Diary of a historical building intervention in Oporto. The careful management of change.

Teresa Cunha Ferreira
CEAU – Faculdade de Arquitectura da Universidade do Porto

ABSTRACT:
The present contribution details an intervention in a 19th century building located in the Oporto Historical Centre buffer zone (UNESCO World Heritage since 1996). The building houses a bookseller and faced a series of problems stemming from structural overload and the lack of maintenance for over half a century. The first phase incorporated intervention on the roof.
The rehabilitation project aimed at preserving the maximum of the pre-existing building, retaining the integrity of the former structure and making only punctual changes and substitutions where necessary. Whenever replacement was duly required, the new elements were proposed in harmonious relationship with the pre-existence without renouncing to their contemporaneity
This paper reports the methodological approach and the story of this intervention: surveys, decay mapping, project designs, site and maintenance program.

1. HISTORICAL AND URBAN CONTEXT

The building stands on Rua Alberto Aires Gouveia in an area of 19th century extension and urban renovation (Ferrão, 1989; Nonnel, 2002)[1]. The former Rua do Carranca (subsequently named Rua da Liberdade before later becoming Alberto Aires Gouveia) was opened at the beginning of the 19th century in the parish of Miragaia in Oporto. The land extending between Rua da Restauração and Rua do Carranca probably belonged to João Allen, who owned a house there in 1835[2].

Although there was no construction in this area, both the B. Clark Plan (1834) and the Joaquim da Costa Lima Plan (1839) represent plots in the southern portion of Rua da Liberdade, which were urbanized later as detailed in the Perry Vidal Plan (1865). However, only in the Telles Ferreira Plan (1892) does the building appear clearly defined with the approximate perimeter that exists today and including its garden backyard[3].

---

[1] For further information on Oporto's urban transformation between the 17th and the 19th centuries, see: Alves, J. J. B. F., *O Porto na Época dos Almadas*, Porto: CMP, 1988; Ferrão, B., *Projecto e transformação urbana do Porto na época dos Almadas* 1758-1813, Porto: Faup, 1989; Nonnel, A. G., *Porto 1763-1852: a construção da cidade entre despotismo e liberalismo*, Faup, 2002.

[2] Cfr. Orthographic and section plans of the new Rua Restauração "(…) rising eight feet in front of the partition wall between John Allen and João Mallen [?], in August 1835", in Historical Archive of Oporto, Livro de Plantas de Casas, no. 212.

[3] It was probably by the end of XIXth century that António da Costa Fontes buys several houses and land comprised between Rua da Restauração and Rua Liberdade. It was not possible to know the exact date of purchase of the house, but only that in 1896, António da Costa Fontes ordered to work on his behalf homes in the same street. Cfr Historical Archive of Oporto, Livro de Plantas de Casas, no.138, f.327-331, of 1896.

According to the Direcção Geral do Património Cultural (General Directorate of Cultural Heritage, 2014), the building is classified as a Property of Public Interest due to its location in the "buffer zone" of the Historic Centre of Oporto, listed as world cultural heritage by UNESCO in 1996 (Loza et al, 1996). The building is currently located in ZEP/ ZAP and ZIP zone (Zone of Priority Intervention) of ACRRU (Critical Area of Urban Recovery and Conversion) defined by Oporto City Council (Câmara Municipal do Porto & Porto Vivo, 2010).

