BUILDINGS IN THE FUTURE

Concepts and Technologies

Proceedings of the IAHS World Congress on Housing,
Rio de Janeiro, Brasil
October 8-12, 1990

Edited by
BERNARDO SCHEINKMAN
The Building Centre of Brazil
and
OKTAY URAL
Florida International University, Miami, USA
## Contents

**VOLUME I**

**Part 1: SMART / INTELLIGENT BUILDING / EXPERT SYSTEMS**

- **a - Information**
  - How We Can Benefit from the Information Age
    - FIUMI, LORENZA
    - Page 3
  - Information Problems and Tools for Building Rehabilitation in Small Towns
    - BARBANENTE, A.; MAIELLARO, N.
    - Page 13

- **b - Communication**
  - Digital Communications, a Tool for Increased Productivity in the Building Trade
    - GIBERT, MARC
    - Page 24
  - Effects of Technological Innovations on Complex Buildings Project
    - DEL NORD, RÓMANO; BOLOGNHA, ROBERTO
    - Page 30

- **c - Cost Evaluation, Economics**
  - A Knowledge Based Approach for Planning House Building Projects
    - FORMOSO, CARLOS T.; BRANDON, PETER S.
    - Page 40
  - A Knowledge - Based Expert System Estimating Construction Cost
    - HERBSMAN, ZOHAR J.
    - Page 52
  - Approximate Cost Estimation of Structures in High Rise Housing Projects
    - SINGH, SURINDER
    - Page 62
  - Cost-Quality Relationship in Houses for Low-Income Users
    - AMARILLA, BEATRIZ CECILIA
    - Page 68
  - Design Synthesis for Cost Efficient Housing
    - ALLEY, CHRISTOPHER L
    - Page 74
  - Factors Affecting the Contractors' Cash Flow and their Sensitivity for Housing Projects
    - SINGH, SURINDER
    - Page 79
  - Integrated Systems Approach to Housing Design
    - SOLTANI, MEHRDAD; NAMINI, AHMAD H.; PHANG, MICHAEL K.
    - Page 87
  - Some Effects of Variations of Management Techniques in Construction
    - HALPERIN, DON A.; WETHERINGTON, LEON
    - Page 99
  - Strategies Maximizing Quality and Economy in Housing Construction with Creative Design and Pre-Construction Management Controls
    - LAWRENCE, ATTILA
    - Page 114
d - Computers Use
Determination of Critical Housing Project Feasibility Parameters Using a Microcomputer
MITRANI, JOSE D. 125

Machine Learning and the Building Procurement Process
BOWEN, P.A.; ERWIN, G.J. 139

ZMEUREANU, RADU; FAZIO, PAUL 151

e - Miscellaneous
Program and Goals of the Researches on Technological Innovation, Recently Launched by the "Progetto Finalizzato Edilizia" of the National Research Council
CERRUTI, C.; VINCI, R. 162

Today's Builder and the Building of Tomorrow
de ALMEIDA, PAULO BRAGA 170

Part 2: ROBOTIC IN CONSTRUCTION

An Integrated Approach Towards Automating Construction
IBAÑEZ - GUZMÁN, JAVIER; ATKIN, BRIAN L.; ATKINSON, PETER; BAYES, JOHN; BRIDGEGATER, COLIN E. 190

Robotics as Part of Computer Integrated Construction
SALAGNAC, JEAN-LUC; VINOT, BENOIT 198

Part 3: ENERGY CONSERVATION IN DESIGN AND CONSTRUCTION

Building with Ventilated Envelope: Thermohygrometric Behaviour
MERONI, I.; ESPOSTI, W.; POLLASTRO, C.; TIRLONI P. 208

Characterization of Passive or Hybrid Solar Components: a Comparison Between Different Testing Methodologies
MERONI, I.; SCAMONI, F.; VANCINI, C.; MUNAFÒ, F. 217

Comfort Drivers in the Automated Controls of Indoor Environments
MacGOWAN, DAVID; THOMPSON, HARLYN E. 228

Development and Experimentation of Innovative Components for Bioclimatic Buildings
MERONI, I.; SCAMONI, F.; TIRLONI, P.; POLLASTRO, C. 233

Energy and Building Rehabilitation - the Situation in Italy: Some Points for Consideration
STELLA, MICHELE 244

Evaluation of Thermokinetic Behaviour of Heating Systems Using and Indoor Test Cell
SCAMONI, F.; MERONI, I. 252

Improvements and Applications of the New Model to Evaluate the Hygrothermal Behaviour of Building Envelope
STAZZI, ALESSANDRO; MUNAFÒ, PLACIDO; NATICCHIA, BERARDO 259

