SCHOOL OF INFRASTRUCTURE

DEPARTMENT OF CIVILENGINEERING

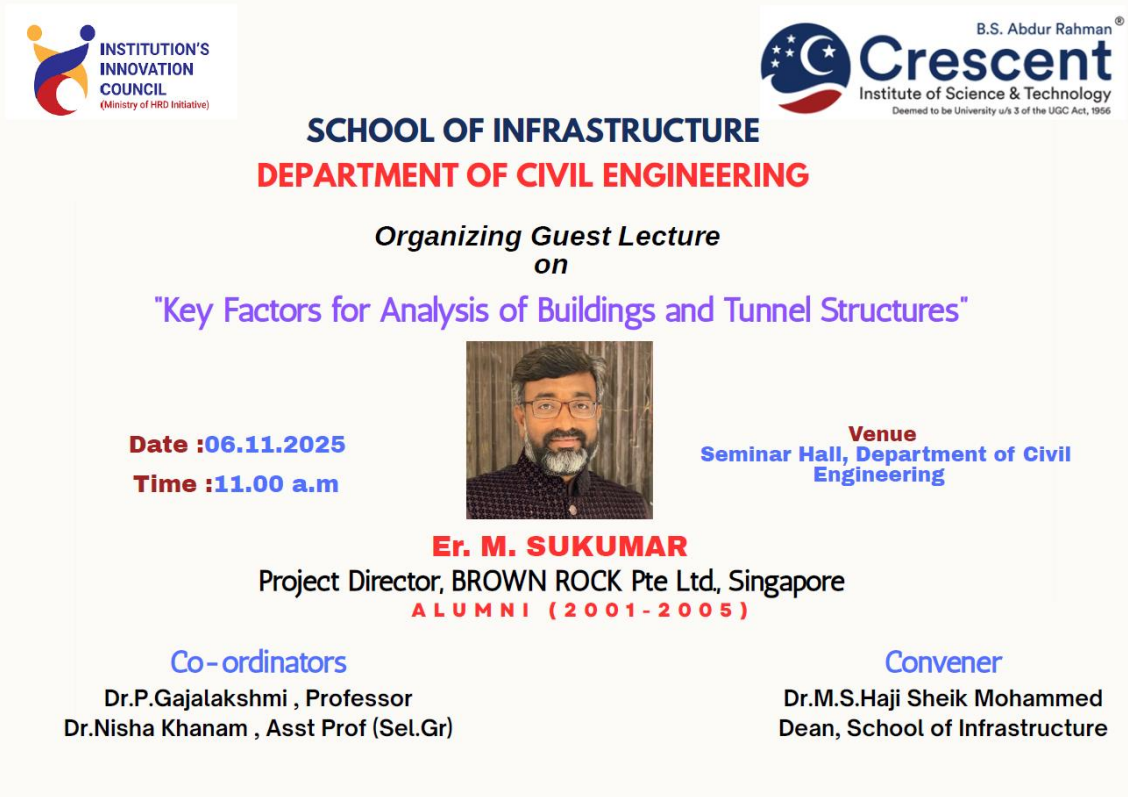
Ref.: 1357/Dean(Sol)/1225 **Date: 18.12.2025**

GUEST LECTURE REPORT ON KEY FACTORS FOR ANALYSIS OF BUILDINGS AND TUNNEL STRUCTURES

Date: 06.11.2025 Time: 11.00 a.m. to 12.15 a.m.

I. Preamble:

A guest lecture on **"Key Factors for Analysis of Buildings and Tunnel Structures"** was organized by the Department of Civil Engineering, School of Infrastructure, in the department Seminar Hall of ES Block, B.S. Abdur Rahman Crescent Institute of Science & Technology on 06.11.2025. This event was supported by Institution's Innovation Council (IIC) of BSACIST.



II. ABOUT THE SPEAKER AND TOPIC

Mr. M. Sukumar, Project Director at **Brown Rock Pte Ltd, Singapore**, is a highly accomplished Civil Engineering professional known for his leadership in major national infrastructure projects. With rich experience spanning bridge construction, large-scale housing developments, airport expansion works, and advanced underground construction

technologies, he has played a key role in delivering complex, high-precision engineering projects. His expertise covers modern tunnelling methods, deep-shaft construction, high-strength concrete applications, and cutting-edge monitoring and instrumentation practices. As a **distinguished alumnus** of B. S. Abdur Rahman Crescent Institute of Science and Technology, he continues to inspire young engineers through his practical insights and extensive international project experience.

