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Keynote Papers

Professionalism and Construction in Developing Countries
George Ofori; National University of Singapore, Singapore

The construction industries in developing countries have inherited the structure of the professions in the former colonial countries. What is the current state of professionalism in the construction industries in developing countries? Who or what determines ‘professionals’? How appropriate is this framework for recognition, registration or accreditation? What are the merits of a “good level of professionalism” in the construction industry, especially in the poorer countries? Are there any dangers if the professions fail to meet this (albeit qualitative) benchmark?

Several questions other questions are addressed. What is professionalism? What does professionalism mean in construction? The usual interpretation of the word relates to the issue of ethics. The reality is much wider than that. However, in construction, the subject has not been much explored. Works on professionalism in the social sciences literature, and in other fields of endeavor, such as medicine and pharmacy are reviewed to show the nature of professionalism. It is also shown that professionalism is very important in the construction industry and the construction process owing to the nature of the task, the context in which it is undertaken, and the actors involved. At the minimum, there is the possibility of danger to public health and safety. Moreover, it is established that professionalism is critical in construction in the developing countries. How have the professions in the developing countries kept up with the pace of development of the professions elsewhere? What can they learn from what happens elsewhere? What can be done to develop professionalism in the construction industries in developing countries? For example, many developing countries, such as Rwanda, Uganda and Kenya, have recently formulated plans for enhancing the performance of their construction industries. What is the coverage of the professions in these industry development plans? Finally, this question is addressed: what is the scope for international co-operation?

Affordable Housing and Their Challenges in Urbanization
Mahyuddin Ramli; Universiti Sains Malaysia, Malaysia

The root of many problems in developed and developing countries is a shortage of adequate supply of affordable housing scheme for the general public. The shortage of housing schemes also leads to escalating of property prices, creating problems in the supply of affordable housing. This is the reason that housing for general public is one of dominant factor in the welfare state and has become the responsibility of any governing authorities that the general public relies on. Hence, it is essential for the governing authorities of developing nations to scrutinize the current state of achievements and housing policies of other developed countries as the initiative towards formulating a sustainable and affordable housing policy. However, the concern is that local housing policy can only be a part of the overall formulation of solution towards provision of affordable housing in areas with rapid rate of urbanisation. Another major aspect which requires consideration towards the development of more affordable housing is the implementation of cost effective construction method, technology and materials in the housing development industry. With that, the implementation of emerging construction technology and material such as ferrocement composite, high performance concrete and engineered cementitious composites for development of affordable houses is always sought after.

Session 1: Planning and Management
10:45 – 12:15, Tuesday 4 December 2012, BJ3-52
Chair: Dr Sadasivam Karuppannan

Settlement, Access and Regional Land Use Outcomes for Post-Tsunami Housing Reconstruction: A Case Study of the Trincomalee Region, Sri Lanka
Rangajeewa Ratanyake, Andrew Butt, Tracy de Cotta; La Trobe University, Australia

The Indian Ocean tsunami of December 2004 resulted in over 35,000 deaths and damage to almost 100,000 houses in coastal Sri Lanka. In the aftermath a significant program of international aid resulted in the reconstruction of over 65,000 housing units — some work is ongoing. The priorities for reconstruction focussed on the immediacy of the post-disaster recovery process, and this has been subject to criticism in relation to the quality and suitability of re-building and of newly built housing and the regional priorities for development funding. Less consideration has been given to the longer-term consequences of the settlement systems that have been created — specifically the creation of small settlement clusters that are distant to employment and services, which in some instances have proved unpopular for these reasons. This paper provides analysis of the established housing projects in the tsunami-affected and post-conflict Trincomalee region on Sri Lanka’s east coast and considers the role of spatial planning in housing reconstruction projects in this region. Locational disadvantage has resulted in many instances as distance to employment and services has increased for many tsunami-affected households and broader spatial planning objectives do not appear to have been adopted.

Urbanisation and Housing for the Urban Poor: Delhi, India
Alpana Sivam; University of South Australia, Australia

Urbanisation is a major global trend, with over half of the world’s population living in urban areas. It is expected that this global urbanisation level will rise to 40% by 2050. Developing countries will face the highest urbanisation rates, whereas the population of the developed world will be likely to remain relatively unchanged for the next two decades. Urbanisation in developing countries will mostly occur in large cities, with many of these cities within Asia. In India especially, high urbanisation rates will occur in both large and medium sized cities.

This situation raises questions regarding how cities will be able to provide housing for the urban poor. Currently, housing for these communities in the majority of cities in developing countries, is provided by the informal sector, in the form of squatter settlements and squatters. The aim of this paper is to identify policy responses to the provision of housing in India and identify ways to improve the provision of quality housing for the urban poor. A desktop methodology has been adopted in order undertake this study. This study concluded that current method of informal housing is not the answer to accommodate the growing urban poor population in Delhi. If government will not seek for alternatives, Delhi’s street dweller population will increase. However, informal housing approaches adopted by other countries is not easily transferable without a viability and applicability check of the approach in Delhi context.

Creating a Gentlemen’s City in Colonial Zimbabwe: Implications for Sustainable Housing Delivery in Post Colonial Zimbabwe
Lovemore Chipungu; University of KwaZulu-Natal, South Africa

The colonial dispensation in Zimbabwe was a protracted mission which was not only driven by capitalist interests, but also by ideological intentions that redefined social and physical relationships within, between and among different social groupings. Through the ideological tool of white supremacy, laws were crafted that legalized and protected the acquisition of resources by the minority settlers. In the ensuing process of capital formation, land emerged as one of the most contested resource as it was acquired to meet capitalist demands through mining, agriculture, urban development and speculation. The conflict
that ideologically defined social relations also find expression in physical space as new towns sprouted that became centres of production for both labour and capital. While labour remained subservient to the dictates of capital and ideology, space was redesigned in a bid to create a gentleman’s city. From a housing perspective, the city so created was characterized by high housing standards — a factor that prompted O’Connor to label similar cities that emerged during this epoch as ‘European Cities’. Harare, like many other of the same era, emerged as a city closed to the indigenous people but only accessible to those that were prepared to sell their labour in return for a residential permit. Even for them, freedom within the city was curtailed by strict adherence to municipal laws. Thus the gentleman’s city emerged with large bungalows, open spaces, efficient infrastructure and tied housing function as the dominant service. But the impacts of such exclusionary policies were felt both before and after independence. Hence this paper revisits the tenets of the gentleman’s city and argues that they significantly contributed to the housing problem which the country is currently experiencing.

Analysis on Land Use Changes in Penang Island, Malaysia
Azitran Marzuki 1, Tarmiji Masron 1, Matthew Rowe 2; 1Universiti Sains Malaysia, Malaysia; 2University of South Australia, Australia

In early days of the beach resort tourism industry, sea and sand were the most appealing attractions for tourists visiting coastal areas. Despite many positive aspects derived from the influx of tourist arrivals, many coastal tourism destinations are increasingly witnessing negative effects associated with physical development. These often have an adverse impact on coastal attraction qualities with significant implications for beach resort quality and related stakeholders. Contemporary beach resorts have gradually evolved to coastal cities due to commercial and urbanization processes, which over time may erode their uniqueness and natural environments. This paper recognizes this and aims to identify how changes in land use patterns influence the evolution of beach resort development along coastal areas. This is achieved through an analysis of the growth and evolution of Batu Feringghi Beach in Penang Island, Malaysia. Drawing upon land use data, aerial photography and GIS technology Batu Feringghi’s land use development, beach resort evolution and their associated impacts from 1982 to 2009 is traced.

Intensification and Urban Metabolism — Analyzing Current Trends for Mumbai
Anindita Mandal, Hugh Byrd; University of Auckland, New Zealand

The growth process of the Metropolitan city of Mumbai, in India, has been linked with the national and global processes of colonization, industrialization, development and underdevelopment. Over the last few years, Mumbai has emerged as a regional economic powerhouse with a sophisticated workforce and a large middle class. Mumbai is currently on the verge of major redevelopment with about 160000 buildings, covering an area of about 59 sq. km and supporting around 2.5 million people. There is a nationalistic desire to establish Mumbai as a World Class city and project it as an image of social welfare and technological progress in the country.

To encourage the redevelopment of these low-rise, old and dilapidated buildings, and to increase the average floor-space index, the government is providing additional FSI as incentive. High-rise residential buildings are being promoted as a sustainable solution by the government and researchers alike, with almost no consideration of the environmental impact of increased density. Also, it does not take into account the finite resource availability for which the city is dependent on its hinterland or the potential for the city’s need to harness its own water or energy from renewable resources.

This research challenges the current convention that the increased densification of cities is compatible with sustainability. The purpose of the paper is to analyse the negative impact, of increasing density on infrastructure and environment, and devising ways to minimise them in large scale brownfield redevelopment projects. Case studies of existing urban areas will be systematically compared with proposed denser developments in terms of their physical characteristics and urban metabolism to derive the infrastructural and environmental implications of proposed densification. The results of this research are likely to go beyond Mumbai and provide a lesson to all cities in emerging economies.

Hambantota Sri Lanka: Challenges in Using a ‘New City’ Planning Approach to Regional Growth in Developing Countries
Medha Gunawardhana 1, Rangajewwa Ratanyake 1, Trevor Budge 1, Chathura De Silva 2; 1La Trobe University, Australia; 2University of Moratuwa, Sri Lanka

Urbanisation and population movement to larger cities is seen to be an inevitable phenomenon in most developing countries. The trends associated with urbanization in developing countries show that the result for some countries has been growing regional disparities. Governments in some developing countries have identified concerns about the issue of regional disparities and are seeking to intervene in order to attempt to redress uneven spatial development. The creation of ‘new cities’ in regional areas is one spatial planning strategy available to governments to support ‘lagging’ regions. One country that has applied this strategy is Sri Lanka. Hambantota, on the south east coast of Sri Lanka was devastated by the Boxing Day Tsunami, has now been selected by the national government for accelerated development with a range of large infrastructure projects. The Hambantota new town project is one example of a spatial planning strategy to develop a regional area and tackle uneven national growth patterns. This paper provides an account and analysis of this ‘top down’ attempt at a new town planning project and strategy. It explores the unique aspects of this particular approach. The paper concludes by exploring the planning implications and issues of continuity which going to challenge the city planning approach taken in Hambantota.

Session 2: Cost, Time & Quality Management
10:45 – 12:15, Tuesday 4 December 2012, BJ3-34
Chair: Dr Amin Akhavan Tabassi

Status of Quality in South African Construction: The Case of a General Contractor
John Smallwood, Fidelis Emuze; Nelson Mandela Metropolitan University, South Africa

The level of defects and rework that occur in construction as a result of non-conformance to quality requirements suggests that quality is not being attained or improved as envisaged in the industry. Therefore, the thrust of the issue in this paper is the assessment of the status accorded quality when executing construction projects. The research design was qualitative in nature (case study), and the primary data collection method was quantitative in nature. The data were collected through the use of a self-administered questionnaire sent to the top, middle, and operational management staff of a South African general contractor (GC) with a nationwide operational portfolio. Health and Safety (H&S) is perceived to be more important than quality by the three levels of management in the GC. Given that productivity, cost, and time are perceived to be more important to the GC’s subcontractors, it is equally arguable that the subcontractors are ‘production’ focused. In addition, the respondents’ perceptions of the definition of quality indicates a lack of understanding of quality as excellence, and the three levels of management also indicate a preference for quality control as against quality assurance. However, the three levels of management appreciate the importance of various aspects relative to the achievement of quality, in particular, management commitment, supervision, planning, and skills; and various aspects constitute barriers to the achievement of quality in the firm. Based on these findings, it can be concluded that there is a need for: generic and quality training of production workers and site management; a holistic understanding and appreciation of quality; enhanced management commitment, planning, work organisation and supervision; and a focus on quality assurance and less emphasis on control.
Effective Cost Management Towards Efficient Delivery of Building Products in the Construction Industry

Julius Ayodeji Fapohunda; Cape Peninsula University of Technology, South Africa

A large number of studies and surveys evidenced the fact that cost overrun affects all kinds of projects in the construction industry, and in all countries either in the public or in the private sector, because project costs are uncertain and funding allocations may not cover the costs incurred, while each project is inherently subject to a cost overrun risk. More so, the nature of a construction project brings about many issues; among is the cost overrun and its effects on delivery of buildings. However, efficient delivery of building products is generally tied to time, cost and quality which serve as basis for measuring the success of a building project. This study evaluates the causes of ineffective delivery of buildings in Nigeria in relation to cost and how to minimise the occurrence. Questionnaire survey was the main instrument used for the research work which was distributed within construction stakeholders: clients, consultants, and contractors in Nigeria. Questionnaires collected were analyzed using statistical tools SPSS version 13. The study reveals among other factors that, delay in construction time contributes mostly to the cost overrun of construction projects which is attributed to the inefficient delivery of buildings in Nigeria. Other factors that are affecting construction cost are inflation, change in design, and non-engaging seasoned professionals for construction. To minimise this predicaments, it is recommended that adequate design, skilled professionals and consultants should be engaged for building construction and its management in addition to skills training on resources management and time management on construction building project. It is anticipated that adequate implementation of these research findings will not only reduce construction cost overrun and variation, but in addition will enhance clients satisfaction.

