

Building for the Future: Evaluating the Current Viability of Thin Shell Concrete Structures

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Abstract

The thin shell structures of Felix Candela are among the most sophisticated examples of structural invention produced in the twentieth century. Their elegant forms are the result of a unique convergence of architecture, engineering and construction concerns. At a time when architects are increasingly attracted to complex forms, the rationality, efficiency and intelligence of Candela's work is an important example for present-day practice. Although architects are interested in Candela's formal language, there is little understanding of the principles behind this work. The purpose of our proposed study is to expand the base of knowledge in both architecture and engineering design by investigating the viability of thin shell concrete structures, concentrating on the work of Felix Candela. This has both a historical dimension - reevaluating

the work of this twentieth century master - and present-day practice implications as we investigate thin shell concrete structures' current viability by evaluating their resistance to loads, economy, environmental sustainability, and intrinsic aesthetic properties. Remarkably, there exists little reliable documentation on the work of Candela. Our proposed study hopes to correct this failing. An interdisciplinary team consisting of architects and engineers, with strong academic and practice credentials, will guide a group of students in the construction of models, analytical drawings, computer simulations, structural analyses, economic comparisons to contemporary conventional building styles, and life cycle assessment. The results of this work will provide an essential contribution to our longer-term goals: a symposium, a traveling museum exhibition, and a book on Candela. We believe that this team is uniquely qualified, as they have already done extensive research on Candela, have access to unique archival material, the necessary language skills, and have established personal contact with Candela's family.