Horizon Europe project ERIES

ONLINE INFO DAY ‘Discovering the Joint Research Centre of the European Commission’, 22 January 2025

Georgios Tsionis, Deputy Head of Unit JRC.E.3 Built Environment

ERIES project (2022-2026)

ERIES ENGINEERING RESEARCH INFRASTRUCTURES FOR EUROPEAN SYNERGIES

Coordinator

IUSS Scuola Universitaria Superiore Pavia

Partners

EUCENTRE FOR YOUR SAFETY

ARISTOTLE UNIVERSITY OF THESSALONIKI

ISTITUTO ITALPON

LNEC LABORATÓRIO NACIONAL DE ENGENHARIA CIVIL

cea

ИЗИИС IZIIS

UNIVERSITÀ DI GENOVA

Western WindEEE Research Institute

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

CSTB

European Commission

University of BRISTOL

Provides transnational access (TA) to advanced research infrastructures in the fields of structural, seismic, wind and geotechnical engineering

TA permits external user groups to advance frontier knowledge and conduct curiosity-driven research toward reducing losses, managing risk, and overall a greener and more sustainable engineering future in Europe

European Commission

Research goals and areas

ENGINEERING RESEARCH INFRASTRUCTURES FOR EUROPEAN SYNERGIES

Research goals

Loss-driven design and mitigation approaches

Risk quantification and prioritisation

Green and sustainable development

Research areas

Built environment

Critical infrastructures

Industrial facilities

Advanced technologies

European Commission

Transnational access installations

- IUSS Pavia and Eucentre Foundation (IT)
  9DLAB Shaking Table, MOBILAB Shaking Table
- Laboratório Nacional de Engenharia Civil (PT)
  ST3D Shaking Table
- Centre de recherche CEA Paris-Saclay (FR)
  AZALEE Shaking Table
- Institute of Earthquake Engineering and Engineering Seismology (MK)
  DYNLAB Shaking Table
- University of Bristol (UK)
  SoFSI Shaking Table, SoFSI Soil Pit, EQUALS Shaking Table

Coordinator

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Transnational access installations

- Aristotle University of Thessaloniki (GR)
  EUROSEISTEST Network and Laboratory
  EUROPROTEAS Model Structure

- University of Patras (GR)
  STRULAB Reaction Wall

- Joint Research Centre (IT)
  ELSA Reaction Wall

Coordinator

Partners

Transnational access installations

ERIES ENGINEERING RESEARCH INFRASTRUCTURES FOR EUROPEAN SYNERGIES

- University of Genova (IT)
  GS-WinDyn Wind Tunnel
  GS-WinDyn Doppler Lidar System
- Western University (CA)
  3D Wind Chamber (WindEEE Dome)
  Environmental Loading Lab (3LP)
- Eindhoven University of Technology (NL)
  TU/e Atmospheric Boundary Layer Wind Tunnel
- CSTB Nantes (FR)
  Jules Verne Climatic Wind Tunnel - Dynamic Unit SC1
  Jules Verne Climatic Wind Tunnel - Thermal Unit SC2

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Transnational access projects

64 transnational access projects selected in four calls

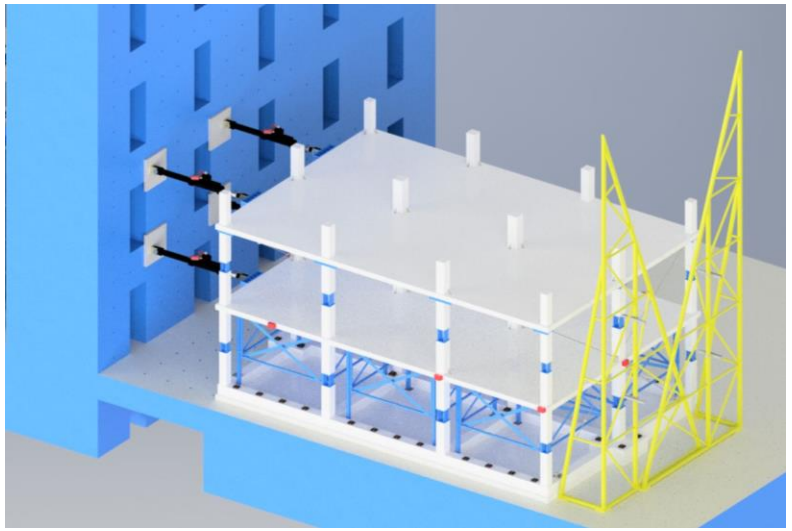
Transnational access projects at JRC

ERIES ENGINEERING RESEARCH INFRASTRUCTURES FOR EUROPEAN SYNERGIES

Structural behaviour of recycled aggregate RC flat slabs with drop panels under seismic and cyclic actions

Improve knowledge of the seismic response of RC flat slab structures with recycled concrete aggregates

Propose design guidelines based on deformation capacity (Eurocode 8, Annex N of Eurocode 2, Model Code)



CERIS Investigação e Inovação em Engenharia Civil para a Sustentabilidade

POLITECNICO MILANO 1863 POLITÉCNICA

STU SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA

Imperial College London

HOLCIM C5Lab Sustainable Construction Materials Association

7 institutions

5 countries

22 users

European Commission

Transnational access projects at JRC

Response evaluation of masonry vaults under pseudo-dynamic loadings

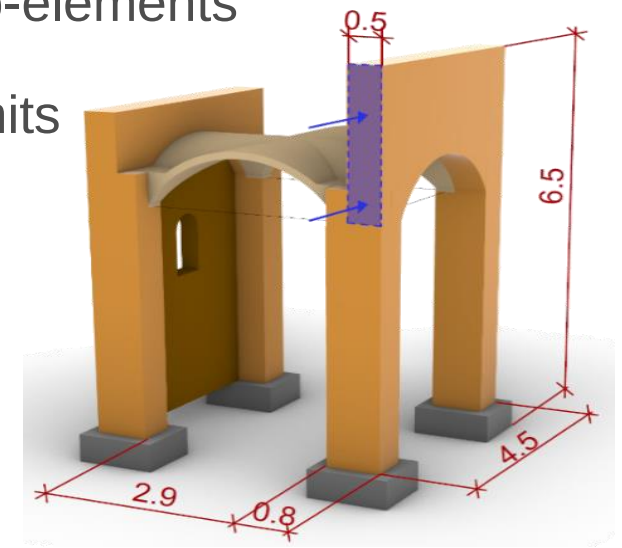
Assess in-plane shear response of unreinforced masonry cross vaults and fibre-reinforced cap for strengthening

Assess numerical modelling strategies and macro-elements

Define limit states, strength and horizontal drift limits

Improve proposed strengthening technique

Update guidelines and standards



3 institutions

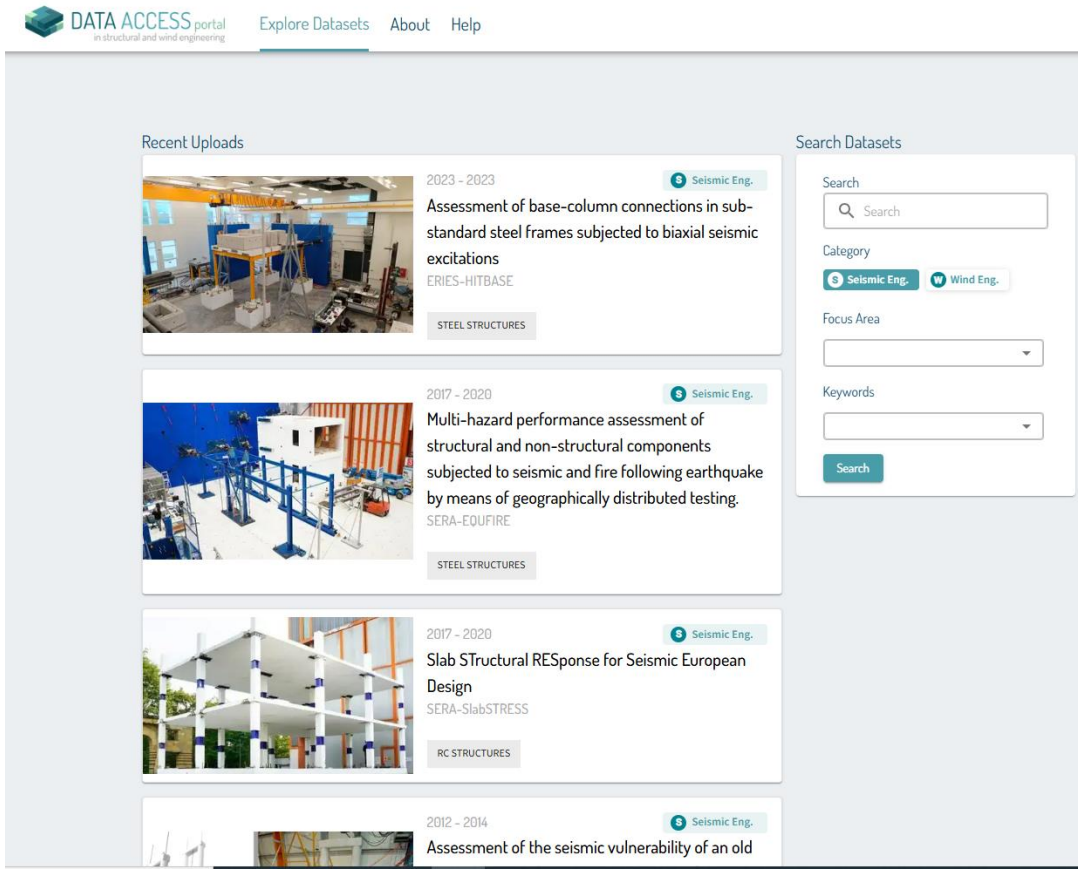
2 countries

11 users

Data access portal

Developed by University of Patras

TA project	Views	Downloads
SERA EQUFIRE	300	74
SERA SlabSTRESS	256	11
SERIES SERFIN	184	6
SERIES RETRO	168	9
SERIES DUAREM	160	6



