

REPORT 8

**MALAYSIAN OUTLINED PAPER
ON CIB W82 PROJECT
«SUSTAINABLE DEVELOPMENT
AND FUTURE OF CONSTRUCTION»**

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NATIONAL REPORT

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1. INTRODUCTION

This paper was prepared with the aim to form part of the International Synthesis of result of CIB W82 Project on «Sustainable Development And The Future of Construction». On 19th March 1998 at CIB W82 project meeting in Paris, Malaysia was invited to submit a brief outlined national paper by 1st May 1998 to enable the Coordinator to incorporate into project paper which will be presented at CIB World Building Congress 1998 in Gavle, Sweden 7-12 June 1998.

Thus, this paper briefly outlined Malaysian scenarios and vision by the year 2010 in the realm of construction industry.

2. DEFINITION OF SUSTAINABLE CONSTRUCTION

The definition given by Kibert is to be adopted, that is, «the creation and responsible management of a healthy built environment based on resource efficient and ecological principles».

3. NATIONAL CONSTRAINTS AND SPECIAL ISSUES

The following issues were identified :-

- 1) Large proportion of the population lives in urban settlements.
- 2) Illegal immigrant create economic and social problems.
- 3) The availability of land, air and water of good quality is a problem.
- 4) Mushrooming of squatter settlements.
- 5) Means for cooperation and large-scale responsibility toward sustained development still exist.
- 6) Unsustainable urban sprawl.
- 7) Depletion of forest.
- 8) The hot climate needs policy to sustain the energy as most houses have installed air-conditioning units.
- 9) The volume of road vehicles is alarmingly responsible for the emission of Co₂.
- 10) Management of Toxic and Industrial waste needs to be reviewed.
- 11) Environmental protection during the construction process.
- 12) Utilization of imported building technologies and materials.

4. ANSWER TO THE MAIN QUESTIONS

4.1 Cities and settlements in 2010

- 1) Denser cities with dense urban buildings of low and high rise.
- 2) More low-rise suburban buildings, less apartment houses, smaller scale and village-like environment.
- 3) Demolition or refurbishment of inferior urban and suburban housing.
- 4) More greenery and greener urban areas, careful planning of non-built land.
- 5) Functionally more integrated and more heterogeneous cities.
- 6) Teleworking will be more common which allows workers to live in less urban or in rural areas.
- 7) Enhanced public transport system and central pedestrian areas.
- 8) Efficient energy distribution and utilization.
- 9) Adequate and clean water supply.
- 10) Integrated waste management system.

4.2 Building

- 1) High and good quality, no quality defects.
- 2) Flexibility, multiple use, functionality of building.
- 3) Small amount of new building, utilization, economic renovation and modification of existing buildings.
- 4) Small energy consumption, energy conservation, autonomous energy production, energy-economic construction, new energy sources, energy storage.
- 5) Long/short service life, life cycle costs.

4.3 Design and construction

- 1) The needs of the user, the participation of the client/user.
- 2) The increasing amount of design work, more demands for design, more investments to design work.
- 3) The importance of ecological knowledge, life-cycle analysis, environmental and ecology databases or other information systems, ecological profile data.
- 4) The importance of local natural conditions and environment.
- 5) Optimum use of passive solar energy.
- 6) The increase of construction on-site, specialized on-site construction.

4.4 Materials, services, components

- 1) Recycling and re-use of materials, products and equipment.

- 2) Recyclableness of materials and ease of demolition.
- 3) Easy repairs and service of equipment, little need of repairs, durability, long service life.
- 4) Economic use of resources, renewable natural resources (like wood), small energy content of materials.
- 5) Healthy non-poisonous and non- allergenic materials.

4.5 Skills and standards

- 1) Skills, qualified labour, expertise.
- 2) Autonomy and responsibility of labour, quality production.
- 3) The ability to handle both new and old materials.
- 4) Flexibility of regulations, non-descriptive regulation.
- 5) The importance of life-cycle and overall performance.

5. CONSEQUENCES TO CONSTRUCTION INDUSTRY IN 2010

5.1 Consequences to built environment

(1) LAND

- 1) Limited amount of space available.
- 2) Less flexibility in future planning.
- 3) Conserved open space and green areas.
- 4) Combined transport corridors.

(2) ENERGY

- 1) Integrate town planning and energy management.
- 2) Depletion of energy resources.
- 3) Reduced energy consumption.

(3) TRAFFIC

- 1) Restricted mobility.
- 2) Reduced noise and air pollution.
- 3) Integrate side development with advanced public transport systems.
- 4) Optimized capacity of existing transportation networks.
- 5) Create new transport networks.

