PLEA 2006
25th INTERNATIONAL CONFERENCE ON
PASSIVE AND LOW ENERGY ARCHITECTURE
GENEVA SWITZERLAND 6-8 SEPTEMBER 2006

Clever Design, Affordable Comfort
A Challenge for Low Energy Architecture and Urban Planning
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Many thoughts for Niobe CHRISSOMALLIDOU who died suddenly at the beginning of this summer
Dear Friends of PLEA,

Geneva and the University of Geneva are proud to host this 23rd Passive and Low Energy Architecture Conference. Organized by the University of Geneva in association with the Specialized High School of Western Switzerland, this conference aims to present the state of research, experiments and achievements in the field of low energy architecture and sustainable built environment.

The three days of the conference are structured around a global topic, «Clever design, affordable comfort: a challenge for low energy in architecture and urban planning».

The first day will focus on «Issues» and reflect on the general problematics in relation to comfort and climate, as well as on examples of traditional architecture. «Case studies» will be presented on the second day, with experiments, analyses and high achievements in the field of building and town planning. Architects from the Geneva region interested in the subject of the conference are invited to join on that day.

The third day, dedicated to the topic «Dissemination», will show education programs, design strategies and tools, examples of research and technology transfer, in order to promote a multidisciplinary approach which integrates technical, architectural, social aspects and economic concerns.

In view of the number of papers received, we have organized three parallel sessions for oral presentations. Invited keynote speeches, oral sessions as well as the possibility for poster authors to make short presentations, will enable participants in PLEA 2006 to have a fruitful exchange of information.

We hope that you will enjoy this conference in Geneva, and that its international environment will facilitate the exchange of views and dialogue between the 40 countries represented at this congress, as well as promote a global development of sustainable architecture and urban planning.

Willi Weber, Chairman
TUESDAY  5 September 2006 afternoon

17:00   Registration
19:00   Welcome from the PLEA Team

WEDNESDAY  6 September 2006 morning

08:00   Registration

09:00   Opening of the 25th PLEA conference
        • Opening by Willi WEBER, Chairman
        • Welcome from the Heads of the University of Geneva and HES-SO
        • Introduction from Koen STEEMERS, President of PLEA

09:15   Keynote speakers
        • Benjamin DESSUS «Energie et environnement, la nécessité de repenser nos infrastructures»
        • Robert HASTING «A time journey through solar architecture – 1900 into the future»

10:30   Coffee break

11:00   Technical sessions
        Auditorium Paxton
        Lessons from traditional architecture
        • Windows as environmental modifiers in Lebanese vernacular architecture
          H. MELKI
        • Applying the lessons of Indian vernacular architecture: the bungalow as example of adaptive climatic response
          K. KRAMER
        • H.AM.M.A.M. project and climate design of Islamic bath buildings
          J. BOUILLOT
        • The historic Hammams of Damascus and Fez: lessons of sustainability and future developments
          M. SIBLEY
        • Bioclimatic interpretation over vernacular houses from historical city Basrah
          A. ALMUSAED, A. AIMSSAD
        • Lighting features in Japanese traditional architecture

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Trombe Hall

Comfort and well-being in indoor and outdoor spaces
- The influence of daylightsign in office buildings on the users comfort
  H. SCHUSTER
- User interactions with environmental control systems in buildings
  A. MAHDAVI, E. KABIR, A. MOHAMMADI, L. LAMBEVA, C. PRÖGHWÖF
- Users’ perception of comfort and well-being in university buildings
  E. TRIANTIS, F. BOUGIATIOTI, A. OIKONOMOU
- Natural light and environmental stress
  I. FONSECA, M. M. PORTO, A. FANCHIOTTI, A. GONÇALVES
- Conceptualizing urban places as a ‘fourth skin’
  S. LENZHOLZER

Bowen Hall

Strategies and tools for renovation
- Passive cooling of existing office buildings – proposal for a building typology
  C. HOFFMANN, K. VOSS
- Zero energy housing retrofit
  B. VALE, R. VALE
- Conversion design of solar houses from active to passive
  K. KIMURA
- The comprehensive housing renovation approach
  M. HAM, R. WOUTERS
- «Brand new second hand» upgrading of a block of flats (b.1956) through energy efficient renovation
  M. KUBIN, M. HAM
- Domestic retrofitting strategies in the UK: effectiveness versus affordability
  P. MAHADEVAN

WEDNESDAY 6 September 2006 morning

11:00 Technical sessions

12:30 Lunch
WEDNESDAY 6 September 2006 afternoon

14:00 Technical sessions

**Auditorium Paxton**

*Lessons from traditional architecture*

- The environmental performance of traditional courtyard housing in China – case study: Zhang’s house, Zhouzhuang, Jiangsu Province
  
  B. FORD, B. LAU, H. ZHANG

- Analysis of the units contributing climate comfort condition in outdoor spaces in Turkish traditional architecture
  
  S. A. GÜLEÇ, F. CANAN, M. KORUMAZ

- The Vernacular as a model for sustainable design
  
  A. HEAL, C. PARADISE, W. FORSTER

- Shifting comfort zone for hot-humid environments
  
  K. JITKHAJORNWANICH

- Wee energy house; environmentally responsive architecture for rural Northern Ireland
  
  J.-A. FLEMING

- Traditional architecture and bioclimatic design – case study: Tecozautla, Hgo. Mexico
  
  R. MANRÍQUEZ, V. FUENTES, L. GUERRERO

**Bowen Hall**

*Design strategies and tools*

- Thermal rehabilitation: assignment of balconies into conservatories; the ‘Libellules’ case study
  
  R. CAMPONOVO, J.-Y. MAGNIN, P. GALINELLI

- Problems of house energy rating (HERS) in warm-humid climates
  
  S. SZOKOLAY

- CEN-Standards for implementing the European directive on energy performance of buildings
  
  C. LAMBORN, S. ALTOMONTE, M. LUTHER, R. FULLER

- New building principles in consequence of legislative demands for reduced energy consumption in Danish housing
  
