovsky Prospekt, and blocks on VO along the exit line.

2 Materials and Methods

Initially, the developers of this method had the idea of unbundling historical neighborhoods, later this approach was called rehabilitation. The goal of this approach was to eliminate low-value development, and with this in mind, proposals for Vasilievsky island

blocks (1974) were developed (Fig. 2, 3) and blocks of the Leninsky (now Admiralteysky) district (Fig. 4,5).

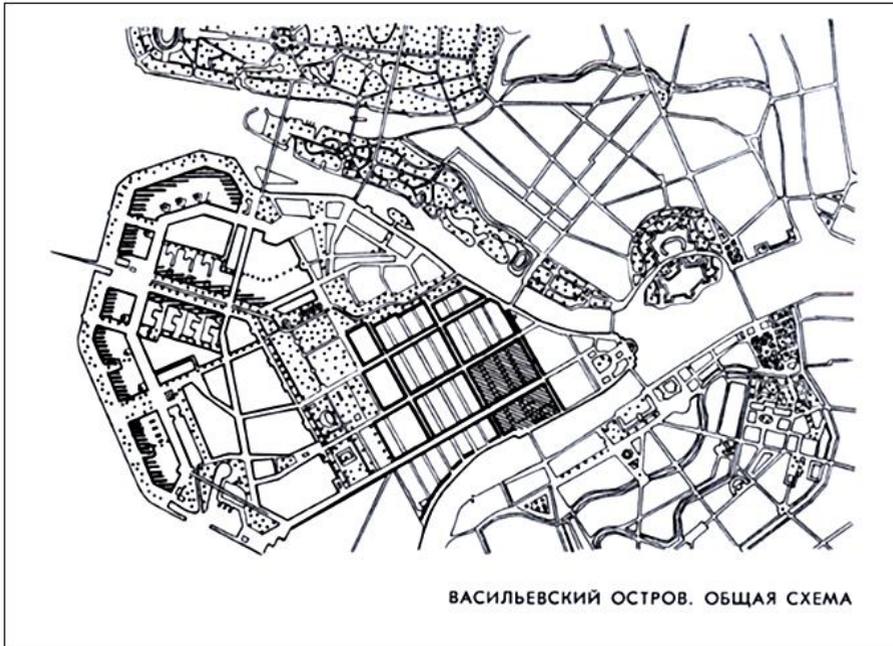


Fig. 2. Vasilievsky island of Saint Petersburg (General scheme).

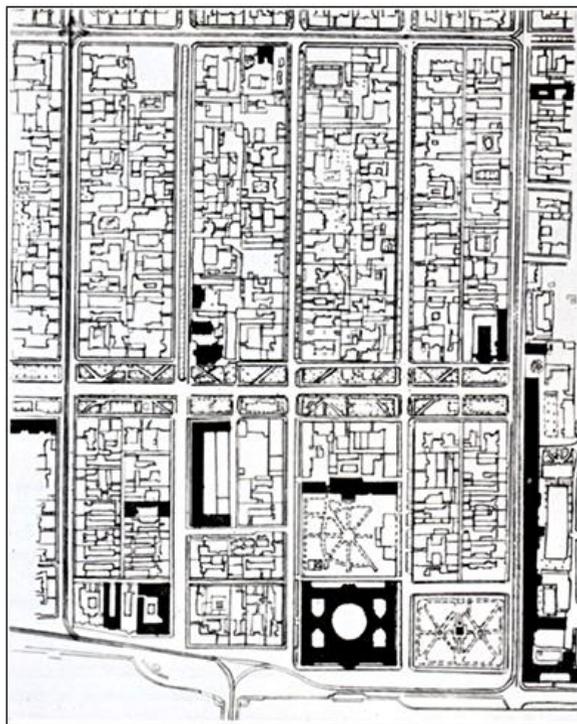


Fig. 3. Urban planning situation before the reconstruction of blocks on Vasilievsky island in 1974.

