

MitRisk – Framework for Seismic Risk Reduction Resorting to Cost-Effective Retrofitting Solutions

Summary

This research proposal was to develop a framework for cost-benefit analysis that will allow the definition of efficient retrofitting plans to be employed in the most vulnerable pre-1983 building typologies that characterize the Portuguese building stock. To accomplish this goal we needed to resort to several models that are involved in the process of seismic risk and loss assessment: seismic hazard, exposure, vulnerability and damage-to-loss models.

CERIS team specific tasks for this project were:

1. To improve our exposure model through the definition of improved taxonomies for buildings (Figures 1 and 2);
2. To develop a fragility and physical vulnerability model of the various building typologies of reinforced concrete before retrofitting including ageing effects;
3. To identify adequate and cost-effective retrofitting techniques as a function of building vulnerability;
4. To develop fragility and physical vulnerability models of retrofitted buildings;
5. To integrate all the previous models into a novel framework for cost-benefit analysis and make it available to the research community.

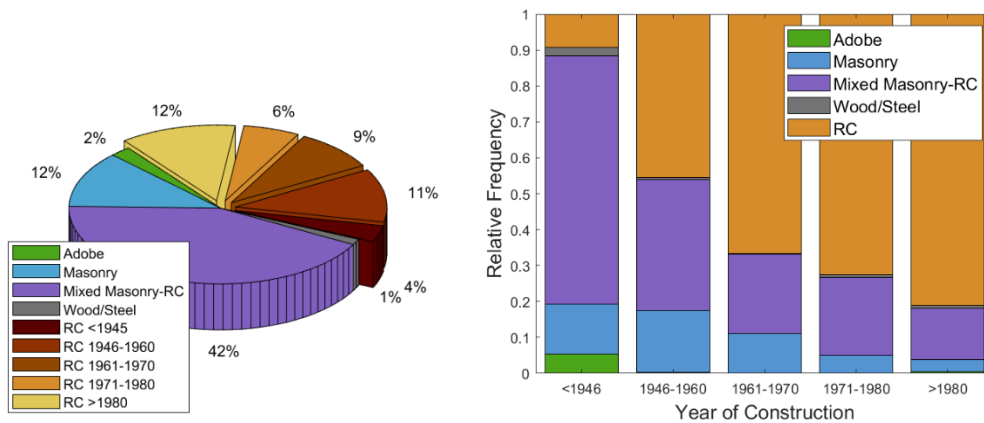


Figure 1. Distribution of Lisbon building stock based on the building typology (left) and building typology and construction period (right).

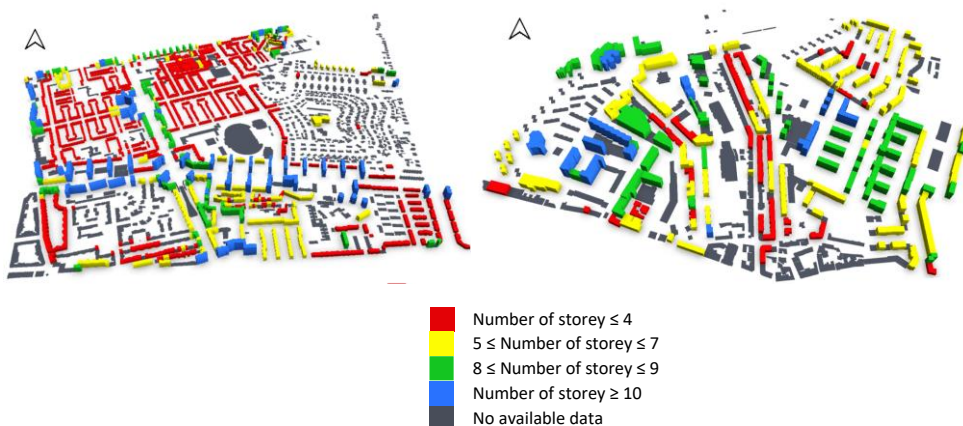


Figure 2. Number of storeys thematic map of Alvalade (left) and Benfica (right).

Project Reference

PTDC/ECI-EST/31865/2017 - POCI-01-0145-FEDER-031865

Leading Institution

FEUP – Faculdade de Engenharia da Universidade do Porto (Portugal)

Partners

IST-ID – Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento (Portugal), UA – University of Aveiro (Portugal)

CERIS Principal Investigator

Rita Bento
(rita.bento@tecnico.ulisboa.pt)

CERIS Research Team

Rita Couto

Funding

FCT – Fundação para a Ciência e a Tecnologia

Period

2018-2021

Total

239 445.97€

CERIS

38 600.00€

Project Website

-