III. ABOUT THE SESSION:

Dr. Nisha Khanam, Assistant Professor (Sel.Gr), welcomed the students and the guest speaker. **Dr. P. Gajalakshmi**, Professor, delivered a brief introduction highlighting the guest's professional expertise and the significance of the lecture. This guest lecture was organized to provide students with practical exposure to the diverse and advanced construction practices used in major infrastructure projects. The session highlighted real-world applications of modern engineering techniques, covering bridge construction, large-scale housing developments, airport expansion works, and innovative underground construction technologies.

The speaker began his talk by giving an overview of major infrastructure projects in Singapore, offering students valuable insights into real-time construction workflows. He discussed the processes involved in bridge construction and highlighted his experience with the iconic Gardens by the Bay development. He also explained the housing development projects carried out between 2023 and 2025, emphasizing planning, coordination, and the scale of urban construction in a high-density city like Singapore.

He next moved on to airport development, sharing his involvement in the Terminal 5 project from 2015 to 2018. Through this, he illustrated how large aviation infrastructures are designed and constructed, focusing on structural requirements, safety factors, and the complexities of working in active airport environments. His explanations helped students understand how mega-projects are executed while maintaining strict timelines and international standards.

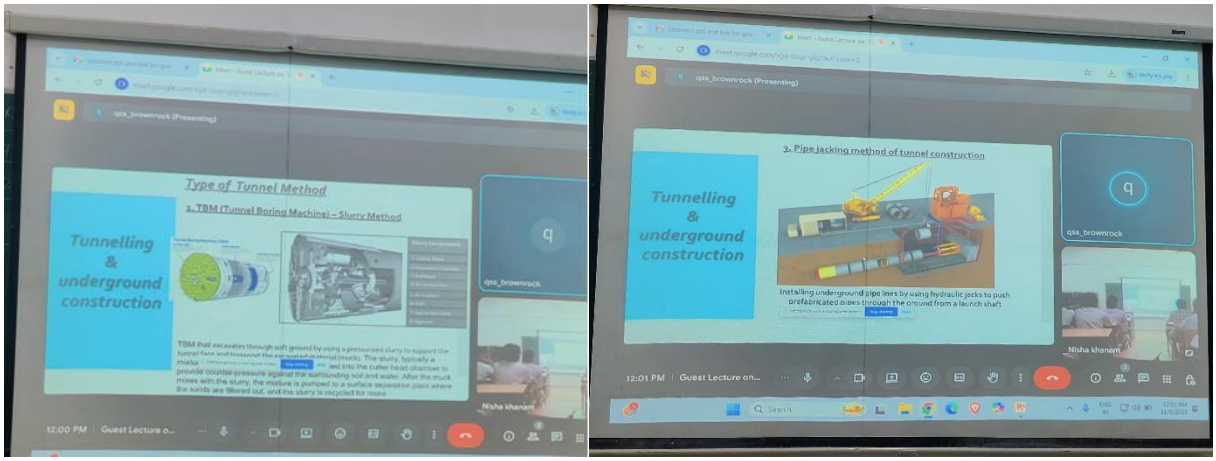
A major portion of the lecture focused on underground construction and tunnelling technologies. He introduced key methods such as the caisson method, diaphragm wall (D-wall) construction, D-wall reinforcement techniques, pipe jacking, and the New Austrian Tunnelling Method (NATM). The speaker also discussed Tunnel Boring Machines (TBM), the Earth Pressure Balance Method (EBM), and the selection criteria for different tunnelling techniques based on soil conditions, project depth, and urban constraints.

The lecture concluded with discussions on high-strength concrete, types of concrete, and fundamental material knowledge required for modern construction. He also emphasized the importance of instrumentation and monitoring in ensuring safety, stability, and long-term performance of structures. Overall, the session provided students with a holistic understanding

