CONTENTS

Building Economics (W055)

The Application of Life Cycle Costing for Building Retrofit
Wilkinson, S. and Ying, F.J. ........................................................................................................................1

Managing Mega Construction Projects - Learning from Two Case Studies: London Underground’s Jubilee Line Extension and BAA’s Heathrow Terminal 5
Potts, K......................................................................................................................................................11

Improving the Design Process
Confino-Rehder, S.....................................................................................................................................23

Innovations in Tunnel Construction and the Associated Economical Consequences for Supplier, Contractor and the Client
Schaiter, B. and Girmscheid, G.................................................................................................................29

The Implications of Incomplete Contracting for Construction Management
Chang, C-Y................................................................................................................................................41

The Price of Risk in Construction Projects: Choosing of an Appropriate Research Methodology
Laryea, S., Badu, E. and Hughes, W. .......................................................................................................51

Poor Quality Costs in Medium-Sized Construction Companies: What can be Learned from other Industries
Dobrescu, L., Holm, K., Låstbom, M., Mjärdne, C., Ottosson, P., Josephson, P.E. and Lindström, J........................................................................................................................................63

Performance Concept in Building (W060)

Risk Management in PPP Maintenance Projects of Communal Street Networks
Pohle, T. and Girmscheid, G.....................................................................................................................75

Risk Management in Different Forms of Contract and Collaboration – Case of Sweden
Osipova, E. and Apleberger, L................................................................................................................88

Client Involvement in Performance based Briefing in Public Private Partnerships Procurement and the use of ICT: Dutch Best Practice
Zeegers, A. and Ang, G.............................................................................................................................98

Risk Management: A Bottom-up Approach to Ascertain Responsibility
Mahesh, G. and Kumaraswamy, M.M.....................................................................................................110

Portuguese Thermal Code’s Evolution and its Contribution to the Sustainable Construction
Ramos, A.F. and Mendes da Silva, J.A.R...............................................................................................119

Decentralized Energy Generation and Waste (Water) Treatment in Residential Districts: The ‘Sustainable Implant’
van Timmeren, A. ....................................................................................................................................130

Why Insulate? The Arguments for Sustainability
Vaz-Sá, A., Rangel, B., de Sousa, H. and Abrantes, V. .........................................................................142

Autonomy or Heteronomy of Essential Services in the Built Environment?
van Timmeren, A. and Röling, W. ...........................................................................................................155

Dynamic Model of Energy Saving Projects Market
Vytlačil, D................................................................................................................................................167

Ecology of the Building Geometry - Environmental Performance of Different Building Shapes
van den Dobbelsteen, A., Thijssen, S., Colaleo, V. and Metz, T. .........................................................178

Solar Energy Conversion with Flexible Photovoltaic Modules Integrated Into Single Ply Roofing Membranes
Beer, H-R. and Hillebrand-Hansen, E. .................................................................................................189
Organisation and Management of Construction (W065)

Complexity of Megaprojects
   Brockmann, C. and Girmscheid, G. ...................................................... 219

Stakeholder Perceptions of Contractor Time, Cost and Quality Management on Building Projects
   Michell, K., Bowen, P., Cattell, K., Edwards, P. and Pearl, R. .................. 231

Effective Financial Incentive Mechanisms: An Australian Case Study
   Rose, T. and Manley, K. ..................................................................... 241

Hunters and Farmers? The HRM Implications of ‘Product-Service’ in Construction
   Johnstone, S., Dainty, A. and Wilkinson, A. ........................................ 254

Generic Axiomatic Requirement Management Model (GARM-M) – Accelerated Target Oriented Handling of Total Service Contracts
   Girmscheid, G. and Mehnert, F. ............................................................. 266

Supply Chain Systems Engineering in Construction
   Vrijhoef, R. and de Ridder, H. ............................................................... 279

The Evaluation of the Delays in the Portuguese Construction
   Couto J.P. and Teixeira, J.C. ............................................................... 292

Whither Partnering? A Trade-off Analysis using a Hong Kong Case Study
   Mahesh, G., Kumaraswamy, M.M. and Anvuur, A.M. ......................... 302

A Method to Evaluate and Manage Client Requirements in Housing Projects

Ethics and Authenticity of Leadership in the Construction Industry
   Toor, S. ur R. and Ofiri, G. ............................................................... 322

Strategic Cooperation Networks for Life-Cycle Service Provisions in Building Construction
   Lunze, D. and Girmscheid, G. ............................................................. 335

Workforce Issues in the Knowledge Age
   Roper, K.O. ..................................................................................... 346

Implementing Innovation: Transforming Practices and Technologies in Construction Work
   Harty, C. ......................................................................................... 357

A Locus for Dynamic Competitiveness in Construction
   Elmualim, A.A. ................................................................................. 371

Measuring Performance in Construction Projects: The Case of the Swedish “Best Practice tool”
   Josephson, P.-E. and Lindström, J. .................................................... 383

