



RNTHAACHEN UNIVERSITY







Foundation the CWE on February 5, 2016 with

- Institute of Steel construction, RWTH Aachen
- Chair of Structural Engineering and Structural Dynamics, RWTH Aachen
- Institute of Structural Concrete, RWTH Aachen









RNTHAACHEN UNIVERSITY

Team

- 6 board members
- 2 managing directors
- 9 employees from the participating institutes
- 1 associated partner









Ambition

- Basic research
- Interdisciplinary research activities
- Use of synergy effects from the working groups
- Meetings/ workshops/ conferences
- Teaching events











Associated Partner

- Assist. Prof. Dr. Marko Marinković
- University of Belgrade, Faculty of Civil Engineering
- Department of Engineering Mechanics and Theory of Structures





Hp







Visiting Scientist

- DAAD Scholarship Holder (CWE/LBB)
- DAAD Scholarship Holder (CWE/STB) → now research associate
- Humboldt Scholarship Holder (2 years, Timisoara)



Hp





Earthquake Engineering



Structural Dynamics



Special loads



Probabilistic





Main research topics

Wind Engineering



- Wind tunnel investigations
- Computational fluid dynamics (CFD)
- Aerodynamic and aeroelastic vibrations
- Structural optimization with respect to wind loading
- Standard work
- Wind loads for construction projects and expert opinions





Main research topics

Earthquake Engineering





- Seismic calculation and design approaches
- Reinforcement, isolation and damping measures Vulnerability studies and failure scenarios
- Earthquake investigations of special structures
- New materials in earthquake engineering





Further research topics

Structural Dynamics



- System Indication
- Numerical methods and structural simulations
- System monitoring
- Vibration reduction
- Structural vibrations
- Human-induced vibrations Intelligent damping systems
- Traffic- and machine-induced vibrations

Special loads

- Explosive loads
- Impact loads
- Impact loads from projectiles
- Aircraft crashes
- Short-term dynamic computational models
- Development of analytical calculation approaches



Probabilistic



- Risk assessments
- Probabilistic safety analyses
- Fragility curves and consequence analyses
- Response surface methods
- Polymorphic uncertainty models
- Numerical design methods
- Reliability analyses
- Safeguards



Research projects

Self-erecting onshore wind turbine with hub height greater than 120m - hybrid tower with lifting device for self-erection



Improved wind and ice load approaches for steel facade elements



Development of an innovative approach to decoupling infill and non-load-bearing masonry partitions from the supporting structure.









Research projects

Database Analysis for Evaluation of Seismic Performance Assessment Tools





Influence of eccentric load application at the exterior wallslab node on the shear capacity of monolithic exterior brick masonry walls



Seismic performance of multicomponent systems in special risk industrial facilities (SPIF)





Research projects

New approaches for the realistic calculation and design of masonry structures under horizontal loads



Applied research projects:

- 13 projects
- 2.6 Mio €

Upcoming projects (EU):

- FREDDAM+ "Valorisation of knowledge for FREE from DAMage steel connections"
- HYCAD: "Innovative steel-concrete HYbrid Coupled walls for buildings in seismic areas: Advancements and Design guidelines"



Industrial projects















- International Conference on Seismic Design of Industrial Facilities, SEDIF (March 2021, registration is open)
- Workshop on building in earthquake zones (2017, 2019, 2021)
- Conference event with the professional association for mobile radio construction technology (April 2018)



Seismic Design of Industrial Facilities -SeDIF 2021

March 1st - 2nd, 2021 Online Conference

register now!







Infrastructure

Wind tunnel



- Test-Section: 2.50 x 1.70 m
- Length: 9.00 m
- Turntable diameter: 2.50 m
- Power: 198 kW
- Maimal wind speed: 35 m/s
- Boundary layer simulation: Counihan





Infrastructure

Uniaxial shaking table

- Manufacturer: MTS
- Payload: 10 t
- Area: 3x3m
- Frequency range: 0-50 Hz
- Max. stroke: 500 mm







Infrastructure

Strong Wall





Further test equipment

- ZwickRoell testing machines Z100 Allround-Line
- Several test cylinder (up to 2.5 MN)
- Highly sensitive velocity and acceleration transducers
- Unbalance exciters for dynamic excitation

The CWE has access to 4 test halls with employee and experience in different specialities (wind, dynamic, steel, conrete, etc.)











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