HOUSING and CONSTRUCTION news

ISSN : 1511-497X
January - March 2002
Volume 4 / Issue 1

NEWS MAGAZINE OF THE HOUSING RESEARCH CENTRE, UNIVERSITI PUTRA MALAYSIA

inside this issue



## Editorial

Dear Reader,

It gives me great pleasure in presenting to you the current issue of the 'Housing and Construction' Newsletter which is totally dedicated to 'Affordable Quality Housing' (AQH). The Newsletter contains articles from eminent academics of the premier universities of the country dealing with various concerns related to AQH. A few of them have even dared to suggest strategies and the modi operandi for achieving the objectives of AQH. I leave it to the readers to take advantage of these views to revive and modernize the construction industry.

Our next issue shall be related to R&D in Construction. We invite you to contribute any significant view you wish to share with fellow readers.

On behalf of the HRC family, I wish our readers a very happy and prosperous New Year. We welcome your views and appreciate your interest in this publication.

Prof. Dr. D.N. Trikha

# AFFORDABLE QUALITY HOUSING

## A National Research Initiative

**Abang Abdullah Abang Ali**
Director, Housing Research Centre, Universiti Putra Malaysia

The quest for better housing for the masses should look beyond providing a roof over the head for the country's low-income group. It should not be limited to providing adequate number of dwelling units at the government's ceiling prices for low cost houses. For this 21st Century at least, we should be looking at providing affordable and a better living environment for the country's growing population. The vision should be to acquire innovative ideas and technologies to facilitate the development of affordable quality housing for sustainable human settlements in the country for this century and beyond.

*continued on next page*



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Affordable quality housing involves providing appropriate housing for the different income groups in the country; at the correct cost of ownership as well as at a certain respectable level of housing quality, especially for the low income group. Much has been said regarding poor workmanship, inappropriate designs leading to poor household comfort, lack of green and recreation spaces and delays in housing delivery. There is thus a need to balance between our needs for housing, recreation, business and industry and develop human settlements that are conducive to the healthy growth of our society. Affordability and quality is thus not limited to house prices and building quality or finishing per se. It covers the entire gamut of the acquiring process: cost, use and maintenance of the housing units in communal neighborhoods.

Unlike most technical products which can be designed and manufactured based on a limited number of parameters, the development of affordable quality housing involves a myriad of issues and factors ranging from social, financial, legal and planning aspects to design, construction and maintenance. Any effort to tackle the problem of providing affordable quality housing in the country must take into account all these aspects, in an effort to provide an integrated solution. The ultimate cost and quality of the house to the buyer is affected by many factors. Development cost is affected by the bureaucracy arising from the numerous legislation administered independently by federal, state and local government agencies. It is affected by the builders' use of building technology and approach to construction, holding costs as well as site location. Housing quality is affected by the thinking and practice of our planners and designers as much as it is affected by poor workmanship. Local social norms, indoor air quality, day lighting and thermal comfort for example are important factors in the design of quality housing. Design standards based on practice overseas especially for different social practices and climate may not necessarily be suitable for our country. There is thus a need to study all these factors in order to develop a more modern, appropriate and integrated approach to housing development in the country.

Unlike most technical products which can be designed and manufactured based on a limited number of parameters, the development of affordable quality housing involves a myriad of issues and factors ranging from social, financial, legal and planning aspects to design, construction and maintenance. Any effort to tackle the problem of providing affordable quality housing in the country must take into account all these aspects, in an effort to provide an integrated solution.

To spearhead research and development activities in this important national issue, a National Research Programme on Affordable Quality Housing was initially mooted as a top-down research programme in the 7th Malaysia Plan by MIGHT Interest Group in Housing & Construction, under the Prime Minister's Department. A research programme proposal was prepared and proposed by the Housing Research Centre (HRC), Universiti Putra Malaysia in collaboration with the Ministry of Housing and Local Government and this proposal was recently supported by MPKSN, Ministry of Science, Technology and Environment for about RM26 million funding; RM24 million from the Ministry of Science, Technology and Environment to be allocated for technology related projects and RM2 million from CIDB for work on legal and financial aspects. A research institute is being proposed to help administer and manage the research programme. A research advisory committee chaired by the Secretary General of the Ministry of Housing and Local Government shall guide the research programme.

