

**Department of Civil Engineering and Engineering Mechanics  
Columbia University**

**2017 Dongju Lee Memorial Lecture**

**Use of Cross and/or Buttress Walls to Protect  
Adjacent Buildings in a Deep Excavation**

**Dr. Chang-Yu Ou**

National Taiwan University of Science and Technology

Tuesday, October 10, 2017

Time: 2:30PM – 3:30PM

Location: 411 Hamilton Hall

Deep excavation in soft clay often causes a significant ground settlement, which in turn damages adjacent buildings. Ground improvement is one of the measures to reduce the ground settlement but its quality is difficult to ensure. In this talk, use of cross and/or buttress walls to protect adjacent buildings in a deep excavation is presented. Cross walls are constructed in a deep excavation starting from one side of a diaphragm wall to the opposite side using the diaphragm wall construction technology. Cross walls function as lateral struts but exist before excavation. With the installation of cross walls, the ground settlement can be reduced significantly. Four case histories with cross walls are presented. However, installation of cross walls is expensive in wide excavations. Buttress walls can be an alternative. The buttress wall is constructed in a way similar to the cross wall but with a limited length. This talk will introduce the two case histories with buttress walls. With an appropriate combination of cross and buttress walls, the adjacent buildings can be ensured and even able to achieve a strut-free lateral support system.

**Dr. Chang-Yu Ou** is a professor in the Department of Construction Engineering at the National Taiwan University of Science and Technology. His research areas include deep excavation, electro-osmotic soil improvement, soft ground tunneling, and soil-structure interaction. Dr. Ou is the Coordinator of the Civil Engineering Program for the National Science Council of Taiwan and Editor-in-Chief of the *Journal of GeoEngineering*. He received bachelor's and master's degrees from National Cheng-Kung University and his PhD from Stanford University.

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**The Dongju Lee Memorial Lecture** was established with a generous contribution from the Lee family. We would like to express our gratitude to DJ's father, Prof. Yong-won Lee (who was the President of Chinju National University of Education, Korea), for his support in establishing the Lecture. DJ, as Dongju preferred to be called, was a student at the Department of Civil Engineering and Engineering Mechanics, where he obtained the MS degree in February 2002 and the Professional degree in February 2003. He completed all course requirements for the PhD in the field of Geotechnical Engineering.