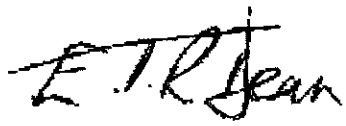
The Need for Research in Onshore and Offshore Geotechnical Engineering

Research is the source of all wealth. It is the process of finding out where things are or how to do things, or how to do things better, safer, more reliably, with greater care of the environment, and sometimes more cheaply. In the 1990s, research at Cambridge England led to increased confidence, reliability and safety for the geotechnical foundation engineering of the huge offshore, tension leg oil platforms (TLPs) that have been installed in the deepwater Gulf of Mexico[1]. Now in the early 21st century, we need ever more research in geotechnical engineering, onshore and offshore, particularly in the West Indies and the Caribbean.

About 40% of Trinidad and Tobago's Gross National Product comes from the petroleum sector[2]. Much of this comes from offshore structures which harness oil and gas reserves from beneath the Gulf of Paria and off the East Coast. Deep water energy reserves exist off Barbados and elsewhere, and new technology is needed to access these riches. On land, foundation and landslip problems, sometimes associated with expansive clays, continue on the islands. To protect these resources, assist development and solve these problems, we need a strategy for geotechnical research. We need high-tech, state-of-the-art facilities and skills including:

- Library facilities, including a catalogue of regional soils and their engineering properties, and a database of regional activities and experiences in geotechnical engineering,
- Communications and computer facilities, including finite element software for geotechnical engineering, and post-processing and visioning technologies like virtual reality,
- Field, laboratory and physical model testing capabilities, including geotechnical centrifuges, to help explore field datasets and validate the new solutions our research will generate.

The development and running of these facilities will need academic, industry and government involvement and funding. Research is expanding rapidly at world level and the West Indies need to be represented in international forums. We need to press forward with the development and acceptance of regional standards[3] and to assist constructively at international level such as in the upcoming ISO standards for offshore foundations[4]. We need the fundamental and applied research facilities, experience and expertise that will support our involvement, inform our industry and help improve people's lives and the environment here and elsewhere on our lovely planet.



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1 Doyle, E.H., Dean, E.T.R. and Newlin, J. (2005). *Lateral Pile Design of the URSA Tension Leg Platform.* Proc ISFOG - Int. Conf. Frontiers in Offshore Geotechnics, Australia.

2 Bureau of Western Hemisphere Affairs (2004). US Department of State, www.state.gov/r/pa/ei/bgn/35638.htm

3 *Guide to the Design and Construction of Small Buildings,* Trinidad and Tobago Bureau of Standards, www.ttbs.org.tt

4 International Standards Organization, www.iso.org