Causes and Effects of Delays and Disruptions in Construction Projects in Tanzania

Geraldine John Kikwasi; Ardhi University, Tanzania

Delays and disruptions are among the challenges faced in the course of executing construction projects. Delays as well as disruptions are sources of potential risks that current studies are looking into ways to manage such as technical, social, economic, legal, financial, resource, construction and commercial. The purpose of this research is to assess causes and effects and disruptions in construction projects. This study is descriptive, designed to draw information from clients, architects, owners, managers and boards and construction firms in regard to causes and effects of delays in construction projects. Two sampling techniques were used to select respondents namely: purposive and random sampling. Literature review, questionnaires and interviews techniques were used to collect data for the study. Findings reveal that the main causes of delays and disruptions are: design changes, delays in payment to contractors, information delays, funding problems, poor project management, compensation issues and disagreement on the valuation of work done. On the other hand, time overrun, cost overrun, negative social impact, idling resources and disputes are the main effects of delays and disruptions. The study concludes that there still exist a number of causes of delays and disruptions and their effects. The study recommends that adequate construction budget, timely issuing of information, finalization of design and project management skills should be the main focus of the parties in project procurement process.

An Investigation into the Effect of Managers’ Leadership Strategies on the Productivity of Road Construction Workers in Iran

Parviz Ghoddousi 1, M. Reza Hosseini 2, Omid Pourafshar 2; 1Iran University of Science and Technology, Iran; 2University of South Australia, Australia

Delays and cost overruns are the pervasive problems of Iranian construction industry. One of the major reasons for the current state is the well-known problem of low productivity of Iranian construction sector. Enhancing the production output or productivity of human resources in construction projects is one of the most important issues. This research aims to address the research gap in this area. Perception of employees on leadership strategies of the project managers. The survey questionnaire consisted of 10 questions directed to 60 project managers of road construction projects. The research questions were about performance of employees and ranking the influencing factors with a great impact on the productivity of construction workers identified. The analysis indicated that the five most important factors related to leadership strategies, significantly affecting the productivity of Iranian road construction workers, are task-oriented style leadership, timeliness of remuneration, ethical behaviour of manager, training, and welfare conditions on site. Surprisingly, relation-oriented style leadership turned out to be the seventh effective factor. Hence, the results can facilitate resolving the long-life disputes over the effectiveness of the strategy of forging relationships with the workers in developing countries such as Iran. Moreover, discussion presented will provide practical guidelines for the policy makers, practitioners and researchers in adopting appropriate leadership strategies in order to improve the productivity of construction sites in Iran and other developing countries.

A Study on Joint Venture Formation Between Construction Organizations in Tanzania

Steven J. Minja 1, Geraldine John Kikwasi 1, Wellington Didibhuka Thwala 2; 1Ardhi University, Tanzania; 2University of Johannesburg, South Africa

Formation of joint ventures between construction companies is one of the recent efforts in combating contractors’ problems in Tanzania and addresses one of the key challenges facing the construction industry today in the country especially when large and complex projects are involved. The main objective of the research is to examine the formation of joint ventures in Tanzania, specifically to: study joint ventures formation procedures; identify criteria in selection of joint venture partner; and identify risks associated with and challenges facing joint venture undertakings in Tanzania. The study adopted a descriptive research design and purposive sampling. Multiple sources of evidence was used to collect information mainly literature review, questionnaires and interviews. Key findings reveal that legal and statutory requirements in the formation of joint ventures include registration by Business Registration and Licensing Agency (BRELA), Contractors Registration Board (CRB) and under Registration of Documents Act (RDA). All JV respondents were registered by BRELA and CRB which are mandatory but only 7 were registered by RDA. Most important factors considered during formation of JVs are: contract agreement, financial stability and commitment while key risks associated with JVs are cultural and social differences, delays in approvals and financial risks. In addition, main challenges faced by performing joint ventures are: identification of possible risks and joint venture agreement interpretation. The study concludes that formation of JVs have been addressing some of emerging challenges facing local construction organizations despite the risks and challenges that exist. The study recommends that firms entering joint ventures should explore the benefits of registering with RDA and ensure risks associated with their JV are properly assessed. The study also recommends introduction of an incentive scheme through Tanzania Investment Centre to grant tax relief for foreign contractors going into joint venture with local construction firms.

Causes, Effects and Methods of Minimizing Delays on Large Construction Projects in Libya

Farag Denini; Man-Made River Project Implementation and Management Authority, Libya

One of the most common and serious problems in construction projects in Libya and worldwide is delays. This study is concerned with delays on large projects in Libya. Its main objectives were to identify the most important factors that causes delays of large construction projects, categorization of the methods of minimizing their impacts, The study was conducted based on thorough literature review related to the subject matter, and a questionnaire survey. A total of 80 delay factors that contribute to the causes of delays were identified and categorized into 8
major groups, 13 common effects of delays, and 20 methods of minimizing construction delays were also identified based on the literature review. Respondents were asked to indicate the degree of importance they would attach to each delay factor. The main delay factors were analyzed and ranked based on the Relative Important Index from Owners, Consultants and Contractors' perspective. The results of the study revealed that the top ten most important delay factors were, slowness in the decision making processes by the Owner; delays in making progress payments by Contractors, delays in obtaining permits from the Government, delays of materials delivery to site, financial difficulties faced by the Contractor, poor project planning and scheduling, shortage of manpower, inadequate Contractors' experience, inaccurate cost estimation, poor site management and supervision. Cost overrun, time overrun and contractual disputes were the most common effects of delays on large construction projects in Libya. This study also revealed that the 5 most effective methods of minimizing construction delays were, awarding bids to reliable contractors to implement the work, ensuring the availability of resources, proper project planning and scheduling, making accurate initial time estimates, ensuring that adequate funds are available throughout the project.

Session 3: Residential Development and Social Issues
10:45 – 12:15, Tuesday 4 December 2012, BJ3-56
Chair: Dr Ruhizal Roosli
A Review of Typology and Sources of Development in the United Arab Emirates
Jafar Bagheri Khorasgani; Professional Architect, Australia
The United Arab Emirates (UAE) has experienced a fast development in terms of urban growth (construction industry) creating business centres such as Dubai and Abu Dhabi for the purpose of facilitating transit of goods and services around the world. Instant development facilitated by the economic boom resulting from resource extraction (oil and gas), population growth, tourism and foreign investment in this country. Projects such as the Burj Al Arab Hotel, the Burj Dubai, and the Palms of Dubai have made Dubai stand out among other cities in the Middle East. Some of these projects funded privately, yet the main ones were invested and executed by the state government. In this paper, typology and causes of stimulation for building and running projects in the UAE is reviewed, as well as their contribution to the development of the Emirates. Three types of projects are identified:
1) Type one: Projects with the intention of improving tourism and profit; these types of projects need both government body for planning, decision making and private sector for investment and contribution in implementation.
2) Type two: Government incentive housing programs such as Sheikh Zayed Housing Programs which have provided housing services for the UAE national families.
3) Type three: Large scale projects; these projects were symbols of development on an international scale which employed and examined mega structures and renewable energy

Whether or not these projects have successfully achieved their goals is debatable. Indeed, planning in the UAE faces a variety of challenges in solving such urban sprawl, traffic congestion and in some instances, failure in completion. In this paper these three types of urban development in the UAE are explained as well as the extent of their success through case studies of selected projects.

A Behavioral Study of Town House Residents in Bangkok
Suppakruangsan1, Timnapat Kaewmuaeang2; 1Chiang Mai University, Thailand; 2Bangkok University, Thailand
The population of many big cities in the ASEAN region, especially Bangkok, has grown rapidly since the year 2000, causing a deficit of accommodation. This gap in the housing market was initially filled by the construction, between 2005 and 2008, of high-rise condominiums, followed by the development of low-level, two- to three-storey town houses.
In 2011, a year in which 11,000 new town house units were constructed, town houses comprised 15% of the new housing market in Bangkok. Since this time more new housing projects have been completed and the town house has begun to challenge the dominance of condominiums in Bangkok's new housing market. It is expected that the market share of town houses will increase to 18% in 2012 (Thai Real Estate Association Report, 2012). This growing popularity of town houses is unique among the rapidly expanding cities of the ASEAN region.

This increase in the supply of townhouses provided the two main aims of study. The first aim was to determine whether the expansion of town house projects can meet the needs of the rising population of Bangkok and, secondly, to discover how the new housing affects the behaviour patterns of its residents. The data was gathered from 36 samples of mid-level projects in four separate areas of Bangkok that showed a constant growth rate of town houses. Ngam Wong Na-khwan, Bang Na-trat, Rama 2 and Buddha Puja.
The results showed that at the appropriate price, town houses met the needs of residents better than comparable condominium housing in the following categories: convenience for small families with one or more members who work in the city as better value (price to space ratio) as compared to condominiums; a diversity of the utilization of space e.g. office, business and home; a sense of community and belonging in the surrounding community provided by the planner. These advantages for residents, town houses seem set to continue increasing their market share in Bangkok, as it continues to grow.

Contributing Factors of Residence Satisfaction: A Case Study of Habitat Residence, University of Johannesburg
Clinton Aigbahvboa, Wellington Didibhuku Thwala; University of Johannesburg, South Africa
The aim of this paper is to ascertain the aspects that influence male students housing satisfaction with their university hall of residence. The primary data for the study was gathered through a structured questionnaire survey. The primary data respondents were only male students who live in the Habitat hall of residence at the Doornfontein campus of the University of Johannesburg. Findings from the study revealed that the most important aspects that influence male students' satisfaction are the building characteristics, neighbourhood facilities, management and maintenance of the residence halls. The research is only limited to male students in a specific hall of residence at the University of Johannesburg. The research findings gives an indication of what the situation will be when a larger sample size of mixed population is engaged. This research is necessitated because of the rising number of student in South Africa University's, hence there is a need for an understanding of student housing in the institutions of higher learning in South Africa. This has been found to contribute to student overall academic performance. The study adds to the knowledge on different aspects that influence student housing satisfaction in a typical university environment.

Interaction of Public and Private Stakeholders to Accelerate Brownfield Redevelopment
A.F. den Otter, E. Blokhuis, Q. Han; Eindhoven University of Technology, The Netherlands
In the early phase of Brownfield redevelopment, key actors like market oriented developers and governmental stakeholders consider opportunities and risks for possible redevelopment. It can be stated that a serious need exists for acceleration of redevelopment of a large number of Brownfields in most Western Countries. Brownfield redevelopment, if well positioned and planned, provides a range of economic, social, and environmental benefits. Nowadays, often a traditional linear planning process shifts to an iterative, dynamic development process by public-private enterprises. The various forms of cooperative effort between local governmental representatives and private developers require a shift of governance from urban central planning to process management that accommodates strategic, flexible behavior of key actors. To establish such collaboration, specifically in open market economies, interaction between key
actors, sharing information and knowledge is essential. However, due to a reactive attitude of public stakeholders, affecting private stakeholders, progress in redevelopment is often substantially delayed; chances and windows of opportunities are missed. This paper reports on the possibilities for accelerating brownfield redevelopment based on a framework for interaction between public and private stakeholders and the outcomes of three years of research to interaction of public stakeholders in a number of brownfield redevelopments in the Netherlands.

