

A Conceptual Framework for Underground Utility Mapping Accuracy Assessment Using Ground Penetrating Radar

Mazlan HASHIM, Siow Wei JAW, and Samsudin AHMAD, MALAYSIA

Key words: conceptual framework, accuracy assessment, underground utility mapping, ground penetrating radar

SUMMARY

Underground utility mapping is an important engineering practice to acquire the as-built information of the buried utility features. Securing the as-built information of the underground utility features will always be a very important step for the city's infrastructure planning. In this regard, an efficient framework, ranging from marking, scanning, detecting, and extracting the geometric information of the buried utilities before displaying the results on preferable deliverable format is very crucial to ensure accurate data acquisition during underground utility mapping. Therefore, this paper demonstrates a conceptual framework for underground utility mapping accuracy assessment using one of the famous non-destructive testing measuring tools, namely Ground Penetrating Radar (GPR). A field-based model which customized for mimic the typical infrastructure that currently buried in the underground was used to assess the effectiveness of the framework. The mapping methodologies, the best practices data acquisition method and reference procedures for assessing the underground utility mapping accuracy was done at the field-based model. The details of this conceptual framework was defines in this paper. Results obtained proved that, the proposed conceptual framework has presented the locational accuracy of underground utility mapping and introduced the best practice for data acquisition using GPR in order to ensure precise underground utility mapping. With the availability of this conceptual framework, it can correct the improper practices that had been practices by the street-workers during underground utility mapping. Through refinement of this conceptual framework, the proposed framework, hence, has the potential to provide unlimited contribution to the improvement of operating procedures of underground utility mapping. Therefore, the establishment of standard operating procedures for surveying work of underground utility mapping in the future towards development of three-dimensional underground cadastral database is within sight.