Dataset from the dynamic shake-table test of a full-scale unreinforced clay-masonry building with flexible timber diaphragms

Stylianos Kallioras\textsuperscript{a,c}, Gabriele Guerrini\textsuperscript{b,c}, Umberto Tomassetti\textsuperscript{b,c}, Simone Peloso\textsuperscript{c}, Francesco Graziotti\textsuperscript{b,c,*}

\textsuperscript{a} UME Graduate School, IUSS Pavia, Piazza della Vittoria 15, 27100 Pavia, Italy
\textsuperscript{b} Department of Civil Engineering and Architecture (DICAr), University of Pavia, via Ferrata 3, 27100 Pavia, Italy
\textsuperscript{c} European Centre for Training and Research in Earthquake Engineering (EUCENTRE), via Ferrata 1, 27100 Pavia, Italy

\begin{abstract}
This paper provides information related to the sensor measurements obtained from an unreinforced masonry building subjected to incremental dynamic shake-table tests at the EUCENTRE facilities in Pavia, Italy. These tests provide a unique data set that captures at full scale the in-plane and out-of-plane behavior of unreinforced masonry walls, and the influence of flexible diaphragms on the dynamic global response of a complete building. The authors made this information available to assist in the development of analytical and numerical models, necessary to estimate the dynamic response and the engineering parameters for the performance-based seismic assessment of unreinforced masonry buildings. All recorded data (acceleration and displacement time histories) and the videos of the tests can be requested online on the EUCENTRE repository at the URL www.eucentre.it/nam-project referring to EUC-BUILD-2. For further interpretation of the sensor recordings, and for a detailed discussion on the seismic performance of the building specimen, the reader is encouraged to consult the corresponding author.
\end{abstract}
referred to the article entitled “Experimental seismic performance of a full-scale unreinforced clay-masonry building with flexible timber diaphragms” (Kallioras et al., 2018) [1].

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###Specifications table

| Subject area                  | Engineering                                      |
|-------------------------------|--------------------------------------------------|
| More specific subject area    | Structural engineering, Earthquake engineering   |
| Type of data                  | Acceleration and displacement time histories      |
| How data was acquired         | Ground shaking of increasing intensity was applied to the building base, while random vibration tests were performed to monitor the evolution of the system dynamic properties at each testing step. The specimen was densely instrumented with accelerometers, wire potentiometers, linear potentiometers, and a three-dimensional motion-capture system that recorded the response of various structural elements |
| Data format                   | .txt files and .mat files with filtered and processed time histories |
| Experimental factors          | The specimen represented a typical unreinforced masonry detached house of the Groningen region of the Netherlands |
| Experimental features         | Incremental unidirectional dynamic shake-table tests were performed up to near-collapse conditions of the building, using input ground motions compatible with induced-seismicity scenarios for the Groningen region of the Netherlands |
| Data source location          | The tests were carried out at the laboratory facilities of the European Centre for Training and Research in Earthquake Engineering (EUCENTRE) based in Pavia, Italy |
| Data accessibility            | All recorded data (acceleration and displacement time histories) and the videos of the tests can be requested online on the EUCENTRE repository at the URL www.eucentre.it/nam-project referring to EUC-BUILD-2. |

###Value of the data

- The paper describes a comprehensive testing campaign that could serve as a benchmark in the field of laboratory testing of structures.
- The instrument measurements provide detailed information about the building dynamic response and could be employed for the calibration of analytical and numerical models.
- The recordings of the optical acquisition system could be used by researchers to establish relationships between local and global damage indicators of masonry wall structures.
- The obtained measurements could be further analyzed to evaluate the effect of flexible diaphragms in the dynamic response of masonry buildings.
- The test outcomes could be used to validate simplified methods to estimate earthquake-induced deformation demands with the focus on unreinforced masonry buildings.

###1. Experimental design, materials and methods

A unidirectional shake-table test was conducted on a full-scale prototype of a clay-brick unreinforced masonry (URM) detached house, featuring typical details of the pre-1940s construction practice of the Groningen region in the Netherlands (Fig. 1). The prototype consisted of double-wythe clay-brick unreinforced masonry walls, not detailed for seismic resistance, with large openings and a
reentrant corner which caused discontinuities along the perimeter walls. The floor system of timber beams and planks provided a flexible diaphragm. The roof was characterized by a very steep pitch; its structure consisted of timber trusses, purlins and boards. The two façades perpendicular to the shaking direction included two typical gable geometries.

