

Geotechnical Distress Evaluation of a Damaged Structure

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Abstract : Gulzar Mahal is a heritage site located in the city of Bahawalpur, Pakistan. The site is under a process of degradation, as cracks are appearing on the walls, roofs, and floor around the building due to differential settlement. To preserve the integrity of the structure, a geotechnical distress evaluation was carried out to evaluate the causal factors and recommend remediation measures. The research involved the characterization of the problematic soil and analysis of the observed distress with respect to the geotechnical properties. Both conventional lab and field tests were used in conjunction with the unconventional techniques like; Electrical Resistivity Tomography (ERT) and FEA. The temporal, geophysical and geotechnical evaluations have concluded that the foundation soil over the past was subjected to variations in the land use, poor drainage patterns, overloading and fluctuations in groundwater table all contributing to the differential settlements manifesting in the form of the visible shear crack across the length and breadth of the building.

Keywords : differential settlement, distress evaluation, finite element analysis, Gulzar Mahal

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