ROLES, RESPONSIBILITIES AND COMPETENCIES PREPARED AS PER PROVISIONS OF SECTION 39 OF THE ENGINEERING COUNCIL ACT NO. 04 OF 2017

As per Provisions of Section 39 (2)(e) of the Engineering Council Act No. 4 of 2017, the Engineering Council of Sri Lanka may make rules to provide for roles, responsibilities and competencies of different categories of engineering practitioners registered under the Act taking into consideration their academic qualifications and practical experience. This document, thus prepared and published by the Engineering Council, serves to define the competencies, roles, and responsibilities of all six categories of Engineering Practitioners, as defined in the Act.

USAGE OF THIS DOCUMENT

The Engineering industry has a wide variety of jobs that need different levels of competencies to carry out them successfully. This document offers the industry a broad list of roles, responsibilities and competencies an engineering practitioner could be expected to deliver in his or her job function. Employment conditions such as recruitments or promotions to each category of engineering practitioners in paid employment could also be governed accordingly. For example, if a particular job function of an organization demands the competencies listed under the Chartered Engineer category in this document then a Chartered Engineer should be recruited for such a position. Personnel from any other category shall not be recruited or promoted to such a post. Such promotions or recruitments without considering these competencies will be considered as a violation of Rules of the Engineering Council of Sri Lanka. For any injury, loss or damage that follows due to lack of competencies, both the engineering practitioner who accepted the job and the organization who offered the job could be held accountable and subjected to disciplinary actions and/or legal actions as per the Engineering Council Act.

INTERPRETATIONS

1. Category: The categories referred in this document are the six categories of Engineering Practitioners given in Schedule ‘A’ of the Act.

2. Qualifications: Defined as per the Schedule ‘A’ of the Act and reproduced in the Table 1 below;

Table 1 – Qualifications applicable to Engineering Practitioners

Chartered Engineers	Associate Engineers	Affiliate Engineers	Incorporated Engineers	Engineering Diplomates	Engineering Technicians
Chartered Engineer of the Institution of Engineers, Sri Lanka established by the Institution of Engineers, Sri Lanka Act, No.17 of 1968.	Four year Full-time degree in Engineering recognized by the Institution of Engineers, Sri Lanka established by the Institution of Engineers, Sri Lanka Act, No.17 of 1968 or an Associate Member of the Institution of Engineers, Sri Lanka established by the Institution of Engineers, Sri Lanka Act, No.17 of 1968.	Three year full time degree in Engineering recognized by the Institution of Engineers, Sri Lanka established by the Institution of Engineers, Sri Lanka Act, No.17 of 1968.	Incorporated Engineer of the Institution of Incorporated Engineers, Sri Lanka established by the Institution of Incorporated Engineers of Sri Lanka (Incorporation) Act, No. 64 of 1992.	Diploma in Engineering from a recognized University or Technical or Technological Institute recognized by the Institution of Incorporated Engineers of Sri Lanka (Incorporation) Act, No. 64 of 1992.	i) National Vocational Qualification Level IV of Engineering Technology or equivalent qualification recognized by the Tertiary and Vocational Education Commission established by the Tertiary and Vocational Education Act, No. 20 of 1990. ii) One year full-time academic course in Engineering Technology and has gained one year industrial experience in the relevant field or a holder of a Diploma or Certificate in Technology by a University or a Technical or Technological Institute of the Government of Sri Lanka.

3. Disciplines are the fields of specialisation in engineering, technology and management/administration where an engineering practitioner would have gained Academic as well as Professional Qualifications, Practical Experience and Competencies. These Disciplines may include specialization such as; Civil, Chemical & Process, Electrical, Electronics, Computer, Mechanical, Production, Manufacturing, Automotive, Mechatronics, Agricultural, Biomedical, Building Services, Marine, Aerospace, Telecommunication, Project Management, Textile & Clothing, Mining, Earth Resources, Materials and Transport & Logistics.

