

The Method of Establishing Integrated 3D Underground Geo-Spatial Data Using Terrestrial LIDAR and Its Application Plan

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SUMMARY

Recently, occurrence rate of 'Sinkhole' is increasing rapidly and nationally. It became a kind of disaster which is threatening this country as well as all the world. Subsidence is the motion of the earth's surface as it shifts downward relative to a datum such as sea-level. It frequently causes major problems in karst terrains, where dissolution of limestone by fluid flow in the subsurface causes the creation of voids. This type of subsidence can result in sinkholes which can be many hundreds of meters deep. Also it causes by excessive using of ground water, leaking of water and sewage, massive excavation work and so on. In Bangkok, ground has subsided 10cm every year and because of that buildings collapsed, underground facilities are destroyed. Besides, in Chicago three cars were buried by land subsidence. Although the damage is increasing as years go by, there are no integrated data for preventing and managing underground utilities and structures and caves. Therefore, in this paper, it describes causes of subsidence and how to manage the integrated underground geo-spatial information based on 3-Dimension which is overlaid with a land registration map and how to manage the data by individual lot of land. Integrated 3D underground geo-spatial data is combined information about underground utilities and structures such as electricity, gas, subway, underground shopping complex and so on that each establishment has and that can be utilized by terrestrial LiDAR and Total station. It explains way of classifying underground space and work procedures for utilizing the data. It is hoped that it is able to contribute to make safe land by using integration 3D geo-spatial data for preventing subsidence and taking follow-up action after disaster.

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