  R. ZEDERKOF JESSEN, P.H. KIRKEGAARD, H. BROHUS

15:50 Short introduction to Posters

16:00 Coffee break / visit of Posters
**Trombe Hall**

*Comfort and well-being in indoor and outdoor spaces*

- Roof cooling techniques  
  E. ERELL, S. YANNAS, J. MOLINA  
  646 / 11571
- Environment and urbanization: Microclimatic variations in a brownfield site in São Paulo, Brazil  
  D. DUARTE, J. GONÇALVES  
  839 / 11497
- Thermal comfort and building energy consumption in the Philippine context  
  M. M. ANDAMON  
  730 / 11547
- Thermal comfort & reduced flood risk through green roofs in the tropics  
  M. LAAR, F. W. GRIMME  
  312 / 11577
- Towards a safe sun-bathing canopy  
  C. MACKAY  
  768 / 11581
- Comfort in the science garden  
  S. UBBELOHDE, G. LOISOS, S. PHILIP  
  973 / 11523

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**Bowen Hall**

*Low energy design at the urban scale*

- Urban form, density and solar potential  
  V. CHEN, K. STEEMERS, M. MONTAVON, R. COMPAGNON  
  904 / 11701
- Optimising energy use in master planning  
  S. STANKOVIC, N. CAMPBELL, W. GAISER, A. STONE  
  189 / 11855
- Assessing urban sustainability: microclimate and design qualities of a new development  
  S. de SCHILLER, John Martin EVANS  
  804 / 11969
- Participative retrofit of the «îlot 13» area in Geneva  
  M. GISSELBAEK, P. HAEFELI, P. HOLMULLER  
  941 / 111049
- Applying GIS tools for analysing urban thermal environment  
  L. C. LUCAS DE SOUZA, A. N. RODRIGUES DA SILVA  
  121 / 11741
- Façades design and environmental performance in building in Chiado  
  N. REDIN, M. CORREIA GUEDES  
  145 / 11269

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**Wednesday September 2006 afternoon**

**16:50 Technical sessions**

*Auditorium Paxton*

**Lessons from traditional architecture**

- The four elements of Santorini architecture lessons in vernacular sustainability  
  T. STASINOPOLOS  
  783 / 1173
- Learning from the past: the traditional compact city in hot-humid climates  
  G. DIAZ, A. Ma. DE LA PEÑA, A. ALFONSO  
  556 / 1119
- Lessons from traditional architecture: design for a climatic responsive contemporary house in Thailand  
  P. ANTARIKANANDA, E. DOUVLOU, K. MCCARTNEY  
  725 / 1143
- Shape, culture and environment: a lesson of urban design from Dakhleh oasis, Egypt  
  R. BALBO  
  882 / 1149
- Bioclimatic elements for traditional Romanian houses  
  N. PETRASINCU, L. FARA  
  975 / 1185
- Shekhawati: urbanism in the semi-desert of India – a climatic study  
  A. AGRAWAL, R. K. JAIN, R. AHUJA  
  978 / 11901

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**18:00 Closure of Day 1**

**19:00 Welcome from the City and Canton of Geneva**
09:00 Keynote speakers
- Bureau Baumschlager-Eberle, «Work»
- Thomas HERZOG, «Extension to the head office of SOKO-BAU, the pensions and benefits fund of German building industry, in Wiesbaden»
- Mario CUCCINELLA, «Work»

10:50 Coffee break

11:00 Technical sessions
Auditorium Paxton

Case study
- Bioclimatic lessons from Luis Barragán’s architecture
  A. FIGUEROA, G. CASTORENA
- Bioclimatic skyscraper – learning from Bawa
  B.-K. TAN, D. ROBSON
- Thermal comfort in a sustainable house by Frank Lloyd Wright
  M. SCHILER, S. BRAHMBHATT
- An analysis of the contributions of lighting and climate to the architecture of Luis Barragán
  D. AVILA
- Brasilia: daylighting analysis of public buildings designed by Oscar Niemeyer
  C. NAVES, D. AMORIM, L. SZABO
- Linking bioclimatic theory and environmental performance in its climatic and cultural context – an analysis into the tropical highrises of Ken Yeang
  P. S. JAHNKASSIM, K. IP
- Architecture integrated to nature: the use of timber by Severiano Porto in Brazilian Amazon
  L. NEVES

Bowen Hall
Low energy design at the urban scale

- Tempering the elements: botanic gardens and the search for paradise
  K. BAKER
- Air ventilation assessment system for high density planning and design
  E. Yen-Yung NG
- Integration of energy issues into the design process of sustainable neighbourhoods
  E. REY
- Solar rights in the design of urban spaces
  I. CARLITO, A. YEZIORO, T. BIERBERG, E. SHAIV
- Exploring the thermal benefits of plants in industrial areas with respect to the tropical climate
  N.-H. WONG, Y. CHEN, S.-T. WONG, C. CHUNG
- Housing daylight in urban centres, study case: Havana
  D. GONZALEZ COURID, A. ZORRILLA, H. GOMEZ

12:50 Lunch
Technical sessions

Auditorium Paxton

Case study

- Thermal studies of suitable ecological building in China’s Loess Plateau region
  Jun MIU, Edward Yan-Tung NG
- Integration of living machine and biogas plant – case EVA Centre Lanxmeer, Culemborg
  A. van TIMMERS, M. TAWIL
- A comparative study of the thermal performance of building materials
  S. EBAS-OZKAN, F. SUMMERS, N. SURVEI, S. YANNAS

Bowen Hall

Low energy design at the urban scale

- «La ville radieuse» by Le Corbusier, once again a case study
  M. MONTAVON, K. STEEMERS, V. CHEN, R. COMPAGNON
- The impermanent house: a psycho-analytical approach to improving Glasgow’s social housing scheme
  J. FUNG, C. PORTEOUS, T. SHARPE
- Thermal comfort in urban space renewal
  G. SOULO, V. DESSI
- Thermal generative model for energy efficient form generation
  S. CHEN, K. STEEMERS
- Impact of on-site variables on the influence of vegetation in lowering outdoor temperature in high-rise high-density environments
  R. GIRIDHARAN, S. GANESAN, B. GIVONI
- The role of courtyards in relation to air temperature of urban dwellings in Athens
  E. TSIANAKI