Types of Problems encountered in engineering practice

Based on their formal educational qualifications in engineering and technology along with relevant practical experience, each category of Engineering Practitioners shall be competent to address and solve problems encountered, pertaining to their Disciplines, reaching up to the 'Problem Type' as mapped to ECSL categories in the Table 2. The classification of a problem as Complex, Broadly Defined, or Well Defined shall be determined by the highest qualified engineering practitioner in the organization/project based on his/her professional judgment and expertise based on the upper limits of scope of capabilities mentioned in the Table 02. In the event of any dispute regarding the classification of the problem type, the matter shall be referred to the ECSL for determination. The decision of ECSL shall be final.

Table 2 – Mapping of problems encountered in practice with the upper limits of the scopes of capabilities of the six categories of EngineeringPractitioners stipulated in the Act

	Problem Type		
	Complex Engineering Problems	**Broadly Defined Engineering Problems**	**Well-Defined Engineering Problems**
Depth of Knowledge, Analysis & Resource Requirement	Have no obvious solution and require an engineering knowledge which allows a fundamentals-based first principles analytical approach, abstract thinking, originality in analysis and involvement of diverse resources to formulate suitable models.	Can be solved by the application of well-proven analysis techniques, through a variety of resources with technological knowledge with a strong emphasis on the application of developed technology.	Can be solved in standardized ways with the involvement of a limited range of resources with technical knowledge supported by practical/vocational experience.
Familiarity Interactions & Interdependencies	Involve infrequently encountered high level problems with wide ranging & conflicting interactions, including many component parts or sub-problems.	Belong to groups of known problems with occasional conflicting interactions, which are parts or sub-systems of problems that are solved by technologically well-accepted processes.	Frequently encountered problems with few interactions, which are discrete parts of sub-systems, which are familiar to most practitioners.
Engineering, Financial, Managerial & Social Interactions	Involve wide range of conflicting Engineering, Financial & Managerial issues coupled with diverse groups of stakeholders with widely varying and conflicting needs.	Involve a variety of factors coupled with several groups of stakeholders with differing and occasionally conflicting needs.	Involve several issues coupled with a limited range of stakeholders with common and occasionally differing needs.
Innovation	Solved by the creative use of engineering principles materials and research-based knowledge in novel ways.	Solved by the use of new materials, techniques or processes in established ways.	Solved by the use of existing materials techniques, or processes in standard ways.
Consequence to society & environment	Have significant consequences in a wide range of contexts, characterized by difficulty of prediction and mitigation, which require serious judgement in	Have reasonably predictable consequences in a range of local contexts, which require general	Have predictable consequences in a limited range of local contexts.

	decision making	judgement in decision making	

Stipulations

1. Competencies are defined as the ability to maintain the quality, standards and accountability under a particular category of engineering practitioner. To practice as an engineering practitioner he/she is expected to acquire relevant competencies.

2. Roles are defined, in relation to the Discipline of the practitioner;
   i. The type of work, functions or jobs that could be undertaken by the practitioner.
   ii. Depth of knowledge required by the practitioner for the successful realization of the work, functions or jobs.

3. Responsibilities are defined pertaining to concepts stated below, in relation to the Discipline of the practitioner.
   i. All engineering practitioners are responsible to the society for the works carried out by them, responsible for their personal safety and the safety of others.
   ii. All engineering practitioners are responsible to update their knowledge on modern technologies/methods/theories and practical applications within the scope of their category, through regular Continuing Professional Development (CPD) activities.
   iii. All engineering practitioners are responsible to be technically and ethically accountable for the performance of professional practice under their respective categories.