The specimen was subjected to incremental dynamic excitations, with input motions representative of induced seismicity scenarios for the Groningen region, characterized by smooth response spectra and short significant duration. The ground motions were progressively scaled in amplitude to achieve the desired demand intensities up to the near-collapse state of the building. Random vibration tests were also performed to monitor the evolution of the system dynamic properties at each testing step.

The geometric characteristics of the building specimen, the construction details, the material properties, the instrumentation plan, the testing protocol, and the major observations from the tests are described in detail in [1]. Therein, the instrument recordings have been employed to link engineering demand parameters to the attainment of significant performance limits states for the assessment of the seismic behavior of the prototype building. Further information about the materials used to construct the specimen and the results of the companion tests on wall components can be found in [2].

Table 1
Accelerometer and potentiometer data: file names.

| Test No. | Test name | Data file name | Matrix sizes (rows No. \( \times \) columns No.) |
|---------|-----------|----------------|-----------------------------------------------|
| 1       | SC1 - 25% | #03–25%-SC1–024 | 5121 \( \times \) 144                        |
| 2       | SC1 - 50% | #05–50%-SC1–047 | 5121 \( \times \) 144                        |
| 3       | SC1 - 100%| #07–100%-SC1–094| 5121 \( \times \) 144                        |
| 4       | SC1 - 150%| #09–150%-SC1–141| 5121 \( \times \) 144                        |
| 5       | SC2 - 50% | #13–50%-SC2–076 | 7681 \( \times \) 144                        |
| 6       | SC2 - 100%| #15–100%-SC2–152| 7681 \( \times \) 144                        |
| 7       | SC2 - 150%| #20–150%-SC2–228| 7681 \( \times \) 144                        |
| 8       | SC2 - 200%| #22–200%-SC2–304| 7681 \( \times \) 144                        |
| 9       | SC2 - 250%| #24–250%-SC2–380| 7681 \( \times \) 144                        |
| 10      | SC2 - 300%| #30–300%-SC2–456| 7681 \( \times \) 144                        |
| 11      | SC2 - 400%| #36–400%-SC2–608| 7681 \( \times \) 144                        |
| 12      | SC2 - 200%-A\(^a\) | #41–200%-SC2–304 | 7681 \( \times \) 144                        |

\(^a\) A: test simulating an aftershock
Table 2
Accelerometer and potentiometer recordings: matrix columns 1 to 124. Letters indicate the type of measuring instrument: A, accelerometer; WP, wire potentiometer; P, potentiometer.