Improving the Thermal Performance of a Light-Weight Metal Roof in Hot Climates
PANTOJA-AAYALA, H. 269

Residential Thermal Test Modules for Saudi Arabia
MOFEEZ, IBRAHEEM AL; WOODS, PAUL 286
Studies on Envelope Design for Energy Conserving High-Rise Buildings in China  
BAIZHAN, LI; SHENGYUAN, TIAN; WENSHENG, LIN  
296

The Environmentally Transparent. Intelligent Home  
CROXFORD, B.  
305

VOLUME II

Part 4: LAND POLICIES / INFRASTRUCTURE / FINANCING SYSTEMS

Affordable Housing - a Challenge for the Engineer  
KRAPFENBAUER, ROBERT  
314

Appropriate Government Policy for Development and Housing Construction  
FLYNN, WILLIAM T.  
319

Building of the Future: What is Good May be Even Better  
BOSSA, SAMIRA  
326

Expert Systems: a Tool for Urban Housing Planners and Builders  
CHAUDHARI, BHASKAR  
341

Housing Construction in Landslide Prone Areas (Trinidad & Tobago)  
SUITE, W.H.E.  
348

Knowledge Acquisition for an Expert System in Land Development  
NAMINI, AHMAD H.; SOLTANI, MEHRDAD; PHANG, MICHAEL K.  
355

Major Metropolitan Cities - Its Severe Housing Shortage and Possible Solutions  
VISWANATH, H.R.  
365

Meeting Challenges of Low Income Groups Housing Informal Settlements and Controlled Squatting in the year 2000 (South African Context)  
BOYA, SILUMKO TOM  
369

Meeting the Housing Demand: State Subsidy Versus Sweat Equity - Is There an Optimal Solution?  
TAITZ, IAN S.  
377

Participation Like Means to Provide Affordable Housing in Major Cities  
IVAKHOFF, DANIEL IVAN  
391

Recent Comparisons of Construction Output and Prices among Central American Countries  
SALAZAR-CARRILLO, JORGE; TIRADO DE ALONSO, IRMA  
397

Rehabilitation of Abandoned Buildings in Urban Areas  
RUGGERI, ROBERTO; MARTINELI, NICOLA  
399

Singapore’s Land Use Policy for the 1990s and Beyond  
LEE, SIM LOO  
411

Strategic Planning in Changing Markets  
WEXLER, JAY A.  
422

The Domotic and the Land Policy  
FERREIRA, JOEL HASSE; SANTO, FERNANDO FERREIRA  
431

The Industrial Archaeology: Analysis of Some Interventions and Effects on the Development Policy of the Urban Areas  
MORINI, A.; VETROMILE, E.  
437
The Infrastructure and the Knowledge Based Economy
HOTTOVY, TIBOR CH. 445

Part 5: BUILDING TECHNIQUES
a - Communication
b - Information
c - New Modes of Fendering
d - Miscellaneous

a - Communication
An Expert System Approach for the Assessment of Wind Environmental Conditions Around Buildings
STATHOPOULOS, THEODORE 470

Elettric and Hydraulic Installations in Urban Construction - Simplified Systems
ELIAKIM, D. 484

Multi - Story Lightweight Panel Buildings
GALLEGOS, HECTOR 493

Technology Strategies and Skill Needs for Intelligent Buildings
GANN, D.M. 505

b - Information
Apropriate Technology as a Solution to the Low-Income Settlements
RAMANA, K. V.; RAMAMURTHY, K. N. 513

Impact of the House of Precast Building Systems in Kuwait Housing Projects
AL-KHAIAT, HUSAIN 521

The Effects of Combined Upgrading and New Development Schemes on Housing Patterns on the Site: Case Study of Ismailia Project in Egypt
SERAG-EL-DIN, HANY B. 542

Traditional Versus Modern Housing in Malaysia - a Comparative Study of Lifestyle and Building Forms
ARANHA, JOSEPH L. 553

c - New Modes of Fendering
The "Sequential Process": a More Productive Organisation in the Building Trade
GIBERT, MARC 565

d - Miscellaneous
Control Management of the Alternative Technologies in a Service Contract with a
Heading - Plan. The Villamarina Hospital in Piombino
ANDREUCCI, ANTONIO; DEL NORD, ROMANO; FELLI, PAOLO 578

Effective Measures to Solve the Lack of Capital Investment in Housing Development of Big Cities
XIAOCHUAN, FENG 592

Housing in Next Decade
DHOLAKIA, K.M.; DAVE, S.D. 595

Innovative Techniques to Improve Foundation Soils for Housing Projects
DURRANI, M. 604

Partially Completed Low Cost Housing Experience, Egypt - an Assessment
KADER, NASAMAT M.A. ABDDEL; ETTOUNEY, SAYED M. 613