AIMS^2 Research Project for Fall 2019 – Spring 2020

Title of Project:	Geotechnical Earthquake Engineering Research: Parametric Study of Seismic Active Earth Pressures on Retaining Walls
Faculty:	Prof. Tzong-Ying Hao

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Project Description

Retaining walls are common structures used to retain earth materials while maintaining a grade change between the front and rear of the wall. The retaining walls are designed to resist earth pressures acting on the rear face of the wall that are caused by the weight of the soil, seismic loads and various surcharge loads.

The findings of Summer 2019 project suggest that the Generalized Limit Equilibrium (GLE) method provides the convenience and simplicity process for engineers in practice. As continued efforts to improve the process, this project will focus on the comparisons of GLE and other published methods used to analyze the seismic active earth pressures for various earthquake ground accelerations.

Goals and Objectives of the Project

(1) Introduce fundamental mechanics of earth materials,
(2) Develop equations based on force equilibrium approach,
(3) Perform numerical calculations on spreadsheets for various combinations of material parameters, and review and summarize the results; and
(4) Compare the results with other published methods.

Expectations

Student research assistants are expected to:

- Attend meetings and work 6 to 8 hours per week,
- Present their work in the AIMS^2 Research Symposium (early Fall 2020, TBA),
- Have strong fundamental engineering background, such as Statics and Mathematics,
- Have computer aided graphic skill, and
- Be willing to learn while learning and think deeply about this project.

Outcomes

Through this project students will:

(1) Develop research skills such as an ability to find and review technical articles to get needed information,
(2) Be engaged to engineering problem-solving steps, and
(3) Enhance their oral and written communication skills (i.e., create a poster, prepare Power Point slides, present orally).