Who We Are & What We Do

KICT

KOREA INSTITUTE of
CONSTRUCTION TECHNOLOGY

Mission and Vision

Research and Development

- Performance advancement technology for national infrastructure facilities
- Response technology for natural disasters
- Technology for eco-friendly land development
- Technology for construction-based convergences
- Technology for high-performance construction materials

Policy-making and Technology Support

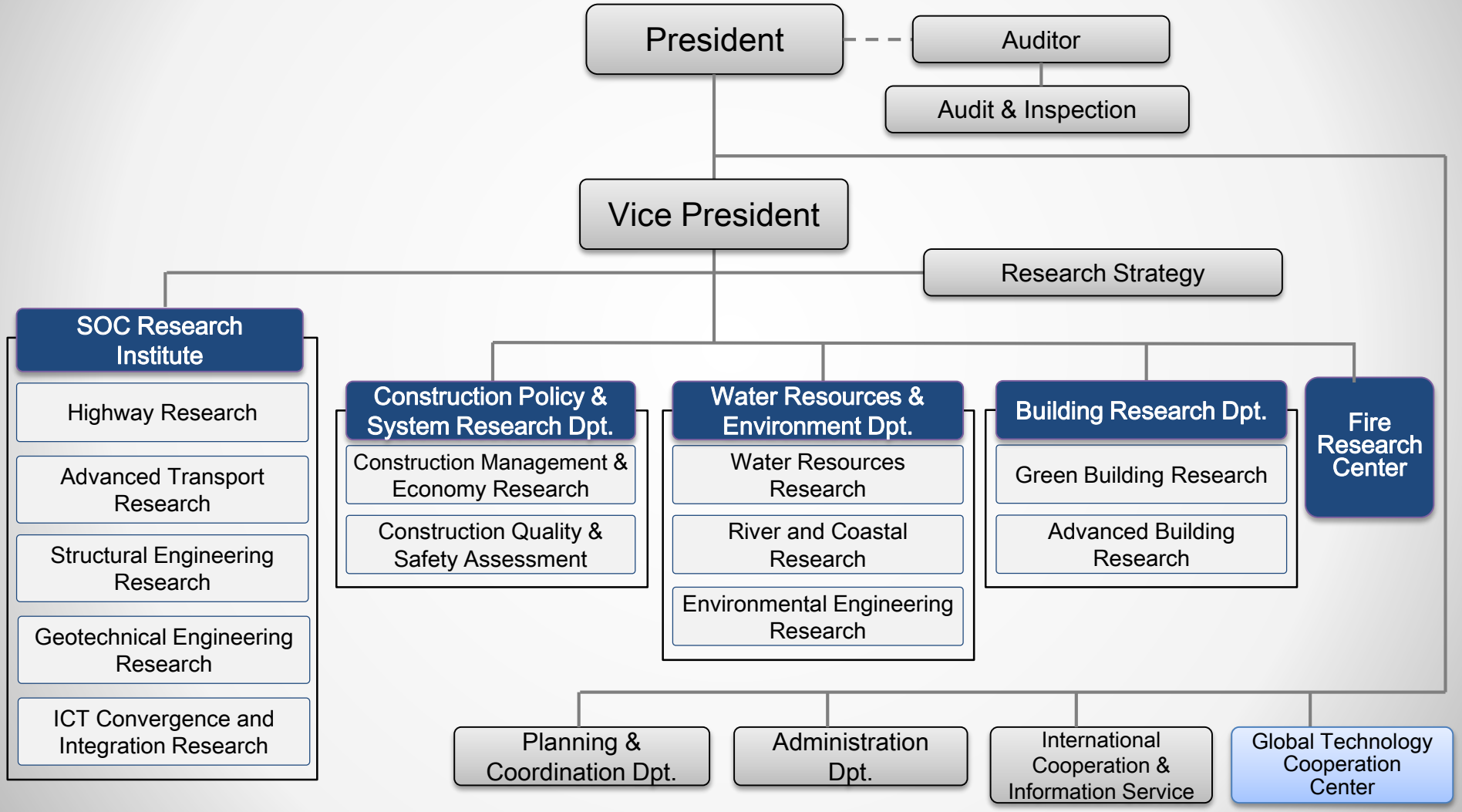
- Policy formulation for national construction technology and industry technology support