The National Research Programme on Affordable Quality Housing which involves some thirteen projects to be carried out by researchers from UPM, UTM, USM, UIA, UM,UKM, UiTM and SIRIM aims to study the various aspects involved in the development of affordable quality housing in the country. Key researchers from USM shall study the planning aspects while those from UTM, UIA, UPM shall concentrate on architectural and indoor environment. The technical and engineering aspects which include structural, construction, foundation, infrastructure, fire safety, IT and standardisation shall be studied by researchers from UPM, UKM, UTM, UM and SIRIM, while the social, legal and financial aspect shall be the responsibility of those from UTM and UPM.

At the end of the five-year national research programme, it is expected that new and innovative ideas and technologies on affordable quality housing will be generated, developed and commercialised for use by the housing and construction industry in the country. Design standards and codes of practice for the planning, design and construction of affordable quality housing shall be proposed. A Malaysian Information Centre and a Show Village on Affordable Quality Housing shall be established at the end of the research programme in an effort to disseminate information and turn Malaysia into a centre of excellence in affordable quality housing.

# National Research Programme on Affordable Quality Housing (AQH) – Financial Regime

Zaiton Ali
Housing Research Centre, Universiti Putra Malaysia

Housing is an important agenda to a nation and the government plays greater role in providing this basic need to the people. In United Kingdom, the housing market is viewed as the market leader in the UK economic cycle. Hutchison (1994) stated that ".. a buoyant housing market injects optimism into the economy, leading to increased consumer spending". In Malaysia, housing has been on the national agenda in policies and programmes initiated since the Second Malaysian Plan (1961-1965). The concept of 'home-owning' democracy rather than provision to government officials has been the cornerstone of the national policies. At present, the Eight Malaysian Plan (2001-2005) fixes a target of a total 615,000 units, where 61.6 percent is targeted for the lower to middle income earners. The Government's policy aim is to provide adequate affordable quality housing for the people to upgrade their quality of life. To achieve this aim, many challenges and problems will be faced; and one of them is the financial factor.

There are many issues related to the financial factor that will be encountered by the government. These include financial-outlay, source of financing for the purchasers, and subsidies, taxes and incentives to be given to the general public and the private sectors. Following this, the research on the financial regime attempts to investigate the financial issues from the government, general public and the private sectors perspectives.

The financial issues identified in the development of AQH are as follows:

- Financial out-lay in providing AQH, especially faced by the government whose involvement is greater for the low cost housing development. Before determining the financial out-lay, market analysis should be carried out to identify the demand and supply aspects for AQH units.
- The introduction of Industrialized Building Systems (IBS) is identified as a mean to minimize the construction costs through its speed delivery system. Comparison on the development costs offered by the conventional and traditional approaches should be done. This will further determine the housing price and the current ceiling price for the low cost housing may be reviewed.
- Issue on "affordability" by the purchasers. Previous study shown that one third of the salary is used to pay the loan payment (Nor'Aini 1994). However, this generalization may be difficult for some households due to their family sizes, types of employments and other expenses that differ form one household to another. The affordability of the public (potential purchasers) should be reviewed.
- The financial supports through loans payment provided by the public agencies and bankers should also be reviewed. For instance, the interest rate of borrowing which has becomes a burden to the purchasers. Thus, alternative financing such as subsidized mortgages should be identified to cater the targeted group.
- Policies, incentives, subsidies and taxes offers by the government relating financial regime on the construction industry should be reviewed and identified. For example, the incentives for capital investment in automation in production, erection and assembly for building materials will encourage the private sector to participate in the AQH development.

The above issues will be the main thrusts for the financial regime research in the National Research Programme on AQH. It is expected that the outcomes will benefit the players involve in the housing industry particularly the public sector, who acts as the policy makers and enhancer for the national housing development.

# Thermally Comfortable Indoors:

## A Solution towards Quality Affordable Housing

Noor Hanita Abdul Majid
Kulliyyah of Architecture & Environmental Design, International Islamic University of Malaysia

Various programmes and research have been undertaken to address to the issues of affordable housing. The Malaysia Development Plan since the Second Five Year Plan: 1961-1965 has continuously dealt on the issues of housing especially targeted to housing people from the low-income group. Currently, the Eighth Malaysian Plan: 2001-2005 emphasised on providing adequate affordable quality housing for the people to upgrade their quality of life.

In the context of indoor environment, affordable housing should be viewed in the capacity of the houses to be thermally comfortable with appropriate daylighting levels. These comfort criteria should be met without undue dependence to energy consuming devices. Air conditioning units, fan, lights and other like equipment add to the running cost in energy. Reduction in energy use in turn will contribute to sustainable environment.

