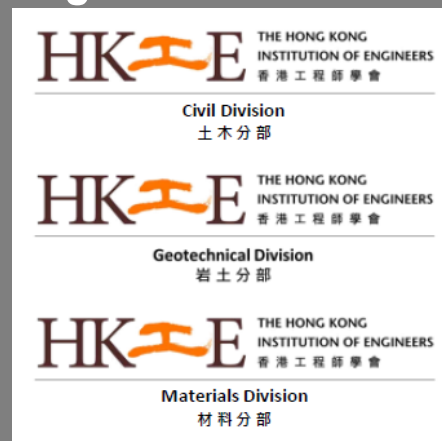


Initiating and Steering Organisation:
混凝土科技常務委員會
Standing Committee on Concrete Technology (SCCT)

LOW CARBON CONCRETE TROPHY COMPETITION 2022

Rule Book and Forms

Organisers:



Supporting Organisations:



LOW CARBON CONCRETE TROPHY COMPETITION 2022

Rule Book and Forms

(Version 4.0)

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1. INTRODUCTION

Hong Kong is striving to achieve carbon neutrality by 2050. Construction is a major activity supporting the economic development of Hong Kong, and hence has an indispensable role in achieving this net zero carbon goal. As a huge amount of concrete is needed for our construction, there is a genuine need to promote the use of low carbon concrete.

To reduce the carbon footprint in concrete production, the use of alternative cementitious materials, such as pulverised fly ash (PFA) and ground granulated blast-furnace slag (GGBS) which have proven effective, has been promoted to our construction industry for some time. The general specifications of the Hong Kong Special Administrative Region Government have allowed the use of PFA to replace cement in concrete production for public work projects in the past three decades. From 2012 onwards, the use of GGBS as cement replacement has also been permitted. The cement replacement level could be up to a maximum of 35% and 75% for PFA and GGBS respectively. Over the years, the production of PFA in Hong Kong is diminishing as local power companies progressively phase out the use of coal for power generation. The trend of using GGBS concrete is now on the rise. It is therefore very important for students, young engineers and all stakeholder practitioners in our construction industry, especially concrete-related practitioners, to become more knowledgeable and committed in the use low carbon concrete, particularly GGBS concrete, in all our construction projects.

The Standing Committee on Concrete Technology of the Development Bureau has initiated this competition, viz “Low Carbon Concrete Trophy Competition 2022”, to arouse the awareness and interest of various personnel and construction industry stakeholders. The initiative has received overwhelming support from the Civil Division, Geotechnical Division and Materials Division of the Hong Kong Institution of Engineers. After gaining the support from many organisations of our construction industry, these three Divisions of HKIE have joined hands to organise the competition.

2. OBJECTIVES

The objective of the Low Carbon Concrete Trophy Competition 2022 is to arouse the awareness and interest of stakeholders in the construction industry towards the benefits of low carbon concrete produced using GGBS.

The participants are required to design a mix of low carbon concrete using GGBS, from which four standard 100 mm cubes and one 100 mm dia. x 200 mm cylinder will be produced to achieve the highest relative score in terms of cost effectiveness (the concrete’s compressive strength and material cost), environmental friendliness (equivalent CO₂ emission of cementitious materials), and durability (ability to resist chloride ion penetration).

3. ENTRY REQUIREMENTS

3.1 Entry for the competition should be made under either the **Students Category** or the **Practitioners Category**. The eligibility and entry requirements of each Category are given below.

3.2 Students Category

(a) Eligibility

Full-time students of the local tertiary education institutes/universities listed below, studying in a bachelor or higher degree programme accredited by the Hong Kong Institution of Engineers / Hong Kong Council for Accreditation of Academic & Vocational Qualifications for admission to the disciplines of civil/geotechnical/materials.

