Overview on The Development of Green Buildings Codes for Kuwait

National Committee of Building Codes in Kuwait

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Chair of Green Buildings Technical Team
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Introduction

• Vast government investment in improving the national infrastructure is anticipated to drive the construction industry. The government is planning to spend KD 37 billion during the 2010-2014 within the Development Plan.

• Within the GCC Construction pie, almost 67% of the total value of projects fall under the Buildings classification. Buildings classification comprises of Buildings as well as Industrial projects.
Construction Industry Practices

Imported standards (American & British):
  • No complete standards that fits this region.

Lack of clarity of contract documents:
  • Incomplete information.
  • Low quality drawings.

Poor management of construction sites:
  • Low health & safety standards.
  • Poor construction waste management.
Why Buildings

• Within the GCC Construction pie, almost 67% of the total value of projects fall under the Buildings classification. Buildings classification comprises of Buildings as well as Industrial projects. The proportionate percentage for Energy and Infrastructure remained at 19% and 14% respectively across all countries in GCC. *

*GCC Construction Industry - Facts and Figures Ventures Middle East, July 2010, Pages: 22
GCC Construction Projects

- Buildings: 67%
- Infrastructure: 14%
- Energy: 19%
Environmental Impact of Buildings

• High Energy Consumption
• Materials Exhaustion
• CO2 Emissions
• Waste Production
• Natural Sites Disturbance
• High Water Consumption
• Human Health: Sick Building Syndrome, VOC’s, Emissions.
Energy Consumption in the United States by the Different Sectors

- Buildings: 49%
- Transportation: 28%
- Industry: 23%
Energy Consumption in the United Kingdom by the Different Sectors

- Buildings: 44%
- Transportation: 34%
- Industry: 22%
Electricity Consumption in the United States by Different Sectors

- Buildings: 76%
- Transportation: 1%
- Industry: 23%
CO2 Emissions in the United States by the Different Sectors

- Buildings: 47%
- Transportation: 33%
- Industry: 20%
The need for Building Codes

Threats to life & inhabitants

High Energy Consumption Rate

Resources Exhaustion

Demand for Unified Sustainable Construction Codes
• Many serious trials by different governmental entities for setting the Construction Codes of Kuwait have faced obstacles trying to apply and implement international codes and standards.

• However, all agreed on the importance and necessity of setting the **sustainable codes** for the three main objectives:

2. Reducing Negative Environmental Impact of Construction, on Air Quality, Waste, Pollution and Environmental Degradation.

3. Protecting Occupants health and providing better quality of life
Establishment of KNCOBC

- National Committee of Building Codes of Kuwait (NCOBC) was established by the Council of Ministers’ Decree # 1145, dated August 16th, 2010.
Structure of KNCOBC

Kuwait Municipality

NCOBC

Technical Team

Concrete Code Team

Energy Code Team

Fire Code Team

Strategic Team

Green Buildings Team
Eng. Alia Al-Sayegh
Chair
Certified Green Specialist - QSAS

Academic Background
Bachelor of Civil Engineering, 2001
College of Engineering and Petroleum, Kuwait University

Professional Experience
- 2001-2007: Civil Engineer in Ministry of Public Works
Special Experience: Sustainability and Green Buildings since 2007, participated in the existence and creation of Green Buildings Industry in Kuwait through lecturing, expo’s, conferences as well as projects.

Main Projects:
• The New Post Hotel - Germany
• Wavy Bay Complex - Oman
• Educational: Higher Institute of Energy, College of Technological Studies - Kuwait
• Expropriation for Public Welfare Headquarter Building - MPW – Kuwait
• The Heritage Village Project - Kuwait

Certificates
• Associate Value Specialist – SAVE-Int.
• Certified Green Specialist - QSAS
Dr. Hasan Kamal
Program Manager - Building and Energy Technologies - KISR

Academic Background
Ph.D. Civil Engineering, 2001
  University of Maryland at College Park, USA
M.Sc. Civil Engineering, 1996
  Kuwait University, Kuwait
B.Sc. Civil Engineering, 1990
  Kuwait University, Kuwait

Professional Experience
• Kuwait Institute for Scientific Research (1993- Now)
  ▪ Program Manager - Infrastructure Risk and Reliability Program
  ▪ Associate Research Scientist – Building and Energy Technologies Department
• Ministry of Public Works (1990-1993)
  ▪ Department Manager - Maintenance Engineering Division

