

Modernization of Uzbekistan Building Code (UBC) System

Quality Management Regulations and Quality Management Test for Construction Work Quality Management

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Introduction

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■ Understanding of the Law

• What is the law?

- It is an important social promise that everyone must keep in order to maintain social order

• The necessity of law

- It is necessary to maintain social order
- It is necessary to guarantee human freedom and rights



• The priority of application of the law

- It is a principle that the law is rated so that the higher-grade law takes precedence over the lower-grade law



Construction Technology Promotion Act

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■ Article 1. Purpose

1. Promotion of construction technology research and development
2. Improve the level of construction technology to promote related industries
3. Appropriate implementation of construction work
4. Improve the quality of construction work and ensure safety
5. Contribute the promotion of public welfare and the development of the national economy



Construction Technology Promotion Act

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■ Article 3. Basic Plan for Construction Technology Progress

• Purpose

- Promote research and development of construction technology and make efficient use of the results
- In order to promote related industries

• Establish period

- Every five years

• Content of the plan

- Basic objectives and directions for the promotion of construction technology
- Measures to promote and utilize construction technology
- Construction technology information management
- Supply and utilization of construction technology personnel and improvement of technical capabilities
- Fostering of construction technology research institutes
- Advancement of construction engineering industrial structure
- Matters concerning support for overseas expansion and international exchange of construction engineering, etc.
- Matters concerning support of construction engineering operators
- Matters concerning environmental management of construction works
- Matters concerning safety management and quality control of construction works
- Other important matters concerning the promotion of construction technology



Construction Technology Promotion Act

Article 20. Development of Construction Engineers

Purpose

- For the efficient utilization and the improvement of technical capabilities of construction engineers

Purpose of education and training for construction engineers

- In order to acquire the knowledge and skills for performing business
- Use to calculate educational and training performance grades



Technical grade	Construction engineer who works on design and construction, etc.	Construction engineer who works quality management	Construction engineer who manages construction projects
Special	Capability index of 75 or higher	Capability index of 75 or higher	Capability index of 80 or higher
Advanced	Capability index below 75 ~ 65 or higher	Capability index below 75 ~ 65 or higher	Capability index below 80 ~ 70 or higher
Intermediate	Capability index below 65 ~ 55 or higher	Capability index below 65 ~ 55 or higher	Capability index below 70 ~ 60 or higher
Basic	Capability index below 55 ~ 35 or higher	Capability index below 55 ~ 35 or higher	Capability index below 60 ~ 40 or higher

Construction Technology Promotion Act

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■ Construction Quality and Safety Management

• Article 55. Construction quality management

- Construction business operator and housing construction registrant form a quality test plan for construction work
- Construction business operator and housing construction registrant conduct quality tests and inspections in accordance with the quality management plan or quality test plan

• Article 56. Accounting and execution of quality management costs

- The contractor appropriates the construction quality management cost in the construction cost

• Article 57. Ensuring the quality of construction materials and components

- A person who produces, imports, or sells construction materials and components
- Construction business operator or housing construction registrant
- Manufacturer of ready mixed concrete or asphalt concrete
- ▶ Construction materials and components certified to conform to Korean industrial standards
Construction materials and components recognized by the Minister of Land, Infrastructure and Transport



Construction Technology Promotion Act

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■ Construction Quality and Safety Management



• Article 60. Agency for quality inspection

- National and public test institute
- Construction engineering operator
- ▶ Conducting tests and inspections for construction work quality management

• Person commissioned as an acting quality management agent

- Quality inspection with materials that have been sealed or verified by the contractor or construction engineering operator
- In the case of issuing a quality test report for materials, etc. used for construction work, enter the quality inspection report and quality inspection contents into the integrated construction support information system within 7 days from the date of issuance

Construction Technology Promotion Act

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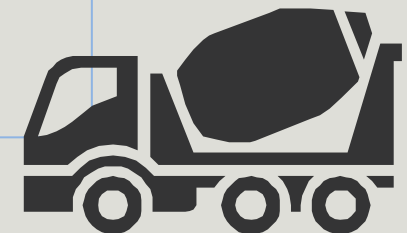
■ Penalty