ERIES

ENGINEERING
RESEARCH
INFRASTRUCTURES
FOR EUROPEAN
SYNERGIES

European Commission

Open access to JRC Research Infrastructures

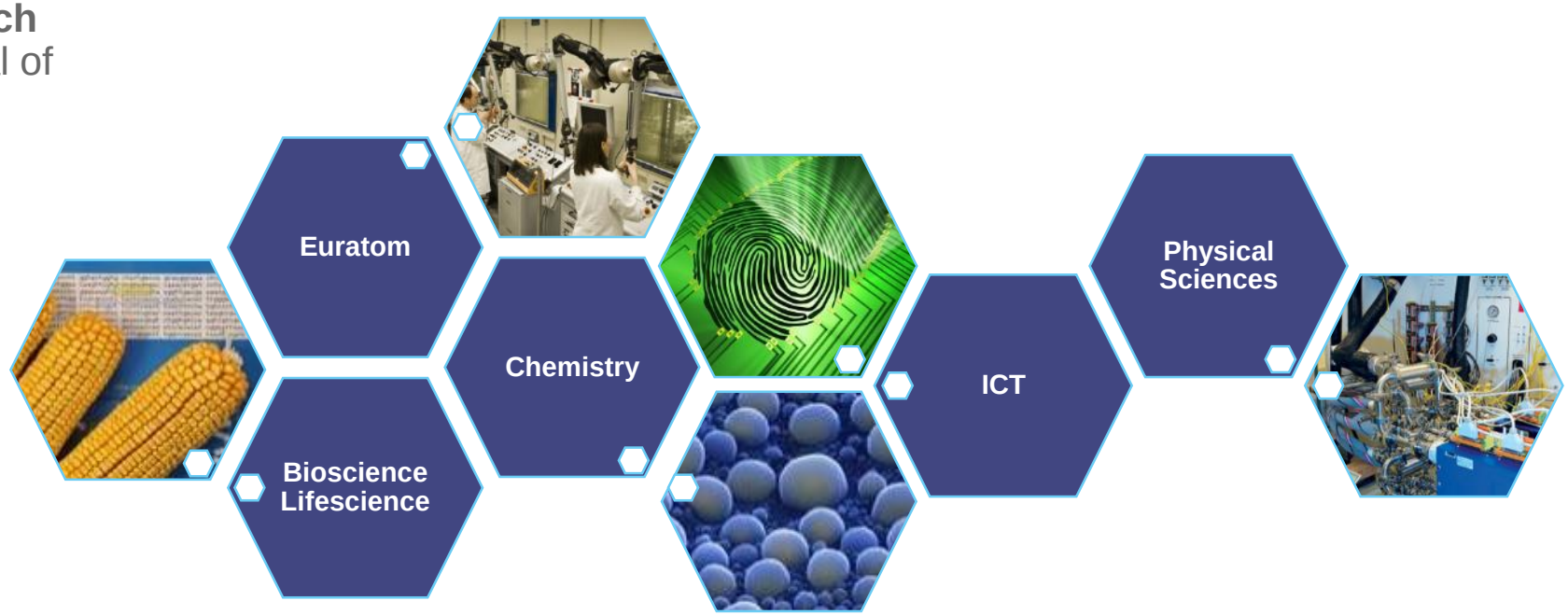
Fabio Taucer

Deputy HoU Scientific Development Programmes

Landscape of JRC Research Infrastructures

JRC hosts **39 physical research infrastructures** with a potential of opening to external users

(out of a total of **53 facilities**)



European Commission

Rationale

Opening up access to JRC Research Infrastructures is part of the **JRC Strategy 2030**

Benefits to users and the ERA

- **Fair** and **transparent** method for allocating access
- Make JRC RIs available to external users in view of the **limited resources** in Europe
- Provide **training and capacity building**
- Bridge the **gap between science and Industry**
- **Dissemination** of knowledge, foster collaboration in Europe

Benefits to the JRC

- Expand JRC **networking** capabilities
- Enter into **new key areas** of research
- Maintain JRC **scientific excellence**
- Raise the **value and visibility** of JRC RIs

Framework for Access

Based on the **Charter of Access to RIs of DG RTD**

Principles and guidelines when defining Access policies for RIs

Access Modes

- **Relevance-driven**
  - **Peer-review selection** following a call for proposals: Scientific implementation, collaboration and access to new users, strategic relevance to the JRC, strategic importance for Europe
  - Mainly targeted to academia and research institutions, as well as to **SMEs**
  - Users charged the **additional costs**; nuclear RIs free of charge – Users pay for consumables
  - Open dissemination after an 18 month embargo period
- **Market-driven**
  - Selection by the JRC
  - Mainly targeted to industry
  - Users charged the full costs
  - Data not disseminated via open schemes

Eligibility

Non-nuclear

- **Member States**
- **Associated countries**: Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, North Macedonia, Norway, Serbia, Tunisia, Turkey, UK, Ukraine

Nuclear

- **Member States**
- **Associated countries**: Ukraine

Open to

✓ EU Member States

✓ Countries associated to Horizon Europe

Facilitating Access – Conditions

Relevance-driven mode – Non-nuclear

Widening Participation and Spreading Excellence (WPSE) countries

- **Cover travel and subsistence** of Users from User Institutions located in the **WPSE** list of countries.
- **Waive the access costs** in the relevance-driven mode to proposals where the Lead User Institution, and at least 2/3 of the Users Institutions are from the **WPSE** list of countries.

Relevance-driven mode – Nuclear

- **Cover travel and accommodation** of Users as part of the Pilot Action in the field of nuclear safety

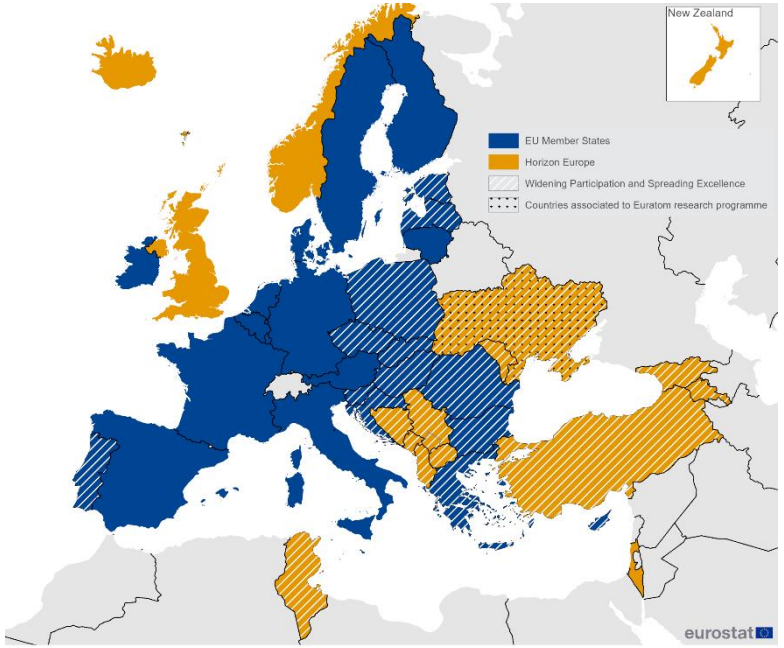
Facilitating Access – list of countries

Relevance-driven mode – Non-nuclear / WPSE Countries

- **Member States:** Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.
- **Associated countries:** eligible countries based on an indicator and published in the work programme.
- **Legal entities from outermost regions as defined in Article 349 TFUE**: Guadeloupe, French Guiana, Martinique, Réunion, Saint-Barthélemy, Saint-Martin, the Azores, Madeira and the Canary Islands.