Poster session – short presentations

Bowen Hall

- Alexandros TOMBAZIS, Introductory remarks for round table discussion:
  «case studies – from theory to practice»

Auditorium Paxton

- A comparative study of the thermal performance of building materials
  S. EBAS-OZKAN, F. SUMMERS, N. SURVEI, S. YANNAS
FRIDAY

09:00 Keynote speakers
- Paula CADIMA, «Retrofitting of social housing: opportunities from the intelligent energy Europe - programme»
- Simos YANNAS, «Learning environment»
- Edgard GOUVEIA Junior, «Empowerment»

10:50 Coffee break

11:00 Technical sessions
Auditorium Paxton
Architectural education for sustainable design
- Communication for knowledge transfer in housing design process
  B. CHEN, A. PITTS
- Australian approach to sustainable design professional development education
  S. BERRY, T. MARKER, C. McGEE
- Applications and developments of blended learning course ecology in architectural design
  P. CAPUTO, W. WEBER, P. HAEFELI, I. REGA
- Centres for regenerative studies: graduate studio experiences in education for sustainable design
  R. KOESTER
- Implementing building energy simulation into the design process: a teaching experience in Brazil
  S. DELBIN, V. GOMES DA SILVA, D. KOVAITOFSKI, L. LABAKI
- Education in environmental construction at the University of Plymouth: the eco-house project
  P. de WILDE, B. PILKINGTON
- Sustainability education: addressing practice and attitude
  P. SASSI

Bowen Hall
Design strategies and tools
- Integration of sustainability in the design process of contemporary architectural practice
  M. TREBICOCK, B. FORD, R. WILSON
- An energy-efficient simulation-assisted lighting control system for buildings
  A. RAMDANI, B. SPASOJEVIC
- The use of genetic algorithms for a net-zero energy solar home design optimisation tool
  R. CHARRON, A. ATHENITIS
- Mapping tools for a sustainable building cycle
  G. van den BRAND
- Design strategies in steady-state systems
  M. CLEMENITI
- Using axiomatic design to support sustainable projects at São Paulo, Brazil
  V. GRAÇA, D. IWA, J. BUDA, J. PETRECHE

12:50 Lunch
Trombe Hall

Design strategies and tools

- Assessment of the effects of environmental factors on air flow in and around buildings
  K-P LAM, S. HAY, P. SATWIKO, J. JENNINGS, J. COLE

- Application of multicriteria optimization in wind flow analysis
  K. KLEMM, H. JEDRZEJUK, W. MARKS

- Impact on water consumption by cooling equipment in arid region of Mexico
  L. C. HERRERA, G. GÓMEZ-AZPEITIA

- Design guidelines for direct ground cooling systems in different climates
  A. ANGELOTTI, G. SOLAINI

- Integral design methodology for collaborative design of sustainable roofs
  E. GUANJEL, W. ZEILER, W. BORSBOOM, H. SPOORENBerg

- Criterion for the design on the building envelope related to ecological sensitivity in tourism buildings in the Mediterranean region, Turkey
  E. ACAR, D. E. ÖNDER

Bowen Hall

Design strategies and tools

- Integration of daylight quality in the design studio: from research to practice
  M.C. DUBOS

- Experimental laboratory for teaching architecture lighting in a virtual learning environment
  V. ATANASIO, F. PEDEIRA, A. PEDEIRA

- Assessing a rapid technique for estimating the daylight transmittance of atrium roofs
  D. LASH, S. SHARPLES

- Simplified on-site method for evaluating solar shading performance of advanced windows
  T. INOUE, M. MOMOTA

- A design method for fixed outside solar shading device
  B. MATUSIAK

- Development of a probe for measuring in-situ the thermal properties of building materials
  B. PINKINGTON, P. de WILDE, S. GOODHEW, R. GRIFFITHS

FRIDAY 8 September 2006 afternoon

14:00 Technical sessions

Auditorium Paxton

Design strategies and tools

- Potential for passive cooling of buildings by night-time ventilation in present and future climates in Europe
  N. ARTMANN, H. MANZ, P. HEISELBERG

- Natural ventilation through buried pipes in a small school in Viamão, Brazil
  D. MUSSKOPF, M. SATTLER

- Ventilated façade design in hot and humid climate
  M. HAASE, A. AMATO

- A new ventilation and thermal storage technique for passive cooling of buildings: thermal phase-shifting
  P. HOLLMULLE, B. LACHAI, J. ZGRAGGEN

- Influence of ventilation mode on passive cooling effect – a proposal of flex vent system
  Y. KODAMA, K. TAKEMASA, F. MIYAOCA, C. HASUI

- The impact of façade designs: orientations, window to wall ratios and shading devices on indoor environment for naturally ventilated residential buildings in Singapore
  L.P. VANG, N. H. WONG

15:50 Poster session – short presentations

16:00 Coffee break

16:50 Distribution of awards, final discussion

- PLEA Award, presentation of work

- Award for best paper

- Award for best poster

- Award for best presentation

17:50 Presentation of PLEA 2007

18:00 Closure of PLEA 2006
PROGRAMME DAY 1
WEDNESDAY 6 SEPTEMBER 2006

POSTERS

LESSONS FROM TRADITIONAL ARCHITECTURE

1. Tradition and innovation in contemporary Romanian architecture
   Ana-Maria Dabija 102 / II-79

2. Summer Thermal and Daylighting Conditions in 19th Century Traditional Buildings of Florina in North-Western Greece
   Aineias Oikonomou 168 / IV-61

3. Cooking practices as an indication of heat use in traditional Greek life. The case of Cyclades islands
   Elias Zacharakopoulos 219 / IV-67

4. Passive Design of Traditional Buildings in the Hot and Arid Regions in Northwest China
   Yu Liu, Jing Li, Jinghua Liu and Ying Fu 238 / IV-57

5. Vernacular passive houses from Aarhus city
   Amjad Almusaed, Asaad Almsad 243 / IV-91

6. Traditional Mayan Architecture According to Latitude and Altitude
   Manuel Rodríguez Viqueira, Víctor Fuentes Freixanet 631 / IV-55

