

ASIA-PACIFIC ECONOMIC COOPERATION



APEC ENGINEER
ASSESSMENT STATEMENT

KOREA APEC ENGINEER
MONITORING COMMITTEE

May 2007

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PART A. APEC ENGINEER MONITORING COMMITTEE – KOREA

A.1 Preamble

Human Resources Development Service of Korea(hereinafter referred as HRD Korea), in July 1999, has initially convened an APEC Engineer Monitoring Committee (hereinafter referred as the Committee) which includes representatives from Ministry of Construction and Transportation, Ministry of Labor, Ministry of Science and Technology, The Korean Professional Engineers Association, Korea Construction Engineers Association (hereinafter referred as KOCEA), Korea Research Institute for Vocational Education, Korea Engineering Services Association, and Korea Society of Civil Engineering; and

since then has accelerated to perform the project, by means of requesting the government concerned to increase the necessary budget and strengthening the responsible team by increasing its members; and

at the 3rd meeting on February 2, 2000, decided upon a framework concerned with "The Rules of Korea APEC Engineer Monitoring Committee", and authorized KOCEA as the Register responsible for registering APEC Engineers in the disciplines of Civil and Structural Engineering, and designated KOCEA as an educational institute responsible for continuing professional development; and

afterwards, on May 25, 2000, resolved for "The Rules of Korea APEC Engineer Monitoring Committee", and enlarged the organization of the Committee (i.e. raised the social standing of the members and increased the government ministries concerned).

As the 3rd(October 2001 in Kuala Lumpur, Malaysia) and 4th(June 2003 in Rotorua, New Zealand) Coordinating Committee were concluded to expand the disciplines of APEC Engineers registration in 15, the Committee had decided to add the 13 disciplines to the existing 2. The Korean Professional Engineers Association(hereinafter referred as KPEA) is designated by the

Committee as a Register and educational institute for the added 13 disciplines.

The initial assessment statement, submitted to the APEC Engineer Project Expert Advisory Group Meeting on July 27–29, 1999, was first revised on Nov. 5, 1999, and was secondly revised on May 25, 2000. and was thirdly revised on February 28, 2005, and was fourthly revised on May 15, 2007.

In accordance with National Technical Qualifications Enforcement Decree (Amended by Presidential Decree No. 195443 Jun. 22, 2006) and Professional Engineers Act (Amended by Act No, 6268 Jan. 26, 2007), Ministry of Science and Technology is in charge of affairs with international mutual recognition of professional engineers. Korea APEC Engineers Monitoring Committee have been moved from Human Resources Development Service of Korea to the Korean Professional Engineers Association since Apr. 1st, 2007

This Assessment Statement has been developed covering 15 engineering disciplines by the Committee, in order to meet the requirements of the APEC Engineer Coordinating Committee and of the current Korean law and regulations, and shall be subject to periodic review and revision by the Committee.

A.2 Organization

A.2.1 Establishment and Operation

A.2.1.1 Establishment

The Committee was established on the basis of the decision of the Steering Committee and by the agreement of the government concerned in July 1999; and decided to revise the number of members to be fifteen (15) at the 3rd meeting on February 2, 2000.

A.2.1.2 Activities

The Committee will conduct:

- 1) activities related to the APEC Engineer Coordinating Committee,
- 2) activities related to the Register of APEC Engineers
- 3) activities related to continuing professional development
- 4) activities related to the Mutual Exemption Agreement of APEC Engineers
- 5) other supporting activities for the APEC Engineers Mutual recognition Project

A.2.2 Membership

- 1) The Committee consists of fifteen (15) members, including one chairman.
- 2) Members will serve for three years (3) duration, and may be re-appointed in the next term.
- 3) The head office

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Mr. Ha-Won Song
Professor of Yonsei University,

Korean Society of Civil Engineers (KSCE)

Mr. Chun–Su Chon

Member of International Cooperation Committee,
Korean Engineering and Consulting Association (KENCA)

Mr. Seok–Yoon Hong

Director General of Office of Planning and Coordination,
Human Resource Development Service of Korea

A.3 APEC Engineers Disciplines for Registration

On the basis of understanding of the government concerned, Korea has decided to identify, for the time being, the engineering disciplines of Civil and Structural engineering for the registration, of which the engineers will be assessed.

Civil Engineering

Structural Engineering

Geotechnical Engineering

Environmental Engineering

Mechanical Engineering

Electrical Engineering

Mining Engineering

Industrial Engineering

Chemical Engineering

Information Engineering

Bio Engineering

Fire Engineering

Building Services Engineering

Petroleum Engineering

Aerospace Engineering

A.4 Relation of Monitoring Committee to Register

The chairman of the Committee shall establish and operate the Register of APEC

Engineers by the resolution of the Committee, in order to conduct the activities related to the administration and operation of the APEC Engineers. And the Register for the disciplines of Civil and Structural Engineering shall be established and included in the organization of KOCEA. and the Register for the other 13 disciplines shall be established and included in the organization of KPEA.

A.5 The Register

The provisions of the operation for the assessment and registration of APEC Engineers, which regulate the followings, shall be submitted by the Register and approved by the Committee.

- 1) The registration criteria of an APEC Engineer
- 2) The registration procedures of an APEC Engineer
- 3) The Management of Registration Book
- 4) The accounting on the registration fee and others

PART B. ASSESSMENT MECHANISMS FOR APEC ENGINEERS

B.1 Accreditation or Recognition of Higher Engineering Education Courses

An applicant for registration shall have satisfied the requirements of one of the assessment mechanism described hereunder.

B.1.1 Assessment Mechanisms

Assessment mechanisms for the recognition of higher engineering education courses are set by Ministry of Education. The applicant who graduates college or university and achieves a degree of Bachelor of Engineering shall be accredited and recognized for higher Engineering Education.

Besides, an applicant shall also be as above, who has achieved the formal education substantially equivalent to that associated with successful completion of:

- 1) an engineering degree delivered and accredited in accordance with the best practice guidelines developed by the Federation of Engineering Institutions of South East Asia and the Pacific; or
- 2) an engineering degree accredited by an organization holding full membership of, and operating in accordance with the terms of, the Washington Accord; or
- 3) the Engineer-in-Training examination set by the Japan Consulting Engineers Association; or
- 4) the combined Fundamentals of Engineering and Principles and Practices of Engineering examination set by the United States National Council of Examiners in Engineering and Surveying; or
- 5) an engineering program accredited by a body independent of the education provider, or an examination set by an authorized body within an economy, provided that the accreditation criteria and procedures, or the examination standards, as

appropriated, have been endorsed by the APEC Engineer Coordinating Committee.

B.1.2 Alternative Assessment Mechanisms

B.1.2.1 Professional Engineer

Applicants without a degree of Bachelor of Engineering will be assessed and accepted through written test and oral test which are required to be a Professional Engineer set by HRD Korea in addition to assessment of their professional experience.

B.1.2.2 Principal Engineer

Applicants as an Principal Engineer without a degree of Bachelor of Engineering or a Certificate of Professional Engineer, will be assessed and accepted through written tests which are required to be an Engineer.

The applicant who has passed the written test for the Engineer can be accredited as an equivalent to the engineer who ha graduated university of the discipline's engineering course

B.2 Assessment for Independent Practice

An engineer who is registered as Professional Engineer or Principal Engineer shall be recognized as eligible for independent practice.

B.2.1 Services Provided by Professional Engineer or Principal Engineer for the Construction Related Engineering Work

The Professional Engineer or Principal Engineer shall be allowed to establish one of the offices or to be employed in one of the offices or companies related to the construction work as shown below to provide the related services:

- Contractor

- Supervising & Consulting Firm
- Architectural design office
- Engineering & Consulting Firm
- Professional Engineer's Office
- Surveyor
- Safety Diagnosis Specialized Agency
- Maintenance and Management Contractor
- Quality Test Agency
- Construction Safety Specialized Agency

The requirement of engineering capacity to establish the office for independent practice is provided in the Attachment 2.

B.2.2 Continuing Professional Development Requirements

According to the Professional Engineers' Act and Construction Technology Management Act, the engineers are required to maintain and improve their professional knowledge and skills. There is no requirement to submit the proof of CPD.

B.2.3 Examination or Interview of Candidate

Written examination of Candidate is not required but interview is required for independent practice.

B.2.4 Code of Conduct

The code of conduct of the Professional Engineer and Principal Engineer as a construction engineer are prescribed in Professional Engineers' Act and Construction Technology Management Act.

There is no extra code of conduct for the assessment for independent practice.

B.3 Specific Assessment Requirements for an APEC Engineer

B.3.1 Seven Years Experience after Graduation in a Recognized Engineering Program

B.3.1.1 Overview

The assessment procedure and criteria of seven years experience after graduation in a recognized engineering program are presented, in accordance with the "Managerial Regulations of APEC Engineer Assessment and Registration(hereinafter referred as Managerial Regulations)".

B.3.1.2 Examination or Interview of Candidate

There is no requirement of examination or interview for the assessment for seven years experience.

B.3.2 Two Years Experience in Responsible Charge of Significant Engineering Work

B.3.2.1 Overview

The assessment procedure and criteria of two years experience in responsible charge of significant engineering work are presented, in accordance with the "Managerial Regulations".

An Engineering work in which an APEC Engineer engages includes more or less, safety, health and welfare of the public and creation of amenable environment and all these are important. Based on this presumption, APEC Engineer's experiences in responsible charge shall be defined as experiences in the engineering work which APEC Engineer made decision by himself.

B.3.2.2 Examination or Interview of Candidate

Written examination, Oral examination or Interview of Candidate is not required. However in case that a career report of candidate is not in coincident with the

requirements, a special oral test is required.

B.3.3 Continuing Professional Development

B.3.3.1 Introduction

A person who has registered or will register on the Register of APEC Engineer, shall be required to invest in continuing professional development to meet the requirements of Korea Monitoring Committee as described in the attached "Managerial Regulations".