Evaluation of Individual Characteristics in Partnering Projects
   Åkerström, S. and Lindahl, G. ............................................................. 395

Human based Value Creating Cooperation in Construction Projects
   Sunding, L. and Ekholm, A. ............................................................... 408

Culture in Construction: Characteristics and Paradigms
   Ferrada, X. and Serpell, A. ............................................................... 421

The Roots to Conflicting Interests among Different Partners in a DBFM Consortium

The Design of the Organisation of a Building Process of an Underground Multimodal Station with a Case-Study of Station Amsterdam Zuid/WTC, a PPP-Project
Facilities Management and Maintenance (W070)

A Facilities Management Resource Consumption Model
Then, D. S-s. and McEwan, A. .......................................................... 600

Advances in ETICS Behaviour Analysis and Consequences for Planning Maintenance
Mendes da Silva, J.A.R and Falorca, J.G.F. ........................................ 612

An Integrated Approach to the “Relife” of Office Buildings
Yang, J. and Lim, S. ........................................................................ 623

Public Private Partnership for Maintenance Activities – System Boundaries for a Life Cycle Oriented Economic Efficiency Analysis
Fastrich, A. and Girmscheid, G. ....................................................... 636

Building Condition Assessment: A Performance Evaluation Tool towards Sustainable Asset Management

The Jerusalem Eco-Housing Project: Integrated Design Solutions
Peled, G. ...................................................................................... 663

Issues and Actions for Sustainable Renovation
Botta, M. .................................................................................... 670

Integrated Plan Analysis (IPA) of Buildings
Zijlstra, H. .................................................................................. 686
The Ventilation Implication of a Combined Life Cycle Assessment (LCA), Life Cycle Costing (LCC) and Health Impact Assessment (HIA) Study for Public Housing in Hong Kong
Wong, F.Y-h. and Amato, A. ...................................................................................................................699

Sustainable Cities for a Sustainable Development: Building Renewal as a Mean of Increasing the Sustainability of the Existing City
Mele, C. and Piantanida, P........................................................................................................................709

Performance Measurement to Communicate Strategy
Räisänen, C. and Björnström, J. ................................................................................................................721

Diagnostic System for Monitoring and Revaluing of Building Constructions
Koppány, A..............................................................................................................................................730

A Survey of Operation and Maintenance Budgetary Practices for Commercial Buildings in Hong Kong – Preliminary Findings
Lai, J.H.K. and Yik, F.W.H.......................................................................................................................742

Pervasive Technologies for Workspace Management at Nationwide Building Society
Clifford, C., Elmualim A.A. and Child, F. .................................................................................................755

Selection Framework for Domestic Subcontractors by Contractors in the Construction Industry
Talukhaba, A.A. and Mapatha, M............................................................................................................768

**Procurement Systems (W092)**

Rethinking the Contractors Trilogy: Identifying the Missing Dimension in the Traditional Construction Delivery System
Hindle, B. and Rwelamila, P.M.D. ...........................................................................................................781

From Bureaucracy to Value-Based Procurement: The Client as Change Agent
Haugbølle, K. and Gottlieb, S.C. .............................................................................................................790

Introducing Innovative Procurement Methods for Supply Chain Integration – Implementing the Challenge
Khalfan, M.M.A. and McDermott, P.........................................................................................................802

Defining the Conditions of a Contractors’ Past Performance Measurement System for Dutch Construction Clients
Geraedts R.P. and Koolwijk, J. ................................................................................................................814

The Construction Contract as a Means for Improving the Contractors’ Performance
Serpell, A. and Samudio, R.....................................................................................................................826

**Architectural Management (W096)**

Designing Risk on International Projects
Grisham, T. and Srinivasan, P. ................................................................................................................838

Manzione, L. and Melhado, S.B. ................................................................................................................850

A Comparative Study of Architects’ use of Briefing Documents Interim Report
Heintz, J.L. and Overgaard, F. .................................................................................................................863

Designing in the Virtual World
Sher, W., Williams, A., Sherratt, S. and Gameson, R. .............................................................................878

The Strategy of Building System Design based on the Influence of “Feng Shui” in Traditional Culture
Huang W-H. and Tzeng, C-T. ....................................................................................................................889

Managing Intellectual Capital Strategically: A Core Competence for Architectural Design Firms in the Turkish Construction Sector
Gozde B., Barlak, O., Yitmen, I. and Murat Gunaydin, H........................................................................902

Towards Sustained Competitiveness in UK Construction: A Multi-Methdoological Approach
Goodier, C.I., Soetanto, R., Dainty, A.R.J., Larsen, G.D. and Quigley, M..............................................915
### Safety and Health in Construction (W099)

- **Keeping Older Workers in Construction: Project Brief**
  - Leaviss, J.C., Gibb, A.G.F. and Bust, P.D. ................................................................. 1160

- **Characteristics of Accidents on Construction Work in Thailand and Prevention Guide**
  - Srinavin, K. .................................................................................................................... 1168