Quality Certification and Testing Services

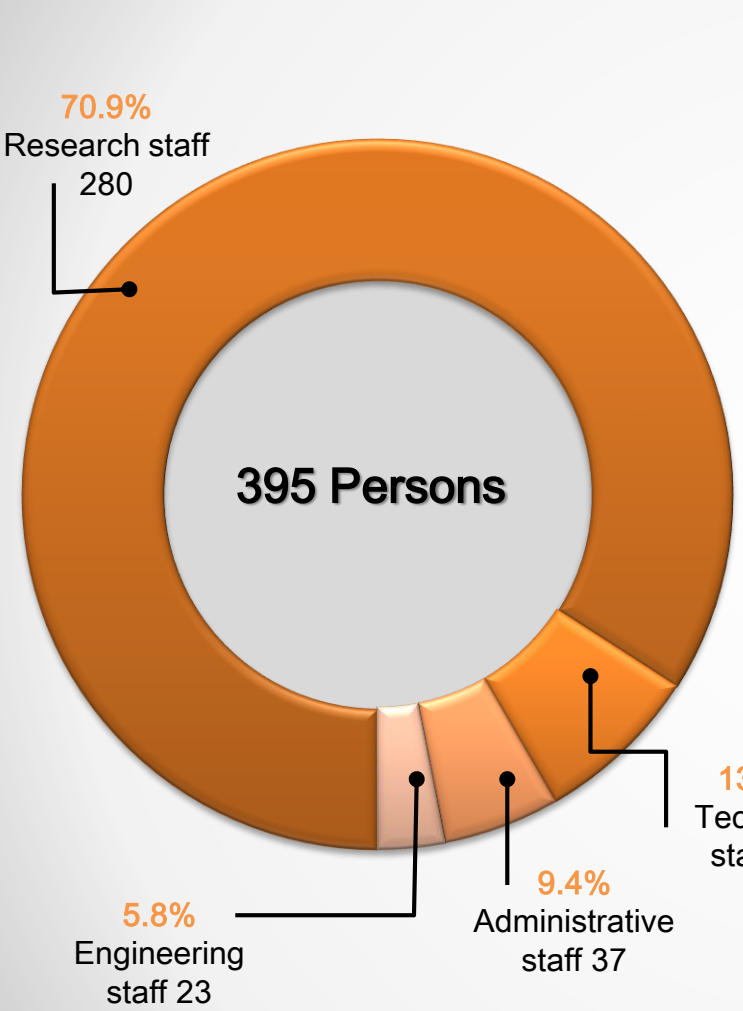
- Quality certification for construction and equipment, implementation of accreditation tests

