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Data Article

Mechanical characterization and force-displacement hysteretic curves from in-plane cyclic tests on strong masonry infills

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ABSTRACT

This article contains information related to a recent study "Performance-based interpretation of in-plane cyclic tests on RC frames with strong masonry infills" (Morandi et al., 2017 [1]). Motivated by the necessity to improve the knowledge of the in-plane seismic response of rigid strong masonry infills, a wide experimental campaign based on in-plane cyclic tests on full-scale RC infilled frame specimens, supplemented with a complete characterization of the materials, has been conducted at the laboratory of the Department of Civil Engineering and Architecture of the University of Pavia. The masonry is constituted by vertically perforated 35 cm thick clay units with tongue and groove and dry head-joints and general-purpose mortar bed-joints. The paper reports the results of the mechanical characterization and of the force-displacement hysteretic curves from the in-plane cyclic tests.

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Specifications Table

Subject area	*Engineering*
More specific subject area	*Earthquake engineering*
Type of data	*Tables, images, text file, graphs, figures*
How data was acquired	*Acquisition from the controller of the actuator, the linear potentiometers and optical markers*
Data format	*Raw and analysed data*
Experimental factors	–
Experimental features	*Tests of material characterization and in-plane cyclic tests*
Data source location	–
Data accessibility	*Data provided in the article is accessible to the public*

Value of the data

- Data in this work may improve the understanding of in-plane cyclic response of strong masonry infills
- Lack of data regarding in-plane experimental tests on strong masonry infills
- Full scale specimens
- Complete characterization of the materials (concrete and reinforcing steel, clay units, mortar and masonry)

1. Data

The data refer to the results of the mechanical characterization and of the in-plane cyclic tests on a strong masonry infill typology. The tests have been conducted at the laboratory of the Department of Civil Engineering and Architecture of the University of Pavia.

The description of the infill typology is reported in Morandi et al. [1].

1.1. Material characterization

A complete characterization of the relevant properties for all materials utilized for the construction of the specimens has been carried out. Principally, the evaluation of clay units, mortar and masonry properties for the selected infill typology was of primary importance. The results of the tests of characterization are described and reported in detail in Section 2.1.

1.2. In-plane cyclic tests

A series of cyclic pseudo-static in-plane tests has been carried out on bare and fully or partially infilled full-scale single-storey, single-bay RC frames, designed according to European code provisions. In particular, one RC frame was tested without infill (TNT) up to maximum drift of 3.50% in order to reach the ultimate conditions of the specimen, while three fully infilled specimens (TA1, TA2 and TA3) were tested at three increasing maximum levels of drift, equal to 1.00, 1.50 and 2.50%. In addition, a partially infilled frame configuration with a 1.44 m wide and full-height opening in the middle of the span (TA4) was tested, reaching a maximum in-plane drift of 1.00%. The in-plane infill performance at increasing levels of drift was aimed to approximately represent different limit state conditions. The type and the dimensions of the tested frames are reported in Morandi et al. [1].