### Thermally Comfortable Indoors

The indoor environments of houses are affected by diverse factors. External factors such as orientation, sun location and air velocity can influence the level of thermal comfort indoors. Orientation and sun location have an effect on the air temperature indoors, while ventilation depended on the building orientation and air velocity.

The climatic condition of Malaysia is characterised by warm and humid conditions. Air temperatures are high around 22 C to 34 C with relative humidity of 55%-99%. The wind flow is generally very calm that results into problems in natural ventilation. Natural ventilation is however essential to promote thermally comfortable indoors. It facilitate airexchange and remove trapped heat inside the houses.

Considerable research and information are available on issues related to indoor environment in the hot humid climate. Studies on thermal comfort and ventilation were conducted to evaluate the conditions of the indoor environment (Abdul Majid, 1997; Abdul Razak, ; Hui, 1998). The researches suggested that it is possible to create thermally comfortable indoors for most part of the day if proper considerations are given to the building design and internal layout of the houses.

### Scenario for the future

The necessity remains to further investigate on issues of the indoor environment. R & D should be carried out on new available resources and ideas in producing innovative concepts and designs. The overall aim is to obtain and provide reasonable thermally comfortable houses with minimal energy usage and additional mechanical means.

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3. Abdul Razak Sapian

# Legal Issues in Affordable Quality Housing in Malaysia

**Assoc. Prof. Dr. Maziah Ismail**
Universiti Teknologi Malaysia

The houses people live in say much about them, about their life-styles and dreams. If we are to design housing to fulfill people's needs – and dreams – we must find out what they want and do not want, and such information must be readily available to designers of future housing and their clients.

Long before people built houses, they had already evolved ways of living together that reflected their needs, values and beliefs. When they began to build shelters and dwellings, these ways were unselfconsciously incorporated into the fabrics they constructed. Materials were what was readily at hand; construction techniques were commensurate with the builders' skills. Form, layout, and decoration reflected what the residents deemed important (Alexander, 1979; Rapport, 1969). Buildings reflected culture; if it were not so, archeology and social history of architecture would have no meaning. Since the post-war period and the massive movement of rural folk into cities, however, a large proportion of the population has had its homes built by strangers – speculative builders or developers, housing authorities, building contractors, architects, and engineers.

There is nothing inherently wrong with this; many activities that we used to do for ourselves, such as growing food and making clothes, are now done for us. Because specialists perform these tasks, we gain free time to gain other pursuits. And despite persuasive arguments to the contrary (Alexander, 1977, 1979), most people do not want to build their own homes. The majority wants a ready-made dwelling, as long as it fulfills the functional and symbolic needs of "home".

However, attainment of acceptable levels of quality in the housing industry has long been a problem. Great expenditures of time, money and resources, both human and material, are wasted each year because of inefficient or nonexistent quality management procedures.

## CHARACTERISTICS OF QUALITY IN HOUSING

In housing, quality can be defined as meeting the requirements of the designer, builder, and regulatory agencies as well as the owner. Requirements may be stated in legal, aesthetic, and functional terms. According to Arditi and Gunaydin (1996), quality in housing can be characterized as follows:

- Meeting the requirements of the owner as to functional adequacy; completion on time, affordable and within budget, life-cycle costs; and operation and maintenance.
- Meeting the requirements of the design professional as to provision of well defined scope of work; budget to assemble and use a qualified, trained and experience staff; budget to obtain adequate field information prior to design; provisions for timely decisions by owner and design professional; and contract to perform necessary work at a fair fee with adequate time allowance.
- Meeting the requirements of the builder as to provision of contract plans, specifications, and other documents prepared in sufficient detail to permit the builder to prepare price proposal or competitive bid; timely decisions by the owner and design professional on authorization and processing of change orders; fair and timely interpretation of contract requirements from field design and inspection staff; and contract for performance of work on a reasonable schedule which permits a reasonable profit.
- Meeting the requirements of regulatory agencies (the public) as to public safety and health; environmental considerations; protection of public property including utilities; and conformance with applicable laws, regulations, codes and policies.

## LEGAL ISSUES IN THE HOUSING SECTOR

In Malaysia, although rapid economic development is a prerequisite to create greater opportunities for improving the quality of life, the provision of adequate and affordable quality housing is another important aspect in enhancing the quality of life.

