

Development of GIS-Based Geotechnical Guidance Maps for Prediction of Soil Bearing Capacity

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Abstract : Foundation design of a structure needs soil investigation to avoid failures due to settlements. This soil investigation is expensive and time-consuming. Developments of new residential societies involve huge leveling of large sites that is accompanied by heavy land filling. Poor practices of land fill for deep depths cause differential settlements and consolidations of underneath soil that sometimes result in the collapse of structures. The extent of filling remains unknown to the individual developer unless soil investigation is carried out. Soil investigation cannot be performed on each available site due to involved costs. However, fair estimate of bearing capacity can be made if such tests are already done in the surrounding areas. The geotechnical guidance maps can provide a fair assessment of soil properties. Previously, GIS-based approaches have been used to develop maps using extrapolation and interpolations techniques for bearing capacities, underground recharge, soil classification, geological hazards, landslide hazards, socio-economic, and soil liquefaction mapping. Standard penetration test (SPT) data of surrounding sites were already available. Google Earth is used for digitization of collected data. Few points were considered for data calibration and validation. Resultant Geographic information system (GIS)-based guidance maps are helpful to anticipate the bearing capacity in the real estate industry.

Keywords : bearing capacity, soil classification, geographical information system, inverse distance weighted, radial basis function

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