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CONCRETE PANEL COMPETITION 2026

American Concrete Institute Singapore Chapter – ACI SC has been playing a proactive role in developing concrete technology through education, training, conferences, and short seminars. Its annual concrete competition also aims to facilitate the progress of the local concrete industry toward high-performance sustainable concrete technology. Each year, the competition also seeks to foster some positive engagement among the industry players and academic researchers/students.

For the Concrete Competition 2026, the theme will be Concrete Panel Challenge. Organized by the American Concrete Institute Singapore Chapter (ACI-SC), this annual competition promotes innovation, sustainability, and engineering excellence in concrete technology. The 2026 edition focuses on developing practical, real-world concrete products with measurable performance.

Eligibility

This competition is open to two categories **(**please see **Rules and Regulations below).** Each participant is limited to one team only. **Registration for the ACI-SC Concrete Panel Competition 2026 is free**.

Rules and Regulations

1. The Concrete Panel Competition 2026 will be judged by the following 4 criteria:
   i. **Criterion 1** - Average flexural strength of concrete panel according to ASTM C947 (the higher the better).
   ii. **Criterion 2** – The ratio for average Compressive strength (ASTM C109) to average concrete density (the higher the better).
   iii. **Criterion 3** - Ratio for recycled waste material mass to total concrete mass. (To be declared in concrete mix design, computed up to 1% – the higher the better)
   iv. **Criterion 4** – Write up (***Please refer to Annex 4***) on how the recycled waste material/s affects the compressive strength or the density or the positive impact towards the zero-carbon initiative.

2. The weightages for scoring for each of the criteria are **1st criterion (50%)**; **2nd criterion (30%)**; **3rd criterion (10%)** and **4th criterion (10%)**.

3. See below for an example of a scoring system:

   Team A achieved an average flexural strength of 50 MPa, average compressive strength of 90MPa and an average density of 1810 kg/m3 (both averages of 3 cubes). Team A also reported a ratio of 30% for Criterion 3 and had a score of 73% for the write-up (For Criterion 4 - awarded by the panel of judges).

   Assumed 10 teams participating, Team A is 2nd for Criterion 1, 4th for criterion 2, 5th for criterion 3, and 9th for criterion 4:

   In this scenario, Team A would have a score of (9/10 x 50%) + (7/10 x 30%) + (6/10 x 10%) + (2/10 x 10%) = 74%

   The team with the highest score will be the winner.

4. Tie-breaker – In the case of a tie-in score, the submission with the higher flexural strength wins the tie.

5. In each entry, the applicant shall submit 4 numbers of 50mm cubes (Compressive Strength Test) and 2 numbers of Panels with Size: 900mm x 300mm x 20mm (Flexural Test). These cube specimens shall be delivered to the appointed test laboratory on the testing date as specified hereunder.

   One (1) of four (4) cubes will be selected randomly and split into two (2) halves to reveal the cross-sections. The judges would review (by observation) the cross sections. Photos of the cross sections will be taken for recording purposes.

   The average density of the remaining (3) cubes will be computed. These three (3) cubes will be tested for compressive strengths and the average computed.

   The dimensions of the panels will be measured. Any dimension that exceeds +/- 5mm will be disqualified.

6. The minimum average compressive strength of the 3 cubes must be **at least 40MPa**.

7. The type of cement used **MUST** be the materials listed in Table 1 of SS 544: Part 2: 2024 Singapore Standard Concrete – Complementary Singapore Standard to SS EN 206 – Part 2: Specification for constituent materials and concrete – Amendment No. 1 2024 (**see the table 1 enclosed**).
   However, recycled waste materials must **NOT** be any of the cementitious components mentioned **in table 1 enclosed**.

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Table 1 — The 27 products in the family of common cements