- **Evaluating Health and Safety Performance of Nigerian Construction Site**
  - Olatunji, O.A., Aje, O.I. and Odugboye, F. ................................................................. 1176

- **Usability in the Workplace Case Study of Pamela Youde Eastern Hospital, Hong Kong**
  - Gilleard, J.D. and Granath, J.A. .................................................................................. 1191

- **The Effect of Awareness of and Compliance with the Duty to Manage Asbestos Regulations**
  - Bust, P., Gibb, A. and Sinclair, A. ................................................................................ 1198

- **Analysis of Accidents on Building Construction Sites Reported in Uganda during 2001 - 2005**
  - Alinaitwe, H., Mwakali, J.A. and Hansson, B. .............................................................. 1208

- **Powered Aerial Access Platforms (PAAPs): Their use and Benefits**
  - Smallwood, J.J. ............................................................................................................ 1222

- **Uptake of an OHS Code of Practice by Australian Construction Firms**
  - Charles, M.B., Furneaux, C., Pillay, J., Thorpe, Castillo, C.P. and Brown, K. ........... 1238

- **Dealing with Cost and Time in the Portuguese Construction Industry**
  - Moura, H.P., Teixeira, J.C. and Pires, B. ..................................................................... 1252

  - Chileshe, N. and Sim, Y.L. ............................................................................................ 1266

- **A Review of Recent Legislative Developments in South Africa and Turkey**
  - Haupt, T.C., Müngen, M.U. and Türkoğlu, K. ............................................................... 1284

- **Social Housing Building Stock Renewal Needs: A Case Study**
  - Fernanda Rodrigues, M. and Cardoso Teixeira, J.M. ................................................... 1299

- **Evaluating the H&S Performance of Nigerian Contractors**
  - Idoro, G.I. ..................................................................................................................... 1310

- **The Influence of Architectural Designers on Construction Ergonomics**
  - Smallwood, J. ............................................................................................................. 1316

- **Health and Safety (H&S) in Roofing**
  - Smallwood, J. ............................................................................................................. 1329

### Information and Knowledge Management in Building (W102)

- **Using the French EPDs to Compare and to Choose Building Products**
  - Lemaire, S., Chevalier, J., Guarracino, G. and Humbert, H. ....................................... 1339

- **Innovative Housing Projects for Low Income Groups in Urban Central Areas: An Approach of Information and Knowledge**
  - Claper, J.R. and Salgado, M.S. .................................................................................... 1352

- **Knowledge Creation and Absorptive Capacity: Influences of Social Capital**
  - Kurul, E., Colantonio, A. and Otsuka, N. .................................................................. 1363

- **Knowledge Sharing and Reuse for Improving Construction Project Earned Value**
  - Ribeiro, F.L. and Cintra, M.A.H. ................................................................................ 1383

- **Technology and Knowledge Transfer for Capability Building in the Ghanaian Construction Industry**
  - van Egmond, E. and Erkelens, P. ................................................................................. 1393
The Construction of the Knowledge Base of Fuzzy Expert System in Building Pathology – From a Functional Access
Molnárka, G.................................................................1406

Towards a Sustainable Building Approach: Arenas of Enactment, Models of Diffusion and the Meaning of Demonstration Projects for Change
Rubino, B., Edén, M. and Femenias, P.................................................................1418

FMEA Software to Enhance Innovation in Building
Hans, J., Joffre, C., Boileve, C. and Fies, B..........................................................1430

Ready? Go the National E-Tendering Initiative – A Malaysian Experience
Lou, E.C.W. ...........................................................................................................1442

Innovation Circles Stimulating Construction Knowledge Exchange
Abbott, C. and Jones, V.................................................................1456

Sharing Knowledge through the Construction Knowledge Exchange: A Demand-led Approach
Lees, M., Wharton, A. and Williams, A.................................................................1479

Successful Collaboration with the Client - A Comparative Study of Three Public Project Networks
Lonka, H., Haapalainen, P. and Naaranoja, M........................................................1491

The Current Development of China’s Construction Management
Wang, H.................................................................................................................1504

Open Residential Building in Iranian Context
Mirmoghtadae, M. .................................................................................................1518

Knowledge Modelling for Performance Measurement of Built Environment
Durmisevic, S., Sariyildiz, S. and Ciftcioglu, O.....................................................1531

Open Building Implementation (W104)

Open Building within the Practice of Polish Architects
Rynska, E.............................................................................................................1542

Renovation and Alternation: An Efficient Way for the Existing Residential Building to Keep up with Social Life
Gao, G., Guo, X. and Mei, Y....................................................................................1553

Development of an Adaptable Integrated Façade System for Housing in Taiwan
Wei, H.-Y., Tu, K.-J. and Lee, W-W. .......................................................................1561

Worlds of Difference: Constructing Urban Landscapes for Inhabitation
Read, S..................................................................................................................1576

