



LABORATÓRIO NACIONAL  
DE ENGENHARIA CIVIL

TESTING  
and METROLOGY

UDinE

Structural Dynamics  
Laboratory

STRUCTURES DEPARTMENT

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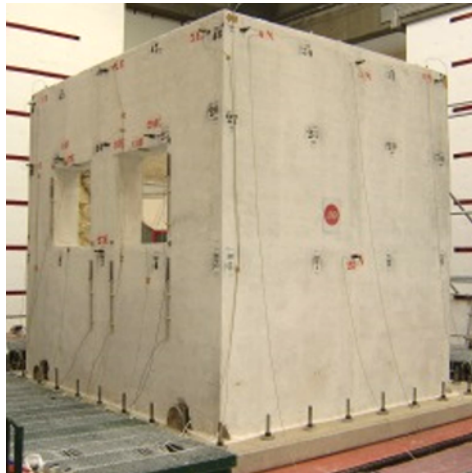
[www.lnecc.pt](http://www.lnecc.pt)

## Scope

The Structural Dynamics Laboratory (UDinE) is integrated in the Structures Department/ Earthquake Engineering and Structural Dynamics Unit of LNEC. It is equipped with several experimental infrastructures necessary for the development of R&D&I activities.

The UDinE is devoted to the characterisation of the seismic performance and vulnerability of large structures or substructures, which are subject to seismic actions of different intensities up to situations of imminent global collapse.

UDinE also carries out tests for the seismic qualification of large equipment.



## Field of expertise

### LNEC-3D seismic testing platform

The LNEC-3D seismic testing platform, where the models to be tested are installed and fixed, has an approximately triangular prismatic shape with the following features: clear dimensions of 6.4x5.6 m<sup>2</sup>; maximum capacity of 40 tonnes; 3 independent orthogonal axes; actively controlled displacements; passively restrained rotations (by torsion bars); frequency ranges between 0 and 40Hz.

### Experimental R&D&I studies

Seismic testing for the evaluation of the seismic performance of both traditional and modern construction buildings and structural typologies, or for the assisted development of seismic

strengthening and rehabilitation of quasi full scale whole structures (1:1.5 up to 1:2) or of full scale substructures.



Seismic testing and experimental evaluation, as well as assisted development of passive or semi-active systems for the mitigation of seismic loads on structures.

### Seismic qualification studies

Seismic qualification tests on equipment and components for the electric power production and distribution industry.



### Other services

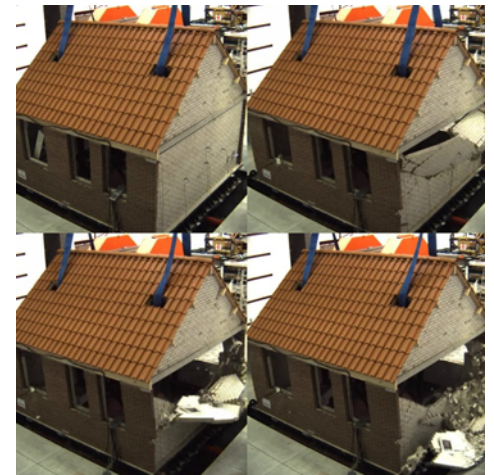
The UDinE conducts advisory studies to assess the seismic vulnerability of important systems or structural components (e.g., buildings and bridges) using methodologies based on objectives

and previously defined performance levels. These studies are backed by the experimental characterisation of the dynamic behaviour of structures, which is essential for implementing reinforcement solutions intended to mitigate the seismic vulnerability with regard to the established performance objectives.

## Highlights

### Experimental study about the seismic risk of masonry buildings

Testing in the LNEC-3D seismic platform of full scale single-family buildings representative of existing masonry structures, with a view to characterise their seismic performance for different intensities of earthquake action.



Testing in the LNEC-3D seismic platform of full scale single-family buildings representative of a typical Dutch house with a view to characterise their seismic performance for different intensities of earthquake action.

### Project SERA – Seismology and Earthquake Engineering Research Infrastructure Alliance for Europe

Project with three user groups: UG1 (University of Genova) comprising brick masonry groin vaults; UG2 (University of Rome) devoted to the development of an integrated construction system for controlling both structural and non-structural damages in buildings; and UG3 (École Polytechnique Fédérale de Lausanne) on the interaction between adjacent masonry buildings in urban settlements.