



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم



**MONA MAGHRABY**



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# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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# جامعة عين شمس التوثيق الإلكتروني والميكروفيلم

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# **PREDICTION OF THE MECHANICAL BEHAVIOR OF HARD SOILS- SOFT ROCKS USING NUMERICAL MODELLING TOOLS**

By

**Khaled Abdelghafar Mostafa Abdelghafar**

A Thesis Submitted to the  
Faculty of Engineering at Cairo University  
in Partial Fulfillment of the  
Requirements for the Degree of  
**MASTER OF SCIENCE**  
in  
**Mining Engineering**

FACULTY OF ENGINEERING, CAIRO UNIVERSITY  
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PREDICTION OF THE MECHANICAL BEHAVIOR OF HARD SOILS- SOFT ROCKS USING NUMERICAL MODELLING TOOLS

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**Summary**

A hard soil-soft rock (HSSR) with an intermediate behavior and properties between hard soils and rocks show complex behaviors. Predicting the response of these materials requires using a mechanical model that can capture the main features of their behaviors. So, two different mechanical models ranging from simple elastic-perfectly plastic Mohr-Coulomb (M-C) to a more complicated strain hardening Double Yield (DY) model are used. The results of these two models are compared to declare the effect of the constitutive mechanical model on the ground behavior.

## **Disclaimer**

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

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