P85. High Efficiency Nano Concrete with Polymer Fiber in Thin Wall Shell Structures

Vitalijs Lusis[1], Andrejs Krasnikovs[2]

[1]Faculty of Civil Engineering, Institute of Building Production and Concrete Mechanics Laboratory,
[2]Institute of Mechanics and Concrete mechanics laboratory,
Riga Technical University, Azenes Str.16/20, Riga, LV 1048, Latvia

High Performance Concrete (HPC) with nano-additives and polymer fibers is a modern composite material its properties can be adjusted by changing mix design, mixing and/or curing technologies. By reducing the construction dead weight, fewer raw materials are consumed and slender and elegant constructions with lower embodied energy become possible. At present in the whole world there might already be about 300 thousand dome buildings.

In presented study, concrete composition containing nano-additives and polymer fibers was used to produce HPC shell construction according to technologies developed and patented by Riga Technical University (RTU) see fig.1.

Fig. 1. Thin wall shell structures

This technology allows to develop and obtain different shells from fibrous concrete, including also dome structures and two-plane bended shells with smooth inner and outer surfaces. Concrete is spread in the necessary thickness on horizontal base, then the upper surface is levelled out and only then, applying pneumatic pressure, by the help of high elasticity material mould the necessary shell bending (height) is built. [1,2].

Keywords: *concrete with nano-additives, fiber reinforced concrete, polymer fibers, thin wall shell structures.*

References:

1. Lusis, V. Formwork with variable geometry for concrete shells production technology. In: "Environment. Technology. Resources." Proceedings of the 9th International Scientific and Practical Conference, 2013, pp. 63-66.
2. Lusis, V. Technology for concrete shells fabrication reinforced by glass fibers. In: 4th International Scientific Conference "Civil Engineering'13" Proceeding Part I, Latvia, Jelgava, 2013. pp.112-116. ISSN 2255-7776, e-ISSN 2255-8861.