Time as the Main Factor
Krebbers, C. and Stojanović, P..............................................................................1589

The Systemic Nature of the Construction Industry
Fernández-Solís, J.L...............................................................................................1598

Urban Regeneration and Renewal: A Case Study of Gaziosmanpasa Municipality in Istanbul
Tut, O., Tirampaci, M. and Kus, H........................................................................1626

Feng Shui: An Alternative Framework for Complexity in Design
Mak, M.Y. and Ng, S.T............................................................................................1638

Operable façade: An Open Building Approach for User Responsive Architecture
Jia B.......................................................................................................................1652

Re-architecture of Industrial Heritage
Bonsignori, C., Post, J. and Rodgers, A.P................................................................1665

Study on the Development of Korean-Style Residential Open Building through the Remodelling of the Experimental Open Building of KICT
Lee, S.O., Kim, S.A., Lim, S.H. and Hwang, E.K..................................................1674
<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Study on the Amendment of Regulations for the Activation of Long life Span Multifamily Housing</td>
<td>Eun-Kyung, H.E., Am, K-S., Ho, L-S. and Ok, L-S.</td>
<td>1685</td>
</tr>
<tr>
<td>Teaching Architecture Students to Work with Distributed Design</td>
<td>Kendall, S.</td>
<td>1694</td>
</tr>
<tr>
<td>Space and Time to Dwell Santa Ursula through 50 years</td>
<td>Andrade, J.</td>
<td>1705</td>
</tr>
<tr>
<td>Designing for Diversity in South Africa: Opportunities for Inclusive Design through the Application of Open Building</td>
<td>Karusseit, C. and Osman, A.</td>
<td>1718</td>
</tr>
<tr>
<td>Partnering and the Problem Resolution Process in Practice</td>
<td>Mustaffa, N.E. and Bowles, G.</td>
<td>1731</td>
</tr>
<tr>
<td>Urban Harvest, and the Hidden Building Resources</td>
<td>Rovers, R.</td>
<td>1739</td>
</tr>
<tr>
<td>Participation Supported, Flexible and Appraisable Model - PSFAM in Urban Transformation</td>
<td>Çelikhan S. and Türkoğlu, K.</td>
<td>1752</td>
</tr>
</tbody>
</table>

**Construction in Developing Countries (W107)**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side Stepping Poor Infrastructure: Enabling Environments in Developing Countries</td>
<td>Gibberd, J.</td>
<td>1761</td>
</tr>
<tr>
<td>Construction as a Driver for Sustainable Regional Development: Focussing on Practice and People</td>
<td>Tijhuis, W.</td>
<td>1772</td>
</tr>
<tr>
<td>Public Private Partnerships: The Provision of Social Infrastructure in Australia</td>
<td>Jefferies, M., McGeorge, D., Cadman, K. and Eng, C.S.</td>
<td>1782</td>
</tr>
<tr>
<td>Joint Construction of Community Schools in Disadvantaged Areas</td>
<td>Giebels, E.J.M., Favié, R., van Eekelen, A.L.M. and Maas, G.J.</td>
<td>1793</td>
</tr>
<tr>
<td>The Challenge of Engaging South Africa’s Unemployed in Construction Sector Delivery</td>
<td>Havemann, G.</td>
<td>1804</td>
</tr>
<tr>
<td>International Technology and Knowledge Flows among Foreign and Local Contractors in Ghana</td>
<td>van Egmond, E. and Vulink, M.</td>
<td>1815</td>
</tr>
<tr>
<td>Mapping the Australian Regulatory Environment: Implications for Construction Firms</td>
<td>Furneaux, C., Brown, K. and Hampson, K.</td>
<td>1827</td>
</tr>
<tr>
<td>Developing a Systems Framework for Sustainable Infrastructure Technologies (SIT) in the Built Environment Focussing on Health Facilities: A Case for Cape Town</td>
<td>Saidi, M.</td>
<td>1840</td>
</tr>
<tr>
<td>Factors of Construction Time for Commercial and Residential Projects in India</td>
<td>Choudhury, I. and Desai, A.</td>
<td>1853</td>
</tr>
<tr>
<td>Improving Housing Quality as a Marketing Strategy</td>
<td>Fernandes, S., Cardoso Teixeira, J. and Lopes, J.</td>
<td>1859</td>
</tr>
<tr>
<td>Defining a Strategic National Agenda on the Theory of Construction for Development</td>
<td>van Wyk, L. and Knoetze, T.</td>
<td>1870</td>
</tr>
<tr>
<td>The Declining Role of the General Contractor in the Kenyan Construction Sector</td>
<td>Wachira, N., Root, D., Bowen, P. And Olima, W.</td>
<td>1883</td>
</tr>
<tr>
<td>School Infrastructure Performance Indicator System (SIPIS)</td>
<td>Gibberd, J.</td>
<td>1894</td>
</tr>
<tr>
<td>The South African Construction Micro Enterprise Development Challenge</td>
<td>Shakantu, W. and Kajimo-Shakantu, K.</td>
<td>1902</td>
</tr>
</tbody>
</table>
Student’s Perception of the Service Learning Component of the Construction Studies Programme at the University of Cape Town
Massyn, M. and le Jeune, K.................................................................1916