Session 4: Culture and Heritage
13:35 - 14:35, Tuesday 4 December 2012, BJ3-34
Chair: Mr Andrew Butt

Renaissance of Arab-Islamic Urbanism: The Eco-Neighborhoods
Hashib Rehailia; Badji Mokhtar University, Algeria

Current urban growth is a major consumer of space taken mainly from farmland and natural areas. The explosion of cities has a direct impact on land capital. The creation of new centers and suburbanisation engendered longer distances, and therefore an increase of various means of transportation which participate in the deteriorating quality of life of communities and biodiversity.

This urban sprawl leads to the abandonment of the old centers and therefore older neighborhoods are now suffering from severe degradation and sometimes dilapidation because of the lack of maintenance. This decay will see as a result the emergence of problems that affect the lives of the inhabitants, not to mention over-consumption of energy.

It is therefore in the management of old, existing buildings that environmental issues can really be raised while searching for a balance between economic and socio-cultural matters within the context of sustainable development.

Old buildings as well and sustainable development now appear as two consensual notions, and therefore, the skills that relate to heritage on the one hand and to the environment on the other hand, must after a period of time converge to shared objectives.

In this context, urban eco-neighborhoods influenced by the Arab-Muslim model continue to grow around the world.

The return to basics to create a habitat that is healthy, economical, comfortable, and more respectful of environmental and religious heritage, helps to ensure a balance between the dynamics of change, protection of identities of the cities oldest neighborhoods and sustainable development.

This work is the outcome of a reflection through several studies to understand the renewal of the Arab-Muslim neighborhoods model, as well as the relevance of this type of urban organization.

The Audio Aesthetic Experience in Contemporary City: A Case Study of Bali
N.P. Giri Putri Setyawathi; University of South Australia, Australia

This article provides an overview of sound aesthetic, encompassing its history and artistic development, and the way it is experienced by the people. It is started with the discussion on the shift of sound taste within societies, as well as the description on the role of sound in urban spaces. The article then describes the user's experiences of the form's aesthetics, including the disjunction between the old sound and the new sound composition in a contemporary city. Most importantly, this article discusses the shift of sound taste in Bali and their impact to the overall aesthetic experience.

Re-Examining Community Transformation in Housing Development in China's Urbanization Process
Fang Xu; University of New South Wales, Australia

The consequence of urbanization in China in the last three decades has altered not only the existing urban fabrics, changed the styles of urban residents housing, but also transformed the existing formation of the community. This paper studies the community transformation in China's housing development accompanied by urbanization process. It examines old and changed concepts of community in pre- and post-period of Work Process mechanism through analyzing changing characteristics of social organization and housing conditions. Based on author's first hand experience engaging in urban planning and renewal projects, and some outcomes of previous cases studies, this research analyses the special characteristics of Chinese urban community and its varied meanings related to the housing development process. By closely examining the transition of urban residents' life style, the research identifies some key issues to rebuild the new community so as to offer some references to the current practice of housing development in China.

Session 5: Building Engineering & Technology
13:35 - 14:35, Tuesday 4 December 2012, BJ3-52
Chair: Dr James Ward

Densified Silica Fume and High Calcium Wood Ash Intergrinded Cement Replacement Material
Cheah Chee Ban, Mahyudinn Ramli; Universiti Sains Malaysia, Malaysia

Wood biomass energy is an emerging source of energy among the developing nations. An inheritance problem related to the use of wood biomass energy is the formation of a significant amount of wood biomass ash as the combustion residue which may cause serious environmental pollution if not managed properly. In the attempt to recycle the wood biomass ash for use as a constituent binder material in concrete, the performance of a new supplementary binder material produced by mechanical hybridization of densified silica fume (DSF) and high calcium wood ash (HCWA) was investigated in the study. Throughout the study, both HCWA and DSF were characterized in term of their respective chemical composition. The physical properties of HCWA were evaluated in terms of its particle grading and compared against DSF and portland cement. Additionally, mechanical strength of mortar produced using HCWA-DSF hybrid binder in partial replacement of cement were investigated. Results indicated enhancement in the compressive strength of mortar containing HCWA-DSF hybrid binder at level of cement replacement up to 15% of binder's weight. Results of the study indicated that the HCWA-DSF hybrid supplementary binder can be effectively used as a partial cement replacement material for production of concrete for construction.

Durability Properties of Coconut Fibre Reinforced Concrete in Sea Water Environment
Wai Hoe Kwan, Mahyudmin Ramli, Noor Faisal Abas; Universiti Sains Malaysia, Malaysia

Marine structures are suffered from the seawater attacks for decades. Till present, the best approach is to use high strength high performance concrete which is low in permeability. Nevertheless, this approach is limited by the crack formations arise from the severe environment attacks. The alternate wetting and drying happens at the splash zone would impose expansion and shrinkage to the structure. Meanwhile the part of the structure that is fully immersed in the seawater would suffer from sulphate attack. Both attacks would result formation of cracks and subsequently the durability of the structure is drastically reduced due to the penetration of harmful substances. By taking the advantage of short discontinuous fibres which provide localize reinforcing effects to the matrix, thus concept of fibre reinforced concrete (FRC) is introduced into high strength concrete. This becomes the core objective of this experiment which is to enhance the strength and durability of the concrete in the aggressive environment. Coconut fibre is cheap and abundant in developing countries like Malaysia. Therefore, it is used for preparing FRC specimens. The specimens were exposed to two different exposure conditions after receiving 28 days of water curing: (i) alternate air and seawater in 14 days cycle of exposure (4 days wetting + 10 days drying) for 12 months and (ii) continuous immersion in the seawater (W-series). Specimens were examined for compressive strength while the durability properties were evaluated by the intrinsic permeability and porosity tests. The mineralogical and microstructures were studied by the X-ray diffraction (XRD) and scanning electron microscopy (SEM) examination. The coconut fibre reinforced...
Introducing Green Infrastructure into the Built Environment of Adelaide
Simon Beecham, Mostafa Razzaghmanesh, Fatemeh Kazemi; University of South Australia, Australia

Adelaide is the capital city of the driest state in Australia and it currently faces three major challenges, namely urbanisation growth, water scarcity and climate change. The consequence of these threats puts more stress on the urban water cycle and increases metropolitan temperatures through urban heat island effects. Introducing green infrastructure through water sensitive urban design is one of the solutions to reduce the harmful impacts of urbanisation while providing additional amenity and water quality benefits for communities and the environment.

This paper describes the results of a current research project that is investigating the water quantity and thermal benefits of two different types of green roofs, namely intensive and extensive. The study site consists of a series of small scale green roofs located at the University of South Australia’s Mawson Lakes campus. Laboratory and field investigations of rainfall and runoff confirm that green roofs can retain significant amounts of stormwater and can also mitigate the peak flow and attenuate the time of concentration. The thermal benefits of green roofs have also been investigated through two scenarios of cold and warm days. The outcomes indicate that the thermal variation of the media is less than surrounding areas and on cold days the media’s temperature is warmer than outside and on warm days it is cooler. Integrating green roofs into the built environments of Adelaide could work as a climate change adaptation tool that could yield significant thermal benefits.

The Relationship Between Urban Greenspace, Health and Climate Change
Morgan Schebella 1, Delene Weber 1, Greg Brown 2; 1 University of South Australia, Australia; 2 University of Queensland, Australia

Rapid rates of urbanization are being experienced globally but are particularly evident in developing countries. Such conditions often mean large open spaces, particularly parks and reserves are under pressure for development. It is vital that we develop tools to enable the strategic evaluation and development of such places. Planners are aware that the value of parks extends beyond the provision of attractive views and biodiversity protection. Proximity to parks can have health benefits to community health and well-being. However, the health benefits of urban parks may be impacted by future climate change. For example, physical activity levels are likely to be influenced by warmer temperatures and increased UV radiation. It is predicted that cities are where climate change will have the greatest impact on people’s health, so it is important to understand the effect that these changes are likely to have on park-based physical activity, in order to prepare for and adapt to climate change effectively. This study investigated residents’ use of parks and reserves in the City of Campbelltown, in South Australia. Using a web-based public participation geographic information system (PPGIS), residents were asked to map where they participated in different types of activities, their favourite location for achieving particular benefits, and the places where they would like to see particular climate change mitigation strategies initiated. Residents then completed a short survey that collected data relating to use patterns, health and demographics. The results give planners valuable spatial information regarding the health value of existing parks as well as provide insights as to how to develop park systems more strategically in the future in order to reduce the potential impacts associated with climate change. PPGIS is discussed as a valuable tool that could assist urban planners in developing countries.
Natural Disaster and the Mental Well-Being of Construction Professionals — A Literature Review

Tom De Garis 1, Jian Zuo 2, Bassam Baroudi 2; 1 Badge Constructions, Australia; 2 University of South Australia, Australia

The effects of natural disasters are usually substantial. These effects are not only reflected in tragic loss of life, but also the damage to infrastructure and economies. In the shadow of every disaster is the psychological impact on the affected population. The construction industry plays a critical role in the rehabilitation of a community in a post-disaster environment. The potential for psychological stress may create an extra level of pressure to construction professionals where the working environment is identified as high-stress under business-as-usual conditions. This study critically reviewed the literature relevant to disaster, disaster recovery and mental health. Consequently a research agenda is proposed in order to address this critical issue.

Post-Disaster C&D Waste Management: The Case of Cowam Project, City of Galle, Sri Lanka

Gayani Karunasena 1, Raufdeen Rameezdeen 2, Dilanthi Amarantunga 3; 1 University of Moratuwa, Sri Lanka; 2 University of South Australia, Australia; 3 University of Salford, UK

Waste management is considered to be the weakest phase in responding to a disaster. This became apparent when Sri Lanka underwent a huge trauma after the Indian Ocean Tsunami of 2004. City of Galle located in the Southern coast is one of the severely affected, causing some 4000 deaths and destroying over 15000 houses. Construction Waste Management (COWAM) project funded by the European Union between 2005–2009 looked at the most sustainable way of dealing with Construction & Demolition (C&D) waste after a disaster and came up with a pilot C&D recycling plant (COWAM Centre) in the city of Galle. This paper reflects on the C&D waste management practices followed by the city authorities during the recovery and reconstruction phase right up to the operation of the COWAM Centre with the intention of seeking best practices for future resilience.

As part of the COWAM case study, semi-structured interviews were conducted among municipal authorities and voluntary organizations to identify the C&D waste management process followed during recovery and reconstruction. Empirical data was collected from actual demolition sites located in Galle to establish the quantity of C&D waste, composition, hazardous substances found and recycling efficiency. Findings revealed that waste was disposed initially into temporary dumping sites and later re-cycled through the COWAM Centre. However, study found a large number of issues that could have been avoided if Galle Municipal Council had the capacity to plan and implement a quick C&D waste management strategy. Key issues which arose were lack of heavy vehicles, lack of manpower, inability to forecast the amount and composition of waste, and inability to identify suitable temporary dumping sites. The characteristics of C&D waste gave a baseline for the design of COWAM Centre. The paper presents a viable approach to overcome issues pertaining to C&D waste management during the aftermath of a disaster through the lessons learned from COWAM project.

Disaster Restoration Projects: A Conceptual Project Management Perspective

Bassam Baroudi 1, Randy R. Rapp 2; 1 University of South Australia, Australia; 2 Purdue University, USA

Disaster events create significant challenges for all those involved with affected people and communities having many needs in the aftermath, one of which is that of reinstating the built environment back to its original pre-disaster condition. That is the restoration and reconstruction of damaged structures. This paper particularly focuses in on the repair and mitigation aspect. These are termed disaster restoration projects and are thought to contain many unique problems not found within conventional construction.

The area of project management is continually attracting interest from various sectors. This is mainly due to its perceived value within the business world. Hence, it seems worthwhile that the emerging disaster restoration field look to project management principles and knowledge for possible benefits. With this in mind this study initially presents some background in respect to disasters, restoration and project management. It then follows on to provide a commentary on the topic examining the project management knowledge areas. The commentary is founded within the spatial aspects and social-economic factors of resettlement and disaster restoration projects. An attempt to explore these complex relationships between the spatial aspects and social-economic issues. For instance, ad hoc utilisation of land and ill-planned infrastructure provisions (special aspects of infrastructure planning) can lead to livelihood disruptions. For this reason, an attempt to explore these complex relationships between spatial aspects and social-economic factors of resettlement is important to minimise long-term issues. This paper discusses the rationale for the potential use of spatial analysis tools and techniques to discover the interactions between socio-economic factors and to propose solutions to redress these issues.