B.3.3.2 The mechanism of Continuing Professional Development

APEC Engineer shall endeavor to maintain and improve the level of the person's professional abilities by further and continuously developing person's skills and knowledge and by gaining practical experiences so as to respond to social needs. More detailed program is provided in the attached "Managerial Regulations".

B.3.4 Code of conduct

B.3.4.1 Introduction

All applicants seeking registration on the APEC Engineers Register shall agree and comply with the "Korea APEC Engineer Code of Ethics" set by the Committee.

B.3.4.2 Korea APEC Engineer Code of Ethics

The Committee has developed APEC Engineers Code of Ethics All APEC Engineers who are registered shall comply with the above Code of Ethics.

B.4 Audit of APEC Engineers

1) KOCEA and KPEA are the approved body for the audit of persons on the Register.

- 2) The Committee has resolved, that any person on the Register may be subject to random audit of their certificates and other records of continuing professional development over the immediate past three years period.
- 3) The Committee shall audit KOCEA and KPEA for the assessment and registration of the APEC Engineer.

PART C. APEC ENGINEER DISCIPLINES FOR REGISTRATION

C.1 Civil Engineering

C.1.1 Indicative Area of Practice

Civil Engineering includes planning, investigation, design, testing, analysis, operation, construction and evaluation of works based on highly specialized knowledge and experience or technical works as management and supervising.

C.1.2 Indicative Scope of Education Programs

Education curriculums normally include mathematical and computational techniques to analyse, design, supervise and construct civil facilities and buildings with solid components, and experimental techniques, including instrumentation, data acquisition, and statistical data treatment on the civil and building structures.

- Materials Testing and Quality Control
- Road and Airport System and Facility
- Port and Harbor System and Facility
- Railway Planning
- River and Riverside Structure
- Dam System and Facility
- Hydraulic Structure
- Water Supply and Piping System
- Sewage Treatment System and Facility
- Construction Planning and Management
- Surveying
- Geo-spatial Information System
- Soil Mechanics
- Rock Mechanics
- Foundation Engineering

- Engineering Seismology and Ground Treatment
- General subjects relating to Civil Engineering and the Earth Sciences
- Construction Planning and Management
- Urban Development
- Structure of a City
- Zone Planning and Design
- Landscape and Scenery of a City
- Forest Protection
- Park System and Facility
- Cadastral Survey Planning and Execution
- Environmental Protection
- Traffic Planning
- Traffic Flows Theory and Feasibility
- Traffic Load Survey, Management and Design
- Traffic Safety and Pollution
- Traffic Land Use Plan

C.1.3 The subtitled specialist Area of Practice

The subtitled specialist areas of practice to be implemented under the technical field of Civil Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Soil Mechanics Foundation
- Harbor Coastal Engineering
- Road and Airports
- Railway
- Water Resources Development
- Water Supply Sewerage
- Civil Engineering Agricultural Fishery
- Civil Engineering Execution
- Civil Engineering Quality Testing
- Surveying Geo-Spatial Information
- Architectural Execution
- Construction Quality Testing

- Urban Planning
- Landscape Architecture
- Construction Safety
- Cadastral Surveying
- Transportation

C.2 Structural Engineering

C.2.1 Indicative Area of Practice

The structural engineers in Korea are currently classified into two categories, i.e. architectural (buildings) and civil (non-building) works as follows:

- 1) The structural engineers of building conduct structural engineering work related to buildings such as,
 - a) structures fixed to the ground having roofs as well as columns or walls including gates etc, as attached structures,
 - b) structures used as ground-stands, etc and their (including a) facilities, and
 - c) the structures including chimneys, advertisement towers, elevated water tanks, retaining walls, industrial facilities, storage facilities, etc as specified in Korean Building Law
- 2) The structural engineers of civil work conduct engineering work on the structures such as for bridges, roads, dams, foundations of civil structures excluding buildings.

Civil Engineering includes planning, investigation, design, testing, analysis, operation, construction and evaluation of works based on highly specialized knowledge and experience or technical works as management and supervising.

C.2.2 Indicative Scope of Education Programs

Education programs normally include mathematical and computational techniques to analyse, design and inspect civil facilities and buildings' structures, and experimental techniques, including instrumentation, data acquisition, and statistical data treatment.

- Structure Analysis
- Steel-frame Structure
- Reinforced Concrete Structure
- Concrete Structure
- Cement Product
- Structural Panning and Calculation
- Supervision of Structure

C.2.3 The subtitled specialist Area of Practice

The subtitles specialist areas of practice to be implemented under the technical field of Civil Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Architectural Structures
- Civil Engineering Structures

C.3 Geotechnical Engineering

C.3.1 Indicative Area of Practice

Geotechnical Engineering includes planning, investigation, design, construction and maintenance of works involving the ground, and works constructed from excavated natural materials.

C.3.2 Indicative Scope of Education Programs

Education programmes may include the following engineering topics:

- Engineering Geomorphology
- Engineering Geology
- Hydrogeology
- Geo-Environmental Engineering
- Geophysical Engineering

- Applied Geochemistry
- Applied Geostatistics
- Geophysical Data Processing
- Geophysical Prospecting
- Tunneling Engineering
- Blasting and Excavation
- Underground Space Technology
- Soil Mechanics
- Rock Mechanics
- Foundation Engineering
- Engineering Seismology and Ground Treatment
- General subjects relating to Civil Engineering and the Earth Sciences

C.3.3 The subtitled specialist Area of Practice

The subtitled specialist areas of practice to be implemented under the technical field of Geotechnical Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Geology and Geotechnical

C.4 Environmental Engineering

C.4.1 Indicative Area of Practice

Environmental Engineering relates to application of engineering principles and practices to improve and maintain the environment for the protection of human health, for the protection of nature's beneficial ecosystems, and for the environment-related enhancement of the quality of human life.

This area includes pollution prevention, water and water resources, systems modelling, waste water, solid waste and hazardous waste, atmospheric systems and air pollution control, and environment and occupational health.

C.4.2 Indicative Scope of Education Programs

Education programs normally include environmental chemistry, an earth science course and a biological science course.

The following engineering topics are normally included in the programs:

- Fluid Mechanics
- Mechanics of Materials
- Ground Water and Soil Contamination
- Soil Physics
- Biological and Chemical Processes
- Air, Water & Noise Pollution Control Engineering
- Solid & Hazardous Wastes Engineering
- Environmental Engineering
- Environmental Assessment and Management Systems
- Sustainable Systems
- Environmental Hydraulics
- Theory and Practice of Waste Recycling
- Environmental Geochemistry

C.4.3 The subtitled specialist Area of Practice

The subtitled specialist areas of practice to be implemented under the technical field of Environmental Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Air Pollution Control
- Water Pollution Control
- Noise and Vibration
- Waste Treatment
- Industrial Hygiene Management
- Weather Forecasting

- natural Environment Management
- Soil Environment

C.5 Mechanical Engineering

C.5.1 Indicative Area of Practice

Mechanical Engineering includes research, design, development, evaluation, manufacture, installation, testing, operation, maintenance and management of machines, machine and thermodynamic processes, and manufacturing and materials handling plants and systems.

This area is applied to manufacturing, transport, electricity generation, and in works and services using machine systems, including the environment of building interiors.

C.5.2 Indicative Scope of Education Programs

Mechanical & Aerospace Engineering

Education programs normally include mathematical and computational techniques to analyse, model and design physical systems with solid and components under steady and transient conditions, and experimental techniques, including instrumentation, data acquisition, and statistical data treatment.

The following topics are normally included in engineering programs:

- Applied Thermodynamics
- Heat and Mass Transfer
- Fluid Mechanics
- Kinematics and Dynamics of Machines
- Materials Technology
- Design and Manufacture of Machine Elements

- Electrical and Electronics Engineering
- Automation and Control Systems
- Mechanics of Machines
- Manufacturing Systems and Technology
- Computer Aided Engineering
- Mechanics of Solids
- Manufacturing Processes
- Internal Combustion Engines
- Fluid Machinery Design
- Machine Design
- Mechanics of Aerospace Structures
- Aerodynamics
- Aircraft Vibration
- Combustion Theory
- Air Conditioning and Refrigeration
- Automotive Engineering
- Gas Turbine
- Fluid Power Engineering
- Precision Machinery Design
- Production Engineering
- Design of Aircraft Structures
- Rocket Propulsion
- V/STOL Aerodynamics
- Jet Propulsion

Materials Engineering

Educational programmes cover a diverse range of subjects. Some are general in nature (e.g. materials technology courses) while others involve specific scientific disciplines such as metallurgy, geology or chemistry.

The range of topics that may be covered includes:

- Principles Engineering Materials

- Physical Chemistry of Materials
- Modern Physics of Materials
- Physical Metallurgy
- Construction Materials Science
- Microelectronic Materials
- Design and Manufacture
- Materials Selection and Failure Analysis
- Analysis of Composite Materials
- Polymer Engineering
- Principles of Extractive Metallurgy
- Thermodynamics of Materials
- Foundry Engineering
- X-ray Crystallography
- Ferrous Production Metallurgy
- Ceramics Engineering
- Thin Film Technology
- Welding Metallurgy
- Electronic Inorganic Materials
- Powder Metallurgy
- Nonferrous Materials and Production Metallurgy
- Control of Materials Processing

Naval Architecture & Ocean Engineering

Education programs for both disciplines normally include mathematics and computational techniques, and the following engineering topics:

- Applied Thermodynamics
- Control
- Electrical and Electronic Engineering
- Kinematics and Dynamics of Machines
- Maintenance Technology
- Marine Power Systems
- Materials Engineering

- Ship Operation Technology
- Naval Architecture and Ocean Engineering
- Marine Structural Dynamics
- Ship Structure Analysis
- Design of Marine Systems and Components
- Ocean Environmental Engineering
- Ship Hydrodynamics
- Structural Analysis and Design of Ocean Structure
- Design of Propulsion Device
- Ship Building Processes
- Ship Design
- Ship System Dynamics
- Computer–Aided Ship Drawing

C.5.3 The subtitled specialist Area of Practice

The subtitles specialist areas of practice to be implemented under the technical field of Mechanical Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Making Machinery
- Welding
- Die and Mould
- Transportation Vehicles
- Hydraulic Machinery
- Industrial Machinery
- Machine Manufacturing Process Design
- Construction Equipment
- Railroad rolling Stock
- Ship Design
- Ship Construction
- Marine Machinery
- Ferrous Metallurgy
- Nonferrous Metallurgy

- Metal Material
- Metal Working
- Nondestructive Testing
- Machine Safety

C.6 Electrical Engineering

C.6.1 Indicative Area of Practice

Electrical Engineering includes research, design, development, manufacture, installation, operation, maintenance and management of equipment, plant and systems within electrical, electronic, communication and computer systems areas.