Relevance-driven mode – Nuclear

- **Member States**
- **Associated countries**: Ukraine



Widening Participation and Spreading Excellence (WPSE) countries

European Commission

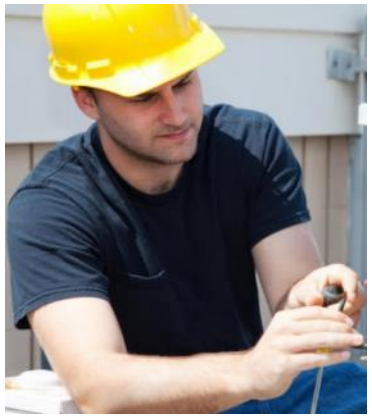
Research Infrastructure Access Agreement

Rights and obligations of JRC and the user(s) concerning:

- Health and safety
- Security rules
- Data protection
- Confidentiality
- Liability and financial aspects
- User access assessment

In-kind contributions:

- Human resources, i.e. for running all or parts of the experimental work or assisting the experimental campaign
- Provision of consumables and equipment



Dedicated portal at EU Science Hub

- **All supporting documents**: Framework and related annexes (template for proposals, agreement documents, IP rules, etc.)
- **Eligibility Criteria**
- **Call for proposals per Research Infrastructure**
  - ✓ Estimated total number of Access Units allocated to the call
  - ✓ Average number of Access Units per project
  - ✓ Estimated additional costs per Access Unit
  - ✓ Priority topics of the Research Infrastructure
- **Selected Projects**
- **User Access Report** / link to databases (after embargo period)

https://ec.europa.eu/jrc/en/research-facility/open-access

European Commission

Research Infrastructures opening access

European Laboratory for Structural Assessment (ELSA) (Ispra, IT)

Reaction Wall

HopLab

Consumer Products Safety (Ispra, IT)

Nanobiotechnology Laboratory

Energy Storage Facilities (Petten, NL)

BESTEST – Battery Energy Storage Testing for Safe Electric Transport

FCTEST – Fuel Cells and Electrolyser Testing facilities

GASTEF – Gas Tank Testing Facility

European research infrastructure for nuclear reaction, radioactivity, radiation and technology studies in science and applications (EUFRAT) (Geel, BE)

GELINA – Neutron time-of-flight facility for high-resolution neutron measurements

HADES – Underground laboratory for ultra-low level gamma-ray spectrometry

MONNET – Tandem accelerator based fast neutron source

RADMET – Radionuclide Metrology laboratories

Actinide User Laboratory (ActUsLab) (Karlsruhe, DE)

PAMEC – Properties of Actinide Materials under Extreme Conditions

FMR – Fuels and Materials Research

HC-KA – Hot Cell Laboratory

Laboratory of the Environmental & Mechanical Materials Assessment (EMMA) (Petten, NL)

LILLA – Liquid Lead Laboratory

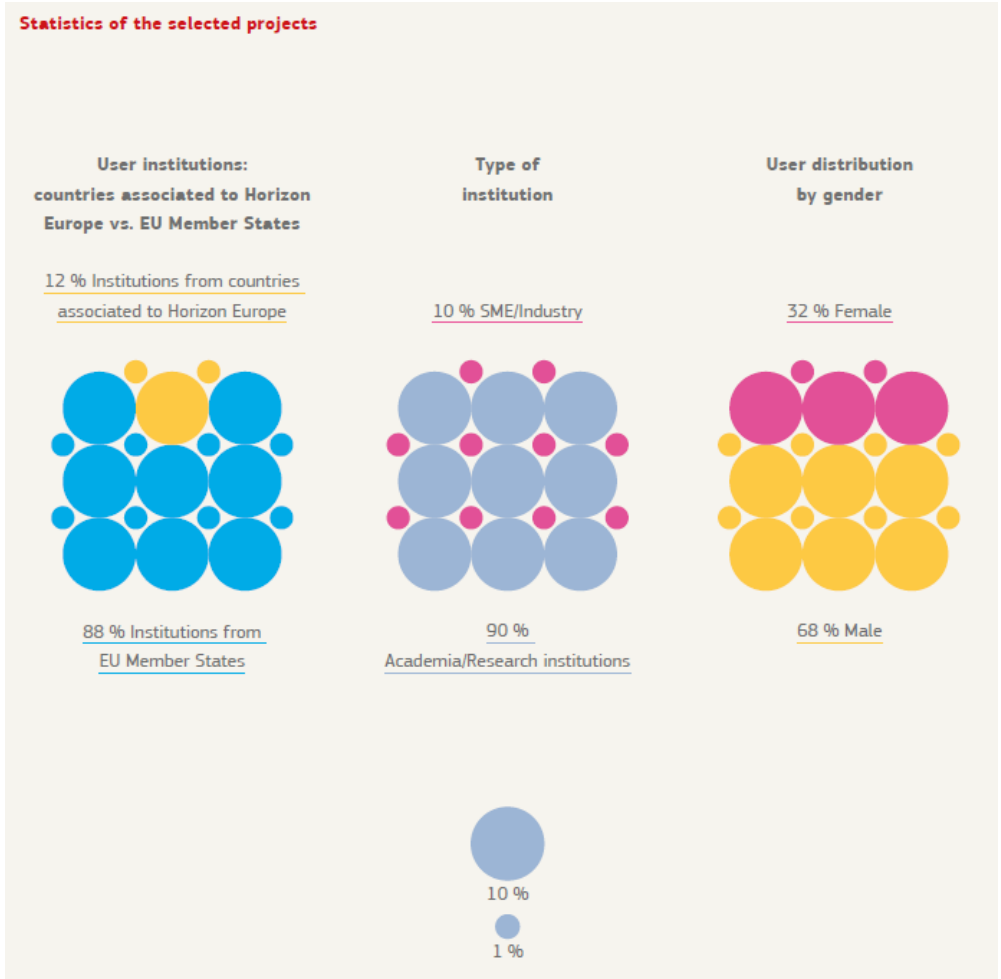
SMPA – Structural Materials Performance Assessment Laboratories

AMALIA – assessment of nuclear power plants core internals

MCL – Micro-Characterisation Laboratory

Since 2017, 17 RIs have opened access to external users at the JRC sites of Ispra, Karlsruhe, Petten and Geel:

Statistics



279 eligible proposals submitted to the JRC

213 selected proposals

164 lead users signed agreements with the JRC

132 user institutions from the proposals having signed agreements with the JRC

562 users from the proposals having signed agreements with the JRC

33 countries from the proposals having signed agreements with the JRC

104 user access projects that have been completed

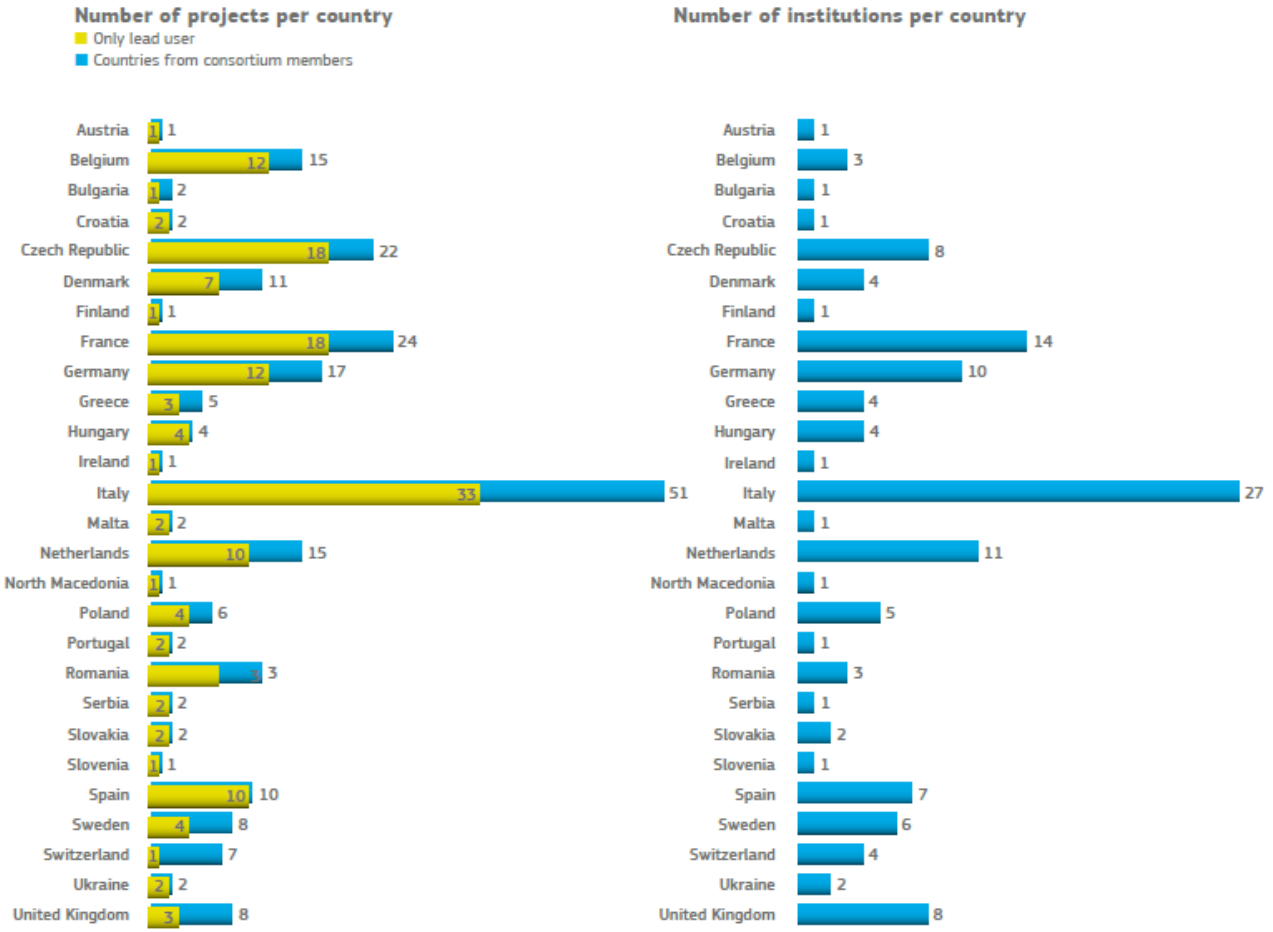
32 % of female applicants

10 % of business participation

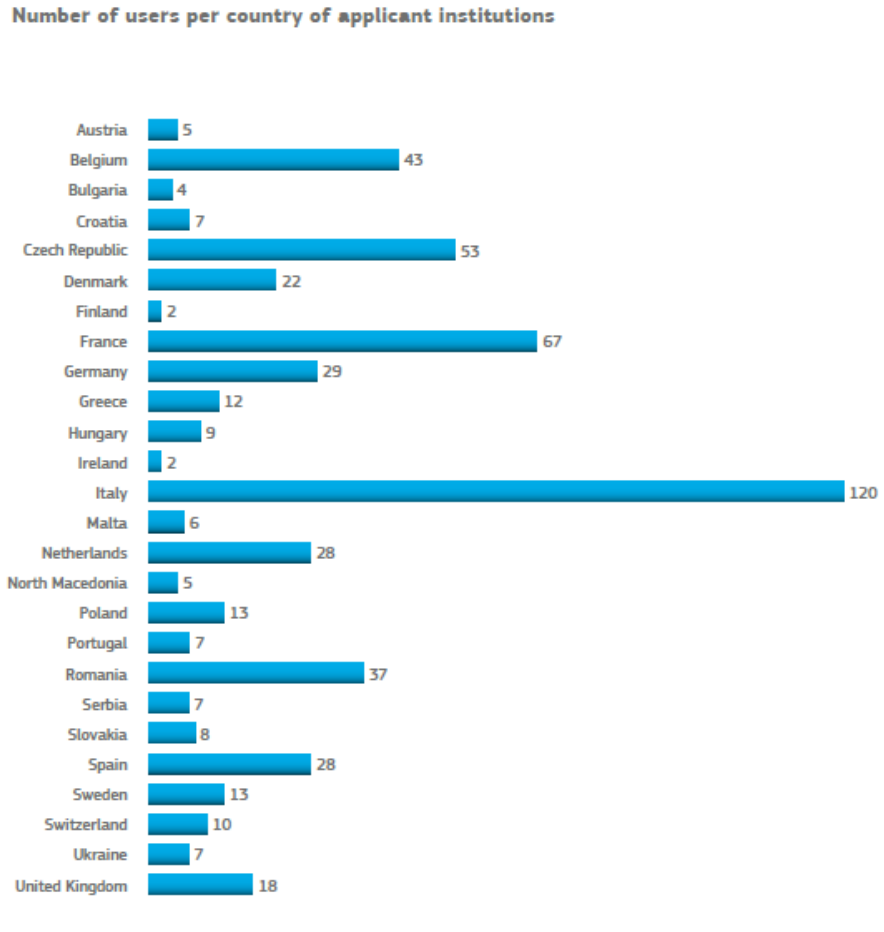
12 % countries associated with Horizon Europe

European Commission

Statistics


Number of projects per country
Only lead user
Countries from consortium members
Austria 1 1
Belgium 12 15
Bulgaria 1 2
Croatia 2 2
Czech Republic 18 22
Denmark 7 11
Finland 1 1
France 18 24
Germany 12 17
Greece 3 5
Hungary 4 4
Ireland 1 1
Italy 33 51
Malta 2 2
Netherlands 10 15
North Macedonia 1 1
Poland 4 6
Portugal 2 2
Romania 3
Serbia 2 2
Slovakia 2 2
Slovenia 1 1
Spain 10 10
Sweden 4 8
Switzerland 1 7
Ukraine 2 2
United Kingdom 3 8

Number of institutions per country
Austria 1
Belgium 3
Bulgaria 1
Croatia 1
Czech Republic 8
Denmark 4
Finland 1
France 14
Germany 10
Greece 4
Hungary 4
Ireland 1
Italy 27
Malta 1
Netherlands 11
North Macedonia 1
Poland 5
Portugal 1
Romania 3
Serbia 1
Slovakia 2
Slovenia 1
Spain 7
Sweden 6
Switzerland 4
Ukraine 2
United Kingdom 8


Number of users per country of applicant institutions
Austria 5
Belgium 43
Bulgaria 4
Croatia 7
Czech Republic 53
Denmark 22
Finland 2
France 67
Germany 29
Greece 12
Hungary 9
Ireland 2
Italy 120
Malta 6
Netherlands 28
North Macedonia 5
Poland 13
Portugal 7
Romania 37
Serbia 7
Slovakia 8
Spain 28
Sweden 13
Switzerland 10
Ukraine 7
United Kingdom 18

Training and capacity building

- Addressed to groups of Users from **universities, research or public institutions, or from a Small-Medium-Enterprises (SME)**
- Preferably with **existing** or under **construction/upgrading** RIs **similar** or **complementary** to those of JRC
- Stays at the JRC will comprise a **full week**, with the participation of groups from several institutions and countries.

Thanks

Any questions?

You can find me fabio.taucer@ec.europa.eu

Open access calls: https://ec.europa.eu/jrc/en/research-facility/open-access

European Commission

European Laboratory for Structural Assessment

ONLINE INFO DAY ‘Discovering the Joint Research Centre of the European Commission’, 22 January 2025

Georgios Tsionis, Deputy Head of Unit JRC.E.3 Built Environment

European Laboratory for Structural Assessment

HopLab

Reaction Wall

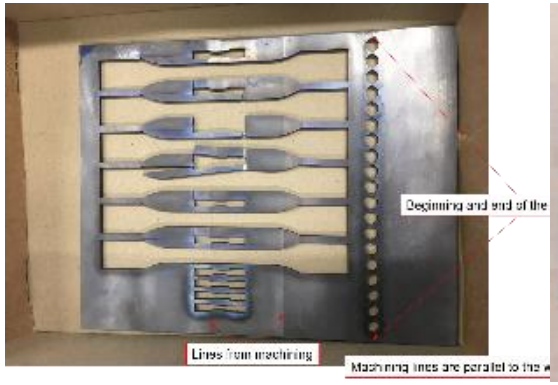
- ✓ **Policies and standards for construction** and built environment
- ✓ **Protection of public spaces** and buildings against terrorist attacks
- ✓ **Open access** to JRC research infrastructures, **Horizon Europe** transnational access, **institutional activities**

HopLab: overview

- ✓ Study of materials and structural components to **very fast dynamic loads**, e.g. blast and impact
- ✓ **World's largest Hopkinson Bar** (200 m): ductile materials
- ✓ Medium-size Hopkinson Bar: brittle materials
- ✓ Smaller Hopkinson Bars: soft cellular materials, high-strength brittle materials, metals