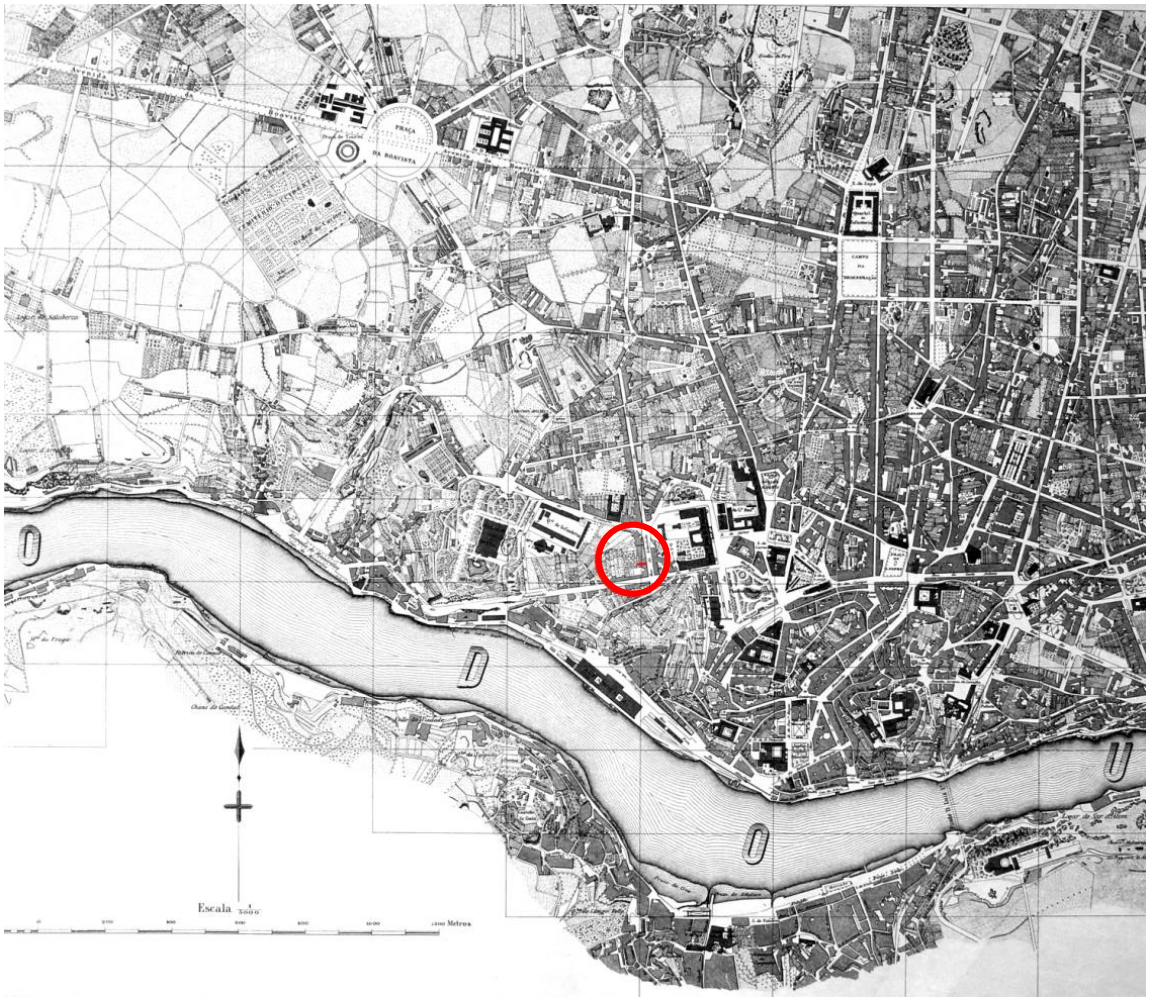

Figure 1. Building location in Telles Ferreira Plan (1892)