- Department of Civil Engineering, the University of Hong Kong (HKU)
- Department of Civil and Environmental Engineering, the Hong Kong University of Science and Technology (HKUST)
- Department of Civil and Environmental Engineering, the Hong Kong Polytechnic University (PolyU)
- Department of Architecture and Civil Engineering, City University of Hong Kong (CityU (ACE))
- Department of Materials Science and Engineering, City University of Hong Kong (CityU (MSE))
- Department of Construction Technology and Engineering, the Technological and Higher Education Institute of Hong Kong (THEi)
- Department of Civil Engineering, Chu Hai College of Higher Education (CHC)

(b) Entry Requirements

- (i) Entry should be in the form of a team of three to six members from the same degree programme under the relevant department of each local tertiary education institute/university listed in Section 3.2(a).
- (ii) A maximum of two teams is allowed from each of the local tertiary education institute/university department listed in Section 3.2(a). *[Remarks: Selection for entries from the same institute/university department, if required, is at the sole discretion of the respective programme coordinator - see Section 13.1 below]*

3.3 Practitioners Category

(a) Eligibility

Companies registered in Hong Kong, with experience in concrete production/construction materials supply, design, construction and repair/maintenance works requiring the use of concrete or laboratory testing for concrete-related tests in projects in Hong Kong, meeting any of the following business nature.

- Production and supply of concrete, certified under the Quality Scheme for Production and Supply of Concrete (QSPSC) (“*Concrete Producer*”); OR
- Supply of construction raw materials related to concrete production or supply of cementitious products, certified to ISO9001 for the design, production and supply of such construction raw materials or cementitious products (“*Material Supplier*”); OR
- Initiation, development or management of construction projects, e.g. Government Departments, Airport Authority, Hong Kong Housing Society, MTRCL, Urban Renewal Authority, private developers, etc. (“*Client*”); OR
- Construction or repair/maintenance of building, foundation or infrastructure works (“*Contractor*”); OR
- Engineering consultancy services (“*Consultant*”); OR

- Laboratories accredited by HOKLAS for concrete-related tests (“*Laboratory*”).

(b) Entry Requirements

- An entry should be in the form of a team of three to eight members.
- At least one member of each team should come from a *Concrete Producer or a Material Supplier*. Preferably, each team should be joined by member(s) from a *Client* and/or a *Contractor* and/or a *Consultant* and/or a *Laboratory*.
- Any eligible company can join a maximum of two teams. (*Note: Each person can participate in one team only.*)

3.4 The registration arrangements are outlined in Section 13.

4. MATERIALS

- Concrete constituent materials (covered by a certificate issued under the CIC Carbon Labelling Scheme or CIC Green Product Certification Scheme, where available) will be provided by the Organising Committee. Only these materials shall be used in the competition.
- Details of the materials (without the brand names), their relevant data (e.g. as given in the scheme or test certificates) and reference unit costs will be provided to the competing teams upon confirmation of registration.
- Participating teams are permitted to carry out trials at their own venues prior to the date of the actual mixing and casting. The concrete constituent materials will be made available for collection from the Public Works Regional Laboratory (Sham Shui Kok) from mid July 2022 onwards (tentatively). The teams shall arrange their own transportation of the materials to their venues for trials.

5. REQUIREMENTS

5.1 Students Category:

Each team will be required to design one concrete mix satisfying the following requirements:

- Target compressive strength of test cubes at 28 days: 45 MPa
- Nominal maximum aggregate size: 20 mm
- Design Slump: 150±35 mm (Please read Clause 16.27 of the General Specification for Civil Engineering Works (2020 Edition) (GS 2020) and Section 2 of CS1:2010).
- The cementitious content is the combined total mass of cement and GGBS per cubic metre of compacted concrete produced. The cementitious content shall be within the range between 270kg/m³ and 550kg/m³.
- GGBS must be used, and its proportion shall comply with Clause 16.14(6) of GS 2020.
- The making of cubes shall be completed within 2.5 hours in accordance with CS1:2010.
- The slump test shall be conducted at least one hour after the addition of water.

