

Unique Shaped Structures: Modelling, Design and Verification of a Water Drop-Shaped Building

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Abstract— Unique shaped structures have been of great interest to the world for the way they impact the environments. Their points of location become centres of attraction for residents and visitors alike. This has brought a lot of joy, love and benefits to the host cities. The inking of water drop-shaped structure came as a contribution towards increasing the number of existing iconic master pieces. This work will consist of creating structural model, analysing and designing the elements in reinforced concrete and glass in accordance to the British Standards. The research will mark an advancement on previous models on bottle-shaped structures. The non-symmetric circular shaped structure is modelled floor by floor to take care of the irregular change of shape vertically and horizontally. Prevailing and the most grievous load combinations are adopted for the non-linear finite element analysis. All the elements passed the structural verification tests and the drifts were within limits for various combination of loads.

Index Terms—Bottle-Shaped Structure, Design, Iconic Building, Reinforced Concrete, Structural Analysis, Verification, Water Drop.