Developing a Systems Analytical Framework for the National Poverty Alleviation System (NPAS): The Community Based Public Works Programme (CBPWP) Case Study
Saidi, M.........................................................................................................1928

The Effect of Political Unrest on Construction Time for Food Grain Warehouses in Bangladesh
Choudhury, I...............................................................................................1941

Procurement Reform: A Research Agenda for Construction in Developing Countries
Ofori, G.........................................................................................................1949

Informal Settlements and Affordable Housing (W110)

Community Participation in the Upgrading of Informal Settlement & Housing at the River Bank of Surabaya
Santosa, H.R. ...............................................................................................1964

The Role of Urban Design in Developing Communities
Giddings, B....................................................................................................1972

People-Planet-Profit-(re)searching for Sustainable Urban Development – How Students from Hogeschool Utrecht, Institute for the Built Environment work in the Tshwane Region of South Africa
van Keeken, E. and Goedknegt, D...............................................................1985

High-Rise Buildings – Needs and Impacts
Ibrahim, E.......................................................................................................1998

Adobe Technology - A Possible Solution to Urban Housing Problems in Ethiopia
Hjort, B. and Sendabo, T...............................................................................2009

Reducing Construction Fall Accidents in the Maintenance Sector: An Industry-Based Survey from Hong Kong
Chan, E.H.W., Lam, E.W.M. and Cheung, E....................................................2021

Nature and Performance of Portuguese Real Estate Investment Funds
Vasques, F., Teixeira, J. and Brandão, E.........................................................2032

Low-Cost Housing: A Continuous Struggle (Overview, Research, Future)
Erkelens, P.A...............................................................................................2045

Opportunities for Clients’ Requirements Management in a New Form of Housing Provision in Brazil

Ready-made Shacks: Learning from the Informal Sector to meet Housing Needs in South Africa
Lizarralde, G. and Root, D.............................................................................2068

Optimization of Building Materials and Designs towards Sustainable Building Construction in Urban Tanzania
Makenya, A.R. and Nguluma, H.M.................................................................2083

Ethics In Construction: Examples from Uganda
Irumba, R. and Mwikali, J.A........................................................................2094

Sustainable Construction Industry for Sustainable Environment: Trees for Shelter and Alternative Building Materials
Elinorata, M....................................................................................................2106

An Evaluation of Small Contractor Development Programme in Swaziland
Thwala, W.D. and Mvubu, M.......................................................................2116

Harnessing the Informal and Formal SMME Construction Sectors to Resolve the South African Construction Skills Shortage
Shakantu, W.M. and Kajimo-Shakantu, K.....................................................2132
Law and Dispute Resolution (W113)

Teaching Law to Undergraduate Surveyors and Construction Managers: A Problem based Learning Approach
Donohoe, S. ................................................................. 2140

Recent Developments in Letters of Intent
Naylor, D. and Green, M. .................................................. 2155

The Contractor’s Quality Obligations: Different Concepts under English and German Contract Law
Hillig, J.-B. ........................................................................ 2169

Application of Public Participation Provisions in Environmental Regulation: Implementation of the Water Framework Directive in UK and Germany
Adshead, J. ........................................................................ 2182

“What do you think of it so far?” The Views and Experiences of Specialist Contractors on Partnering in the UK
Mason, J. ........................................................................... 2192

Regulatory Systems for Building in Europe
Meijer, F. and Visscher, H. .................................................. 2207

Teaching and Learning Ethics: The Construction Manager’s Perspective
Mondejar, R., Cheung, S-O. and Suen, H. ............................. 2220

Tasks and Responsibilities for Building Control in Europe
Visscher, H. and Meijer, F. ..................................................... 2234

The Evolution of Adjudication Law in the Construction Industry in New South Wales
Uher, T.E. and Brand, M.C. .................................................. 2245

Expert Evidence in Rights to Light Litigation: A Review of Judicial Attitudes to Current Practice in the UK
Chynoweth, P. ................................................................. 2261

Incentives in Construction Contracts: Should we Pay for Performance?
Hughes, W., Yohannes, I. and Hillig, J-B. ............................. 2272

Liability for Building Operations in Singapore: Sorry and then Safe?
Christudason, A. ................................................................ 2284

A Facility Manager’s Approach to Standardized Construction Contracts
Thomas-Mobley, L. and Khuncumchoo, N. ......................... 2296

Smart and Sustainable Built Environments (TG55)

Geosynthetics: Some Sustainable Design Concepts for Developing Countries
Davies, P. ........................................................................... 2309

Ecological Sustainability in Construction: A Vision for 2025
Amod, S. ............................................................................ 2319