• Article 85. Penalty

- A person who causes serious damage to the main structure part of the facility and causes personal injury or death shall be sentenced to life imprisonment or imprisonment for not less than three years
- A person who endangers a person is sentenced to up to 10 years in prison or a fine of up to 100 million won

• Article 88. Penalty

- The following persons shall be punished by imprisonment with labor for not more than two years or a fine of not more than 20 million won
 - ① A person who has performed construction engineering work without registration
 - ② A construction business operator or housing construction registrant who has not established or implemented a quality control plan or quality test plan or has not conducted a quality test or inspection
 - ③ A person who supplies or uses construction materials or components for which quality is not secured
 - ④ Those who reuse returned ready-mix concrete without quality certification



Enforcement Decree of the Construction Technology Promotion Act

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■ Construction Project Management



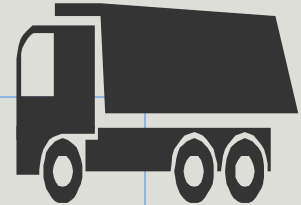
• Article 55. Implementation of construction management

- The term “Construction work prescribed by Presidential Decree” means the following construction work
 - ① Construction with a total construction cost of more than 20 billion won
 - ② Construction work recognized by the ordering office as necessary for the construction of bridges, tunnels, drainage gates, railroads, subways, elevated roads, waste treatment facilities, wastewater treatment facilities, or public sewage treatment facilities
 - ③ Other construction works deemed necessary by the ordering office to manage construction projects such as acting supervisory authority
- The ordering agency may not apply construction project management, such as acting supervisory authority, to the following construction works
 - ① Repair, restoration and maintenance of designated cultural properties and temporary designated cultural properties
 - ② Construction according to the Rural Development Project, Living Environment Improvement Project, and Agricultural Industrial Complex Development Project
 - ③ Construction carried out by local governments
 - ④ Construction work with simple and repetitive contents prescribed by Ordinance of the Ministry of Land, Infrastructure and Transport
 - ⑤ Military Special Works, Correctional Facilities Works and State Confidential Construction Works
 - ⑥ Broadcasting Facilities Corporation with Specialized Technology
 - ⑦ Construction of nuclear reactors, radiation generators, related facilities, nuclear fuel cycle facilities, and disposal facilities

Enforcement Decree of the Construction Technology Promotion Act

■ Construction Project Management

• Article 59. Business scope and contents of construction project management



- Categorization of business scope

- ① Pre-design stage
- ② Basic design stage
- ③ Implementation design stage
- ④ Procurement stage
- ⑤ Construction stage
- ⑥ Post-construction stage

- Step-by-step business content

- ① General business management such as planning, operation, and coordination of construction works
- ② Construction contract management
- ③ Construction cost management
- ④ Construction work process management
- ⑤ Construction quality management
- ⑥ Safety management of construction works
- ⑦ Environmental management of construction works
- ⑧ Construction project information management
- ⑨ Management of risk factors related to construction cost, process, quality, safety, etc.

Enforcement Decree of the Construction Technology Promotion Act

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■ Construction Quality and Safety Management

• Article 89. Construction subject to quality management plan

- Construction works that require a quality management plan are as follows

- ① Construction work subject to construction project management, with a total construction cost of more than 50 billion won.
- ② Construction of multi-use buildings with a total floor area of 30,000 square meters or more
- ③ Construction work that requires a quality management plan to be established in the construction contract

- Construction work requiring additional quality test plans

- ① Civil engineering works with a total construction cost of more than 500 million won
- ② Construction of buildings with a floor area of 660 square meters or more
- ③ Specialized construction with a total construction cost of more than 200 million won



Enforcement Decree of the Construction Technology Promotion Act

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■ Construction Quality and Safety Management

• Article 91. Quality test and inspection

- Quality tests and inspections shall be conducted in accordance with the Korean Industrial Standards, Construction Standards, or the Construction Work Quality Inspection Standards determined and announced by the Minister of Land, Infrastructure and Transport
- The following materials may not be inspected for quality
 - ① Materials for which test reports are submitted by national and public testing agencies or construction technology service providers acting on behalf of quality inspections
 - ② Korean Industrial Standards Certified Products
 - ③ [Industrial Safety and Health Act] Products certified for safety in accordance with the regulations.
 - ④ Materials that have been inspected or certified for quality in accordance with relevant laws and regulations such as the [Housing Act]



