



## Ground-breaking ceremony for world's first adaptive high-rise building

Demonstrator high-rise building is being constructed within the special research field 1244 at the University of Stuttgart

On 26<sup>th</sup> October 2018 the ground-breaking ceremony for the world's first adaptive high-rise building took place on Vaihingen Campus, University of Stuttgart, in the presence of the Minister of Science of Baden-Württemberg, Theresia Bauer. Scientists will investigate here under real conditions on a scale of 1:1 how buildings can actively adapt to changing environmental influences. The prototype, funded by the German Research Foundation, will be created within the special research field 1244 "Adaptive shells and structures for the built environment of tomorrow" at the University of Stuttgart, under the leadership of Professor Werner Sobek (Institute of Lightweight Structures and Conceptual Design, ILEK) and Professor Oliver Sawodny (Institute for System Dynamics, ISYS).

### University Communication

Head of University Communication and Press Spokesperson

Dr. Hans-Herwig Geyer

Contact  
T 0711 685-82555

Contact person  
Andrea Mayer-Grenu

Contact  
T 0711 685-82176  
F 0711 685-82291  
hkom@uni-stuttgart.de



Visualization of the demonstrator high-rise building. Image: University of Stuttgart/ILEK



The demonstrator high-rise building comprises 12 storeys with a height of approx. 36.50 m and a floor area of 5.00 m by 5.00 m. An adjacent stairwell contains all vertical supply lines as well as the vertical interconnection.

The unique aspect of this high-rise building is the integration of active elements in the supporting structure. An interaction of sensors and actuators thus enables, for example, the balancing out of vibrations occurring in the tower due to wind forces by means of an intelligent regulation concept. Sensors thereby record deformations occurring whilst hydraulic actuators in the supporting structure ensure that the vibrations are dampened in a targeted way through counter forces – in this way it is possible to build far lighter as this would be the case without adaptivity. Special research field spokesperson Professor Werner Sobek is hopeful: “This project will help us to not only maintain our leading position in the world but to extend it further.”

The façade of the building initially comprises a one-layer, recycled membrane that is gradually replaced by shell elements that could actively influence the light and energy input into the building, the exchange of air as well as the heat transition. The aim is the realization of maximum user comfort with minimum energy expenditure. In the demonstrator, besides own developments from the special research field, technical solutions produced by external partners will also be investigated and tested. The total building costs of the project amount to 2 million Euros, of which the University of Stuttgart will bear around 1.3 million Euros itself.

Around 150 guests took part in the festive ground-breaking ceremony for the demonstrator high-rise building, including important project partners of the University of Stuttgart from business and industry. After a short introduction by the spokesperson from the special research field, Professor Werner Sobek and his representative, Professor Oliver Sawodny, the Minister of Science Theresia Bauer as well as Professor Peter Middendorf as Pro-Rector for Science and Technology Transfer at the University of Stuttgart gave short addresses. Demonstrations in augmented reality with the aid of mixed-reality glasses enabled the



guests to acquire an impressive insight into the future of the building. The presentation of an adaptive demonstrator model on a scale of 1:18 rounded off the program.

The special research field 1244 at the University of Stuttgart concerns itself with the question of how in view of a growing world population and shrinking resources more living space can be created in future with fewer materials. Against the background of maximum savings of material and energy consumption with a simultaneous increase in user comfort, 14 university institutes from a diverse range of faculties are researching the potential and applicability of adaptive building shells and structures in the construction field. The research comprises the development of individual (building) components as well as their integration in an overall system.

**Professional contact:**

Stefanie Weidner, University of Stuttgart, Project Department SFB 1244,  
Tel.: +49 (0)711/685 63705, email: [stefanie.weidner@ilek.uni-stuttgart.de](mailto:stefanie.weidner@ilek.uni-stuttgart.de)

**Press contact:**

Andrea Mayer-Grenu, University of Stuttgart, University  
Communication, Tel.: +49 (0)711/685 82176, email: [andrea.mayer-grenu@hkom.uni-stuttgart.de](mailto:andrea.mayer-grenu@hkom.uni-stuttgart.de)