NATIONAL SEMINAR, EXPOSITION AND CORPORATE TALK ON CIVIL ENGINEERING 1996 (NASEC'96)

THEME : CIVIL ENGINEERING TOWARDS VISION 2020

14 JANUARY 1996 (SUNDAY)

AT UTM SKUDAI CAMPUS

PAPER: CIVIL ENGINEERING - THE CHALLENGES AND OPPORTUNITIES

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Abstract

Civil engineers play an important role in the development, especially in the infrastructures. Infrastructures are vital for economic growth particularly for developing countries. In Malaysia, we have successfully implemented many mega projects such as North South Highway, Penang Bridge, dams, ports, airports, power stations, water supply systems and highrise buildings. The technology and experience gained by our civil engineers in these projects would place our civil engineers to a level of greater opportunities to export the expertise to other developing countries who are in need of them. The challenge is to continue updating on professional skill in acquiring new technologies and resources as well as extending our knowledge in the related areas such as project management and communication skills for better quality and productivity. The global liberalisation would extend our market to many countries especially the developing neighbours. In our pursue for challenges and opportunities, we should not neglect in our awareness for environmental health and safety issues.

Introduction

As you may be aware, civil engineers account for more than half of the total engineers in our country. This indicates the significant of the contribution of civil engineers to the development of our country.

Infrastructure development sector has been growing steadily at about 10% per year over the past decade. This can also be observed from the output for construction. In 1980, the total output for construction was only about 6 billion ringgit. It has doubled in 10 years. In 1990, the output for construction was 12 billion ringgit. It has been estimated that the output for construction for 1995 to be over 32 billion ringgit. Based on the numerous on-going and future mega projects, as well as our vision to become a fully developed nation

by the year 2020, the growth will continue for the next few decades.

Infrastructure development

Infrastructure is vital and also the basic framework necessary to facilitate development. Civil engineers have an important role to play in advising the policy makers and also contribute directly to the process of formulating, planning, design and implementing infrastructure projects. The essential of modern life includes the construction of roads, bridges, railways, dams, airports and seaports as well as coastal developments. This is in addition to the provision of clean water, natural resources, waste disposal, transport for safe and efficient movement of people and goods. There is also a need for civil engineers to be aware of the importance of co-ordinated approach to long term planning for adequate and efficient infrastructure.

There are growing concern on environmental degradation such as urban air pollutions, traffic congestion and pollution of both fresh and sea water as a result of infrastructure development. The development of technologies that utilise resources as efficiently as possible and minimize environmental harm while increasing industrial productivity and improving quality of life will be challenges facing civil engineers.

New Technology and Research and Development

There is a need to continue updating the professional skills, acquiring new technologies and resources as well as extending their knowledge in the related areas such as awareness of environmental issues, health and safety measures, financial and legal aspects of projects, management techniques and communication skills. It is a tall order to expect any individual to have all of these skills and keep up with all these knowledge and its advancement. Therefore, there is a need to produce specialists within the civil engineers for

better quality civil engineering projects in a shorter time.

In acquiring new technologies, there is a need to keep in touch with new discoveries and breakthroughs and to be open-minded about their potential applications. The increasing use of polymeric substance and greater use of prefabricated components for civil engineering constructions are some of the examples.

The ability to judge and utilise new discoveries and breakthroughs would reduce cost and time as well as improving quality.

The use of computer-aided packages in designs and constructions in civil engineering is growing, and has reduced the time spent in carrying out the work. Semi or fully automated production looks set to be applicable to civil engineering. The extent and potential of these techniques would be greater in years to come. We should take advantage and explore their limit for the civil engineering works.

In addition to avail ourselves to the new technologies, we should also extend them for innovations through research and development, which include improving the present technique and to explore better use of our natural resources for civil engineering construction.

Demand for Civil Engineers

As on December 1995, there are over 26,000 Malaysian engineers registered with the Board of Engineers Malaysia (BEM). About one third of them are professional engineers. In terms of discipline, civil engineers comprise approximately 53% of the registered engineers with the BEM.

Malaysia is enjoying the accelerated economic growth with the construction

sector being forecasted with a 14% growth for 1996 and 1997. Hence, the demand for the civil engineers will continue to grow. According to the Second Outline Perspective Plan (OPP2), it has been estimated that there is a shortage of about 17,000 engineers by the year 2000 of which civil engineers account for about 30%. It looks not promising enough that our country is able to produce enough engineers to meet the demand.

The Institution of Engineers Malaysia has embarked on a study of Formation of Engineers recently. The findings have confirmed the declining trend of students taking up engineering. In addition to producing and nurturing of quality engineers, the report also explores ways to encourage students taking up engineering, thereby assisting our country to achieve our Vision 2020.

Opportunities for Civil Engineers

Our country has successfully implemented a number of mega projects such as the North South Expressway, Penang bridge, dams, ports, power stations, water supply systems, highrise buildings and airports. A number of them were implemented through corporatisation and privatisation. The technology and experience gained by our civil engineers in these projects have propelled us towards a level enabling us to export our services to many other developing countries who are in need of the similar infrastructural development. Although many of our civil engineers have already gained access and secured services overseas, it is therefore timely that our civil engineers should further aggressively pursue the idea of exporting our engineering services.

The expansion of our engineering services abroad is timely especially with the global trade liberalisation implemented on January 1995.

Conclusion

Civil engineers have contributed significantly in the development of our nation, especially in the infrastructures. In our quest to achieve the status of a fully developed nation by the year 2020, the demand for civil engineers would continue. There is a need to continue to update on professional skills, be open-minded in the new technologies and to innovate through research and development for higher quality and productivity. In addition, there is also a need to extend our knowledge to other related areas such as environmental, health and safety issues, project development and management techniques as well as communication skills.

With the global liberalisation in trades and services, the challenges and opportunities for civil engineers would be far greater in the years to come.