

Chapter Reports

Advancements in Concrete Technology Showcased at ACI ULaval Conference

The annual ACI ULaval Conference was held at Université Laval (ULaval), Québec City, QC, Canada, on September 20, 2023. This event was organized by the ACI Université Laval Student Chapter. Bringing together students, professors, and technical staff from the university's research group, the conference aimed to foster collaboration and exchange ideas on the latest technological developments and innovative projects in the field of concrete structures.

The day was filled with insightful presentations, comprising three academic research sessions and three industry presentations. The lineup provided a comprehensive overview of cutting-edge advancements in both theoretical and practical aspects of concrete design, construction, and management.

The Student Chapter surveyed the preferences of the association members by requesting them to complete a form by listing a number of subjects. The lectures included topics such as ecological optimization in concrete, three-dimensional printing and architectural design, structural observation and repair, and the impact of aggregates on concrete.

The academic presentations delved into the intricacies of recent research projects conducted within the university's laboratories and on site, showcasing the depth of knowledge and expertise within the academic community. Topics ranged from materials science to structural engineering, demonstrating the commitment of the university's research group to addressing contemporary challenges in the realm of concrete technology.

Complementing the academic sessions, industry presentations offered a valuable bridge between theoretical knowledge and real-world applications. Professionals from the concrete industry shared their experiences, best practices,

and insights gained from working on various projects. This interaction facilitated a dynamic exchange of ideas, providing students and researchers with practical perspectives on the implementation of concrete technologies in the field.

The lectures were largely organized by student committee members, and in addition to the lectures, the morning snack, meal, and beverages were arranged by the organization. The success of the event is mainly due to the financial support of numerous partners. Without the donors' generosity, this event could not have taken place.

The ACI ULaval Conference 2023 underscored the importance of bridging the gap between academia and industry. As the ACI Université Laval Student Chapter reflected on the success of this conference, it became evident that such initiatives play a pivotal role in shaping the future of concrete technology. The ACI ULaval Conference not only celebrated the achievements of the academic and industrial communities but also set the stage for continued collaboration and innovation in the dynamic field of concrete engineering.

ACI Singapore Chapter Annual Seminar 2023

The ACI Singapore Chapter organized its Annual Seminar 2023—Concrete Horizons: Advancing Sustainability and Innovation in Concrete Technologies on October 27, 2023, at the Holiday Inn Singapore Orchard City Centre. The seminar was supported by 22 sponsors and co-organizers and was themed “Innovations and Sustainability in Concrete Technology: Building a Stronger Future.” Eleven keynote speakers were featured, comprising industry experts, academics, and private practitioners who shared their expertise and vast knowledge of the rapid advances and developments in concrete technology. This seminar provided a forum to promote innovation, sustainability, and productivity in concrete technology as well as applications for the construction industry to exchange knowledge and provide opportunities for industry experts, researchers, academics, and students to network in the field.

The seminar was chaired by Geng Guoqing, Assistant Professor, Department of Civil and Environmental Engineering, National University of Singapore, and a Director of the ACI Singapore Chapter Board.

Guest of Honor address

The seminar was privileged to have Kaliannan Thanabal, Commissioner of Building Control, Group Director (Building Resilience), Building and Construction Authority (BCA), as the Guest of Honor. During his address, he stressed the importance of sustainability as the impacts of climate change



Participants of the 2023 ACI ULaval Conference

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have become increasingly evident in our day-to-day lives. He updated the audience on the efforts by BCA to address sustainability issues in the built environment for Singapore's future.

Welcome address

Lu Jin Ping, ACI Singapore Chapter President, delivered a warm welcome address. First, Lu expressed his great honor to welcome 180 participants, consisting of the distinguished Guest of Honor, VIPs, keynote speakers, sponsors, and participants of the seminar. He then highlighted the theme of the seminar, with an emphasis on the need to balance innovation and sustainability in an era when environmental consciousness and resource efficiency are paramount. Lastly, Lu extended his gratitude to the seminar delegates and participants for their presence, which signified their commitment to the advancement of concrete technology and dedication to building a better world.

Presentations

Experts from renowned local institutions were invited to present various topics on sustainability and innovation in concrete technologies, including core challenges, innovative concrete technologies, sustainable concrete solutions, and application of concrete technologies.

The invited speakers included:

- Tan Sze Tiong, Group Director/Chief Sustainability Officer, Building & Research Institute, Housing & Development Board;
- Tan Kang Hai, School of Civil and Environmental Engineering, Director of Protective Technology Research Centre, Nanyang Technological University;
- Geng Guoqing, Assistant Professor, Department of Civil and Environmental Engineering, National University of Singapore;
- Wang Su, Senior Scientist, Pan-United Concrete Pte Ltd;
- Yang En-Hua, Associate Professor, School of Civil and Environmental Engineering, Nanyang Technological University;
- Thong Ya Xuan, Lead Research Scientist, Centre of Innovation for Built Environment Advanced Materials, Singapore Polytechnic;
- Tan Ming Jen, Professor, Nanyang Technological University, and Director, HP-NTU Digital Manufacturing Corporate Lab;
- Gan Cheng Chian, Technical Manager, Building Products, Bekaert Singapore Pte Ltd; and
- Qian Shunzhi, Associate Professor, School of Civil and Environmental Engineering, Nanyang Technological University.

Green Concrete Cube Competition 2023

The annual Green Concrete Cube Competition was jointly organized by the ACI Singapore Chapter and Temasek Polytechnic School of Applied Science, Centre for Urban Sustainability, aiming to facilitate the progress of the local concrete industry toward high-performance sustainable concrete technology. The competition was open to individuals, tertiary institutes, companies, and organizations.

The entries for the Green Concrete Cube Competition 2023 were of high quality. Out of 13 teams, two were from the Universiti Malaya, Kuala Lumpur, Malaysia. The panel of judges comprised distinguished academics and practitioners in the concrete industry. The top five winning teams were selected based on the judging criteria and awarded with the Gold Award (800 USD), Silver Award (600 USD), Bronze Award (300 USD), Merit Award (200 USD each), and Commendation (100 USD each), respectively. During the award presentation session, each team was invited to give a 5-minute presentation to discuss their design mixtures for the competition.

Closing speech

The seminar provided participants with a platform for networking, knowledge sharing, and exchange of ideas on sustainability and innovation in concrete technologies. In the closing speech, Geng Guoqing, Chair of the ACI Singapore Chapter Annual Seminar 2023, expressed gratitude to all who contributed to the success of the seminar.

As Geng stated in his closing speech, "This seminar owed much of its success to the organizing team, supporting



Guest of Honor Kaliannan Thanabala presenting during the opening address for the ACI Singapore Chapter Annual Seminar 2023

organizations, student Board members from ACI Singapore Student Chapter, and industry sponsors for their strong support.”

For more information about the ACI Singapore Chapter Annual Seminar 2023 and Green Concrete Cube Competition 2023, visit www.concrete.org.sg.

ACI Singapore Student Chapter Fundraising

The ACI Singapore Student Chapter hosted a Coaster Fundraising Event on October 27, 2023. Over the course of a month, the Student Chapter prepared, cast, and raised funds using beautifully crafted coasters. The proceeds generated from this event will serve to bolster future activities of the Student Chapter. In total, the coasters brought in 707 SGD.

Approximately 4 weeks prior to the event, the student members gathered at Singapore Polytechnic’s (SP) laboratory to commence the coaster casting process, drawing upon the knowledge and experience gained from previous workshops. Nonshrink grout cement was used for its known quick-setting properties. On the first day, the team diligently mixed the grout cement with water at a water-cement ratio (w/c) of approximately 0.4. This mixture was then placed into specially designed molds featuring intricate patterns, such as pandas, orcas, and cats. On that first day, the team successfully cast around 30 coasters, using up all available molds. Subsequently, these coasters were left to cure in the laboratory.

Three days later, several members returned to SP’s lab to demold and sand the coasters. The demolding was swift

because the mold had been oiled prior to the grout mixture placement. However, the sanding process was more cumbersome because the uneven surface, marred by sediment buildup, demanded careful attention to detail to ensure each coaster met the team’s exact standards. To address this, a sanding machine was used for some of the coasters, while the remainder were meticulously sanded by hand.

The coaster casting process was repeated an additional four times until the desired 120 coasters were successfully produced.

The next step in this creative journey was to determine how best to decorate the coasters for a polished finish. It was decided to coat the coasters with a layer of pristine white spray paint, accentuated by a delicate gold outline. This method emphasized the intricacies of the patterns engraved on the coasters. It took several days to complete the painting process and ensure the paint had dried.

To support the fundraiser, the Student Chapter members created a banner and a video that highlighted the vision, mission, and past events of the ACI Singapore Student Chapter. These events encompassed a visit to the company Samwoh, a concrete casting workshop at SP, and an Exchange dialog from Shenzhen University, among others. The banner served as a visual representation of the Student Chapter’s mission, helping to elucidate the purpose of its fundraising efforts. Simultaneously, the video showcased its various activities and played a pivotal role in conveying the Chapter’s narrative. This video presentation effectively portrayed the essence of the ACI Singapore Student Chapter, offering a comprehensive overview of its contributions and aspirations. Together, the banner and the video provided an immersive experience, enriching the audience’s understanding of the Chapter’s commitment to education and community involvement.

On the day of the fundraising event, all coasters were transported to the hotel where the event took place. Most of the sales occurred during the morning as seminar attendees registered for the event. Customers set their own prices for the coasters, giving them the opportunity to contribute as they saw appropriate. The team not only achieved its fundraising goals but also found immense satisfaction in the process. This event stands as a testament to the dedication and passion for advancing the goals of the ACI Singapore Student Chapter.