7. Quality Concept in Persian Precedent Architecture: A Lesson in Eco-Building Design
   Ali Vali-Andebili, Abdol Halam Boussabane 709 / IV-37

8. Past and present of sustainability: the case of Castellana, an historical centre in South Italy
   Dora Francese, Luca Buoninconti 742 / IV-25

9. The role of landscape design in improving the microclimate in traditional courtyard-buildings in hot arid climates
   Shady Attia 746 / IV-61

10. The relationship between climate and energy in vernacular architecture in central Italy
    Kristian Fabbri, Lamberto Tichinchi 749 / IV-195

11. Climate Control Strategies Used in Rural Housing: Ardebil Province
    Shahabandoo Djalilian, Mansoureh Tahbaz 771 / IV-89

12. Evaluation of the Energy Efficiency of Gaziantep Traditional Houses
    Mustafa Korumaz, Fatih Canan, Saadet Armagan Güleç 797 / III-95

13. The traditional architecture in Sicily: the rural area around the volcano Etna
    Irene Caltabiano 855 / III-101

14. A systematic approach to scientific study of traditional architecture
    Ardeshir Mahdavi, Lyudmila Lambeva, Dina K. Shehayeb, Alaa El-Habashi 860 / III-25

15. Traditional architecture in the Dakhleh Oasis, Egypt:
    space, form and building systems
    Francesco De Filippi 881 / II-15

16. Autonomous Lightweight Houses: Learning from Yurts
    Katarina Monicic 886 / II-15

17. Local Tradition and Bioclimatic Architecture in the Italian Alpine Region
    Rossano Albarico 905 / II-107

18. Traditional climate-adapted typologies as a base for a new contemporary architectural approach
    C. Ganem, A. Esteves, H. Coch 913 / III-117

COMFORT AND WELL-BEING IN INDOOR AND OUTDOOR SPACES

1. Thermal comfort evaluation in outdoor space of tropical humid climate
   Letícia Zambrano, Cristina Malafaia and Leopoldo E.G. Bastos 116 / III-37

2. A sense of comfort in open space around owner-built houses: the case of Campinas, Brazil
   Evandro Z. Monteiro, Mayra de Mattos Moreno, Silvia A. Mikami G. Pina, Luclia C. Tabaki, Doris C.C.K. Kowaltowski, Vanessa Gomes da Silva, Mariela C. Aires de Oliveira 138 / III-45

3. Design Evaluation and Strategies: the case of University Auditoriums
   Doris C.C.K. Kowaltowski, Silvia A. Mikami G. Pina, Stelamains R. Bertoli, Carolina Soler 139 / III-63

4. Noise - Violence relation in a sample of houses in Colima
   Gabriel Gómez-Azpeitia, Ana G. Magaña, Armando Alcantara 148 / III-64

5. Biophilic architecture, the concept of healthy sustainable architecture
   Amjad Almusaed, Asaad Almsad, Zaki Khalil Abu-Shahik, Salih Khalil 151 / III-138

6. Outdoor Comfort in Low-Income Housing Design
   Thalita Gójil, Ercilia Hinton 178 / III-16

7. Comfort and well-being in solar buildings. Results from a European audit
   Claude-Alain Roulet, Chris Cox, Phil Bluyssen 182 / III-38

8. Modelling the thermal bioclimate in urban areas with the RayMan Model
   Andreas Matzarakis, Frank Rutz, Helmut Mayer 196 / III-44

9. Comfort Levels for Office Environment Users
   Luciana C. de Fonseca, Marcelo de A. Romero and Carlos A. R. Esteves 212 / III-52

10. Thermal comfort in Bangkok residential buildings, Thailand
    Preechaya Rangsirirosa 234 / III-54

11. The importance of users’ actions for the sensation of comfort in buildings

12. Calibration of outdoor thermal comfort models
    Leonardo Marques Monteiro, Marcia Pinada Alucci 314 / III-15

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13 A computational application to assess thermal and luminous comfort under tensioned membrane structures
M. Peinado Alucci, L. Marques Monteiro, R. Brandão, A. Miana, M. Marcondes, D. Costa, N. Moura
14 Ponds, Green Roofs, Pergolas and High Albedo Materials; Which Cooling Technique for Urban Spaces?
Eleftheria Alexandri, Phil Jones
15 Low-Cost Climate Control System for Museum Storage Facility on Tenerife Island
Shin Maekawa and Maria Garcia Morales
16 Study on Effect of Greenery in Campus Area
Steve Kardinal Jusuf, Wong Nyuk Hien, Aung Aung La Win, Hnin Kyaw Thu, Ta Swaya Negara, Wu Xuchao
17 The noise influence in the school environment
M. Oliveira Santos, C. Malafaia, M. Lygia Niemeyer
18 Elements for the design of acoustic barriers: some cases in Rio de Janeiro city
Cristina Malafaia, Maria Julia Oliveira Santos, Maria Lygia Niemeyer
19 Environmental Comfort Perception in the Alvorada Sustainable Low-Cost House: Second Post-Occupancy Evaluation
Adriana de Oliveira Santos, Cristiano Richter, Eugenia Aumand Kuhn, Manoel Benvenoge Potes, Mauricio Lago Magra, Patricia de Freitas Nerbis, Miguel Aloysio Sattler
20 Influence of building design on thermal comfort of hawkers centers in Singapore
Song Jiafang, Wong Nyuk Hien
21 Assessment of visual comfort of spectators in stadia
Ágota Szücs, Michel Perraudeau, Francis Allard
22 Thermal comfort and passive design strategy of bus shelters
Tzu-Ping Lin, Andreas Matzarakis, Jia-Jian Huang
23 Daylight measurement in Milan
Tiziana Poli, Luca Pietro Gattoni, Daniele Zappalà, Robert Gottardi
24 Comparison between the UK and Taiwan on the sound environment in urban residential areas
C. Yu, J. Kang
25 Behaviour of People in Open Spaces in Dependence of Thermal Comfort Conditions
Lutz Katzschner
26 Considerations on glazed office buildings retrofit focusing luminic and visual comfort
Siegfried Neutzling Buchweitz, Leopoldo Eurico Gonçalves Bastos, Teresa C. F. Queiroz, Eduardo Breviglieri Pereira de Castro
27 Transition Spaces and Thermal Comfort – Opportunities for Optimising Energy
Adrian Pitts, Jasmins Ilnets Soler
28 Thermal Comfort and Environmental Modelling in Atrium Buildings
Rong Li
29 Urban Environmental Glares: the Secondary Consequence of Highly Reflective Materials
Marc Schler, Elizabeth Valmont
30 Shading Devices Designed to Achieve the Desired Quality of Internal Daylight Environment
Dariusz Heim, Kamil Kieszkowski
31 The Guidelines for Internal Daylighting Design Based on Global Daylight Index (GDI)
Dariusz Heim, Piotr Klemm, Eliza Szczepanska
32 The Impact of Daylighting-Guiding Systems on Indoor Natural Light Penetration: Simulation Analysis for Light Shelves
Hanam Mustafa Kamal Saby
33 Evaluation of indoor environment quality of Urban Residential Buildings in Chongqing
Xie Hui, Baizhan Li, Jie Zheng
34 The «soundwalk» as an operational component for urban design
Flora Venot, Catherine Semidor
35 Effect of Urban Forest on Daylight Availability in Built Environments. The case of Metropolitan area in Mendoza
Claudia F. Martinez, Lorenza Córcoles, Martin Endrizzi, Andrea Pattini, M. Alicia Cantón
36 Daylighting the retail environment
Caroline Paradise, Amanda Heal and Wayne Forster
37 Impact of Urban Parks on the Climatic Pattern of Mendoza’s Metropolitan Area, in Argentina
Erica Corea, Claudia Martinez, Graciela Lesino, Carlos de Rosa, Alicia Cantón
38 Warm-Humid Climate: Methodology to Study the Distribution of Air Temperature
Angelina D. L. Costa, Lucila C. Labaki, Virginia Maria D. de Araújo
39 Daylight at home: differences between developers and architectural competition houses
Gabriel Rodriguez, Daniel Siret

