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Alexandria University  
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**The Reference Architecture Guidelines for Choosing of  
Structure Systems of High-Rise buildings in Egypt, the Case  
of (The Iconic Tower) New Administration Capital, Egypt.**

**A Thesis  
submitted in partial fulfilment of the requirements for the degree of  
Master of Science**

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## ABSTRACT

This research explores the complex engineering challenges of constructing high-rise buildings, focusing on the selection of optimal structural systems. The study analyzes the impact of lateral loads, such as wind and seismic forces, on various structural systems, including shear walls, mega-cores, mega-columns, tubes, and hybrids. The economic efficiency of these systems is also examined, considering factors like floor space, spatial efficiency, and mixed-use flexibility. The research aims to develop guidelines for architects, engineers, and civil engineers to select the most suitable structural system for tall buildings during the early planning stages.

The study investigates the evolution of high-rise buildings, from ancient structures to modern skyscrapers, and the role of advancements in materials and technology. It discusses the unique challenges of managing lateral loads and functional requirements in high-rise construction. The economic feasibility of these projects is addressed, highlighting the benefits and challenges, such as high capital costs and environmental risks.

The research methodology combines theoretical and analytical approaches. The theoretical aspect involves studying suitable structural systems for vertical expansion and explaining their key elements. The analytical approach entails comparing different structural systems of high-altitude buildings to identify factors influencing their performance. This includes examining the shape of various systems, their resistance to wind forces, flexibility in floor planning, and potential for time and cost savings.

The findings offer insights into the structural systems of high-rise buildings and their ability to withstand lateral forces. The study also provides guidelines to assist in selecting the optimal structural system for tall buildings, considering factors like building dimensions, location, orientation, design, function, shape, and cost. These guidelines aim to enhance the safety and structural stability of high-rise buildings while optimizing their functionality and economic efficiency.