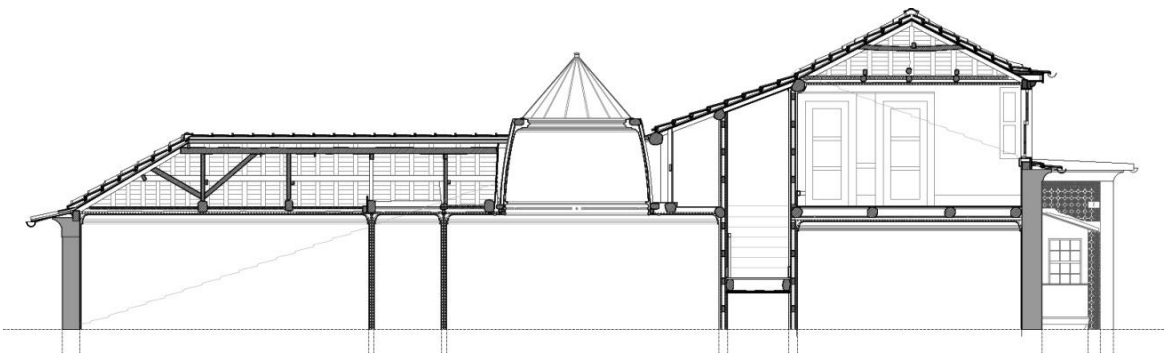

Figure 2. Longitudinal view of the building's middle section

2. PRE-EXISTING BUILDING CONDITIONS

2.1. CONSTRUCTION CHARACTERIZATION

The building encloses traditional materials and techniques in accordance with the typology of preindustrial period constructive systems in Oporto (V. Freitas, J. Teixeira, N. Valentim, 2012). In particular, the edifice has granite masonry bearing structures finished in “azulejos” (ceramic tiles) on the main and rear façades with hydrophobic mortar on the south gable and corrugated metal sheeting on the north gable.

The horizontal structures are oak and chestnut beams holding affixed clamping and locking substructures whether wooden floors or stucco ceilings.

The outer facings of the recessed floors are in plastered masonry in the main and rear façades, and the side facings are in timber panelling (“tabique”) coated with metallic sheeting and crowned with wooden cornices. The window frames are in wood painted a vivid red.

The roof structure is in oak and chestnut and inlaid with a substructure of rods, lining and slats to support the Marseille tile roof. The front eave contains a longer tile type (“canudo tile”) 70 cm in length.

The cover features a main structure with two sloped roof rising towards the west, which holds three other structures: (1) a recessed floor with three sloped roofs facing east to the main façade (with simple trussed structures); (2) a west facing recessed floor with four backwards inclining slopes (in a cross locking structure); (3) an elliptical shaped skylight with a structure consisting of a crowning and lower groundsill and staves.

2.2. BRIEF REFLECTION ON PRE-EXISTING CONDITION (DECAY MAPPING)

This intervention project focused on the conservation of the roof that was already in an advanced state of degradation due to the lack of maintenance throughout various decades (with no record of any consistent repairs to the roof since 1927[4]).

The project was motivated by interior gravitational infiltration in several points such as the base of the skylight and by some structural fissures as evaluated in the report made by the Instituto da Construção of the Oporto University Faculty of Engineering.

The main problems identified generaly involved the decay of ceramic tiles, the deterioration of the timber structures (due to the presence of water, insects and fungi), the decay of the mortars, the painted wooden and the metal features, among others problems such as:

- Advanced decay of the tiles with a considerable number of them either broken or with low levels of waterproofing;
- Advanced decay of the eave tiles due to the presence of biological colonization and the decay of the setting mortars;
- Gaps in the southwest corner roof tiles as well as over the bathroom area in the meanwhile remedied with metal sheeting;
- Decay of the gable end crowning tiles alongside the rotting of the mortar fixing;
- Advanced degradation of the recessed floor metal sheeting;
- Advanced degradation of the skylight cladding sheet and its drip tray (which caused water infiltration and the decay of the skylight support beam structure) and of the upper metallic edge;
- Deterioration of the rainwater drainage system, including the metal guides, gutters, the back downpipe and the capitals;
- Decay of some timber features due to rot or insect and fungal attack (beams, rods, upper skylight structure support beam, roof lining and slats);
- Detachment of the plasterwork along the upper face of the bathrooms;
- Wear of the painting on the recessed floor crowning wooden cornices;
- Oxidation of the metallic features and fissures in their outer facings.

[4] Information in the Historical Archive refers to tile replacement in 1927 and to an extension in the backyard for the magazine.