5.2 Practitioners Category:

Each team will be required to design one concrete mix satisfying the following requirements:

- (1) Target compressive strength of test cubes at 28 days: 60 MPa
- (2) Nominal maximum aggregate size: 20 mm
- (3) Design Slump: 150±35 mm (Please read Clause 16.27 of GS 2020 and Section 2 of CS1:2010)
- (4) The cementitious content is the combined total mass of cement and GGBS per cubic metre of compacted concrete produced. The cementitious content shall be within the range between 270kg/m³ and 550kg/m³.
- (5) The proportion of GGBS as a separate cementitious material shall be between 35% and 90% of the total cementitious content for the concrete.
- (6) The making of cubes and cylinder shall be completed within 2.5 hours in accordance with CS1:2010.
- (7) The slump test shall be conducted at least one hour after the addition of water.
- (8) The results of the rapid chloride penetration test (RCPT) shall not exceed 4,000 Coulombs¹.

5.3 The mix design submission arrangements are outlined in Section 13.

6. CASTING OF CUBES AND CYLINDERS AND PERFORMING SLUMP TESTS

- 6.1 Each team is permitted to carry out trials at its own venue prior to the day of the actual mixing and casting. The arrangement of distributing the concrete constituent materials for trials is outlined in Section 4.
- 6.2 The exact date of casting the cubes and cylinders will be announced in mid July 2022 (tentatively in August 2022 for both the Students Category and the Practitioners Category).
- 6.3 On the day of the actual mixing and casting, each team will be required to mix one batch of concrete, followed by sampling fresh concrete to perform slump tests and make four standard 100 mm cubes and one 100 mm dia. x 200 mm cylinder (Note: *Casting of cylinder is required for the Practitioners Category only*) in accordance with CS1:2010. The team will have free access to OPC, GGBS, coarse and fine aggregates at normal sheltered stockpile conditions, water and admixtures. Each mix shall have a sufficient amount of concrete for performing two slump tests and for making the required number of 100 mm cubes and one 100 mm dia. x 200 mm cylinder. For the avoidance of doubt, concrete used for performing the slump tests shall be reused for the casting of cubes and cylinders as far as practicable.
- 6.4 If there is any change in the mix details when mixing the concrete, the actual mix used shall be submitted for compliance checking and record on the same day of mixing the concrete.
- 6.5 The actual mixing and casting will be conducted at the following locations:
 - (a) Students Category:
The Hong Kong Polytechnic University Concrete Technology Laboratory (PolyU Concrete Lab)

¹ The RCPT procedures shall comply with Section 19 of CS1:2010. A RCPT result with a charge passed exceeding 4,000 Coulombs indicates a “High” chloride ion penetrability and low reinforced concrete durability.

(Note: Mixers and the actual aggregate moisture contents will be provided to the teams by PolyU Concrete Lab.)

(b) Practitioners Category:

Public Works Regional Laboratory (Sham Shui Kok) (PWRLSSK)

(Note: The teams are required to bring their own portable mixing tools and devices to determine the actual aggregate moisture contents of the aggregates and mixing of the concrete. Advance approval on the use of such tools and devices should be obtained from the Organising Committee.)

- 6.6 A unique reference number will be assigned to each team for the labelling and identification of their cubes/cylinder without revealing the names of the team/degree programme/organisations.
- 6.7 The cubes and cylinder shall be demoulded and cured in water at $27\pm 3^{\circ}\text{C}$ in accordance with CS1:2010. The demoulding and curing will be performed by PolyU Concrete Lab and PWRLSSK for teams in the Students Category and the Practitioners Category respectively.
- 6.8 On the required dates after casting, the cubes will be crushed by the laboratory(ies) assigned by the Organising Committee in accordance with CS1:2010 in the presence of the teams. Pursuant to Clause 16.59(5) of GS 2020, the compressive strength test result at each age will be obtained based on the average compressive strength of two cubes of each mix at each date will be obtained.
- 6.9 The cylinder (*Note: Practitioners Category only*) will be tested by RCPT in accordance with Section 19 of CS1:2010 on the 28th day in order to determine the concrete's ability to resist chloride ion penetration. The laboratories to perform the RCPT will be assigned by the Organising Committee.

7. ASSESSMENT

7.1 Each team's compliance with the competition requirements will be assessed by the Judging Panels in two stages as follows:

7.2 Stage 1 – Assessment of Mix Design Submission

7.2.1 The submitted mix designs will be assessed by the relevant Judging Panel for compliance with the relevant requirements as set out in Section 5.

