

78. Restoration of Sta. Maria Maggiore (SMLM). Baena. Cordoba. Spain. Austerity and efficiency in recovering lost spaces.

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Abstract. "The recovery of the architectural soul of the Holy Church Maria Maggiore, lost in the vicissitudes of history." part of the intervention in the church of SMLM, whose purpose is described, was the symbolic and emblematic recovery of architectural spaces, destroyed in the period of the Spanish Civil War (1936-1939). The article explores the conceptual field of restoration, and values the efficiency and sustainability as essential premises, which have been, are and will be part of the DNA of Architecture. Our generation continues to provide conceptual developments in these fields and material evolution through technological advances.

Disclosed summarizes the conceptual and the material partially methodology strategies austerity and efficiency in the restoration work on the church SMLM specifically, the spatial reconstruction of the spaces lost in the chapels of ships; Gospel (North), Epistle (South) and the choir at the foot of the central nave (West). The option to recover the dimensions of these spaces, was ruled out because of the huge costs involved in the fields; urban, architectural, social, economic, environmental and cultural. Therefore architectural strategies based on traditional concepts of architecture were created, as is the intentional austerity, inexhaustible source of creativity, efficiency and sustainability. The strategy of creative and constructive austerity, was formalized by inserting new walls intentioned and constructive architectural level, along with the use of natural and artificial to evoke an efficient and sustainable recovery of lost spatial light.

Keywords. Corpus Architectural, imagined spaces, creative Austerity, durability, streamlined maintenance.

1 Introduction

The restoration of the Church of SMLM, designed and directed by the author in 2002, was based on the search for sustainability and efficiency; in the creative and the material and the process of intervention in this monumental architecture.

SMLM had the Gothic and baroque splendor, before its destruction in the Spanish Civil War from 1936 to 1939.

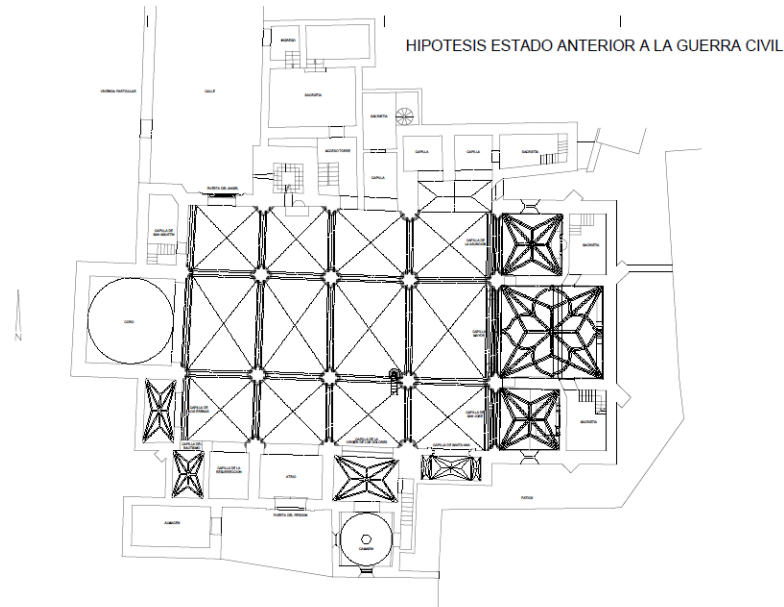


Fig. 1 Initial state before the destruction of the Civil War spaces choir (west) and side chapels (north and south) were lost

Historical overview of "The vicissitudes of history" church.

- XIII. First references of the temple after the reconquest of Baena occupying the site of a mosque.
- XV - XVI Construction Corps three ships . Possibly 1 abo-off limits. Ogival Gothic, Plateresque grille and door Angel Statement by Hernán Ruiz I the Old
- XVII 1681 Earthquake. Destruction of roofs and domes.Rebuilding and reconstruction covers plaster vaults.New set of bells in the tower.Altar Baroque chapel
- XVIII Baroques Reforms
- XIX Construction Choir
- XX Fire and destruction in July 1936 Civil War Various interventions of restoration and protection
- XXI Restoration of the author.