This area is applied to electrical power generation, transmission, distribution and utilization, manufacture, instrumentation and control in industry, communications networks, electronic plant and equipment, integration and control of computer systems.

C.6.2 Indicative Scope of Education Programs

Electrical & Electronics Engineering

Education programs provide a thorough understanding of the principles of electricity, electronic circuits, computers, communications, and electromagnetism.

The following engineering topics are normally included in the programs:

- Circuit Analysis and Network Theory
- Electromagnetic Theory
- Analogue Systems
- Control Systems
- Communications Systems
- Logic Circuits

- Electronic Circuits
- Circuit Theory
- Electro–Magnetic–Mechanical Energy Conversion and Distribution
- Electric Power Engineering
- Semiconductor Devices
- Digital Systems Design
- VLSI Systems Design
- Operating Systems
- Optical Electronics
- Plasma Engineering Photonics
- Electric Machine and Control
- Analog and Digital Circuits
- Microprocessors and Microcomputer Systems
- Integrated Circuits and Computer–Aided Circuit Design
- Linear Systems, Signal Processing, and Theory of Control
- Wired and Wireless Communications, Optoelectronics
- Data Communications, Computer Network, and Internet Protocols
- Multimedia Technologies and Information Processing Techniques
- Programming Techniques, Database Management, and Software Engineering

C.6.3 The subtitled specialist Area of Practice

The subtitled specialist areas of practice to be implemented under the technical field of Electrical Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Generation Transmission and Distribution
- Electric Application
- Electric Railway
- Railroad Signal Apparatus

- Industrial Instrumentation and Control
- Electric Safety

C.7 Mining Engineering

C.7.1 Indicative Area of Practice

Mining Engineering concerns with the research, exploration, design, development, installation, operation, maintenance and management of underground and open pit mines of the extraction and environmental and safety considerations.

C.7.2 Indicative Scope of Education Programs

The following engineering topics are normally included in the programs:

- Geological Engineering
- Mineralogy
- Thermodynamics
- Hydrogeology
- Analytical Chemistry
- Gas Engineering
- Soil Mechanics
- Rock Mechanics
- Mining Engineering
- Geophysical Prospecting
- Elements of Mineral Processing
- Unit Operations and Milling Processes
- Mine Evaluation and Ore Reserve Estimation
- Environmental Protection and Occupational Health and Safety
- Mining Equipment Selection and Maintenance
- Underground Open Pit Mines
- Explosives Technology
- Resource Geology
- Tunneling Engineering

- Remote Sensing

C.7.3 The subtitled specialist Area of Practice

The subtitled specialist areas of practice to be implemented under the technical field of Mining Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Underground Resources Development
- Underground Resource Treatment
- Prospecting
- Explosives & Blasting

C.8 Industrial Engineering

C.8.1 Indicative Area of Practice

Industrial engineering is concerned with the design, improvement, and installation of integrated systems of people, material, equipment, information and energy. It requires the ability to plan, organize, and operate industrial and business facilities and processes for the economic, safe and effective use of physical and human resources. C.8.2 Indicative Scope of Education Programs Education programmes normally include the fundamentals of engineering science, mathematical and computational techniques, basic engineering communication skills such as engineering drawing, report writings etc.

C.8.2 Indicative Scope of Education Programs

The following engineering topics are normally included in the education programme:

- Manufacturing Processes Analysis
- Computer Integrated Manufacturing and Automation
- Motion and Time Study

- Quality Management
- Production Control
- Organization Theory
- Quality and Reliability Engineering
- Operations Management
- Project Management
- Ergonomics (Human Factors) and Work Design (Work Study)
- Manufacturing Databases and Systems
- Engineering Economic Analysis
- Industrial Information Systems
- System Modeling and Simulation
- Plant Engineering and Plant Maintenance
- Material Flow and Layout Planing
- Safety Systems

C.8.3 The subtitled specialist Area of Practice

The subtitles specialist areas of practice to be implemented under the technical field of Industrial Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Plant Control
- Quality Control
- Packing
- Product Design

C.9 Chemical Engineering

C.9.1 Indicative Ares of Practice

Chemical Engineering concerns research, design, development, manufacture, installation, operation, maintenance and management of commercial scale chemistry plants and process systems, industrial processing and fabrication of products undergoing chemical and/or physical changes being applied to materials

for construction, process systems and equipment for instrumentation and control, and protection of the environment.

C.9.2 Indicative Scope of Education Programs

Chemical Engineering

Education Programs normally provide a through grounding in chemistry, including advanced chemistry such as organic chemistry, inorganic chemistry, analytical chemistry, materials chemistry, or biochemistry, selected as appropriate to the goals of the programs.

The following engineering topics are normally included in the programs:

- Material and Energy Balance Applied to Chemistry
- Processes
- Heat, Mass and Momentum Transfer
- Chemical Reactor Engineering
- Process Design
- Safety Systems
- Environment Control
- Physical Chemistry
- Organic Chemistry
- Process Calculations
- Process Thermodynamics
- Instrumental Analysis
- Inorganic Chemistry for Engineers
- Polymer Chemistry
- Solid State Chemistry
- Process Fluid Mechanics
- Chemical Engineering Thermodynamics
- Electrochemistry
- Polymer Engineering
- Petroleum and Fine Chemistry

- Chemical Plant Design
- Process Control
- Computer Application in Chemical Engineering
- Chemical Processes in Semiconductor Fabrication

Nuclear Engineering

Education programs include nuclear fission and fusion technology.

The following engineering topics are normally included in the programs:

- Basic Nuclear Engineering
- Nuclear Reactor Hydrodynamics
- Plasma Electrodynamics
- Reactor Theory
- Nuclear Physics for Engineers
- Nuclear Fusion
- Nuclear Heat Transport
- Health Physics
- Nuclear Materials Engineering
- Physical Chemistry for Engineering
- Reactor Safety Technology
- Nuclear Power Economics and Licensing
- Plasma Processing
- Plasma Measurements and Diagnostics
- Nuclear Powerplant System and Control Engineering

Fiber & Polymer Engineering

Education programs concentrating on the manufacturing, processing, and application of fibrous and polymeric materials.

The following engineering topics are normally included in the programs :

- Fiber and Polymer Engineering
- Polymer Synthesis
- Organic Synthetic Chemistry
- Yarn Formation
- Fibrous Materials
- Textile Processing
- Physics of Fibers and Polymers
- Textile Composite Materials
- Polymeric Materials
- Instrumental Analysis of Polymers
- Color Science
- Textile Coloration
- Textile Finishing
- Control Principle for Fiber and Polymer Processing

C.9.3 The subtitled specialist Area of Practice

The subtitled specialist areas of practice to be implemented under the technical field of Chemical Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Surface Treatment
- Polymer
- Industrial Chemistry
- Chemical Plant Design
- Chemical Apparatus Equipment
- Ceramic
- Atomic Power Generation
- Nuclear Fuel
- Radiation Management
- Spinning
- Raw Silk
- Artificial Fiber
- Dyeing and Finishing

- Clothing
- Weaving
- Chemical Safety

C.10 Information Engineering

C.10.1 Indicative Area of Practice

Information Engineering concerns research, design, development, manufacturing, installation, operation, maintenance, system integration and project management of products and services within the area of telecommunications, information technology, and computing systems.

C.10.2 Indicative Scope of Education Programs

Education Programs should provide a thorough understanding of the fundamental scientific principles, the prevalent technology standards, and common engineering practice of telecommunications (wired and wireless), computing systems, networks, and information systems.

The following engineering topics are normally included in the programs:

- Circuit Theory
- VLSI Circuit
- Digital Systems & Microprocessor
- Digital Communications
- Radio Communications
- Optical Communications
- Data Communications
- Computer Network, System Architecture & Disturbed
- Computing
- Telecommunications Switching and Networking
- Cryptography & Security
- Image/Video Coding & Processing

- Software Engineering(covering Analysis, Design Implementation, Testing, Maintenance and Quality)
- Software Application
- Computer Graphics
- Operating Systems
- Database Systems
- Programming Languages, Compilers & Methodology
- Artificial Intelligence
- Information Systems Management
- Decision Making & Optimization
- Computer Architecture

C.10.3 The subtitled specialist Area of Practice

The subtitles specialist areas of practice to be implemented under the technical field of Information & Software Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Computer
- Electronic Application
- Information Communication
- Information Management
- Computer System Application

C.11 Bio Engineering

C.11.1 Indicative Area of Practice

Bio Engineering concerns variety of unit operations associated with food processing, preservation. and factory automation. It also covers the development of control and measurement techniques for food procession using state-of-the-art electronics and computer technology. and design of process controller, microwave heating. ultrasonics, ohmic heating, freezing, and image analysis are also being investigated. Technologies developed are used widely in

the food industry.