7.2.2 For the Students Category, a team will be disqualified if their mix design does not comply with any one of requirements (4) and (5) listed at Section 5.1.

7.2.3 For the Practitioners Category, a team will be disqualified if their mix design does not comply with any one of requirements (4) and (5) listed at Section 5.2.

7.2.4 The disqualified teams will be notified by the Organising Committee via email. Such teams will not proceed to the concrete mixing and cube/cylinder casting stage.

7.3 Stage 2 – Upon Concrete Mixing and Cube Strength Testing/RCPT

7.3.1 Upon concrete mixing and cube strength testing/RCPT, a team will be disqualified if any one of the following conditions (where appropriate) occurs:

- (1) The average of two measured slump test values is not within 150 ± 35 mm;

- (2) The making of cubes and cylinder was not completed within 2.5 hours in accordance with CS1:2010;
- (3) The slump tests were conducted less than one hour after the addition of water;
- (4) *(For Students Category only)* The average strength of the 28-day cubes is less than 42 MPa;
- (5) *(For Practitioners Category only)* The average strength of the 28-day cubes is less than 60 MPa; and
- (6) *(For Practitioners Category only)* The RCPT result indicates the charge passed exceeded 4,000 Coulombs.

7.3.2 The disqualified teams will be notified by the Organising Committee regarding their disqualification in person at the concrete mixing/cube testing site or via email. Such teams will not proceed to the scoring stage.

7.4 The teams who have passed both the Stage 1 and Stage 2 assessments will proceed to the scoring stage. The scoring criteria will follow those given in Section 8.

8. SCORING CRITERIA

8.1 The scoring will be conducted by the Judging Panels in accordance with the following scoring criteria for the determination of the top 3 teams and the winner of the extra prize in each Category.

8.2 Students Category:

For Team i :

- (1) 7-day average strength of the cubes A & B per unit material cost of mix $_i$,

$$S7s_i \text{ (MPa/\$)} = (f_{cu,A} + f_{cu,B})_i / 2 / Cost_i \text{ (rounded to four decimal places)}$$

where: $Cost_i = \text{Unit material cost of the concrete mix}_i$

- (2) 28-day average strength of the cubes C & D,

$$S28_i \text{ (MPa)} = (f_{cu,C} + f_{cu,D})_i / 2 \text{ (rounded to one decimal place)}$$

The strength requirement score, **StrReq score**, shall be awarded as follows:

If $S28_i < 42$ MPa, the team will be disqualified.

If $42 \text{ MPa} \leq S28_i < 45$ MPa, **StrReq score** = 0.

If $45 \text{ MPa} \leq S28_i < 50$ MPa, **StrReq score** = 10.0.

If $50 \text{ MPa} \leq S28_i < 55$ MPa, **StrReq score** = 5.0.

If $S28_i \geq 55$ MPa, **StrReq score** = 0.

If the difference between the compressive strengths of the two 28-day test cubes (i.e. $f_{cu,C}$ and $f_{cu,D}$) exceeds 15% of their average value, **StrReq** will be marked as 0. (Please refer to Clause 16.61(3) of GS 2020.)

- (3) % Carbon Emission Reduction of GGBS concrete for mix $_i$ compared with a reference OPC concrete,

$$CE_i \text{ (%) } = \% \text{ Carbon Emission Reduction of GGBS concrete compared with}$$

a reference OPC concrete (rounded to one decimal place)

(Note: Equivalent CO₂ emission of mix_i (take cementitious contents only),

$$E_i \text{ (kg/m}^3\text{)} = \text{OPC-CO}_2 \text{ eq.}_i + \text{GGBS-CO}_2 \text{ eq.}_i \text{ (rounded to one decimal place)}$$

where: $\text{OPC-CO}_2 \text{ eq.}_i = \text{CO}_2 \text{ eq. per m}^3 \text{ of concrete from OPC in mix}_i \text{ in kg}$
 $\text{GGBS-CO}_2 \text{ eq.}_i = \text{CO}_2 \text{ eq. per m}^3 \text{ of concrete from GGBS in mix}_i \text{ in kg}$

The equivalent carbon emission of the concrete constituent materials and the reference OPC concrete of the same target compressive strength at 28 days will be provided to the teams.

