

Speech of Randeep Singh Surjewala, Minister for P.W.D.(B&R), Industries and Parliamentary Affairs, Government of Haryana on the occasion of inauguration of IBC Mid Term Session & National seminar on Technological Advances in Construction Industry Focus-Faster Speed and Better Quality on 09-04-2011 at Suraj Kund (Hotel Rajhans) Faridabad, Haryana.

Respected Ch. Bhupinder Singh Hooda, Chief Minister, Haryana; my worthy colleague, Shri Prahlad Singh Gillankhera, Chief Parliamentary Secretary, P.W.D.(B&R); Shri Bhisham Kumar Chug, President, Indian Building Congress; Shri O.P. Goel, Founder President, Indian Building Congress; Shri S.C. Chaudhary, Secretary P.W.D.(B&R); Shri Mahesh Kumar, Sr. Vice President, Indian Building Congress & Engineer-in-Chief, Haryana P.W.D.(B&R) and others officers sitting on the dias, press from print and electronic media, all Engineers from Haryana and other States and all other esteemed guests.

It is, indeed, a privilege to be Guest of Honour on the occasion of inauguration of the IBC Mid Term Session & National Seminar on Technological Advances in Construction Industry Focus-Faster Speed and Better Quality.

Indian Building Congress (IBC) is a prestigious organization engaged in diverse professional activities which include dissemination of knowledge through technical reports, journals, news letters, and conferences. A number of technical committees are functioning in IBC to draft technical documents to fulfill the need of construction industry. National Seminars have been organized on important topics such as Information Technology, Energy Management, Water Management, Quality Management, Earthquake, Fire, Urban Planning and Design etc. in the past. Training of workers and supervisory staff has also been taken up by IBC on a large scale. What is heartening to note is the fact that CIDC has also opened Workmen Training Centers at Nuh, Palwal and Panchkula in collaboration with Department of P.W. (B&R).

We, in Haryana, are privileged to have unflinching support of our Chief Minister, Ch. Bhupinder Singh Hooda and the entire government in ensuring overall infrastructural development in the State in a speedy and innovative manner. Department of P.W. (B&R) in Haryana has an outstanding team of engineers in Shri Mahesh Kumar, Engineer-in-Chief and other senior Chief Engineers. You can judge the governmental support to Department's infrastructure initiative by the fact that between 2000-05 (when we had a non-Congress government in the State), Department executed works of a value of Rs.397 crore only in construction, maintenance and renovation of buildings. As against this, since 2005 till date, Department has executed building construction/maintenance/renovation projects worth Rs.2100 crore. In addition, 345 buildings costing Rs.1050 crore are under construction at present. We are constructing the first All Women University of North India in Khanpur Kalan in Sonapat; Medical Colleges at Sonapat, Karnal and Mewat and many other prestigious projects. Rain water harvesting, Energy Efficient T-5 fittings and CFL lamps and Solar Water Heating System are part of standardized procedure. 'Nirman Sadan', headquarter of P.W.D. (B&R) at Chandigarh has been awarded the Best Institutional Building by IBC and has been given Vishwakarma Award by CIDC. Housing Complex of Rajiv Gandhi Thermal Power Plant at Khedar in Hisar and Sir Chhotu Ram Samarak at Sampla in Rohtak have got Indian Concrete Institute Awards.

Quality and speed are the guiding moto of our Department. Credit for the same must go to our junior most engineers to our engineering hierarchy, besides all our associate contractors and suppliers. I can assure Chief Minister, Ch. Bhupinder Singh Hooda as also President of IBC and other delegates present here that we shall continue to evolve, assimilate and infuse new and better technologies and techniques to deliver projects on time and get maximum cost efficiencies.

Last two decades of 20th Century and last decade of 21st Century have been harbinger of major change in construction industry. These three decades have witnessed a new upsurge in industrialization with focus on faster speed and better quality construction due to various technological advances. Industrialization has given birth to many new materials like reinforced cement concrete, structural steel, plastics etc. which along with new knowledge of structural engineering and new method of construction gave rise to high rise buildings, big dams, express ways, airport and structures of all sorts having all facilities of lighting, ventilation, heating, communication etc. This has led to specialization with modern construction becoming a coordinated work of a team of specialists.

