



NEWSMAGAZINE OF THE HOUSING RESEARCH CENTRE, UNIVERSITI PUTRA MALAYSIA

Editorial

The construction industry is suffering from fragmented, poorly managed organisations, poorly developed communication systems and design/construction separation. Hence the industry has not been able to combine high quality, productivity and customer satisfaction. Several problems have floundered the construction industry in the past despite the evolution of several innovative concepts and techniques. The problems included poorly defined projects, constructability problems, inadequate design information, inefficient supply chain logistics, and construction processes predominated by non-value added activities.

Design construction integration and quality have been problems in construction ever since the middle of the last century. Several contractual arrangements including Design and Build, Management contracting and partnership were suggested to integrate design and construction. However, no significant improvements along this direction were made so far despite of their implementations. Quality in construction is still a major research agenda despite the application of several quality concepts including Quality Assurance, Reengineering and Total Quality Management.

The construction industry is yet to make significant progress against the above traditional problems but recently, it has been challenged with a problem of 'sustaining' its outputs. This new problem outweighs the traditional ones since it exerts completely a new methodology in the way in which buildings are designed, constructed and maintained. Sustainable construction with improved productivity and quality is the key problem facing today's construction industry. It requires all construction related parties including professionals, clients, contractors and architects to work as a team in developing new strategies and standards for both design and construction of buildings. ■

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Sustainable Construction in Malaysia

Priorities and Actions

Dr. L. Jawahar Nesan
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Malaysia's submission to the 5th session of the United Nation's Commission on Sustainable Development recognised inappropriate standards in construction practices that led to unsustainable developments in infrastructure, housing and public utilities.

It is evident that without having established proper standards for sustainable developments Malaysia is faced

with a variety of complex challenges and threats to sustainability as it is compelled to proceed with its national priority, i.e. "to provide adequate shelter, relocation of industrial areas, improvement of service facilities for waste disposal, sewage treatment, sanitation, water supply and energy and transport". The consequences are far from imagination as such natural habitats are shrinking and covered in concrete, global warming is as high as ever before, and inappropriate building systems that waste energy and resources and lack cultural heritage are mushrooming.

The global definition of the sustainable construction is "the creation and responsible management of a healthy built environment based on resource efficient and ecological principles". Sustainable construction has different approaches and different priorities in different countries. However, what prompts the Malaysian construction industry to adopt sustainability? Several of the prevailing problems associated with developments including ecological impacts to the environment, social, cultural and indigenous resources warrant continuous retrospection of the construction practice in Malaysia for sustainable developments. The key factors that drive Malaysia to adopt sustainable construction practices include: a large proportion of population lives in urban settlements; the availability of land, air and good quality building is a problem; unsustainable urban sprawl; depletion of forests continues; energy needs to be conserved as most facilities have installed air-conditioning units; lack of environmental protection during the

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Impeding Factors in the Implementation of a Quality Management System in a Construction Project

Lessons from Kuala Lumpur International Airport construction

What is QMS ?

The concept of Quality Management System (QMS) is relatively new in the construction industry in Malaysia. It has however been practised since 1994 in view of the importance to manage quality within this sector. QMS is defined as "all activities of the overall management function that determine the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement". It is believed that if the objectives of a firm are well defined and appreciated by all employees, the

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HRC and IEM on Design of Longhouses

The Institute Engineers Malaysia (IEM) Sarawak branch is keen to cooperate with the Housing Research Centre (HRC), UPM to design better, safer and comfortable longhouses.

IEM's Chairman, Peter Chong Chung Ping said the move was to identify suitable design of longhouse, which is equipped with all the safety aspects without affecting its traditional design. Two of the HRC members are currently performing research on the longhouse design in the state. According to Professor Abang Abdullah Abang Ali, the Director of the HRC, "the safety aspect of the longhouse has become quite an issue especially when it comes to efforts to make them less vulnerable to fire threat". A lot of fire, which involved longhouses, was difficult to put under

control due to problems such as location and the structure of the longhouses.

The proposal and research will also recommend that the longhouses in the state be equipped with automatic water sprinkler system on their roofs, Professor Abdullah suggested in a press conference in Kuching. Longhouses in Sarawak have a distinct advantage because of the abundant rainfall and proximity to river banks, which provide a reliable supply of water to be stored in elevated tanks to provide gravity pressure and the necessary flow.



Prof. Abang Abdullah Abang Ali

Regeneration of the Mines Resort City — *A Developer's Challenge* —

Yvonne Chan
Executive, Perception Management



After 10 years of careful planning and hardwork, a multi-million RM dream finally became a reality. The reality in none other than the sprawling 1,000 acre Mines Resort City, home to the Seven Wonders of Malaysia.