STRATEGIES AND TOOLS FOR RENOVATION
1 Daylight for Sustainable Intervention in Historic Towns: The case of Edinburgh and Cairo
Sura Al-Maiyah, Hisham Elkadi
2 Shower Tower, Miele Showroom, Johannesburg South Africa
Paul Carew, Gerry Jaubert
3 Energy-Efficient and Culturally Relevant Housing Concepts for Modern Native American Settlements
David N. Benjamin
4 Monitoring of Miele corporate headquarters Johannesburg, South Africa
Gerry Jaubert
5 Exploiting Natural Ventilation for Renovation of Historic Buildings in an Urban Context
Vincent Buhagiar, Phil Jones
6 Renovation of apartments adding portal structures and façade-elements for extra space and high energy performance
Michiel Ham, Arend Schamhart
7 Some Possibilities of Extensions in Building Renovation
Natasa Cukovic-Ignjatovic, Dusan Ignjatovic
PROGRAMME DAY 2
THURSDAY 7 SEPTEMBER 2006

POSTERS

LOW-ENERGY DESIGN AT URBAN SCALE

1. A GIS-based Method for Determining Natural Ventilation Potentials and Urban Morphology
   Tung-Shen Hsie, Ian C. Ward 156 / 1707

2. Optimal orientation for a typical Italian residential building and its urban context
   Antonio Carbonari, Luca Porciani, Federica Fido 186 / 11-845

3. Impact of urban design on daylight availability
   Solange M. Leder, Fernando O. R. Pereira, Anderson Clara, Marcela G. Ramos 209 / 1695

   Niccolò Aste, Umberto Beneventano, Michela Buzzetti, Lavinia Tagliabue 222 / 1713

   Giancarlo Chiesa, Niccolò Aste, Michela Buzzetti, Marcella Capobianco 224 / 1721

   Amy Jo Holtz 700 / 1849

7. Energy design strategies for city-centres: an evaluation
   Rajat Aggarwal 777 / 1683

8. Lessons for the Application of Renewable Energy Technologies in High Density Urban Locations
   Lynne Sullivan, Brian Mark, Tessa Parnell 875 / 1727

9. Examples of Low Energy Design at Urban Scale in Egypt
   Suzette Michel, Hend Elsayed 885 / 11-839

10. Solar Energy Potential of Low Density Urban Zones in Mendoza’s Metropolitan Area
    Manuela Arboit, Alejandro Mesa, Carlos de Rosa 909 / 1733

CASE STUDIES

1. The Energy-producing Greenhouse
   Jon Kristriss 112 / 1741

2. Energetic and Environmental Impacts of the Urban Sprawl on Productive Oasis Land around Cities in Arid Zones: The Case of Mendoza’s Metropolitan Area, in Argentina
   Alejandro Mesa, Manuela Arboit, Carlos de Rosa 118 / 1747

   Silvia Martin, Ignacio Gonzalez, Ignacio Cañas 164 / 1827

4. Thermal performance of a passive solar house for continental climate, in Florina, north-western Greece
   Achilleas Stavros, Flora Bougiatioti, Ainesia Oikonomou 167 / 1863

5. Environmental Evaluation of an Active Façade in a Naturally Ventilated Office Building
   Ian C. Ward, Hassan Altn, J. Mahelnikova, D. Plsk 201 / 1839

   Yufan Zhang, I.C. Ward 202 / 1845

7. The performance of award winning houses
   V. Saebert, T. Williamson, A. Rafof, H. Bennets 229 / 1855

8. Passive cooling for complex buildings in a humid tropical area – Study case Colombia
   Agustín Adame 233 / 1867

9. The microclimate in housing estates in the Northeast of Brazil
   Ana Lucia R.C. da Silveira, Marta A. B. Romero 237 / 1873

10. The Landcare Research building: Sustainable performance in practice
    Robert Vale, Margaret Lawton, Fraser Morgan 305 / 1861

11. An adaptable urban house designed for the southern Brazilian climate – emphasis on summer and winter thermal comfort
    Marianne Castella 306 / 1893

