Salwa Akl

# بسم اللّه الرحمن الرحيم

## مركز الشبكات وتكنولوجيا المعلومات

## قسم التوثيق الإلكتروني

Salwa Akl

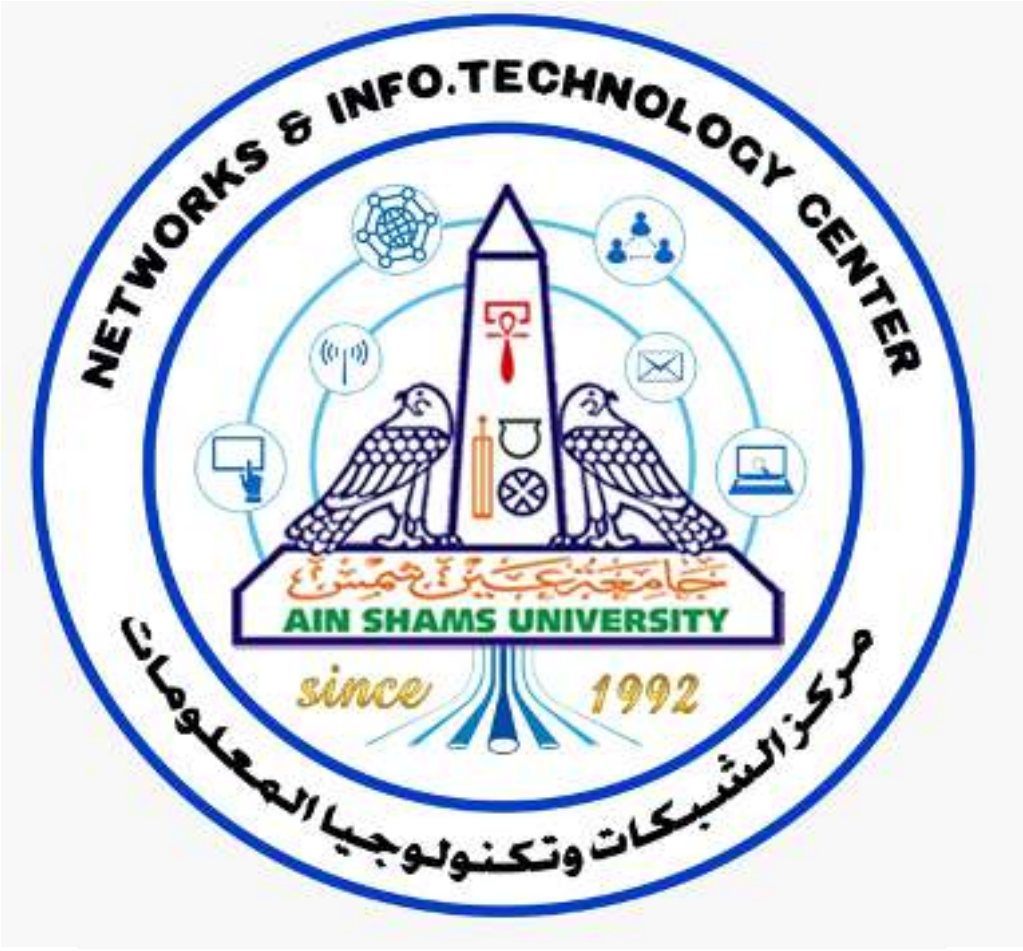
# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