Innovation in Buildings: A Socio-Eco-Technical Approach
Carassus, J. .......................................................................... 2331

Managing Building Projects through Enhanced Communication – An ICT Based Strategy for Small and Medium Enterprises
Yang, J., Ahuja, V. and Shankar, R. ....................................... 2344

Steel and Zinc as an Important Component of Sustainable Construction
White, R ........................................................................... 2358

Possibilities of Indoor Air Pollution due to Conventional Construction Industry Practices
Debashis, S. ........................................................................... 2370
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Building Material Selection Importance at the Building Design Process for its Sustainability</td>
<td>2384</td>
</tr>
<tr>
<td>Marques, F.M. and Salgado, M.S.</td>
<td></td>
</tr>
<tr>
<td>The Construction Portuguese Industry seems to Ignore the Deconstruction Method</td>
<td>2397</td>
</tr>
<tr>
<td>Couto, A.B. and Couto, J.P.</td>
<td></td>
</tr>
<tr>
<td>Environmental Criteria and Indicators used in Environmental Assessment of Buildings</td>
<td>2406</td>
</tr>
<tr>
<td>Haapio, A. and Viitaniemi, P.</td>
<td></td>
</tr>
<tr>
<td>Sustainability Assessment of Buildings: Would LEED Lead Brazil Anywhere?</td>
<td>2417</td>
</tr>
<tr>
<td>da Silva, V. G.</td>
<td></td>
</tr>
<tr>
<td>Sustainable Management of Construction Projects</td>
<td>2428</td>
</tr>
<tr>
<td>Schultmann, F. and Sunke, N.</td>
<td></td>
</tr>
<tr>
<td>A Methodology for Predicting the Magnitude of Environmental Impacts Related to the Building Construction Process</td>
<td>2441</td>
</tr>
<tr>
<td>Gangoilells M., Casals, M., Gassó, S., Forcada, N. and Roca, X.</td>
<td></td>
</tr>
<tr>
<td>Energy Potential Mapping – A Systematic Approach to Sustainable Regional Planning based on Climate Change, Local Potentials and Exergy</td>
<td>2450</td>
</tr>
<tr>
<td>van den Dobbelsteen, A., Jansen, S., van Timmeren, A. and Roggema, R.</td>
<td></td>
</tr>
<tr>
<td>The Impact of the Spanish Built Environment on Climate Change and the Implication to Legal Frameworks</td>
<td>2461</td>
</tr>
<tr>
<td>Gangoilells M., Casals, M., Forcada, N. and Roca, X.</td>
<td></td>
</tr>
<tr>
<td>Environmental Impact of Construction Products: Leaching Behaviour During Service Life</td>
<td>2471</td>
</tr>
<tr>
<td>Schiopu, N., Jayr, E., Méhu, J. and Moszkowicz, K.</td>
<td></td>
</tr>
<tr>
<td>Project Performance Measurement for Productivity Improvements</td>
<td>2484</td>
</tr>
<tr>
<td>Gyadu-Asiedu W., Scheublin, F.J. and van Egmond-de Wilde de Ligny, E.L.C.</td>
<td></td>
</tr>
<tr>
<td>Finding Complementary Lines for a Sustainable Development of Buildings in a Worsened Climate</td>
<td>2496</td>
</tr>
<tr>
<td>Radu, A. and Vasilache, M.</td>
<td></td>
</tr>
</tbody>
</table>

**Industrialisation in Construction (TG57)**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages and Limitations of Precast Concrete Construction in High-rise Buildings: Hong Kong Case Studies</td>
<td>2504</td>
</tr>
<tr>
<td>Jaillon, L. and Poon, C.S.</td>
<td></td>
</tr>
<tr>
<td>Innovative Sales Concept and Knowledge-Platform for Prefabricated Building Construction</td>
<td>2515</td>
</tr>
<tr>
<td>Girmscheid, G. and Kröcher, M.</td>
<td></td>
</tr>
<tr>
<td>Strategy to Enhance use of ICT in Construction</td>
<td>2527</td>
</tr>
<tr>
<td>Frits, S.</td>
<td></td>
</tr>
<tr>
<td>Applying Future Industrialised Processes to Construction</td>
<td>2536</td>
</tr>
<tr>
<td>Design of One-Storey Residential Houses, made of Prefabricated Elements, Intended for Building in South Africa</td>
<td>2548</td>
</tr>
<tr>
<td>Aleksandrova, L.</td>
<td></td>
</tr>
<tr>
<td>Designing Communications on International Projects</td>
<td>2556</td>
</tr>
<tr>
<td>Grisham, T. and Srinivasan, P.</td>
<td></td>
</tr>
<tr>
<td>Reducing Construction Waste by Decisions within the Design Process</td>
<td>2568</td>
</tr>
<tr>
<td>Baldwin, A., Poon, C-S., Shen, L-Y., Austin, S. and Wong, I.</td>
<td></td>
</tr>
<tr>
<td>A Systems Approach to Generate Integrated Design Solutions</td>
<td>2584</td>
</tr>
<tr>
<td>Richard, R-B.</td>
<td></td>
</tr>
<tr>
<td>Industrializing the Construction Sector through Innovation – Tolerance Dilemma</td>
<td>2596</td>
</tr>
<tr>
<td>Landin, A. and Kämpe, P.</td>
<td></td>
</tr>
</tbody>
</table>
Investigation into the Feasibility of Hybrid Concrete Construction (HCC) in South Africa
Jurgens, C.J. and Wium, J.A........................2607