Therefore, in the Eighth Malaysia Plan period, housing development programmes will continue to give emphasis to the provision of adequate, affordable and quality housing for all Malaysians, particularly the medium and low-income group. Towards this end, the Government will provide the necessary support and regulatory measures to ensure the efficient development of the housing industry. A major development in the Plan period will be the substantial provision of low and medium-cost houses costing between RM26,000 to RM60,000 per unit. This will enable buyers with monthly incomes ranging from RM751 to RM1,500 per month to purchase quality houses within their affordability.

To date, the process of housing provision is regulated by at least 40 related laws and regulations. Despite this fact, however, it appears that they are not properly integrated and there are still many issues not resolved. Malpezzi and Mayo (1997) revealed that a wide range of the government intervention through regulations covering such things as right of way, land for community facilities, setbacks and back alley requirements, had raised cost by 30 percent on average and also skewed profitability towards the high end of the market. This analysis demonstrated that the costs of regulatory and pricing restrictions far outweighed the benefits of subsidies and regulatory exemptions. It is also argued that an important explanation for the poor quality but high house prices in Malaysia is the policy environment in which the developers must function. The most serious problem in the implementation of rules and regulations included lack of demand due to inappropriate pricing, poor choice of locations and designs by developers, and administrative constraints. The administrative constraints hampering programme implementation reflected the problems posed by the Government's normal housing regulations and procedures which result in lengthy delays and high cost for developers. Implementation was also hampered by the reluctance of local planning authorities to approve plans consistent with acceptable new, lower infrastructure standards included in the programme. The issue of strata title is also a common problem surrounding high-rise multi-residential dwellings units. In addition, enforcement of the regulations as well as policies is not standardized and lack consistency between various government agencies.

The most serious problem in the implementation of rules and regulations included lack of demand due to inappropriate pricing, poor choice of locations and designs by developers, and administrative constraints.

## CONCLUSION

One lesson we can draw here is that implementation of the rules and regulation results in a conflict between government intervention with the market expectations and perceptions. Furthermore, problems pertaining to legal issues in housing are considered as secondary and so lack priority. This explains the problem of under-research on legal issues in the housing sector. As a result, currently, the housing sector continuously experienced a glut with over RM10 billion worth of housing units not sold. There is an imbalance between demand and supply of housing units in the market.

A number of questions arise. One, what factors contribute to this problem of poor take-up rate when studies illustrate that there is still high demand for housing units particularly for the medium and low-cost units? Two, how can the legal mechanism help match the level of demand and supply in the housing market? Most importantly, three, how can it help in the process of providing affordable quality housing in Malaysia, as defined by Arditi and Gunaydin (1996)?

It is therefore evident that the problem on housing is very complex and involved the total spectrum of housing and human settlement issues, ranging from research on socioeconomic, legal and political aspects to research and development on building materials and designs. Research on affordable quality housing therefore, requires multi-disciplinary or inter-disciplinary approaches involving interactions between architects, planners, engineers, surveyors, policy makers, contractors and social scientists. Findings from such multi-disciplinary research will then provide the basis to design and build affordable quality housing in order to fulfill the needs, wants as well as dreams of housing purchasers in Malaysia.

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# Indoor Air Quality and Housing

**Nor Mariah Adam**
Housing Research Centre, Faculty of Engineering, UPM

Indoor air quality (IAQ) refers to the quality of air inside a building where a person occupies, work or live in. IAQ can be a problem when there is inadequate fresh air supply, presence of odour, moulds, pollutants (volatile organic compounds, particulates, moisture, smoke) and presence of environmental stressors such as noise. Figure 1 shows a schematic of sources of indoor air pollution (Burberry, 1997). For thermal comfort, the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) recommend an indoor temperature of 24 – 27 o C; relative humidity of 30 – 70 % and air-exchange rate of 0.5 – 3 per hour for naturally-ventilated spaces. The World Health Organization recommends a minimum of 0.25 m/s air velocity at all places with maximum permissible level of 9 ppm (parts per million) for carbon monoxide indoor and 18ppm on the street (outdoor); with oxygen content of 20.9 % by volume for indoor and outdoor.

Indoor air pollution can be controlled by removing the source of pollution, provide local air extract at pollution sources, provide general ventilation to dilute and remove pollution by use of extract or ventilation fans, purification of indoor air by using air ionisers. Masking by means of acceptable scents cannot be recommended as a method of solution for improving IAQ situation.