- (4) % Cost Reduction of GGBS concrete compared with a reference OPC concrete,

$$CR_i \text{ (\%)} = \text{\% Cost Reduction of GGBS concrete compared with reference OPC concrete} \text{ (rounded to one decimal place)}$$

The cost of the concrete constituent materials and the reference OPC concrete of the same target compressive strength at 28 days will be provided to the teams.

- (5) Calculation for determining the scores of the teams,

$$\text{Score} = (CE_i/CE_{max}) \times 60 + (CR_i/CR_{max}) \times 30 + \text{StrReq score} \text{ (rounded to one decimal place)}$$

where: $CE_{max} = \text{the highest value of } CE_i, \text{ as defined in sub-section (3) above, attained amongst the competing teams of the Students Category.}$

$CR_{max} = \text{the highest value of } CR_i, \text{ as defined in sub-section (4) above, attained amongst the competing teams of the Students Category.}$

- (6) Score calculation for determining the extra prize winner,

$$\text{Score (Extra Prize)} = (S7_{si}/S7_{smax}) \times 100 \text{ (rounded to four decimal places)}$$

where: $S7_{smax} = \text{the highest value of } S7_{si}, \text{ as defined in sub-section (1) above, attained amongst the competing teams of the Students Category.}$

8.3 Practitioners Category:

For Team *i*:

- (1) 28-day average strength of the cubes A & B,

$$S28_i \text{ (MPa)} = (f_{cu,A} + f_{cu,B})_i / 2 \text{ (rounded to one decimal place)}$$

The strength requirement score, **StrReq score**, shall be awarded as follows:

If $S28_i < 60$ MPa, the team will be disqualified.

If $60 \text{ MPa} \leq S28_i < 65$ MPa, **StrReq score** = 10.0.

If $65 \text{ MPa} \leq S28_i < 70$ MPa, **StrReq score** = 5.0.

If $S28_i \geq 70$ MPa, **StrReq score** = 0.

If the difference between the compressive strengths of the two 28-day test cubes (i.e. $f_{cu,A}$ and $f_{cu,B}$) exceeds 15% of their average value, **StrReq** will be marked as 0. (Please refer to

Clause 16.61(3) of GS 2020.)

- (2) 56-day average strength of the cubes C & D per unit material cost of mix_i,

$$S56_{\$i} \text{ (MPa/\$)} = (f_{cu,C} + f_{cu,D})_i / 2 / Cost_i \text{ (rounded to four decimal places)}$$

where: $Cost_i = \text{Unit material cost of the concrete mix}_i$

- (3) Ability to resist chloride ion penetration for mix_i in terms of charge passed in a RCPT,

$$Q_i \text{ (Coul.) (rounded to one decimal place)}$$

- (4) % Carbon Emission Reduction of GGBS concrete for mix_i compared with a reference OPC concrete,

$$CE_i \text{ (%) = \% Carbon Emission Reduction of GGBS concrete compared with a reference OPC concrete (rounded to one decimal place)}$$

(Note: Equivalent CO₂ emission of mix_i (take cementitious contents only),

$$E_i \text{ (kg/m}^3\text{)} = OPC\text{-CO}_2 \text{ eq.}_i + GGBS\text{-CO}_2 \text{ eq.}_i \text{ (rounded to one decimal place)}$$

where: $OPC\text{-CO}_2 \text{ eq.}_i = \text{CO}_2 \text{ eq. per m}^3 \text{ of concrete from OPC in mix}_i \text{ in kg}$
 $GGBS\text{-CO}_2 \text{ eq.}_i = \text{CO}_2 \text{ eq. per m}^3 \text{ of concrete from GGBS in mix}_i \text{ in kg}$

The equivalent carbon emission of the concrete constituent materials and the reference OPC concrete of the same target compressive strength at 28 days will be provided to the teams.