2 Methodology of the conceptual. The architectural intervention strategies SMLM. Austerity and efficiency restoration

The methodological description is made mainly in the conceptual and partially in the material of the intervention.

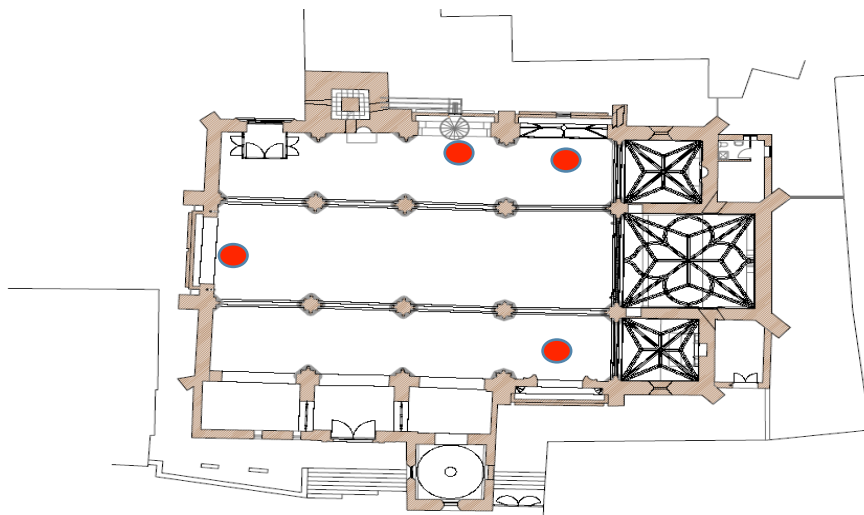


Fig. 2 Current status restored. Red dots indicate the symbolic recovery of the lost spaces of the choir and the chapels of the aisles

2.1 Strategies creative and constructive austerity

The intervention incorporated creative responses in the areas of form and function. The identification of the religious function in this temple, has been present throughout its history, and has therefore been issued, meaning it and strengthening it for the coming times and his legacy to future generations.

The strategies developed in the restoration were:

Preservation of the remains and the elements that define their existing architectures.

Integration of the new architecture in the process of historical and architectural evolution.

Formal identification and new architectural material contributions.

respectful, contrasted and architectural continuity of the new with the existing recovery to reach a whole, unitary and diverse that contributes to their spiritual and material wealth dialogue.

Readability and temporary location of the new architectural contributions.

2.2 Strategies in the intervention of external forms volumetric reordering.

New envelopes, in areas with loss of historical spaces.

symbolic recovery of lost spaces of the chapels of the aisles, and especially the

choir, closing the great destroyed volume, with the symbolism of a door, linking past its destruction, with the present recovery.



Fig. 3 Sketch design and photo restoration project, the author. At the foot of the central nave new wall symbolizing the door of history. past its destruction, with the present recovery.

2.3 Strategies in the interior spaces

Restoration and renovation of the vaults with plywood, to transmit; space spirituality, visual comfort and serenity between past and present architecture.

Recovery and integration of emerging archaeological remains

symbolic recovery of architectural spaces choir and lost chapels, by incorporating new walls minimalist creation, simple construction, arranged in separation from the existing remains of these spaces, and the efficient use of natural and artificial light to evoke perceptually architectural spaces, whose original volumes, today it is not possible recovery.



Fig. 4 Recovery symbolic space of the old Choir, lost in the Civil War. Left physical and dimensional reality destroyed, Right evoked space without authentic dimensional reality.

3 Methodology of the material. Formalization of architectural strategies SMLM

New sustainable and efficient technologies in symbiosis with the building systems and traditional crafts, which have proven rationality, durability and ease of maintenance, using materials allowed to continue the existing nobility were incorporated.

existing pathologies were resolved, reinforcing the structural stability, improving the protection and performance of its architectural envelopes and ensuring long-term durability of materials and construction systems.