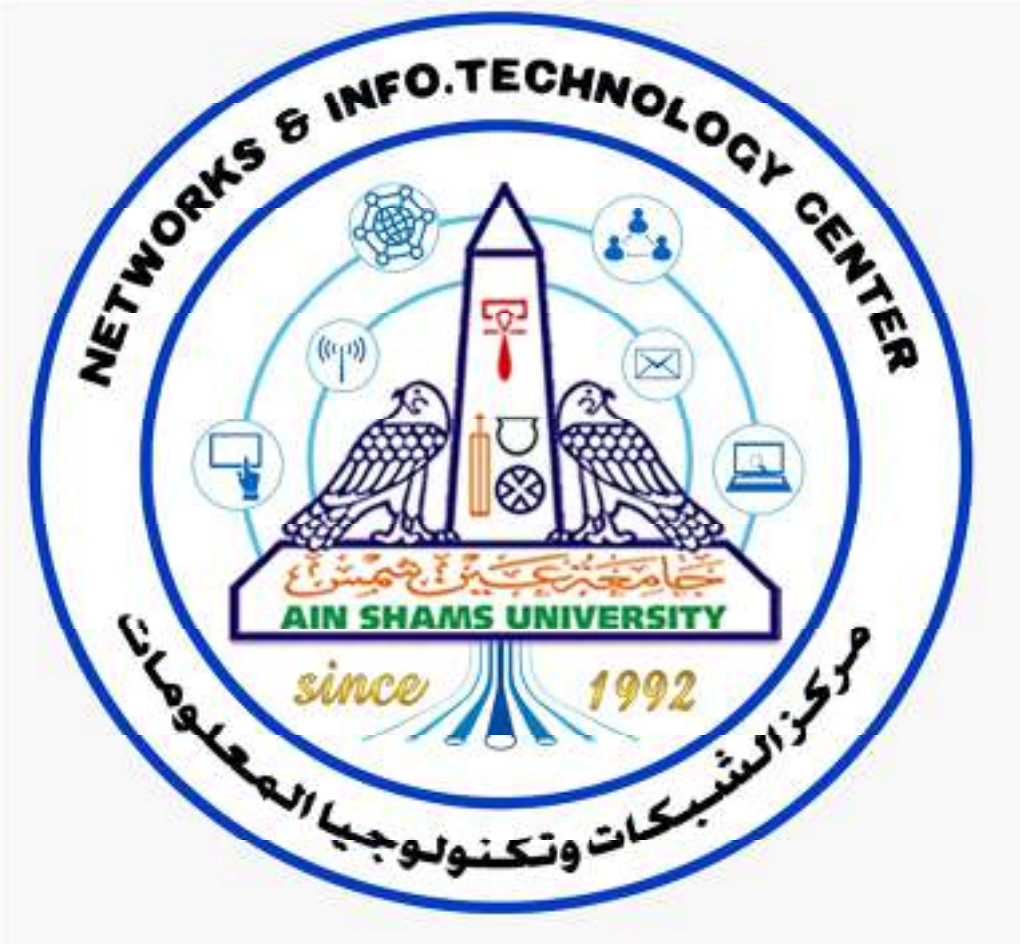
## قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



Salwa Akl




# بعض الوثائق الأصلية تالفة
# وبالرسالة صفحات لم ترد بالأصل

# *A STUDY ON THE ENGINEERING FACTORS AFFECTING THE EFFICIENCY OF SOME RECLAIMING EQUIPMENT UNDER EGYPTIAN CONDITIONS*

BY

*ASHRAF EL-SAYED MOHAMED MOSTAFA EL-SHAZLY*
B. Sc. ( Agric. Mech.), Fac. of Agric., Ain Shams University, 1982
M. Sc. (Agric. Mech.), Fac. of Agric., Ain Shams University, 1991

A thesis submitted in partial fulfillment

of

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in

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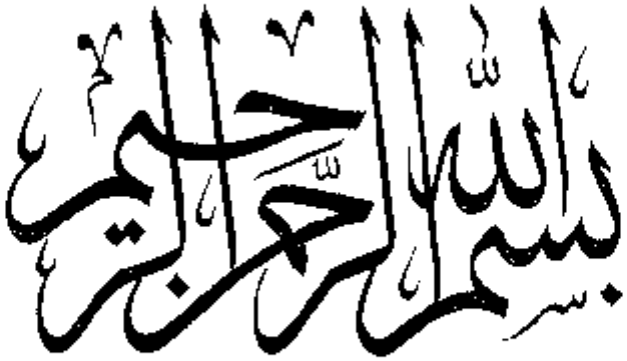
( Agricultural Mechanization )

Department of Agricultural Mechanization

Faculty of Agriculture

Ain Shams University

1998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# *APPROVAL SHEET*

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Date of Examination : / / 1998 .

