

## Influence of maintenance on durability and life cycle cost of building envelope elements

### Summary

In recent years, due to the advanced state of degradation of buildings in cities, there has been a growing concern in the adoption of maintenance policies. In this sense, recently, theoretical studies have been developed to assess the effectiveness of maintenance on the durability of buildings and their components. Ongoing studies propose probabilistic maintenance models, applied to building envelope elements. In these models, the impact of maintenance on the state of degradation is quantified based on experts, and the real impact of maintenance actions is not identified.

The present investigation intends to fill this gap, seeking to quantify the influence of maintenance actions on the building envelope elements, using in situ inspection, before and after intervention. In this way, a maintenance plan design tool will be optimized, based on useful life prediction models, assessing in a more realistic way the effects of maintenance on the degradation of elements.

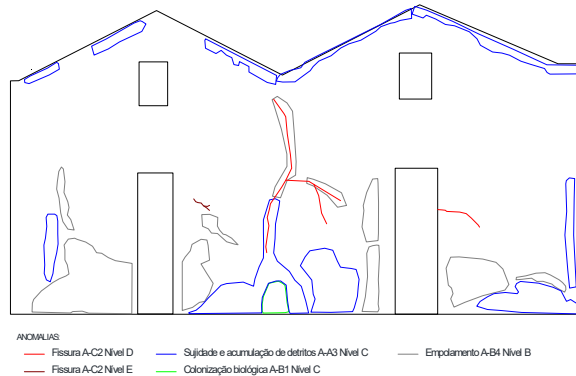
The main objectives are (i) develop a methodology to assess the state of degradation of the building envelope elements, using visual inspection, after a maintenance action has taken place; ii) evaluate and quantify the performance increase in the elements of building envelope through a maintenance action; iii) improve a maintenance plan design tool, based on useful life prediction models, introducing the impacts of maintenance actions in a more realistic way in the degradation models; iv) optimize the life cycle cost of the building envelope elements, through the adoption of appropriate maintenance strategies; v) investigate proposals for mitigating the risk associated with degradation.

### Keywords

Building envelope, condition-based maintenance, maintenance strategies, durability of constructions, service life prediction, maintenance impact.



Building envelope inspection.



Quantification of degradation.



### PhD student

Ilídio dos Santos Dias

### PhD program

Civil Engineering (IST, University of Lisbon)

### Supervisor

Ana Silva (CERIS, IST, University of Lisbon)

### Co-supervisor

Inês Flores-Colen (CERIS, IST, University of Lisbon)

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