The process intended to establish the materialization of form, both the renovation and reform SMLM, and adding new forms and elements. Conceptual options in the intervention process, the following intensities ranged between materialization:

1. Reconstruction of the vaults, with high intensity in the presence and role of the material used, the natural and laminated wood.

contrasted display (in the formal and material), new elements compared to the remains of the pre-existence remains baroque plaster vaults.

2. Austere materialization, using discreetly everything related to the material. In the design and construction of the new enclosure walls, with low intensity in the presence and role of the material used, sandstone similar to that used in the Church.

3.1 The construction systems

The research conducted on various construction systems SMLM and newly incorporated, enabled through recovery and renewal, life and service put this extraordinary architecture. Methodologically intervention in the following development and content were contemplated:

- Adaptation to the form and function
- Sensory Features
- Technical services
- Maintenance and conservation
- Analysis of R & D + i
- Energy Efficiency
- Ecological sensitivity
- Costs and production process
- Recycling

3.1.1 Adaptation to the form and function

Throughout the history of the pre-existence, interventions with different strategies, means and ends are produced, so it is common to find constructive processes and incongruous deconstructive, which may require clarification and reordering

operations on them. Even repair and / or elimination of incompatibilities, which may have, in construction systems and materials. In SMLM we find a clear example in their vaults. We are aware of the stages occurred in its baroque vaults, which are:

1. Initial state, baroque splendor before the destruction of the Civil War, (Fig.5)

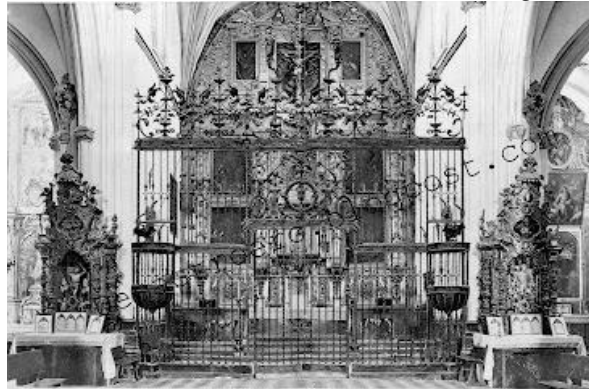


Fig. 5 Initial state before the destruction in the Civil War. Baroque splendor.

2. State after the destruction (Fig.6)



Fig. 6 State after the fire and destruction in the Civil War from 1936 to 1939. Carmelo Ruiz photo

3. Transient state intervention in 1970-1975 by the architect José A Gómez Luengo, consisting of works of protection with new fencing and the construction of a new roof with metal structure (Fig 7)

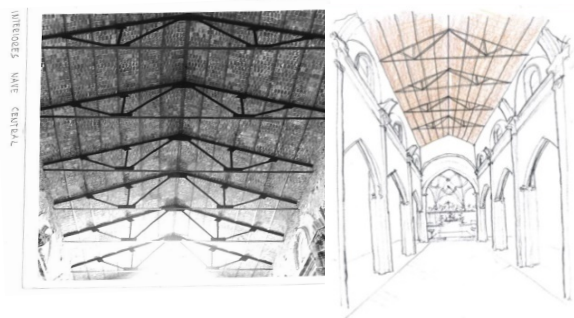


Fig. 7 New roof made from 1970 to 1975 Architect José A Gómez Luengo. Photo and sketch of the author

4. Final State intervention of the author, where one of the main strategies of the restoration was the restoration of the vaults with current technology, building systems introduced in the following differences:

Material, plywood. Construction discontinuity introducing separation between the wooden profiles making up the dome, intended to be received in two ways new vaults:

ONGOING PERCEPTION-SOLID . Perceived under normal conditions of natural light and artificial lighting, luminaries arranged under the vaults (Fig 8). The new vaults, clearly inspired by the original forms, positioned slightly higher, while respecting the remains of the original baroque plaster starts.