| Col. No. | Sensor ID | Rec. DOF | UM | Assocd. mass (in x dir.) | Measured quantity - Instrument location |
|---------|-----------|----------|----|--------------------------|----------------------------------------|
| 1       | -         | -        | [s] | -                        | Time                                   |
| 2       | A 1       | x        | [g] | 146                      | Floor diaphragm acceleration (S-W corner, +2900) |
| 3       | y         | [g]      | -  |                          |                                        |
| 4       | z         | [g]      | -  |                          |                                        |
| 5       | A 2       | x        | [g] | 220                      | Floor diaphragm accel. (S-E corner, +2900) |
| 6       | Offline   | -        | -  |                          | for y component of A 2, see column No.53 |
| 7       | A 2       | z        | [g] | -                        | Floor diaphragm accel. (S-E corner, +2900) |
| 8       | Offline   | -        | -  |                          | for x component of A 3, see column No.54 |
| 9       | Offline   | -        | -  |                          | for y component of A 3, see column No.54 |
| 10      | A 3       | z        | [g] | -                        | Floor diaphragm accel. (N-E corner, +2900) |
| 11      | A 4       | x        | [g] | 220                      | Floor diaphragm accel. (N-W corner, +2900) |
| 12      | y         | [g]      | -  |                          |                                        |
| 13      | z         | [g]      | -  |                          |                                        |
| 14      | A 5       | x        | [g] | 240                      | Floor diaphragm accel. (West protruding corner, +2900) |
| 15      | A 6       | x        | [g] | 315                      | Floor diaphragm accel. (centre of mass, +2900) |
| 16      | y         | [g]      | -  |                          |                                        |
| 17      | z         | [g]      | -  |                          |                                        |
| 18      | A 7       | x        | [g] | 451                      | Roof ridge beam accel. (South end, +6074 mm) |
| 19      | y         | [g]      | -  |                          |                                        |
| 20      | z         | [g]      | -  |                          |                                        |
| 21      | A 8       | x        | [g] | 548                      | Roof ridge beam accel. (North end, +6074 mm) |
| 22      | y         | [g]      | -  |                          |                                        |
| 23      | z         | [g]      | -  |                          |                                        |
| 24      | Offline   | -        | -  |                          | for z component of A 9, see column No.56 |
| 25      | A 10      | x        | [g] | 1554                     | South wall accel. (S-W corner, +2900)   |
| 26      | A 11      | x        | [g] | 1789                     | South wall accel. (midspan, +2900)      |
| 27      | A 12      | x        | [g] | 921                      | South wall accel. (S-E corner, +2900)   |
| 28      | A 13      | x        | [g] | 1154                     | North wall accel. (N-E corner, +2900)   |
| 29      | A 14      | x        | [g] | 1203                     | North wall accel. (midspan, +2900)      |
| 30      | A 15      | x        | [g] | 1611                     | North wall accel. (N-W corner, +2900)   |
| 31      | A 16      | x        | [g] | 266                      | Floor diaphragm accel. (South midspan, +2900) |
| 32      | A 17      | x        | [g] | 275                      | Floor diaphragm accel. (North midspan, +2900) |
| 33      | A 18      | x        | [g] | 310                      | South wall mid-height accel. (midspan, +1450 mm) |
| 34      | A 19      | x        | [g] | 761                      | South gable wall accel. (S/W corner, +3815 mm) |
| 35      | A 20      | x        | [g] | 671                      | South gable wall top accel. (+6031 mm)   |
| 36      | A 21      | x        | [g] | 584                      | North wall mid-height accel. (midspan, +1430 mm) |
| 37      | A 22      | x        | [g] | 145                      | North clipped gable wall mid-height accel. (midspan, +3815 mm) |
| 38      | A 23      | x        | [g] | 1146                     | North clipped gable wall top accel. (midspan, +4847 mm) |
| 39      | A 24      | x        | [g] | 4755                     | Foundation beam accel. (West, +0.000)    |
| 40      | A 25      | x        | [g] | 4034                     | Foundation beam accel. (East, +0.000)    |
