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# Application of ERT, and SSR to Detect the shallow subsurface cracks under buildings of District No. 27 at 15th May City, Helwan, Egypt.

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## ABSTRACT

15th May City, 12 km to the southeast of Helwan city, is one of promised cities planned in 1986 by the Egyptian government through its program to withdraw the population from the condensed central Nile valley to the side parts of the Nile valley Egypt.

The present study runs on the district No. 27. at 15th May city. The main target of this study is to detect the cracks in the shallow subsurface layer under buildings and estimate its displacement to reach its causes.

This study embraces, two dimension electrical resistivity, and shallow seismic refraction surveys. The two dimension electrical imaging technique was interpreted in terms of depths and thicknesses of the geoelectric layers, on this regard, it suggests a succession of three layers, and in addition, the boundaries of the crack could be sensed. The shallow seismic refraction technique results revealed a succession of three seismic layers. These layers illustrated from both techniques are dried limestone “calcite to dolomite” layer, and the second is wetted to semi-wetted "Marley limestone". On the other hand, these parameters allow for separating the area into layers of different competence nature and consequently different appropriateness. Five cracks sites have been detected with its directions in the study area, the main reason of these crack reveal to the irrigation water which used in garden's watering among the buildings.

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