Techniques and different materials, wood brown color type. vaulted ceiling with edges, independent and separate sections .with sags on edges in the side arches and perpiños.



Fig. 8 Nave vaults. Photo and sketch of the design phase by the author

PERCEPTION BROKEN-TRANSPARENT. Perceived when artificial illumination under the vaults is very thin almost nonexistent, and the existing internal space between the new plywood vaults and existing cover, see (Fig.9) lights. The lower surface of the cover and its metal truss structure were protected with fireproof mortar and this was painted in dark blue, with the intention to be viewed from below and through separations Woods vaults, as a representation of the sky symbolizing the sky.

In the project three levels of interior lighting were designed and one of them consisted of the powerful illumination of the internal space between vaults and covered to achieve the effect described.



Fig. 9 Perception discontinuous transparent

3.1.2 Sensory Features

The different perceptions of interventions in SMLM, are considered the following types:

Subjective, each person feels and lives specifically.

Temporary, the passage of time can qualify the first sensations from the radical to the neutral, even change them altogether ... which today do not like or understand it, tomorrow can be pleasant and understandable. Social and cultural changes, modify the ways to perceive and feel these issues.

Perform an abstraction and suppose the change of system constructive vaults with plywood, the other made of stainless steel. The mere fact imagine this change causes us very different and distant sensations, immediately.

3.1.3 Technical performance

Architectural, technical and construction quality should be taken into account, being interventions on an architectural heritage which must be preserved and transmitted to future generations in the best possible conditions. This principle transcends the concept of life that we attach to existing buildings.

3.1.4 Maintenance and conservation

The construction system must be adequately addressed the survival of the building over time and use.

Durability and ease of maintenance of the system, should be a starting premise and conditioning to ensure the added value in the qualification and quantification of the intervention process.

A proposal of creative quality, that does not include these concepts may be doomed to failure over time.

In SMLM addition to the use of materials and construction systems under this principle, eg, walkways, galvanized steel, laminated wood, natural stone, glass, double layers of glass and molded glass skylights of the new enclosures, ceramic covering elements ... etc. maintenance paths and their corresponding elements to ensure the safety of people engaged in the maintenance and conservation were also designed. Especially paths covered with lifelines, anchors, and ladders transit openings were disposed, to access all the surfaces of the covers.

3.1.5 Analysis of I+D+i

Technical innovation or new systems from research and new developments available today were used in SMLM. Specifically applied in the Tower, systems of static consolidation or sewn inclined, involving the introduction of a structural mesh in its walls by: Perforations and holes, later injected grouts, and in them the introduction of steel bars in the holes sealed with cement grout. The purpose

improve the strength and elasticity behavior against seismic actions. WBW is in high seismic risk zone.

The technique of "stitched inclined" was developed in the 50s of the twentieth century in Italy and continues perfected using hydraulic lime slurries and fiberglass rods.

3.1.6 Energy efficiency

Assessment of ecological footprint in our intervention is complex, but necessary to establish the energy efficiency of building systems chosen. The proper choice of the most efficient, allowing us to participate in the global sustainability of the production process and maintenance of everything related to the natural world. The energy consumed for the realization and implementation of building systems should be considered by the architect and explicit users for proper assessment. The sustainability of the construction system chosen, is a factor that must be known before opting for its use, and keep it in mind throughout the creative process.

In SMLM intervention was performed in the following fields:

Using regulated labels. As far as possible industrialized building systems and materials with organic accreditation at all stages they were required by approved environmental seals or eco-labels. When there was no possibility of locating the above, the environmental conditions were considered, rational, stable and durable exploitation of natural elements.

Building systems in the following activities were also carried out:

Reduction as far as possible; energy consumption, supply and sanitation discharges.

Waste recycling work, previous standard classification of types of containers.

Control of the rates of the materials and constructive systems used.

systematic use of natural materials characteristics, due to its lower impact manufacturing and extraction, eg stone and wood.