Enforcement Decree of the Construction Technology Promotion Act

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■ Construction Quality and Safety Management

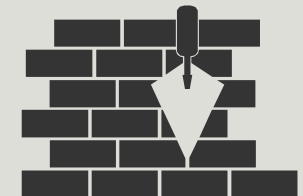
• Article 95. Scope of construction materials and components

- The term “Construction materials and members prescribed by Presidential Decree” means construction materials and members falling under any of the following

- ① Ready mixed concrete
- ② Asphalt concrete
- ③ Sea sand
- ④ Crushed aggregate
- ⑤ Reinforced steel, H-shaped steel, structural eye-shaped steel, construction steel sheet with a thickness of 6 millimeters or more, structural steel pipes, high tension bolts, PC steel wires, PC steel wires, and PC steel rods
- ⑥ Recycled aggregate

- The term “Construction prescribed by Presidential Decree” means any of the following construction works

- ① In the case where a construction business operator or housing construction registrant intends to use construction materials or components under each subparagraph of paragraph (1)
- ② When a manufacturer of ready mixed concrete or asphalt concrete intends to use construction materials such as sea sand, crushed aggregates, rebars, and H-shaped steel in paragraph (1) above



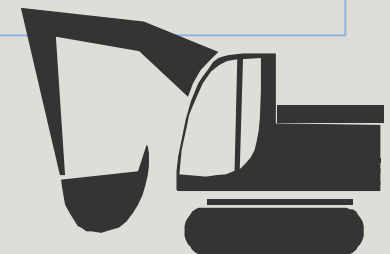
Enforcement Decree of the Construction Technology Promotion Act

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■ Construction Quality and Safety Management

• Article 95. Scope of construction materials and components

- Construction materials and components shall be the following construction materials and components
 - ① As a result of the quality inspection requested by the construction business operator and housing construction registrant and manufacturers of ready-mixed concrete or asphalt concrete to the national testing agency acting on behalf of the quality inspection, construction materials that are above the standard prescribed by the Korean Industrial Standards or meet the specifications
 - ② As a result of the quality inspection conducted by the construction project management service provider or construction supervisor of the relevant construction project, construction materials and components that are above the standard set by the Korean Industrial Standard or suitable for the specifications of the construction
 - ③ Recycled aggregate that conforms to the quality standards under the [Construction Waste Recycling Promotion Act]
 - ④ Aggregate that meets the quality standards according to [Aggregate Collection Method]



Quality Management of Construction Work

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Quality management

Definition of quality management

Quality management by introducing quality management techniques at all stages of planning, investigation, design, construction, etc.

Quality management activities for construction performance conducted through inspection and inspection of materials and construction conditions used at construction sites

Purpose of quality management

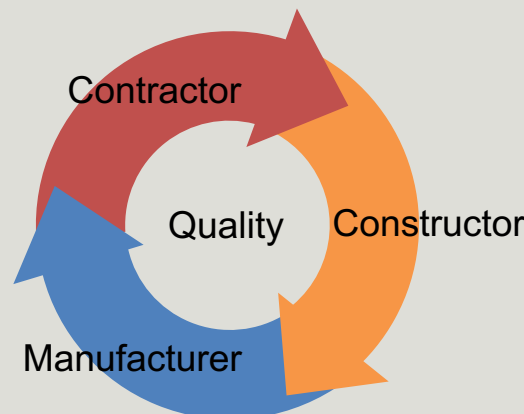
A generic term for all means and systems to economically produce products of quality that meet the needs of the contractor

Conduct inspections and tests at every stage of the process, identify problems early, and guide them to proceed with the construction as intended to ensure reliability of the construction work

Purpose of quality test

Test and investigate the characteristics of a sample or specimen of a material or product for quality control and generate data

Objectively evaluating the quality of construction to induce sound construction, such as prevention of poor construction



Quality Management of Construction Work

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■ Characteristics of Quality Management in Construction Projects