Re-Architecture: Reality or Utopia?
Roders, A.P., Post, J. and Erkelens, P.A................2619

Reusing and Recycling Construction Aggregates as Mitigation Measures to Environmental
Destruction - The Case of Dar es Salaam, Tanzania
Mufuruki; T.S., van Egmond; E.F.C. and Scheublin, F.J.M. ................3033

Development in Assembling Sandwich Facade Units
Vastert, E.W. .................................................2640

Effect of Contract Programming on Project Performance in Nigeria
Idoro, G.I. and Olalusi, O.C...............................2650

**Built Environment Complexity (TG62)**

The Exponentialoid of Resource Consumption
Fernández-Solis, J.L..............................................2655

A Decision making Tool based on Ontologies for Risks Evaluation and Systems Integration
Forcada, N., Casals, M., Gangoilels, M., Roca, X. and Fuertes, A.......................2675

The Exponentialoid of Emissions Generation
Fernández-Solis, J.L..............................................2685

The Cyclical Nature of Construction Industry Employment and Higher Education Recruitment
Hurst, A., Hodgkinson, M. and Mutch, A................2699

The Forces Behind the Exponentialoid Growth in Construction
Fernández-Solis, J.L..............................................2710

Defining the Force that Tames an Exponentialoid
Fernández-Solis, J.L..............................................2730

Complexity Theory and the Maintenance Paradigm
Sharp, M........................................................2744

Systems Dynamics, Sustainability and Construction Complexity
Fernandez-Solis, J.L..............................................2752

Models and Metaphors: Some Applications of Complexity Theory for Design, Construction and
Property Management
Rooke, J., Molloy, E.M., Sinclair, M., Koskela, L., Kagioglou, M., Siriwardena, M.
and Siemieniuch, C..............................................2764

Inflation, Profit and Building
Stojanović, P. and Krebers, C.................................2776

Comparison of Construction Materials and Techniques in New and Refurbished Housing
Projects
Cuperus, Y., Kawano, N., Lin, K., Marosszeky, M. and Murakami, S.............2788

Principle Solutions with SILA
Stojanović, P. and Krebers, C.................................2798

The Human Factor in Building
Stojanović, P. and Krebers, C.................................2807

A Complexity-based Conceptual Framework for Whole Life Risk Assessment
Boussabaine A......................................................2819

The Complexity of Issues Surrounding the Implementation of Continuing Professional
Development for Construction Managers
Hurst, A., Hodgkinson, M. and Mutch, A..............................2829

The Contractor's Liability for Workmanship and Design: Is it a Matter of Competence or Status?
Adriaanse, J.......................................................2839
A Preliminary Report on Applications of the Most Economically Advantageous Tender (MEAT) Award Mechanism
Dreschler, M., de Ridder, H. and Beheshti, R. .......................................................................................2852

The Impact of the Workplace Safety and Health Act 2006 on the Developer
Chan, P..................................................................................................................................................2864

Project Contract Strategy Knowledge Base of Civil Engineers - the Time to Reflect
Rwelamila, P.D. and Ruwaida Edries, R...............................................................................................2875

**Disasters and the Built Environment (TG63)**

A Tale of Two Floods: Reconstruction after Flood Damage in New Zealand
Wilkinson, S., Zuo, K., le Masurier, J. and van der Zon, J. ..............................................................2895

Modular Building Solutions for Emergency in Developing Countries
Maiellaro, N., Lassandro, P., Lerario, A., Regina, G. and Zonno, M. ....................................................2907

Construction for Development (but also for Security?)
Gueli, R..................................................................................................................................................2920

PRE-EMPT: Developing a Protocol for Built-in Resilience to Disasters
Bosher, L., Dainty, A., Carrillo, P. and Glass, J. ...................................................................................2931

Synergising Disaster Risk Management and Construction Research: A Multi-Disciplinary Initiative from the UK
Goodier, C., Bosher, L., Fleming, A. and Soetanto, R. .........................................................................2942

Regulatory Frameworks for Post-Disaster Reconstruction: Improving Resilience in the Process
le Masurier, J., Rotimi, J.O. and Wilkinson, S.......................................................................................2954

EURASIA: Role of Construction Education in Capacity Building for Facilities and Infrastructure Development within a Developing Country Setting
Keraminiyage, K., Haigh, R., Amaratunga, D. and Baldry, D. ............................................................2968