C.11.2 Indicative Scope of Education Programs

The following engineering topics are normally included in the education programs:

- Analytical Chemistry
- Organic Chemistry
- Physical Chemistry
- Food Chemistry
- Food Microbiology
- Food Engineering
- Food Preservation
- Food Process Engineering
- Dairy Food Processing
- Fermentation Technology
- Cereal Food Processing
- Food Plant design
- Meat and Fish Processing
- Food Sanitation
- Fruit and Vegetable Processing

C.11.3 The subtitled specialist Area of Practice

The subtitled specialist areas of practice to be implemented under the technical field of Bio Engineering discipline for the registration of APEC Engineer shall be as shown below:

- Seeds
- Protected Cultivation
- Forestry
- Livestock
- Forest Product Processing

- Agricultural Chemistry
- Food Stuff
- Ocean
- Aquatic Cultivation
- Fishery
- Fisheries Processing

C.12 Fire Engineering

C.12.1 Indicative Area of Practice

Fire Engineering covers fire and explosion in the whole field of industry, which break out due to the development of high-tech industry, prevention of injuries and calamities, safe preservation, handling, transportation and new material application of dangerous materials, product safety design in a manufacturing process, defect diagnosis and durability estimation of industrial equipment and engineering practices in the field of chemical engineering, new material, machine, system, electricity and construction which is related to system safety design such as chemical plant and nuclear power plant.

C.12.2 Indicative Scope of Education Program

Education programs normally relate to nurture high level professionals who will play a key role in identifying origins of various calamities caused by major fire and accidents, establishing countermeasures and improving fire fighting technology, fire fighting administration and disaster prevention by understanding and applying fire fighting science through scientific research.

The following engineering topics are normally included in the education programs:

- Fire Administration
- Fire Technology Standards and Act
- Fire Hydraulic Dynamics

- Applied Mechanics
- Industrial Materials
- Fire Prevention Engineering
- Thermic Transmission
- Fire Fighting Electrics
- Fire Modeling
- Fire Fighting Equipment
- Alarm Equipment
- Evacuation Simulation
- City Disaster Prevention Plan
- Disaster Management
- Reheating Equipment
- Special Process Management
- Fire Movement
- Hazardous Materials
- Analysis and Evaluation of Disaster and Calamity
- Analysis and Evaluation of Riskiness
- Relief Material Diagnosis
- Relief and Rescue Seminar
- Fire Fighting Policy Seminar
- Evaluation on the Aftermath of Disaster

C.12.3 The subtitle specialist Area of Practice

The subtitles specialist areas of practice to be implemented under the technical field of Fire Engineering discipline for registration of APEC Engineer shall be as shown below:

- Fire Fighting Facilities

C.13 Building Services Engineering

C.13.1 Indicative Area of Practice

Building Service Engineering relates to research, design, development, manufacturing, equipment, operation, maintenance of machinery and electric equipment, plant equipment, system and component of building environment responding to outside environment, health protection of mankind, improvement of living security, environment protection for a support of production process, environment protection in and outside of buildings, environment concerning a quality improvement of human life, development and residence of buildings which enable the improvement and maintenance of environment to provide optimal working condition to man related equipment for the improvement of productivity.

Building Service Engineering includes wide range of field such as electricity, HVAC(Heating, Ventilation and Air Purification), fire fighting equipment, fire extinguishing pipe and drainpipe, perpendicular carriage, automatic building automation system.

C.13.2 Indicative Scope of Education Program

The purpose of education programs is to develop intellectual technology and analysis ability in the field of system of Building Service Engineering.

Generally the scope of education programs is as follows:

- Building Environment Engineering
- Design and Management Skills of Building Service Technology System
- Dynamic Interaction with External Environment, Building Covers, Building Service engineering System and Activities of Tenants
- Combination of Building Service Engineering System and Architectural & Structural Element
- Mathematical and Calculating Analysis and Technology, Model and Design of Building Service Technology under the temporary and permanent condition
- Machinery Use, Data Collection and Experimental Technology including Operation Analysis

- Communication between Effectiveness and Professional Habit
- Contract concerning Architecture Construction, Legal and Economical Knowledge

The following engineering topics are normally included in the education programs:

- Architecture Environment
- Basic Engineering
- Heating, Ventilation, Air–Purification
- Fire Dynamics
- Fire Engineering System
- Water Supply Engineering
- Waste Water and Waste Engineering
- Electricity Device and System
- Building Electronics
- Light Engineering
- Perpendicular Conveyance
- System Model and Analysis
- Software Design Simulation
- Building Management and Supervision
- Design for Operation and Maintenance
- Building Operation
- Building Acoustics
- Efficient Building Energy
- Management of Building Exteriors
- Recycling Energy
- Construction Management
- Engineering Law

C.13.3 The subtitle specialist Area of Practice

The subtitles specialist areas of practice to be implemented under the technical field of Building Service Engineering discipline for registration of APEC Engineer shall be as shown below:

- Air-conditioning and Refrigerating Machinery
- Building Electrical Facilities
- Building Mechanical Facilities

C.14 Petroleum Engineering

C.14.1 Indicative Area of Practice

Petroleum Engineering relates to exploration of hydrocarbon energy such as petroleum and natural gas, drilling and production engineering concerning development and production, underflow engineering and underflow computer simulation method for an estimation of proper output and operation analysis, development, transportation and storage in general.

C.14.2 Indicative Scope of Education Program

Education programs cover reserves evaluation technology of oil & gas land, production and transportation technology, gas storing technology, underground water engineering, transfer and proliferation of contaminated material, flowing of gas at landfill.

The following engineering topics are normally included in the education programs:

- Sedimentation geology
- Hydrodynamics
- Petroleum Engineering
- Gas Engineering
- Oil Exploration Engineering
- Oil land Evaluation Engineering
- Oil well Experiment Engineering
- Natural Gas Production Engineering
- Rock Mechanics and Base Rock Engineering

- Blasting Engineering
- Underground Space Engineering
- Environment Earth Chemistry
- Geological Environment Engineering
- Electric and Radio Wave Exploration
- Gravity and Magnetic Exploration
- Elastic Wave Exploration

C.14.3 The subtitle specialist Area of Practice

The subtitles specialist areas of practice to be implemented under the technical field of Petroleum Engineering discipline for registration of APEC Engineer shall be as shown below:

- Gas

C.15 Aerospace Engineering

C.15.1 Indicative Area of Practice

Aerospace Engineering relates to research, design, development, manufacturing, maintenance and operation engineering system of passenger aircraft, fighter planes, helicopters, missiles, space shuttles and communication satellite.

C.15.2 Indicative Scope of Education Program

Education programs cover the field of aerodynamics, structural and structural dynamics, propulsion engine, aviation dynamics and control.

The following engineering topics are normally included in the education programs:

- Aerodynamics field covers various computer numerical analysis about shock

wave flowing, boundary layer theory, engine intake flowing, jet flowing, nozzle flowing, wing and body flowing, aircraft flowing through lessons about aerodynamics, gas dynamics, computation hydrodynamics, boundary layer theory, supersonic flowing, acoustics, V/STOL aerodynamics, experimental aerodynamics and sonic & wind channel facilities, supersonic flowing research facilities using shock wave and experimental research using laser current meter and holography.

- Structural and structural dynamics field covers structural integrity through lessons about structural dynamics, composite dynamics, aeroelasticity, finite element method, experiment stress analysis, analysis ability of structural combination matter, experimental research using electricity and stress analysis equipment, structural analysis and research using computers and intellectual structure using optical fiber sensor and piezoelectric materials.
- Propulsion engine field covers function estimation of propulsion engine through lessons about propulsion engine, gas dynamics, combustion engineering and thermic transmission, combustion engine, combustion, design, radiant heat transmission of rocket propellant, theoretical modeling and experimental research by numerical analysis about various combustion phenomenon.
- Aviation dynamics and control field covers stability analysis, control design, flight rut optimization, induction method, target tracking and navigation method through lessons about aviation dynamics, aviation control, induction and navigation.

C.15.3 The subtitle specialist Area of Practice

The subtitles specialist areas of practice to be implemented under the technical field of Aerospace Engineering discipline for registration of APEC Engineer shall be as shown below:

- Aircraft Body
- Aero-Motor

PART D. ATTACHMENTS

D.1 The Ethic Code of Professional Engineer

D.2 Korea APEC Engineer Code of Ethics

D.3 The Sub-titled Specialist Area of Practice Related to Construction Work and Subjects of National Technical Qualification Testing for Professional Engineer Examination

D.4 The Current Assessment Mechanisms for Korean Engineers

Attachment:

D. 1 The Ethic Code of Professional Engineer

The Ethic Code of Professional Engineer

Enacted on December 23, 1993 (5th session of board director meeting resolution)
Amended on December 15, 1995 (6th session of board director meeting resolution)

1. Preserving and Maintenance the Graceful Reputation
Professional Engineer should continually try to improve technology, maintain graceful reputation, execute business and function with strong self confidence and responsibility.
2. Dignity of Professional Technology
Professional Engineer should always behave on the basis of technical conscience and would not assume any assignment that does not belong to his professional field.
3. Neutrality Status
Professional Engineer should not join or be employed in the field that is not related to his professional specialty and should not be paid by any money for the assigned project other than contracted amount from the project owner.
4. Clear Contract
Professional Engineer should prevent from any dispute related to an assigned project by making the clarified contract with the project owner.
5. Preservation of Confidential Information
Professional Engineer should always maintain an attitude to protect the legitimate interest of contractual party and should not disclose or steal the confidential information related to his job.
6. Excessive Competition
Professional Engineer should not defame or obstruct other member's business and would not illegitimately reduce his payment rate to cause an excessive competition with fellow engineers.
7. Limitation of Advertisement
Professional Engineer should not mention and advertise a specialty that is not related to his own in order to avoid a misleading advertisement.
8. Cooperation with Other Professional Engineer
Professional Engineer should voluntarily try to cooperate with other Professional Engineers or special technicians for the benefit of project owner.

D. 2 Korea APEC Engineer Code of Ethics

The Ethic Committee Rule

Enacted on December 23, 1993 (5th session of board director meeting resolution)
Amended on December 15, 1995 (6th session of board director meeting resolution)

Sect. 1. (Object): This rule regulates necessary matters for the operation of the ethic Committee (hereinafter Called as Committee) defined by the Sect. 31 of Article.