Main types	Notation of the 27 products (types of common cement)		Composition (percentage by mass[a])										
			Main constituents										Minor additional constituents
			Clinker	Blast-furnace slag	Silica fume	Pozzolana		Fly ash		Burnt shale	Limestone		
						natural	natural calcined	siliceous	calca-reous				
			K	S	D[b]	P	Q	V	W	T	L	LL	
CEM I	Portland cement	CEM I	95-100	–	–	–	–	–	–	–	–	–	0-5
CEM II	Portland-slag cement	CEM II/A-S	80-94	6-20	–	–	–	–	–	–	–	–	0-5
		CEM II/B-S	65-79	21-35	–	–	–	–	–	–	–	–	0-5
	Portland-silica fume cement	CEM II/A-D	90-94	–	6-10	–	–	–	–	–	–	–	0-5
	Portland-pozzolana cement	CEM II/A-P	80-94	–	–	6-20	–	–	–	–	–	–	0-5
		CEM II/B-P	65-79	–	–	21-35	–	–	–	–	–	–	0-5
		CEM II/A-Q	80-94	–	–	–	6-20	–	–	–	–	–	0-5
		CEM II/B-Q	65-79	–	–	–	21-35	–	–	–	–	–	0-5
	Portland-fly ash cement	CEM II/A-V	80-94	–	–	–	–	6-20	–	–	–	–	0-5
		CEM II/B-V	65-79	–	–	–	–	21-35	–	–	–	–	0-5
		CEM II/A-W	80-94	–	–	–	–	–	6-20	–	–	–	0-5
		CEM II/B-W	65-79	–	–	–	–	–	21-35	–	–	–	0-5
	Portland-burnt shale cement	CEM II/A-T	80-94	–	–	–	–	–	–	6-20	–	–	0-5
		CEM II/B-T	65-79	–	–	–	–	–	–	21-35	–	–	0-5
	Portland-limestone cement	CEM II/A-L	80-94	–	–	–	–	–	–	–	6-20	–	0-5
		CEM II/B-L	65-79	–	–	–	–	–	–	–	21-35	–	0-5
		CEM II/A-LL	80-94	–	–	–	–	–	–	–	–	6-20	0-5
		CEM II/B-LL	65-79	–	–	–	–	–	–	–	–	21-35	0-5
	Portland-composite cement[c]	CEM II/A-M	80-88	‹---------- 12-20 ----------›									0-5
		CEM II/B-M	65-79	‹---------- 21-35 ----------›									
CEM III	Blast furnace cement	CEM III/A	35-64	36-65	–	–	–	–	–	–	–	–	0-5
		CEM III/B	20-34	66-80	–	–	–	–	–	–	–	–	0-5
		CEM III/C	5-19	81-95	–	–	–	–	–	–	–	–	0-5
CEM IV	Pozzolanic cement[c]	CEM IV/A	65-89	–	<---------- 11-35 ---------->					–	–	–	0-5
		CEM IV/B	45-64	–	<---------- 36-55 ---------->					–	–	–	0-5
CEM V	Composite cement[c]	CEM V/A	40-64	18-30	–	<------- 18-30 ------->			–	–	–	–	0-5
		CEM V/B	20-38	31-49	–	<------- 31-49 ------->			–	–	–	–	0-5

[a] The values in the table refer to the sum of the main and minor additional constituents.

[b] The proportion of silica fume is limited to 10 %.

[c] In Portland-composite cements CEM II/A-M and CEM II/B-M, in pozzolanic cements CEM IV/A and CEM IV/B and in composite cements CEM V/A and CEM V/B the main constituents other than clinker shall be declared by designation of the cement (for examples, see Clause 8).

8. Recycled Waste materials like recycled concrete aggregates; and recycled materials such as plastic, glass, clay, etc. can be used.

9. The recycled waste materials to be used shall be **declared in the official entry form and must be approved by the judges** before casting the cubes. In the official entry form, **more than one recycled waste material can be submitted for approval**. The final selected recycled waste material/s used should be amongst the approved recycled waste material/s in the official entry form submitted.

10. The ratio of recycled waste material mass to total concrete mass shall be **at least 10%**.

11. **A photo/s of the recycled waste material/s** used is to be submitted together with the write-up.

12. Each contestant shall provide, together with the specimens submitted, a statement declaring/showing the following (see **sample form for concrete mix design** provided):
    i. The mix composition of the submitted concrete cubes.
    ii. The type, strength class, and density of cement to be used.
    iii. The type and density of Additions/Supplementary Cement Materials SCM to be used.
    iv. The type and density of coarse aggregates to be used.
    v. The type and density of fine aggregates to be used.
    vi. The type of admixtures and/or additives to be used.
    vii. The type and density of recycled waste material to be used.
    viii. The date for the casting of the cubes.
    ix. The method of curing.

    Contestants are required to furnish additional details if requested by the panel of judges.

13. The **flexural and compressive strength** shall be recorded to the **nearest 0.1 MPa** and the **concrete density to 10 kg/m^3**.

14. The **compressive strength-to-density ratio** shall be computed to the nearest **0.0001 MPa /(kg/m^3)**.

15. The **compressive strength standard deviation shall not exceed 5 N/mm^2**.

16. **THE DECISION OF THE PANEL OF JUDGES SHALL BE FINAL.** The organizer and the judges are not obliged to provide any reasons or enter any discussions or correspondence relating to these rules and regulations, the organization of the competition, or any of the judges' decisions. Announcement of Winners will be on ***Tuesday, 22 September 2026***.

Registration and Submission

1. Entries submitted may be individual or group entries of not more than 5 members. Each participant/team is allowed to submit **one** entry only.

2. There are two categories in this competition:
   Student Category –
   for students from Undergraduate, Polytechnic, ITE and Junior Colleges
   Open Category –
   for academics (Master, PhD), and Researchers from Universities and Practitioners from Industries

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3. Interested participants/teams must submit expression of interest for the participation by ***31 May 2026*** (see template in **Annex 2**).