(4) WATER

- 1) Combined use of drinking water and grey water.
- 2) Closed system, non run-off to sewage system.

(5) MATERIALS

- 1) Use of local materials.
- 2) New in-situ diagnosis and repair techniques.

(6) OTHER ASPECTS

- 1) Social sustainability.
- 2) Public involvement in planning.
- 3) Maintain rural settlement structure.
- 4) Imply ecological principles in physical planning.

5.2 Consequences to initiating and designing**(1) LAND**

- 1) Efficient use of land.
- 2) Intensive use of land.

(2) ENERGY

- 1) Integrated design for energy efficiency.
- 2) Refrain from air conditioning.
- 3) Passive cooling and lighting.
- 4) Safeguarding indoor environment.

(3) WATER

- 1) Drinking water conservation.

(4) MATERIALS

- 1) Durable, non-toxic, recyclable and reusable.
- 2) Durable coating system.
- 3) Design for disassembly, short lived components.
- 4) Local materials, traditional and non-traditional construction.
- 5) Lightweight construction.

(5) OTHER ASPECTS

- 1) More information and communication.
- 2) Customer participation.
- 3) Environmental accounting of building.
- 4) New building designs taking account of tele-working and IT applications.
- 5) Optimization through eco-balance tools.
- 6) Integration of building functionalities.
- 7) Post completion design assessment.

5.3 Consequences to construction and demolition

(1) LAND

- 1) Ensure flora and wildlife protection.
- 2) No blasting to create building site.

(2) ENERGY

- 1) Minimize transportation.
- 2) Energy saving refurbishment.

(3) MATERIALS

- 1) Produce operating manuals for building systems.
- 2) Construct for disassembly, modular approach.
- 3) On site waste management.
- 4) Refurbishment without nuisance to occupants.
- 5) Labelling of products to facilitate selective removal and recycling.

(4) OTHER ASPECTS

- 1) Turn key process.
- 2) Increased partnership between designers, contractors and manufacturers.
- 3) Quality standards for whole building.
- 4) Improved working conditions.
- 5) Business opportunities for recycling.
- 6) Improved site logistics.

5.4 Consequences to operating and maintenance

(1) ENERGY

- 1) Easy retrofit of energy saving system.

(2) WATER

- 1) Establish tools and systems for water management.

(3) MATERIALS

- 1) Planned maintenance and refurbishment programmes.
- 2) Decision support systems to consider between refurbishment or demolition.
- 3) Adapt building for future needs.

(4) OTHER ASPECTS

- 1) Better control of indoor air quality, noise and health risks.

- 2) Tools for control.

5.5 Consequences to components, materials, services and assembly

(1) ENERGY

- 1) Passive and hybrid technologies for cooling.
- 2) Passive lighting systems.
- 3) Systems for easy retrofit in existing buildings.

(2) WATER

- 1) Integrate saving system into building design.

(3) MATERIALS

- 1) Logistics for reuse and closed-loop recycling.
- 2) Exchangeability of components through standardized dimensions.
- 3) Renewable and durable materials.
- 4) Use of local resources.
- 5) Development of new materials for easy retrofit.

5.6 Consequences to skills and standards

- 1) Qualified labour.
- 2) More specialization in environmental issues.
- 3) Performance based building regulations.
- 4) Integrated knowledge of whole building process.

6. RECOMMENDATIONS

6.1 Policies

- 1) Continue and reemphasize existing regulations and strategies.
- 2) Review and develop measurable performance standards.
- 3) Promote interdisciplinary training and courses.
- 4) Promote awareness and R & D on Sustainable Development.

6.2 Design

- 1) Develop new design standards.
- 2) Adopt open system.
- 3) Adopt and adapt jointing and assembly techniques.
- 4) Impose minimum recycled material content.

- 5) Consider environmental qualities of material.
- 6) Adopt more integrated approach to design process.

6.3 Manufacturing

- 1) Product development base on life cycle consideration.
- 2) Practice better waste management.
- 3) Practice reliable labelling scheme.
- 4) Reengineer production process of standardized elements.

6.4 Construction

- 1) Reduce environmental impact during process.
- 2) Reengineer process to meet the concept of open building.
- 3) Increase partnership with designers and manufacturers.

6.5 Operation and maintenance

- 1) Establish maintenance programs.
- 2) Develop and apply decision support system for refurbishment.

7. CONCLUSION

To meet the challenges to strengthen the ability to pursue the fundamental policy of achieving sustainable development and national unity, a number of new strategies need to be formulated. The Development Plans need to retain, reemphasize and continue to give serious attention to strategies for generating sustained and improved economic growth. It will also address the need to balance growth with the protection of the environment and indigenous natural resources.