Specificity of Construction Production

- The one-piece order industry
- Depending on the content and conditions

Lack of awareness of quality management

- Stereotypes that only personnel should be managed
- Conventions that follow experience, intuition, and guts rather than data

A variety of environment

- Different conditions such as location for each project
- Diversity of social and environmental quality characteristics and management

Quality evaluation criteria unclear

- Establishing a quality-cost relationship is not specific
- Customer requirements vary

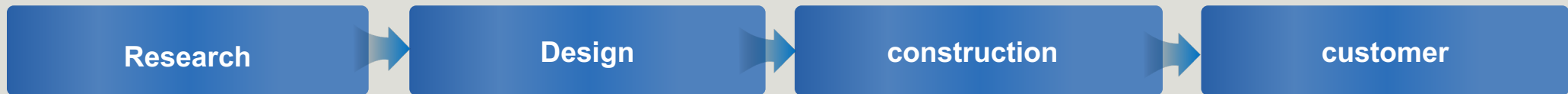


Quality Management of Construction Work

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Time and Cost for Inappropriate Measures for Construction Projects

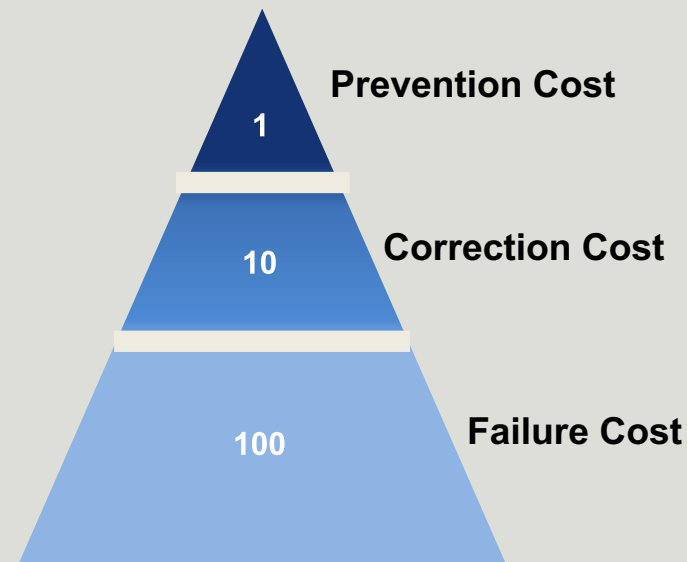
Engineering stage : Inspection stage : Customer use stage = 1 : 10 : 100



Difficult to detect or
predict defects
but
easy to fix



Easy to detect
defects
but
costly to fix



Quality Management of Construction Work

■ Quality Test Plan

- Construction business operator and housing construction registrant must establish a quality test plan and obtain approval from the contractor before construction
- Before submitting the plan to the contractor, it shall be reviewed and confirmed by the construction supervisor or the construction project management engineer
- An contractor other than the ordering agency shall submit a quality plan to the head of the licensing and licensing agency in advance
- The submitted ordering office or the head of the licensing agency shall examine the contents of the plan and notify the result in writing (appropriate, inappropriate, etc.) to the construction business operator and housing construction registrant
- The contractor shall issue an approval letter to the construction business operator and housing construction registrant if the contents of the quality test plan are judged appropriate and the main building department appropriate
- The person placing an order shall check whether the quality control work is properly carried out in accordance with the quality test plan (at least once a year)
- If it is deemed necessary to correct it as a result of confirmation, the construction business operator and housing construction registrant shall correct it without delay and notify the contractor of the result.