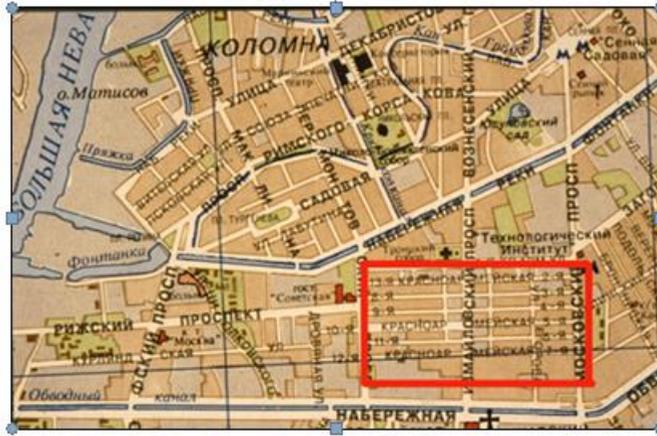


Fig. 4. Urban planning situation of Krasnoarmeyskaya streets during reconstruction in the mid-1960s.



Fig. 5. Urban planning situation before reconstruction of residential quarters of Krasnoarmeyskaya streets (existing situation), layout.

This approach has improved the sanitary and hygienic properties of indoor premises.

The fundamental principle of architectural and planning reconstruction of blocks is the transition from a separate small-sized block to a larger structural object. For example, it can be a group of residential blocks located within the same main territory [4]. It was assumed that as a result of the reconstruction of a group of blocks, a new functional and planning organization of the main structural element of the reconstructed districts of the city with the conditional name "enlarged quarter" would appear. The estimated area was from 15 to 20 hectares, the population-about 5.4-8.0 thousand people. This transformation was to take

place while preserving the existing network of roads and streets, as well as a small block as the main planning element of historically developed areas.

The volume-planning organization of the primary group of blocks was decided in accordance with the General structure and spatial composition of the enlarged block and was usually characterized by a combination of dense perimeter development along the streets and the resulting green courtyard spaces. Depending on the types and sizes of residential blocks, the degree of preservation of the housing stock, the density of development, the location of schools and the service network, several options for organizing enlarged blocks were possible.

The basis for combining the primary structural elements is the system of cultural and consumer services for the population.

According to the developers, the scheme in the form of a single group of primary structural elements (paired blocks) provided for by the peripheral section of the school is the most widespread in historically developed districts.

The common means of these transformations was to liberate courtyard spaces by demolishing low-value residential buildings, preserving the perimeter of residential buildings and the architectural landscape of streets.

The General plan for the development of Leningrad, approved in 1966 by the Council of Ministers of the USSR, defined the main positions of the Central part of the city, which provided for a radical solution of the most important social, urban planning and medical issues [3].

The decision of the Executive Committee of the Leningrad city Council in Leningrad created protection zones around architectural monuments that are under state protection. The purpose of this step is to ensure better preservation of monuments, architectural complexes and ensembles, their architecture and art, urban planning qualities and creation of necessary conditions for public acquaintance with them tourists and residents (Fig.6).

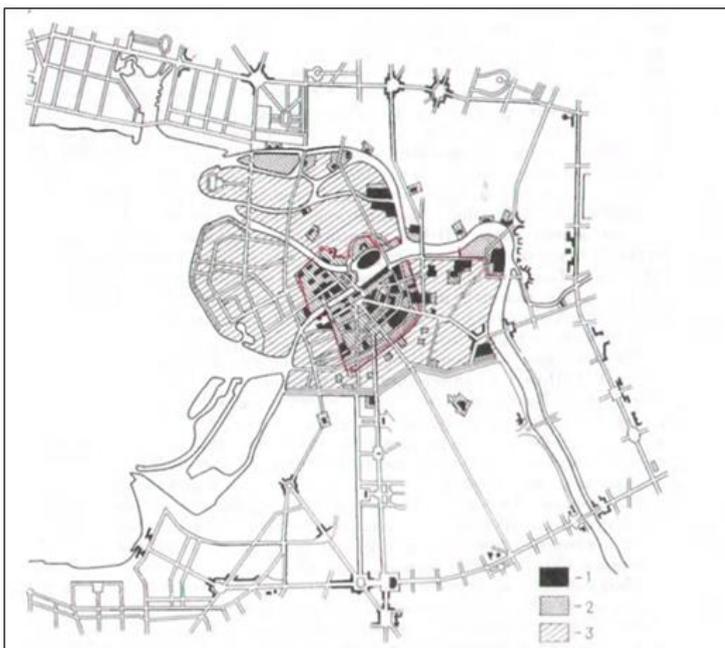


Fig. 6. Scheme of security zoning at the urban planning level

In the protected zones, urban planning regimes were defined: the prohibition of new construction, the possibility of restoration of objects. On the territory of protected zones,

new construction and redevelopment, as well as planting of plantings that distort the historical appearance of the area are prohibited. Later buildings and layers that distort monuments interfere with their perception, or clutter up their surroundings are subject to demolition.

