From earliest times, man has sought to improve his habitat and environment, with considerable success, from the Middle Ages, through the Industrial Revolution, and up to the Technological Revolution of the late 20th and early 21st centuries.

At the forefront of these major changes over the past 200 years or so, have been professional engineers from varying backgrounds and disciplines who have pioneered radical changes and improvements for society as a whole. In more recent years, the engineer has been recognised as the primary innovator of new construction and building services technology and techniques and very often a significant contributor or often the “Architect” to the form and aesthetics of the project. This is readily recognised on major tunnels, bridges and other civil engineering projects but is also becoming more commonplace on the structural forms of general buildings, sports stadiums and other structures. Within structures and buildings, the Building Services Engineers now impact and influence every aspect of the built environment.

In the area of transportation, for example, we have witnessed the construction of ever increasing long span structures, both bridges and tunnels. All these advances have been achieved through technical innovation, both in regard to the key elements of the structures as well as the unique methods of construction. The introduction of the balanced cantilever, segmental and push launch methods of bridge construction have seen huge advances
in the development of road networks worldwide. Cable stayed and suspension bridges have been equally innovative and are fast becoming part of our daily environment.

With regard to building structures, technical innovation has seen a dramatic revolution and growth in precast and prefabricated structures. Fastrack construction is the order of the day and this has been achieved largely through rapid assembly techniques such as composite concrete/steel floor plates, architectural precast cladding panels, fabricated off-site and erected by high capacity mobile cranes.

All of these fast-track methods have been driven by cost reductions and optimisation of resources in times of significant labour shortages. The benefits of these innovations are there for all to see, and have resulted in structures that meet the requirements of sustainable development, particularly in regard to re-cycling of building components and, future land re-development by subsequent generations.

But probably of greatest significance, is the radical change in the Built Environment with regard to the extent and complexity of building services required of the engineer. The traditional Mechanical and Electrical services now include Building Transport systems, computer controlled environments, complex telephony and data systems infrastructures, support services for critical medical, process and industrial installations, to name but a few. Modern building services designs are also committed to the concept of low energy buildings, the use of natural ventilation where possible, the integration of services with function, the consideration of future-proofing and in-built services flexibility and the whole area of “eco-friendly” building services.

The early “improved” internal environment of buildings designed in the mid 1960’s and early 70’s relied heavily on large amounts of heat with mechanical ventilation to achieve an acceptable working environment. These designs were extremely “energy intensive” and with rising oil prices became very costly to run and maintain. They also suffered from considerable inefficiencies in regard to air circulation and other more sophisticated air-conditioning systems.

With a greater emphasis on energy conservation in recent years, technical innovation has seen the use of the thermal mass of the structural floor plates as a means of absorbing thermal differentials within a building, due to solar gain and also increased heat sources from computer equipment. Nowadays, minimal heat inputs are required for properly insulated and constructed buildings on a year round basis, resulting in significant energy savings to both the building occupier and more particularly to the hard-pressed national utility suppliers.

Improved natural ventilation systems, using the vertical “stack effect” of a double skin façade system, means that today’s buildings are both more comfortable from the users viewpoint as well as being considerably more healthy to work in.

Equally unrecognisable today would be the outdated and simplistic electrical designs for buildings of 30 years ago. Today’s designs incorporate every electrical or communications technology available.

All of these improvements in our living and working environments have been achieved by engineers who have addressed technical issues and resolved them for the overall betterment of the community and world in which we live.

It is crucial that today’s engineers remain at the fore-front of all aspects of technical innovation, so that the benefits accruing to society will not only impact on present generations, but that their designs and innovations will both recognise and enhance the role and rights of future generations to live in a world that is equally shared by all.