| 41      | A 26      | x        | [g] | 493                      | North clipped gable wall mid-height acc. (N-E corner, +3815 mm) |
| 42      | A 27      | x        | [g] | -                        | Steel frame accel. (N-W column, +2900)   |
| 43      | A 28      | x        | [g] | -                        | Steel frame top accel. (North side)     |
| 44      | A 29      | x        | [g] | 1456                     | East wall accel. (Southern side, +2900)  |
| 45      | A 30      | x        | [g] | 1986                     | East wall accel. (Northern side, +2900)  |
| 46      | A 31      | x        | [g] | 891                      | West wall accel. (protruding corner, +2900 mm) |
| 47      | A 32      | x        | [g] | 1202                     | West wall accel. (reentrant corner, +2900 mm) |
| 48      | A 33      | x        | [g] | 493                      | Roof/Wall plate accel. (S-W corner, +2900) |
| 49      | A 34      | x        | [g] | 286                      | Roof/Wall plate accel. (S-E corner, +3840) |
| 50      | A 35      | x        | [g] | 250                      | Roof/Wall plate accel. (N-E corner, +3840) |
| 51      | A 36      | x        | [g] | 250                      | Roof/Wall plate accel. (N-W corner, +3840) |
| 52      | A 37      | x        | [g] | 875                      | South gable wall accel. (S-E corner, +3815 mm) |
| 53      | A 2       | y        | [g] | -                        | Floor diaphragm accel. (S-E corner, +2900) |
| 54      | A 3       | y        | [g] | 224                      | Floor diaphragm accel. (N-E corner, +2900) |
| 55      | y         | [g]      | -  |                          |                                        |
| 56      | A 9       | z        | [g] | -                        | Roof ridge beam accel. (midspan, +6074)  |
| 57      | A 38      | x        | [g] | 596                      | North clipped gable wall mid-height acc. (N-W corner, +3815 mm) |
| 58      | Offline   | -        | -  |                          |                                        |
| Col. No. | Sensor ID | Rec. DOF UM (in x dir.) | Assocd. mass [kg] | Measured quantity - Instrument location |
|---------|-----------|------------------------|-------------------|------------------------------------------|
| 59      | WP 1 x    | [mm]                   | -                 | South wall mid-height deflection (w.r.t. the steel frame, +1474 mm) |
| 60      | WP 2 x    | [mm]                   | -                 | North wall mid-height def. (w.r.t. the steel frame, +1428 mm) |
| 61      | WP 3 x    | [mm]                   | -                 | South gable wall top def. (w.r.t. the steel frame, +5800 mm) |
| 62      | WP 4 x    | [mm]                   | -                 | North clipped gable wall top def. (w.r.t. the steel fr., +4824 mm) |
| 63      | WP 5 x    | [mm]                   | -                 | Roof ridge beam displacement (w.r.t. the steel frame, +6074 mm) |
| 64      | WP 6 x    | [mm]                   | -                 | Floor diaphragm longitudinal deformation (along the East wall) |
| 65      | WP 7 x    | [mm]                   | -                 | Floor diaphragm longitudinal def. (along the West wall) |
| 66      | WP 8 NW-SE | [mm]                 | -                 | Floor diaphragm shear def. (along the N-W to S-E diagonal) |
| 67      | WP 9 NE-SW | [mm]                | -                 | Floor diaphragm shear def. (along the N-E to S-W diagonal) |
| 68      | WP 46 diagonal | [mm]         | -                 | East squat pier def. (along the bottom/right to top/left diagonal) |
| 69      | WP 47 diagonal | [mm]              | -                 | East squat pier def. (along the bottom/left to top/right diagonal) |
| 70      | WP 51 diagonal | [mm]            | -                 | East wall top def. (along the bottom/right to top/left diagonal) |
| 71      | WP 52 diagonal | [mm]            | -                 | East wall top def. (along the bottom/left to top/right diagonal) |
| 72      | Offline   | -                      | -                 | - |
| 73      | P 10 x    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, S-W corner, +2900 mm) |
| 74      | P 11 y    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, South, +2900 mm) |
| 75      | P 12 x    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel fr., South midspan, +2900 mm) |
| 76      | P 13 x    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, S-E corner, +2900 mm) |
| 77      | P 14 x    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, N-E corner, +2900 mm) |
| 78      | P 15 y    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, N-W corner, +2900 mm) |
| 79      | P 16 x    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, S-E corner, +2900 mm) |