The development control zone is established for certain districts of the city, ensembles, complexes and individual monuments outside the boundaries of protected zones in order to preserve the historical character of the district's architecture, its planning system and natural environment.

New construction is allowed within the regulatory zones, but the height and density of buildings are limited by regulations. It is forbidden to place new industrial enterprises, transport and storage devices and other structures that pollute the territory, air and water basins. Zones of development regulation are established within such borders that allow preserving the historically established system of city planning, the nature of the natural and architectural environment of monuments-ensembles, groups of monuments and the environment of urban development and the natural landscape [5].

3 Results

The authors of this method proposed two approaches:

1. Rehabilitation, as a method of disaggregation of historical neighborhoods;
2. An intensive approach that takes into account pedestrian directions when transforming historical blocks and preserves the scale of intra-block spaces – small courtyards.

For example, blocks Ligovsky Prospekt was used the method of reorganization, which provided for the elimination of through passages, the formation of the front building block Ligovsky prospect, improve social services blocks the construction of two kindergartens and the expansion of the school (Fig. 7).



Fig. 7. Neighborhoods on Ligovsky Prospekt, along the Obvodny Canal (late 1960-early 1970s)

At the same time, when designing the reconstruction of this quarter, the internal reserves that existed in this territory were not used for the possible compaction of intra-quarter development (Fig. 8) [6].



Fig. 8. Unused opportunities in the quarter on Obvodny Canal

In the blocks along Moskovsky Prospekt and on Vasilievsky Island, none of the proposed options were implemented. The result of which was overpopulation of these quarters (instead of the normative 500 people / sq.m in fact 1000 people / sq.m). In the projects for the transformation of the quarters of Vasilievsky Island (1984), the method of intensive reconstruction was used [7-10].

4 Discussion

The developers of this technique analyzed the results of designing the reconstruction of the quarters of Vasilyevsky Island and Moskovsky Prospekt [8-12]. In this analysis, it turned out that during the redevelopment of historical quarters, large losses of living space occur, therefore, a decision was made to develop the second approach (intensive reconstruction), clearly illustrated by the example of VO quarters (1984 project) (Fig. 9).

Conversion Goals:

1. The need to disaggregate the old densely built-up quarters of the historical center to improve sanitary standards;
2. Schemes of security zones and zones of regulation of development (first appears in the GP 1966); planning of security measures at the city-planning level;
3. Architectural inventory of buildings;
4. Directions of a comprehensive reconstruction of residential areas;
5. Classification of residential areas.

