SERA PROJECT
TRANSNATIONAL ACCESS TO JRC ELSA REACTION WALL

The SERA project

SERA is the ""Seismology and Earthquake Engineering Research Infrastructure Alliance for Europe"", responding to the priorities identified in the call INFRAIA-01-2016-2017 Research Infrastructure for Earthquake Hazard.

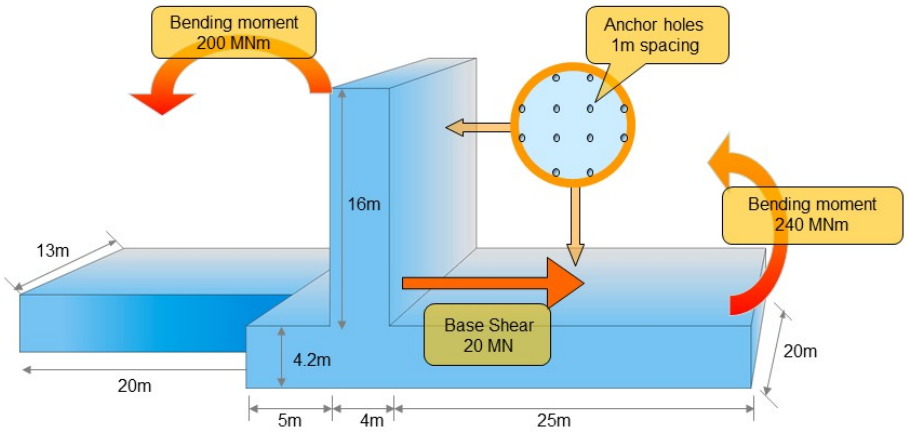
The overall objective of SERA is to give a significant contribution to improve the access to data, services and research infrastructures, and deliver solutions based on innovative R&D in seismology and earthquake engineering, aiming at reducing the exposure of our society to the risk posed by natural and anthropogenic earthquakes.

Among other activities, SERA will offer transnational access to the largest collection of high-class experimental facilities in earthquake engineering.

Transnational Access to ELSA Reaction Wall

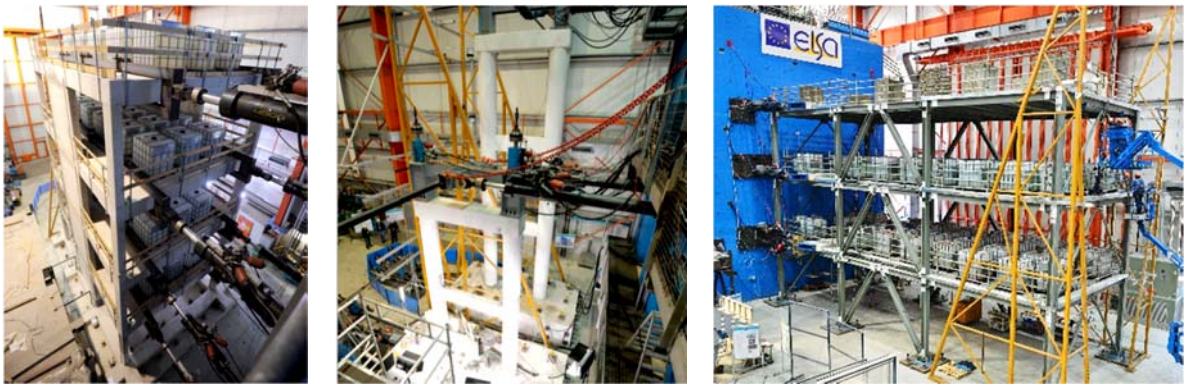
Within SERA, the Joint Research Centre will offer to two user groups a total of **10 access days to the ELSA Reaction Wall**. An access day is a day on which a test is performed and during which the installation will be to the full service of the user group.

ELSA operates a **16 m-tall, 21 m-long reaction wall, with two reaction platforms of total surface 760 m²** that allow testing real-scale specimens on both sides of the wall. The laboratory is equipped with **28 actuators with capacities between 0.2 and 3 MN and strokes between ±0.125 and 1.0 m**. The actuators control system is designed in-house to perform tests with the continuous pseudo-dynamic method with substructuring, that permits testing elements of large structures, bidirectional testing of multi-storey buildings, and testing of strain-rate dependent devices.



Dimensions and capacity of the ELSA Reaction Wall

The experimental tests that are conducted at the ELSA Reaction Wall are of such scale and complexity, that no other infrastructure in Europe can match. The uniqueness of the services that ELSA offers, including first-class technical support and state-of-the-art instrumentation and experimental techniques for executing the tests, makes it a first candidate for European users to apply for access.



(a) (b) (c)

Examples of recent projects at the ELSA Reaction Wall: full-scale four-storey frame building retrofitted with RC infilling (a), bridge piers (5.8 m and 10.3 m in height) tested using the continuous pseudo-dynamic method with non-linear substructuring (b) and full-scale four-storey steel frame building with removable bolted links (c)

The services that will be given to the users include:

- technical assistance in the definition of the specimen and the testing programme;
- instrumentation of the specimens with state-of-the-art sensors;
- use of the pseudo-dynamic method with substructuring techniques for the simulation of the seismic action on large-scale structures;
- a computer network with access to structural analysis software, in particular CAST3M for non-linear modelling;
- assistance for the development of advanced numerical models;
- a data repository system accessible via Internet;
- use of photogrammetric techniques for tracing deformations of structures;
- opportunity to collaborate with the numerous international partners of ELSA;
- logistic support for organising meetings and workshops and access to the JRC library.

Further to the current areas of research, new ones that will be opened to users comprise: performance of elements of buildings using glass as structural material; performance of structures against multiple natural and man-made hazards; multi-functional materials/elements for energy-efficient new and existing (nearly zero-energy) buildings; pre-normative research in support of the next generation of the Eurocodes; applications of automated construction; innovative sensors for smart infrastructures and cities.

Further information

ELSA Reaction wall	https://ec.europa.eu/jrc/en/research-facility/elsa
360° Virtual tour of ELSA	http://www.pearleye.it/virtualtour/5/jrc/elsa/en/index.html
SERA Transnational Access activities	https://sera-ta.eucentre.it JRC-SERA-TA@ec.europa.eu

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