

Some Innovative Solutions for Dealing with Problematic Soils in Infrastructure Developments

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Problematic soils (e.g. collapsible, soft, reactive) pose significant challenges to the geotechnical communities due to their low bearing capacity and high compressibility, causing distress and damage to many infrastructure developments including foundations, retaining walls, pavements, etc. The constraints on construction time and ever-growing infrastructure developments as well as the environmental and safety issues, maintenance costs and expected lifetime of structures have continued to demand unflinching innovation in construction encircling problematic soils. Although the risks associated with problematic soils have been long recognised, problems associated with these soils are ever increasing and substantial financial losses are incurred in many places around the world. Numerous solutions have thus been proposed for construction on problematic soils including replacement of the entire problematic materials, soil stabilisation by chemical additives (e.g. cement) and use of pile foundations. However, most existing solutions have either environmental serious concerns (e.g. chemical additives) or expensive (e.g. pile foundations). In this work, some innovative and promising solutions for dealing with problematic soils are proposed and presented, and their controlling parameters, efficiency and limitations are demonstrated and discussed.