- (5) % Cost Reduction of GGBS concrete compared with a reference OPC concrete,

$$CR_i \text{ (%) = \% Cost Reduction of GGBS concrete compared with reference OPC concrete (rounded to one decimal place)}$$

The cost of the concrete constituent materials and the reference OPC concrete of the same target compressive strength at 28 days will be provided to the teams.

- (6) Calculation for determining the scores of the teams,

$$\text{Score} = (Q_{min}/Q_i) \times 20 + (CE_i/CE_{max}) \times 50 + (CR_i/CR_{max}) \times 20 + \text{StrReq score (rounded to one decimal place)}$$

where: $Q_{min} = \text{the lowest value of } Q_i \text{, as defined in sub-section (3) above, attained amongst the competing teams of the Practitioners Category.}$

$CE_{max} = \text{the highest value of } CE_i \text{, as defined in sub-section (4) above, attained amongst the competing teams of the Practitioners Category.}$

$CR_{max} = \text{the highest value of } CR_i \text{, as defined in sub-section (5) above, attained amongst the competing teams of the Practitioners Category.}$

- (7) Score calculation for determining the extra prize winner,

$$\text{Score (Extra Prize)} = (S56_{\$i}/S56_{\$max}) \times 100\% \text{ (rounded to four decimal places)}$$

where: $S56_{max}$ = the highest value of $S56_{si}$, as defined in sub-section (2) above, attained amongst the competing teams of the Practitioners Category.

9. JUDGING PANELS

9.1 There are two Judging Panels for this competition. One is for the Students Category and the other is for the Practitioners Category. The judges are appointed by the Organising Committee with details presented in Sections 9.2 and 9.3.

9.2 Judging Panel for the Students Category:

Name	Position
Ir Dr PL Richard PANG	Chairman
Ir Prof Philip WK CHUNG	Member
Ir Alfred KL HO	
Ir Roy KC HUNG	
Ir Wallace SM TAM	
Ir Dr Jaime SK YEUNG	
Ir Dr Herbert ZHENG	

9.3 Judging Panel for the Practitioners Category:

Name	Position
Ir Dr PL Richard PANG	Chairman
Ir Prof Albert KH KWAN	Member
Ir Prof Christopher KY LEUNG	
Ir Prof Irene MC LO	
Ir Prof CS POON	
Dr HL YE	

10. JUDGING AND COMPLIANCE

10.1 The judges will make the final assessment, determination on compliance with the rules and penalties for rules violations. Disqualified entries shall not be included in the scoring or considered for prizes. All details of violations/penalties will be provided to the teams. The decision of the judges will be final, and appeals will not be considered.

10.2 The Organising Committee reserves the right to perform a detailed examination and check all entries for compliance with the competition rules. Due to the complexity of this task, the examination may be done after all the tests have been completed and before the prize presentation date. If the examination shows that a team did not follow the rules, the team will be disqualified.

11. PRIZES

Trophies will be presented to the three teams in each Category obtaining the highest scores based on the scoring criteria given in Section 8. Of the top 3 teams in each Category, an extra prize will be presented to the team achieving the highest 7-day strength/unit material cost and 56-day strength/unit

material cost for the Students Category and the Practitioners Category respectively, based on the scoring criteria given in Section 8. Merit/participation certificates will be presented to all participating teams.

12. ANNOUNCEMENT OF RESULTS AND PRIZE PRESENTATION

The announcement of the competition results and the presentation of prizes will be conducted during the SCCT Annual Concrete Seminar 2022, to be held on 10 November 2022.

13. REGISTRATION AND MIX DESIGN SUBMISSION

13.1 Registration Arrangement for Students Category

Registration for entry to the competition should be made using the “Registration Form (Students Category)” attached to this document. The completed form should be sent to the Organising Committee (Attn: Ir Jackie CK LEUNG) via email: lcctc2022@cedd.gov.hk by **31 May 2022**, by the coordinator of each education institute/university (see below). Registration will be confirmed via email by **10 June 2022**.

