

Modelling, Analysis and Design of a Bottle-Shaped Building

Anthony Nkem Ede* (PhD) and Edidiong Godwin Udoh

Department of Civil Engineering, College of Engineering, Covenant University, Canaan Land, KM 10, Idiroko Road, P.M.B. 1023 Ota, Ogun State, Nigeria.

* E-mail of the corresponding author: anthony.ede@covenantuniversity.edu.ng

Abstract

The emergence of unique structures around the world have turned the points of its location to centers of attraction thereby yielding benefits to the economy of the cities where they are cited. Worldwide, iconic structures stand out, placing its location on the map. Hence, the idea of bottle-shaped building was birthed trying to put bottle to tension. This research models, analyses and designs a bottle-shaped structure according to the British Standard. The works carried out in this research consisted of step by step generation of a three dimensional computer models of the bottle shaped super-structure, analysis and design of critical members for various combination of dead load, live load and the wind load and the critical analysis of the results obtained. The results of the nonlinear finite element analysis carried out for different ranges of loading scenarios were so exiting. It confirmed the validity of the approach adopted for the model and showed that the realization of the structure is very feasible.

Keywords: Bottle-Shaped Building, Iconic Building, Reinforced Concrete, Structural Analysis and Design,