Critical Success Factor for Community-Based Post-Disaster Housing Reconstruction Project (CHPRP) in Pre-Construction Stage in Indonesia

Taufika Ophiyandri, Dilanthi Amarantunga, Chaminda Pathirage; University of Salford, UK

The purpose of this paper is to investigate the Critical Success Factors (CSFs) of Community-Based Post-disaster Housing Reconstruction Project (CHPRP) in order to ensure the success of the programme. An extensive literature review and interviews were undertaken to establish selected factors contributing to the success of community-based post-disaster housing reconstruction project. Following this, a questionnaire survey was administered to key stakeholders in order to perceive their view on CSFs of CHPRP. Data was analysed by deploying statistical software. It was found that twelve factors are considered to be the CSFs: transparency and accountability, appropriate reconstruction policy/strategy, gathering trust from community, understanding on community based method, facilitator capacity, implementer capacity, good coordination and communication, significant level of community participation/control, sufficient funding availability, involvement of all community members, successful beneficiaries identification, and appropriate project organisation.

Socio-Economic and Spatial Aspects in Post-Disaster Resettlement Programmes

Pantip Piyatadsananon, Kaushal Keraminiyage, Dilanthi Amarantunga; University of Salford, UK

Resettlement programmes are designed and implemented all over the world to relocate people to safer areas who are displaced due to various reasons, i.e. development projects, natural disasters, conflicts and alike. Wide ranges of problems affect the design and implementation of these programmes. Among those problems, often the attention goes to immediate, short-term issues such as land availability, speedy construction, and onsite sanitation. However, the problems of resettlement programmes extend beyond short-term issues to include long term socio-economic issues which are often overlooked when designing and implementing resettlement programmes. Those socio-economic issues, for instance, impoverishment, livelihood disruption and marginalisation are often inter-linked creating complex dynamics. Previous research related to socio-economic issues in resettlement programmes reveal strong links between the spatial aspects and socio-economic issues. For instance, ad-hoc utilisation of land and ill-planned infrastructure provisions (special aspects of infrastructure planning) can lead to livelihood disruptions. For this reason, an attempt to explore these complex relationships between spatial aspects and socio-economic factors of resettlement is important to minimise long-term issues. This paper discusses the rationale for the potential use of spatial analysis tools and techniques to discover the interactions between socio-economic factors and to propose solutions to redress these issues.
Session 8: Climate Change and Sustainability
15:15 – 16:30, Tuesday 4 December 2012, BJ3-34
Chair: Dr Delene Weber

Responding to Rising Sea Levels: The Australian Experience
Jon Kellett¹, Jacqueline Balston¹, Steven Li², Geoff Wells¹, Mark Western¹; ¹University of South Australia, Australia; ²RMIT University, Australia

As sea levels rise over the next century many coastal settlements will face an increased threat from periodic flooding and permanent erosion. Planning policy in Australia and elsewhere is already starting to address this issue by defining coastal zones and placing specific controls on new development in these zones. But the question of how policy deals with existing development in threatened coastal areas remains problematic. Several locations in Australia have faced this problem in recent years and policy has begun to emerge as a result of experience. Much of this policy may be viewed as a reactive to specific circumstances. This paper reviews a range of issues and using three case studies from New South Wales and South Australia, seeks to outline the data requirements for proactive decision making. The discussion covers technical, legal and financial aspects. Using the results of a global literature review and interviews with Australian local councils facing coastal inundation and erosion problems, the paper proposes a decision mapping approach to analyse the threat of sea level rise to existing development and to generate robust policy. It suggests this methodology may also be appropriate to locations outside Australia.

Addressing the Impacts of Climate Induced Migration on Urban System: A Study of Bangladesh
Reazul Ahsan, Sadasivam Karuppannan, Jon Kellett; University of South Australia, Australia

Human understanding of potential climate change impacts has improved enormously. Environmental impacts and extreme climate events have introduced a new social community named “climate migrants or displaced communities”. Hurricane Katrina in New Orleans and Cyclone Sidr and Aila in Bangladesh forced hundreds of thousands of people to migrate from the exposed coastal regions. Most of such migration took place towards urban areas which are yet to address climate change in local urban systems. Climate migration leads to chaotic and overwhelming levels of urbanization with attendant poor living standard and unsustainable urban growth. Bangladesh is among the countries most severely affected by climate change and climate induced migration. Using a case study approach drawing on empirical research on climate migrants in Bangladesh, this study examines the drivers of migration and the subsequent effects on the urban systems in Bangladesh.

An Overview of Developing Urban Public Transport in Iran
Vahid Poorjafari, Wen Long Yue; University of South Australia, Australia

It is now widely accepted that public transport is a critical element in urban planning. Considering the substantial growth in the number of private cars and their negative side effects in developing countries over the recent years, development of public transport has drawn the attention of policy makers and led to introducing new strategies and policy instruments in some of those countries to enhance public transportation. Similarly in Iran, a national policy package was legislated in 2008 in order to direct the resources and efforts to this target. This paper aims to evaluate this policy package and investigate its impacts on the public transport systems in Iran over the recent years. The process of developing this policy package, as well as its aspects and objectives are presented in this paper. Furthermore, this paper discusses whether this policy package has been successful in achieving the intended objectives and highlights the existing obstacles and deficiencies in the way of implementing this policy package.

3D Analysis and Investigation of Traffic Noise from Roads of the Adelaide CBD and Their Impact on Buildings
Saad Alsharrah, David Bruce; University of South Australia, Australia

This study analyses and investigates a 3D representation of traffic noise in an urban environment using a Geographic Information Systems (GIS) platform. Using SoundPLAN noise prediction software, traffic noise is calculated and represented in a GIS environment. A 3D model of buildings in the Adelaide CBD is integrated into the GIS and traffic noise levels are utilised to assess noise at different heights. The Equivalent Continuous Level (LAeq), measured in A-Weighted Decibels (dBA), is utilised to investigate the impact of traffic noise on residential buildings. Results show that there is high impact of traffic noise in the foreground and on building façades suggesting that residential use may not be suitable in these areas. Lower noise impact is witnessed in the rear of buildings and in higher levels indicating that these areas are more suitable for residential purposes. Such analysis and investigation is of significance for urban planners and can aid in management and decision making.

Urban Greenway System as a Green Infrastructure to Mitigate Air Pollution — Darakeh River Valley as a Case Study
Sahar Nedae Tousi¹, Amin Masoudi¹, Sina Shahab²; ¹University of Shahid Beheshti, Iran; ²University of Tehran, Iran

Greenways are one of the most significant urban green spaces in terms of human relation with nature. These linear elements as an element of the ecological structure of cities have a fundamental role in human mental and physical health, due to their specific characteristics in combination with other natural elements. These spaces are necessary for urban ecosystem health to make positive changes in climate and urban environments, mitigate air pollution and increase aesthetic values. Therefore, greenway system is one of the most important thematic areas for planning to improve quality of life for residents. Protection of natural ecological systems, providing extensive recreational opportunities for citizens, economic interests and protection of heritage and cultural values are the advantages of greenways.

In Tehran, metropolitan sprawl on peri-urban environments, especially to the Alborz Mountains Range and its southern slopes has led to environmental destruction of open and green spaces, gardens, and valuable valleys and foothills areas. This has caused irrevocable changes in this area. Developing of built environment in rivers’ surrounding areas and even river valleys in north of Tehran, has disrupted natural process in these areas and caused changes in landscape of these valuable ecological areas. Therefore, according to air pollution and lack of recreational space at this metropolis, greenways system, in general, and Darakeh River Valley as a case study of this article, could be effective in responding to human needs and reduce urban air pollution in this metropolis.

So, this article explores an appropriate planning tool to improve the environmental quality of Darakeh River Valley, with background and literature review of greenways, and studying strengths and opportunities, weaknesses and threats in this greenway, as one of the most important green infrastructure to mitigate air pollution in Tehran metropolitan area.
Session 9: Traditional Architecture and Heritage
15:15 – 16:30, Tuesday 4 December 2012, BJ3-36
Chair: Dr Alpama Sivam

Analysis of Entering Sequences in Traditional Iranian House
Yahaya Ahmad, Faeezeh Nabavi; University of Malaya, Malaysia

In Persian culture, position of family is very important and plays a vital role in the design of traditional house. Providing comfort, peace and privacy for all family members was the most important part of designing these kinds of houses. The point that nowadays is lost in modern houses. In Iran, as a Muslim country, culture and religious beliefs played an important role in formation of a traditional house. People like to separate their secluded private life from public intercourse, so, traditional house is divided into two parts: andaruni (family zone) and biruni (guests). Biruni located near the entrance side, but andaruni has spread in other parts of the house.

This paper aims to study privacy in traditional courtyard houses in Iran by analyzing entering sequences and building forms. Thirty selected traditional Iranian houses in Yazd were examined. The criteria included in this study are building form and entering sequences. The unique form and specific entering sequences for arriving at the building in these houses for guests and members were analyzed. This study has concluded with strategies that can be adopted in modern house design in Iran that may enhance the quality home design that response to lifestyle and religious belief of their users such as space division, lobby and harmony with culture.

Reviving the Heart of a Historical Metropolis: Case Study of Ataba and Opera Squares Design, Cairo, Egypt
Kareem Adel Ismail; University of Auckland, New Zealand

In a historical Metropolis like Cairo, where 20 million people live in a city with more than 1000 years of history, many social, economic and environmental problems arise, threatening the historical heritage that the city have. Ataba and Opera squares are clear example of this dilemma; the two squares located in the heart of Cairo have suffered from continuous deterioration through the last three decades, with a wide range of complex problems ranging from spread of informal markets, traffic congestion, and most significantly loss of cultural historical values. Through this paper, the researcher is presenting his team work in formation of a re-development proposal for these important squares in the heart of Cairo, which was awarded the 2nd place in an international design competition. This work included investigation of the existing challenges and issues facing the area, where the team work collected data about the current conditions and resident’s problems through survey, site visits, and visits to responsible authorities. After analysing the collected data, the team created an integrated urban design proposal titled “heart of the heart,” where numbers of integrated themes and projects were proposed. These projects aim at solving some of the complex socio-economic problems of the residents and creating an environmentally sustainable green space in the heart of polluted Cairo. In conclusion, the researcher reviews how the proposed project has responded to residents’ needs from different socio-economic groups and preserved the rich cultural and historical heritage of the area through design.

The Routes of Timurid Architectural Influence (1370–1524) in Mughal Buildings (1526–1709)
Maryam Khazaee, Naziaty Yaacob, Zakaria Alcheikh Mahmood Awad, Zuraini Binti Md Ali; University of Malaya, Malaysia

The most universal of the Indo-Muslim styles is the Mughal; the mode of the Muslim architecture prevailing in the subcontinent coalesced in it to form a pan-Indian style. It is proved that Mughal architecture is influenced by Iranian architecture as Persian architecture before and after Islam has had a wide area of influence. The Iranian style of architecture, which include Ilkhanid, Timurid, Safavid traditions, became a matrix for the Indian. Mughal period (1526–1707) was contemporary with Safavid dynasty in Iran (1524–1729) and Timurid period (1370–1524) was before both of them. Even though based on several scholars, Mughal styles have been affected from Timurid dynasty more than Safavid, in addition Timurid architecture was prototype for both of Safavid and Mughal styles.

The purpose of this paper is defining the routes of architectural influence from Timurid to Mughal with historical interpretation from secondary data, moreover investigating the validity of each proposition. According to historical evidences, there are three propositions for this architectural transition that including: first Timurid style is a precursor of Indian styles earlier than Mughal (Delhi sultanate, Deccan sultanate). The second route is direct influence from Timurid architecture, and third way is via Indian style — Safavid — that concurrent with Mughal. In this article, the authors focus in the routes via Iran (second and third propositions). The research adopts a historical interpretation as the main strategy from secondary data.