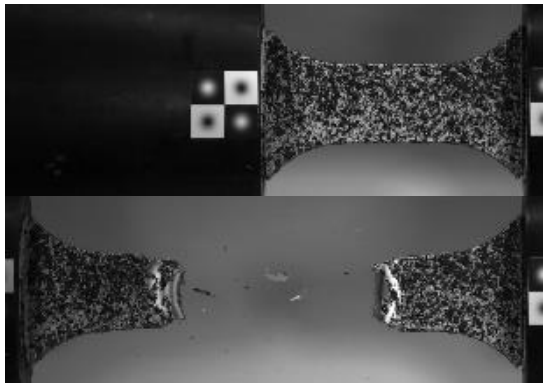
HopLab: recent projects

Electron beam welded specimens
ENSTA Bretagne, I-Cube Research – Bmax, CERN



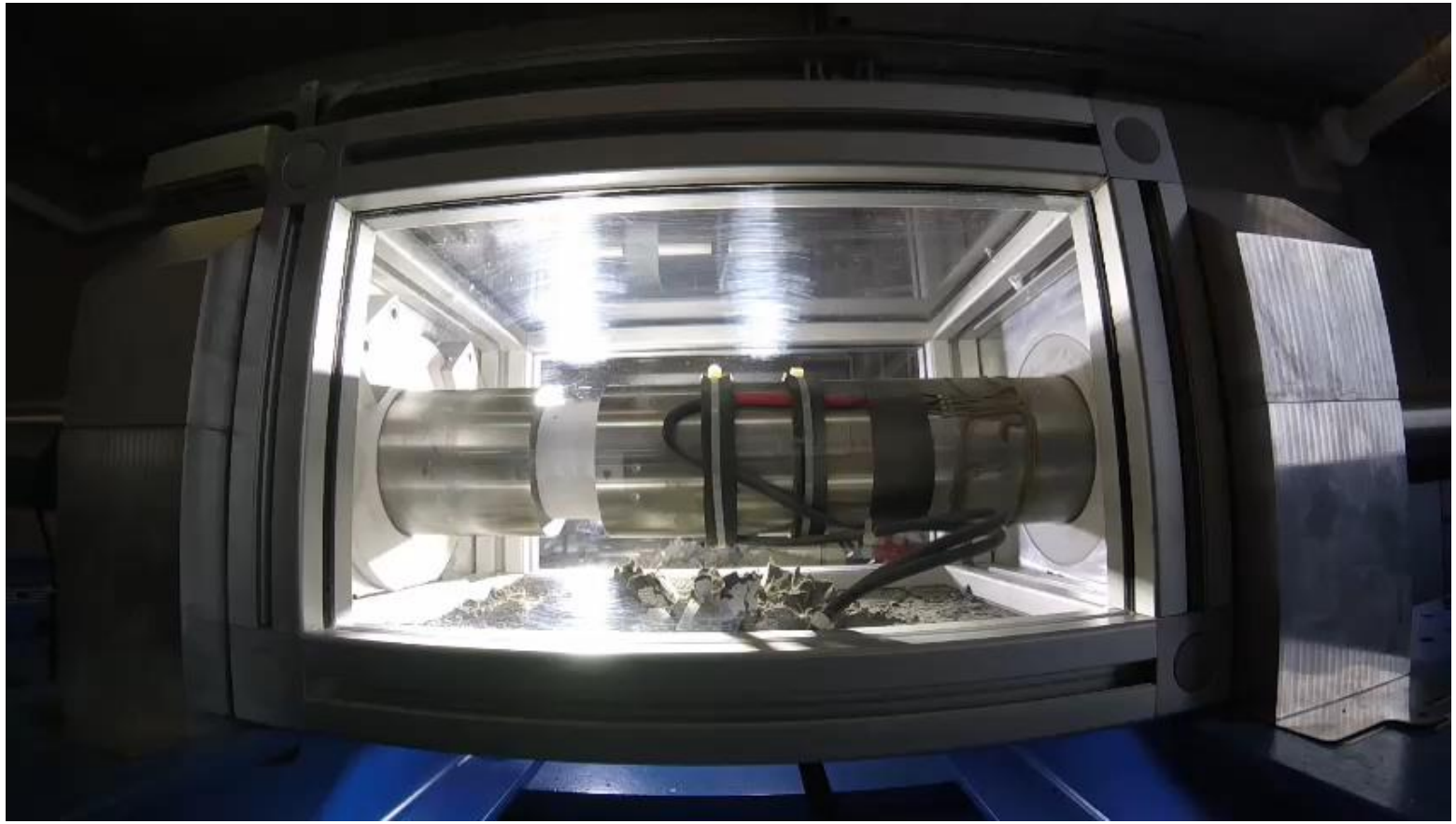
Automated tape composites
University of Oxford, University of Edinburgh, Rolls Royce, Imperial College

High strength & very high strength steel
SUPSI, Bochum University, ETHZ

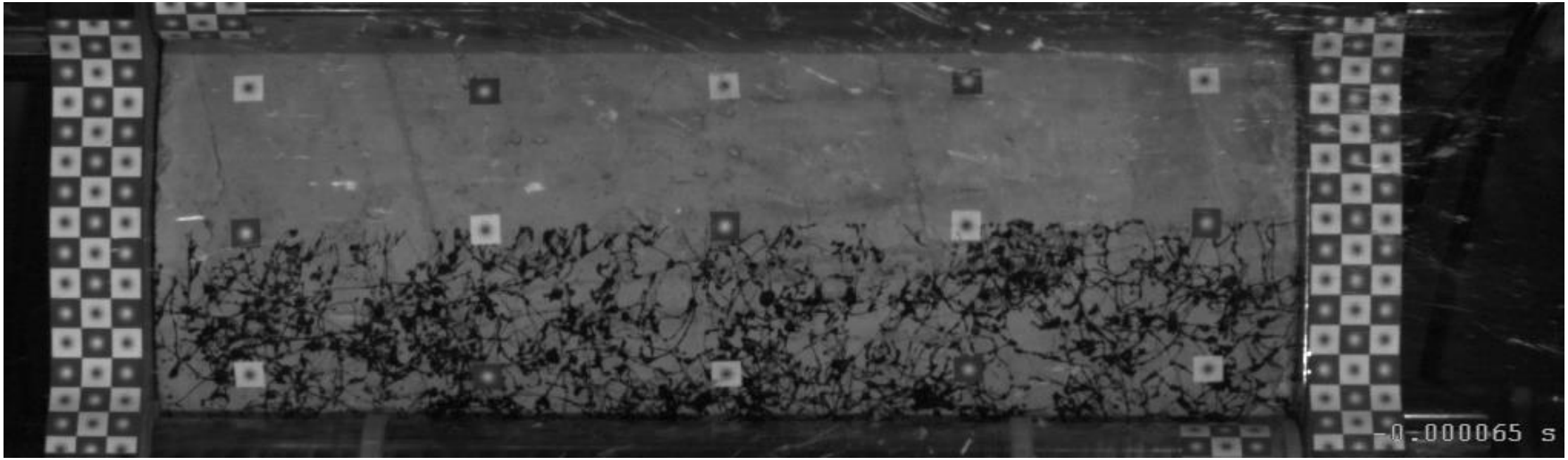


Adobe masonry
Delft University of Technology, TNO Defence Safety and Security, Netherlands Defence Academy

HopLab: very fast dynamic tests

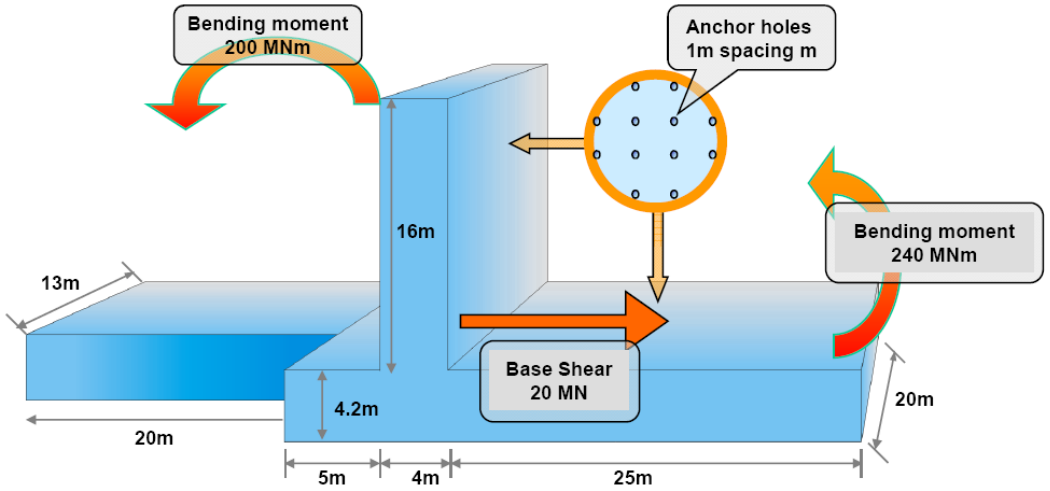


HopLab: very fast dynamic tests



Reaction Wall: overview

- ✓ **Safety assessment** of structures against natural and man-made hazards
- ✓ **Unique dimensions**
- ✓ Mono- or bi-directional experimental tests on **full-scale specimens**
- ✓ **Hybrid testing** for larger structures, e.g. bridges