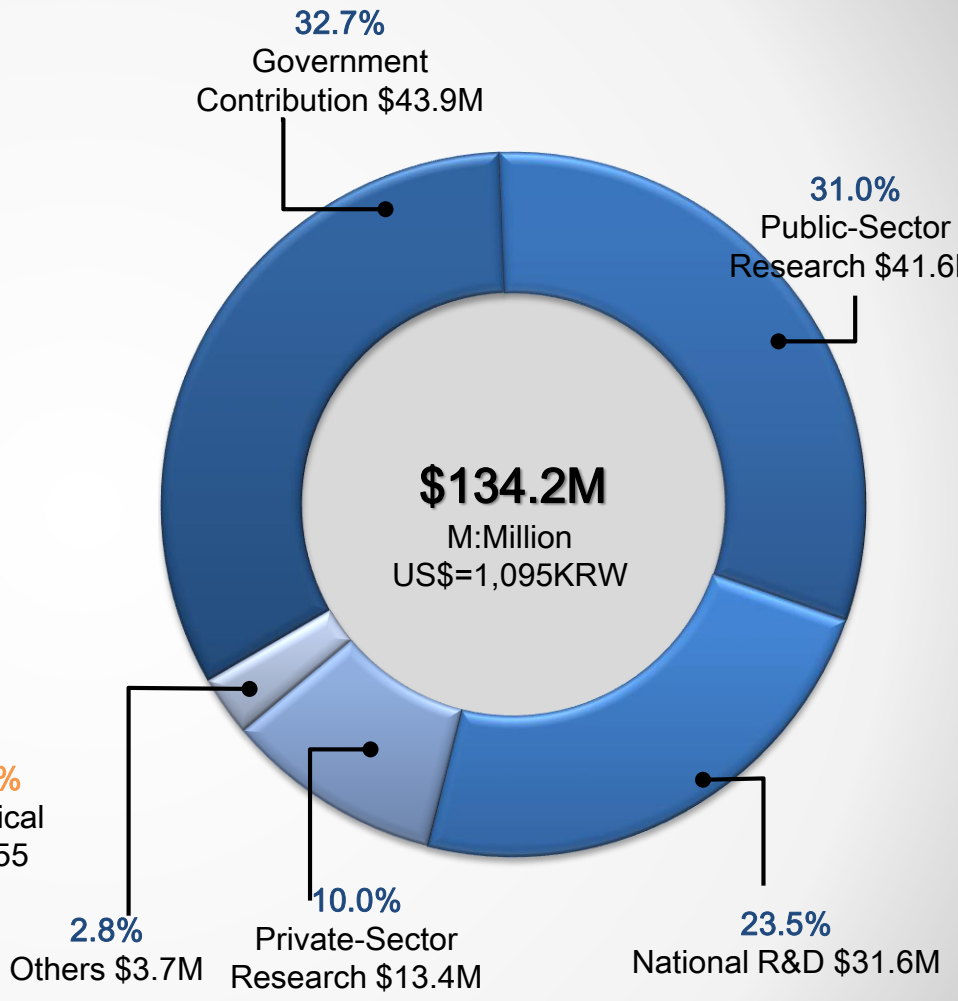
Organization

- Mission-oriented: 1 Institute, 3 Departments, and 2 Centers

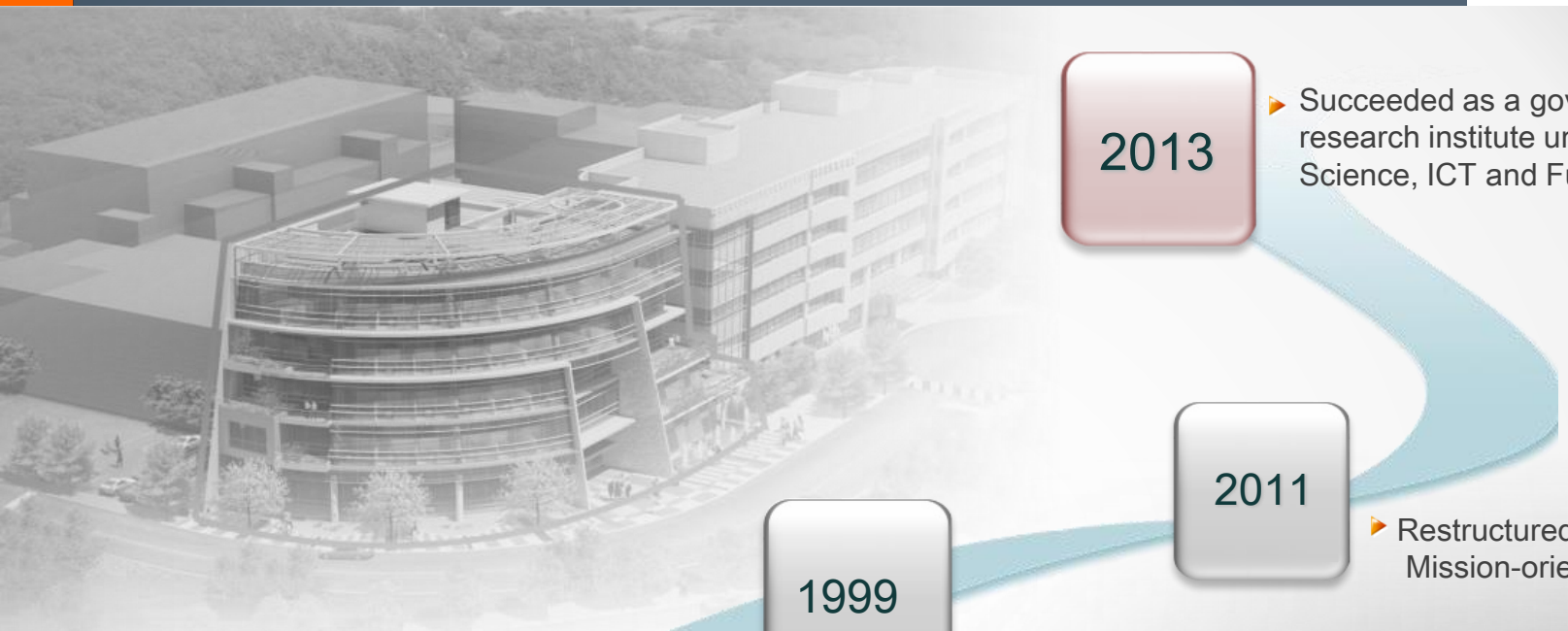


Personnel and Budget





History



2013
- Succeeded as a government-sponsored research institute under the Ministry of Science, ICT and Future Planning