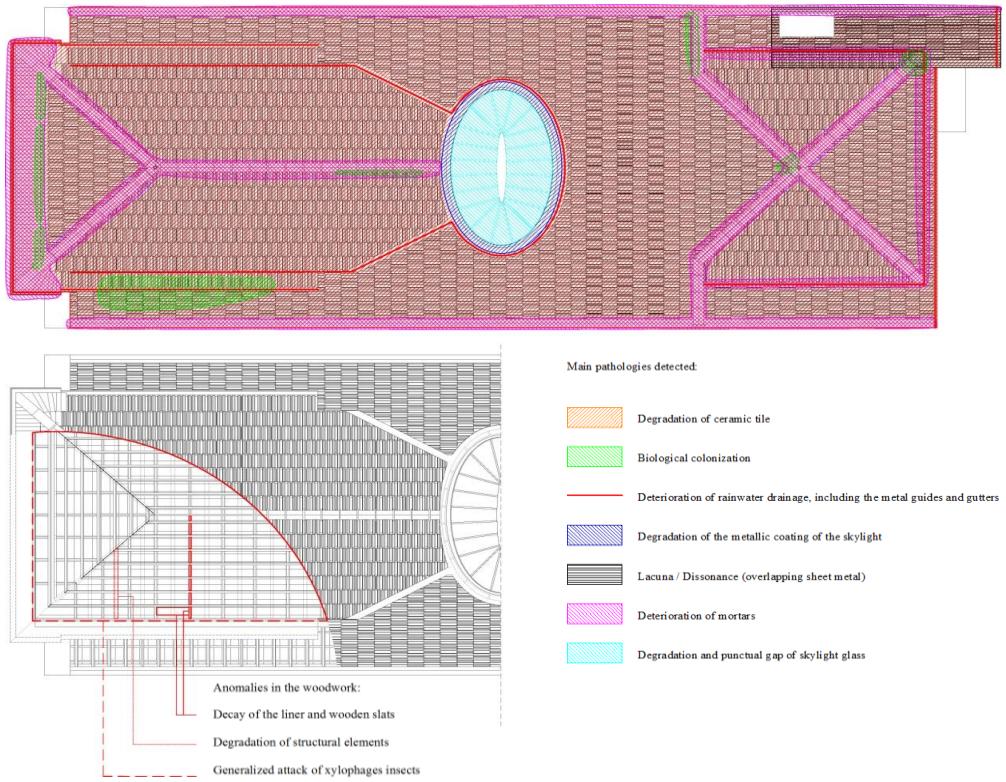

Figure 3. Decay mapping

3. DIARY OF THE INTERVENTION

The objectives of this intervention involved ensuring and improving the watertight integrity of the roof and, simultaneously, retaining all of the features in good condition in order to preserve the building's constructive authenticity. With the intention of conserving the organic unity of the building, traditional materials and construction technologies were preferred as more compatible, sustainable and harmonious with the old structures.

The intervention scope foresaw only minimal structural reinforcement (ISCARSAH, 2003), preserving all the timber structures still in good condition (structural features, beams and rods, liner) involving surface cleaning and curative and preventive treatment against the action of wood-destroying agents (xylophages), except for the slats and much of the lining that could not be preserved. Where necessary, the rods, beams and wood trusses were reinforced with prosthetic pine wood treated and bonded with metal brackets or clamps. The upper skylight support beam structure (rotted in the central zone) was enhanced by a new lattice structure in treated pine, which now distributes loads to the horizontal floor beams.

The project attempted to ensure the maintenance of a percentage of pre-existing tiles even if this ultimately proved impossible due to the different dimensions of current Marseille tiles.

To improve the cover's impermeability, a waterproof and breathable tile was proposed (above the counter-slats and below the slats) into which the ceramic Marseille tiles are set. This solution enables the ventilation of the attic through a 1 cm spacing between board linings. Thermo-acoustic insulation wool fitted to the horizontal surface of the attic).

