Contemporary architectural design and construction operates under the extreme pressures of time and resource management. Design-development times are progressively being reduced while the complexity of spatial, structural and manufacturing parameters are constantly increasing. Significantly, a majority of design decisions with regard to the overall geometry of the project are made within a compacted early-design phase. Subsequently, down-stream production and delivery processes post-rationalize such geometries while attempting to retain the design intentions from the early-phases.

Such a process comes at a high premium of resources—time and personnel. Thus, there is increasingly a need to inform architectural design with critical aspects of structural design and fabrication processes from the early stages.
This prototype was one such time-bound collaboration, including: an examination of computational geometry and design tools and their use in a multi-stage, collaborative design phase, application of topology optimization methods for design and form-finding of concrete shell structures, incorporation of structural design in early-design and strategies to describe complex geometry (that is form-work and steel reinforcement layout) onsite in a labor intensive economy and the teaching thereof.

We hoped to make a case for a more holistic design practice—from collaborative design to fabrication, and thus a more holistic reduction of costs—design time and resource, material savings via topology optimization and the need to include fabrication costs in such evaluations.
5 Images of Completed Prototype

6 Onsite Assembly of Form-work and Laying of Steel Reinforcement
IMAGE CREDITS
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