3.1.7 Ecological Sensitivity

Environmental awareness. the necessary coordination with government and environmental organizations for the reconciliation of the restoration with the maintenance and promotion of the birds there installed, Kestrels primillas, protected species was performed. Baena has a healthy colony of these birds and SMLM has become an excellent breeding.

3.1.8 Costs and production process

It is not present in this section the concrete and comparative quotations economic, but explain the concepts of economic value in the constructive systems used in SMLM both the requirements of its implementation processes and assembly, and the requirements of their materials . Basically the following production systems were considered:

BUILDING SYSTEMS INDUSTRIAL PRODUCTION. market availability of new technologies were investigated and incorporated into the intervention, for efficiency and economy. Some examples follow.

1. Masonry ventilated in the new enclosures. Masonry anchored with stainless steel fasteners on reinforced concrete walls. Production of anchors and development of the building blocks of sandstone were drawn from external to work industrially.
2. Vaults of plywood, all bearing elements, arches, anchors plates, pieces of internal union, straps, clamps ... etc. They were manufactured off-site.
3. Cover material on the top surface and waterproofing roofs, and fire protection in the soffit, by projecting approved and tested for these requirements industrial mortars.

ARTISAN CONSTRUCTION PRODUCTION SYSTEMS

They have the advantages of standardization and economy of means, yet traditional and artisanal systems are essential in preserving the architectural and historical values.

SMLM intervention, contemplated the recovery of historic building systems, many of them obsolete, assumed economic increases and serious difficulties in finding qualified and experienced in them, but it took accept them in the project.

In any case the following recommendations were considered:

No use of harmful building systems, capable of emitting pollution or result in the evolution of health problems.

Use of raw materials at least made possible and where possible local or nearby to reduce costs and establish greater integration into the environment origin.

Application of the criteria recycling-reuse, to facilitate renewal in time. Design and build, contributing to sustainable development.

Criteria for the duration and the necessary maintenance used in building systems, non-use of constructive solutions from the economic point, whose impact medium and long term have high costs for renewal, but could be profitable in the short term placement.

3.1.9 Recycling

Recycling in building systems, it is discussed in relation to the materials used, and their own conditioning installation and implementation of the designed system. ease of removal and maximum recovery of materials is contemplated.

SMLM have been made in recycling operations in elements such as ceramic roof tiles, stone elements, reusing some murals and ceramic debris as subbase exterior screeds and some ornamental elements.

4. Conclusions

The restoration carried out in SMLM, for symbolic and emblematic recovery of architectural spaces, destroyed in the period of the Spanish civil war, shows the conceptual validity and material strategies austerity and efficiency in restoring contained in the proposed methodology.

Sustainability and efficiency in the creative and material, have always been core values of architecture,

His achievement is not understood only in the application of a certain current innovative technologies and some energy strategies, of which today have more options and capabilities, but it is an essential creative universe, complex, based on the innate values and the architecture. Intentionality, the creative genius and rationality in the use of resources (materials and construction systems) throughout history, show us clearly the way to go.

Creativity tends to his own spiritual and material validation over time, ie the durability, along with the necessary austerity maintenance ... the quasi-eternity that makes it sustainable and efficient.

In the restoration of existing architectures, all these concepts are innate and are not only the consequence of innovation in sustainability and efficiency, but they have been, are and will be an inseparable part of "Architectural corpus" and so we claim it, as an inherent value of architecture.

It is looking at the architectural experience with the aim of extracting the legacy teachings in these fields and complete with current developments. Efficiency is not a heritage created by our generation, it has been practiced since the dawn of Architecture.

In short, the methodology and architectural strategies developed concepts such as simplicity, ease of maintenance, durability, rationality of materials and constructive solutions are an essential part of the architecture and fundamental in the complex achieving sustainability and efficiency, both in the creative and materially.

Build with less and create more architecture and sensory experiences in space and in the flagship. This has been the objective natural symbiosis of creative efficiency, austerity and sustainable construction materials. And this implies generic, direct and obvious economic and environmental advantages shape.

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