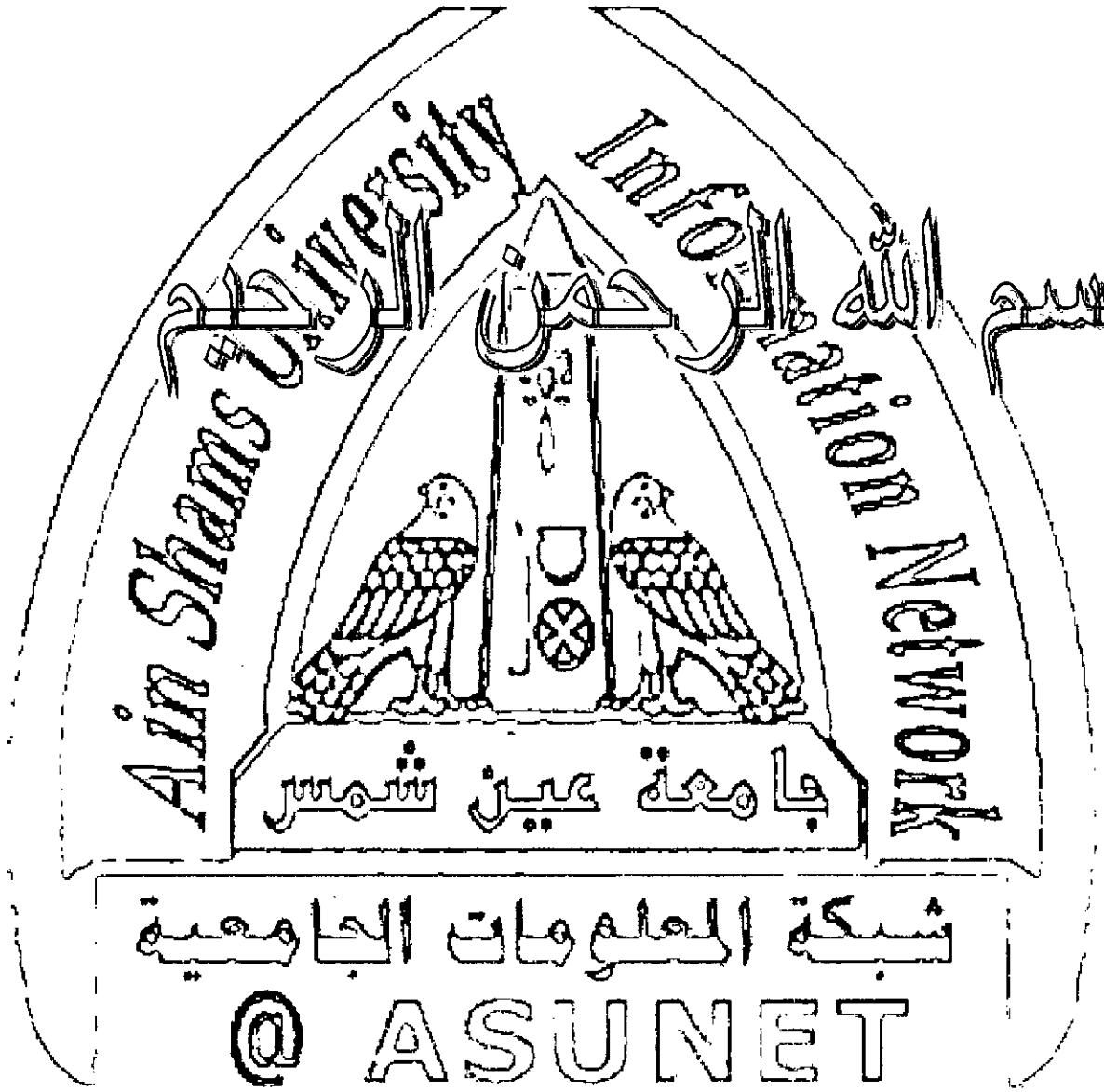
شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار
في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

