

Geotechnical Education in the USA: A Comparative Analysis of Academic Schooling vs. Industry Needs in the Area of Earth Retaining Structures

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Abstract : The academic rigor of the geotechnical engineering curriculum indicates strong institutional and geographical variations. Geotechnical engineering deals with the most challenging civil engineering material, as opposed to structural engineering, environmental studies, transportation engineering, and water resources. Yet, technical expectations posed by the practicing professional community do not necessarily consider the challenges inherent to the disparity in academic rigor and disciplinary differences. To recognize the skill shortages among current graduates as well as identify opportunities to better equip graduate students in specific fields of geotechnical engineering, a two-part survey was developed in collaboration with the Earth Retaining Structures (ERS) Committee of the American Society of Civil Engineers. Earth Retaining Structures are critical components of infrastructure systems and integral components to many major engineering projects. Within the geotechnical curriculum, Earth Retaining Structures is either taught as a separate course or major subject within a foundation design class. Part 1 of the survey investigated the breadth and depth of the curriculum with respect to ERS by requesting faculty across the United States to provide data on their curricular content, integration of practice-oriented course content, student preparation for professional licensing, and level of technical competency expected upon student graduation. Part 2 of the survey enables a comparison of training provided versus training needed. This second survey addressed practicing geotechnical engineers in all sectors of the profession (e.g., private engineering consulting, governmental agencies, contractors, suppliers/manufacturers) and collected data on the expectations with respect to technical and non-technical skills of engineering graduates entering the professional workforce. Results identified skill shortages in soft skills, critical thinking, analytical and language skills, familiarity with design codes and standards, and communication with various stakeholders. The data will be used to develop educational tools to advance the proficiency and expertise of geotechnical engineering students to meet and exceed the expectations of the profession and to stimulate a lifelong interest in advancing the field of geotechnical engineering.

Keywords : geotechnical engineering, academic training, industry requirements, earth retaining structures

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