Education Institute/University	Name of Coordinator	Email address
HKU	Dr HL YE	hlye@hku.hk
HKUST	Ir Prof Christopher KY LEUNG	ckleung@ust.hk
PolyU	Ir Prof CS POON	chi-sun.poon@polyu.edu.hk
CityU (ACE)	Dr Jeff JF WANG	jefwang@cityu.edu.hk
CityU (MSE)	Dr Jonathan CY CHUNG	jonathan.cy.chung@cityu.edu.hk
THEi	Dr Simon HF WONG	ceshfw@thei.edu.hk
CHC	Dr Natalie XQ LI	natalieli@chuhai.edu.hk

The coordinators will be responsible for coordinating the registration of teams in their respective Institute/University. He/she will also be responsible for providing the necessary briefing and coaching to the registered teams in their respective Institute/University on concrete mix design, concrete mixing, performance of slump tests and cube casting.

13.2 Registration Arrangement for Practitioners Category

Registration for entry to the competition should be made using the “Registration Form (Practitioners Category)” attached to this document. The completed form should be sent to the Organising Committee (Attn: Ir Jackie CK LEUNG) via email: lcctc2022@cedd.gov.hk by **31 May 2022**, with a team coordinator nominated for correspondence. Registration will be confirmed via email by 10 June 2022.

13.3 Mix Design Submission

The mix design should be submitted using the “Mix Design Submission Form” attached to this document. The completed form should be sent to the Organising Committee (Attn: Ir Jackie CK LEUNG) via email: lcctc2022@cedd.gov.hk **on or before 30 June 2022**.

14. Competition Programme

Activity	Key Dates
Registration	8 February ~ 31 May 2022
Confirmation of Registration	10 June 2022
Mix Design Submission Deadline	30 June 2022
Announcement of Cube/Cylinder Casting Dates	Mid July 2022 (tentative)
Collection of Trial Raw Materials	Mid July 2022 (tentative)
Cube/Cylinder Casting (Practitioners Category)	August 2022 (tentative)
Cube Casting (Students Category)	August 2022 (tentative)
Cube Testing (Practitioners Category)	28 days and 56 days after cube casting
RCPT (Practitioners Category)	28 days after cylinder casting
Cube Testing (Students Category)	7 days and 28 days after cube casting
Announcement of Results and Prize Presentation	10 November 2022 (SCCT Annual Concrete Seminar 2022)

15. Acknowledgements

Special thanks are given to the Department of Civil and Environmental Engineering of the Hong Kong Polytechnic University for providing the laboratory venue and facilities for production, curing and testing of cubes for the Competition.

The sponsorship of the raw materials for test cube production by the Hong Kong Construction Materials Association and the Institute of Quarrying (Hong Kong Branch) is highly appreciated.

16. Enquiries

Enquiries can be directed to

Ir Jackie CK LEUNG

Tel: 2305 1288

Email: lcctc2022@cedd.gov.hk

Low Carbon Concrete Trophy Competition 2022
Organising Committee
8 February 2022

Low Carbon Concrete Trophy Competition 2022

Registration Form (Students Category)

Closing Date: 31 May 2022

- Please read the Rule Book for the Low Carbon Concrete Trophy Competition 2022 before filling in this form.
 - The completed registration form should be sent to the Organising Committee (Attn: Ir Jackie CK Leung) via email: lcctc2022@cedd.gov.hk by **31 May 2022**, by the corresponding Institute/University Coordinator.
 - Please refer to Section 13 of the Rule Book for the list of coordinators.
-

Team Details

Institute/University			
Name of Institute/University :			
Degree Programme :			
Institute/University Coordinator :			
Team			
Team Member No.	Name	Contact Telephone No.	Institute/University Email Address
1 (Team Leader)			
2			
3			
4			
5			
6			

Notes:

- Registration will be confirmed via email by 10 June 2022. A team number will be assigned to each successfully registered team upon confirmation.
- Details of the concrete constituent materials to be used in the competition (without the brand names), their relevant data (e.g. as given in the recognised scheme or test certificates) and reference unit costs will be provided to the team upon confirmation of registration.
- The confirmed teams will be required to submit the mix design (separate form) to the Organising Committee on or before 30 June 2022.
- The personal data provided in this form will be used by the Organising Committee for the Low Carbon Concrete Trophy Competition 2022 only. The provision of personal data by means of this form is voluntary. If you do not provide sufficient information, we may not be able to process your registration or correspond with you. The personal data you provide in this form may be disclosed to other relevant organisations for cross reference should the need arises. You have a right of access and correction to the personal data provided under the Personal Data (Privacy) Ordinance, including right to obtain a copy of your personal data provided in this form.

