UNDERGROUND PVC/PE WATER PIPE DETECTION SYSTEM

RADK Sampath

(138526J)

Degree of Master of Science

Department of Electronic and Telecommunication Engineering

University of Moratuwa
Sri Lanka

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Rajapaksha Arachchige Don Kaveendra Sampath

(138526J)

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Department of Electronic and Telecommunication Engineering

University of Moratuwa
Sri Lanka

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DECLARATION OF THE CANDIDATE AND SUPERVISOR

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ABSTRACT

With the development of technology, a lot of underground cables, wires and pipes are buried underneath. There is lot of equipment to detect metal objects, but limited equipment to detect non-metallic objects which are very expensive.

The objective of the research was to develop a low cost equipment to detect underground non-metallic pipes in either horizontal or vertical placed positions. Since this type of detection cannot be done using electromagnetic locators, an acoustic method is used to generate continuous-wave (CW) acoustic signal, which is then injected and transmitted throughout the pipe. Afterwards, the transmitted signals were captured using a seismic sensor. The data gathered was used to determine the location of the buried non-metallic pipes. The received signals were amplified, filtered and then differentiated using cross-correlation method. As a result, a reduction in unwanted signals was observed, thereby accurate transmitted signals from the actual underground pipe was captured.

DEDICATION

Thanks go to mum, dad and uncle for almost unbelievable support. They are the most important people in my world and I dedicate this thesis to them.

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LIST OF ABBREVIATION

GPR	Ground Penetrating Radar.
CW	Continuous Wave.
EM	Electro Magnetic.
PVC	Poly Vinyl Chloride.
PE	Poly Ethylene.
NWSDB	National Water Supply and Drainage Board.
CMRR	Common Mode Rejection Ratio.
PCB	Printed Circuit Board.
IC	Integrated Circuit.
DIP	Dual Inline Package.
ADC	Analogue to Digital Conversion.
DC	Direct Current