International Joint Research Laboratory of Earthquake Engineering

地震工程国际合作联合实验室

主要成员
Main Members

Tongji University, China
同 济 大 学

Pacific Earthquake Engineering Research Center, USA
美国太平洋地震工程研究中心

Structural Engineering Research Center, Tokyo Institute of Technology, Japan
日本东京工业大学结构工程研究中心

European Centre for Training and Research in Earthquake Engineering, Italy
意大利欧洲地震工程研究中心

观察员
Observer

Joint Research Centre, European Commission
欧盟联合研究中心

International Joint Research Laboratory of Earthquake Engineering (ILEE)

• Motivation

Recent earthquakes worldwide have caused many significant economic and society losses. Earthquake disaster mitigation is becoming a key national strategy for many countries. Over the last 50 years, many remarkable earthquake engineering research have been achieved. Tongji University housed the world-class multi-functional shaking table testing facility, which is currently the sixteenth node of the U.S. George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES).

With more than 20 years' international collaboration experience in earthquake engineering research, Tongji University is partnering with Pacific Earthquake Engineering Research Center, Structural Engineering Research Center at Tokyo Institute of Technology, and European Centre for Training and Research in Earthquake Engineering to form the International Joint Research Laboratory of Earthquake Engineering (ILEE).

• Main Members

Tongji University, China	同济大学 TONGJI UNIVERSITY
Pacific Earthquake Engineering Research Center, USA	PEER PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER
Structural Engineering Research Center, Tokyo Institute of Technology, Japan	東京工業大学 Tokyo Institute of Technology
European Centre for Training and Research in Earthquake Engineering, Italy	EUCENTRE European Centre for Training and Research in Earthquake Engineering

• Observer

Joint Research Centre, European Commission	EUROPEAN COMMISSION DIRECTORATE-GENERAL Joint Research Centre

• Directors

Director: Prof. **Xianglin Gu** (Tongji University), Prof. **Stephen A. Mahin** (University of California, Berkeley)

Vice director: Prof. **Jianzhong Li** (Tongji University), Prof. **Ying Zhou** (Tongji University)

Director of scientific committee: Prof. **Xilin Lu** (Tongji University)

• Contact Information

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Part I

Base and Structure

• Tongji University unites four earthquake engineering research centers in the world

• Platforms

1. State Key Laboratory of Disaster Reduction in Civil Engineering
2. National Engineering Technology Research Center for Prefabrication Construction in Civil Engineering
3. Key Laboratory of Geotechnical and Underground Engineering
4. Innovation Center for Disaster Prevention in Civil Engineering（111 Project）

• Building Concepts

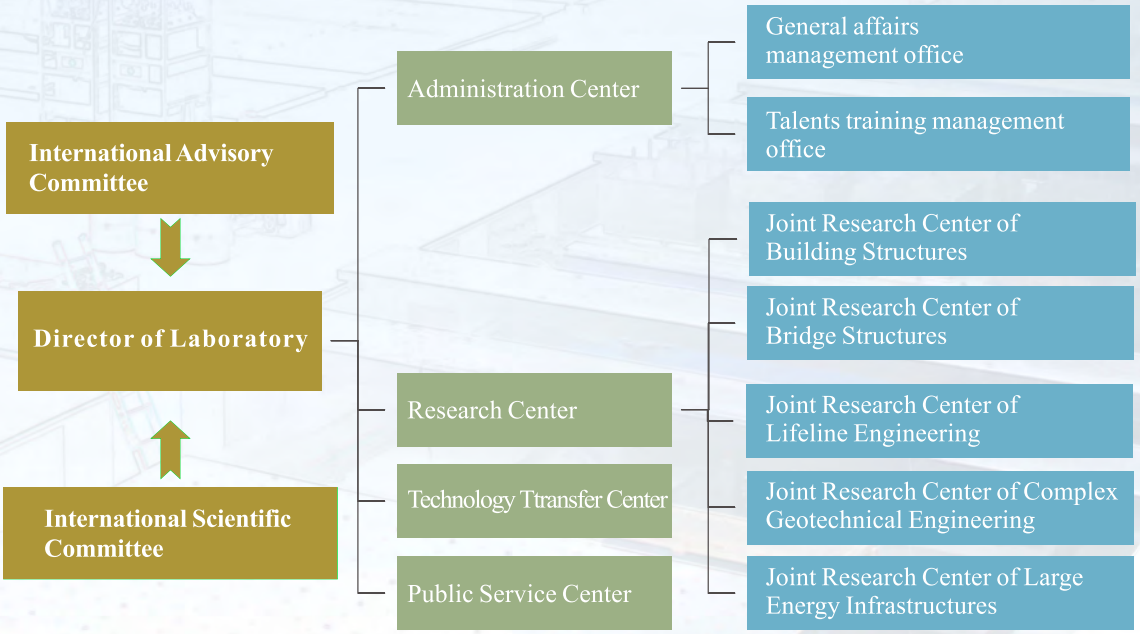
Collaborative innovation, Resource sharing, Inclusivity, Openness, World first-class
(Talents、Achievements、Environment)