① Plan establishment



② Submission



③ Approval



④ Confirmation



⑤ Completion

Quality Management of Construction Work

품질시험비 산출

종별	시험종목	인력				공공요금			인건비(1)	공공요금(2)	재료비(3)	장비손료(4)	교정비(5)	계(6)
		시험				전기	상수도	가스						
		특급	고급	중급	초급	Kwh	m3	m3						
내화점토질벽돌	압축강도			0.8		0.5	0.5		15,786	836	166	158	508	17,454
내화점토질벽돌	잔존선형창수축률		0.2		0.2				7,614	0	76	76	233	7,999
고알루미나질내화벽돌	모양, 치수				0.2				3,322	0	33	33	102	
고알루미나질내화벽돌	내화도		0.2		0.1				5,952	0	60	60	182	
고알루미나질내화벽돌	열보기가공률, 부피비중			0.3					5,920	0	59	59	181	
고알루미나질내화벽돌	압축강도			0.8		0.5	0.5		15,786	836	166	158	508	
고알루미나질내화벽돌	잔존선형창수축률		0.2		0.2				7,614	0	76	76	233	
고알루미나질내화벽돌	화확성분			0.1		28.6	0.1		1,973	2,561	45	20	138	
내화단열벽돌	열모양				0.2				3,322	0	33	33	102	
내화단열벽돌	부피비중			0.3					5,920	0	59	59	181	
내화단열벽돌	압축강도			0.8		0.5	0.5		15,786	836	166	158	508	
연소재벽돌	열모양및치수			0.2					3,322	0	33	33	102	
연소재벽돌	압축강도			0.8		2.9	0.7		15,786	1,355	171	158	524	
연소재벽돌	흡수율			1.0		78.1	0.6		19,733	7,513	272	197	831	
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속빈콘크리트블록	기간비중			0.5					9,867	0	99	99	302	
속빈콘크리트블록	압축강도			0.6		2.9	0.5		11,840	1,037	129	118	394	
속빈콘크리트블록	흡수율			0.9		166.6	0.4		17,760	14,629	324	178	987	
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지장콘크리트블록	압축강도			0.6		2.9	0.7		11,840	1,355	132	118	403	
지장콘크리트블록	흡수율			0.9		166.6	0.5		17,760	14,788	325	178	992	
지장콘크리트블록	투수성				0.2		0.3		3,322	476	38	33	116	
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경량기포콘크리트블록	단열성시험		0.8		1.0				33,777	0	338	338	1,034	
속빈유리블록	열모양및치수			0.2					3,947	0	39	39	121	
속빈유리블록	비틀림				0.1				1,661	0	17	17	51	
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속빈유리블록	열충격성			0.1			0.1		1,973	159	21	20	65	
속빈유리블록	알칼리용출량			0.1					1,973	0	20	20	60	
시멘트계 역채형 방수재	안정성		0.2	0.2		252.7	0.4		8,238	21,862	301	82	914	

품질관리계획서 (QUALITY PLAN)

문서번호 : QP -000000-00(REV.0)