Low Carbon Concrete Trophy Competition 2022

Registration Form (Practitioners Category)

Closing Date: 31 May 2022

- Please read the Rule Book for the Low Carbon Concrete Trophy Competition 2022 before filling in this form.
- The completed registration form should be sent to the Organising Committee (Attn: Ir Jackie CK Leung) via email: lcctc2022@cedd.gov.hk by **31 May 2022**, by the Team Leader (Team Member No. 1 below).

Team Details

Team					
Team Member No.	Name	Company Name	Business Nature*	Contact Telephone No.	Company Email Address
1 (Team Leader)					
2					
3					
4					
5					
6					
7					
8					

* Business Nature should only be one of the following:
Concrete Producer ("CP") / Material Supplier ("MS") / Client ("CLI") / Contractor ("CON") / Consultant ("CSU") / Laboratory ("LAB"). Please refer to Section 3.3(a) of the Rule Book for the definitions of the Business Natures.

Notes:

- Registration will be confirmed via email by **10 June 2022**. A team number will be assigned to each successfully registered team upon confirmation.
- Details of the concrete constituent materials to be used in the competition (without the brand names), their relevant data (e.g. as given in the recognised scheme or test certificates) and reference unit costs will be provided upon confirmation of registration.
- The confirmed teams will be required to submit the mix design (separate form) to the Organising Committee on or before 30 June 2022.
- The personal data provided in this form will be used by the Organising Committee for the Low Carbon Concrete Trophy Competition 2022 only. The provision of personal data by means of this form is voluntary. If you do not provide sufficient information, we may not be able to process your registration or correspond with you. The personal data you provide in this form may be disclosed to other relevant organisations for cross reference should the need arises. You have a right of access and correction to the personal data provided under the Personal Data (Privacy) Ordinance, including right to obtain a copy of your personal data provided in this form.

Low Carbon Concrete Trophy Competition 2022

Mix Design Submission Form

To be submitted by: **30 June 2022**

- Please read the Rule Book for the Low Carbon Concrete Trophy Competition 2022 before filling in this form.
- The completed mix Design form should be submitted to the Organising Committee (Attn: Mr Jackie CK Leung) via email: lcctc2022@cedd.gov.hk by **30 June 2022**.
- For teams in the Students Category, the submission should be made by the coordinator of their corresponding Institute/University.
- For teams in the Practitioners Category, the submission should be made by the Team Leader (Team Member No. 1).

Team Details

Team	
Category	Students / Practitioners*
Team No.	
Team Members	
Team Member No.	Name
1 (Team Leader)	
2	
3	
4	
5	
6	
7	
8	
Institute/University Coordinator (for Students Category only)	
Name	

Mix Design Details

Target Compressive Strength in 28 days	45 MPa (Students Category) / 60 MPa (Practitioners Category)*				
Materials	Design Mix Details	Unit Cost	Cost/m ³	Unit CO ₂ eq.	CO ₂ eq. per m ³
1. OPC Brand:	kg/m ³	\$ /T			
2. GGBS Brand:	kg/m ³	\$ /T			
3. Aggregate 20mm	kg/m ³	\$ /T		---	---
4. Aggregate 10mm	kg/m ³	\$ /T		---	---
5. Fines	kg/m ³	\$ /T		---	---
6. Water	kg/m ³	---		---	---
7. Admixture: Superplasticizer – Mid-range Brand:	kg/m ³	\$ /kg		---	---
8. Admixture: Superplasticizer – High-range Brand:	kg/m ³	\$ /kg		---	---
	Total	---		---	

* Delete as appropriate.