2011
- Restructured into a Mission-oriented Organization

1999
- Merged with National Construction Lab of Korea

1988
- Designed as a government-sponsored research institute

1983
- Establishment of Korea Institute of Construction Technology

R&D Infrastructure

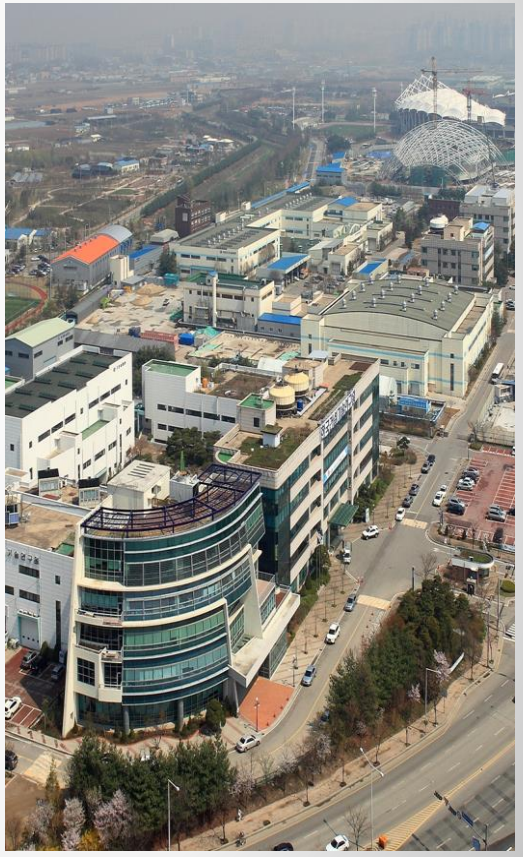
R&D Infrastructure

- R&D Infrastructures
  for experimentation and verification-based research




R&D Infrastructure: Headquarters in Goyang

Building Envelope Performance/ Pavement Material Test Lab. Structural Testing Lab. Construction Environment Research Lab. Indoor Air Quality Lab. Floor Impact Sound Test Bldg. Zero Carbon Green Home. Environmental Materials Research Lab. And 13 more Labs and Bldgs.



R&D Infrastructure: Fire Research Center in Hwasung

Conducts Full-Scale Fire Tests

Large-scale Burn Hall, Material Property Test Lab., Combustion Property Test Lab., High Performance Fire Resistance Lab.

R&D Infrastructure: River Experiment Center in Andong

l Conducts Various River Experiments

Revetment Experiment, Ecological/topographical Experiment for Hydraulic Structure and Revetment, Stability Experiment for River and Hydraulic Structure

R&D Infrastructure: SOC Evaluation Research Center in Yeoncheon

l Offers a 'One-Stop Total R&D Verification Service'

SOC Verification Center, Business Support Center, Construction R&D Test Beds

Major Research Projects

Introduction

- Development of WMA additives that lower the production temperature of the existing hot-mix asphalt mixtures by over 30℃ and development of construction technology for WMA mixtures using such additives
- Development of WMA additive and pavement technology by pavement function (pavement for general traffic, SMA (Stone Mastic Asphalt) pavement, high-ratio recycling pavement, permeable and high-durability pavement, etc.)
- Development of WMA additive and pavement construction technology customized for developing countries (Mongolia,Indonesia, Columbia, etc.)

Warm-mix Asphalt

Results & Outcome

- Registration of nine domestic patents and application for five international patents concerning WMA additives
- Royalty revenues: KRW 680 million (USD 0.6 million)
- Technology application at home and abroad(USA, China, Japan, Portugal, Italy, Mongolia; expressways and national roads in Korea, etc.)
- Commencement of overseas export starting from 2012

Effects & Meaning

- Reduction of petroleum fuel consumption and carbon emissions by over 30% compared to the existing hot-mix asphalt (HMA) technology
- Early opening to traffic owing to reduction of construction delay time by 25%
- Advancement into the overseas eco-friendly road construction market