Table 3 –Competencies Stipulated for Engineering Practitioners

Chartered Engineers	Associate Engineers	Affiliate Engineers	Incorporated Engineers	Engineering Diplomates	Engineering Technicians
Possess and demonstrate effective inter-personal and communication skills commensurate with the roles undertaken					
Ability to comprehensively use science, mathematics and specialist Engineering &management principles coupled with theoretical andcomprehensive practical knowledge and experience on Complex Engineering/ Related Problems by sustainably optimising the application of existing & emerging technologies and Engineering processes.	Ability to comprehensively use science, mathematics and specialist engineering & management principles coupled with knowledge andunderstanding of Complex Engineering problems to sustainably optimise the application of existing & emerging technologies and Engineering processes.	Ability to use knowledge of science, mathematics and generally established technological principles coupledwith knowledge and understanding of Broadly-defined Engineering problems for the sustainable application of existing technologies.	Ability to use knowledge ofscience, mathematics, technology and management coupled with practical knowledge and experience for Broadly-defined Engineering problems for the sustainable application of existing technologies.	Ability to use knowledge ofscience, mathematics and well established technical principles coupled with knowledge on Broadly-defined Engineering problems for the sustainable application of existing technologies.	Ability to use basic knowledge & common technical principles coupledwith knowledge and vocational experience on Routine Technical problemsfor the sustainable application of existing procedures.
Ability to address multi-faceted issues, formulate policies, programmes and projects using theoretical & practical knowledge coupledwith experience for the analysis and design of solutions to complex Engineering/ Related problems.	Ability to apply appropriatetheoretical & practical knowledge to the analysis and design of solutions to Complex Engineering problems.	Ability to apply appropriatetheoretical & practical knowledge to the analysis and development of solutions to Broadly-defined Engineering problems.	Ability to apply appropriate theoretical & practical knowledge coupled with experience to developmentof solutions to Broadly-defined Engineering problems.	Ability to apply appropriatetheoretical & practical knowledge to the development of solutions to Broadly-defined Engineering problems.	Ability to apply basic theoretical & practical knowledge coupled with vocational experience tothe development of solutions to Well-defined Technical problems.
Ability to provide Engineering, Managerial andFinancial leadership/advise for national economic development, complex Engineering/ Business/ Service oriented organizations and Policy Implementation bodies	Ability to provide Engineering, Managerial andFinancial inputs to teams oncomplex Engineering. problems	Ability to provide Technological inputs to teams on Broadly-defined Engineering problems.	Ability to provide managerial and Technological guidance to teams on Broadly-defined Engineering problems	Ability to provide technicalinputs to teams on Broadly-defined Engineering problems.	Ability to be an effective technical member in teams to handle Well-defined technical problems.

Ability to exercise professional judgment, recognizing obligations to thenation, society, profession and the environment in the national and international perspective	Ability to comprehend and apply standards, recognizing obligations to nation, society,the profession and the environment in the national and international perspective	Ability to comprehend and apply standards, recognizing obligations to nation, society,the profession and the environment.	Ability to comprehend and apply standards, recognizing obligations to nation, society, the profession and the environment.	Ability to comprehend and apply standards, recognizing obligations to nation, society, the profession andthe environment.	Ability to understand standards, recognizing obligations to nation, society, the profession andthe environment.