Furthermore, in order to increase project durability, improvements were made to the gable systems crowning the walls, the rainwater drainage system (metal guides and gutters) as well as coating the skylight in a new high performance and durability material – zinc. The introduction of this material led to the integration of contemporary features - although carefully aligned with the pre-existing and reinterpreting traditional construction systems - exploring its expressive potential particularly in the folds, in the continuous skylight cover plate and in the new piece at the intersection of the bathrooms with the rear façade making a ruff and liming system.

Figure 4. Photographic survey before the intervention

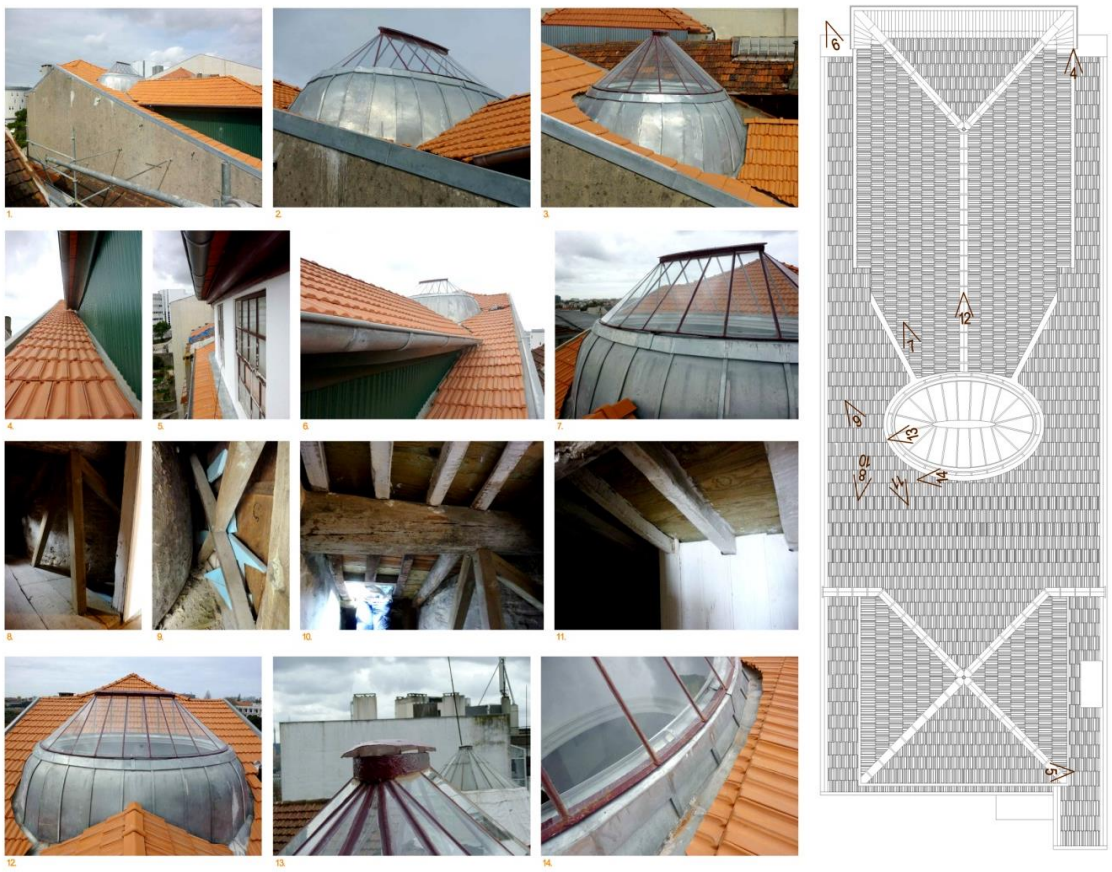

Figure 5. Photographic survey after the intervention

This approach strove for continuity with tradition, without renouncing the contemporaneous nature of the project “to 'continue-innovating’, [in] a dialogue, seeking more for similarities and continuity, than cultivating the difference and rupture” (Távora 1985: 77).

