Architectural application of FRC cladding in the Future

A guideline for FRC

In recent years there has been an increased interest in using FRC in High End Architectural buildings such as the Kapsarc in Saudi Arabia, the Heydar Aliiev Cultural Center in Azerbaijan, both by Zaha Hadid, and the proposed New Qatar National Museum by Ateliers Jean Nouvel. These buildings assume the usage of panels as cladding in a complex geometry context, posing ever new challenges for the industry. The research aim to analyse the recent developments in applying FRC for building facades featuring complex shapes or patterns, and exploit limitations which are currently present, and the possibility for widen the application of FRC.

The aim of the research is to investigate the current developments in the use of Fibre Reinforced Concrete (FRC) as a cladding material for high-end architectural applications, and to look into widening its application. In close collaboration with at least one leading FRC manufacturer, it is proposed to explore the possibilities of new applications and, at the same time, evaluate the current state of production capabilities.

The motivation is that FRC, as a cladding material, has not been exploited for new applications in the same way as structural glass. Having worked with complex geometry steel and glass structures, I believe that there will be a future for curved and doubly-curved FRC. In particular, curved, and especially doubly-curved and free-form, FRC is a lot cheaper to produce than similar shapes in glass, and it is possible to create a similar architectural language with both materials.

The goal of the research is to develop guidelines that can be used by Architects to understand and make better use of FRC in buildings, both as cladding and for more structural applications. The methods used to achieve this goal will include analysing the results of tests on new FRC applications.

The key steps that will be taken to reach this goal will be to establish collaboration with at least one leading FRC manufacture, to understand fully the requirements that govern the present architectural requests, and to commence collaborative development of new applications of FRC. Further steps will include reviewing current high-end architectural projects and analyse the challenges that drive the current development of FRC.

The results will include an analysis of the collaboration with the manufacturers, a review of any similar products on the market, and an explanation of the current challenges in the application of FRC; the results will also elaborate on the possibilities for the development of both current and new applications. The research will conclude by stating which of the initial targets have been achieved so far and which further steps will be needed to finalise the research.