Architect’s Role in Developing Architecture of Contemporary Mosques — An Analytic Study of Construction Technology in Abdul Wahid Al Wakeel’s Projects as a Case Study
Nader Jawad El Namara; Islamic University of Gaza, Palestine

Since the beginning of history, architecture started to search in the surrounding environment for components that form the architectural structure and it tried to subdue them to the benefit of man. Due to modern technology and existence of new elements, they started to replace traditional methods of building. Moreover, it ignores man and environment and only focuses on how high can it reach and how to make architecture as an international place to market these materials as a kind of financial and economic income. Therefore, Abdul Wahid Al Wakeel’s projects as a case study came to revamp concepts of traditional technology in building with modern creative methods. He renewed many materials and methods of construction and their role in reviving the Islamic architecture with modern touches. The study found that Al Wakeel has significantly contributed in accomplishing such mission and maintaining the Islamic identity through using a construction technology able to subject the surrounding environment and other local elements and to activate of man. Due to modern technology and existence of new elements, they started to replace traditional methods of building. Moreover, it ignores man and environment and only focuses on how high can it reach and how to make architecture as an international place to market these materials as a kind of financial and economic income. Therefore, Abdul Wahid Al Wakeel’s projects as a case study came to revamp concepts of traditional technology in building with modern creative methods. He renewed many materials and methods of construction and their role in reviving the Islamic architecture with modern touches. The study found that Al Wakeel has significantly contributed in accomplishing such mission and maintaining the Islamic identity through using a construction technology able to subject the surrounding environment and other local elements and to activate of man. Due to modern technology and existence of new elements, they started to replace traditional methods of building. Moreover, it ignores man and environment and only focuses on how high can it reach and how to make architecture as an international place to market these materials as a kind of financial and economic income. Therefore, Abdul Wahid Al Wakeel’s projects as a case study came to revamp concepts of traditional technology in building with modern creative methods. He renewed many materials and methods of construction and their role in reviving the Islamic architecture with modern touches.

Session 10: Value and Knowledge Management
10:40 – 12:25, Wednesday 5 December 2012, H2-02
Chair: Dr Rameez Rameezdeen

P/E Premium and Expected Returns in Pakistan’s Construction Equity Market
M. Shahzad Anjum1, Abu Hassan Abu Bakar1, Arshad Hassan2; 1Universiti Sains Malaysia, Malaysia; 2Muhammad Ali Jinnah University, Pakistan

This paper examines the relationship between P/E ratios and investment performance of equity securities in Karachi Stock Exchange (KSE) which is the national stock exchange of Pakistan having more than 600 listed companies, comprising 34 sectors of the economy, with special emphasis on the construction industry. Stock price data for June 2002 – July 2007 has been used to test the intended relationships. Securities for each year were sorted on
the basis of price to earnings (P/E) ratio and two portfolios were constructed, each comprising 30 percent securities on the basis of highest and lowest P/E ratios. The difference between returns of two portfolios provided P/E premium. Further, to test the relationship between P/E ratio premium and equity market return, the portfolio returns were regressed against market premium and P/E premium. The results indicate that low P/E portfolios, on average, earned higher absolute and risk-adjusted rates of return than those of higher P/E securities. The results reported in this paper are consistent with the view that P/E ratio information was “fully reflected” in security prices in as rapid a manner as postulated by the semi-strong form of the efficient market hypothesis. However, the behavior of security prices over the 7-year study period does not support the efficient market hypothesis. This study also indicated that returns on growth stock (high P/E ratios) often lag behind those of value stocks (low P/E ratios). Therefore investors can design the investment strategies on the basis of behavior of growth stock as well as value stock for enhancing their long-term performance.

Value Management in Sustainable Building Development
Kamand M. Roufechaei, Abu Hassan Abu Bakar, Amin Akhavan Tabassi; Universiti Sains Malaysia, Malaysia
This paper is part of an ongoing doctoral research project based on the integration of value management (VM) and sustainable building development in construction industry of Malaysia. Sustainable construction is a significant issue for this country that needs serious attention in order sustainability to be developed and implemented in construction project. As Value management is one of the Project management skills and tools, it can help to develop sustainable construction. Value management (VM) has the capability to assist the absorption of sustainability at the conceptual and design stage of project process. The intrinsic capabilities of VM to assist in sustainability aspects in construction projects has not been fully realised and optimised. To reduce this variation and to promote wider integration, the element of sustainability thinking and actions need to be absorbed systematically into the VM process. This study aims to identify sustainable building development and value management. Also, the research evaluates a benefit of integration sustainable building development and value management. This paper puts forwards a concept map of research and organizing research methods for each objective of the study.

Mediating Role of Organization Learning Between Knowledge Management and Growth Performance in Construction Companies: A Framework
Mohamad Nizam Yusof, Abu Hassan Abu Bakar; Universiti Sains Malaysia, Malaysia
Contemporary construction businesses are facing multifaceted challenges in today’s highly competitive environment which require them to plan right strategies in order to remain relevance and grow in the industry. Growth performance of the companies is often understood as business success and most companies are planning to improve their growth performance. Knowledge is recognized as a valuable resource for companies to sustain competitiveness in a turbulent business environment. However, due to lack of systematic knowledge organization, companies are not realizing and optimizing what they already know. For that reason knowledge management is introduced to assist organization managing the knowledge systematically and effectively. The implementation of knowledge management can offer higher impacts on the organizations’ performance when they take into consideration the organizational learning in their strategic plan. This paper reviews the concepts of knowledge management, growth performance and organizational learning and tries to establish relationship between knowledge management and growth performance along with the role of organizational learning as a mediator. The framework relating knowledge management and growth performance with organizational learning plays a mediating role will be established and recommended for future study in construction.

Towards the Integration of Risk and Value Management
A. Ranesh 1, G. Zillante 2, Nicholas Chileshe 1;
1University of South Australia, Australia; 2University of Adelaide, Australia
Governments are increasingly faced with the challenge of delivering infrastructure developments under difficult budget constraints. Public Private Partnerships (PPPs) are being used widely as a means of meeting public infrastructure demands through private finance. The aim is to achieve value for money (VM) through the allocation of risks to the party who can manage them more effectively. If project risks are not well managed, the project will face cost, quality and time overruns thereby affecting the viability of the project. Both Risk Management (RM) and Value Management (VM) are considered to be best practice in project management and enable organisations to define objectives when delivering complex projects whilst reducing risk and maximising value. Over the years researchers and practitioners have argued that the integration of RM and VM in a single study would avoid duplication of work and deliver better value for money thereby leading to better project outcomes.

As part of an ongoing doctoral study into the integration of risk management and value management in PPP projects, this paper attempts to examine the application of risk and value management practice in infrastructure development projects, predominantly in PPP projects, through semi-structured interviews conducted as a qualitative research methodology with ten industry practitioners. To achieve this aim, this paper attempts to identify the similarities and differences between the two processes along with the benefits and critical success factors for the integration of RM and VM in PPP projects. The results suggest that, although risk and value management activities are said to be used in projects; “normal” RM and VM studies are rarely undertaken. The observations to date suggest that, although there are barriers against the integration of RM and VM, there is a need for the development of a systematic process to enable the integration of risk and value management to occur.

Knowledge Management Infrastructure Capabilities and Project Benefits Using Partial Least Squares (PLS) Modelling
Muhammad Asim Tufail, Abu Hassan Abu Bakar, Wiwied Virgiyanti; Universiti Sains Malaysia, Malaysia
To understand the success and failure of knowledge management, firms must identify and assess the organizational capabilities required for the effort to prosper, which is the focus of this paper. Literature has offered important theoretical grounding for this study with regard to organization’s infrastructure capabilities as part predictor of knowledge management performance. This study aligned the unit of analysis more closely with the practitioners’ level of implementation by selecting population of analysis as project based organization (PBO’s) in construction industry. The project based perspective leads to results of a more informative and prescriptive nature for practitioners as the field of knowledge management in construction PBO’s is driven by practical need. This study identifies the relationship of knowledge infrastructure capabilities and project benefits in construction organizations as benefits come from the business environment and the extent to which they contribute to achievement of strategic goals and overall success of the project. Data has been collected from project managers in 70 Grade 7 Malaysian Contracting companies. The sample size is determined through power technique using G*power software, structural equation modelling using partial least squares has been formulated. The findings show a significant relationship between knowledge management infrastructure capabilities and project benefits.

An Empirical Investigation on the Relationship Between Knowledge Management Processes and Competitive Advantage
Wiwied Virgiyanti, Abu Hassan Abu Bakar, Muhammad Asim Tufail; Universiti Sains Malaysia, Malaysia
Recently, achieving and sustaining competitive advantage in the business world have received a phenomenal attention,
since they are capable to maintain and improve a company’s performance in the global market. To respond the rapid-changing market and competitive advantage can be achieved through developing the existing and creating the new resources and capabilities. Amongst these resources and capabilities, knowledge management (KM) has been recognised as the core of business to gain the competitive advantage. Knowledge management has been proposed and described for its possible role in creating sustainable competitive advantage for organizations in every industry, including construction industry. In line with that, this study is aimed to examine the relationship between knowledge management processes and competitive advantage in construction companies in Malaysia. This study utilized Knowledge Management Assessment Instrument (KMAI) to measure knowledge management processes, and a set of adopted questions to measure competitive advantage within the selected organizations. The data collection involved 70 Grade-7 (G7) constructions companies under the classification of Construction Industry Development Board (CIDB) Malaysia. For data analysis, PLS (Partial Least Squares) technique was used to analyze the collected data. The results confirmed the strong relationship between knowledge management processes and competitive advantage.

Session 11: Housing and City Planning
10:40 – 12:25, Wednesday 5 December 2012, Bf3-32
Chair: Dr Matthew Rofe

Critical Indicators for Measuring Residential Satisfaction in Publicly Subsidised Low-Income Housing in South Africa
Clinton Aigbavboa, Wellington Didibhuku Thwala; University of Johannesburg, South Africa

The common attributes of measuring residential satisfaction (RS) in housing are not universal, but context specific. Some attributes are regarded as inadequate in providing meaningful information to government and other agencies to develop houses that will be satisfactorily to the occupants’. Researches have indicated that there is no consensus on what constitutes appropriate RS features. This study sought to validate the identified set of leading indicators to government and other agencies responsible for the provision of low-income housing to improve RS on low-income housing developments. The Delphi approach was used where the views of housing experts were solicited on 19 potential attributes as identified from literature. Consensus was achieved after three iterative rounds. The expert’s scored each attributes on a 10-point Likert scale of influence, where 1 = low influence and 10 = high influence. They had opportunity to re-consider their scores as informed by the group median score. The scales adapted for consensus were: strong consensus, median 9–10, mean 8–10, inter quartile deviation (IQR) ≤ 1; good consensus, median 7–8.99, mean 6.99, mean ≤ 5.99 and IQR ≤ 2.1 ≤ 3. The key findings indicate that there was a good to strong consensus of 12 attributes; while four (4) of the attributes had weak consensus. The attributes with weak consensus were from the contextual attributes of the occupants, relating to their personal characteristics, social and economic features, culture and their participation in the housing process. The study contributes to the body of knowledge on the subject where no consensus has been reached pertaining to critical attributes for measuring residential satisfaction in publicly subsidised low-income housing in South Africa. Hence, the identified attributes can be further developed into a structured RS improvement model/framework for low-income housing development.

Establishing an Optimal Range of Density for Sustainable Urban Form
Victor Vásquez, Huágh Byrd; University of Auckland, New Zealand

Density and energy are strictly related in our modern society and the discussion about the most suitable range in urban form is under constant debate. Proposals of optimum density are currently manage on the basis of fossil fuels and imported energy. This paper aims to find an optimal range of density for sustainable urban form when posing neighbourhoods able to generate their own housing energy needs on-site. Solar energy has been considered as the main source to generate essential needs able to maintain a typical household, such as: space heating demand, domestic, transport and space cooling. The paper suggests that in the specific case of the Talca, the case study, a range up to 30 households per hectare is able to achieve its energy self-sufficiency according to their own annual energy consumption and after having taken measures to reduce that consumption.

The Urban Poor’s Collective Planning Activities as Strategies to Insecure Housing and Tenure: The Experiences of Two Civil Society Groups in Iloilo City, Philippines
Rhodella A. Ibabao 1, Suzanne Vallance 2, P. Ali Memnon 2; 1University of the Philippines-Visayas, Philippines; 2Lincoln University, New Zealand

The study interrogates collective activities of two civil society groups in Iloilo City, Philippines to address the problem of housing and tenure security. Their activities, strategies and programmes are then evaluated in the context of the insurgent planning and co-production planning literature. The insurgent planning framework highlights the importance of civil society groups in transforming society, sometimes — but not always — through opposition to, or resistance against state practices. Whilst the insurgent planning model leads us to recognise ‘new’ planning spaces it fails to recognise civil society-driven transformation and change through the increasing engagement of groups with the government and other stakeholders. The co-production framework provides an alternative understanding of practices that focus on collaboration of civil society groups with other sectors. Results of this study suggest that, in practice, civil society groups tend to adopt a variety of collective acts, and combine insurgent and co-production planning approaches. A key conclusion of the study is that it is rarely the case that groups favour one approach over the other; rather, it is usually a particular blend of ad-hoc/strategic and opposition / collaboration strategies.

