Faculty of Engineering
Ain Shams University
Cairo, Egypt

Soil Purification Capability during Infiltration of Polluted Water

By
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A Thesis Submitted to the
Faculty of Engineering at Ain Shams University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Civil Engineering – Structure Dept.

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DEDICATION

This work takes a period from my life. I wish to dedicate it to who suffered to educate, build capacity and help my self to be as I am.

TO MY FATHER, MY MOTHER & MY SISTER

I wish to dedicate it also to who ease my life and share in carrying the responsibility to help me.

TO MY WIFE & MY DAUGHTER

For my wife care and encouragement and for my daughter smile.

STATEMENT

This thesis is submitted to Ain Shames University for the degree of Master of Science in Civil Engineering (Structural Engineering).

The work included in this thesis was carried out by the author in the Department of Structural Engineering, Faculty of Engineering, Ain Shames University, from October 2006 to February 2009.

No part of this thesis has submitted for a degree or a qualification at any other university or institute.

Date: - _ _ _/_ _ _/2009
Signature: - _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
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ABSTRACT

Name : - SHERIF AFIFI ABD EL MOTTALB
Title : - Soil Purification Capability during Infiltration Of Polluted Water
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Abstract: -

Sewage from homes and businesses contains bacteria, viruses, nutrients and some chemicals. It must be treated before it reaches ground water because of the potential for disease transmission and environmental contamination. Individual sewage-treatment systems commonly known as septic tank which isn't sufficient to treat wastewater to an acceptable limit based on the environmental point of view, so treatment by soil layers is a proven method of controlling negative environment effects of sewage.

The research work in this study is aimed towards selection of the most appropriate sand soil, the effective sand depth which gives the best removal efficiency and the best infiltration rate which gives best removal efficiency.

The experimental work plan was directed to investigate the impact of three different types of sand soil. A pilot plant was designed and installed at EL-BERKA wastewater treatment plant, in Cairo.

Continues flow pilot plant testing was conducted to achieve the study objective. The study resulted in the following conclusions:

- The effective sand type which gives the best removal efficiency is sand type (I), which is fine sand.
- The effective depth of sand which gives the best removal efficiency is 80cm.
- The best tested infiltration rate, which gives the maximum removal efficiency of pollutants, is $3m^3/m^2/d$.

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