

GROUND PENETRATING RADAR FOR DETERMINATION OF BURIED PIPELINE GEOMETRIC PROPERTIES

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Abstract: Rapid population growth has led to the optimal use of land on the surface especially in densely populated urban environments. Utility companies seek out emerging solution to install and extend the utility pipeline in subsurface (stratum) to meet the growing demand for different utility services such as water, gas, electricity, salinity, telecommunication and etc. This encouraging construction and renewal of utility pipeline in the subsurface and directly leading to a boom of construction work in the utility construction industries. Accurate information of these buried utility pipeline are hence essential to the utility industries, particularly during utility pipeline installation, rehabilitation and maintenance process. In this regards, subsurface utility mapping using different trenchless technologies are vital for sustaining the information of these buried utility pipeline. Ground Penetrating Radar (GPR) has been selected as the top measuring tool to acquire data of these buried pipelines. Nevertheless, there are still lack of a standard methodology for acquiring and keeping the records of these buried pipeline in current utility industries. For this reason, the “hit and miss” concept is often being applied in utility industries, where it has lead to many catastrophic damages to the buried pipeline. Therefore, this paper is to present a good practice of data acquisition scanning technique for reporting the higher accuracy geometric properties of the buried pipeline. The accuracy of three data acquisition scanning techniques are also discussed in this study based on the findings of the experiments carried out throughout this study. Results, indicated that along pipe scanning technique has demonstrated outstanding performance in providing high accuracy data (less than ± 10 centimetres) which equivalent to Quality Level A utility data among all the scanning techniques that tested in this study. This indicated that use of appropriate data acquisition scanning technique is vital to determine the quality of the data acquired using the GPR.