4. Interested participants/teams must submit Concrete Mix Design by **15 June 2026** (see template in **Annex 3**).

5. All submissions will be reviewed, and approved entries from each category will be notified on ***20th June 2026***.

6. The selected participants/teams are to **submit completed competition write up summary *(see template in Annex 4)*** to email address below **by *Friday, 31 July 2026, 11:59PM* (Singapore Time)**:

   Subject: **Submission by "XXX" ("Participant's Name") for Panel Competition Summary at ACI (SC) 2026**
   Email address: **heng.fokhun@concrete.org.sg & Desmond.low@concrete.org.sg**

7. Casting of specimens: Any date between ***14 July to 31 Jul 2026***
   Photo/s of the specimens cast - showing labels stating:

   - *ACI CONCRETE COMPETITION*
   - *the date of casting and*
   - *Specimen numbering*

   to be emailed to the above e-mail address on the day of casting. The photo/s will be used for verification during testing.

8. Date and time for testing (after 28 days from casting date ***11 August to 28 August 2026***) to be arranged accordingly. Specimens must be delivered to the testing lab on the testing day.

9. Test Laboratory Appointed: ***R.A.K Materials Consultants Pte Ltd at BLK 2032, Bukit Batok Street 2, #01-298, Singapore 659537***.

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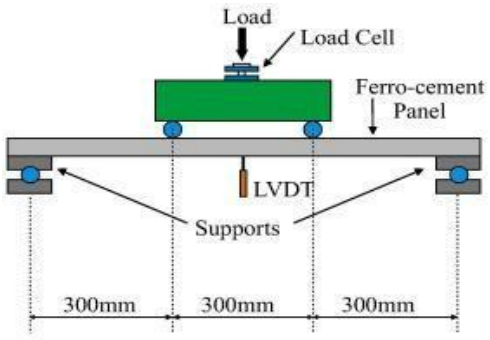
10. The prize presentation will be at the Annual ACI-SC conference on ***22 September 2026 Tue***. Five prizes in each category will be awarded as follows:

Award	Students' Category	Open Category
Gold	S$1000	S$1000
Silver	S$800	S$800
Bronze	S$500	S$500
Merit	S$200	S$200
Commendation	S$100	S$100

11. Critical dates for Competition as follows:

	Date of Submission
Express of Interest	31 May 2026
Mix Design Submission	15 June 2026
Announcement of Approved Candidates	20 June 2026
Casting of Panel & Cubes	14 July – 31 July 2026
Write-Up Submission	31July 2026
Dates of Testing	11 August – 28 August 2026
Announcement of Winner	22 September 2026

ANNEX 1 (Typical Examples)



a) Schematics of Flexural Test

b) Flexural Test Setup

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ANNEX 2

CONCRETE PANEL COMPETITION 2026

OFFICIAL ENTRY FORM

(Due Date: 31 May 2026)

CATOGERY – OPEN / STUDENT (Circle to Choose - only one)

NAME OF TEAM:

_____

INDIVIDUAL / TERTIARY INSTITUTE / COMPANY / ORGANIZATION

_____

ADDRESS:

_____

_____

NATURE OF BUSINESS:

_____

NAME OF TEAM MEMBERS:

1. _____
2. _____
3. _____
4. _____
5. _____

Team Leader : _____ Contact Tel No. : _____

Designation: _____ Email Address : _____

Date: _____ **Signature :** _____

PROGRESS THROUGH KNOWLEDGE

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ANNEX 3

CONCRETE PANEL COMPETITION 2026

CONCRETE COMPOSITION

(Due Date: 15 June 2026)

01 Cement Type: _____

02 Additions / Supplementary Cementitious Materials SCM: _____

03 Coarse Aggregate Type & Size: _____

04 Fine Aggregate Type & Size: _____

05 Admixture/Additive/Others: _____

06 Fiber Type: _____

07 Water: _____

08 Date of Casting: _____

09 Method of Curing: _____

Note: Contestant can add to the above list (if necessary)

Person-in-charge: _____ Contact Tel No.: _____

Designation: _____ Email Address: _____

Date: _____

_____

Signature

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ANNEX 4

CONCRETE PANEL COMPETITION 2026

Write Up Rules
(Due Date: 31 July 2026)

01 Project Summary

02 Each participant/team is required to prepare a project summary comprising the following sub-headings:

- Arial Font – Size 12
- Line Spacing – 1.5
- Maximum of 5 pages write up (Including Results, Tables, Diagrams and Photos if any)

03 Project Title

04 Abstract (Maximum 100 words)

05 Introduction

06 Problem(s)/Issue(s) Arising, Key Challenges(s), Solution(s), Key Challenge(s), Innovativeness, Application(s) where it can be applied to.

07 Materials and Methods

08 Results and Discussion

09 Conclusions and Recommendations

Photo/s of Recycled Waste Material/s used to be enclosed.