Construction industry has made phenomenal progress in last couple of years notwithstanding the overall financial meltdown. A number of New Materials and New Technologies have been developed. In this world of globalization and competitiveness, it is imperative that Construction Industry should adopt New Materials and New technologies to remain ahead of time and for achieving faster speed and better quality in Construction Projects.

Numerous technological advances have been made in construction industry in terms of faster speed and better quality. To deliberate on each, one can take a matter of days. I shall, however, restrict myself in today's session to two, which, in my humble opinion, are most relevant to India's growing infrastructure needs. These are:-

(1) USE OF INFORMATION TECHNOLOGY IN CONSTRUCTION INDUSTRY.

Technological advances and new software have altered the face of engineering design sector. Unlike the design firms, construction industry has not kept pace with Information Technology advancements.

With proper use of Information Technology, construction industry has the potential to lower project costs, shorten schedules and streamline coordination between managers, suppliers and contractors.

(1-A) May I mention some of Information Technology developments available to the construction industry:-

(i) ELECTRONIC DOCUMENT MANAGEMENT (EDM)

Electronic Document Management (EDM) is a well known system consisting of a private network that uses internet protocol to transmit information. This system is typically accessible only by authorized users and utilizes central database with a complete collection of all project related documents. All these project documents are stored on a single server and the user interface can be as simple as an FTP (File Transfer Protocol) site or a user friendly web page complete with a search engine. In present day and age, this entire data can be on a cloud. Rising popularity of this type of document management has promoted development of large number of third party service providers.

Simple EDM can comprise of something as basic as a folder hierarchy system with a set of folders and sub-folders containing different project information. Users can log-in to a password protected website to access these folders and documents within them and can edit, upload or download files.

Of course, an ideal would be to have a meta-data based search function in order to ensure retrieval of correct information.

EDM ensures seamless communication between team members as well as between managers, suppliers and contractors. EDM streamlines all documents transfer through one server and create a single place where uploaded documents can be found. This

can significantly improve project efficiency, cut time and lower cost.

(ii) **3-D MODELLING AND BUILDING INFORMATION MODELS (BIM)**

Another significant IT development is computer modeling in 3rd and 4th dimensions. These computer models allow 3-Dimensional visualization of construction projects, so that clients, design engineers and contractors can perform visualized walk-through, view realistic renderings of buildings before actual construction and even examine construction frequencies in 4-Dimensional animations.

For construction industry, benefit of BIM comes from simulation efforts by these modeling programmes, seamless production of accurate construction documents and automated quantity take-offs and measurements. Contractors can use the model to analyze the constructability of highly detailed areas and visualize potential problem areas. Contractors may also be able to point out mismatch of coordination between engineering designs where for example, mechanical or electrical equipment and duct work were to overlap with structural elements. This type of early-on constructability verification can save considerable time and money by preventing expensive re-work or on-site corrections. It will also make contractor and the architect/engineer more aware of constructability and field issues in order to encourage construction team members to appreciate the design concept and rationale behind various engineering aspects. A 3-Dimensional model can help each party visualize the concerns that the other may have and same can be eventually addressed with a better understanding of each other's needs. Cost and time saving can also be achieved through automatically calculated quantity take-off extracted directly from this model.

(iii) CONSTRUCTION SEQUENCING AND 4-D MODELING

Ability to visualize construction sequence in 4-Dimensions is beneficial in two regards:-

- (a)** It assures efficient use of resources on site and helps the construction team find schedule inconsistencies and access or delivery issues.
- (b)** It informs stakeholders and project members of the construction approach and schedule in a manner that is coherent and easy to understand.

This type of digital project is considered one of the Advanced Building Information Module (BIM) programmes available and offers support over the entire life cycle of building projects including design and engineering, fabrication, construction project management and on-site construction activities. Digital project has powerful 4-D potential because it integrates Primavera Scheduling Software with 3-Dimensional Building Modeling. This software allows users to view 3-D models of construction industry as components of project contract documentation.

(1-B) OBSTACLES – TECHNICAL, PERSONAL AND PSYCHOLOGICAL

Needless to add that even today obstacles to infusion of information technology into construction industry are technical and psychological. Technical obstacles can easily be overcome by sheer availability of vast pool of software professionals within India. It is the personal and psychological obstacles and the resistance to change with managers, government and private; contractors and suppliers that need to be addressed by making them stakeholders.