Why IAQ? We spent 90 % of our lives indoors (at work, shopping, sleeping etc.). A home is one's castle and any unbearable odours; uncomfortable environment may cause misery to the occupants. Besides, known diseases attributed by poor indoor air quality is sick building syndrome; building related diseases e.g. poor sanitation, infestations; asthma and multiple chemical sensitivity may render physical, financial and emotional sufferings to occupants.

Though proper design of building layout, i.e. location, number and size of openings; selection of suitable building materials; and optimal design of building services can create a good indoor environment for its occupants.

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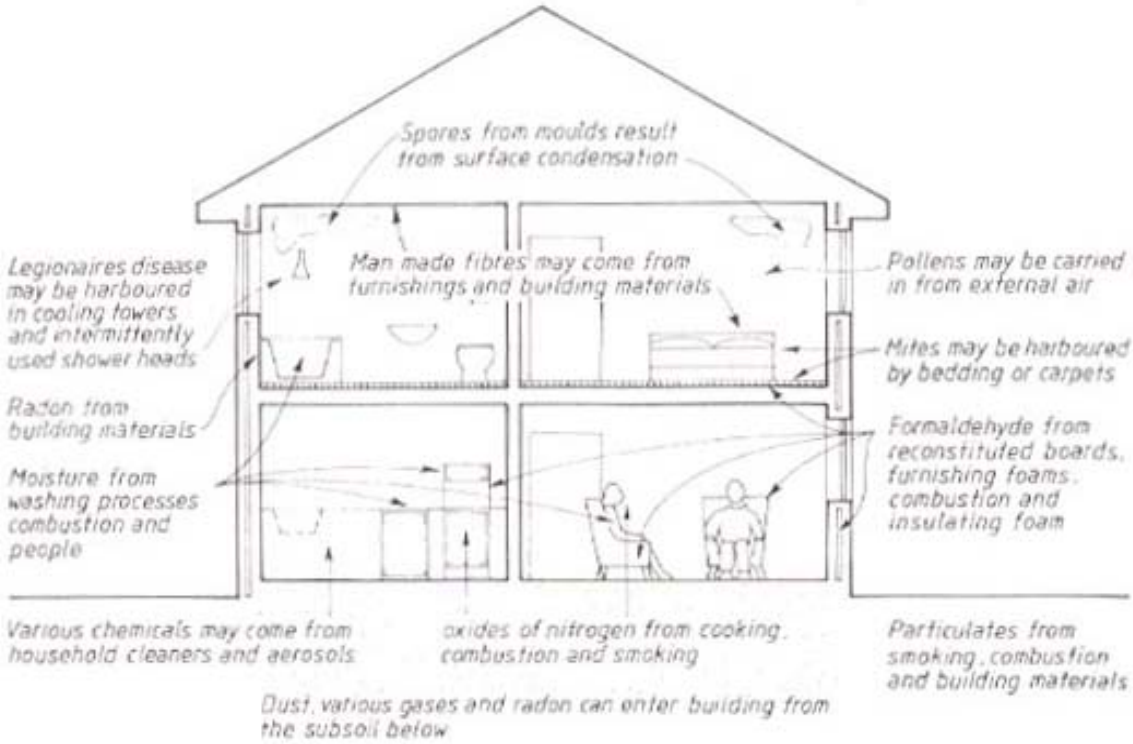


*3.11 Sources of internal air pollution*

# State-of -the-Art Review on Fire Safety for Quality Housing

Siti H. Topsir[1] • Nor M. Adom[2]

An increase in the incidents of fire in housing that result in fatality has become a disturbing trend in this country. These incidents could have been avoided with proper building planning that includes effective means of escape, reduction of fire spread and reduction of fire outbreak.

However, with the 11th September 2001 structural collapse of the World Trade Centre, engineers will have to re-evaluate building performance during fires especially tall building designs. The collapse of the 110-storey steel towers should be the beginning of an evolution of fire engineering in modern tall buildings. Concrete building is not spared as Brazil had experienced the collapse of the 21-storey reinforced concrete building in 1987.

Continuous use of new building materials is a major concern in providing sufficient fire resistance and egress time for the occupants. Statistics of fire incidents reported that the most common known cause of fatality is inhalation of smokes. Fire resistance requirements in buildings in local by-laws has been based on perceptive based and it is about time performance based fire engineering be included in the local by-laws as new emerging construction materials are developed on perceptive based and it is about time performance based fire engineering be included in the local by-laws.