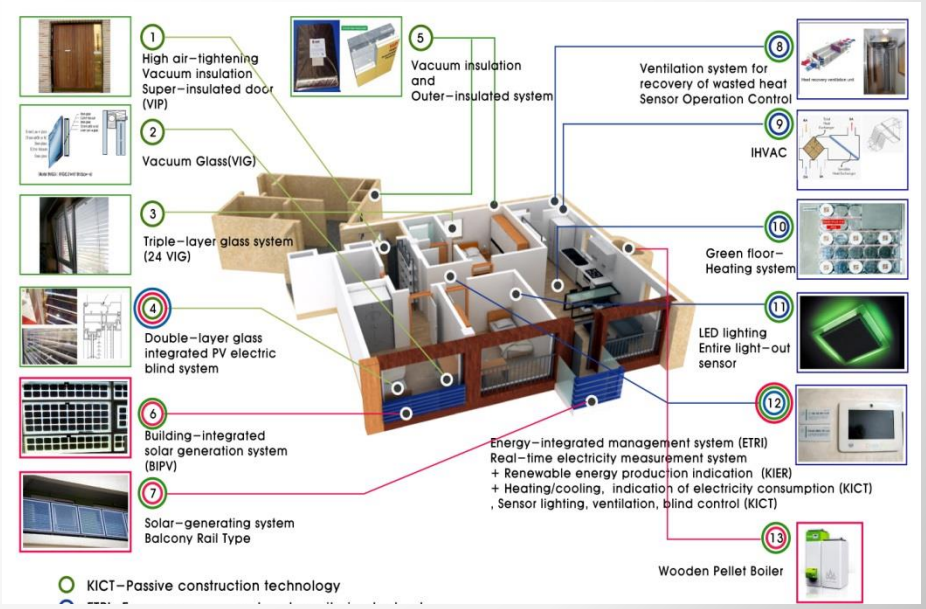
Warm-mix Asphalt

Reduction in Energy Consumption and Greenhouse Gas Emission

Zero-Carbon Green Home

Introduction

- Development of the world's top-tier super-insulating windows using vacuum insulation glass
- Development of dry-type, modular exterior insulation system using vacuum insulation materials
- Development of technology to apply renewable energy hybrid thermal supply system
- Development of IT-integrated(HEMS-HAN linked) green home energy management system



Zero-Carbon Green Home

Results & Outcome

- Development of super-insulating vacuum windows and dry-type vacuum exterior insulation system
- Development of a zero-carbon 'green-home' demonstration apartment (high-rise apartment)

Effects & Meaning

- Support for the government's green home supply project and zero-energy housing complex project
- Reduction of heating and cooling costs by over 50% (payback period: within 10 years)
- Reduction of energy costs by KRW 30 trillion (USD 27.4 billion) (building lifecycle of 40 years based on 1 million units)
- Annual Reduction of CO_2 emissions by 2.5 million tons

Super Bridge 200 Project

Introduction

Increase of National Budget and Social Cost due to Drawbacks of Current Bridge Technology

- Concrete Bridges
  - Frequent maintenance, repair, replacement
  - Heavy weight, reduced constructability
- Steel Bridge
  - Corrosion, periodic re-painting
  - High cost

SUPER Bridge 200, New Bridge Technology

- Application of UHPC to a cable stayed bridge
  - To reduce construction cost 20%
  - To reduce maintenance cost 20%
  - To extend the service life of main structural elements up to 200 years

c.f.: UHPC (Ultra High Performance Concrete)
- Compressive Strength : 200 MPa
- Durability : 200 years

Super Bridge 200 Project

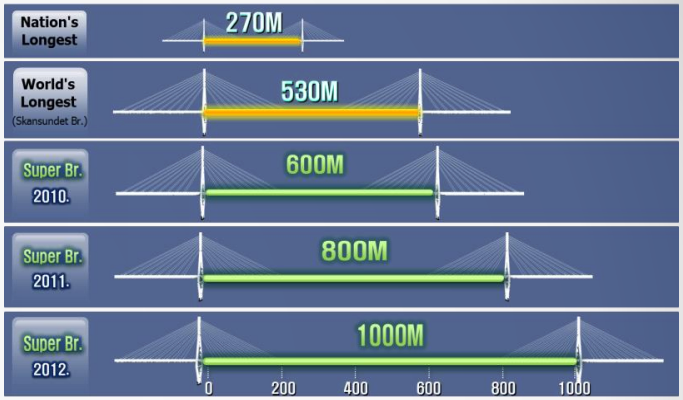
Result & Outcome

Improvement of UHPC

- 70% reduction in fabrication cost
- Improvement of tensile strength from 8 MPa to 19 MPa

