ACI SC Annual Project Competition 2022

The ACI Singapore Chapter (ACI SC) held its ACI SC Annual Project Competition 2022 themed "Advanced Concrete Materials & Technologies for the Future" on December 16, 2022. This year's project competition was the first in-person competition since the COVID-19 pandemic. In addition, the competition was available online via Microsoft Teams for those who could not attend in-person. The competition was a great success, and attendees, including judges, participants, supporters, and ACI SC board members, benefited from the discussions and ideas on the interesting projects.

Lu Jinping, President of ACI SC, made an opening speech highlighting that the competition was aimed at facilitating the progress of the concrete industry toward innovative applications of high-quality materials and technologies to improve the quality of living through designing and building environmentally sustainable and livable cities. He then thanked the organization team led by Desmond Low, Li Wei, Jiang Shan, Tao Nengfu, and Lim Jian Ye for their efforts in organizing this year's competition and introduced the judges and participating teams.

The competition comprised the submission of a project summary and PowerPoint presentation. There were two categories in this competition:

- Students' Category—for polytechnic, institute of technical education, and junior college students; and
- Open Category—for students, academics, and researchers from industry, universities, and practitioners.

Gold Award winners (Students' Category) with ACI SC President Lu Jinping and Vice President Chen Enyi

Gold Award winner (Open Category) with ACI SC President Lu Jinping and Vice President Chen Enyi

Judges, organizing committee members, and participants at the ACI SC Annual Project Competition

This year's entries were very high quality. The projects were presented to a panel of judges consisting of distinguished academics and practitioners in the concrete industry. The competition for the student category was chaired by Lim Jian Ye, President of the ACI Singapore Student Chapter, and also a student in his fourth year pursuing his Bachelor of Engineering degree, majoring in civil and structural engineering at the National University of Singapore. The competition for the open category was chaired by Jiang Shan, Honorary Secretary, ACI SC.

After a competition among 12 teams, a team consisting of two students from Singapore Polytechnic won the Gold Award (Students' Category) for their project on "Aerogel Incorporated Cement Plaster," while the Gold Award (Open Category) went to the National University of Singapore for their work on "Measurement of 2D Particle Shape Descriptors by Static Image Analysis Using MASK-RCNN."

Discover, Learn, and Experience Workshop at ASC Show 2022

The ACI Singapore Chapter Student Committee collaborated with the Temasek Polytechnic School of Applied Science (ASC) at its Centre for Urban Sustainability facilities during the ASC Show 2022. An introductory workshop on "Building with Low-Carbon Materials" for high school and tertiary education students was held on October 19, 2022. The objective of this workshop was to highlight and understand the importance of using low-carbon materials (for example, clay) as an alternative material to high-carbon cementitious concrete. There were hands-on activities involving 20 students using air-dried clay to mimic the high-compressive, low-tensile strength characteristics of concrete.

The workshop introduced the basic material properties of concrete and described how the addition of excavated waste clay, which is found in abundance across Singapore, can help concrete to be more sustainable. This workshop aimed to spark interest among the attendees toward concrete studies and to enlighten them about the sustainability efforts within the built industry.

The Student Committee conducted the introductory lesson for the participants and elaborated on the significance of using waste clay in concrete mixtures, including its potential to replace sand, which Singapore lacks due to the country's limited natural aggregate resources.

After the lesson, the student participants witnessed the flexural testing of miniature beams, measuring 400 x 400 x 1600 mm (16 x 16 x 63 in.), made of air-dried clay. The clay material was chosen to compare with the profiles of concrete compressive and tensile strengths. Each set consisted of a control beam with no reinforcement and a test beam reinforced with wooden chopsticks. The flexural tests were conducted to illustrate the importance of reinforcement within a concrete structure to enhance its load capacity.

Flexural testing of clay beams using an Instron universal testing machine

Student participants during the hands-on clay modeling session

Workshop group with student participants

In the remaining part of the workshop, each student participant was given a block of air-dried clay for a hands-on modeling session. While handling the clay material, the participants were introduced to the concept of workability, such that the addition of water allows easier handling of the material but has a trade-off in strength. The participants were able to bring home the modeled clay blocks as souvenirs.