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# Innovations in Materials and Prefab Elements Define AQH

**Prof Dr. D.N. Trikha**
Universiti Putra Malaysia

Civil construction is estimated to constitute about 55% of the delivery cost of a housing unit and thus defines to a large extent the affordability of the built-up houses for the target groups. The two easy options, viz. reduce costs by lowering standards and specifications and employ cheap foreign labour, need to be immediately discarded, as the former result in increased maintenance costs, faster deterioration, shorter life and increased frequency of replacement of eventually inhabitable houses, while the latter is neither socially welcome nor conducive to adoption of industrialised building systems (IBS). As experienced in developed countries after 2nd world war, quality construction, despite labour shortage, is achievable through IBS and prefabrication.

The country has tried to encourage adoption of foreign IBS but with little success. This is probably because of lack necessary infrastructure and technical back-up. There is also a growing realization of the importance of sustainable development so as to preserve the fast depleting natural resources. It is also being emphasized that indoor environment can be improved without expending mechanical energy through most of the year. Any strategy for AQH thus requires development of innovative materials, building elements and structural systems to enhance quality of construction as regards durability, strength, fire resistance and indoor environment efficiently and economically.

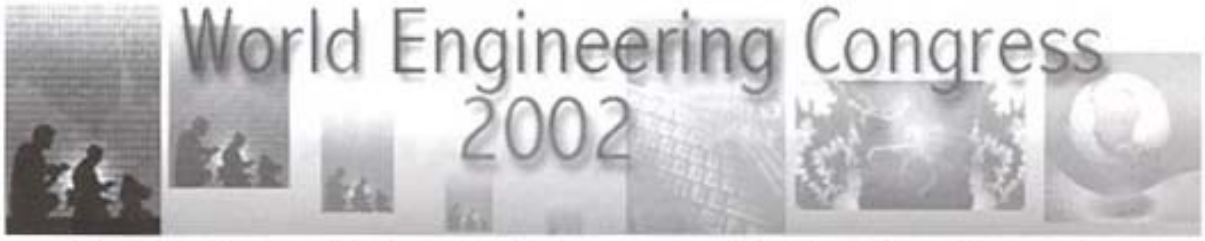
At the Housing Research Centre, considerable success has been achieved in developing innovative materials and elements to achieve quality construction at affordable costs. Interlocking concrete

hollow blocks (Putra Blocks) have been developed which permit mortarless construction thus ensuring faster construction with minimal labour. The hollows in the blocks tend to lower indoor temperatures. There is a saving of material as well. Further research is envisaged to build these blocks in light weight concretes using industrial wastes sothat larger sized blocks can be precast reducing further labour requirement and the joints.

Another building element, ready for commercial exploitation , is a precast concrete sandwich panel (PCSP) which has been extensively investigated for strength for use in wall or floor construction. The intermediate sandwich polystyrene layer provides the necessary insulation to lower indoor temperatures. Further studies on optimizing the polystyrene layer for desired thermal effects are being pursued.

It is, however, necessary to point out that considerable R&D effort still needs to be made to develop indigenous IBS. There is need for development of recycled materials and substitute materials for timber and sand. Innovative element configurations are needed to be evolved for durability and thermal comfort. Equipment and machinery for automation in manufacture and assembly needs to be locally developed. Structural systems appropriate for different storey construction and regions utilizing new materials and elements and the local equipment and machinery need to be established. Considerable research effort is still needed on studies to improve indoor air quality and temperatures through suitable insulations or building materials. National standards on AQH have to be prepared to ensure uniformity and quality in construction.

The government is keen to support both basic and applied research and has earmarked enough funds for R&D through its IRPA programmes. It is for us, the academics, to grasp the opportunities and to meet the challenges.




# ENGINEERING INNOVATION AND SUSTAINABILITY: GLOBAL CHALLENGES AND ISSUES

**22nd - 25th July 2002, Kuching, Sarawak, MALAYSIA**

## *CALL FOR PAPERS CALL FOR PAPERS CALL FOR PAPERS*

**Theme and Objective:** The World Engineering Congress was originally proposed after the Institution of Engineer's Malaysia (IEM) study on the formation of engineers in Malaysia in 1999. The present Congress is the second Congress. The first Congress was held in 1999 and was attended by more than 500 participants from all over the world with more then 400 technical papers presented.