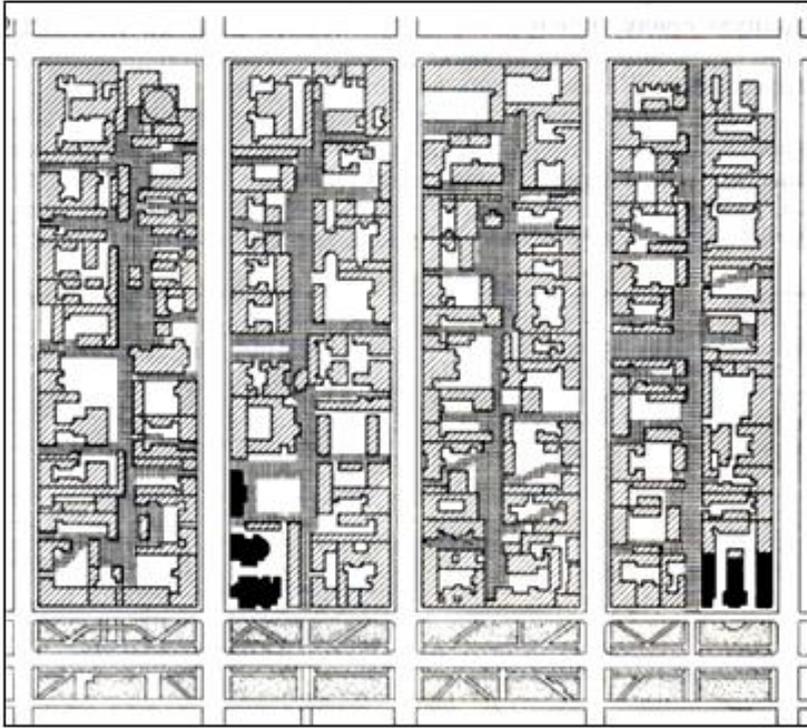


Fig. 9. The project for the reconstruction of the quarters of Vasilievsky Island (mid-1980s) an intensive version

The main directions of the comprehensive reconstruction of residential areas in the Master Plan of Leningrad in 1966 were developed at different levels:

1. Town-planning (integrated security zone and development regulation zones);
2. Quarterly (rehabilitation and intensive approach);
3. Object (transformation at the level of quarters with the allocation of buildings of various historical and architectural values).

As a result of the work done at the city-planning level, a partial implementation of the quarter on the Obvodny Canal was carried out, proposals for the development of the quarter and object level remained at the project stage [9-13].

The results obtained (at quarterly level):

1. Reconstruction of quarters on the Obvodny channel (partially implemented);
2. The reconstruction project of the quarters of the Leninsky district (now Admiralteysky) district. Red Army streets (Fig. 10, 11).



Fig. 10. Design proposals after the reconstruction of residential areas of the Leninsky district, Krasnoarmeyskaya streets

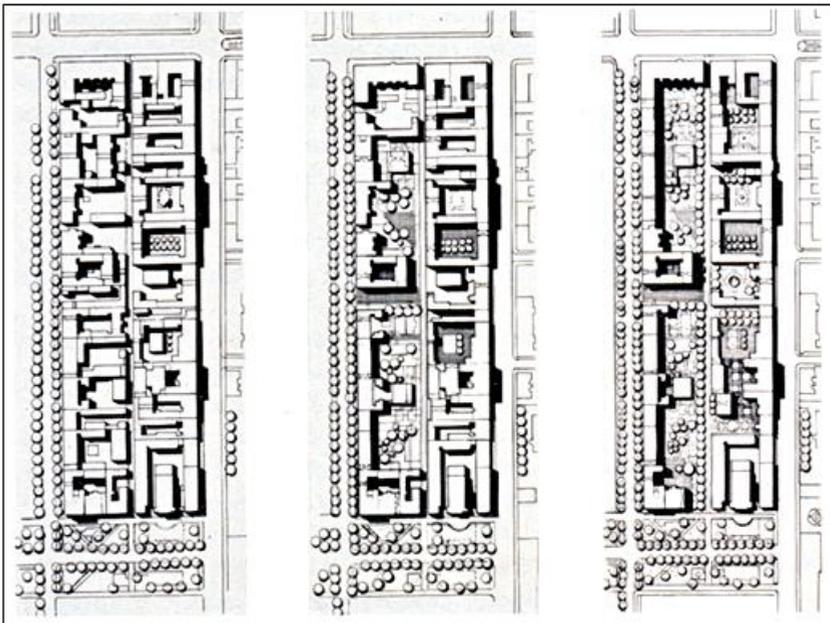


Fig. 11. Stages of reconstruction of the elements of the quarters (Krasnoarmeyskaya streets), design decisions.

Two project proposals were developed: in 1974 an extensive version was developed, and in 1984 an intensive version of the reconstruction of a group of quarters (Fig. 12).

