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Technology of Gyro Orientation Measurement Unit (Gyro Omu) for Underground Utility Mapping Practice

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Abstract : At present, most operators who are working on projects for utilities such as power, water, oil, gas, telecommunication and sewerage are using technologies e.g. Total station, Global Positioning System (GPS), Electromagnetic Locator (EML) and Ground Penetrating Radar (GPR) to perform underground utility mapping. With the increase in popularity of Horizontal Directional Drilling (HDD) method among the local authorities and asset owners, most of newly installed underground utilities need to use the HDD method. HDD method is seen as simple and create not much disturbance to the public and traffic. Thus, it was the preferred utilities installation method in most of areas especially in urban areas. HDDs were installed much deeper than exiting utilities (some reports saying that HDD is averaging 5 meter in depth). However, this impacts the accuracy or ability of existing underground utility mapping technologies. In most of Malaysia underground soil condition, those technologies were limited to maximum of 3 meter depth. Thus, those utilities which were installed much deeper than 3 meter depth could not be detected by using existing detection tools. The accuracy and reliability of existing underground utility mapping technologies or work procedure were in doubt. Thus, a mitigation action plan is required. While installing new utility using Horizontal Directional Drilling (HDD) method, a more accurate underground utility mapping can be achieved by using Gyro OMU compared to existing practice using e.g. EML and GPR. Gyro OMU is a method to accurately identify the location of HDD thus this mapping can be used or referred to avoid those cost of breakdown due to future HDD works which can be caused by inaccurate underground utility mapping.

Keywords : Gyro Orientation Measurement Unit (Gyro OMU), Horizontal Directional Drilling (HDD), Ground Penetrating Radar (GPR), Electromagnetic Locator (EML)
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