Sect. 2. (Organization and Term): (1) The committee consists of one chairman and the committee members of less than 15. (2) The term of chairman and committee member is 3 year. However their terms may be renewed.

Sect. 3. (Function): The functions of committee indicate below.

- 1) Enacting an Ethic Code and executing it.
- 2) Resolving the rewards of members
- 3) Determining the punishment of members.
- 4) Other matters to maintain the reputation engineers.

Sect. 4. (Function of Committee Member): (1) Chairman represents the Committee and manage its operation. (2) Committee members deliberate and decide necessary matters of operation of Committee, and become an acting chairman by biological seniority order. (3) Chairman and committee members should execute their functions fairly and correctly with their conscience and faithfulness, and should not disclose confidential information related to their responsibility.

Sect. 5. (Meeting and Determination): (1) The Chairman calls the meetings under the each of following cases and he presides the meeting.

- 1) The chairman of KPEA requests Committee to resolve the member's rewards.
- 2) The chairman of KPEA requests Committee to determine member's punishment.
- 3) Other matters that require to call Committee meetings.

(2) The Quorum of Committee meetings is simple majority member's present and the resolution shall be made by simple majority votes of presenting committee members. Committee chairman has a casting vote that votes are counted as equally divided for yes and no.

Sect. 6. (Deliberation of Member's Reward): (1) Committee chairman should call a meeting and deliberates the KPEA chairman's requests to reward members. (2) The deliberation procedure, ways, sorts of rewards and other necessary matters shall be defined by the Rule of Rewards.

Sect. 7. (Punishment Resolution of Members): (1) Committee chairman should call for a committee meeting and resolve the KPEA chairman's requests to punish members. (2) The deliberating procedure, ways, sorts of punishment and other necessary matter shall be defined by the Rule of Punishment.

Sect. 8. (Making and Keeping Records of Meetings): (1) The Committee should make and keep the records of meetings. (2) The records of meeting described in Paragraph (1) should include each of following matters.

- 1) Time, date and place of meeting.
- 2) Name of presented committee members (attendants' signatures and seals)
- 3) Agendas and contents of meetings.

Sect. 9. (Amendment of Rule): This Rule shall be amended by the resolution of board director meetings.

Additional Rule

This rule shall be effective on the day resolution by board director meeting.

D. 3 Rule of Punishment

Rule of Punishment

Enacted on December 23, 1993 (5th session of board director meeting resolution)
Amended on December 15, 1995 (6th session of board director meeting resolution)

Sect. 1. (Object): This rule regulates necessary matters for the punishment of member pursuant to Sect. 8 of the Article.

Sect. 2. (Classification of Punishment): There are 3 classes of punishment as below.

- 1) Warning
- 2) Suspension of Member's Qualification
- 3) Revocation of Member's Qualification

Sect. 3. (Request for Punishment): The chairman may request, by submitting exhibit 1 form to the Ethic Committee for punishment of member who subjects to punish by voting the Ethic Code of Professional engineer and the regulation of Article.

Sect. 4. (Deliberation of Punishment): (1) The chairman of Ethic Committee (hereinafter called as chairman) should call for an ethic committee (hereinafter called as committee) within 20 days from the notified date of request and deliberate the matter of requested punishment pursuant to Sect. 3. (2) the chairman may request necessary investigative, supplemental information and materials to the KPEA chairman.

Sect. 5. (hearing Explanation): The Committee should provide an opportunity the subjected member to express his own oral or written explanation and if necessary, should listen to the related third party opinion when committee plan to reprimand a member.

Sect. 6. (Punishment Determination): The criterion of punishment, pursuant to Sect. 2 is shown in the Exhibit 1 Table.

Sect. 7. (Report of Result): The chairman should without delay report the decision based on the criterion of punishment to KPEA chairman by exhibit 2 form.

Sect. 8. (Decision of Acceptance): (1) Ad KPEA chairman receives the report pursuant to Sect. 7, he should decide to accept the Committee report at its face or not within 30 days with a consultation of board director meeting. However, he is not able to change the contents of committee decision. (2) The board directors may let chairman attend board meeting and express his opinion in order for board to decide an acceptance. (3) KPEA chairman should notify the decision describes in the Paragraph (1) to committee chairman and concerned member. (4) When board director meeting rejects the report, KPEA chairman should immediately request committee chairman to reconsider it.

Sect. 9. (Request of Reconsideration): The member who is punished and objects the decision may request a reconsideration one time only by submitting Exhibit 3 Form to KPEA chairman within 10 days from the date that the punishment notice arrives.

Sect. 10. (Procedure and Decision of Reconsideration): (1) KPEA chairman should request a reconsideration to the committee within 10 days from the date he receives a request to reconsider pursuant to Sect. 9. (2) The committee may reject a request of reconsideration defines in the paragraph (4), Sect. 8 and paragraph (1) of this sect. if it lacks legitimate point of reason. (3) As Chairman completes reconsideration of its request, he should promptly report by Exhibit 2 Form to KPEA chairman regarding to result of reconsideration pursuant to paragraph (4), section 8 and paragraph (1) of this section. (4) The committee shall not make severer decision regarding reconsideration request comparison with the original punishment pursuant to paragraph (4), sect. 8 and paragraph (1) of this sect. The procedure of reconsideration pursuant to paragraph (4), sect. 8 and paragraph (1) of this sect. shall be regulated by the sect. 5 and sect. 6.

Sect. 11. (Acceptance for Punishment Request): KPEA chairman should request supplemental materials when the evidence for punishment is not acceptable or insufficient, and should reject the request itself if the necessary evidence would not be supplemented.

Sect. 12. (Effectiveness of Punishment): (1) The punishment becomes effective as KPEA chairman sends a notice by Exhibit 2. Form to the punished member pursuant to sect. 8 and term of punishment shall be counted from the expired dated of the request for reconsideration pursuant to sect. 9. (2) When a punished member submits a request of reconsideration, the effectiveness of original punishment shall be withheld until the date of final decision.

Sect. 13. (Amendment of rule): This rule shall be amended by the resolution of board director meeting.

Additional Rule

This rule shall be effective on the day the board director meeting resolves it.

The Criterion of Punishment Decision

(Related to Sect. 6)

Violation	Class of Punishment
1. Defaming the honor of professional engineers in violation of the Sect. 1, 4, 5, 8 of Ethic Code.	Warning
2. Degrading reputation of professional engineers in violation of Sect. 2, 7 of Ethic Code or repeated violations of paragraph 1.	6 months suspension of membership
3. Severely damaging the interest and honor of professional engineers in violation of Sect. 3, 6 of Ethic Code.	9 months suspension of membership
4. Intentionally or recklessly damaging the interests of other party seriously during the execution of professional engineer business.	12 months suspension of membership
5. Determined as a disqualified member who performs destructive behaviors against the object of KPEA, and severely destroys the reputation of professional engineers by defaming honor of member.	Revocation of membership

D. 4 Korea APEC Engineer Code of Ethics

Korea APEC Engineer Code of Ethics

APEC Engineers in Korea, here-in-after Engineers, shall comply with this Code of Ethics to awaken themselves to the importance of the mission, international prestige and responsibility by following fundamental canons.

1. Maintaining and Enhancing Honor and Dignity

Engineers shall be committed to continuing professional development while enhancing honor and dignity and shall perform their duties in the firm belief of professional integrity.

2. Honesty and Fairness

Engineers shall perform professional services conscientiously setting limits to only in areas of their specialty and shall not engage in the act to disgrace other's reputation.

3. Sincerity and Faithfulness

Engineers shall, upon being commissioned in their specialty fields, avoid any conflicts with their employers or clients by elaborating contract conditions in advance and shall not accept compensations other than justifiable per the contract spirit.

4. Observing Secrecy

Engineer shall perform professional services for the interests of their employers or clients at all times and shall neither divulge nor make a fraudulent use of the secret pertinent to performing their contractual duties.

5. Cooperation with Engineers in other special Fields

Engineer shall cooperate with specialists in other fields on their own initiatives when deemed necessary for the interests of their employers or clients.

D. 5 The Sub-titled Specialist Areas of Practice Related to APEC Engineers' Disciplines for Registration and the Subjects of National Technical Qualification Testing for Professional Engineer

The Sub-titled Specialist Areas of Practice Related to APEC Engineers' Disciplines for Registration and the Subjects of National Technical Qualification Testing for Professional Engineer

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
Civil Engineering	Soil Mechanics Foundation	Soil Mechanics, Earth Structure and Foundation, Other Details of Soil Mechanics & Foundation Engineering
	Harbor Coastal Engineering	Harbor Planning, Outer Facilities, Approach Facilities, Security Signal, Loading & unloading Facilities, Protection of Coast, Other Details of Harbor and Coastal Engineering
	Road and Airports	Highway & Transportation, Highway Structures, Highway auxiliary Facilities, Airport Planning, Airport auxiliary Facilities, Other Details of Highway and Airports
	Railway	Railway Plan, Track, Railway Structures, Railroad Station, Security Device, Operation Schedule, Other Details of Railway
	Water Resources Development	River, River Structures, Dam, Planning, Control and Supervision of Hydraulic Structures
	Water Supply Sewage	Waterworks & Industrial Waste Planning, Intake, Delivery and Distribution, Purification, and quality of water, Other Details of Waterworks, Water Quality Control, Sewer System, such as Disposal of garbage, sewage
	Civil Engineering Agricultural Fishery	Irrigation Drainage, Maintenance of Cultivated Land, Reclamation, Details of Maintenance of Farm Land
	Civil Engineering Execution	Construction Planning, Construction Management, Construction Equipment, Construction Machinery and Other Details of Construction
	Civil Engineering Quality Testing	Properties, Usage, and Test of Civil Engineering Material, Details of Material Dynamics and Quality Control