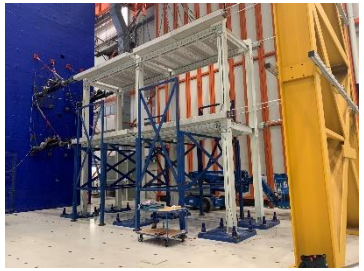


Reaction Wall: recent and ongoing projects

Europe’s largest facility for the safety assessment of structures

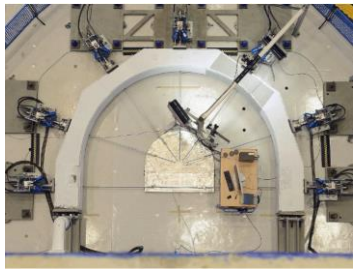
Flat-slab RC building

Retrofit with cross-laminated timber

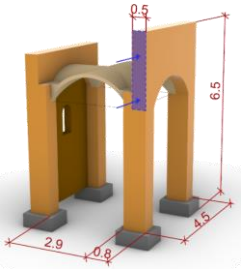


Fibre-polymer composite frame

Steel building: fire following earthquake



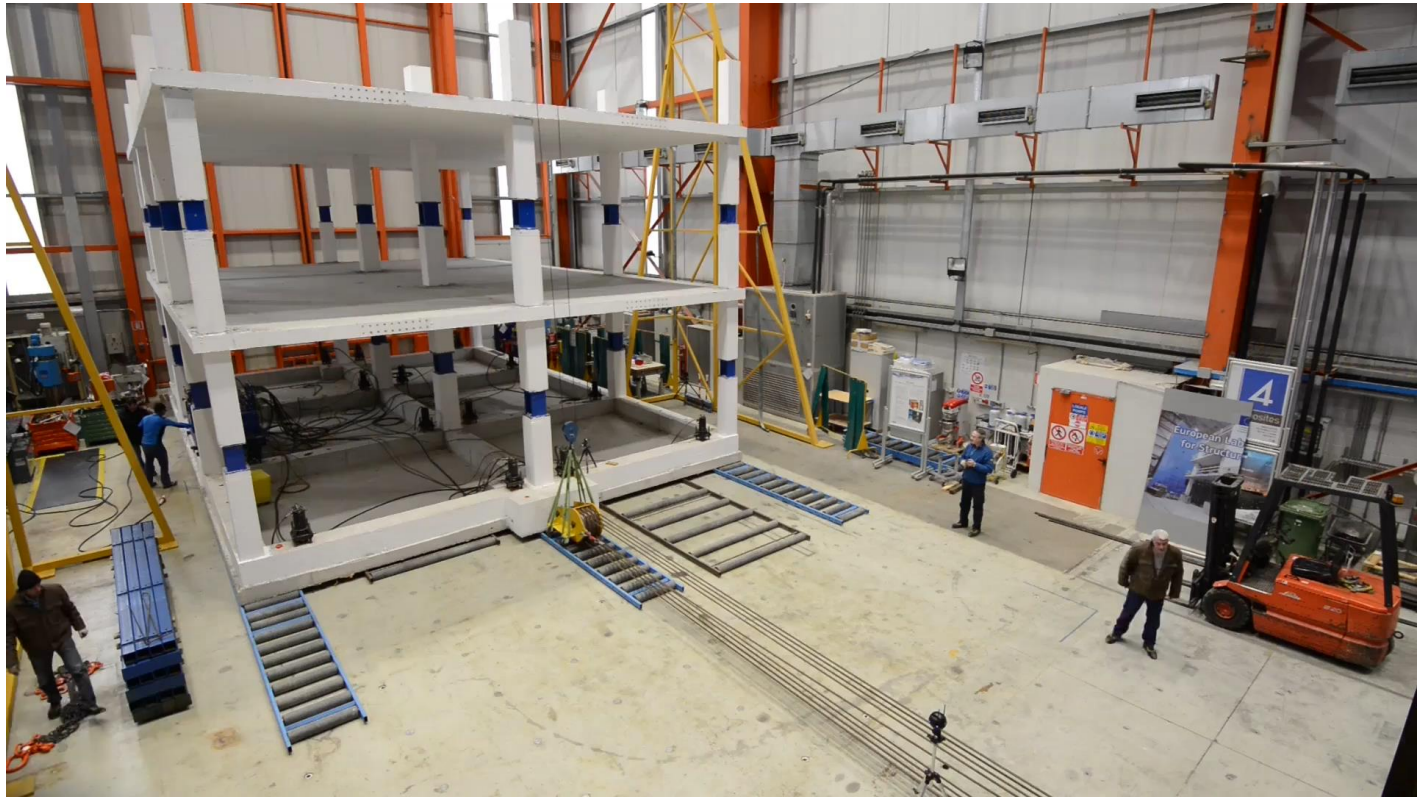