Measuring Residential Satisfaction of High Rise Residential in Kuala Lumpur
Rohaya Ghani, Mastura Jaffar, Mohd Yahaya Mohd Daud; Universiti Sains Malaysia, Malaysia

Residential satisfaction is important in assessing the quality of individual life and it gives an impact to housing environment. Dissatisfaction of residents in high rise residential has negative implication such as financial constraint due to the nonpayment of maintenance charges that ultimately affect the harmony of residents’ living. The purpose of this paper is to identify the factors that influence the residential satisfaction level of high rise residential. The research is based on a survey of medium cost apartments within Kuala Lumpur, Malaysia with the residents as the respondents. Data were drawn from a simple random sampling method. Self administered questionnaire was utilized for data collection and a sample of 283 respondents was used. From the construction of 50 items to measure the level of residents satisfaction based on literature review, the results indicated that three proposed factors were determined. This paper presents significant components in measuring the level of residential satisfaction of high rise housing.

Urban Planning and Sustainability in Developed and Developing Countries
Sadasivam Karuppannan; University of South Australia, Australia

Planning strategies have been the centrepiece of urban planning for a long time. Though they are called by different names such as master plan, structure plan, and strategy plan the theoretical underpinnings of long-term plans for cities and towns have a common origin in scientific approaches to urban planning. The main motive of urban planning can be said to achieve desired shape and structure of cities accommodating the present and future needs of community. Over the last twenty years or so urban planning has embraced the notion of sustainability to varying degrees. There are currently different developed and developing countries in the perception of sustainability and the ways in which planning has dealt with the abstract notion

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of sustainability in long-term plans for cities and towns. This paper reflects on contemporary approaches to urban planning in developing and developed countries and present how sustainability is embedded in planning.

Session 12: Critical Issues in Developing Countries
10:40 – 12:25, Wednesday 5 December 2012, B3-34
Chair: Professor Abu Hassan Abu Bakar

Perceptions of Construction Management: The Case of a South African General Contractor
John Smallwood, Fidelis Emuze; Nelson Mandela Metropolitan University, South Africa

Construction management, which entails the management of both the business of construction and projects, is underpinned by key core competencies, surface competencies in the form of knowledge areas and skills, the functions and activities of management work, the nine functions in an organisation, the eleven construction resources, and the eleven project parameters. Competency relative to the knowledge areas and skills, and the manifestation of core competencies influence the effective management of the functions in an organisation and the resources, and the achievement of performance standards relative to the project parameters using a range of resources. Because of the importance of the above mentioned and the performance of a certain South African general contractor (GC), a case study was embarked upon to identify the perceptions of the three levels of management in the firm. Findings indicate that certain knowledge areas and skills are more important than others; core competencies are important; the functions of management work and activities are generally all important, and certain functions, resources, and project parameters are more important than others. The paper concludes that given the systemic nature of construction — the interconnectedness of functions, processes, activities, resources, and performance parameters, the subsets of all the aforementioned are equally important and that competence relative thereto is critical, and hence the GC’s experience of performance.

Sri Lanka Vehicular Emission Control Project: Successes and Failures
M.M.S.S.B. Yalegama; University of South Australia, Australia

This study focuses on identifying the project management gaps that contribute to the below par success of five year Sri Lanka Vehicle Emission Testing (SLVET) Project, which is currently executed to mitigate the health risk posed by deteriorating air quality on the commuters and dwellers in urban areas. Designed as a foolproof system, SLVET was expected to reduce the exhaust emissions from the aging and ill-maintained vehicle fleet, the major source of urban air pollution. However, 3.5 years into commissioning, it has been unable to implement the project in full. Launched in year 2008 as a Private Public Partnership (PPP), SLVET project encountered several issues relating to institutional structure, legal provisions and project management during project design, planning and execution phases. Even though the air pollution issues existed in urban areas, the legal regime required the project to cover the whole country. At present, technical issues in the testing procedures have caused heavy public concerns in the accuracy of results. Incidents of frauds are frequently reported and contracted parties, in certain instances, act in breach of the contract with government. Planned monitoring systems are still not functional.

This paper appraises the SLVET project to recognise successes, identifies issues and recommends measures to rectify current and possible future issues. All major stakeholders and key personnel who involved in initiating the project were interviewed to obtain views on the current implementation status and recommendations for improvement. The responses indicated that the changing political environment and vested interests of certain key stakeholders have contributed to the project delay. However, it revealed that several issues could have been avoided through the application of project management principles.

Structuring an IBS Micro-Climate Leading to Mechanization of Construction Industry in Developing Countries
C.P. Gomez, Zuhairi Abd Hamid, Kamarul AnuarMohamad Kamar; Universiti Tun Hussein Onn Malaysia, Malaysia; Construction Research Institute of Malaysia, Malaysia

Primarily, Industrialized Building Systems (IBS) is used in Malaysia to achieve higher quality building construction, and accelerate the time of completion of projects. Currently, IBS technology is mainly used on public projects, induced by government policy, focused on industrialization of the construction industry. However, by 2015 with the anticipated amendment of a minimum 40% use of IBS on both public and private projects, as well as the impact of Free Trade Area (AFTA) agreement, it is expected that there will be a two-fold increase in demand of IBS components in Malaysia coupled by a more ‘open’ investment opportunity for new IBS manufacturers as well as expansion of capacity amongst existing IBS service providers. Additionally, with the increasing emphasis placed on meeting the sustainable development agenda, the construction industry is in an unenviable position to resolve its infamous 4D image of ‘Dirty’, ‘Dangerous’, ‘Difficult’ coupled with ‘Delay’. This paper proposes ‘mechanization’ and ‘automation’ as a platform that would steer the Malaysian construction industry in a systemic manner towards achieving a robust IBS value chain infrastructure, viewed within a developing country construction industry capacity building context. The mode of mechanization is to be based on sustainable ‘green’ technology concept. The approach taken is to use the current ‘precast concrete’ manufacturing process. This paper recognises that the advantage of speed and quality is found to be current IBS providers and that public organizations on ad-hoc projects that are seen to disturb the market from developing trends leading towards more stable demand or ‘pull’. Hence, it is proposed for the facilitation of an IBS micro-climate that is driven by industry-oriented practice leading towards a more consistent market demand-pull approach that can steer the industry towards clear sustainability outcomes.

Approaches of Implementing Information and Communication Technologies (ICTs) Within the Construction Industry
M. Reza Hosseini, Nicholas Chileshe, Jian Zuo, Bassam Baroudi; University of South Australia, Australia

Industry in general has seen many technological developments in recent decades. However, the construction industry has not kept up particularly within the context in peninsular Malaysia as a representative case study for analysis. The research findings in the short-term are expected to benefit both the public and private sector in assisting decision making and actively formulating business strategies for the setting-up or expansion of IBS manufacturing plants. This paper recognizes that the advantage of speed and quality is found to be current IBS providers and that public organizations on ad-hoc projects that are seen to disturb the market from developing trends leading towards more stable demand or ‘pull’. Hence, it is proposed for the facilitation of an IBS micro-climate that is driven by industry-oriented practice leading towards a more consistent market demand-pull approach that can steer the industry towards clear sustainability outcomes.
Assessment of the Mentorship Programmes Within the Small and Medium Sized Contractor Development Programme in South Africa
Godfrey Mofokeng, Wellington Didibhuku Thwala; University of Johannesburg, South Africa

The South African government has been implementing various small and medium sized contractor development programmes in an effort to redress the legacy of created by apartheid government. The programmes fulfill such an objective through awarding construction projects to the historically disadvantaged black contractors to enable them develop competent skills, build viable construction firms, create jobs and redistribute wealth. This emerging contractor’s lack capacity to undertake the work and a mentorship programme was put in place to assist the contractors with technical, managerial, contractual and business implementing mentors, which sought to assist in running the construction business. The main aim of the paper is conduct an assessment of the implementation of the contractor development mentorship programme in South Africa using the Free State Province as a case study. A review of literature will be done and Free State Province will be used a case study. Once the assessment of the mentorship programme is done, the paper will make recommendations on how mentorship within the contractor development programme can be improved.

Management Challenges Within Multiple Project Environments: Lessons for Developing Countries
Noor Ismah Hashim, Nicholas Chileshe, Bassam Baroudi; University of South Australia, Australia

In the construction industry, multiple project environments (MPE) exist where more than one project is managed simultaneously. The driving force behind MPEs is the pragmatic allocation of resources encumbered by uncertain economic times. However, MPEs create management challenges that need to be addressed. For that reason, this paper aims to investigate the challenges in respect to managing MPEs within the construction industry. It essentially reviews state-of-art knowledge in respect to MPEs identifying the rationale behind their development. At this stage it would appear that the interdependency and uncertainty within inputs, processes and outputs are major contributing factors to the MPE problem. It is of note that the majority of these findings were based within the context of developed countries. Hence, this review sets out to inform practitioners from developing countries in respect to lessons learned within more developed countries. This review is expected to lead to further investigations on MPEs and their inherent challenges.

A Review of Construction Practices in the UAE: Suggestions for Sustainable Development in Western Australia
Jafar Bagheri Khorasgani; Professional Architect, Australia

There are similarities between the United Arab Emirates and Western Australia, regarding their climate, economy, resource extraction and growth (urban development). Yet new development (construction) in these countries has many problems; they tend to use valuable land, create an unfriendly environment for walking or transit use, and rely on a very long supply chain among many other issues. These new developments are inherently unsustainable; however traditional cities in the Middle East were sustainable. The obvious questions are what has changed and why? What lessons in city building are there for Australia? What are the limitations for uptake by the Australian development industry? Industry intends to develop with the purpose of benefit and business, also to improve and experience new technologies for the benefit of development. On the other hand, sustainability aims to keep options open for the future. The issue of “how and where the development industry and sustainability goals will converge” needs to be addressed.

Unfortunately, current patterns of construction industry have thus far neglected sustainability. By studying and analysing current practices undertaken in the UAE and considering sustainability goals, the research found that sustainability has been neglected in the process of development. This paper seeks to uncover the reasons that construction practices have not kept up with the goals of sustainability in the UAE. Discussing the results, the research will give suggestions for better implementation of sustainability in Western Australia.

Session 13: Sustainable Engineering Practices
10:40 – 12:25, Wednesday 5 December 2012, BJ3-30
Chair: Dr James Ward

Mechanical Properties of Concrete Incorporating Waste Lightweight Aggregate
B.A. Herki, J.M. Khatib, D. Searle, P. Georgakias; University of Wolverhampton, UK

Utilising waste polystyrene (PS) in the construction of lightweight concrete will help improve the problem of disposing this solid waste and ecological imbalance that has been caused due to a high demand of normal weight aggregates for concrete in the construction industry. This paper investigates and presents the results of an experimental study on the effects of waste Polystyrene based lightweight aggregate called Stabilised Polystyrene (SPS) in a composite matrix of clay and cement in concrete. The composite aggregate was formed with 80% waste polystyrene which was shredded to different sizes, 10% red clay dust to improve the resistance to segregation and 10% Portland cement. Effects of SPS aggregate on fundamental properties of concrete were investigated. Three series of concrete with three different W/C ratios of 0.6, 0.8 and 1.0 with varying SPS content ratios of 0, 30, 60 and 100% as partial replacement of natural aggregate by equivalent volume were prepared and tested. The properties of concrete investigated in this paper were compressive strength and ultrasonic pulse velocity (UPV) for series one. The results indicate there is a decrease in compressive strength and UPV with increasing amounts of SPS in concrete. However, acceptable strength is obtained when using high proportions of SPS.