Knowledge Sharing in Disaster Risk Management Strategies: Sri Lankan Post-Tsunami Context
Pathirage, C., Amaratunga, D., Haigh, R. and Baldry, D. ....................................................................2981

Improving Infrastructure to ReduceFuture Vulnerabilities to Natural Disasters: Review of Infrastructure Development Associated with Post Tsunami Reconstruction in Sri Lanka
Palliyaguru, R., Amaratunga D. and Haigh, R. .......................................................................................2994

Improvement of Basic Functions for Visualizing Schedule and 3D Object in 4D CAD System
Kang, L.S., Park, S.Y., Moon, H.S. and Kim, C.K..................................................................................3009

The use of E-commerce Applications in Construction: An Interpretative Model
Costantino N. and Pietroforte R. ...........................................................................................................3019

**Miscellaneous**

The Role of Women in Construction Industry Development: The UK Perspective

The Structure of the South African Building and Construction Industry: Preliminary Results
Milford, R., Ngozwana, N. and Dlungwana, S....................................................................................3046

Uniqueness, Complexity and Risks in Construction Projects: Implications for Small/Medium Scale Contractor Development Programmes of South Africa
Egbeonu, E............................................................................................................................................3064

Success Factors of Women Entrepreneurs in Construction
Verwey, I................................................................................................................................................3081

Use of Steel-making Co-Products and Marble and Granite Industry Waste in the Production of Low Impact Building Components
Gomes, V., Silva, J.G., Souza Filho M.L.S. and Silva, M.G..................................................................3103
Structural and Finishing Costs in Yemen
Basel, S. ................................................................................................................................................3116

The Challenges of Quantifying Construction Works for Project Control in Ghana
Nani, G. and Adjei-Kumi, T....................................................................................................................3134

Regional Construction Markets: The Example of Bremen, Germany
Brockmann, C. and Nolte, L. .................................................................................................................3146

Liberalisation of Construction and Related Engineering Services
Somba, J.J. ...........................................................................................................................................3159

A Comprehensive Framework for Building Design Support
Yahiaoui, A. ...........................................................................................................................................3168

An Integrated Emerging Contractor Development Model for the Construction Industry: Practical Implementation and Statistical Quantification
Hauptfleisch, D., Lazarus, S., Knoetze, T. and Liebenberg, S..............................................................3181

The Importance of the Project Coordinator in Construction Management: The Entrepreneur’s Vision
Adesse, E. and Salgado, M.S. ................................................................................................................3194

Additional Papers

PPP Process Model for Service Provision - PPP tender and Award Process Model
Dreyer, J. and Girmscheid, G................................................................................................................3212

Sustainable Building Design - case study for Rio de Janeiro - Brazil

The Role of Women in Construction Industry Development: The UK Perspective
Shanmugam, M., Amaratunga, D., Haigh, R., Elvitigala, G. Baldry, D. and Ruddock, L......................3233

Improving the Skills and Competencies of Knowledge Management ‘Specialists’ through Targeted Education and Training
Egbu, C.O. and Ilozor, B.D....................................................................................................................3248

Construction Clients and Industry Innovations: an Understanding of their Roles and Impact
Egby, C.O. and Ilozor, B.D....................................................................................................................3259

Collaborative Teamwork in Construction: An Exploratory Study of the Role of Project Insurance
Ndekugri, I. and Daeche, H...................................................................................................................3268

Sustainability as the Force that Tames an Exponentialoid
Fernández-Solís, J.L. ............................................................................................................................3280

Safety and Quality in the Portuguese Construction industry
Moura, H.P., Teixeira, J.C. and Pires, B. ..............................................................................................3294

Holistic Enterprise Risk Management - Risk Coverage and Risk Control
Girmscheid, G. ......................................................................................................................................3307

Integrated Design and Production. Decision-making Tools for Optimal Industrialization of Housing Construction
Monjo-Carrió, J., Oteiza, I. And Queipo de Llano, J.A. ........................................................................3317
### Additional Papers

Upgrading Vecindades in downtown Mexico City  
Martin-Chavez, A. .......................................................... 3327

Theoretical Study on solar and pellet heating systems to reduce electricity demand for residence heating  
Lundh, M and Wäckelgård, E.......................................................... 3337

Strategies for minimizing the whole of life cycle cost of reinforced concrete Bridge exposed to aggressive environment  
Humphreys, M. Setunge, S. Fenwick, J and Alwi, S........................................ 3349

The EU enlargement – a threat to health and safety on Norwegian construction sites  
Aslesen, S and Oedegaard, A.......................................................... 3361

Logistics in construction – Economic and environment sustainability in harmony  
Vidalakis, C. Tookey, J and Sommerville, J.................................................. 3384

Human Resource Management Croatia Case  
Anita, C and Mladen, R............................................................. 3397

Emotional Intelligence of Project Managers  
Mak, M and Cornwell, N............................................................. 3409