

# Concrete column-slab system: simulation of column failure



## EpsilonSensor: Case Study

The performance of a full-scale concrete structure was investigated during the simulation of column failure. EpsilonSensors were installed inside the slab by tightening to the existing reinforcement. The main aim was to observe the crack morphology. Additional optical fibres were glued to the steel reinforcement to analyse its behaviour during the yielding process. The Nerve-Sensor system measured strains successfully during the entire research until the planned structural failure.



## Benefits of application

- Detection of **all the cracks** inside the concrete up to **structural failure**
- Thousands of measurement points with **very fast and easy installation**
- Analysis of **steel yielding under extremely large strain levels**
- Max. registered strains **ten times higher** than in conventional foil strain gauges

## Example results



EpsilonSensors allowed for detailed structural performance analysis during key research steps: (1) mechanical loading in the elastic range, (2) changing the static scheme by removing the column (see the first cracks in the figure) and (3) additional loading through hydraulic jacket up to the total structural failure. Max. registered strains were ten times higher than in the case of conventional foil strain gauges, which were destroyed very early on.

 **4 000** measurement points

 **20 m** of sensing path

 **2 x** EpsilonSensor

 **short-term** (load tests)



project  
partner:

