

# CONSTRUCTION TECHNOLOGY CLUSTER



## Research Profile

The research activities of the Construction Technology Cluster are oriented towards practical applications in the construction industry.

Numerical modelling and experimental techniques are employed to develop new design methodologies and innovative construction technologies. The objectives of the Construction Technology Cluster are to implement research outcomes into codes of practice and disseminate them to the construction industry.

## Research Topics

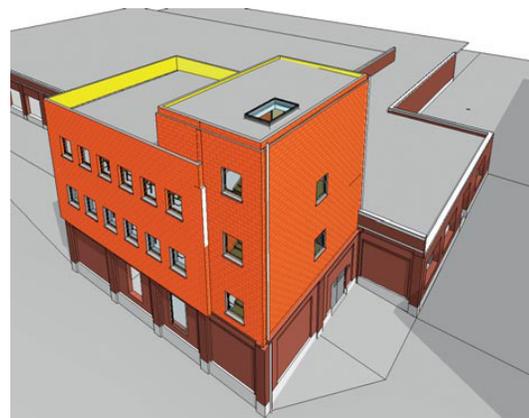
The technology cluster brings together researchers from 3 KU Leuven campuses to develop research in the following domains:

### Structural Mechanics

- Human-induced vibrations
- Steel, concrete and composite structures

### Sustainable Buildings

- Energy and indoor climate
- Timber structures and use of organic fibres
- Life cycle analysis and CO<sub>2</sub> assessment of communities
- Building Information Modelling and improved process management for all life cycle stages of buildings ("big BIM")
- Commissioning, building management and monitoring



### Building Materials and Building Technology

- Ready-mixed and self-compacting concrete
- Concrete mix design and durability of concrete structures
- Sustainable materials management: recycling & re-use, selective demolition, demountable construction

### Coastal Engineering

- Environmental structural loading
- Beach and dune dynamics

### Soil Mechanics

- Dynamic soil characteristics and liquefaction analysis

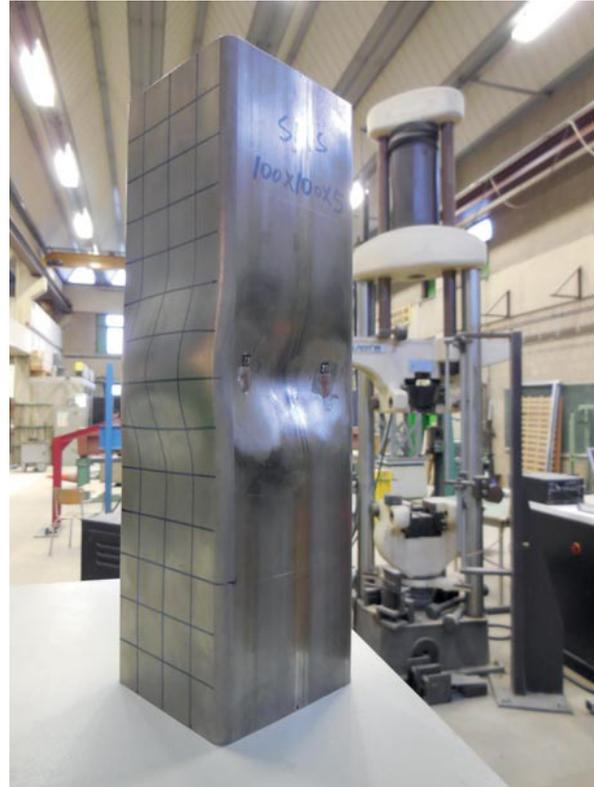
### Geomatics

- Laser-scanning, photogrammetry and 3D geometry of buildings
- Geo data management (GIS) and GIS – BIM link

## Unique infrastructure

The infrastructure of the TC Construction is dispersed over three KU Leuven campuses.

- Near Zero Energy test building with two lecture rooms, certified compliant Passive House standard. The building has an integrated, open system for Building Management and extensive, long-term monitoring. It is part of the network of IEA EBC Annex 58 full-scale testing facilities for “Reliable Building Energy Performance Characterisation Based on Full Scale Dynamic Measurements”.
- Large equipment for structural tests including a test floor (19.5m - 7.2m) for full-scale structures, a hydraulic press with a 1000 kN capacity for testing columns up to 3 m long and frames for four-point bending tests up to 750 kN per load.
- Laser scanner, total stations and photogrammetry equipment for on-site high-resolution measurement of buildings and infrastructure.
- Laboratory infrastructure for concrete technology
- State-of-the-art welding facilities through collaboration with the Welding Engineering Centre
- Cyclic triaxial testing cell
- Dynamic testing of structures: data-acquisition system, dynamic excitation (impulse hammer for modal analysis, shaker vibration system), acceleration sensors for structural vibrations (wired and wireless tri-axial sensors), 3D wireless human motion tracking system, force plate capturing 3D ground reaction forces.



## Collaboration

- An extensive network of SMEs, research centres and universities in Belgium and Europe has been developed through collaborative research projects, EU projects and consultancy.
- Researchers from the technology cluster act as Belgian representatives in various groups, including the Evolution Groups of Eurocodes, Technical Committees of ECCS European Cost Actions and the IEA EBC programme.
- The Construction Technology Cluster strives for complementarities with all sections of the Department of Civil Engineering. Our research often bridges the gap between more fundamental research and the practical needs of SMEs.

## Contact

Department of Civil Engineering  
Technology Cluster Construction  
Kasteelpark Arenberg 40 box 2448  
3001 LEUVEN, Belgium  
tc-construction@kuleuven.be  
www.fet.kuleuven.be/tc-construction



*The research groups of the Construction Technology Cluster are active on the technology campuses in Ostend, Ghent and De Nayer Sint-Katelijne-Waver. In 2017-2018 the research of Campus Ostend will move to a new campus in Bruges.*