| 80      | P 17 y    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, N-W corner, +2900 mm) |
| 81      | P 18 x    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, S-W corner, +2900 mm) |
| 82      | P 19 x    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, N-W corner, +2900 mm) |
| 83      | P 20 y    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the steel frame, S-W corner, +2900 mm) |
| 84      | P 21 x    | [mm]                   | -                 | South wall defl. (w.r.t. the diaphragm, S-W corner, +2900 mm) |
| 85      | P 22 x    | [mm]                   | -                 | South wall defl. (w.r.t. the diaphragm, midspan, +2900 mm) |
| 86      | P 23 x    | [mm]                   | -                 | South wall defl. (w.r.t. the diaphragm, S-E corner, +2900 mm) |
| 87      | P 24 x    | [mm]                   | -                 | North wall defl. (w.r.t. the diaphragm, N-E corner, +2900 mm) |
| 88      | P 25 x    | [mm]                   | -                 | North wall defl. (w.r.t. the diaphragm, midspan, +2900 mm) |
| 89      | P 26 x    | [mm]                   | -                 | North wall defl. (w.r.t. the diaphragm, N-W corner, +2900 mm) |
| 90      | P 27 y    | [mm]                   | -                 | East wall top displ. (w.r.t. the steel frame, South side, +3755 mm) |
| 91      | P 28 x    | [mm]                   | -                 | East wall top displ. (w.r.t. the steel frame, North side, +3755 mm) |
| 92      | P 29 y    | [mm]                   | -                 | East wall top displ. (w.r.t. the steel frame, North side, +3755 mm) |
| 93      | P 30 x    | [mm]                   | -                 | East wall top displ. (w.r.t. the steel frame, North side, +3755 mm) |
| 94      | P 31 y    | [mm]                   | -                 | East wall top displ. (w.r.t. the steel frame, North side, +3755 mm) |
| 95      | P 32 x    | [mm]                   | -                 | Roof ridge beam displ. (w.r.t. the top of South gable, +5710 mm) |
| 96      | P 33 x    | [mm]                   | -                 | Roof truss (East rafter) displ. (w.r.t. the North clipped gable) |
| 97      | P 34 x    | [mm]                   | -                 | Roof truss (West rafter) displ. (w.r.t. the North clipped gable) |
| 98      | P 35 x    | [mm]                   | -                 | East wall sliding (w.r.t. the foundation beam) |
| 99      | P 36 x    | [mm]                   | -                 | Foundation sliding (w.r.t. the shake table, East side) |
| 100     | P 37 x    | [mm]                   | -                 | West innermost wall sliding (w.r.t. the foundation beam) |
| 101     | P 38 x    | [mm]                   | -                 | Foundation sliding (w.r.t. the shake table, West side) |
| 102     | P 39 x    | [mm]                   | -                 | Foundation sliding (w.r.t. the shake table, West side) |
| 103     | Offline   | -                      | -                 | - |
| 104     | P 41 x    | [mm]                   | -                 | North clipped gable top displ. (w.r.t. the hip wall plate, midspan) |
| 105     | WP 42 z   | [mm]                   | -                 | East southernmost pier uplift |
| 106     | WP 43 x   | [mm]                   | -                 | East squat pier horizontal deformation (top) |
| 107     | WP 44 z   | [mm]                   | -                 | East squat pier vertical deformation (left) |
| 108     | WP 45 z   | [mm]                   | -                 | East squat pier vertical deformation (right) |
| 109     | WP 48 x   | [mm]                   | -                 | East wall top horizontal deformation (top) |
| 110     | WP 49 z   | [mm]                   | -                 | East wall top vertical deformation (left) |
| 111     | WP 50 z   | [mm]                   | -                 | East wall top vertical deformation (right) |
| 112     | P 53 x    | [mm]                   | -                 | Floor diaph. displ. (w.r.t. the West wall, protr. corner, +2900 mm) |
| 113     | P 54 x    | [mm]                   | -                 | Roof/Wall plate sliding (w.r.t. the top of East wall, +3755 mm) |
| 114     | Offline   | -                      | -                 | - |
| 115     | P 56 x    | [mm]                   | -                 | Roof truss (East rafter) displ. (w.r.t. the South gable wall) |
| 116     | WP 57 x   | [mm]                   | -                 | East squat pier horizontal def. (mid-height) |
| 117     | P 55 x    | [mm]                   | -                 | Roof truss (West rafter) displ. (w.r.t. the South gable wall) |
| 118     | P 40 x    | [mm]                   | -                 | Shake table displ. (w.r.t. the laboratory floor) |
2. Data