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
	Surveying Geo-Spatial Information	Planning, Control, and Practice of Land Survey and Topographical Information, Other Details of Land Surveys
	Architectural Execution	Details of Building Construction Execution, Progress Control and Cost Estimation
	Construction Quality Testing	Properties, Usage, and Test of Construction Material, Quality Inspection Control, Other Details of Material Dynamics and Quality Control
	Urban Planning	City Construction, Land Usage, City Development and Planning and Design of Many kinds of Collective Housing Areas, Other Details of Planning and Control of City and Region
	Landscape Architecture	Details of Planning and Control of Environment Protections, Wood Protection, Park and forest, Vacant Land, Landscape Architecture, and City Landscape
	Construction Safety	Industrial Safety Management Theory (Accident Cause Analysis and measurement, Protection Facilities and Apparatus, Safety Inspection Point), Industrial Psychology and Education (Human Engineering), Industrial Safety Related Regulations, Plan, Management, and Inspection of safe management of Machinery Industry, Other Details of Industrial Machinery Safety
	Cadastral Surveying	Planning, Control, Practice and Assessment of Cadastral Surveying, Other Details on Cadastral Engineering
	Transportation	Traffic Planning, Traffic Economy, Theory of Traffic Flow, Traffic Survey, Management and Planning of Traffic, Traffic Safety and Pollution, Land Utilization Planning, Other Details on Traffic Engineering
Structural Engineering	Architectural Structures	Planning, Calculation, and Supervision of Building Structures, Other Details of Building Structures
	Civil Engineering Structures	Structure Analysis, Steel-frame Structure, Reinforced Concrete Structure, Concrete Structure, Cement Product, Other Details of Structures
Geotechnical Engineering	Geology and Geotechnical	Survey, Evaluation and Analysis of Geology and Geotechnical, Measurement, Evaluation and Analysis of Earthquake, Underground Water Research, Seismic Survey, Other Details on Geology & Geotechnical and Consultation
Environmental	Air Pollution Control	Phenomenon, Planning, Management, Prevention and

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
Engineering		Measurement Technology of Air pollution
	Water Pollution Control	Waste Water & Waste Treatment, Soil, River & Marine Pollution, Other Details on Phenomenon, Planning, Management and Prevention of Environment Pollution
	Noise and Vibration	Phenomenon, Planning, Management, Prevention and Measurement Technology of Noise and Vibration
	Wastes Treatment	Management, Planning & Handling, Disposal & Recycling of Subsistence & Industrial Waste
	Industrial Hygiene Management	Industrial Hygiene, Industrial Ventilation, Working Condition Measurement & Evaluation Method, Working Condition Management
	Weather Forecasting	Live Weather Forecasting, Short Term Weather Forecasting, Middle & Long Term Weather Forecasting, Industrial Weather Forecasting & Application
	Natural Environment Management	Landscape Ecology, Natural Environment Relations Act, Ecological Reconstruction Engineering, Environmental and Ecological Management, Environment Program, Details on Research, Preservation & Reconstruction Program and Construction of Natural Environment
	Soil Environment	Evaluation Method of Site Environment, Purification Technology of Soil & Underground Water Pollution, Environment Management, Examination Method of Soil Pollution Processing, Soil & Underground Water Environment Relations Act, Environment Management of Soil & Underground Water, Purification & Restoration of Soil & Underground Water Pollution
Mechanical Engineering	Making Machinery	Cutting, Grinding, Molding, Forging, Welding, Heat-Treatment, Making Machinery Method, Jig, Lathing, Drilling Machine, Milling Machine, Grinding Machine, Press, Precision Measurement Tool, Other Details on Metal Building Machine and Wood Working Machin
	Hydraulic Machinery	Water Mill, Pump, Compressor, Blower, Other Details on Hydraulic Machinery
	Welding	Welding Method, Welding Metallurgy, Welding Material, Welding Structural Design, Welding Construction Management, Welding Apparatus, Safety Hygiene, Additional Inspection of Welding, Laws & Standards on Welding, Details on Machinery Building & Production Management

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
	Die and Mould	Die & Mould Material, Die & Mould Processing, Die & Mould Design, Die & Mould Making, Whole Details on Die & Mould Design by Industrial Application and Machinery Die by Processing (CAD/CAM)
	Transportation Vehicles	Cars, Electric Vehicles, Electric Vehicle, Details on Design, Manufacturing and Management Skills of Diesel Vehicle & Other Motor Vehicle
	Industrial Machinery	Spinning Machinery, Weaving Machinery & Other Fiber Machinery, Pulp Manufacturing Machinery, Compressor, Roll Machinery, Metal Process Machinery, Coal Carter, Hemline Machinery & Other Mining Machinery, Grain Processing Machinery, Agricultural Machinery, Crane, Conveyor, Cableway, Carrier Machine, Electricity Machinery, Chemical Machinery, Details on Printing Machine & Industrial-Purpose Machine
	Machine Manufacturing Process Design	Design of Machinery Cutting Manufacturing Process & Tools(Jig & Fixture, Gauge, Cutting Tools and Die & Mould)
	Construction Equipment	Earth-Moving Machine, Packing Machine, Dredger, Construction Plant Mechanical Facilities & Other Construction Equipment
	Railroad Rolling Stock	Railroad as a system, Railroad Rolling and Diesel-Powered Vehicle, Electricity-Powered Vehicle, Passenger & Freight Car, Design, Operation and Maintenance of Various types of Railway Train such as High-Speed Railway & Magnetic-Charged Train
	Ferrous Metallurgy	Manufacturing Principle of Steel & Alloy Steel, Refining Method & Manufacturing Facilities
	Nonferrous Metallurgy	Refining Method of Gold, Silver, Cooper, Lead, Zinc, Aluminum and Other Nonferrous Metals, Method of Smelting & Alloy and Facilities
	Metal Material	Characteristics of Ferrous & Non-ferrous Material and Other Metal Material, Heat Treatment, Details on Test and Usage
	Metal Working	Moulding, Forging, Rolling, Welding & Heat Treatment, Details on Technology and Facilities of Metal Working
	Nondestructive Testing	Nondestructive Testing, Practical Affairs & Equipment of Nondestructive Testing, Metal Working Engineering, Welding Engineering, Details on Related Standards and Acts

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
	Machine Safety	Industrial Safety Management(Analysis of Accident Cause & Countermeasures, Safeguard Devices & Protection Tools, Method of Safety Checks), Industrial Psychology & Education(Ergonomics), Industrial Safety Relations Act, Planning, Management, Survey on Safety Operation of Machine Industry, Other Details on Industrial Machinery Safety
	Ship Design	Basic Design, Detailed Design, Details on Ship Design,
	Ship Construction	Ship Building Engineering, Production Management, Ship Equipment, Other Details on Ship Building
	Marine Machinery	Design of Ship Power apparatus, Ship Machinery, Auxiliary Machinery, Equipment, Engine Installation & Process Management, Other Details on Engine
Electrical Engineering	Generation Transmission and Distribution	Planning & Operation of Generation Transmission and Distribution Equipment, Generation Equipment, Transmission Equipment, Distribution Equipment, Transformation Equipment, Other Details on Generation Transmission and Distribution
	Electric Application	Electricity Application Direct Current Converter, Alternating Current Converter, Transformer, Electric Power Transformation apparatus, Switch, Circuit-Breaker, Control Equipment, Protection Equipment, Electric Heat & Electric Chemistry, Electric Railway, Illumination, Automatic Control, High Voltage Technology, Electromotive Force Application, Electricity Application apparatus & Electricity Material
	Electric Railway	Planning & Design of Electric Railway Equipment, Construction, Consultation, Technology Guidance, Maintenance, Safety Diagnosis & Other Details on Electric Railway Equipment
	Railroad Signal Apparatus	Planning & Design, Construction, Consultation of Electricity Equipment of Railroad Signal and Other Details on Electricity Equipment of Railroad Signal Complementation
	Industrial Instrumentation and Control	Automatic Control, Electronic Equipment, Engineering Planning, Electronic Measurement & Instrumentation, Design of Measuring Equipment& Control Equipment, Details on Manufacturing & Management Technology
	Electric Safety	Industrial Safety Controls(Analysis of Accident Cause & Countermeasures, Safeguard apparatus & Protection Tools,

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
		Method of Safety Checks), Industry Psychology & Education(Ergonomics), Industrial Safety Relations Act, Planning, Management, Survey on Safety Operation of electrical Industry, Other Details on electrical Safety
Mining Engineering	Underground Resources Development	Resources Development, Facility Equipment & Operation, Evaluation, Other Details on Resources Management & Disposal
	Prospecting	Resources Exploration, Seismic Survey, Geochemistry Exploration, Details on Boring Exploration & Evaluation
	Underground Resources Treatment	Material Science, Mineral & Petrography, Crushing Engineering, Details on general Refining
	Explosives Handling	Explosives, Blasting, Excavation, Explosive handling Foundation Engineering, Rock Engineering
Industrial Engineering	Plant Control	Plant Planning & Design, Plant Organization, Production Planing & Control(Plant Control), Equipment & Tool Management, Material & Transportation Management, Operation Management, Economic Success Story, Cost Management
	Quality Control	Quality Planning & Design, Quality Management Operation, Statistical Quality Management, Quality Cost Management & Industry Standardization, Other Details on Quality Control
	Packing	Planning & Design of Packing, Packing Method, Packing Material & Packing Equipment, Other Details on Packing
	Product Design	Planning, Method, Marketing of Product Design and Product Planning, Production Management, Other Details on Product Design
Chemical Engineering	Surface Treatment	Paints, Thermal Spray, Infiltration, Metal Corrosion Method, Nonmetal Covering, Covering Hardening & Anti-Corrosion, Other Details on Metal Surface Treatment Technology
	Polymer	Pulp, Synthetic Fiber, Details on Moulding Process and Equipment of Rubber & Adhesive
	Industrial Chemistry	Fertilizer, Acid, Alkali, Dye, Oils and Fats, Fuel & Lubricant, Details on Manufacturing and Equipment of Electrochemistry
	Chemical Plant Design	Business Plan on Chemical Plant Foundation, Feasibility, Basic Design, Purchase, Procurement, Inspection,