□ 준 리 본

■ 비 준 리 본

Manager

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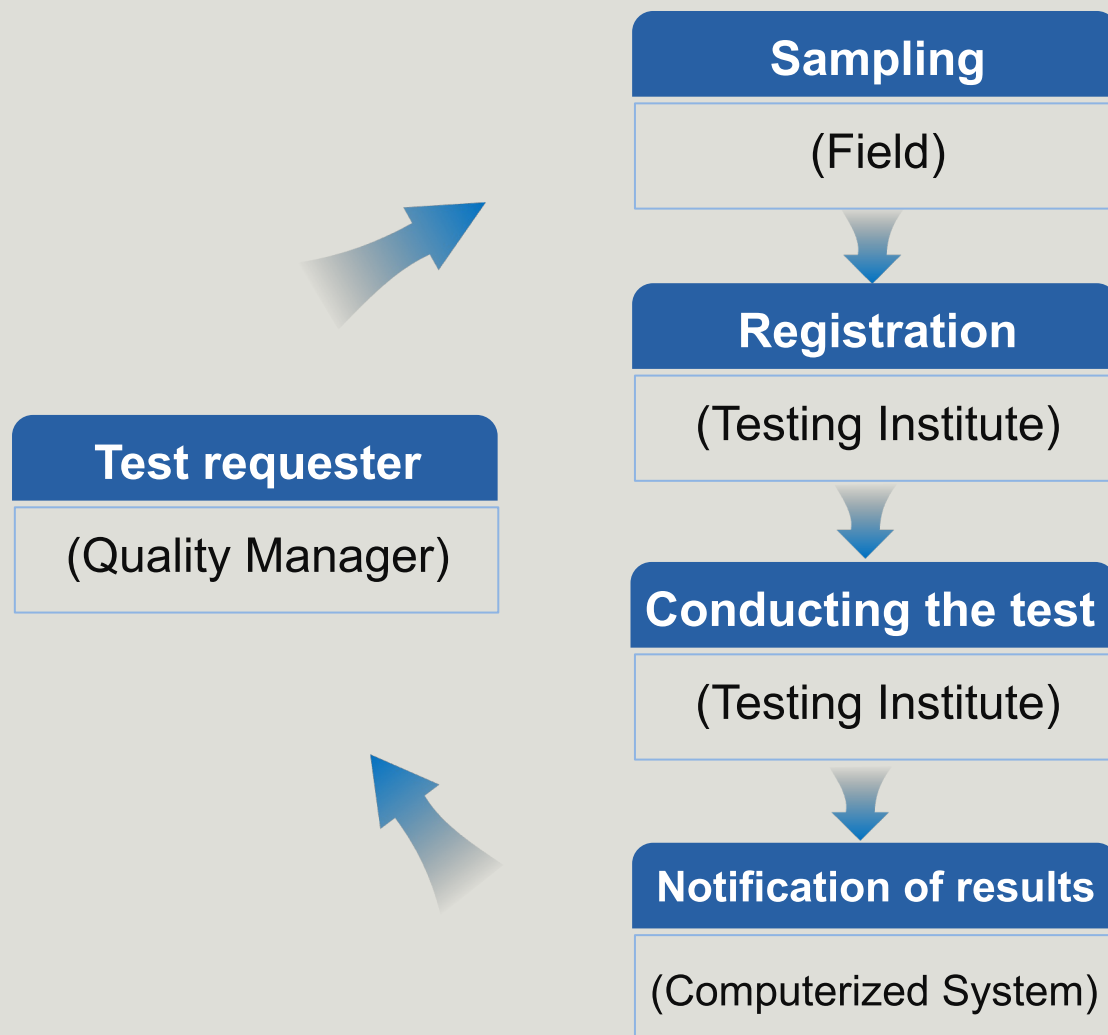
(Construction Company Logo)

(Site Name)

Quality Management of Construction Work

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Quality Test Processing Procedure



■ 건설기술 진흥법 시행규칙[별지 제48호서식]

품질검사 의뢰서

시험·검사종목	(*)		
시료명			
시료량	(채취일:..)		
시료 또는 자재 생산국			
시료 채취 장소			
시료 채취자	소속	담당 업무	성명 (서명 또는 인)
참관자	소속	담당 업무	성명 (서명 또는 인)

접수증

1. 접수일:
2. 의뢰 시험·검사 종목:
3. 시료명 및 시료량:
귀하께서 의뢰한 시험·검사 요청 건은 접수일부터 약 ()일이 걸릴 예정임을 알려드리며 이 접수증을 발급합니다.

접수자: ○○○ (건설엔지니어링사업자) 년 월 일
성명 (서명 또는 인)

Quality Management of Construction Work

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Sealed Sample for Quality Test



Quality Management of Construction Work

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Quality Test



Quality Management of Construction Work

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Sample After Test



Quality Management of Construction Work

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Test Report

■ 간접기술 진흥법 시행규칙(별지 제49호 서식)

품질검사 성적서

시료명(생산국)	용접사 기량시험(SM35B, FCAW(1G)) (대한민국)				
시료 채취 장소	[Redacted]				
성과 이용 목적	품질시험용	성적서번호	TQK-2021-[Redacted]		
공사명	[Redacted]				
발주자	[Redacted]				
시공자	[Redacted]				
의뢰인	[Redacted]				
국가중요시설 여부	해당없음	시험일자	2020-12-01		
		준공예정일자	2021-09-30		

귀하가 품질시험·검사를 의뢰한 위 시료에 대해서 아래 시험 방법에 따라 시험·검사한 결과를 「간접 기술 진흥법 시행규칙」 제56조 제3항에 따라 다음과 같이 알려드립니다.