The specimen was densely instrumented with sensors that recorded the dynamic response at various locations. All recorded acceleration and displacement time histories and the videos of the tests are available upon request at the following URL: www.eucentre.it/nam-project.

2.1. Data acquisition: accelerometers and potentiometers

The instrumentation consisted of 38 accelerometers, 21 wire potentiometers, and 37 linear potentiometers, installed on the building to capture its structural response during the dynamic tests. The majority of the sensors was mounted in the shaking direction, while some were also oriented transversely or vertically. The instrumentation plan is illustrated in Figs. 9 and 10 of Ref. [1].

Data obtained from accelerometers and potentiometers are provided in twelve .txt files, named after the corresponding shake-table test, as defined in Table 1. Each file is a two-dimensional matrix of 144 columns, where each column contains the time history of a measured or derived physical quantity. The lines of the .txt files correspond to individual instants of the time series.

Table 2 lists the content of the first 124 columns of each matrix, corresponding to quantities directly measured by the sensors: number of column; sensor identification number; recorded degree of freedom; measurement units; brief description of measured quantity and location of the instrument; mass attributed to accelerometer location (Table 2). All acceleration and displacement recordings were filtered using a quadratic low-pass filter set to a frequency of 50 Hz. The data are organized in each file as follows:

i. Column 1 contains the time at a sampling rate 256 Hz;
ii. Columns 2–58 contain the acceleration time histories recorded by the 38 accelerometers, corresponding to 52 degrees of freedom. Note that five in-between channels, shown in grey in the table, were offline. Acceleration recordings are provided in units of g;
iii. Columns 59–124 contain the displacement time histories measured by wire and linear potentiometers. Note that eight in-between channels, shown in grey in the table, were offline. Displacement measurements are expressed in units of mm.

Table 3 describes the quantities provided in columns 125–144 of each .txt file, which were not directly measured by the acquisition system, but were derived after post-processing. Quantities such as inertia forces (e.g., base shear and gables-roof inertia forces), interstorey drift ratios, and shear deformations were computed after the assumptions mentioned in sections 5.3 and 5.5 of Ref. [1]. Accelerations and forces are provided in units of g and kN, respectively; displacements are given in mm, and shear deformations are expressed in percentage.
2.2. Data acquisition: 3D optical motion-capture system

A three-dimensional optical motion-capture system was also employed [3,4]. Passive spherical markers coated with a retro-reflective material were placed on the West, North, and South façades. Fixed cameras recorded the x, y and z coordinates of the monitored points as they varied during the earthquake simulations, allowing to derive relative and total displacements of the building and local deformations of its components. For easier reference and data manipulation, each marker is identified by a code number, as shown on Fig. 2. The coordinate reference system is illustrated on Fig. 3.

Recordings of the optical acquisition system are provided in a single .mat file, named “EUC_BUILD_2_3DOpticalAcqData.mat”, organized as a three-dimensional matrix with indices i, j, k. This matrix contains twelve two-dimensional matrices corresponding to the twelve tests. Each two-dimensional matrix has on its columns the time series of the three coordinates of the markers (in units of mm) based on the reference system shown on Fig. 3. The time series are synchronized with those obtained from potentiometers and accelerometers at sampling rate of 256 Hz. For reference to any element of the matrix, the indices follow these rules, as illustrated on Fig. 4:

i. The row index, i, varies from 1 to the length of the time series (5121 or 7681 components);
Fig. 2. Location of the markers mounted on the specimen: (a) North view; (b) South view; (c) West view.

Fig. 3. Reference coordinate system of the 3D optical motion-capture system: (a) location of targets on the specimen; (b) ground-floor plan; (c) North view; (d) West view. (units of cm).
ii. The column index, \( j \), varies from 1 to 583: column No. 1 contains the time at sampling rate of 256 Hz, while columns 2 to 583 contain the coordinate time history of each target along the \( x \), \( y \) and \( z \) directions of the reference system;

iii. The third index, \( k \), varies from 1 to 12 and indicates the number of test, according to Table 4.

A complementary .mat file, called “EUC_BUILD_2_3DOpticalAcqData_Labels.mat”, provides a row vector for labelling the columns of each two-dimensional data matrix and relating them to the marker coordinates. Every marker ID number appears three times, each time followed by suffix “.1”, “.2” or “.3” to identify the \( x \), \( y \) and \( z \) coordinates of the marker, respectively.

During the tests SC2 - 200%, 250% and 300%, the trajectories of some markers were not successfully tracked by the motion-detection system (“missing markers”): the corresponding time histories were substituted with “not-a-number” elements in the data matrix. Moreover, the recorded

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**Table 4**

Optical acquisition data: content of 3D matrix “EUC_BUILD_2_3DOpticalAcqData”.