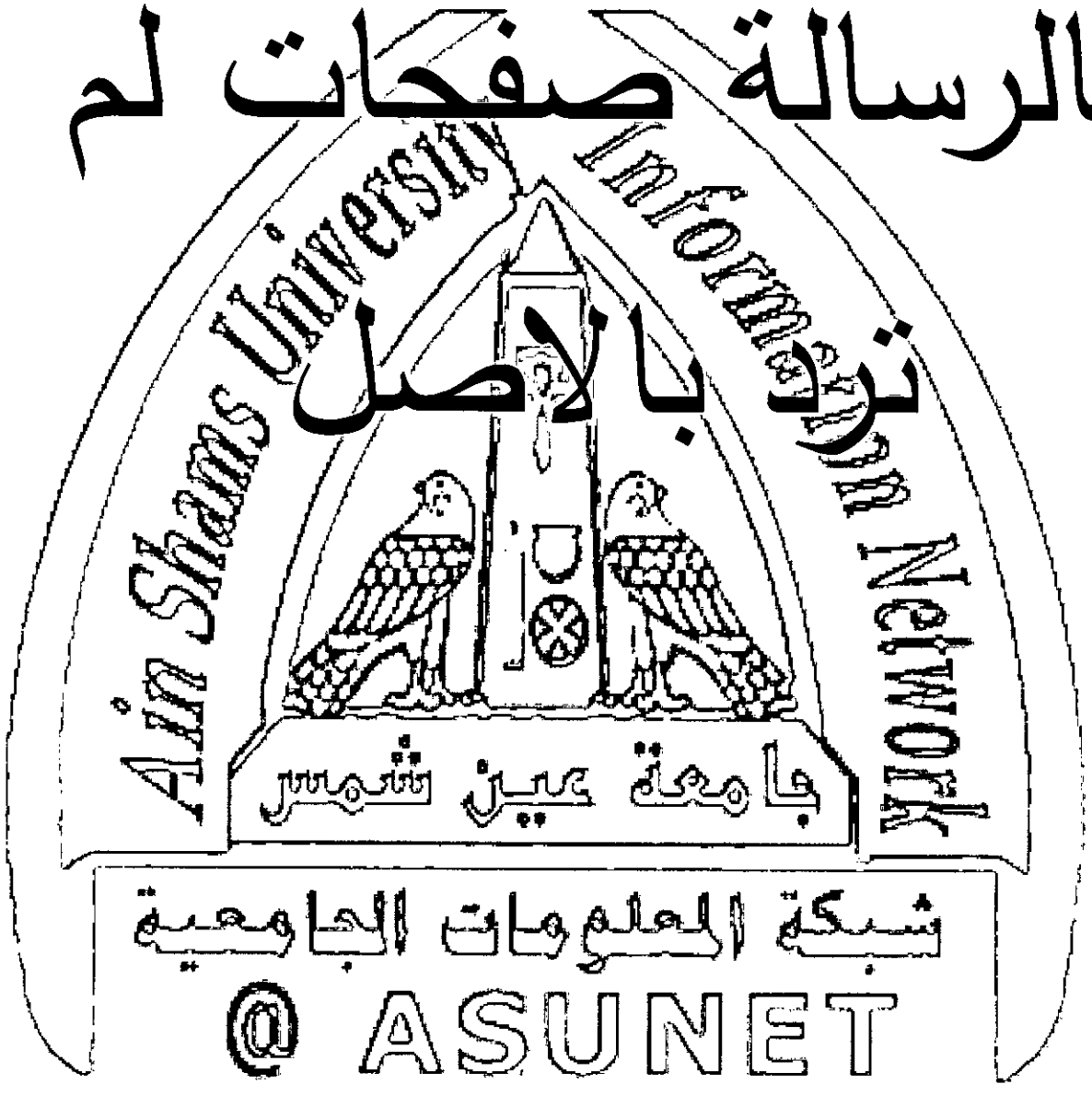
To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

بعض الوثائق الأصلية تالفة

Ain Shams University Information Network
جامعة عين شمس
شبكة المعلومات الجامعية
@ ASUNET



بالرسالة صفحات لم ترد بالاصل

Developing an Analytical Program for Solving the Analytical Equations of Fully /Partially Penetrating Wells, Using Matlab Program.

By

Eng.\ Hany Gomaa Ahmed El_Said

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

Irrigation and Hydraulics

Supervised by

Prof. Sherif Mohamed Ahmed El-Didy

Professor of hydraulics, Faculty of Engineering, Cairo University

Asc. Prof. Ahmad Wagdy Abdeldayem

Asc. Professor of hydraulics, Faculty of Engineering, Cairo University

Faculty of Engineering – Cairo University

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Abstract

In general, wells partially penetrate the entire thickness of the aquifer. If the length of water entry (or the screen interval) in a well is less than the entire thickness of the aquifer, the well is called *partially penetrating well.* The influence of partial penetration of a well becomes less pronounced as the ratio between the screen interval and the aquifer thickness increases. The groundwater flow to or from a partially penetrating well is three dimensional. As a result, the drawdown around pumping and observation wells is dependant on their screened lengths and location along the thickness of the aquifer. A few number of computer programs appears to provide solutions for partially penetrating well, but, none of these programs deals with all equations of fully/partially penetrating wells, for all kinds of aquifers, and for all flow conditions. Moreover, the free access programs are extremely limited.

The main objective of this study is to develop an analytical program, using Matlab program, for solving the analytical equations of groundwater-wells. The equations are developed by Theis, Hantush, Jacob, and Neuman covering confined aquifers, semi-confined aquifers, and unconfined ones. The program saves the time and effort of calculations for solving the complicated analytical equations. The program is a visual interacting one, but this interface is made using Matlab program, with the advantage of reducing the probability of error in entering data. The solutions simulate different conditions of fully/ partially penetrating wells in steady and unsteady conditions.

More understanding of the wells hydraulics has been achieved through using the program. A group of dimensionless curves are prepared for fine , medium, and coarse sand, to predict the increase in drawdown or the decrease in discharge due to the wells partial penetration. Some specific problems, concerning wells hydraulics, are investigated. The additional drawdown due to partial penetration is also addressed. The effective aquifer thickness in case of well partial penetration is identified. The optimum screen length for maximum well yield, is also predicted. The radius of influence of wells, is finally determined by the program.

Acknowledgement

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Special Thanks to Prof. Dr. Sherief M. El-Didy for his patience on me and for his powerful guidance. I also thank him for providing me with some important books in this field which help me a lot.

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To anyone who has helped me, thank you very much.

Finally, I dedicate this work to my family who have provided me with continuous support and who did their best to put me on the right road of progress in life.

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