**USE OF ELECTRICAL RESISTIVITY TOMOGRAPHY (ert) AS A TOOL TO CHARACTERIZE A CLAYEY SUBSOIL IN URBAN AREAS AT RISK: cASE STUDY IN MEXICO CITY (1079470)**

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Geological and geophysical studies were carried out in a residential area located towards the NE of Mexico City. The appearance of a fracture produced a series of damages to the civil infrastructure as well as severe harms to houses and constructions. Several homes had to be vacated and their inhabitants relocated. This area is built on top of clayey materials, of what constituted the old lake of Texcoco. This fracture was attributed to a leak in a pipe that carries drinking water, which in turn triggered flooding in some houses and subsidence due to the rapid erosion of the clays in the subsoil, causing fractures in the clayey horizon.

Three-dimensional Electrical Resistivity Tomography (ERT-3D) method was applied to characterize the subsoil under three blocks of houses. Three different types of non-conventional array were employed, the Wenner-Sclumberger Perimeter (WSP), Minimum Coupling and Gradient, where the electrodes surround the series of houses. This allowed adequate coverage of apparent resistivity observations to be made. Such procedure allowed to identify geological and anthropogenic features that could put the inhabitants at risk, in addition to making a comparison of the ERT-3D study in two different times of the year: rainy season and dry season in the affected area.

In both periods, the results show a complex subsoil, showing subsidence zones towards the central portion of each area. In one of the studied areas, two cavities could be detected at a depth of approximately 16 m. These features notoriously affect the buildings that are above that cavity. The study carried out in the rainy season shows a subsoil that is highly saturated with water, due to the fact that it is a clayey subsoil. In the dry season (less water saturation), a series of high resistivity anomalies have been more clearly detected that can be associated with pipelines in process, which have already caused serious structural damage to the houses located in the surface. This observed piping process continues to increase in the investigated area.

In both seasons it was possible to infer areas where there is a greater concentration of water that causes differential subsidence, whose depths vary between the surface level and in some cases up to more than 15 m deep. This is reflected in the extensive damage to homes and urban infrastructure.