Extruded tunnel lining regeneration



Cultural heritage

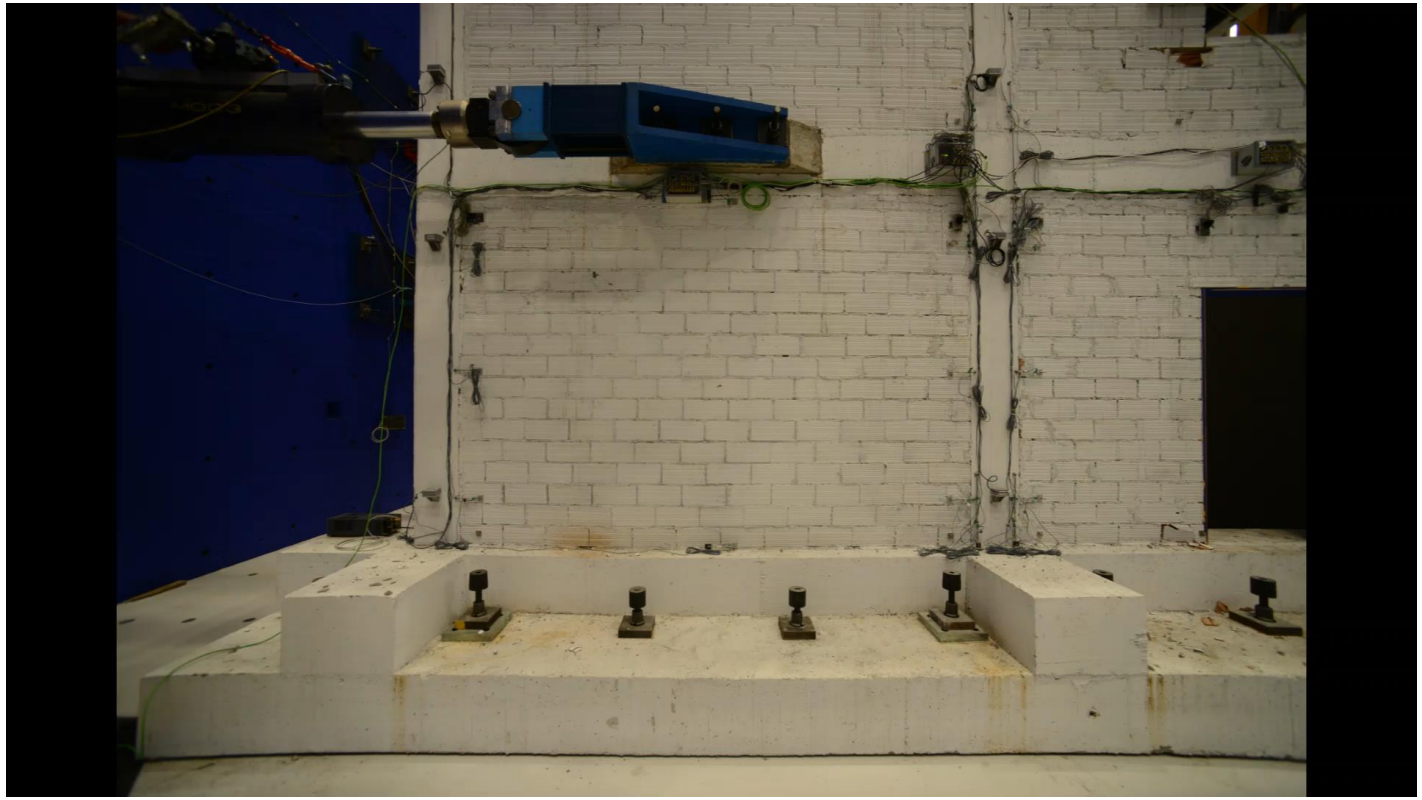
European Commission

Reaction Wall: large-scale tests



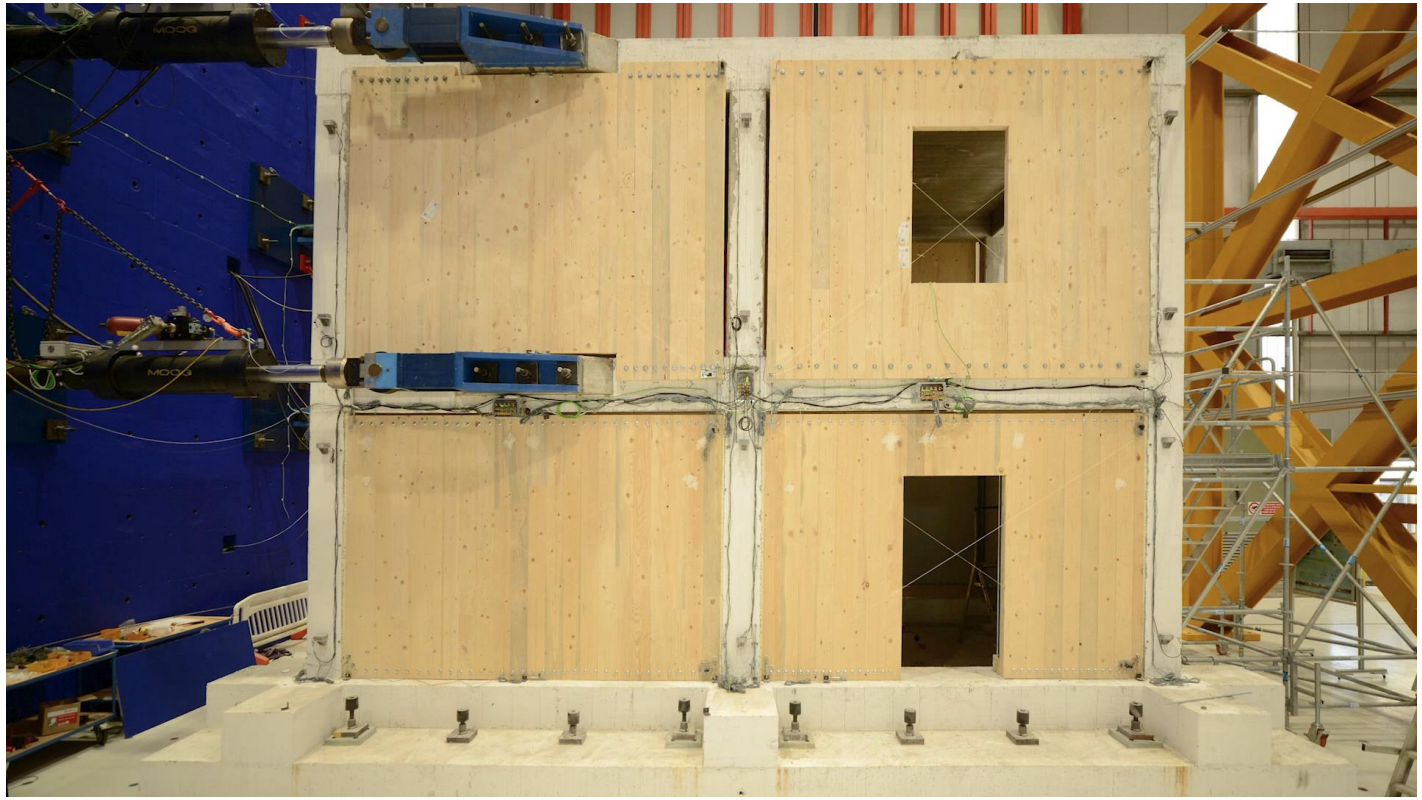
Flat slab RC building: cyclic test after repair of slab-column connections at first storey, 6.0 % drift ratio

Reaction Wall: large-scale tests



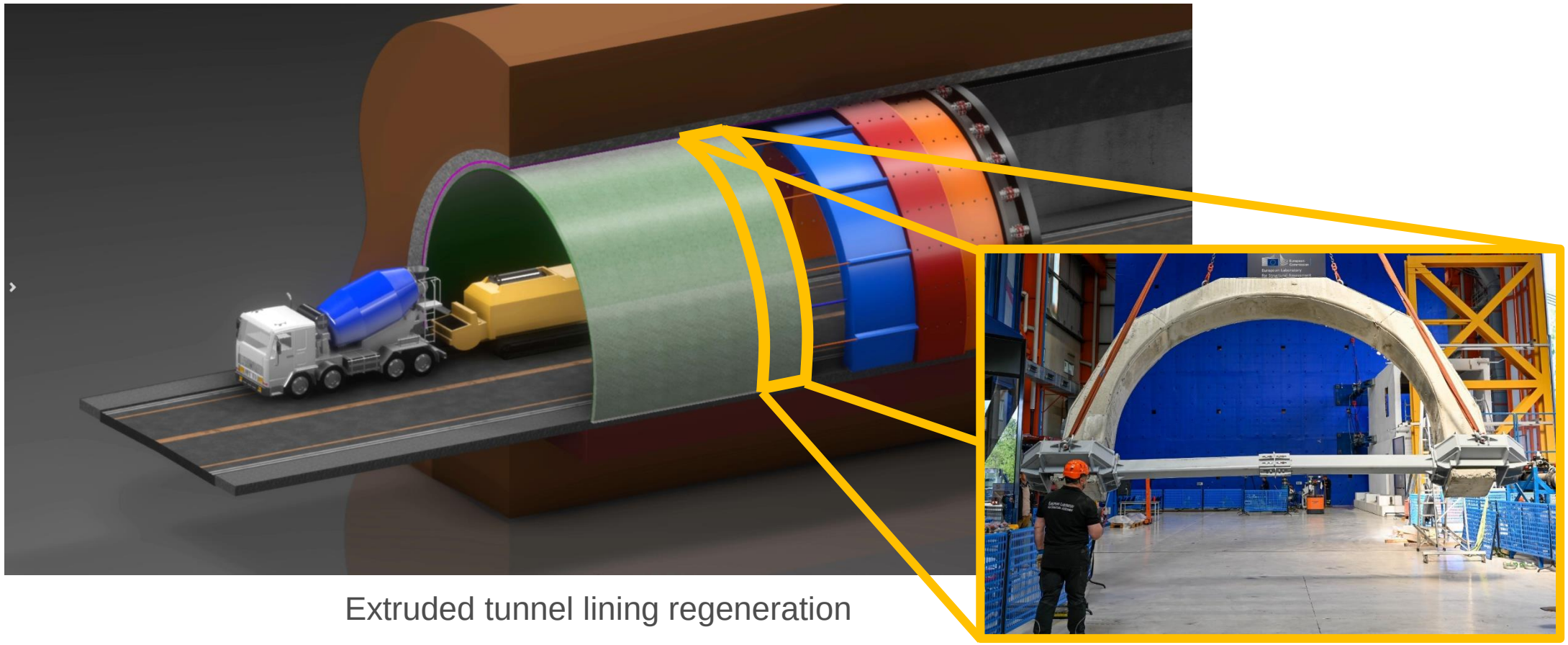
As-built RC building with brick walls, design earthquake