Maintaining that in rehabilitation interventions “conserving the integrity of what exists is very important” (Siza, 2011: 186,188), new elements are in keeping with the principles of contextual design in continuity with the pre-existing attributes: character, scale, form, composition, proportion. Even though these additions may be discerned as new or identifiable, upon closer inspection they “developed to work in harmony with the existing; completing not competing” (ICOMOS ISCAH20, 2011: 4).

Another important feature in the intervention was the preservation and improvement of natural ventilation systems: gaps between lining, breathable tile and ventilated crowning (“cumeeira”). Namely in the skylight, the mechanism of combined ventilation was recovered: air circulates under the lower horizontal steel frame towards a ventilation “chimney” in the top. These kind of passive systems such as combined natural air ventilation are extremely important for damage prevention and for the future maintenance of the buildings.

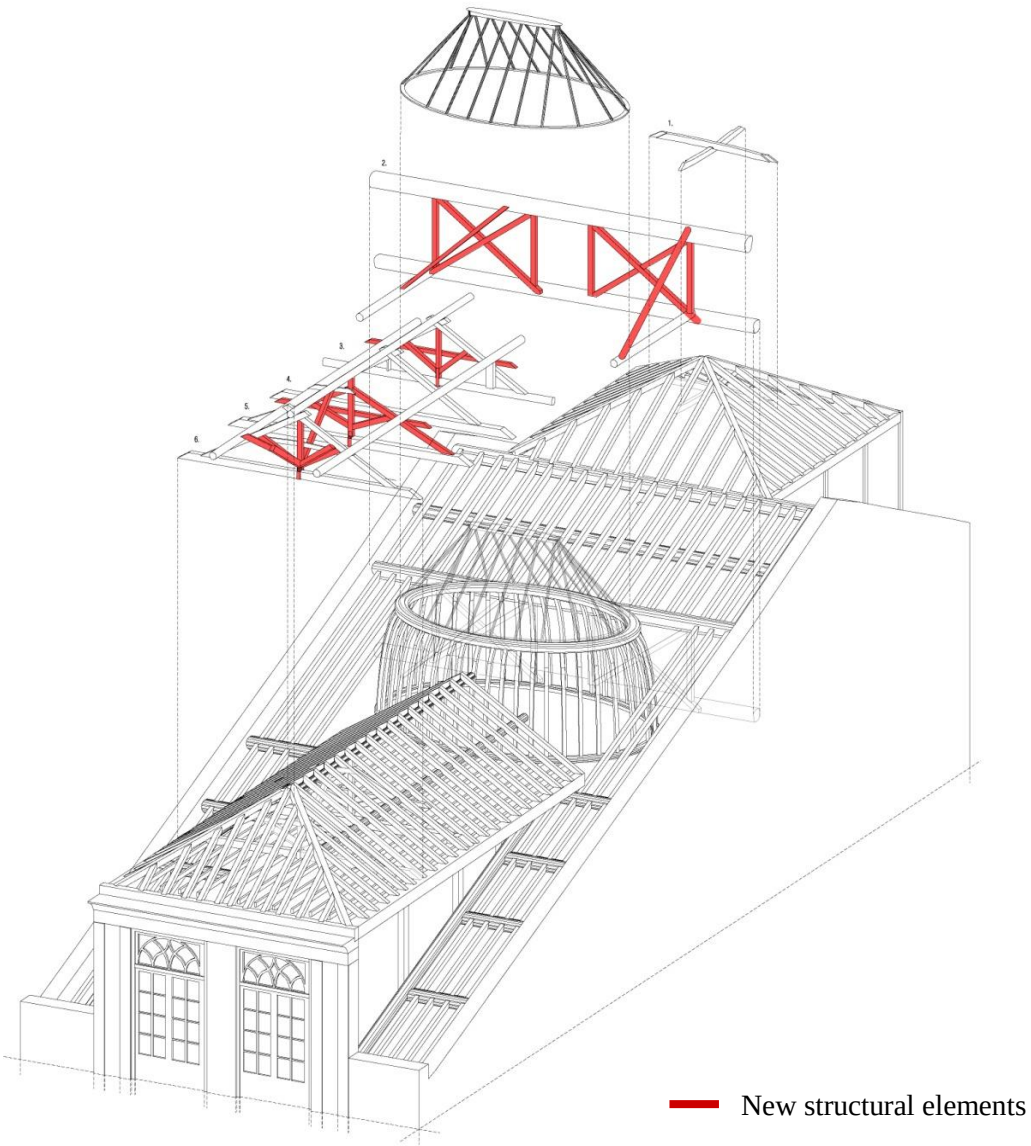

Figure 6. Axonometric representation with new structural elements

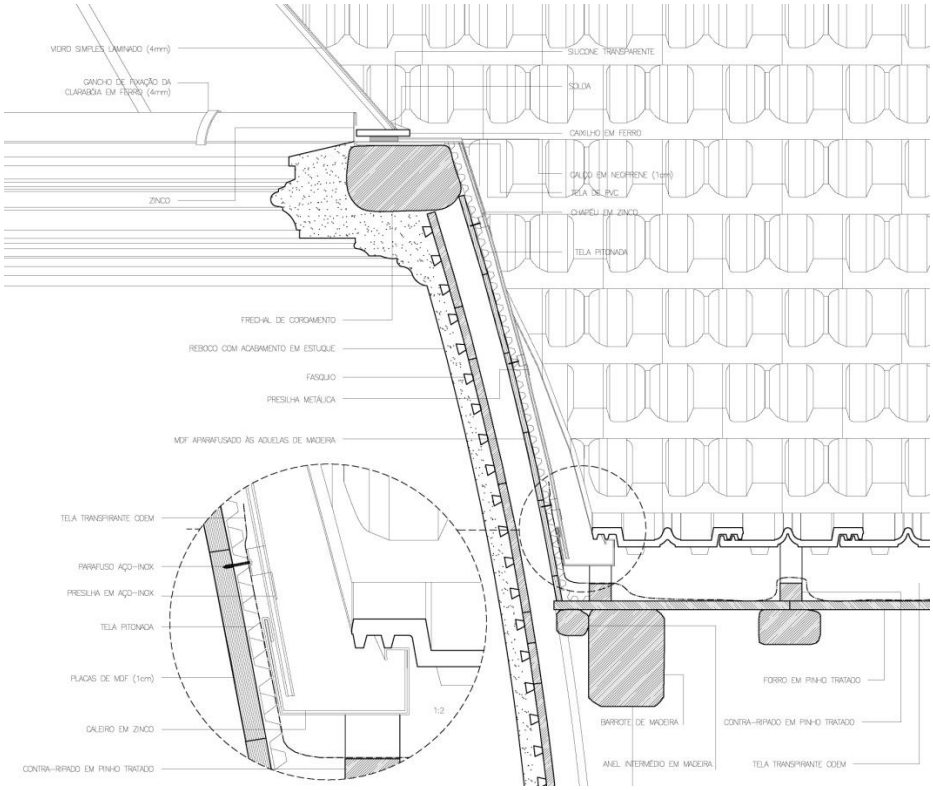

Figure 7. Constructive detail of the skylight

4. MAINTENANCE PROGRAM

"Take proper care of your monuments and you will not need to restore them. A few sheets of lead put in time upon the roof, a few dead leaves and sticks swept in time out of a water-course, will save both roof and walls from ruin. Watch an old building with an anxious care (…)" (Ruskin, 1849). So wrote John Ruskin in 1849 inciting others to the good practice of regular maintenance contrary to the perverse and widespread tendency to leave buildings to ruin and to later restore them thoroughly.