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
		construction & Business Management, Details on Chemical Plant Design
	Chemical Apparatus Equipment	Heat Operation, Separation Operation & Chemical Reaction Operation, Chemical Process Operation, Handling & Process & Manufacturing and Storage & Distribution of Gas, Gas-powered Apparatus and Equipment
	Ceramic	Ceramic Material, Ceramic Manufacturing Process, Product Characteristics, Ceramic Plant Design, Manufacturing Apparatus, Details on Plant Quality Control
	Atomic Power Generation	Nuclear Reactor Theory, Thermal Hydraulics, Nuclear Reactor Material, Radiation Waste Disposal, Economical Efficiency of Atomic Power Generation, Measurement and Control of Nuclear Reactor, Details on Operation Management of Atomic Power Generation
	Nuclear Fuel	The Details on Nuclear Fuel Period Technology Nuclear Fuel Cycle Technology, Nuclear Fuel Material Engineering, Details on Design & Manufacturing Method of Nuclear Fuel
	Radiation Management	Radiation Principle, Health Physics, Radiation Waste Disposal, Details on Radiation Measurement
	Spinning	Cotton, Woolen, Silk, Synthetic Fiber, Staple Fiber, Generated Fiber & Inorganic Fiber, Other Details on Spinning Method & Equipment
	Artificial Fiber	Synthetic Fiber, Staple Fiber, Regenerated Fiber & Inorganic Fiber, Details on Method of Artificial Fiber Spinning (including Spirit Manufacturing), Machinery and Equipment of Artificial Fiber Spinning
	Weaving	Weaving Equipment (including Twine & Yarn Processing), Weaving & Entwining, Other Details of Manufacturing Method and Equipment
	Dyeing and Finishing	Degumming & Bleaching of Fiber Product, Method, Equipment and Handling of Dyeing and Finishing
	Clothing	Clothing Design, Apparel Technology, Clothing and Environment, Details on Clothing and Materials & Fiber Testing
	Raw Silk	Fiber Materials, Details on Raw Silk & Filature
	Chemical Safety	Industrial Safety Management(Accident Cause Analysis and Countermeasures, Protection Facilities and Apparatus,

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
		Safety Inspection Method), Industrial Psychology & Education(Ergonomics), Industrial Safety Relations Act, Planning, Management and Survey on Safety Operation of Chemical Industry, Other Details of Chemical Safety
Information Engineering	Computer	Storage, Operation Equipment, In/Output Device, Assistant Storage & Peripheral Device, Other Details on Design, Manufacturing and Management Technology of Computer
	Electronic Application	Electronic Material, Electronic Machinery, Design, Manufacturing and Management Technology of Sound and Image Machinery
	Information Communication	Design, Building, Preservation & Sound, Data, Communication Method related Broadcasting, Protocol, Machinery & Equipment, Technology Standards of Radio/Cable Communication Network
	Information Management	Design & Calculation of Information System(Structure, Collection, Sorting, Accumulation and Search of Information), Other Details on Analysis, Management and Basic Application of Information
	Computer System Application	Hardware System, Analysis, Design and Embodiment of Software System, Other Details on Computer Application
Bio-Engineering	Forestry	Forestation & Afforestation, Forestry Management, Forestry Engineering, Detail on Forest Tree Yielding & Forestry Machinery
	Seeds	Production, Preservation, Guarantee and Breeding of Seeds
	Protected Cultivation	Design and Installation of Gardening Facilities, Environment Control within Facilities & Cultivation Management
	Livestock	Livestock Breeding, Nutrition, Physiology, Raising, Forage, Grassland, Production & Management of Livestock
	Forest Product Processing	Production, Processing and Improvement of Lumber, Other Details on Manufacturing, Processing, Planning, Management and Inspection of Forest Product
	Agricultural Chemistry	Fertilizer, Planning & Operation of Soil and Agricultural Chemicals, Details of Agricultural Chemistry
	Food Stuff	Production / Processing of Food Stuff, Food Stuff Industry Plan, Preservation, Storage, Evaluation and Checks on Food Stuff
	Ocean	Ocean Life, Ocean Geology, Ocean Chemistry, Ocean Physics, Ocean Resources & Ocean Engineering, Survey,

Disciplines	Sub-titled Specialist Areas of Practice	The Subjects of Written Test
		Evaluation and Planning of Ocean Part
	Aquatic Cultivation	Aquaculture, Invertebrates Cultivation, Details on Seaweed Cultivation & Fishery Disease
	Fishery	Fishery Material, Fishery Machinery, Fishery, Marine Resources, Marine Ocean, Fishing Equipment, Fishery Ecology, Fishery Physics, Details of Fishing Ground and Marine Production Management
	Fisheries Processing	Manufacturing & Processing, Production Planning and Refrigeration of Fisheries Products, Design of Production/Processing
Fire Engineering	Fire Fighting Facilities	Fire & Extinguishing Theory (Combustion, Explosion, Combustion Product & Extinguishing Material, Fire fighting Hydraulics & Fire Dynamics, Design & Construction of Fire Facilities, Structural Principal of Fire Equipment(General Fire Equipment), Architectural Prevention(Refuge Program, Smoke Control, Prevention /Fire-Proof Design & Architectural Material), Evaluation on Fire & Explosion Possibilities and Security(Target for Fire), Details of Fire Relations Act
Building Services Engineering	Building Mechanical Facilities	Planning, Design, and Supervision of Building Mechanical Facilities, Other Details on Building Mechanical Facilities
	Air-Conditioning and Refrigerating Machinery	Cooling/Heating Apparatus, Refrigerating Machine, Air-Condition Apparatus, Cooling/Heating & Refrigerating Machine
	Building Electrical Facilities	Planning & Design of Building Electrical Facilities, Consultation & Decorative Design, Other Details of Building Electrical Facilities
Petroleum Engineering	Gas	General Safety Management(Accident Cause Analysis and Countermeasure, Protection Facilities and Apparatus, Safety Inspection Method), Industrial Safety Engineering, Gas & Industrial Safety Relations Act, Design & Construction of High Pressure Gas and Planning, Management and Survey on Safety Operation of Gas Industry, Other Details on Safety
Aerospace Engineering	Aero-Motor	Reciprocating Engine, Turboprop, Turbojet Engine, Rocket Engine, Power & Machinery
	Aircraft Body	Propeller Plane, Jet Plane, Rocket and Other Details on Aircraft Body

D. 6 The Current Assessment Mechanisms for Korean Engineers

THE CURRENT ASSESSMENT MECHANISMS FOR KOREAN ENGINEERS

1. Professional Engineer

1.1 General

A professional engineer has the uppermost qualifications to provide special technology and guidance in planning, study, design, analysis, inspection, test, construction, supervision, assessment and project management, which require advanced technology application capability and specialization.

1.2 Definition

- A Professional Engineer is an engineer who is capable of the application of advanced knowledge and practical experience, and has been qualified as a professional engineer through National Technical Qualification Testing
- A Professional Engineer is classified as having the highest national technical qualifications, and is qualified by the government as having the highest level of capability corresponding to his/her field

1.3 Technical Fields

There are twenty-two (22) technical fields classified as below for the examination of Professional Engineers according to National Technical Qualification Act:

Machinery, Metal, Chemical and Ceramics, Electricity, Electronics, Telecommunication, Shipbuilding, Aviation, Civil Engineering, Building Construction, Textile, Mine Resources, Information Processing, National Land Development, Agriculture and Forestry, Oceanography, Industrial Design, Energy, Safety Management, Environment, Transportation, Industrial Application.

Reference is made to the sub-titled specialist areas of practice for each technical field in the attachment.

The fifteen (15) managing ministries, including the Ministry of Construction and Transportation, the Ministry of Science and Technology etc, are managing qualification certificate holders.

1.4 Qualifications of Professional Engineer

1.4.1 Application Requirements for a Professional Engineer Designation

Those who meet one of the following requirements will be qualified to take the test for professional engineers.

- 1) An applicant who has been employed more than 4 years in the same field of technical expertise after Engineer certification (which includes similar technical business practice defined by the Ordinance of Ministry of Labor. Hereinafter named "the same field of technical business practice").
- 2) An applicant who has been employed more than 6 years in the same field of technical business after acquisition of the certificate of Industrial Engineer.
- 3) An applicant who has been employed more than 8 years in the same field of technical business practice after acquisition of certificate of the Craftsman.
- 4) An applicant who has been employed more than 7 years in the same field of technical business practice after graduation from a college or after the acknowledgment of education equal to or more than that of a college or university graduate (hereinafter named as "a graduate").
- 5) An applicant who has been employed more than 7 years in the same field of technical business practice after completion of a technical education course equivalent to the level of the related engineer at the institute of education and

training permitted by the Ordinance of Ministry of Labor.