World's longest concrete cable stayed bridge

- Technology to extend economically the limit of main span of a concrete cable stayed bridge from 530 m to 1000 m



Effect & Meaning

Economic feasibility – cost analysis

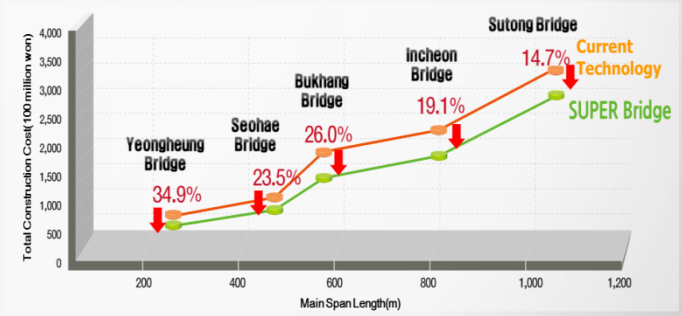
- Reduction in construction cost over a wide range of main spans
- 20% reduction in average

Saving national construction budget and social cost

- Saving 200 million US dollars over 10 years
- 44% reduction in CO_2 emission from bridge construction
- 20% reduction in bridge maintenance cost

Total construction cost(100Million Won)

Construction Cost	200 m Class	400 m Class	600 m Class	800 m Class	1,000 m Class
Current Technology	513	948	1870	2241	3504
SUPER Bridge	334(34.9%↓)	725(23.5%↓)	1384(26.0%↓)	1812(19.1%↓)	2990(14.7%↓)



Super Bridge 200 Project

World's 1st UHPC pedestrian cable stayed bridge

World's 1st UHPC highway cable stayed bridge

UHPC highway bridge

International Cooperation

Strategic Relationship Based on MOU (53 Institutions as of July.8 2013)

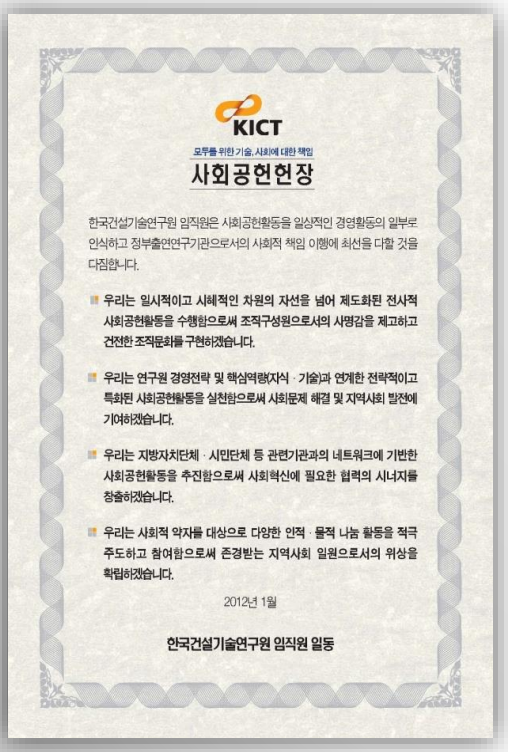
- Delft University of Technology, Netherlands
- Fraunhofer Institute Bauphysik, Germany
- Colorado State University, USA
- Transport Research Laboratory, UK
- Korean-American Scientists and Engineers Association
- Department of Roads, Mongolia
- Asian Institute of Technology, Thailand

International Joint Seminars

- Japan Institute of Construction Engineering, Japan
- Institute of Water Resources and Hydropower Research, China
- Public Works Research Institute, Japan
- Research Institute of Highway, China

Social Contribution Activities

- Establish/announce the social contribution charter (January 2012) : Technology for all, social responsibilities
- Designate ‘KICT Sharing Day’ and implement relay activities : Create a sharing and contribution culture. (August 2012~; once a month)
- Implement social contribution activities linking to the core capabilities of the institute (knowledge/talent) (2004~) : Construction technology experience courses for children; science mentoring programs for teenagers



KICT

모두를 위한 기술, 사회에 대한 책임

사회공헌헌장

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2012년 1월

한국건설기술연구원 임직원 일동

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