

## ERIES-VERDI metadata

Required Field	Description/Options
Title of the dataset or experimental test campaign/project	VERDI – Vibration-based post-Earthquake Rapid Damage Identification in historic masonry towers
Engineering Discipline	Earthquake Engineering
Brief description of the dataset (max 300 words)	<p>The ERIES-VERDI (Vibration-based post-Earthquake Rapid Damage Identification in historic masonry towers) project aims to assess the effectiveness and scalability of innovative vibration-based SHM methods for damage localization and quantification in earthquake-excited masonry constructions. The project proposed a dynamic investigation of the behaviour of masonry towers embedded within building aggregate, using shake table testing to validate SHM methods on a stone masonry tower subjected to different seismic inputs.</p> <p>The dataset contains the results of the experimental campaign carried out at the LNEC facilities, in Lisbon. The masonry tower was built with calcareous stone and lime mortar, with boundary conditions reproducing the surrounding aggregates, at a 1:7 scale, featuring a total height of about 6.30 m, a square cross section of 1.0 x 1.0 m<sup>2</sup>, 0.2 m thick walls and small openings. The material was characterized by vertical compression tests on masonry wallets, three-point bending and compression tests on mortar specimens, and compression tests on stone specimens, all available at the dataset.</p> <p>The tests on the scaled tower were carried out in two different configurations. In the first configuration, ambient vibration tests (AVT) were performed while it was standing on the floor of the testing hall. In the second configuration, shake table (ST) tests were performed where it underwent dynamic identification through ambient and forced vibration tests, followed by seismic tests with different input motions. The dataset includes recordings from a dense monitoring system collected during all shaking tests, as well as under white- and pink-noise excitations at different damage levels. It also provides detailed information on the damage state at each intensity level, enabling the development and validation of Structural Health Monitoring (SHM) algorithms for earthquake-induced damage.</p>
Keywords	Slender masonry towers, Shake table tests, Structural Health Monitoring, Damage identification, Dynamic identification, Ambient vibration tests
Experiment Type	<ul style="list-style-type: none"> <li>● Shake-table test</li> <li>● Vertical Compression Test</li> <li>● Diagonal Compression Test</li> </ul>

Experiment Scale	Reduced scale (1:7)
Experiment Test Taxonomy (taken from <a href="https://experiments.builtenvdata.eu/taxonomy">https://experiments.builtenvdata.eu/taxonomy</a> )	<p><i>Specimen Type</i>: Full structural assembly (FSA)  <i>Specimen Sub-Type</i>: Undefined? Wall? (none, it's a tower)</p> <p><i>Material Type</i>: Masonry (MUR)  <i>Material Technology</i>: Rubble, field stone, or semi-dressed stone (STRUB)</p>
How to Cite This Work	LNEC report in progress
Dataset PI	Filippo, Ubertini, University of Perugia, <a href="https://orcid.org/0000-0002-5044-8482">https://orcid.org/0000-0002-5044-8482</a>
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Dataset Facility	LNEC
Years of Experiments	2026
Publications	<ul style="list-style-type: none"> <li>Ponte, M., Candeias, P., Bernardo, V., Ribeiro, F., Marques, A., Cavalagli, N., Masciotta, M.G., Barontini, A., García-Macías, E., Mendes, N., Lourenço, P.B., Ubertini, F. (2026) Vibration-based post-Earthquake Rapid Damage Identification in historic masonry towers. Experimental campaign of the ERIES-VERDI project at LNEC. In: 18<sup>th</sup> European Conference on Earthquake Engineering (ECEE2026). Berlin, Germany, 14-18 September 2026. (Submitted)</li> <li>Masciotta, M.G., Barontini, A., García-Macías, E., Cavalagli, N., Ponte, M., Bernardo, V., Candeias, P., Mendes, N., Lourenço, P.B., Ubertini, F. (2026).</li> </ul>

	<p>Dynamic characterization of a scaled stone masonry tower prior to shaking table tests. In: 2026 International Workshop in Engineering Research Infrastructures for European Synergies (ERIES-IW2026). Pavia, Italy, 25-27 May 2026. (Accepted)</p> <ul style="list-style-type: none"> <li>• Mirzaei, M., Mendes, N., Barontini, A., Cavalagli, N., García-Macías, E., Masciotta, M.G., Ubertini, F., Lourenço, P.B. (2026). Frequency content influence on the seismic behavior of a historic masonry tower. In: 2026 International Workshop in Engineering Research Infrastructures for European Synergies (ERIES-IW2026). Pavia, Italy, 25-27 May 2026. (Accepted)</li> <li>• Mariucci, E., Cavalagli, N., García-Macías, E., Masciotta, M.G., Barontini, A., Ponte, M., Bernardo, V., Ribeiro, F.L., Candeias, P.X., Mendes, N., Lourenço, P.B., Ubertini, F. (2026). Nonlinear simulation of a scaled masonry tower under shaking table tests using the applied element method. In: 2026 International Workshop in Engineering Research Infrastructures for European Synergies (ERIES-IW2026). Pavia, Italy, 25-27 May 2026. (Accepted)</li> </ul>
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Image (also provided separately)

