INTISARI

PEMETAAN UTILITAS BAWAH TANAH DAN REKOMENDASI AREA PENANAMAN PIPA BARU MENGGUNAKAN METODE *GROUND PENETRATING RADAR* (GPR) DI PLTGU, JAWA TIMUR

Oleh

Jordy Reformeras Salaam
17/412618/PA/17937

Permintaan penanaman utilitas bawah tanah meningkat seiring dengan pertumbuhan penduduk perkotaan setiap tahunnya. Kerusakan utilitas bawah tanah selama penggalian merupakan masalah serius yang dapat mengakibatkan korban jiwa, cedera, keterlambatan proyek, gangguan pada layanan, dan tingginya biaya perbaikan. Penelitian ini dilakukan untuk mendapatkan informasi sebaran utilitas yang terdapat di daerah penelitian PLTGU, serta area kosong yang dapat dijadikan rekomendasi untuk ditanami jalur pipa baru. Sebaran utilitas bawah tanah didapatkan melalui pengolahan 7 data lintasan *Ground Penetrating Radar* (GPR) menggunakan *software ReflexW*, serta proses interpretasi dan visualisasi 2D dan 3D menggunakan *software ArcGIS* dan *SketchUp*. Melalui analisis utilitas terpasang, rekomendasi jalur pipa baru dibuat dengan memenuhi standardisasi galian pipa yang berlaku di Indonesia.

Hasil pengolahan GPR menunjukkan keberadaan utilitas bawah tanah berupa kabel fiber optik yang melintasi 3 lintasan survei pada kedalaman 20-40 cm, serta pipa bawah tanah pada kedalaman 2,5 meter. Analisis radargram dengan data literatur menunjukkan beberapa area kosong yang dapat dijadikan rekomendasi jalur pipa baru. Berdasarkan informasi area kosong tersebut, rekomendasi 3 jalur pipa baru dirancang sesuai kriteria dalam standardisasi nasional. Ketiga jalur pipa baru didesain memiliki diameter sebesar 1,15 meter, dengan interval antar pipa sebesar 3 meter, dan ditanam pada kedalaman 4,5 meter. Hasil rancangan ini diharapkan dapat menjadi rekomendasi desain penanaman utilitas baru di PLTGU untuk menghindari kerusakan utilitas terpasang pada masa mendatang.

Kata kunci : utilitas bawah tanah, GPR, pencegahan kerusakan, rekomendasi jalur pipa baru, standarisasi galian pipa

\

ABSTRACT

UNDERGROUND UTILITES MAPPING AND AREA RECOMMENDATIONS FOR NEW PIPE INSTALLATION USING THE GROUND PENETRATING RADAR (GPR) METHOD AT PLTGU, EAST JAVA

By

Jordy Reformeras Salaam
17/412618/PA/17937

The demand for underground utilities is increasing as the urban population grows every year. Damage to underground utilities during excavation is a serious problem that can result in casualties, injuries, project delays, disruptions in costly services, and large repair costs. This research was conducted to obtain information on the distribution of utilities in the research area of PLTGU, as well as empty areas that can be used as recommendations for planting new pipelines. The distribution of underground utilities is obtained through processing 7 Ground Penetrating Radar (GPR) track data using ReflexW software, as well as 2D and 3D interpretation and visualization processes using ArcGIS and SketchUp software. Through the analysis of installed utilities, recommendations for new pipelines are made by meeting the pipe excavation standards that apply in Indonesia.

The results of GPR processing indicate the presence of underground utilities in the form of fiber optic cables that cross 3 survey lines at a depth of 20-40 cm, as well as underground pipes at a depth of 2.5 meters. Radargram analysis with literature data shows several empty areas that can be used as recommendations for new pipelines. Based on the information on the vacant area, the recommendation for 3 new pipelines is designed according to the criteria in national standardization. The three newly designed pipelines have a diameter of 1.15 meters, with an interval between pipes of 3 meters, and are planted at a depth of 4.5 meters. The results of this design are expected to be a design recommendation for new utility plantings at PLTGU to avoid damage to installed utilities in the future.

Keywords : underground utilities, GPR, damage prevention, pipelines recommendations, pipe excavation standards