What seemed an impossible challenge to transform the world's largest unused open cast tin mine into a beautifully landscaped oasis in the middle of the city was accomplished by

a dedicated team headed by Tan Sri Le Kim Yew, Founder and Managing Director of Country Heights Holdings Berhad and the mastermind behind the country's first mega urban regeneration project.

Soon after he pioneered country-style living with his flagship project, Country Heights in Kajang, Tan Sri Lee had his eyes set on the barren worked-over Hong Fatt Mine in the Sungai Besi area. He envisioned an exclusive integrated resort city carved out of the scarred land surrounding the huge

waterlogged mine, which he saw as the beginning of a magnificent 150-acre lake.

Problems faced by the development team who took on this challenge to transform the brownfield were enormous. The team had to overcome topographical obstacles with clever soil engineering as the site generally sloped steeply from east to west with the eastern edge 60 to 70 metres above sea level while the western edge was about 40 metres above sea level, making the task of earthworks

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responsibilities of the department and the designation are clearly delineated and the procedures are well documented, it is likely that the products or services of the firm are "fit for purpose" and meet the clients' requirements. This is so important as for a company to remain viable it should meet the two essential factors i.e. to satisfy the client and to make profit. Evidences show that by adopting QMS, communications can be improved, mistakes, rework and wastages can be minimised, subcontractors and suppliers can be better controlled and thus consequently, improved productivity, profit and market share can be achieved. In a project specific QMS, the employer will forward his quality requirements to the employee. The activities, resources and events that will be deployed by the employee to meet the requirements of the specific project shall be written in a document called 'quality plan', which provides a quality assurance to the employer.

However the success of the implementation of QMS solely does not only depend on good and well-defined processes and procedures but also on continuous improvement of both 'processes' and 'people'. Thus, the capabilities of the practitioners also play an important role to the successful implementation of the QMS.

The Impeding Factors and Suggestions for Improvement

From a case study conducted at the Kuala Lumpur International Airport construction project, the main factors that impeded the implementation of the QMS were discovered to be as follows:

- ▶ lack of experience in the implementation of the QMS;
- ▶ extreme reliance upon the traditional methods of construction management;
- ▶ negative attitude towards new approach;
- ▶ subcontractors' or suppliers' difficulties in adopting the QMS of large organisations;
- ▶ misconception of the QMS; (e.g.

QMS mandates a higher level of product quality, QMS tend to cause bureaucracy, paper work, administrative cost and loss of innovative opportunity) and

- ▶ the quality policies were prepared by the consultants that had limited knowledge about the construction processes.

In general all these factors were due to the failure to understand the ethos of the QMS, lack of positive view of the significant benefits that a QMS can bring to the construction works and also lack of capability and skill to implement the QMS. As such, the following suggestions can better help remedy the situation:

◆ Instigate A Quality Working Environment

To promote a total change in the construction industry towards a quality-working environment is not an easy task. The importance of providing the quality working culture in the construction industry is however undeniable as it will unconsciously change the mentality of the construction community towards a quality working culture. Therefore steps should be taken to initiate the change. Commitment from all levels of management especially from the top level is very essential to materialise the concept. Thus the government should play its role to promote and educate the people especially the construction team through regular campaigns, seminars and courses so as to convince all construction participants to implement QMS in their companies and projects.

◆ Enforce Companies to Implement QMS

By enforcing regulations construction companies and consulting firms can be made included in the QMS, so that all parties will have no choice other than practicing the quality system in their projects and consequently the QMS will become part of their life.

Although this is considered to be a rigorous stance it is one of the best ways to enhance the quality of the consultants and the contractors in Malaysia. As a result they will also have an opportunity to compete foreign companies in international projects.

◆ Frequent Training and Seminars

It is evident from the KLIA experience that training can constructively make a rapid change in the direction of the quality system. Thus the developers in the public and private sectors should play their role to promote training to the project managers, the consultants and the contractors. For example, the developers can request them to attend a QMS seminar or having a QMS certification before they can participate in their projects. This will encourage the consultants, the project manager and the contractors to implement QMS in their organisation.

◆ Increase Frequency of quality Audit

To ensure the smooth run of the implementation of the QMS, auditing has to be carried out frequently. Inconsistency in auditing will lead to poor control over the performance and quality of the work, resulting in failure to accomplish the work in time and up to the specification.

