

INDUSTRIAL DESIGN PROBLEM

INTRODUCTION

From primitive hutments of early years to sophisticated buildings of the modern era, the civil engineering industry's growth has been phenomenal.

The civil engineering industry deals with many challenges in day-to-day life that most people are unaware of. And to bridge this gap and connect the budding civil engineers of the future to outside industrial affairs, AKAAR brings you the IDP competition.

The theme of the problem statement revolves around the **durability of concrete**.

The competition will give you the experience of the civil engineering industry's real-world problems and make you brainstorm ideas, learn, and explore the industry.

TEAM SPECIFICATIONS

1. Each team can consist of a maximum of **3 participants**, with at least one member should be majoring in **Civil Engineering**
2. The competition is exclusively for **Undergraduate students**.
3. The students forming a team can be from **different colleges**.
4. No participant can register with more than one team. In such a case, both teams will be disqualified.

REGISTRATION FORM

<https://tinyurl.com/aakaar-idp>



Website: aakaariitb.in
Department of Civil Engineering
IIT Bombay

PROBLEM STATEMENT:

The **Government of India (GOI)** wishes to build a **marine bridge** that shall connect the sub-urban to the central city.

The bridge shall also help in decentralizing the traffic and population towards the suburbs. Additionally, GOI plans to construct the new international airport in the suburbs in the next five years.



(A Marine bridge is a structure on open water for loading and unloading of goods & people)

(Image only for sample representation, it is in no way related to final bridge design)

- The maintenance of marine bridges is a costly and time-consuming activity. The marine bridge needs to withstand saltwater's corrosive effects and the wear from being in a wet environment. The design-life of this bridge shall be **125 years of service**.
- Since the exposure will be very severe, the main danger is to the concrete in constant contact with saline water. The main challenge is to **protect the reinforcement steel** from water seeping through the pores within concrete.
- Additionally, the GOI wishes to promote green initiatives in construction and wish to showcase this project as a **green construction pioneer**.
- Hence the concrete needs to be designed with **water permeability of less than 8mm and RCPT values less than 1000 coulombs**.

Identify the right raw materials for concrete mix design, keeping in mind the **concrete durability** & use of **green building products**.

Also, come up with a suitable mix design for M50 grade keeping the durability aspects in mind. You can refer to relevant IS codes & handbooks for mix-design.



STRUCTURE OF THE COMPETITION

SUBMISSION OF SOLUTION

1. A one-page summary of your whole work towards the problem
2. PPT (Maximum 20 slides), illustrating the solution methodology and step-by-step procedure in detail.

Deadline: 10-March-2021

PRESENTATION ROUND

All the teams making submissions in the first round shall be presenting it on the event day. They will use the same PPT submitted for this. The presentation can be done by any of the members of the team and should describe their comprehension and approach towards the problem.

You will be provided only 10 mins for the presentation, which will then be followed by a 5 minutes Q/A session by the jury.

The dates for the presentation round (Tentatively: mid-march) will be announced after the first submission, and details shall be intimated with teams making submissions.

SOME GUIDELINES TO BE FOLLOWED

1. Any source referred should be cited correctly in the document. We will check the plagiarized content. If found any, the submission will be rejected, and the team will be debarred from further participating in all the IIT Bombay events.
2. Write the names of all the team members in the presentation and the one-page summary.

JUDGING CRITERIA

The weightage for the rounds would be as follows:

1. Submission of solution (Summary + PPT)- (20 + 40) %
2. Presentation - 40%

Besides the solution of the problem, emphasis will be given to the approach methodology of the problem. Therefore, comprehension of the problem and approach of solving it with more durable and sustainability-oriented green solutions will be focused on.



GENERAL RULES AND CERTIFICATE POLICY

1. AAKAAR IIT Bombay, as the competition organizer, reserves the right to modify any of the above rules of the competition if deemed necessary, and the same will be reflected on the website immediately.
2. Teams not making submissions by 10th march will be disqualified, and no certificate will be provided to disqualified teams.
3. Queries related to the competition will be entertained only by mail. Mail id for any query is mentioned below.
4. Any query related to this competition should be asked by Team Leader only.
5. The team will be disqualified if any of the competition rules are violated.
6. In all cases, the decision of AAKAAR team will be final.

CONTACT DETAILS:

For any queries regarding this competition, you can mail at hemant.aakaariitb@gmail.com

(Subject: Query regarding IDP competition: Team Leader Name)

Please avoid contacting AAKAAR team members directly without following the above step.

Note: Only the team leader will communicate on behalf of the team.

PS: You are advised to start to work on the problem as soon you register as it might be time taking.



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