    Rosangela Tenorio, Aldomar Pedrini, Hugh Morris, Te Kipas Kepe Brian Morgan, Ros Haskins 83 / 1953

13. FAUUSP, São Paulo, Brazil: an icon of Brazilian modern architecture with lessons and questions on environmental design and thermal comfort
    J-C. Gonçalves, P. Sanches, R Cavalcante 515 / 1875

14. Sustainable development in a precarious urban environment: the case of the University City of Soa, Cameroon
    Alice Fiuza 527 / 11-009

15. Environmental and economical assessment of a more sustainable low-cost house
    Eugenia Aumond Kuhn, Miguel Albiyko Satler 570 / 1765

16. Greenhouse technologies for a painting studio
    C. Claret, D. Alatayyud, S. Santos, J. Vidal 607 / 1951

17. Analysis of thermal behavioural of a low-cost, single-family, housing prototype considering specific climatic conditions
    A. Aorella, G. Grigaitis, M.-A. Satler 608 / 11-933

18. Visitors’ Center in Archeological Sites – an architectural approach to the sustainable use

19. Sustainable City Planning and Building Design: Case Study
    Kem F To 712 / 1895

20. Placing low-energy architecture in a low-cost economy
    Alan M. Jones 718 / 1759
21 Frei Pacífico Primary School Sustainable Project
Nasira Zanardo Zanin, Cristian Riveros Illanes, Miguel Aloysio Sattler, Vivian Ecker, Raquel Azevedo 719 / I-879

22 Achieving Suitable Thermal Performance in Residential Buildings in Wuhan, China
Feifei Sun 726 / I-927

23 A Very Low Cost Sustainable Housing Prototype for Tijuana, Mexico
Pablo La Roche, Irma Ramirez, Kyle Brown, Kristian Whitsett, Kim Wehinger, Mauricio Carranza, Leslie Lum, Sonya Reed 766 / I-773

24 Post-Occupancy Evaluation of a Scientists Village Complex in the Desert – Towards a Comprehensive Methodology
Liat Frenkel, Shiri Fundaminsky, Isaac Mei, Lusi Morhayim 769 / I-907

25 Energy performance of a retrofit ted pilot building made with industrialized technology
Tamás Csoknyai 775 / I-957

26 EULEB – EUropean high quality Low Energy Buildings
Jörg Schlenger, Helmut Müller 782 / I-919

27 Daylighting Strategy for Kuwait Autism Center Eliminates the Need for Electric Lighting
Abdullah Al-Mohaisen 801 / I-963

28 Optimized Social Housing in France
Jean Bouillot, Philippe Gagliardi 828 / I-987

29 The sustainable Development of Intelligent Building in China
Zheng Jie, Wu Pei, Chen Liang, Sun Jie 830 / I-915

30 Ambiguous Porosity – Integrated Urban Gaps Identification and Experimenting Urban Connectivity
Chady S. Brech 863 / I-1041

31 Comparison of soundscape on the ground floor of tube houses in Hanoi and open urban space in Bordeaux
Tuan Anh Nguyen 865 / I-1029

32 Relationship between urban activities and soundscape: commercial areas in Bor deaux and Hanoi
Tuan Anh Nguyen, Catherine Semidor 866 / I-1035

33 Evaporative Cooling in Tropical Climate: Case Study of Campinas, Brazil
Carla Fernanda Barbosa Teixeira, Lucila Chebel Labaki 888 / I-887

34 Environmental Profile and Building Process. Life-Cycle Assessment application to experimental dry external wall Construction Systems
Carol Mancielli 911 / I-1023

35 A border customs control building at 4,700 m. above sea level in Southern Andes plateau: a challenge for design in extreme climatic conditions
Pablo Flores, Gabriela Armijo, Eugenio Collados 927 / I-885

36 Intra-Urban Mobility and Suburbanisation Influences on the Urban Form
Agapi Fylaktou Cattaneo 955 / I-1011

37 Bioclimatic Performance of High Rise Office Buildings: A Case Study in Penang Island
Lokman Hakim Ismail, Magda Sibley 970 / I-981

38 Learning more from existing indoors: An investigation of roof lighting within lecture rooms
Djamila Rouag-Saffidine, Sarah Benharkat 976 / I-797

39 Public Offices Buildings in Brasília: a point of view of Environmental Comfort
Joane Sabrosa da Silva, Claudia Naves, David Amorim 983 / I-881

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Karin Regina de Castro Marins 101 / I-189

2 Design guidelines for thermal comfort in row houses in Bangkok
Pattaranan Takkanon 109 / I-279

3 A web tool for the choice of daylight scale model materials
Magali Bodart, Rodrigue de Peñaranda, Arnaud Deneyer, Gilles Flamant 110 / I-133

4 A guide for the building of daylight scale models
Magali Bodart, Arnaud Deneyer 114 / I-139

5 Passive Design of an Indoor Railway Station
Matthew Payne, Matthew Jessup 127 / I-189

6 Passive Down draught Evaporative Cooling Applied on Existing Fabric: Using Traditional Chimney as Case Study in Portugal
Ana Cláudia Martins de Melo, Manuel Correia Guedes 129 / I-1203

7 Daylighting museums – a case study in Lisbon
Fernanda Sá de Oliveira, Manuel Correia Guedes 130 / I-287

8 Bioclimatic architecture in East-Timor – a path to sustainability
Gonçalo Silva, Manuel Correia Guedes 132 / I-287

9 Comparing the accuracy of daylighting physical and virtual models for complex fenestration systems
A. Thanachareonkit, J.-L. Scartezzini, D. Robinson 136 / I-145

10 An Approach to the Effects of Environmental Change on Building Design and Construction
N. Papamanolis 140 / I-171
11 Numerical and experimental analysis of light pipes’ performances: comparison of the obtained results
Paola Zazini, Fabrizio Chella, Angelo Scardinu 143 / $219

12 A dynamic skylight for daylighting and assisting climatisation in a medium-size room
Antonia Carbonari, Fabio Peron, Nicola Cerese 187 / $201