- 결 과 -

연번	시험·검사종목	시험·검사방법	단위	시도 구분	시험·검사 결과	책임기술인		시험·검사자		
						자격종목 및 자격증번호	성명	서명	성명	서명
1	측면굴림시험(No.1)	AWS D1.5 : 2020	-	[Redacted]	Acceptable	비파괴검사기사 (97202020574V)	김태훈	김태훈	정원도	정원도
2	측면굴림시험(No.1)	AWS D1.5 : 2020	-	[Redacted]	Acceptable					
3	측면굴림시험(No.1)	AWS D1.5 : 2020	-	[Redacted]	Acceptable					
4	측면굴림시험(No.1)	AWS D1.5 : 2020	-	[Redacted]	Acceptable					
5	측면굴림시험(No.1)	AWS D1.5 : 2020	-	[Redacted]	Acceptable					
6	측면굴림시험(No.1)	AWS D1.5 : 2020	-	[Redacted]	Acceptable					
7	측면굴림시험(No.1)	AWS D1.5 : 2020	-	[Redacted]	Acceptable					

한국화학융합시험연구원

전화번호: 정원도(02-2092-4044)
주소: 우 13810 경기도 과천시 교육로 98(중영동) 한국화학융합시험연구원 과천
비고

1. 국가중요시설 여부는 「국가중요시설(시설명)」로 적습니다.
2. 국가중요시설이란 대통령령, 국회의사당, 대법원, 국가정보원, 중앙행정기관의 청사, 원자력발전소, 발전용량, 100만 KW이상 발전소, 전국으로 방송되는 공영 라디오·TV방송국, 라디오 방송국 송신출력 500kW 이상의 송신시설, 군사시설, 공항 및 댐 등을 말합니다.

유의사항

책임기술인 및 시험검사자의 성과와 서명이 없는 경우에는 결과에 대한 보증을 할 수 없습니다.

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KTR KOREA TESTING & RESEARCH INSTITUTE

Quality Management of Construction Work

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■ Nondestructive Test



(Ultrasonic Test)



(Computed Radiography)



(Magnetic particle detection test)



(Penetration Test)

Quality Management of Construction Work

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■ Fire Resistance Test



(Fire resistance test equipment for horizontal members)



(Fire resistance test equipment for vertical members)



(Smokeproof test equipment)

Quality Management of Construction Work

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■ Fire Resistance Test(Vertical Members)



Quality Management of Construction Work

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■ Fire Resistance Test(Vertical Members)



Quality Management of Construction Work

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■ Fire Resistance Test(Horizontal Members)