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# *ABSTRACT*

***Ashraf El-Sayed Mohamed Mostafa El-Shazly . A Study on The Engineering Factors Affecting The Efficiency of Some Reclaiming Equipment Under Egyptian Conditions .Unpublished Doctor of Philosophy . University of Ain Shams . Faculty of Agriculture . Agricultural Mechanization Department .***

The aims of this investigation were to performance the engineering factors affecting the earthmoving machines productivity as duration time, turning resistance, cutting depth, cutting speed, speed reduction, rolling resistance; and their influences on power requirements, fuel consumption; and machine capacity

Two experimental sites were selected in both Fayum and Nobaria to represent the most common soils of new reclaimed land in both areas . And two different type for earthmoving equipment, bulldozer and elevator motor scraper were used for these equipment .

The important obtained results of the study could be summarized as follows :

**** Bulldozer Machine ( Fayum site)***

1- The rolling resistance power is increased by 36.8 and 37.3% when traveling speed increased from 2.6 to 3.8 km/hr and from 3.8 to 5.1 km/hr respectively . The minimum coefficient of rolling resistance for the bulldozer was 0.08 .

2- The coefficient of rolling resistance and friction resistance was 0.28 when the forward speed of the bulldozer having 3.92 km/hr

3- The speed reduction on working gear (2nd gear ) was 9.9, 11.5, 13.5 and 17.2% at drawpower 16.2, 19.4, 23.2; and 21.2 hp respectively .

4- The bulldozer develops 23.2 hp maximum drawpower in 2nd gear and specific fuel consumption was minimum equal 0.2 kg/hp .

5- The draw pull force was 1200, 1450, 1900; and 2300 kp at cutting depth 3, 5, 8; and 12 cm respectively, and the unit draft has average constant value (0.47) at these cutting depths .

6- The turning resistance was 1100, 1600, 1850; and 2400 kp at 30, 45, 80, and 90° turning angle respectively .

7- The bulldozer capacity increased by increasing cutting depth and reached maximum capacity at 5.5 cm cutting depth and after that the capacity will be decreased .

8- According to the obtained data graphic model (Nomograph) was designed and tested . This Nomograph could correlated bulldozer engine performance, load, forward speed; and fuel consumption during the actual earthmoving operation .

**** Elevator Motor Scraper (Nobaria Site)***

1- The torque transmitted to driving wheel was 13263 and 12820 kp.m at cutting depth 8 and 10 cm with 2250 and 2050 rpm engine speed and the speed ratio obtained for the working gear is 236.8 .

2- The rolling resistance power increasing by increasing forward speed and minimum coefficient of rolling resistance was 0.062 .

3- The average cutting speed resistance was ranged between 40 to 100 $kN/m^2$ at cutting depth 4, 6, 8; and 10 cm on 2nd gear speed .

4- The speed reduction increased from 16.2 to 18.9% when cutting depth increased from 4 to 6 cm while by increasing cutting depth from 6 to 10 cm the speed reduction increased from 18.9 to 34.7% .

5- The fuel consumption increased by 21.4% when the cutting depth increased from 6 to 10 cm .

6- The values motor scraper capacity were found to be 360, 411, 480; and 543 $m^3/hr$ at cutting depth 4 6, 8; and 10 cm respectively during the earthmoving operation

7- According to the obtained data graphic model (Nomograph) was designed and tested . This Nomograph could correlated scraper engine performance, load, forward speed; and fuel consumption during the actual earthmoving operation .

***Keywords :*** *Land reclamation, Earthmoving equipment, Bulldozer, Motor scraper, Engine performance, Rolling resistance, Speed reduction, Cutting speed, Cutting depth, Machine capacity .*

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