



The 6th International Conference on GEOTECHNICS FOR SUSTAINABLE INFRASTRUCTURE DEVELOPMENT

NOVEMBER 26-27, 2026 • HANOI, VIETNAM



PRE-CONFERENCE WORKSHOP

Geotechnics for High-Speed Railways

25 November 2026 • Wednesday • National Convention Center (NCC), Hanoi, Vietnam

— SPEAKERS —



Dr. Cai Degou

China Academy of Railway Sciences Co., Ltd, China



Dr. Yoshitsugu Momoya

Railway Technical Research Institute, Japan



Dr. Susumu Nakajima

Railway Technical Research Institute, Japan

MORNING

Geotechnics for High-Speed Railways in China

Presenter: Dr. Cai Degou — China Academy of Railway Sciences Co., Ltd, China

TIME	TOPIC	KEY POINTS
8:30 – 9:00	Introduction of HSR in China	• Overview of China's HSR development: operational scale, development history and Belt & Road engineering practice • Core requirements for HSR lines in China: smoothness, stability and deformation/settlement control • Core geotechnical challenges: rainy, dry and cold climates; soft soil, loess, red beds and karst
9:00 – 9:45	Design practices	• Theories and design methods for controlling dynamic deformation of HSR subgrades • Structural types of HSR subgrades: typical general structures and transition sections • Construction control and dynamic verification: fill material grouping/selection; physical and chemical soil improvement
9:45 – 10:15	Q&A and Tea Break	
10:15 – 10:45	Foundation solutions	• Soft/loose soils: pile foundations, rigid inclusion foundations, cement-mixed column foundations • Expansive soils & rocks: replacement treatment, composite foundation methods • Karst regions: radar & electrical detection, foundation stability assessment and treatment
10:45 – 11:30	Case studies and summary	CASE 1 — BEIJING-SHANGHAI HSR • Soft soil issues & subgrade treatment challenges; CFG pile composite foundation solutions CASE 2 — SHANGHAI-KUNMING HSR • Drainage/waterproofing in high-rainfall areas; karst investigation & treatment (grouting, ground reinforcement) • Core geotechnical technologies and lessons learned from China's HSR practice
11:30 – 12:00	Q&A	

Presenters: Dr. Yoshitsugu Momoya & Dr. Susumu Nakajima — Railway Technical Research Institute, Japan

TIME	TOPIC	KEY POINTS
13:30 – 14:00	Introduction of HSR in Japan	• Overview of HSR development in Japan • Overview of design specifications and standards of HSR in Japan • Unique features of HSR in Japan
14:00 – 15:00	Design of ballasted tracks, slab tracks & subgrade	• Comparison between ballasted track and slab track systems • Challenges of ballasted tracks on soft roadbeds and subgrades • Roadbed and subgrade design and specifications • Applications of slab track systems on earth structures
15:00 – 15:30	Q&A and Tea Break	
15:30 – 16:30	Case studies of Japanese HSR (Shinkansen)	• Natural environment of Japan: seismic-prone country, frequent heavy rain • Geotechnical challenges in Shinkansen construction, especially on weak subsoil • Composition ratio of HSR structures: drastic reduction of earth structures and its recovery following new technology • Lessons from the first-generation Shinkansen (Tokaido Shinkansen): demanding maintenance from continuous settlement/deformation due to rainfall and earthquakes
16:30 – 17:00	Evolution of geotechnical structures for HSR in Japan	• Development of Geosynthetics Reinforced Soil (GRS) structures: GRS wall, GRS bridge abutment, GRS integral bridge • Application of reinforced soil structures in recent Shinkansen construction: Hokuriku, Kyushu and Hokkaido lines
17:00 – 17:30	Q&A	