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BEZIER'S, B-SPLINE AND NURBS REACTIVE POWDER CONCRETE SHELLS – THE ANALYSIS OF POTENTIAL USE AS ROFFING

Computer techniques allow dynamic development in every branch of science. It can be especially noticed in the geometric aspect of space modeling, which currently is in its bloom as is observed in cinematography pictures or computer games. The objects'environment and the objects themselves are created by means of B-Spline and Nurbs complex shells obtained on the basis of Bezier's curve. Nowadays, wide range of space modeling programs is available, which can be used for not only creation of visualization but also, for example, for simulation of mechanical operation of construction objects, which is variable in time. Therefore, with the use of these programs it is possible to merge space geometry with architectural dimension.

New trend concerning erection of spectacular buildings of complex geometrical form i.e. so-called architecture of the future (Fig.1), refers to designing complex shells of Bezier's, B-Spline and Nurbs type, which are very often used as roofings. Many of them are waiting for realization because materials and technologies for their construction are still being found. The solution can be an attempt to use reactive powder concrete, whose physical, mechanical and rheological qualities enable wide usage in many difficult construction realizations. It is due to the possibility of decreasing the cross section of element sustaining features of the whole object.

Shawnessy station in Calgary can be an example of this novel conrete mixture, where the tchickness of the shell, which is Catalan shell, for roofing is 2cm. Unfortunately, there is lack of roofing shells from reactive powder concrete of complex structure. Therefore, there is a need to introduce research on the possibilites of application of that material in complex constructional relizations.

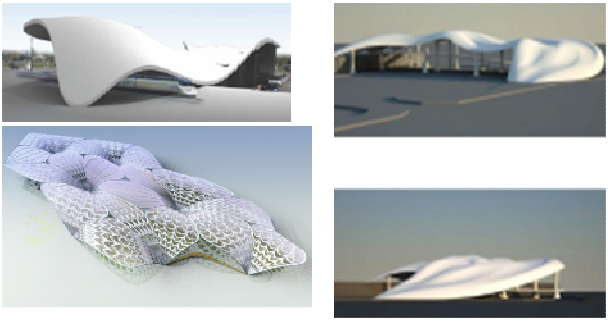

Fig. 1 Examples of coating roofing.

Considerations can be based on the existing Nurbs shell, which is used as concrete roofing of Funeral Hall in Kakamigahara, and treat it as the base shell. Next, identical roofing from reactive powder concrete should be modeled in a computer program (Fig. 2) and its mechanical operation, bearing capacity and thickness should be determined. The effects can be very interesting as far as getting the answer on mechanical difference between two objects is concerned.

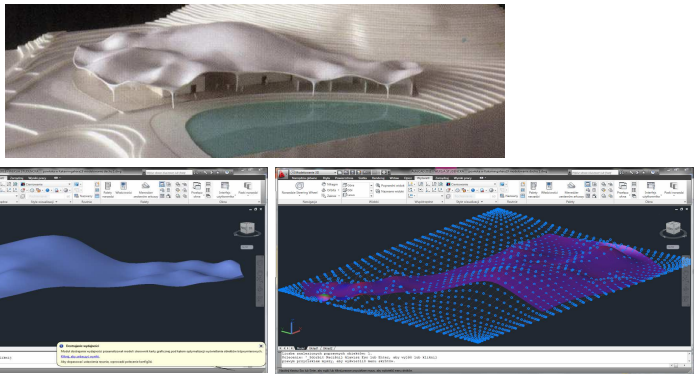

Fig. 2 At the top of the object Funeral Hall in Kakamigahara.
At the bottom of a spatial object model in Autocad 2011.