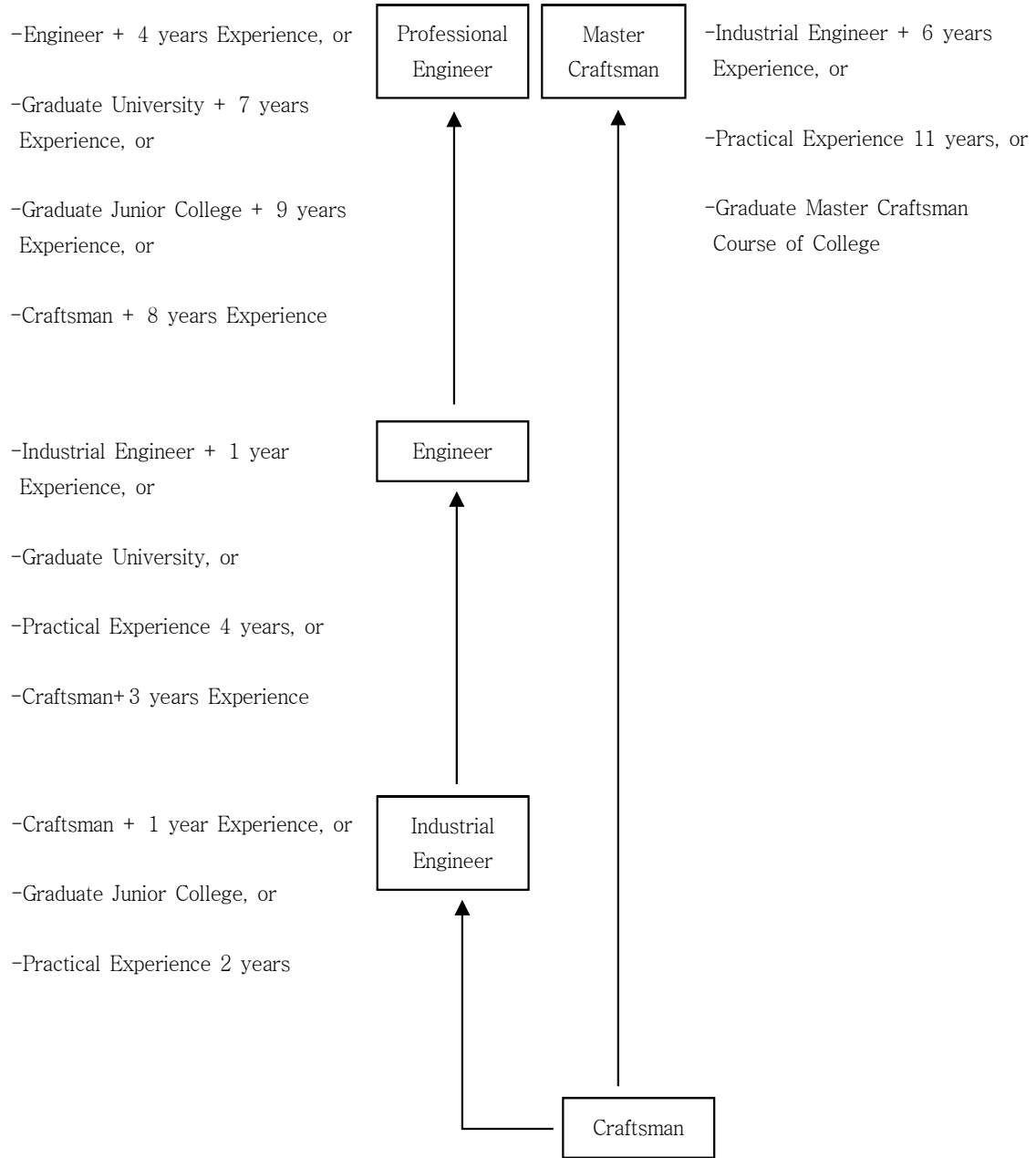
- 6) An applicant who has been employed more than 9 years in the same field of technical business practice after graduation from a junior college or after the acknowledgment of education equal to or more than that of a junior graduate (hereinafter named as "a junior graduate").
- 7) An applicant who has been employed more than 9 years in the same field of technical business practice after completion of a technical education course equivalent to the level of the related industrial engineer at the Institute of Education and Training permitted by the Ordinance of Ministry of Labor.
- 8) An applicant who has been employed more than 11 years in the same field of technical business practice.

※ Actual business experience in the same technical field will be acknowledged.

1.4.2 System of National Technical Qualification Testing

The Current system of National Technical Qualification Testing has been set in accordance with 'National Technical Qualification Act', and 'Enforcement Decree of National Technical Qualification Act'. The Brief introduction of the system is provided in the Attachment 7.

<Application Requirement System of National Technical Qualification Testing>



2. Construction Engineer and Principal Engineer

2.1 General

The Construction Technology Management Act' has adopted the Construction Engineer system to promote the research and development of Construction Technology in addition to the existing National Technical Qualification system.

The Construction Engineer is classified into 4 (four) grades as below by the qualifications and the experience:

- Principal Engineer
- Senior Engineer
- Intermediate Engineer
- Junior Engineer

The Principal Engineer is the highest grade of the Construction Engineer. The Professional Engineers qualified and registered according to National technical Qualification Act naturally belong to the grade of the Principal Engineer in Construction Technology Management Act.

The Engineers other than Professional Engineers can be acknowledged into the grade of the Principal Engineers under the name of 'Principal Engineer'.

2.2 Definition

- Construction Technology:

The term "Construction Technology" means technology relating to such matters as stipulated in the following items:

- (a) Planning, investigation, design, supervision of design, execution of work, safety checkup, precision safety diagnosis and safety review in relation to a construction work
- (b) Maintenance, repair, dismantlement, management and operation of facilities

- (c) Purchase and procurement of materials needed for construction work
- (d) Testing, assessment, advice and guidance in relation to construction work
- (e) Supervision of construction work
- (f) Trial run for construction equipment
- (g) Management of construction projects
- (h) Such other matters relating to construction work as determined by the Presidential Decree

– Construction Engineer:

A person who has qualifications in respect of Construction work or Construction technology consulting services pursuant to relevant Acts such as the National technical Qualifications Act or who is recognized by the Presidential decrees as having Certain academic or other career.

– Principal Engineer:

The engineer equivalent to professional Engineer in Construction Technology Management Act, who has been acknowledged according to his/her experience and academic achievement without passing the National Technical Qualification Testing.

2.3 Technical Fields

The Professional Engineers and Principal Engineer who belong to the grade of the Principal Engineer among Construction Engineers are providing technical guidance on Construction planning, Survey, Design supervision, Construction works, Safety inspection, Analysis of Safety. Maintenance, Repair and demolition of facilities.

The sub-titled specialist areas of practice for each technical field related to Construction technology are divided into 21 areas of 5 technical fields.

– There are 11 areas for Civil Engineering:

Civil Engineering Agricultural Fishery, Road and Airports, Water Supply Sewage, Water Resources Development, Railway, Civil Engineering Structures, Civil Engineering Execution, Civil Engineering Quality Testing, Soil Mechanics Foundation, Harbor Coastal Engineering, Surveying Geo-Spatial Information

– There are 4 areas for Building Engineering:
Architectural Structures, *Building Mechanical Facilities*, Architectural Execution,
Construction Quality Testing.

– There are 4 areas for National Land Development:
Urban Planning, Landscape Architecture, Cadastral Surveying, *Geology and
Geotechnical*

– There is 1 area for Safety Management:
Construction Safety

– There are 1 areas for Transportation:
Transportation

2.4 Qualification requirements of Principal Engineer

Engineers who meet one of the following requirements of qualifying ranges will be designated as a Principal Engineer.

Engineers with certificate of qualification

- An Engineer who has over 10 years experience in construction works as a holder of Engineer Certificate
- Engineer who has over 13 years experience in construction works as a holder of Industrial Certificate

Engineers who have education or experience

- Engineers with a Doctorate degree and over 3 years experience in construction works
- Engineers with a Master degree and over 9 years experience in construction works
- Engineers with a Bachelor degree and over 12 years experience in construction

works

- Engineers with a Diploma of Junior College and over 15 years experience in construction works

2.5 Assessment procedure of Principal Engineer

To be designated as an Principal Engineer, an applicant must submit to the KOCEA, his experience report stating experience, certificates and education with evidence documents. The KOCEA evaluates and confirms the applicant's experience, certificates and education according to the criteria of "Construction Technology Management Act" and the criteria set up by the Minister of Construction and Transportation.

2.5.1 Assessing methods by the experience

Assessing methods for categorizing technical fields and the classifying grade of Construction Engineers.

- Professional technical fields for Construction Engineers are categorized by the engineering field of his/her expertise. His/her expertise has been sorted out of all of experiences for technical fields and assessed respectively in accordance with the education relevant to construction works, and/or certificate of qualification, or experience engaged in construction works
- The grade of construction engineer is classified according to years of experience calculated through the assessing method by experience

Method of calculating experience:

- The effective period of the experience in the technical fields is calculated by summarizing the periods of actual practices in construction in each technical field
- In case the technical field to be acknowledged does not match with the education course or certificate of national technical qualification or the acknowledged field of construction engineer of the applicant, 3 years of relevant experience shall be deducted

2.5.2 Assessing methods by the education

Acknowledging construction technology–related university education:

- A graduate who has completed college courses related to construction technology
- A graduate who completed courses related to construction technology from the Military Academy founded by the Law of Military Academy Foundation
- A graduate who has completed courses related to construction technology according to the Law of Korea Advanced Institute of Science and Technology and the Law of Kwangju Advanced Institute of Science and Technology
- A graduate who has completed courses related to construction technology at a Short–term Military Academy founded by the Law of Short–term Military Academy foundation (Bachelors course)
- An applicant who has certified domestic or overseas educational equivalents

2.6 Qualification of Principal Engineer

- Engineers with a master degree and over 9 years experience in engineering work
- Engineers with a Engineer Certificate and over 10 years experience in engineering work
- Engineers with a bachelor degree and over 12 years experience in engineering work

2.7 Assessment procedure of Principal Engineer

- To be designated as an Principal Engineer an applicant must submit Interview application with the Principal Engineer certificate
- Interviewing subjects are:
 - . Professional Engineer Code of Ethics
 - . English & communication ability
 - . Professional Competency
 - . CPD

3. Engineer's ethics

3.1 Professional Engineer

- The ethical principles of professional engineers, developed by the Korean Professional Engineers Association is to perform faithfully his duties. The ethics principles of professional engineers are stipulated in the Professional Engineers Act, Article 3

3.2 Construction Engineer (Principal Engineer)

- The ethical principles of Construction Engineers describe the role of the construction engineer as to devote themselves to the national economic development and to foster their ethical sentiment, made in 1988, setting down as a behavioral guide

4. Related Acts

- Professional Engineer
 - . "Professional Engineer Act"
 - . "National Technical Qualification Act"
- Construction Engineer (Principal Engineer)
 - . "Construction Technology Management Act"