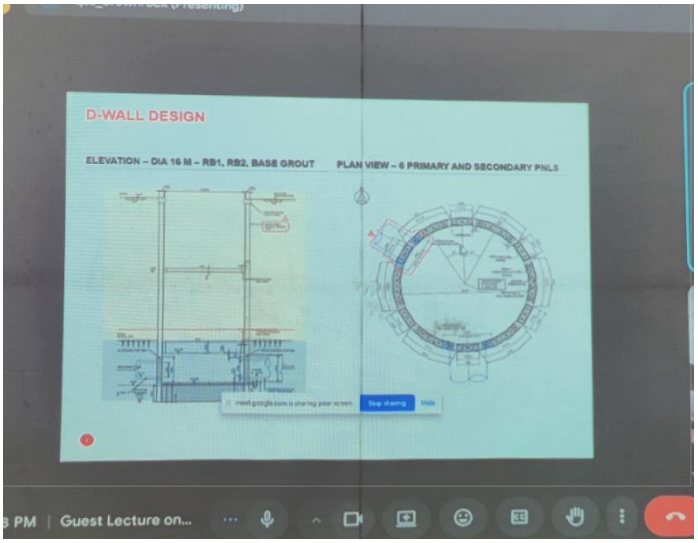
of advanced construction practices, blending technical knowledge with practical, industry-based insights.

Following the lecture, an interactive Q&A session enabled students to discuss practical challenges and real-time issues related to modern construction technologies and underground engineering. The speaker addressed each query with clarity, sharing valuable insights drawn from his extensive experience in large-scale infrastructure projects in Singapore. The speaker also motivated students to study well and in future he will recruit the students for their future project at Singapore. The session concluded with a vote of thanks delivered by **Dr. Nisha Khanam**, expressing gratitude to the speaker for his impactful and informative presentation.

Students of III year B.Tech – Civil Engineering



Explanation about tunnelling method and construction



Detailing of D-Wall Design

Explanation about Shaft Construction

IV. DETAILS OF PARTICIPANTS:

The III-year B. Tech Civil Engineering students who attended the technical talk are:

S. No	RRN	Name
1	230011601001	ABDUL AADHIL M
2	230011601002	ABDUL RAHIM
3	230011601003	AKRAM JAWEETH A
4	230011601004	ARAVINTHAN THEIVARAJ
5	230011601005	ARSHATH IBRAHIM S
6	230011601007	IMRAN FARID A

S. No	RRN	Name
7	230011601008	JAMEEL AHAMED M
8	230011601009	MAHALAKSHMI K
9	230011601010	MOHAMED ASLAM S
10	230011601011	MOHAMED SHADIQM
11	230011601012	MOHAMED YASIN S
12	230011601013	MOHAMMED AJMAL
13	230011601014	MOHAMMED FAAIZ K
14	230011601015	MOHAMMED MEHRAN P
15	230011601016	MOHAMMED RAZEEN T
16	230011601017	MOHAMMED SIDDIQ S
17	230011601018	RAMEEZA YASMIN P K
18	230011601019	ROSHAN ASFAQ
19	230011601020	SAAD SAYEED SHAIRKHAN
20	230011601021	SURYA MOORTHY M
21	230011601022	SYED AHAMED K M
22	230011601023	SYED MASOOTH
23	230011601024	THOKCHOM WANGLEN MOILANGCHA
24	230011601025	THYCUS MARIO VALANTINE D
25	230011601026	YUKESH G
26	230011602001	ABDUL ASIF M
27	230011602002	ESAKKI RAJESH R
28	230011602003	FASLAN AHAMED A
29	230011602005	MOHAMED JASIM H
30	230011602006	MOHAMED YUSUF IRFAN M
31	230011602007	NAUFAL AHAMED
32	230011602008	RITHVIK K
33	230011602009	MUHAMADHU SULTHAN S
34	230011602010	DILEEP KUMAR S

V. OUTCOME

The guest lecture provided students with valuable exposure to real-time construction practices used in large-scale infrastructure projects in Singapore. Students gained a deeper understanding of modern engineering techniques, including advanced tunnelling methods, deep-shaft construction, and diaphragm wall applications.

The session enhanced their knowledge of high-strength concrete, material selection, and the importance of instrumentation and monitoring in ensuring project safety and performance. Through practical insights shared from major bridges, tunnelling under bridges, housing, and airport development projects, students developed a stronger appreciation for the technical precision, planning, and coordination required in the construction industry. Overall, the lecture enriched their practical understanding and strengthened their readiness for future professional roles in civil engineering.

Co-ordinator
Dr. Nisha Khanam
Assistant Professor (Sel.Gr)

Co-ordinator
Dr.P.Gajalakshmi
Professor

Convener
Dr. M.S. Haji Sheik Mohammed
Dean,School of Infrastructure