◆ Incentives

Incentives, either in a monetary form or otherwise by job guarantees and forms of appreciation should be adopted for the construction team to successfully perform the work in accordance with the QMS requirements. This will encourage them to continuously implement the QMS. All benefits that the company gains during the implementation of the QMS should be publicised to dispel the fear and misunderstanding of other companies on the implementation of the QMS. ■

One Day National Seminar on INDUSTRIALISED BUILDING SYSTEMS

“Towards an open building system”

TUESDAY 26 SEPTEMBER, 2000

0800 – 1730 HRS

OFFICIAL ADDRESS BY

Y.B. Dato' Seri S. Samy Vellu
Minister of Works

Jointly organised by the Housing Research Centre (HRC), UPM and CIDB Steering Committee on Industrialised Building System, the seminar shall provide an opportunity for participants to listen to the various presentations on building systems in Malaysia. By bringing together all parties involved in the building industry, we hope to share experiences amongst individuals and organisations in an effort to develop a synergy that will further develop the Malaysian building industry.

It is hoped that deliberations in the seminar shall encourage the use of *Modular Coordination* as well as *the Open Building System*, which is currently being promoted by the CIDB Steering Committee on Industrialised Building Systems. The Steering Committee has developed a Strategic Plan for Implementation of IBS in Malaysia and has proposed the amendment of the UBBL to include the use of modular coordination in the building industry.

Objectives

- To discuss the latest developments in IBS.
- To provide exposure to university & industry collaboration.
- To develop network between researchers and industry leaders.
- To enhance the use of *Modular Coordination & Open Building System* in the building industry

Who Should Attend

Architects, Engineers, Developers, Contractors, Academics & Researchers, Federal & State Housing Agencies, SEDCs, Local Authorities and System Builders.

Registration

Fees for the registration:

- RM350 per delegate/speaker/exhibitor
- RM300 for each delegate in a group of 3 person or more.

Cancellation of registration in 7 days prior to the event is subject to a RM100 service charge. No refund of fees shall be claimed if less than 7 days prior to event. Substitution of delegates may be made at no extra cost.

For further information please contact:

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construction process; and greater reliance on imported building technologies and materials.

To respond to this challenge, planners, architects, engineers, contractors and clients will need to renew, design, construct and maintain the built environment in harmony with natural and cultural environment and in ways that conserve energy and resources. This will require a fundamental relook in the way in which buildings are designed and produced.

Unlike the traditional approach, the building design at earlier stage of the project should acknowledge the four major resources, viz. land, energy, water and materials. Efficient use of land is vital in Malaysia where population density is high and mainly confined to urban areas. Design for efficient land use requires the building to be multi-functional, flexible and adaptable, better in life cycle performance and suitable to the local environment. Greater use of existing buildings (after being refurbished) is another option, which seeks sustainable design standards for the conversion of non-functioning buildings.

Suitable energy saving technologies have to be adopted, which

will require new designs of roof, façade and foundations and passive heating/cooling systems. Renewable energy sources should be developed and integrated into the design. Buildings in Malaysia should as much as possible refrain from air conditioning.

Materials technology is another domain, which needs to be integrated with the design. Durable building materials of non-toxic nature, light weight, climatic control and recyclable should be identified indigenously and incorporated into the building system. In conjunction with materials technology, buildings should be designed for disassembly; especially in the case of short lived components the concept of disassembly is key to sustainability.

The key sustainable issues to be considered during the construction phase include restructuring of the working relationship between parties, improved site logistics, new project life cycle that incorporates the concept of 'construction for disassembly' and quality standards for sustainable buildings. Increased partnership between parties including designers, contractors and manufacturers enables integrated sustainable approach a reality by having input from all relevant sources. Consequently, appropriate

contractual arrangements have to be adopted. Construction should also incorporate energy saving site operations and refurbishment techniques. In addition, blasting to create building sites should be strictly prohibited.

To conclude, sustainability undoubtedly seeks change, which means right from the conception to the commission of a building project every issue will have to be assessed and evaluated for sustainability. This calls for a paradigm shift of the construction industry from its traditional notion of 'commercialisation' towards adapting to the new and emerging construction markets which have environmental and social dimensions.

Of course, science and technology should be perceived as a means of fulfilling the demands of the humankind such that present fulfillments will not conflict with the ability of future generations to meet their own demands. If sustainability is to be achieved in construction, all relevant parties including technocrats, authorities, politicians and the society should coherently face the challenge with greater interactions and cooperation amongst them. ■

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- b. Steel fabrics
- c. Steel wire, wire ropes
- d. Steel pipes and fittings
- e. Ductile and cast iron pipes and fittings
- f. Conveyor chain
- g. Manhole cover and frame
- h. Ceiling suspension system
- i. Access raised floor system
- j. Road studs and etc
- k. Bolts and nuts

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- b. Cement testing
- c. Fresh concrete mixing and testing
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 - Strength and density
 - Drying shrinkage
- e. Fresh grout mixing and testing
- f. Mortar mixing and testing
- g. Concrete product testing
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 - Paving block
 - Concrete pole, pipe, pile, box culvert and manhole
- h. Concrete panel
- i. Scaffolding
- j. Tile adhesive

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- c. Roofing
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