ACI Singapore Student Chapter fundraising event



Completed coasters

ACI Georgia Tech Student Chapter First Site Visit

The newly formed ACI Georgia Institute of Technology (Georgia Tech) Student Chapter went on its first-ever site visit. Students, faculty, and local practitioners joined a tour of one of Midtown Atlanta’s reinforced concrete high-rise

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construction projects. The new luxury condominium complex will tower over Juniper Street at 34 and 37 stories for the north and south towers, respectively. The Student Chapter got the opportunity to walk the site during work hours on the eighth story, which was cast earlier in the week.

The ACI Georgia Tech Student Chapter had already established a working relationship with structural engineers at Uzun + Case and General Contractor Brasfield & Gorrie, collaborating within the ACI Georgia Chapter. On site, the students learned about the project from representatives of both companies, who explained aspects from the aggressive project schedule to the innovative post-tensioning approach used in the slab system.

As a Student Chapter, the organization understands that these experiential learning opportunities are vital for professional and educational development as well as community building. All the attendees learned a lot and had a lot of fun. The Student Chapter looks forward to returning to this job, as it is expected to top out the north tower in the spring, and to having more field trips to jobsites, laboratories, and more.

ACI BUET Student Chapter Visit to ABC Building Products Ltd.

On September 7, 2023, the ACI Bangladesh University of Engineering and Technology (BUET) Student Chapter embarked on a journey into the realm of ready mixed concrete at ABC Building Products Ltd. Guided by the Chapter's Faculty Advisor, Rupak Mutsuddy, this immersive experience allowed the students to delve into the heart of the concrete industry and witness firsthand the intricacies of its operations.

The visit was not just a tour—it was an educational opportunity that provided the Student Chapter with unparalleled insights into every stage of concrete production, from the selection of raw materials to the implementation of top-notch safety protocols. Exploring the inner workings of ABC Building Products Ltd. was a unique chance for student members to broaden their understanding of the concrete industry and witness the meticulous processes that contribute to the creation of high-quality ready mixed concrete.

One of the highlights of the students' visit was gaining an insider's perspective on the complexities of the ready mixed concrete industry. The students were able to observe the production process from start to finish, witnessing the careful blending of materials, the precise measurement of proportions, and the rigorous quality checks that ensure the end product meets the highest standards. This hands-on experience deepened the students' appreciation for the precision and expertise required in producing concrete that is not only durable but also adheres to strict quality benchmarks.



ACI BUET Student Chapter members during a site tour at ABC Building Products Ltd.

The ACI BUET Student Chapter was particularly impressed by ABC Building Products Ltd.'s commitment to excellence and its state-of-the-art equipment. ABC Ready Mix Concrete showcased innovation and efficiency in its operations. The visit allowed the students to see how cutting-edge technology is harnessed to streamline processes, enhance productivity, and ensure the consistent delivery of high-quality concrete.

ACI CUET Student Chapter Technical Tour 2023

In an effort to bridge the gap between theoretical knowledge and practical application, the ACI Chittagong University of Engineering and Technology (CUET) Student Chapter embarked on a technical tour of the intricacies of industrial operations at Royal Cement Ltd. and KSRM Steel Plant Ltd. in Bangladesh.

The journey commenced with a warm welcome and safety briefing extended by the staff, emphasizing the inherent risks of the industrial zone. Commorade M.S. Kabir, Plant Director, provided a comprehensive overview, paving the way for an immersive experience.

For this captivating exploration from a civil engineering perspective, the ACI CUET Student Chapter was divided into two groups, A and B, for a fascinating look at the production processes of steel and cement.

Group A toured the pivotal melting and rolling zones of the steel factory. The melting zone is where imported scraps are transformed into billets—the very essence of structural steel. The scraps, sourced internationally, were liquefied by the intense heat to forge the fundamental building blocks of steel.

As the molten metal took shape, the rolling zone showcased the process of shaping these billets, demystifying the intricate path from raw material to the structural backbone of modern construction.

Simultaneously, Group B delved into the world of cement production for a tangible manifestation of theoretical knowledge acquired in classrooms. At the cement factory, they witnessed the practical embodiment of principles learned in civil engineering courses. This segment of the tour not only broadened the students' perspectives on the practical applications of civil engineering but also instilled an appreciation for the complexities involved in transforming raw materials into the robust structures that define the built environment. The fusion of theory and reality in these industrial processes served as a valuable educational experience, enriching the students' understanding of the civil engineering discipline.

In the second session, groups were swapped, ensuring every student had the opportunity to explore both the steel and cement factories. This intentional rotation fostered a comprehensive understanding of diverse industrial processes, enriching the students' knowledge and broadening their perspectives within the realms of both steel and cement



Participants of the ACI CUET Student Chapter Technical Tour 2023

production. Despite the inherent risks associated with these industrial sites, the adherence to safety protocols by the students not only guaranteed an accident-free experience but also underscored the paramount importance of prioritizing safety in the pursuit of knowledge and professional growth.

This tour, characterized by its theoretical insights and practical exposure, underscored the Chapter's dedication to preparing students for the dynamic challenges of the engineering industry.

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