The engineer and his education

Profession

The Engineer and HisEducation“ The term civil engineering describes engineering work performed by civilians for non-military purposes. In general it describes the profession of designing and executing structural works for the general public and the communalenvironment. Civil engineering covers different areas of engineering, including the design and construction of large buildings, roads, bridges, canals, railway lines, airports, water-supply systems, dams, irrigation, harbour, docks, aqueducts, and tunnels. “ The civil engineer needs a thorough knowledge of surveying, of the properties and mechanics of construction materials, of the mechanics of structures and soils, and of hydraulics and fluid mechanics. Today civil engineering includes the production and distribution of energy, the development of aircrafts and airports, the construction of chemical process plants and nuclear power stations, and water desalination. Brieger, N. & Pohl, A. Technical English Vocabulary and Grammar. Oxford: Summertown, 2002. p. 44 Civil engineering’s scope is so broad and given with the definition above denotes a wide variety of functions of a civil engineer. The functions of an engineer are to design, to construct, to advise, to operate, to investigate, and to supervise. It is hisresponsibilityto make a plan a reality.

An engineer must develop ideas that will produce an effective design; he must know and implement right construction methods and manners; he must advise his employer as to the feasibility of the proposed project, the cost which will be entailed, and the results which will be accomplished; he must investigate conditions and provide solutions to meet the needs in case problems are observed; he must supervise and make sure that the work is done according to the plan; and he must see to it that the works which have

been created from his plan and under his supervision will properly perform its intended purpose.

In order for an engineer to perform such functions, it is important for him to have skills incritical thinking, complex problem solving, operation analysis, and judgment and decision making. He must use logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems; he must identify complex problems and review related information to develop and evaluate options and implement solutions; he must be able to analyze needs and product requirements to create a design; and he should consider the relative costs and benefits of potential actions to choose the most appropriate one.

Thus, a civil engineer ought to have knowledge inmathematicsto solve mathematical problems; knowledge of the practical application of engineeringscience and technologyand this includes applying principles, techniques, procedures, and equipment to the design and production of various goods and service; knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models; knowledge of building and construction specifically of the materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads; and the last but the least is the knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar. It is a common notion that engineers do not need so much of English language but it should also be considered that success in engineering depends as much upon the ability to present an idea

convincingly as it does upon the ability to perform calculations or experiments.

You may perform the most miraculous experiment in the laboratory, yet you have not contributed anything to the advancement of knowledge until you have shared your results to others. It is by means of speech and writing that the discoveries made in the laboratories are made useful. Engineering work is not finished until the results are clearly recorded and presented to others. Theeveryday useof English by the engineers is to write technical reports on his work for presentation to other engineers or to the management. These reports must present the results of his investigation in an accurate and orderly manner to those immediately interested in the work, and also to acquaint executives with the progress being made on the subject. In a larger ense, the engineer has an opportunity to use English in furthering the general understanding of the economic forces at work in our civilization. It is the job of the engineer, who has the technical background, to interpret the technical facts upon which modern civilization is based into language which everyone can understand. The engineer who learns to master English and use it in these two important ways will do most to advance his chosen profession. He will be able to present his own investigations to his fellow engineers. More important still, he will be able to gain the understanding of our people who are interested in technical subjects, yet need them explained in simple language.

The civil engineer has the challenge to satisfy the vital needs of the society as a global player who is able to design, build, manage and maintain complex infrastructure projects with a global approach, taking into account

socio-economical and environmental interactions. He is a generalist with high competences in various fields such as structures, hydraulic schemes and energy, geotechnics and tunnelling, transportation infrastructures and systems, language and management, legal and economical aspects as well as environmental issues. Civil engineers work in multidisciplinary and very often multicultural teams. They are challenged to create the necessary infrastructures for the prosperity of the economy, hence guaranteeing the whole population an adequate standard of life.