



SEMINAR

Stress Diffusion Experiment in Sand

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Date: 28 July 2021, Wednesday

Time: 08:00 pm to 10:00 pm

Venue: Zoom Meeting - Zoom ID: 982 6740 9626 Passcode: 328235

Abstract

Given the great importance of horizontal stress, or the K ratio, in many geotechnical problems, it seemed reasonable that it might also have a great and previously unexpected importance in stress distribution. Plate bearing load tests in a large sand box with boundary lateral stress control showed, by measurements using buried stress cells, that the greater the initial horizontal stress the more rapidly the vertical loading from the plate diffuses or spreads horizontally with depth. The measurements also showed that with horizontal stress constant, an increasing plate load progressively focuses a greater percent of the load into the sand under and along the axis of the plate. These diffusion and focusing results have the same cause and can become linked. The experiment results with two elastic half-space theories will be compared: simple Boussinesq, nonhomogeneous Boussinesq, and one particulate-probabilistic theory described in Harr. A preliminary study with the PLAXIS finite element program will be presented to show promise for predicting both results. Practical applications and notes two principles of load transmission in soils demonstrated in the experiment will be discussed.

Biography

Prof. John H. Schmertmann is a Professor Emeritus of civil and coastal engineering at the University of Florida. Prof. Schmertmann earned a bachelor's degree in civil engineering from the Massachusetts Institute of Technology in 1950, and a master's degree in 1954 and doctorate in 1962, both from Northwestern University. In 1970, he proposed a new procedure for estimating settlement of shallow foundations on granular soils. He is one of the world's best-known geotechnical experts. Prof. Schmertmann published more than 75 technical writings with 3 national and 1 divisional ASCE awards for outstanding papers: The Collingwood Prize in 1956, the Norman Medal (highest ASCE award) in 1971, the State-of-the-art Award in 1977, the Middlebrooks Award in 1981. The other honours that he received include: 1971 FES Award for Technical Achievement, ASTM committee D-18 special Service Award in 1981, 2002, the ASCE Terzaghi Lecture in 1989, and ASCE'S Special Geotechnical Publication No. 180 published in his honor in 2008. To date Prof. Schmertmann has led seminars and lectures at over 50 Universities and Societies in the USA and 30 foreign. Listed in "Who's Who in America" and in AAES "Who's Who in Engineering". Member National Academy of Engineering, elected 1984. Prof. Schmertmann significantly contributed to the practical and theoretical developments of geotechnical engineering, particularly in the specialty areas of consolidation testing, settlement analysis methods, seepage and piping, fundamental shear strength, shrink/swell clay, insitu testing, and soil ageing. His in-situ testing work includes a leading role in, a theoretical understanding of Standard Penetration Test, introducing the Dutch cone penetration and Marchetti dilatometer tests into the USA, and in developing the associated ASTM Standards. Prof. Schmertmann has over 55-years experience in providing geotechnical consultation services and resolves over 500 assignment in geotechnical problems. These assignments have varied in scope from shrink/swell clay problems at residences to the geotechnical investigation and design recommendations for the foundations for the former world record concrete Sunshine Skyway Bridge replacement across Tampa Bay.

For enquiries, please contact Ms Rebecca Yau at Tel: 2358 7164.