Conclusion



KTR

Innovating for the future

Innovation - Change - Trust - Collaboration

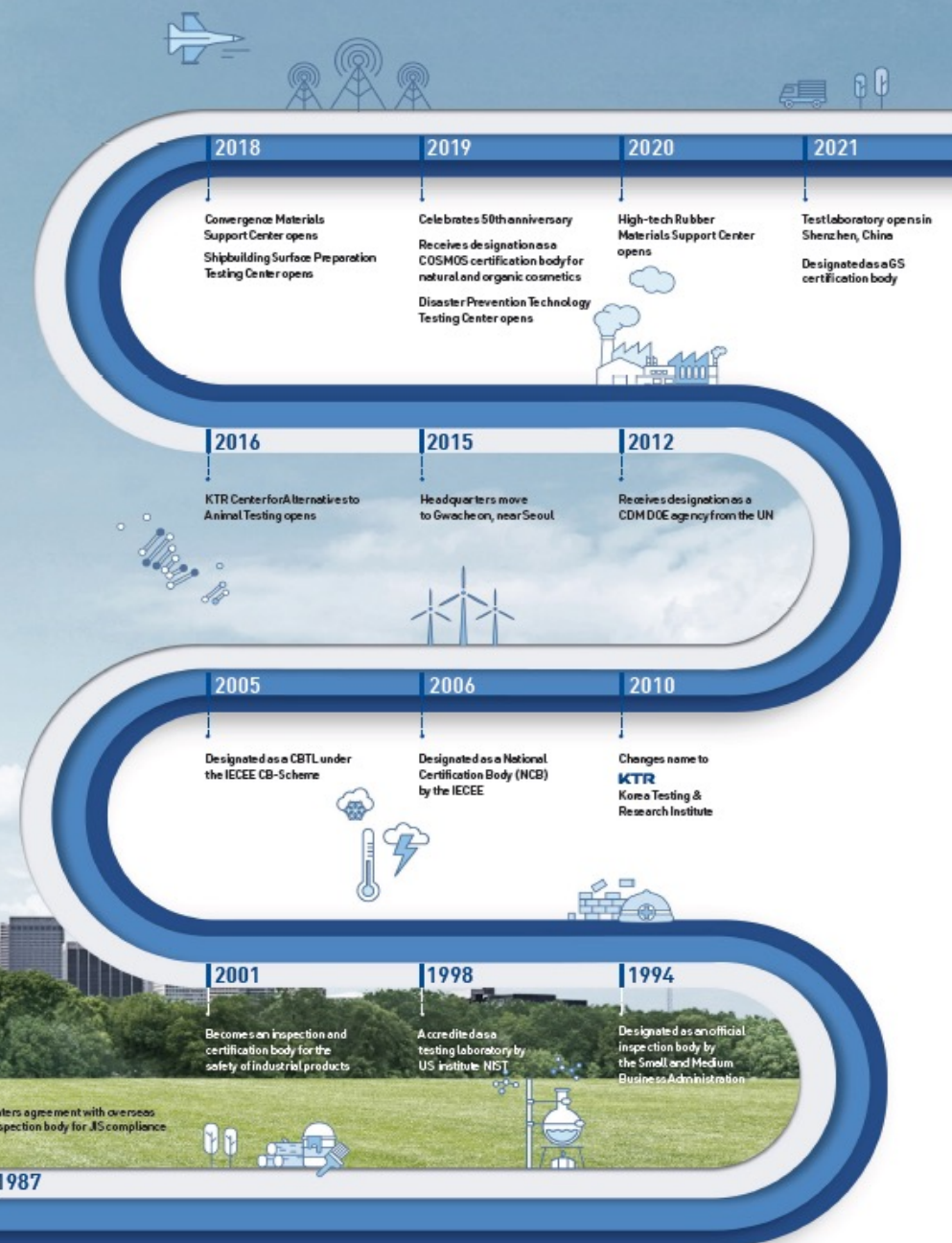
KTR bases all its efforts on these four ideals.
We pledge to continue this focus on future innovation,
reliability and collaboration working closely with our clients
to fulfil their compliance needs.

With KTR at its side, businesses have seen change
and innovation at an unprecedented speed over the past 50 years.

Today, KTR has become one of the world's
leading testing, inspection, verification & certification institutes.

By responding quickly to global technology requirements such as Industry 4.0,
KTR is continuing to pave the way for industry of the future,
promoting carbon neutrality and alternative energy sources.

We pursue growth for our customers through enhancing consumer trust in their
capability to innovate within their individually ever-changing business landscape.



KTR

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KTR Global network

With a global partner network connecting 180 overseas organizations in 40 countries, KTR is able to support businesses with their international regulatory and compliance needs.



KTR Locations

Eight laboratories

Gwacheon • Incheon • Yongin • Ulsan I • Ulsan II • Hwasun
Gwangyang • Suncheon

18 branches and offices

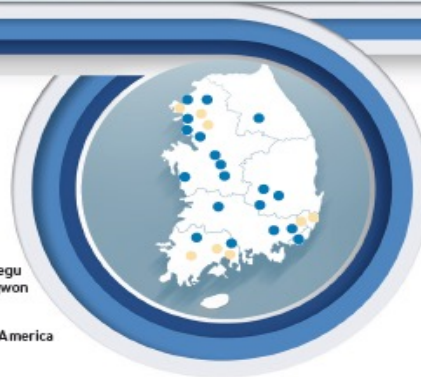
Gimpo • Ansan • Hwasung • Bucheon • Uijeongbu • Daejeon • Daegu
Gwangju • Busan • Cheongju • Cheonan • Wonju • Jeonju • Changwon
Gwangyang • Hongsung • Yangsan • Gumi

Six overseas branches

China [Shanghai, Qingdao, Shenzhen] • Europe • Vietnam • Latin America

One overseas laboratory

China [Shenzhen]



KOREA



GLOBAL



Modernization of Uzbekistan Building Code (UBC) System