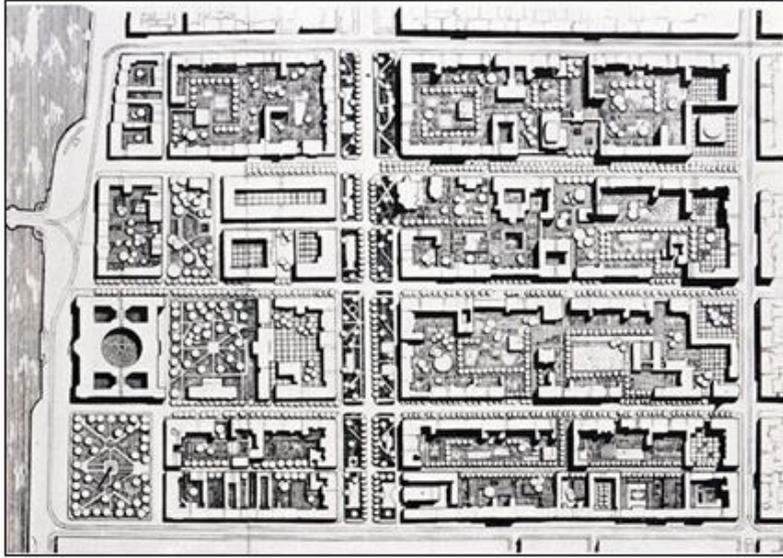


Fig. 12. The reconstruction project of the quarters of Vasilyevsky Island (mid-1970s), an extensive version.

5 Conclusions

1. The main provisions for urban reconstruction, laid down in the General Plan of Leningrad in 1966, regarding the definition of the boundaries of the United Security Zone and the Regulation Zone for Development, as well as land use regimes in these zones were later developed and refined and have not lost their relevance today.

2. The ideas and results of urban planning reconstruction at the level of quarters of the historical center of Leningrad, discussed in this article, can be used in modern realities, taking into account the changing urban planning situation and modern regulatory documents. In the 1990s territorial building codes TSN -1 for the historical center (approved) and TSN -2 for the periphery and new areas (do not work) were developed.

Later, relevant regulations were created. Currently operating are TSN 30-305-2002 "URBAN PLANNING. RECONSTRUCTION AND CONSTRUCTION OF NECENTRAL AREAS OF ST. PETERSBURG". Developed by the Leningrad Scientific Research and Design Institute for Housing and Civil Engineering, OJSC LENNIIPROEKT, adopted and enacted by order of the Governor of St. Petersburg dated 02.22.2002 No. 251-ra, instead of VSN 1-89, "Norms for designing the planning and development of new residential areas Leningrad.

The general plan of Leningrad in 1966 was almost completely implemented in terms of building reconstruction of historical territories in the free territories over the next 20-25 years. In terms of transforming historic neighborhoods, projects were presented that were not implemented.

The general plan of Leningrad in 1966 was almost completely implemented in terms of building reconstruction of historical territories in the free territories over the next 20-25 years. In terms of transforming historic neighborhoods, projects were presented that were not implemented.

References

1. V. A. Kamensky, A. I. Naumov (1973)
2. A.V. Makhrovskaya (1986)
3. A.V. Makhrovskaya (1974)
4. A. F. Shutov, A.V. Makhrovskaya (1970)
5. A. G. Vaitens MARKHI (2018)
6. V. S. Goryunov, A. G. Vaitens J.Bull.civ.eng., **56**, 6, 24-28 (2016)
7. F.Vajtens, S. J.World Appl.Sc., **13**, 13-20 (2013)
8. A. G. Vaitens (2010)
9. A. G. Vaitens, *Regulations in the plans of urban development of Petrograd-Leningrad - Saint Petersburg (1920-2000)*, 24-31 (2007)
10. O. A. Pastukh, *Innovations and traditions in modern restoration on the example of objects of cultural heritage of St. Petersburg*, 189-195 (2016)
11. L. Lavrov, F. Perov, A. Ereemeeva, *Transportation Research Procedure* **36**, 418-426 (2018) DOI: [org/10.1016/j.trpro.2018.12.117](https://doi.org/10.1016/j.trpro.2018.12.117)
12. Belal, E. Shcherbina, *IFAC-PapersOnLine* **52**, 252019, 252-257. DOI: [10.1016/j.ifacol.2019.12.491](https://doi.org/10.1016/j.ifacol.2019.12.491)
13. F. Ribera, A. Nesticò, P. Cucco, G. Maselli, *Journal of Cultural Heritage* **41**, 2020, 166-177 (2019). DOI: [10.1016/j.culher.2019.06.004](https://doi.org/10.1016/j.culher.2019.06.004)