Internationalization

International research	International talent training
International research team	International operation management

Part Ⅱ
Management and Operation

• Organization Diagram of ILEE



Part III

International Scientific Research

• Earthquake Resilient Civil & Infrastructure Engineering

Cross-discipline Research

• Earthquake resistance of building structures

1. New type of typical super high-rise building
2. High-performance structural components and new type of structural systems
3. Pile-soil-structure interaction system
4. Efficient numerical modeling and seismic damage assessment

Numerical calculation models of China Pavilion

Multi-efficient numerical modeling

Shaking table test of soil structure interaction

Shaking table test of Shanghai Tower

• Earthquake resistance of bridge structures

1. Seismic research on long-span bridges and super tall pier bridges
2. Seismic ductility design method of bridge pile foundations
3. Seismic research on rocking pile-group foundations

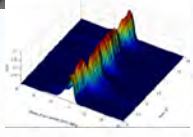
Cyclic test of pile-group group foundation

Shaking table test of cable-stayed bridge model

Cyclic and shaking table tests of rocking pile-group foundation

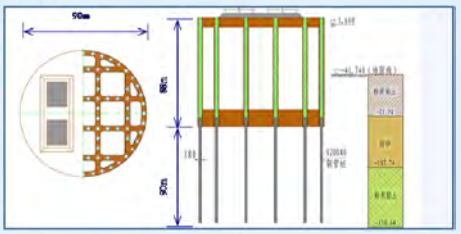
• Earthquake resistance of lifeline engineering

1. Seismic performance evaluation of lifeline engineering structures
2. Seismic functional and connectivity reliability analysis of lifeline engineering
3. Seismic optimization design of lifeline engineering

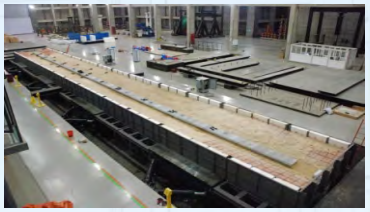


• Earthquake resistance of tunnel structure and deep-water foundation

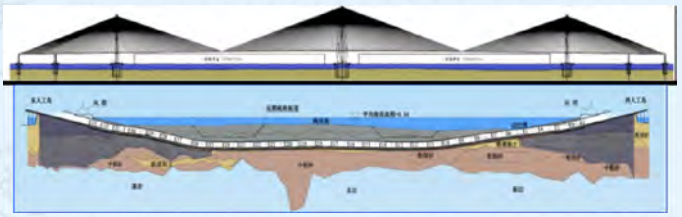
1. Soft soil liquefaction mechanism under earthquakes
2. Seismic resistance of deep-water composite foundation of bridges in soft soils
3. Seismic analysis of super-long tunnel in soft soils under deep water



Deep-water foundation of bridges



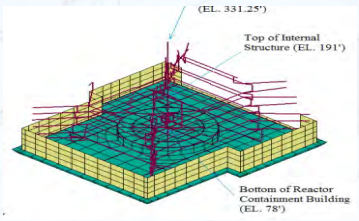
Multi-shaking-table tests of super-long immersed tunnel under non-uniform seismic loadings



The super-long immersed tunnel of Hongkong-Zhuhai-Macao bridge engineering

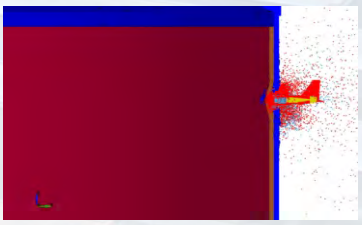
• Earthquake resistance of large energy infrastructures

1. Seismic dissipation and isolation of extra-large LNG tank
2. Seismic resistance of nuclear equipments and structures
3. Influence of nonlinear soil-structure interaction on seismic resistance of nuclear power plants
4. Seismic PRA (probabilistic risk assessment) method of nuclear power plants



Numerical model of isolated NPP

Shaking table test of nuclear blower



Simulation of aircraft impact on tank

Seismic isolation test of extra-large LNG tank