13 Eco-efficiency of passivhaus in Mediterranean climate
Monica Lavagna 199 / $257

14 Parametric Lighting Studies
S. Garcia Tavera, L. Stümper Kinsel, H. da Costa Silva 210 / $213

15 Cost-effective thermal insulation in housing
Igor Sanjee, Michiel Ham 217 / $263

16 House/Home Energy Rating Schemes/Systems (HERS)
T. Williamson, V. Soebarto, H. Benetti, A. Radford 230 / $227

17 Shading as an active component for solar control: an integrated approach at the early design stage
Alfarawasaa Tempekaasha, Andreas K. Afentis 235 / $1157

18 Architectural design and environmental performance: the ADDENDA method through case study
Leticia Zambrano, Leopoldo Euroco González Bastos, Pierre Fernandez, Frédéric Bonneaud, Alain Castells 244 / $1305

19 Office Buildings Façades: The Relationship between Costs and Performance
L. Fernanda de Souza Pinto, M. de Andrade Roméro 245 / $269

20 Potentials of Window Design in Inducing Airchange in Still Air Condition
K. Shabbir Ahmed, A. Haq, M. Moniruzzaman 303 / $1209

21 Robust design: a way to control energy use from the human behaviour in architectural spaces
M. Palme, A. Isalgue, H. Coch, R. Serra 311 / $1311

22 Effect of Reflection of Sunlight on Illuminance and Energy Gain of Greenhouses
Mila Pucar 316 / $1183

23 Modelling the solar factor of glazing combined with indoor Venetian blinds
Alessandro Dama, Tilmann Kuhn, Lorenzo Pagliano 303 / $1243

24 Does the EPBD promote the solar architecture?
András Zöld, Zsuzsa Szalay 508 / $1159

25 Sustainable Façade Design for Zero Energy Buildings in the Tropics
Matthias Haase, Alex Amato 509 / $1275

26 Performance Based Window Selection Model for Residential Buildings
Ashan Tavl, Hakan Yaman, Ilkai Celiner 521 / $1237

27 Interrelation between glazed Surfaces, Building Structure and Thermal Comfort
Ferenc Kalmár, András Csiha 503 / $1243

28 A green experiment conducted in the tropical climate
Chen Yu, Wong Nyuk Hon 533 / $251

29 Thorough Study of a Proposal to Improve the Thermal Behaviour of a Bioclimatic Building

30 The Use of the Artificial Sky as a Means for Studying the Daylight Performance of Classrooms
Konstantinos Antoniou, Aikaterini Meresi 571 / $225

31 Natural ventilation simulation with coupling program between building simulation (BS) and computational fluid dynamics (CFD) simulation program for accurate prediction of indoor thermal environment
Wang Liping, Wong Nyuk Hon 576 / $1195

32 Air Flow Exchange Velocity of Urban Canyon Cavities due to Thermal Spatial Differences
Maria Oliveira Pandol, Helder Gonçalves, Paulo Ferro 582 / $1317

33 A Systematic Parametric Study on a Passive Room-Dehumidifying System Using the Sorption Property of a Wooden Attic Space
Aremit Narangwiti, Sakamoto Yuzo 617 / $257

34 Permeability, Porosity and Better Ventilated Design for High Density Cities
Edward Ng, Nyuk Hon Wong, Mei Xi Han 643 / $1329

35 Eco-Building Design (EBD): Design Strategies to Increase Building Compatibility
Ali Vaskili-Ardebili, Abdel Halim Bousbaaouane 708 / $1177

36 Improvement of precooling supply air by way of coupled earth to air heat exchanger and solar chimney
José Careia da Silva 711 / $369

37 Daylight in Urban Canyons: Planning in Europe
Luca Bratas, Mike Wilson 735 / $1207

38 Cooling natural ventilation for office buildings in a Mediterranean climate
Waldio Bustamante Gómez 736 / $1335

39 A Method to Identify the Solar Absorptance of Opaque Surfaces with a Low-cost Spectrometer
Kelen Danielle, Mauricio Rrance 758 / $1385

40 Five Locations to Represent World Climates
Khaled Mansy 767 / $1197

41 Load-Representative Temperature-Difference Method, a Third Generation Design-Assisting Tool
Khaled Mansy 767 / $1401

42 Methodological Model for Evaluating the Thermal Behavior of External Walls Exposed to Moisture Phenomena
Leonardo Yeas 774 / $1303

43 Using Daylighting in Highly Luminous Climates: Visual Comfort and Performance
I. Guedi Capeluto, Carlos E. Ochoa 781 / $1231

44 Design Fire in Performance-based Fire Safety Design for Green and Sustainable Buildings
W.K. Chow 820 / $1243

45 Sarah Kubitschek Hospital-Salvador, Brazil: principles for a healing architecture at latitude 13°
Rosangela Tenorio 837 / $1321

46 A Simple Thermal Model for the Development Project «KIUMA» in Tropic Climate, Matemanga, Tanzania
Unit Eysak 845 / $1405

47 Investigation on a natural ventilation system using the structure design of a building
Fretin Dominique, Bedendo Ivana, Szabo László Péda, Amodo Wagner, Benites Enrique, Joerg Spanenger 852 / $1351

48 Optimization of the solar control devices in windows for hot climates
Silvia Arias 877 / $1163
49 Summer climatic data for Geneva: average and extreme conditions
Pierre Ineichen 899 / ll-391

50 Sustainable building life-cycle: approach model and construction techniques
Luca Beraghi 903 / ll-437

51 Environmental compatibility of the coastal tourist installations: definition of a sustainable planning design tool
Antorella Serafini 919 / ll-291

52 Whose Sustainability Is It Anyway?
Ruchita Sutaria, Aalok Deshmukh 939 / ll-165

53 Intra-urban Ventilation Conditions and Interactions between Urban Morphology and Climate Variables
Homero Jorge M. de Carvalho, Oscar Daniel Corbella 977 / ll-291

54 Environmental impact assessment of building construction systems
Reto Camponovo, Catherine Mezt, laurent Valtet 997 / ll-329

55 An Approach to Low-Energy Architecture for Commercial Buildings in Vietnam
Viet Tuan Do, Alan N. Young 999 / l-355

ARCHITECTURAL EDUCATION FOR SUSTAINABLE DESIGN

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Ana Maria Dabija 103 / l-749

