

Report from a joint research project for the use of retractable membrane structures in South Korea

Kyung-Ju HWANG*, Alexander Hub^a

* School of Architecture at University of Seoul
163 Seoulsiripdae-ro, Dongdaemun-gu, Seoul 130-743 Korea
e-mail: kj.hwang@uos.ac.kr

^a Alfred Rein Ingenieure GmbH
Fuchseckstraße 7, 70188 Stuttgart, Germany
e-mail: mail@ar-ingenieure.com

Abstract

At the last structural membranes conference in 2017 it was reported about a Korean joint research project which has the task to develop the basics for an economical and light retractable roof solution. Different project teams from the field of research and economy have developed new approaches to these topics in the former two years. Here should an extensive monitoring concept enable the validation of the results by control and analysis of the operation of the construction.

In the current project phase the integration of the found results in the construction of the demonstrator appears on the agenda. The mounting of the primary structure of the roof is planned for the summer of 2019. In springtime 2020 the final completion of testbed is scheduled.

The design of the prototype happens in a close coordination with the Korean architect and AR engineers who take over a consulting function within the scope of the research project. Because of the special site conditions the technical solution of testbed contains both a rail based and a rope based moving concept. Moreover the different driving axes have strong varying total lengths which have to be controlled by a sophisticated control system. The structural analysis of the Testbed system has been executed by the Korean engineering office with the software SOFISTIK. The Validation of the results happens in a successive way by AR engineers.

The coordination occurs within the scope of internal conferences and workshops which take place with participation of AR engineers both in South Korea and in Germany.

For the realization of the testbed project for the planning of the moving concept a high qualified Korean company from the field of ropeways and coasters is participated. The different moving concepts have been tested in the company workshop with a 1:1 mockup.

The actuation will be fully implemented with the necessary sensors in order to enable a far reached controlled operation of the roof. These sensors constitute the basic equipment for the monitoring.

References

- [1] K-J. Hwang, A. Hub, *Report from a joint research project for the use of retractable membrane structures in South Korea*, structural membrane Symposium 2017, Munich, Germany, October 7-9, 2017