Research Interest
• Structural engineering
• Reliability analysis and assessment
• Soil and cavity treatment
Arch. Maryann Alexieva
BREEAM-International Green Building Assessor

Academic Background
Master Degree in Urban Design, Architecture -1975
The University Of Architecture and Civil Engineering–SOFIA, BULGARIA

Professional Experience
- 35 years in the field of Urban Design, Architecture, Interior Design, Management and Construction Administration
- Special Professional Fields: Sustainable Development & Green Building Design, Journalism, Historic Preservations and Development
Main Projects: Large scale urban & regional design & architecture in Bulgaria and Germany
Kuwait- headquarters and commercial colleges -KOTC, Kuwait Trade Centre, TEC, EPA, LAL, EPWD,
College of Technological Studies, Higher Institute of Energy
Interior design: Heritage Village Project

Certificates
- Consultant in the field of design by the Kuwait Society of Engineers- KSE # 17233
- BREEAM-International Green Building Assessor
Arch. Zlatka Ormanova  
Sustainability International Consultant

**Academic Background**
Master Degree in Urban Design, Architecture -1975

**Professional Experience:**
- Sustainable Regional development: strategic planning, sustainable spatial and urban development; international projects management for environmental and bio-diversity protection and social economic development, and coastal zone management, environment and health-national action plan funded by UNDP, WB, IUCN, British Know-How Fund – Ministry of regional development and public works, Director “Regional development” Directorate and “European coordination and international cooperation” directorate;
- Legislation in the above mentioned areas and its harmonization with EU regulations and best practices;
- Lecturer in EU sustainable urban development policy – University for Architecture, Construction and Geodesy, Sofia, Bulgaria;
- Training in the field of sustainable regional development and environment protection: Cambridge-UK, Tokyo-Japan, Soul-South Korea, Dortmund-FR Germany (Design and construction, in-service training in GD “Regional Development”-EU Commission, Brussels, USEPA, others
- Membership: Bulgarian union of architects, Japan international cooperation agency (JICA), Korean international cooperation agency (KOICA).
Arch. Abdul Hafeth Al-Mujaibel
LEED Accredited Professional from the U.S. Green Building Council

Academic Background
Bachelor of Architecture, 2002
Kent State University, USA

Professional Experience
More than 9 years in the field of design & construction.
Companies:
• Pan Arab Consulting Engineers
• KEO International Consultants
• Public Authority for Housing Welfare
Projects:
• The Avenues Phase III – Shuwaikh, Kuwait
• GUST- Mishrif, Kuwait
• The Pearl, Porto Arabia – Doha, Qatar
• Al-Reem Mall & Condominiums – Abu Dhabi, UAE

Certificates
• Professional Engineer Certificate from Kuwait Engineering Society.
• LEED Accredited Professional from the U.S. Green Building Council.
Goals

1. the ultimate goal- to work towards sustainable built environment which is aligned with the internationally accepted sustainability values

2. to create codes, standards and practices as integral and coordinated part of the building /construction process

3. to coordinate with other teams and to contribute to integrated construction building construction system of codes, standards and practices
Objectives

1. Team- set up activities to define the roles and responsibilities within the team
2. Setting the objectives to achieve the goals
3. Setting of the work programme and needed coordination
4. Defining the necessary studies/existing practices/ the road map to achieve the goals
5. Defining terms and terminology
6. Defining the milestone documents/separate reports/
Challenges of Green Approach

1. Lack of Economical Driving Force
2. Social Factors (awareness & knowledge)
3. Shortage in Local experience, specialists and expertise
4. Privation of adopting governmental authority
5. Reliance and/or Conflict with other building regulations
6. Lack of incentives
7. Poor Green Market
Our Start


• Review of Major Existing Systems; International & Regional
GBT Team - Work Stages

• To reach the assigned goals and objectives in the best way, the GBT team agreed to work in the following stages:

1- Studies & Application of GB Systems
2- Elaborating Green Building Standards
3- Elaborating Codes and Regulations
4- Monitor and follow-up with the developments of Authorities Implementing the issued standards & codes.
Stage I : Studies & Application of GB Systems

• Stage Kickoff : Nov, 2010
• Stage Report issued : Feb, 2012
• Report Title : Report #1 : Fundamentals for Establishment of Sustainable Design Standards and Code in the Construction Field of Kuwait
• Pending : Finalizing Assessment on the case study project.
Report #1 consists of 3 Parts

• Part I : Includes detailed studies about the Buildings and their environmental impact.
• The studies covered the following issues :
   Why Buildings
   What makes sustainable construction a priority
   What makes sustainable urban design a priority
Further aspects to consider for building/construction sustainability

Construction materials and products

Environmental Site and building design

Key issues to consider as part of designing/building GB

Opportunities for Green Transformation in the construction sector

Steps toward creation of GB standards & Codes
Part I (Cont.)