Readiness Towards Environmental-Friendly Practices (EFP) in the Malaysian Construction Industry
Siti Nur Fazillah Mohd Fauzi, Nor’aini Yusof; Universiti Sains Malaysia, Malaysia

It is well-documented that the construction industry is one of the many industries that exploit already-scarce natural resources and further pollute the environment. The bad impact to the environment such as the depletion of the rain forests, green house effect and pollution is too severe, as far as the construction industry is concerned. Hence, there is growing concern among the practitioners on the best measures to protect the environment. One of the solutions is by implementing environmental-friendly practices (EFP). It is, however, uncertain as to what extent is the firm ready for the EFP. Thus, the aim of this study is to measure the readiness of practitioners in the Malaysian construction industry in implementing EFP. Three major practitioners in the construction industry namely consultants, contractors and developers were evaluated based on four attributes: the perceived benefit of the EFP, security, collaboration and certainty towards EFP implementation. The attributes were measured in five scales; from strongly disagree to strongly agree. Then, the data gathered were analyzed using the descriptive statistics from the SPSS software. The results show that for perceived benefit and security, the respondents’ answers had been ‘somewhat agree’ and for collaboration and certainty, the respondents had chosen the scale ‘agree’. The result implies that although the practitioners understand the purpose of the EFP and are willing to share the message about the EFP with their colleagues, they are still unsure about the benefit they will get from the EFP and even have admitted to feel quite insecure about these practices.

How Can Vertical and Horizontal Non-Uniform Environments Enhance the Occupants’ Thermal Comfort (Exclusive Literature Review in Non-Uniform Environments)
Nafiseh Hamidi; University of Melbourne, Australia

This paper is an exclusive literature review on the effectiveness of creating vertical and horizontal non-uniform environments for enhancing the human thermal comfort.
Hydraulic Designs of WSUD Technologies for Stormwater Management in Dhaka, Bangladesh

Faisal Ahammed1, Guna Alankarage Hewa 1, John R. Argue2; 1University of South Australia, Australia; 2SA Water Centre for Water Management and Reuse, Australia

The existing drainage system of Dhaka, the capital city of Bangladesh, considers stormwater as a little useful resource. Its main focus is collecting the stormwater as completely and as quickly as possible and discharging it directly to nearest waterways. This system has failed to drain out the stormwater after medium to heavy rainfall events. This leads flooding during monsoon and stagnant waters become breeding grounds for mosquitoes. A decentralized stormwater management option, like, Water Sensitive Urban Design (WSUD) was investigated for Dhaka’s drainage network. Three practical alternatives including leaky-wells, soak-aways and infiltration trenches were identified and designed. We also developed rainfall Intensity-Frequency-Duration (IFD) relationships required in the design process. We evaluated 100 years average recurrence interval storm using ‘Regime in Balance’ strategy and the hydraulic designs show that a 13-15 m² WSUD technology in 500 m² residential allotment may improve Dhaka’s unsatisfactory stormwater management option into one which is sustainable. The geo-hydrologic conditions: topographic slope, groundwater table, soil hydraulic conductivity and emptying time also support for the installations of WSUD technologies in Dhaka. The approach described in this paper can be equally applicable to other developing countries with similar geo-environmental and socio-economic conditions for minimizing flood frequency and improving stormwater quality and quantity.

To Upgrade in-situ? Pros for Stormwater Management and Drainage in a Johannesburg Informal Settlement

Olumuyiwa Bayode Adegun; University of the Witwatersrand, South Africa

South Africa is home to vibrant cities. The cities are home to low-income informal settlements which account for a notable portion of its population. Government at various levels have shown concern and made efforts towards improving the lot of households in informal settlements. Municipal authorities are however avoiding the typical in-situ informal settlement upgrading approach despite been a feature in the extant housing policy. The paper argues that despite an unsatisfactory stormwater management option in the current informal settlement upgrading approach, in-situ upgrading holds the potential to improve the quality of life and living conditions in informal settlements. It elaborates on three main factors identified as favourable towards stormwater management and drainage improvements for an in-situ upgrading process in the design of an informal settlement in South Africa’s informal settlements. The factors are spatial configuration (order), strong community organization and the potentials of green infrastructure. These potentials can be tapped into for sustainable in-situ upgrading of Slovo Park and any other urban informal settlement with similar features.

Evaluation of Procurement Systems Performance for Mechanical and Electrical Services Towards Effective Delivery of Construction Products

Ajabola Fatokun1, Julius Ayodeji Fapohunda2; 1Yaba College of Technology, Nigeria; 2Cape Peninsula University of Technology, South Africa

This study critically evaluates different procurement mechanisms and approaches practiced in the Nigerian construction industry, and ascertain the appropriateness of each method towards building services installation and project delivery in the industry. Views of scholars and authors on procurement system were reviewed and discussed summarizing the procurements methods. Questionnaires were administered to stakeholders in the industry within the local government areas in Lagos state involved in the procurements of mechanical and electrical services for building projects. The data collected from the questionnaires was analyzed using the statistical package for social sciences (SPSS Version 13) statistical tools. The analysis method in this research study are managed properly, a project will significantly achieve its time, cost and quality objectives, in addition to client satisfaction.

Managing Changes in Construction: A Conceptual Framework

Zhuoyuan Wang, Benson T.H. Lim; University of New South Wales, Australia

The ability of organizations to manage and implement change is the key towards their continued survival in a turbulent and unpredictable environment. This paper attempts to provide an integral conceptual framework, highlighting the plausible factors and organisational attributes driving change management in construction. Under this aim, the specific objectives are to: (1) review the concept of change management and competitiveness; (2) identify the key determinants of organizational change management; and (3) propose a conceptual framework of change management of construction. This paper attempts to provide an integral conceptual framework, highlighting the plausible factors and organisational attributes driving change management.

Fundamental Classification of Innovation Creation and Adoption in the Malaysian Construction Industry

Nor’aini Yusof, Ruhizal Roosli, Ernawati Mustafa Kamal; Universiti Sains Malaysia, Malaysia

This paper reports on the progress of a study to develop fundamental classification in an attempt to differentiate between the terms of innovation creation and innovation adoption within an organisational setting in the Malaysian construction industry. The recent debate on innovation within an organisational setting has shifted to focus on whether innovation is being adopted or implemented because of its major impact on organisational effectiveness. Scholars tend to define innovation as being adopted and created synonymously. Relying heavily on innovation adoption may only
provide a temporary solution to a problem. For each innovation creation or innovation adoption, different skill, resources and culture are needed to encourage each innovation. The argument justifies the need for another study to develop fundamental classification so as to distinguish between the two innovations. The objectives of this paper are to identify the fundamental concept and to classify the criteria of innovation creation and innovation adoption in construction industry. To date, the literatures strongly suggest the framework for identifying and distinguishing between innovation creation and innovation adoption can be classified into 5 major dimensions; i) innovation definition, ii) innovation objective, iii) innovation process, iv) innovation role and v) innovation success factor. The discussion will help to develop conceptual frameworks which provide better understanding about the differences between innovation creation and innovation adoption. In particular, the new fundamental classification of innovation creation and innovation adoption discovered in the study could be used as a foundation for conducting future research to identify appropriate skills, knowledge, culture and resources for such innovations.

**Volatility in Construction: Different Dimensions and Types of Changes**

Zhuoyuan Wang, Benson T.H. Lim, Imriyas Kamardeen; University of New South Wales, Australia

Effective change management has been touted as the next strategic weapon for competitiveness. The aim of this paper is to investigate the dimensions of changes in construction. Under this aim, the specific objectives are to: define and classify the types of changes; and operationalize the types of changes. The literature review reveals that changes in construction could categorise along five dimensions: time; need; effect; process; and environment. Each dimension comprises at least two different types of changes. The identified dimensions and types of changes will be tested in the next stage of a research project, and thereafter the empirical findings will attempt to provide industry practitioners in-depth insights into different constituents of change that could affect their business operation.

**Session 15: Building Sustainable Communities**

13:30 – 14:45, Wednesday 5 December 2012, BJ3-52
Chair: Dr Delene Weber

**The Effect of Project Based Learning on Environmental Literacy of Pre-Service Teachers in Malaysia: The Affective Component**

Shaik Ismail Nazifah 1, Turiman Suandi 1, Azizi Muda 2, Noriati A. Rashid 1, 2Universiti Putra Malaysia, Malaysia; 2Universiti Pendidikan Sultan Idris, Malaysia; 3Institute of Teacher Education, Malaysia

This paper presents an empirical study on the effect of project based learning approach on the environmental literacy of pre-service teachers. The research was applied to students from the Institute of Teacher Education Malaysia. A fifteen-week environmental education course was delivered through the method of project-based learning in the experimental group while the control group were taught using traditional lecture. The project study only discussed data from the pre-test and post-test survey administered on the students before the treatment (pretest) and after the completion of the environmental education course (posttest). MANOVA and t-test were used in the analysis of the data to show the differences within and between the means of the scores from both experimental and control group. The present study only discusses the result for the affective component of environmental literacy. The analysis based on the total scores shows that the experimental group differs significantly to the control group in terms of the affective component of environmental literacy. However, further analysis based on the subscale level shows that the scores for the experimental and control group is significantly higher for only two out of the three subscales of affective component of environmental literacy namely for “Attitude and Values for the Prevention and Remediation of Environmental Problems and Issues” and “Perspective on Environmentally Responsible Behavior” subscales than the “Environmental Sensitivity/ Awareness” subscale. No significant difference was observed for the “Environmental Sensitivity/ Awareness” subscale. For the most part, based on research findings, it can be asserted that project based approach is effective in reaching targets for environmental education. Additionally, suggestions concerning future research are provided.

**The Importance of Engagement in the Creation of Icon Developments That Promote Sustainable and Healthy Communities**

Denni Russell, Delene Weber; University of South Australia, Australia

A redevelopment of the Queenscliff Harbour in Victoria was completed in 2009 following extensive community consultation. The project was designed to be a community centrepiece that promoted sustainability. This paper explores the importance of community engagement in the creation of major icon developments that deliver benefits to the community. This is achieved through investigation of the satisfaction residents and tourists have with the redevelopment and the consultation and planning process preceding the redevelopment of the precinct. In addition the perceived personal and community benefits people associate with the harbour area were investigated. The physical recreation values of the development were assessed using a questionnaire for observing play and recreation in communities developed by Mackenzie et al (2006). This indicated the site is not frequently used for vigorous physical activity, rather it is a site for leisurely strolls and a meeting place for coffee. Results suggest some tension between local residents and developers in terms of the consultation process. Specifically, a concern existed that input from the community was not adequately considered in the final plans. The greatest use of the area was by tourists who demonstrated a high degree of satisfaction with the development. Local residents, on the other hand, reported lower levels of satisfaction. This paper highlights the need to have clear objectives, to understand the public and what types of participation are appropriate. It also offers a set of recommendations for managers on how to build better community support for future major projects.

**Social Carrying Capacity in Langkawi Island, Malaysia**

Maryam Yousef, Azizan Marzuki, Alireza Jalali; Universiti Sains Malaysia, Malaysia

In recent years, both scholars and tourist destination managers have focused on social carrying capacity. Although there is an expanding volume of research on social carrying capacity, this field is relatively new in Asian tourism destinations as a whole and in Malaysia in particular. The long term aims of this study are 1) to measure social indicators of carrying capacity in the Langkawi Island, and determine thresholds when perceived impacts for these indicators reach unacceptable levels 2) to estimate the extent to which indicators of carrying capacities are currently being exceeded and if this is impacting tourist experiences and 3) to determine the extent to which conflicts exist among various recreation activity groups. It will be supposed that the findings of this study could contribute to both theoretical and practical perspectives on the subject of social carrying capacity.

**Conerving Cultural Heritage: A Malaysian Stakeholder’s Perspective**

Kamarul Bahrain Shuib1, Habshah Hashim 1, Barbara Koth 2, 1Universiti Teknologi MARA, Malaysia; 2University of South Australia, Australia

The importance of rural landscape as cultural heritage has to do with how people perceive or value the outdoor aesthetic. Very little is known about the variability between cultures in the perception of such natural and altered landscapes. Due to increasing threats of urbanization, land development and technological advancement, an understanding of the community’s perception and the manner by which people associate meanings to ordinary landscapes and built structures will aid in the formulation of strategies for rural landscape conservation. This paper presents the perceived landscape values held by communities of interest in Kedah, a northern state in Peninsular Malaysia. Using Q-sort methodology the research examined how stakeholders characterised landscape
innovative method of this paper lets us identify aspects of personal
preferences. This research presents some early findings of the research. The
window-view and whether urban background has any influence on
deployed to identify the preferred elements of their workplace
Kevin Lynch's and Brian Goody's 'mental images' method is
this question, this research focuses on individuals' perception
perceive nature from their views differently? In order to answer
be leading to the sense of the estrangement from nature and
suburbia. Can this lack of contact with natural environments
get an overview of this issue, a comparison was made of individuals
dramatically reduces the interaction with natural environments. To
Leila Mirza, Michael Linzey, Hugh Byrd; University of
Natural Environments

The Impact of Urban Background on Appreciation of
Natural Environments
Leila Mirza, Michael Linzey, Hugh Byrd; University of Auckland, New Zealand

For the first time in human history, more than half of the world’s population lives in towns and cities. The acceleration of
habitat alteration as well as the prevalence of modern lifestyle dramatically reduces the interaction with natural environments. To
get an overview of this issue, a comparison was made of individuals who experience nature on a daily basis by living and playing in
suburbia. Can this lack of contact with natural environments be leading to the sense of the estrangement from nature and consequentially fewer tendencies to invest in its protection?