(1-C) INFORMATION TECHNOLOGY TO BE DRIVEN BY OWNER'S VISION

Last but not the least, a Building Information Module (BIM) Software is only as intelligent and as useful as the information it receives. In other words, 'garbage in, garbage out' rule still applies. An Information

Technology Software is finally driven by owner's vision and oversight. It is, therefore, imperative that (a) owner's vision and needs must be clearly understood and incorporated and (b) all involved parties i.e. owner, manager, contractor, supplier etc. must embrace BIM.

Net result will be cutting costs and shortening schedule, making the entire system efficient. Indian Building Congress has an important role to play in infusing Information Technology, disseminating its widespread uses and ensuring that all the stakeholders utilize it effectively for cost efficiencies and speedy pace of construction.

(2) CONCRETE – TECHNOLOGY AND CHALLENGES

Undoubtedly, concrete is world's most used construction material being used in highways, bridges, dams, skyscrapers, driveways, parking lots and innumerable other applications.

With growing demands of concrete, new challenges are posed before us to have 'quality concrete' that has (a) high early strength, (b) high performance, (c) shorter construction time and (d) is climate-friendly.

Last decade has seen many advances in new concrete technology. Some of the more interesting new concretes are called High Performance Concrete (HPC), Ultra High Performance Concrete and Geopolymer Concrete. High Performance Concrete usually contains recycled materials such as fly-ash, blast-furnace, slag and silica fume, thereby reducing the need to dispose of these materials. Biggest benefit of course is the reduction in need to use cement, thereby reducing carbon dioxide emissions. We also have the new concrete technology known as 'BSI' that has a much higher tensile and bending strength than standard concrete. It is much denser than standard concrete and structures built with it will need far less new concrete, perhaps, as much as 80% less. 'Ductal' is another new concrete technology that is denser than DSI. Ductal uses steel or organic fibres

to create a concrete that is stronger than DSI. Ductal is being tested for use in earthquake resistant structures, bridges, tunnels and nuclear containment structures. Both DSI and Ductal have low maintenance cost because of their very low porosity and are very resistant to penetration by water or chemicals.

Another challenge lies in designing high performance and high strength concretes that requires a variety of newly developed admixtures. On one hand, it is high performance and on the other, addition of admixtures sometimes make the concretes undergo excessive shrinking and cracking defeating the very purpose. Another burning issue is related to curing concrete. What should be the timing, duration and type of curing? What should be the balance between curing time and speed of construction? These are challenges that can be described as the 'knowledge gap'. An effective training programme needs to be designed for construction industry for bridging this knowledge gap with topics such as:- (a) properties of individual concrete ingredients, (b) interaction of various ingredients in concrete mixtures, (c) arriving at the optimum mixtures for different types of application, (d) desired level of exposures to adverse environment and (e) advanced methods of testing concrete and its ingredients with speed, accuracy and precision.

Last but not the least, we need to stay in touch with new technology and opportunity being offered by the ever expanding world of newly developing concrete. Latest such example being of 'Self Consolidating Concrete' that can flow easily into tight and constricted spaces without requiring vibrations. Today, advances in admixture and mix proportioning are making Self Consolidating Concrete a practical reality around the world. Similarly, a futuristic idea is of 'Self Cleaning Concrete'. Recently introduced formulations of cement are able to neutralize pollution. Harmful smog can be turned into harmless compounds and washed away. Proprietary technology (based on particles of 'titanium dioxide') makes this cement special - capable of

breaking down smog or other pollution that has attached itself to the concrete by a process known as 'photocatalysis'.

These are the real challenges before construction industry. While each stakeholder has to play a role, yet IBC is the most suitable organization to provide a connecting link to such formidable challenges. I am certain that deliberations of this Seminar will throw important light before entire construction industry on issues relating to faster delivery, cost effectiveness and optimum utilization of public money. I once again congratulate IBC and its President, Department of P.W. (B&R) and its Engineer-in-Chief as also all others for organizing this function in Haryana. We shall continue to look forward to these meaningful deliberations in future also.

JAI HIND !