Acknowledging that "prevention is better than cure", the project stipulated the definition of preventive and maintenance actions after the intervention. To expedite inspections and maintenance, the installation of lifelines was recommended to enable the performance of these tasks with certified security and avoiding any future need for scaffolding. The following maintenance schedule was also recommended:

- Annual tasks: inspecting the roofs (ideally in late fall and before winter); checking for broken tiles and the rainwater drainage system (gutters, downpipes, etc.); visual inspection of timber structure.
- Every five year tasks: painting of exterior window frames; painting of metallic elements, among others.
- Every ten year tasks: façades review; preventive structural inspection; preventive treatment of timber structures.

In the current context, awareness of the downturn in the economic and environmental resources available has encouraged a more sustainable safeguarding of architectural heritage through the implementation of strategies for preventive conservation, monitoring and maintenance (Ferreira, 2011). As the Portuguese architect Alvaro Siza sustains "the way we have lost the habit of maintaining houses is very serious. Basically, it's a cultural problem. (…). If the money could be channelled into those resources, into creating the habits and culture of maintenance, the problem would be much less serious." (Siza, 2004). Hence, "if causes of decay can be removed, or at least reduced, something worthwhile has been achieved" (Feilden and J. Jokiletho, 1998).

5. FINAL NOTE

The intervention project followed a conservative approach applying principles in accordance with the international declarations, charters and recommendations (ICOMOS). Regarding the intervention project, this incorporates an indicative methodology: (1) preliminary knowledge: surveys (historical, geometric and constructive), decay mapping and non-destructive inspections; (2) design project and planning; (3) intervention, acknowledging principles of compatibility and authenticity preservation; (4) its monitoring and maintenance over time.

Such interventions seek to preserve the monument's authenticity and organic unity, therefore traditional techniques and materials are prefered as more compatible and sustainable. When additions are necessary for contemporary usage, the relationship between the old and the new preferentially reflects continuity and dialogue – whether material, constructive, tectonic, composite, typological or conceptual – with contemporary or analogical and non-mimetic expression.

Maintenance is the last phase in the process, consisting of its monitoring and maintenance over the time, aiming at the sustainability of the site as well as to its transmission to future generations.

REFERENCES

Câmara Municipal do Porto & Porto Vivo, 2010. Sociedade de Reabilitação Urbana, Plano de Gestão Porto: Porto, CMP/Porto Vivo-SRU.

Feilden, B. & Jokiletho. J. 1998. *Management guidelines for world cultural heritage sites*, Roma: ICCROM.

Ferrão, B., 1989. *Projecto e transformação urbana do Porto na época dos Almadas* 1758-1813, Porto: Faup Publicações.

Freitas, V., Teixeira J., Valentim, N., 2011, *Manual de Apoio ao Projecto de. Reabilitação de Edifícios Antigos***,** Porto: FEUP.

Ferreira, T. 2011. *Manutenção e Património corrente. Conceitos e perspectivas*, in *Cuidar das casas: a manutenção do Património corrente*, Porto: ICOMOS/FEUP.

ISCARSAH 2003, *Principles for the analysis, conservation and structural restoration of architectural heritage*, ICOMOS.

Loza et al. 1996. *Porto a património mundial: processo de candidatura da cidade do Porto à classificação pela UNESCO como Património Cultural da Humanidade 1993*: CMP.

Ruskin, J. 1849. *The Lamp of memory*, in *The Seven Lamps of Architecture*, London: Smith, Elder & Co.

Siza, A. 2002. *Recuperação e Manutenção*, in *A intervenção no património. Práticas de conservação e reabilitação.* Porto: FEUP.

Siza, A., 2011. *Conferencia para el CAH20*, in *Intervention Approaches in the 20th-Century Architectural Heritage*, International Conference CAH20th, Madrid, pp. 186-188.

Távora, F. 1985. *Pousada de Santa Marinha - Guimarães*, in Boletim nº 130, Barcelos: DGEMN, p. 77.