2 An easy-learning and easy-teaching tool for indoor thermal analysis – ArcTech
Léa Cristina Lucas de Souza, João Roberto Gomes de Faria, Kátia Lívia Zambon 125 / 1617

3 Up-Skilling Architects and Building Services Engineers in the Use of Higher Level Evaluation Tools for Energy Efficient Design of Buildings
Ian C. Ward, Martin Brocklesby 155 / 803

4 Architecture Unplugged: The Teaching of the Principles, Needs and Calculation Procedures for Sustainable Housing Design
Phillip Tabb, Hazem Rashed-Ali 181 / 617

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6 Architectural education for sustainable design. A proposal for improving indoor environment quality
Claude-Alain Roulet 181 / 1653

7 Designed Green Toolbox as Built Environment Educating Method. Analytical comparison between two groups of students with different cultural background
Usama El Fiky, Inass Hamdy, Mohamed Fikry 207 / l-779

8 Vision Evaluation of the Students in Architecture about Sustainable Architecture in a Local Context in Konya / Turkey
Fatih Canan, Mustafa Karumaz, Saadet Armagan Güleç 300 / l-779

9 Sustainability criteria as a helping tool for developing architectural projects
María Andrea Triana, Alice T. Cybis Pereira, Fernando O. Ruttkay Pereira 733 / l-799

10 Towards Key Performance Indicators for ‘Environmental Building’
Pieter de Wilde, Steve Goodhew 792 / l-809

11 Analysis of the Potential of Controlled Air Movement for Improving Comfort Conditions in an Ambient Chamber
José Roberto Garcia Chávez, Juan José Amíriz García, Hernando Romero Paredes 957 / ll-659

12 Whose Sustainability Is It Anyway? Teaching about failures in building design and construction
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13 What went wrong? Teaching about failures in building design and construction
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19 Towards Key Performance Indicators for ‘Environmental Building’
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20 Sustainability issues in architectural education – the integrated approach
Eufrosyne Tantis 932 / ll-1635

21 Architectural Research into Environmental Performance
Werner Gaiser, Steve Hardy 966 / ll-1635

22 Theory meets ‘reality’: an Energy-effective House Design course
Deborah White 998 / ll-1665
Participative retrofit of the «ÎLOT 13 » area in Geneva
Housing some 600 people, the Îlot 13 buildings are located behind the railway station. Supposed to be demolished and reconstructed in the 1960’s, it raised a large political and urbanistic debate. Beyond the simple question of maintaining the constructed structure, the inhabitants were claiming a type of architectural intervention that would be based on their active participation in both decision-making and execution. The aim was firstly to preserve the existing social and economic structure and sustain the experimentation of local democracy, and secondly to give care to an ecological rehabilitation process. Several inhabitant cooperatives were constituted so that the local government supported a set of real-estate operations, making the experiment possible through a step-by-step approach, paying special attention to the inhabitants’ effective needs. The result was interesting architectural solutions and affordable rents, as well as low-cost renewable energy production.

Low-energy (Minergie®) multifamily buildings
Recently, around Geneva, a few low-energy buildings were achieved according to the Minergie standard. From the preliminary draft till the buildings construction, close attention has been given to the energy concept by an interdisciplinary group of architects and engineers.

«LE POMMIER» / Grand-Saconnex / Geneva
A large multifamily complex of about 21’000 square meters (three buildings) was recently built in the suburb of Geneva and was certified Minergie®, a Swiss quality label. This outstanding realization is actually under monitoring by the Energy Centre of the University of Geneva (CUEPE) for a four-year period. Annual gas consumption per unit of gross heated floor was measured as 228 MJ/m² for the first year, more than the predicted value of 92 MJ/m², and will probably lower to 191 MJ/m² for the second year. Although higher than the designed value, the performance of these buildings remains excellent compared to the usual measured values for recent buildings (350-400 MJ/m²), especially considering their large scale and residential nature. The design, realization and exploitation stages are currently under investigation in order to better understand the difference between designed and measured value.

CODHA Cooperative housing
«LES ZABOUCHES» Charmilles-Châtelaine, 2004
This housing community includes 27 flats dispatched on 2 Minergie buildings.

«LES VOIRETS» Plan-les-Ouates, 2006
This housing complex, currently under construction, integrates many ecological concepts like Minergie, embodied energy of construction materials, geobiology, Feng-Shui, etc.
THE HAMMAMS WORKSHOP
AN ALL-DAY EVENT ON 9 SEPTEMBER 2006
GENEVA, SWITZERLAND

Extending the «Hammams» workshop from the last PLEA conference in Lebanon, Jean Bouillot and Heidi Dumreicher organize in Geneva a workshop about «Hammams and baths, sanitary and sociocultural aspects».

Programme

Morning
- Guided visit of the «Bains des Pâquis» including bathing for amateurs
- Lunch in the «Buvette des Bains des Pâquis»

Afternoon
Workshop in Uni-Mail on the topic «Hammams and baths, sanitary and sociocultural aspects»
Different speakers will develop the different topics within the Hammam project:
- Sociocultural aspects of Hammams
  Heidi DUMREICHER, Bettina KOLB
  Typology of Hammam buildings around the Mediterranean
  Magda SIBLEY
- Analysis and diagnosis of Hammam buildings
  Ardeshir MAHDAWI
- Design of Hammam buildings through different climates
  Jean BOUILLOT
- Comments and discussion

Practical Information
- Visits restricted to 30 people
- Registration and information at the Conference Desk

www.plea2006.org
1. Uni Mail / Conference Venue
2. Hôpitaux Universitaire de Genève (HUG) / Geneva Hospital
3. Embarkation peer
4. Gare CFF Cornavin / Railway station

- - - Tram 15
- - - - - - Tram 17

**Emergency**

Cardiомobile / ambulance  Tel. 144
Police  Tel. 117
Pompiers / Fire brigade  Tel. 118
Hôpitaux universitaires de Genève (HUG) / Geneva Hospital
Rue Micheli-du-Crest 24
1211 Genève 14
Tel. 022 382 33 11