| Test No. - 3D matrix index \( k \) | Test name     | Two-dimensional matrix sizes (rows No. \( \times \) columns No.) |
|----------------------------------|--------------|---------------------------------------------------------------|
| 1                                | SC1–25%      | 5121 \( \times \) 583                                        |
| 2                                | SC1–50%      | 5121 \( \times \) 583                                        |
| 3                                | SC1–100%     | 5121 \( \times \) 583                                        |
| 4                                | SC1–150%     | 5121 \( \times \) 583                                        |
| 5                                | SC2–50%      | 7681 \( \times \) 583                                        |
| 6                                | SC2–100%     | 7681 \( \times \) 583                                        |
| 7                                | SC2–150%     | 7681 \( \times \) 583                                        |
| 8                                | SC2–200%     | 7681 \( \times \) 583                                        |
| 9                                | SC2–250%     | 7681 \( \times \) 583                                        |
| 10                               | SC2–300%     | 7681 \( \times \) 583                                        |
| 11                               | SC2–400%     | 7681 \( \times \) 583                                        |
| 12                               | SC2–200%-A \( ^a \) | 7681 \( \times \) 583                                      |

\( ^a \) A: test simulating an aftershock.
| Matrix index $k$ | Test name    | “Missing marker” ID No. | “Ghost marker” ID No. |
|-----------------|--------------|------------------------|----------------------|
| 1               | SC1 - 25%    | 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 10101, 30205         |
| 2               | SC1 - 50%    | 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 10101, 30205         |
| 3               | SC1 - 100%   | 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 10101, 30205         |
| 4               | SC1 - 150%   | 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 30101                |
| 5               | SC2 - 50%    | 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 30101                |
| 6               | SC2 - 100%   | 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 30101                |
| 7               | SC2 - 150%   | 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 10202, 11101, 30101  |
| 8               | SC2 - 200%   | 10203, 30101, 30203, 30204, 30205, 30302, 30303, 30403, 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 11001, 11101, 30202, 30803 |
| 9               | SC2 - 250%   | 10203, 30101, 30203, 30204, 30205, 30302, 30303, 30403, 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 10101, 30202, 30803  |
| 10              | SC2 - 300%   | 10203, 30101, 30203, 30204, 30205, 30302, 30303, 30403, 31201, 31202, 31301, 31302, 31401, 31402, 31501, 31502 | 10101, 10204, 10303, 10202, 11101 |
| 11              | SC2 - 400%   | -                       | 10101, 10202, 30205  |
| 12              | SC2 - 200%-A$^1$ | -                        | 10101, 10202, 30205   |

$^1$ A: test simulating an aftershock

* The “missing” markers listed in grey were mounted on the specimen only during tests SC2-400% and SC2-200%-A
trajectories of a few markers (i.e., those at the N-E and S-E corners of the building) were interrupted when they displaced out of the viewing cone of the cameras (“ghost markers”): these gaps were filled with zeros in the post-processing of the data. Table 5 lists in black the ID numbers of the “missing markers” and the “ghost markers” for each dynamic test.

Eight additional markers were mounted on the South façade only for the last two tests, SC2 - 400% and SC2–200%-A (aftershock): they are shown in boxes on Fig. 2 and listed in grey in Table 5.

The following MATLAB routine gives three examples of the use of the two provided .mat files:

```
load EUC_BUILD_2_3DOpticalAcqData_Labels.mat;
load EUC_BUILD_2_3DOpticalAcqData.mat;

% EXAMPLE 1: Give the time history of the x coordinate [in mm] of marker 20101 (test No. 11, SC2 - 400%)
coord_20101_x = EUC_BUILD_2_3DOpticalAcqData(:,find(EUC_BUILD_2_3DOpticalAcqData_Labels == 20101.1),11);

% EXAMPLE 2: Give the time history of the y coordinate [in mm] of marker 20702 (test No. 5, SC2 - 50%)
coord_20702_y = EUC_BUILD_2_3DOpticalAcqData(:,find(EUC_BUILD_2_3DOpticalAcqData_Labels == 20702.2),5);

% EXAMPLE 3: Give the time histories of the displacement of all markers [in mm]
Displ = EUC_BUILD_2_3DOpticalAcqData;
InitPos = EUC_BUILD_2_3DOpticalAcqData(1,:,:);
for k = 1:size(EUC_BUILD_2_3DOpticalAcqData,3)
    for i = 1:size(EUC_BUILD_2_3DOpticalAcqData,1)
        for j = 2:size(EUC_BUILD_2_3DOpticalAcqData,2)
            Displ(i,j,k) = EUC_BUILD_2_3DOpticalAcqData(i,j,k) - InitPos (1,j,k);
        end
    end
end
```

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Transparency document. Supporting information

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2018.03.047.
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