Table 4 – Roles Stipulated for Engineering Practitioners

Chartered Engineers	Associate Engineers	Affiliate Engineers	Incorporated Engineers	Engineering Diplomates	Engineering Technicians
Be Involved as Leaders & TopManagers Accountable for the Analysis, Design, Planning, Implementation, Operation, Maintenance andOverall Administration, pertaining up to Complex Engineering and/or Management solutions, systems and organizations at national level.	Be Involved and responsible for the Analysis, Design, Planning, Implementation, Operation, Maintenanceand Administration, pertaining up to ComplexEngineering solutions, systems and/or organizations.	Be Involved and responsible for the Implementation, planning, design, analysis, and maintenance of broadly-defined engineering problems.	Be Involved and responsible for the Implementation, planning, design, analysis, and operation & maintenance of broadly-defined engineering problems.	Be Involved in the Implementation, Operation and Maintenance of broadly-defined applications.	Be Involved in the Implementation, Operation and Maintenance of Common Technical applications.
Exercise Professional/ Theoretical Judgment in the field of Engineering & related multi-faceted scenarios in normal & emergency situations as requested by the State or Courts of Law, including disciplinary matters related to work in engineering, technology or related services.	Exercise Theoretical Judgment based on engineering knowledgeand training pertaining up to Complex Engineering matters.	Exercise Theoretical Judgment based on knowledge and Training pertaining to broadly-defined engineering matters.	Exercise theoretical Judgment based on engineering knowledge, training & experience on broadly-defined engineering matters.	Exercise Appraisal based on technical knowledge &training on broadly-defined technical matters.	Exercise Appraisal based on basic technical knowledge &vocational training.
Lead/ Manage/ Approve,Policies, Programs and Projects, including Contracts, Finance, and Human resources. Manage trade-offs between technical and socio- economic Factors.	Manage/Prepare, Contracts, Finance andHuman resources in projects. Manage trade-offs between technical and socio- economic factors.	Prepare/Coordinate Contracts and Human resources in technological components of projects.	Manage/Prepare, Coordinate technical activities andHuman resources in technological components of projects.	Coordinate technical activities and Human resources in technical components of projects.	Supervise Technical activities and Humanresources in technicaltasks of projects.

Prepare, Check, Certify and/orApprove Designs/Drawings, Estimates, Bills of Quantities and Financial Plans pertaining up to complex engineering solutions and provide professional evidence for their suitability at any forum including Courts of Law.	Prepare, Check and Recommend Designs/Drawings, Estimates and Bills of Quantities pertaining upto complex engineering solutions	Prepare and Check Drawings, Estimates & Bills of Quantities pertaining to technological applications	Prepare and Check Designs/Drawings, Estimates & Bills of Quantities pertaining up to broadly-defined engineering solutions within accepted competencies of this category.	Prepare and Check Drawings, Estimates &Bills of Quantities pertaining to broadly-defined technical applications.	Prepare Drawings & Bills ofQuantities pertaining to Common Technical applications.

Table 5 – Responsibilities Stipulated for Engineering Practitioners

Chartered Engineers	Associate Engineers	Affiliate Engineers	Incorporated Engineers	Engineering Diplomates	Engineering Technicians
Accountable to the nation and society for the sustainable utilization of natural resources and funds under the roles undertaken.					
Exercise principles of health & safety for oneself, other operatives and the public within working environment					
Undertake regular Continuing Professional Development (CPD) activities sufficient to update and maintain competencies relevant to each category.					
Abide by the ECSL Code of Conduct.					
Abide by the Codes of Ethics and Conduct of relevant nominating bodies.					
Develop, Approve & Implement sustainable solutions up to complex engineering problems	Develop, Recommend &Implement sustainable solutions up to complex engineering problems	Develop, Recommend &Implement sustainable solutions to general technological problems	Develop, Recommend &Implement sustainable solutions up to broadly-defined technological problems	Develop, recommend & implement sustainable solutions up to broadly-defined technological problems.	Implement sustainablesolutions to Common Technical problems.
Manage diverse groups of stakeholders, including the public, with widely varying requirements.	Coordinate with diverse groups of stakeholders with widely varying requirements.	Coordinate with general groups of stakeholders with varying requirements.	Coordinate with general groups of stakeholders with varying requirements.	Coordinate with general groups of stakeholders with known requirements.	Coordinate with well definedgroups of stakeholders with limited known requirements.
Resolve wide-ranging andconflicting engineering, technological & technical issues.	Recommend solutions to wide-ranging and conflictingengineering, technological & technical issues.	Recommend solutions to conflicting technological issues.	Recommend solutions to wide-ranging and conflictingtechnological issues.	Recommend solutions to conflicting technical issues.	Recommend solutions to common technical issues.
Provide Overall Leadership,Training & Ethical guidance to subordinates.	Provide Leadership & Guidance to subordinates.	Provide Leadership & Guidance to subordinates.	Provide Leadership, Training &Guidance to subordinates.	Provide Tutoring & Guidance to subordinates.	Provide Guidance to peers.