Reaction Wall: large-scale tests



RC building with cross-laminated timber panels, 150 % design earthquake

Reaction Wall: large-scale tests



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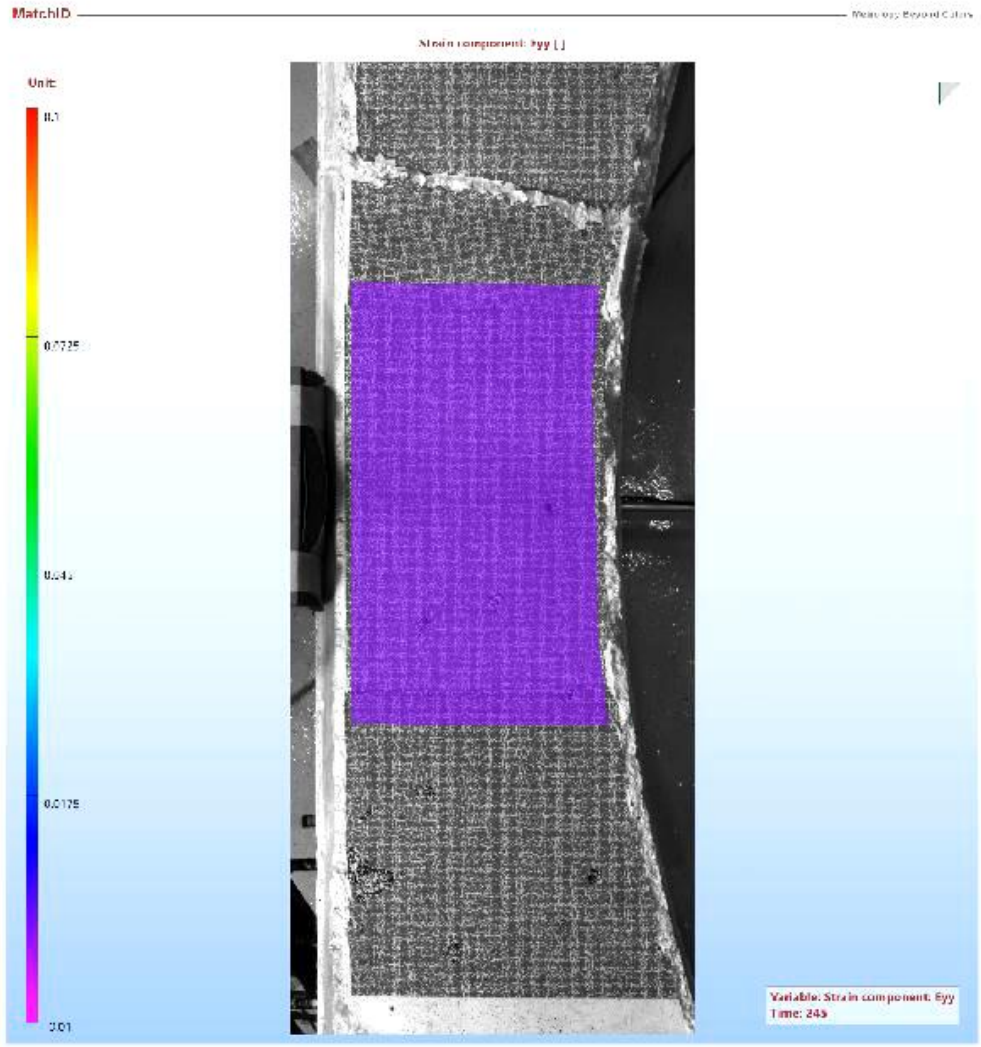
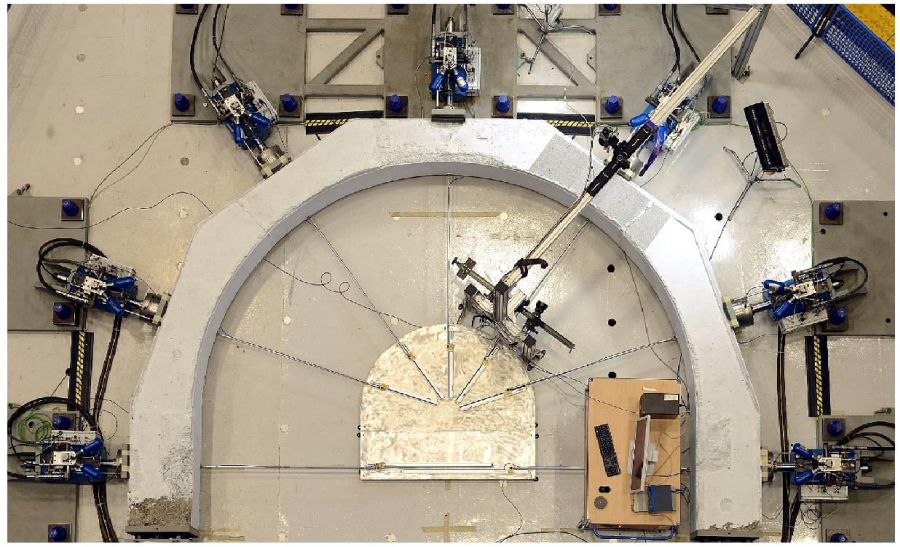
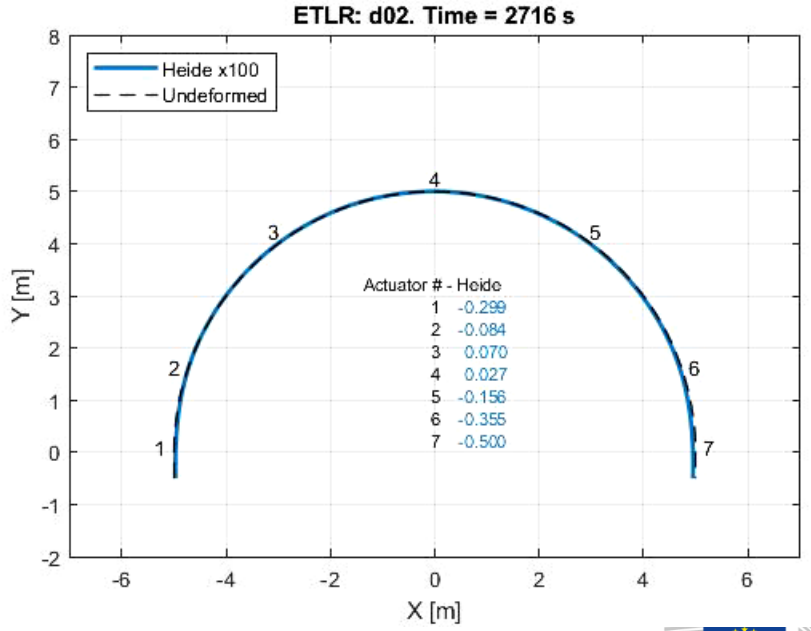
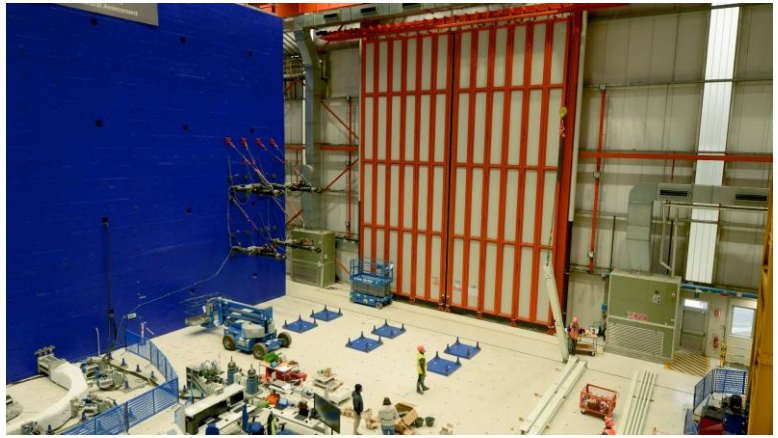
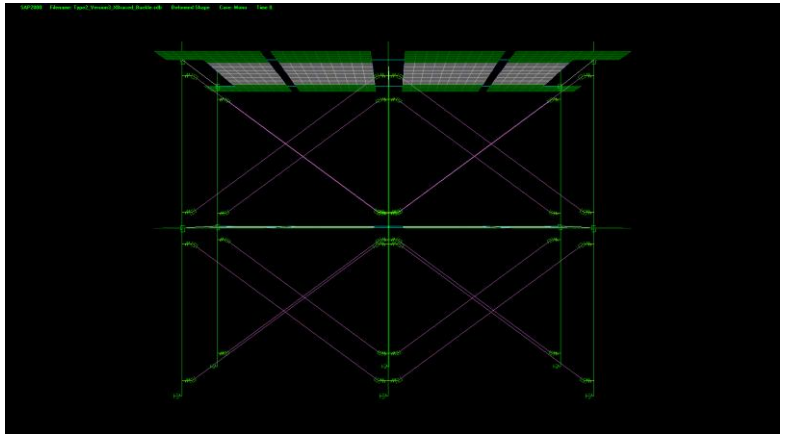


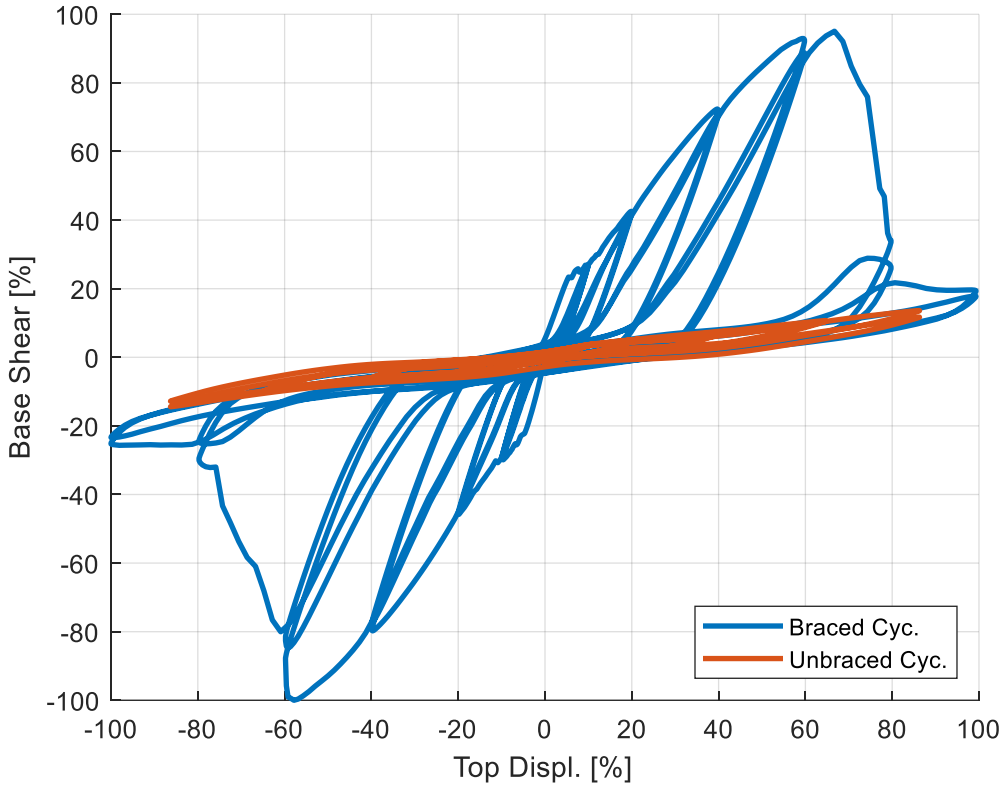




Reaction Wall: large-scale tests







Outreach and dissemination

- User Access Report at JRC Science Hub after embargo period
- Peer-reviewed scientific papers and PhD theses
- Contribution to European standards
- Technology transfer for industrial applications
- Graduate and post-graduate university courses
- International partnership, e.g. blind prediction competition
- Basis for future research

Stay in touch

HopLab

Reaction Wall

JRC-OPEN-ELSA@ec.europa.eu