The theme of this congress *WEC2002*, is '*Engineering Innovation and Sustainability: Global Challenges and Issues*'. WEC2002 is to provide an avenue for deliberations on key issues on new and innovative areas of engineering for technological progress. Equally important is the issue of sustainability, which can be defined as a process of change in which the orientation of technology and the allocation of resources which is needed to meet the present needs and aspiration of mankind. WEC2002 is also meant to provide a forum for discussion on appropriate and innovative technology for development, particularly for the developing countries, meeting the need to help eradicate poverty, and bridging the technological gap between the developed and developing world. This congress shall therefore provide a good opportunity for a gathering and sharing of experiences amongst an international community of engineers and other professionals in related fields, academics, researchers, scientists as well as policy makers interested in addressing issues related to the theme of the congress. The congress is organised into eight (8) technical sessions and papers are invited under the followings disciplines:

- **Biological, Agricultural and Food Engineering**
- **Chemical and Environmental Engineering**
- **Civil and Structural Engineering**
- **Information Communication Technology**
- **Electrical and Electronic Engineering**
- **Engineering Education, Training and Policy**
- **Manufacturing Engineering, Automation and Robotics**
- **Mechanical and Aerospace Engineering**

INVITED SPEAKERS:

Renowned international experts will be invited to deliver keynote and special lectures related to the theme of the congress. They include Prof. J. Allen (Manchester), Prof. J.J.O'Connor (Oxford), Prof. M. Gregory (Cambridge), Prof. S. Pallegrino (Cambridge), Prof. M.H.Rashid (Florida), Prof. A. Karaali (Istanbul), Prof. C.Christopoulos (Nottingham) and Prof. J.N.Reddy (Texas A&M).

KEY DATES:

- **Dateline (Extended) for submitting abstract** (about 300 words)
  **30th June 2001**
- **Notification of provisional acceptance**
  **30th August 2001**
- **Dateline for submitting camera-ready manuscript**
  **29th December 2001**

EXHIBITION:

There will be a concurrent exhibition at the conference venue. For more details please liase with Ir. Peter Chong Chung Ping at Tel: 082 – 428506 Email: iemsb@po.jaring.my

For General Information and Enquiries, Please contact :

**Secretary of the Organising Committee**
(A/Prof. Dr. Bujang Bin Kim Huat)
**c/o Faculty of Engineering**
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19 – 21 February 2002 • 3-Day **Specialist Course on Bridge**
at Mines Beach Resort & Spa, Seri Kembangan, Selangor Darul Ehsan.

# BRIDGE

## ASSESSMENT AND REHABILITATION

### *Highlight of the course:*

- Overview of the structural behaviour of different bridge types
- The critical stress-resultants for structural cracking
- The latest non-destructive techniques for possible causes
- A computer algorithm to assess the bridge condition
- Proven methods of repairs and strengthening and
- Discussion of two recent case studies of bridge assessment and rehabilitation in Malaysia

**Registration Fee:**

- Early Registration
  (before 15 January 2002)

  **RM750.00**

- Registration
  (16 January onwards)
  **RM950.00**

**For further information, kindly contact:**
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13 April 2001

## Celebration & Farewell Lunch

To celebrate the Putra Block research team winning a Gold Medal Award at the 29th International Exhibition of Invention – New Techniques and Products, held on 4-8 April 2001 in Geneva, Switzerland, a lunch was held at the Faculty. At the lunch, members of HRC also bid farewell to its esteemed member, Dr. Mahgoub Osman Mahgoub, who was returning to his home country, Sudan. The Dean of the Faculty of Engineering also attended the lunch.

17 September 2001

## Seminar IBS 2001

HRC has successfully organised another national seminar on Industrialised Building Systems 2001 on 17 September 2001 at the Putra World Trade Centre, Kuala Lumpur.

The seminar was organised in conjunction with CIDB's International Construction Week (ICW2001) and officiated by Datuk Seri S. Samy Vellu, Minister of Works, Malaysia. The seminar also saw the launch of the 'Manual for Assessment for Industrialised Building System'.

About 150 participants from various government agencies and private firms attended the seminar.

### Congratulations!

HRC wishes to congratulate its member, Assoc. Prof. Ir. Dr. Mohd Salleh Jaafar on his promotion to Associate Professor. We are very happy for you.