• National Conditions to date affecting sustainable building design and Construction:
  ➢ Meteorological Conditions of Kuwait
  ➢ Cultural and historical specifics in architecture
  ➢ Construction industry to date in Kuwait
  ➢ Biodiversity and climate change in Kuwait
  ➢ Coastal and marine ecosystems
  ➢ Regulatory framework to date
  ➢ Institutional framework to date
  ➢ UNDP Kuwait: Environment & Energy
Part I (Cont.)

- Green Practices across individual GCC countries:
  - Brief information on environmental conditions
  - Construction Market in GCC
  - Major GB projects in the Gulf
  - Environmental sustainability in tradition architecture
  - Biodiversity and protected areas
  - Policies and initiatives
  - Legislative initiatives
  - Institutional developments
  - Civil Society
Part II

• This part of the report includes:
  ➢ Review of International GB rating systems
  ➢ Regional GB rating systems
  ➢ Analysis and Comparisons between systems
  ➢ Findings and recommendations
Review Phase

• GB Team reviewed the following systems:
  - LEED
  - BREEAM
  - Green Star
  - Estidama
  - QSAS
Scope of Review

• Background
• References & Standards
• Methodology (Assessment Procedure)
• Categories/ Classifications
• Criteria
• Rating
• Local Compatibility
Findings

• All systems share the same major goals and concerns in: Site Sustainability, Energy Efficiency, Water Efficiency, Occupants Health, Materials Use.

• However, Systems differ in: background, methodologies, standards, rating method, specific criteria and special considerations.
Recommendations

• Team members recommended the Primary System QSAS and the Reference System BREEAM-Gulf.
• This was supported by the recommendation of The First Forum of the GCC Unified Building Code, 11-13 October, 2010
• As well as the Saudi Forum of Green Buildings, 16-18 October, 2010.
Working with QSAS

• Team members attended several meetings with Barwa & Qatari Diar Institute “Founders of QSAS” - currently known as Gulf Organisation for Research and Development (GORD).

• Team chair attended full training workshop of QSAS in Doha, attended exam and passed as Certified Green Professional.

• Currently an assessment case study is ongoing for a Kuwaiti Governmental Project (MPW)
Working with QSAS (Cont.)

- Team members reviewed Categories and Criteria of QSAS system and prepared for discussion with QSAS technical team.
- Several discussion meetings through mutual visits and conference calls
- Discussion on Business Models for implementation of QSAS in Kuwait
Part III

• Case Study – Application of QSAS on a local governmental project: EPWD Building:
  ➢ Main goals & objectives
  ➢ Briefly about the project
  ➢ The building special green building tools
  ➢ The QSAS method for GB assessment
  ➢ Expected results and conclusions
Project Data

- BUILT UP AREA : 33,000 m²
- PLOT AREA : 4670 m²
- VALUE : 13,000,000 K.D.
- TYPE : OFFICE BUILDING
- Number of floors : 3 basements + Ground + 9 Floors
- Total parking : 220 cars
- Total Users : 275 employees + Visitors
Project’s Main GB Design Features

- **Use of** **Renewable Energy** (4 different solar applications)
- **Minimum Energy** consumption: HVAC energy efficient system, increased thermal insulation, minimized heat transmission and radiation by reduced “U” and shading values of glass
- **Minimum Water** consumption: collecting gutter drains, local water treatment plant, double piping for treated water reuse
- **Fully automated** building
- **Smart Architecture / Smart Design**
- **Responsible** **Materials** selection
Expected Impact on Local Environment

- Energy saving
- Reduce CO2 emission
- Use of recycled materials
- Reduce the amount of construction waste materials
- Efficient use of resources
- Reduce impacts on
  - Environment
  - Human health
- Improve quality of life
Expected Impact on Construction Industry

- Proper Use of Land and Sites
- Reduce the life cycle cost of buildings
- Efficient use of energy inside buildings
- Proper use of building materials
- Reduce the deterioration rate of building
- Better Quality of Life for Building occupants
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