This paper hypothesizes that this sense of estrangement which can occur due to the lack of daily contact with nature can impact on the way people perceive and value natural environments. The research question is, "Do people with varying urban backgrounds perceive nature from their views differently?" In order to answer this question, this research focuses on individuals' perception about their workplace window-view. In addition to questionnaire, Kevin Lynch’s and Brian Goody’s 'mental images' method is deployed to identify the preferred elements of their workplace window-view and whether urban background has any influence on their preferences.

This paper presents some early findings of the research. The innovative method of this paper lets us identify aspects of personal appreciation and personal values related to individuals' lives and lifestyles. In the process of analysis, produced mental images are tested against photographs taken from participants' workplace views. At the end, the conclusion highlights similarities that may appear between maps of people with a comparable urban background.

Urban Heat Island Effect Mitigation in Rapidly
Developing Cities: Case Study of Dubai Marina
Ehsan Sharifi, Steffen Lehmann; University of South Australia, Australia

Cities in developing countries are expected to accommodate up to 50% of the global population by 2050. Huge demands for energy, natural resources and mobility in these rapidly growing cities make them major contributors to global warming, with 80 percent of the CO2e emitted. In summer, however, cities experience the effect of additional heat storage, that is trapped in thermal mass and can result in the city centre being significantly hotter compared to the pre-urban surroundings (frequently up to 4.5 °C or more), which is called the Urban Heat Island (UHI) effect. Changing land surfaces, anthropogenic waste heat and trapping sunlight heat in buildings' mass have been cited as the main contributors to the UHI effect. As developed cities' substantial energy consumption and concomitant heat production, public life in most metropolitan areas is suffering from the UHI effect during summer nights, when night-cooling is not effective at pedestrian level.
This paper aims to compare the UHI mitigation strategies of historical cities of Bushehr (Iran) and Sana’a (Yemen) with the contemporary development of Dubai Marina (United Arab Emirates). Shadow patterns, wind flow, vegetation ratio and other materials are studied to investigate their effectiveness on microclimate moderation in hot and humid climate. The study benefits from aerial and on-spot photos and existing climate and spatial databases as primary sources. Secondary data is produced by using Feature Extraction methods and analytical diagrams. A quantitative analysis chart based on Strengths, Weaknesses, Opportunities and Threats (SWOT) is being used for further discussion.
The results indicate that increasing the use of permanent shadow, natural ventilation, light and permeable materials and vegetation can contribute to mitigation of the UHI effect, while the use of surface water, car-oriented transport systems and free standing building layouts would magnify the UHI effect in hot and humid climates. The outcome of this research is a set of design guidelines for developing cities in hot and humid climate to facilitate UHI mitigation in urban planning.

Is Urbanised City Sustainable? A Case Study of
Denpasar, Bali
Tri Angraini PrajnaWrddhi, Alpana Sivam, Sadasivam Karuppanan; University of South Australia, Australia

Sustainability is one of the most important themes and many aspect of development are related with sustainability. Environmental degradation in developing countries has become a serious issue and a lot has been done to minimise it and promote sustainability. Bali is one of the most favourite tourist destinations in the world. New developments supporting tourism industry has become a priority and has resulted in unprecedented growth in Denpasar island covers 2.27% of the Bali Island. This city has transformed to cope with the demand for infrastructure and services. Population in Denpasar has grown by 4.05% by per year and it remains as the fastest growing city in Indonesia. With 788,455 people spread over an area of 127.98 sq km, the density is about 6,170 persons per sq km in Denpasar. This paper attempts to discover the quality of urban vitality in Denpasar by assessing it through Urban Design Principles. The findings would improve the urban vitality to achieve a sustainable city for Denpasar.
Joint-Venture Home Financing: A Fair Alternative to Interest Based Mortgage Scheme

Imriyas Kamardeen; University of New South Wales, Australia

Owning a home is a great challenge for families in developing countries. Because of high interest rates, inflation rates and low income levels of families in developing countries, mortgage loans also qualify unaffordable for many families. Moreover, the mortgage loan scheme is disadvantageous to borrowers and the national economy in many ways. An alternative home financing method, called joint-venture home financing, is developed where: (1) the traditional model of lender-borrower relationship is re-structured into joint-venture partnership, (2) fairness in home financing is established by adopting a trade-based home financing model, and (3) housing affordability is improved for middle-to-low income families. The effectiveness and fairness of the proposed new financing model is proven with a scenario-based analysis. The new model can pave the way to resolve many economic problems caused by the conventional mortgage scheme and housing unaffordability.

Sustainability Practices in Organizations: Comparative Analysis Between Australia and Malaysia on University Facilities Management

Mohamad Sufian Hasim, Stephen Pullen, Alpana Sivam; University of South Australia, Australia

Sustainability practices at an organizational level are becoming more important in achieving the sustainable development goal. Over the last few decades, there have been a number of studies on organizational commitment towards adopting sustainability practices. However, most of the studies were for developed countries rather than developing countries. Furthermore, little has been written about sustainability practices in the facilities management field for university organizations and none of these studies have been comparatively investigated between developed and developing nations. This paper proposes a comparative case study analysis on the extent of sustainability adoption in Australian and Malaysian universities with the focus on facilities management practices. It also identifies potential factors that influence sustainability outcomes. Data collection was through online self-administered questionnaires. The survey was carried out across Australian and Malaysian universities and directed to 216 managerial positions in facilities management departments. The survey achieved a total response rate of 50%. Analysis of data revealed that sustainability is widely adopted in facilities management practices for both countries with comparatively no major differences between them. However, Australia is leading with two sustainability indicators concerning economic and environmental initiatives and Malaysia was found to be more advanced in social considerations. A few potential drivers were detected in the Australian context such as a high commitment from top management; various pressures from stakeholders; policy and plan in place; availability of knowledge enhanced programs and reporting. This research provides useful insights for universities in both countries in relation to the commitment towards sustainable facilities management practices with the opportunity to learn from others for future improvement and adds to the literature on developing a sustainable university.

Capability Factors in Implementing Industrialised Building Systems in Malaysia: The Building Contractor’s Perspective

Mohd Hanizun Hanafi, Mohd Nurfadzi Mat Nah, Arman Abdul Razak, Shardy Abdullah, Mohamad Adhar Yahaya; Universiti Sains Malaysia, Malaysia

In the efforts to modernize and further develop the construction industry, as well as to increase the industry’s levels of effectiveness and efficiency, particularly in Malaysia, the Industrialized Building System or more commonly known as the IBS, is one of the systems that have been developed towards achieving this end. Various initiatives have been promoted to encourage the more extensive use of this system within the nation’s industry. However, in ensuring a more increased implementation of IBS among contractors, a study on the capabilities of these firms (in reference to building contractors) has to be initially conducted to gauge whether the promotional efforts undertaken are in-line with the contractors’ capability levels. With that in mind, this study is undertaken with the aim of identifying the main factors that will enable a heightened usage of the IBS in construction firms within Malaysia. This study was conducted by means of a quantitative method where the respondents involved comprise of IBS contractors operating in four Malaysian foremost states, namely the Federal Territories, Selangor, Penang, and Johor. A simple random sampling approach was used in determining the study respondents. Some of the statistical analyses adopted in this study were the factor analyses, the mean analysis as well as reliability analysis. Findings derived from these analyses have indicated that the initial action and knowledge seeking attitude press, as the most important factors that enable increased capability levels among contractors in implementing the IBS within the Malaysian construction industry.

Facilities & Services Performance (FSPerf) as a Measuring Tool to Evaluate Students’ Living Experience in the On-Campus Housing

Nurul ‘Ulyani Mohd Najib, Nor’aini Yusof; Universiti Sains Malaysia, Malaysia

The arguments on residential satisfaction topic have boomed a few years ago and have been fiercely debated in a variety of house settings and research areas especially in the family house setting related to the factors affecting overall residential satisfaction, loyalty behaviour involved in rented houses, and many more. Nevertheless, beyond those scopes, this article focuses on the in-depth discovery of the suitable methods that should be used to assess the living experience among the students who stayed at the university’s on-campus housing. Previous researchers have discussed more on this topic and several measurement tools that were useful to assess this living experience have been introduced. For example service quality (SERVQUAL) method, residential environmental satisfaction scale (RESS), household satisfaction index (HSI), and etc. But, the rationale of this paper is to elaborate extensively on the facilities and services performance (FSPerf) method which imitated and based on the service performance (SERVPERF) method, as the most accurate measuring tool to evaluate tertiary students’ living experience. Hence, this paper proposes and envisages that the integration between tangibles, reliability, responsiveness, assurance, empathy, and etc.诈量ly dimensions can contribute to the aim supporting an extremely good on-campus living experience for tertiary students. Therefore, this study was based on a comprehensive and conventional review and analysis of the definitions from a series of texts and journals. This paper starts by defining the living experience in the on-campus housing, subsequently followed with the deliberation about measurement tools to evaluate the living experience in the campus house setting, and lastly, discussion on the adopted and adapted facilities and services performance (FSPerf) method.

Unallocated

Citizens Perceptions Towards the Use of Green Facades in the Built Environment of a Developing City (Shiraz)

Niaz Esmaili, Shahram Zare; Islamic Azad University, Iran

Local governments are attempting to achieve development programs based on the rate of population growth and the requirements and expectations envisaged by their citizens. It is inevitable that this impatience will happen eventually, but in any case it seems that it is merely for posterity, and people who are now living in cities cannot enjoy the outcomes of such development programs due to the extensive infrastructure changes required. This paper argues that designing innovative urban systems on a small scale can improve the qualities of urban life in the short term, with long term visions.
This paper focuses on the built environment. It is argued that the relationship between culture and environment can benefit developing countries by encouraging the use of their local resources to achieve more livable urban environments.

Highlighting natural landscapes in cities can be an effective method to improve the spirit of society. Using nature and providing urban greenery, especially in residential areas which have a reasonable percentage of building facades under personal ownership could be beneficial and more practical for improving livability of the built environment.

This case study is based on Shiraz, one of the great cities of Iran. We believe that the usage of vegetation in urban facades is a crucial action plan, not only for our country but also in most developing countries that are now changing their architectural styles. As for Shiraz, in contrast to the past when people had an indoor-oriented life style and the walls were relatively tall with very limited openings towards the streets, nowadays, architects are trying to design more outside-oriented buildings, in which the usage of landscape features and green facades promote environmental diversity and quality.

Finally, the vernacular and contemporary architecture of Shiraz will be discussed, with special attention being given to green facades as a small scale design solution for changing the urban space image in this city or maybe in other developing cities.

Living Condition — The Key Issue of Housing Development in Beijing Fengtai District

Wen Tao Liu, Rahmat Azam Mustafa; Universiti Sains Malaysia, Malaysia

Good life cannot be achieved without having good living condition. Living condition is the most important factor for people’s lives. In Beijing Fengtai District, the second largest district in Beijing (area: 306 square kilometers; population: 1,360,000), with three types of housing that had been chosen for the survey: apartment, traditional house and terrace house. The objectives contained in this research are to study residents’ perspectives and preference in the future living condition in Beijing’s Fengtai District. Also, the study is to know the government’s opinion on living condition and for future housing development. The close-ended questionnaire with the five-point Likert scale is used as the study methodology. It includes eight attributes of living condition, residents’ opinion on living condition now and preference in the future. A random sample was selected in order to choose the potential respondents for the survey purposes. Total of 400 respondents’ answers were analyzed through the SPSS (Statistics Package of Social Science). Additionally, residents’ positive satisfaction can also produce the high return rate to the housing development.
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