

Application of Ground Penetrating Radar to the Detection of Subsurface Footing

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Abstract

Geophysical methods can provide useful underground information that is commonly used in engineering applications to determine foundation structures. The footing is a part of the foundation that transfers the load to a larger soil area. They are typically made of concrete with rebar reinforcement that has been poured into an excavated trench. The purpose of footings is to support the foundation and prevent settling of subsurface soil, otherwise the building structure may be instability and damaged. Footing design for supporting the total load is very important. In case of the building structure above the ground was removed and the footing and column was still kept for future project. The footing information is anyway needed. With a lack of footing information, investigation by using nondestructive testing (NDT) method such as ground penetrating radar (GPR) is a better choice and cheaper than drilling method. GPR is a geophysical method with high stratum classification capabilities. In this study, GPR was conducted to determine the subsurface footings structure. The study site is in front of a gas station in Singhanakhon district, Songkhla province. The left footing structure was built over many years. In order to use this footing, it must be inspected its size and structure for estimating its supporting load from the weight of building. GPR system with an antenna frequency of 100 MHz and 200 MHz were carried out by dragging the antenna in 6 measuring profiles beside the footing column. The radargram has been processed by ReflexW software. The interpretation results of radargram for footing spread with a size of about 2.5 m × 2.5 m and a depth to the footing of about 3.2 m have been obtained.

Keywords: ground penetrating radar (GPR), spread footing