

# **Report on Five day online STC “Prospects of Future Research in Structural and Geotechnical Engineering” held between 7 - 11 September 2020 in CED, NITJ**

## **Theme of the STC**

- The aim of the workshop was to bring the Structural Engineers and Geotechnical Engineers at one platform to share their views and experiences with special reference to Innovative Construction. Conferences, seminars and workshops are the platforms where the academicians, researchers and engineers share their knowledge about these innovative developments.
- Nowadays, demand of lightweight structure is increasing day by day to meet the current demands of the society. In case of lightweight structures, catastrophes happen due to wind load, fatigue load, impact load and earthquake load. So, it is imperative to talk about these lightweight materials, science behind them, their load carrying capacity and other loads that can affect their efficiency. How these light weight structures offer new opportunities for planning astonishing designs of buildings is also a scope of future research. Currently, materials like metakaolin, silica fumes, fly ash, ground granulated blast furnace slag etc. are being used for making lightweight structures.
- It is also known that the performance of super-structure depends on the behaviour of sub-structure. With the increasing urbanization, most of the new structures are being built on the soils having engineering properties below the required level. Therefore, it is very important to talk about the innovative techniques like soil stabilization and soil reinforcement to improve its engineering and load bearing properties.
- For fulfilling this goal, this STC has defined the following objectives as its sub-themes:
  - Lightweight structure resistant to earthquake load, wind load, fatigue load and impact load.
  - Innovative materials
  - Sub-structure
  - Soil-structure interactions
  - Soil stabilization

## **Itinerary of the STC:**

### **First day:**

On the first day, the STC was inaugurated by the Honourable Director, Dr Lalit Kumar Awasthi, Dr. B.R. Ambedkar NIT Jalandhar as its Chief Guest. The organising team of the STC, Dr. Neelam Rani, Dr. Shashi Kant Sharma and Dr. Vaibhav Sharma were present along with Dr.S P Singh, Professo & HoD, Civil Engineering Department. Dr. A K Ahuja, Professor, IIT Roorkee was felicitated by the organising team.

Dr. Ahuja gave inaugural speech on the importance of wind loads on buildings and different methods to calculate the wind loads.

Dr. L.K. Awasthi, the worthy Director of Dr. B.R. Ambedkar NIT Jalandhar laid views on the importance of making the construction industry sustainable by making use of advanced and cheap materials, which are readily available in India.

After inauguration Dr. A K Ahuja delivered expert lecture on the topic “Effects of Wind Loads on Buildings”. He discussed about the various techniques of calculating the wind loads. He also discussed about the effect of different shape of buildings and terrain. He showed the lab experiment on solar panels, bridges, buildings and many more.

In the afternoon session, Dr Akhil Upadhyay from IIT Roorkee delivered lecture on the topic “Laminated Composite Structures”. He showcased various and vivid pictures of different laminated materials that we use in the construction. He has also discussed the future research of these materials.

### **Second day:**

In the morning session of day two, Dr Anupam Chakraborti from IIT Rooekee, talked on “Laminated composites and sandwich structures”. He had discussed about the different type of laminated structure on which the research is going on. A lot of participants appreciated and acknowledged the efforts and knowledge shared by Dr. Anupam Chakraborti.

In the afternoon session, Dr. Aditya Singh Rajput delivered an essential lecture on the topic “India’s Deteriorating Infrastructure Challenges and Solutions”, which is the need of this

century. He has discussed the different causes because of which the structure got deteriorate and the solution of that. .

### **Third day:**

Morning session of day three was honoured by Dr. Arvind K Agnihotri from NIT Jalandhar who delivered lecture on “Reinforced Soil Foundations”. He highlighted the mechanics of reinforced soil foundations and explained the methodologies followed to design any reinforced-soil foundations.

Dr. R K Sharma from NIT Hamirpur delivered a lecture on “Modification of Clayey Soil using Waste Materials” in the evening session. The lecture attracted the participants, who put interesting queries regarding the development of techniques for using various types of waste materials.

### **Fourth day:**

In the morning session of fourth day, Dr. N. K. Samadhiya from IIT Roorkee delivered a lecture on “Analysis of a Powerhouse Cavern in Anisotropic Rockmass”. The lecture focussed on the analysis of the stresses, and deformations that can happen in the rockmass while interacting with a powerhouse structure.

In the afternoon session, Dr. Sonalisa Ray delivered an expert lecture on the topic “Fracture and Fatigue Studies in Concrete Structure”. She had discussed about the history of fracture and fatigue, classical methods of classification, size effect of cracks, and future research that are going on in this area.

### **Fifth day:**

On the morning of fifth day, Dr Satyendra Mittal from IIT Roorkee delivered lecture on “Ground Improvement Techniques”. The main attraction of his presentation was the on-field photographs, especially of the concept of soil nailing, which attracted numerous participants and resulted in an effective interaction session.

In the afternoon session Dr R K Dutta of NIT Hamirpur delivered lecture on “Characterization of Natural Geotextiles”. The participants were informed of the importance and applicability of the natural geotextiles in improving the engineering properties of the parent soil.

