

# Wood Solutions Fair Speakers 2010

## Architectural

### **1. Eden Project – The Core, Cornwall, England**

Ulrich Dangel, Associate Professor, School of Architecture, University of Texas

The Education Resource Centre in Cornwall, England, also known as *The Core*, is a supporting facility to the Eden Project, a series of geodesic biome structures housing botanical collections. The design of the building was developed from phyllotaxis, which is the mathematical basis for nearly all plant growth. Hence the roof structure recalls the arrangement of scales on a pinecone or the seeds in a sunflower head. In collaboration with engineering firm SKM Anthony Hunts, this naturally occurring rhythm has been resolved into an efficient and elegant timber structure, which serves as the focal point of the project.

#### **Ulrich Dangel**

Ulrich Dangel is an Assistant Professor at the University of Texas at Austin where he teaches graduate and undergraduate courses in design, construction, architectural detailing, and structural design. He received a Diploma in Architecture from Universität Stuttgart in Germany and a Master of Architecture from the University of Oregon. His professional career led him to London where he worked for internationally renowned architecture firms Foster and Partners as well as Grimshaw. He is a registered architect in Germany and the UK and is also co-founder of *Glass and Dangel*, an emerging design firm in Austin, Texas.

**2. Cross Laminated Structural Timber used innovatively in two new School Academy Buildings in the UK.** Sophie Campbell BA Arch, Dip Arch, RIBA, Project Leader, and Architect at Sheppard Robson, London, England

Sophie will be giving an introduction to the UK's largest structural timber building: The Open Academy in Norwich. This unique new-build academy is saving 2,900 tonnes of CO2 emissions when compared with an equivalent building frame in steel or concrete. The discussion will include other examples of school's which this practice is building in the UK using this construction method as both a structural material, and an aesthetic proposal. The benefits of the use of timber within the design and to the construction programme will be explained, along with the concepts behind the buildings themselves.

#### **Sophie Campbell BA Arch, Dip Arch, RIBA, Project Leader, and Architect at Sheppard Robson**

Sophie gained her degree at Nottingham University, she went on to complete her Part 1 placement at Hampshire County Architects and then went back to receive her diploma in Architecture at the Bartlett School of Architecture at UCL in 2004. Sophie Joined Sheppard Robson Architects in 2004 and completed her Part 3 RIBA training in 2006. Since then she has project led a number of successful schemes including Norwich's Open Academy, Norfolk's First Academy Building and the award Winning Vincent Building at Cranfield University. Her latest Education projects are the City Academy Norwich due for Completion in 2012 and the UK's first-ever Montessori State School.

Sophie has been a member of Building Magazine's Graduate Advisory Board since September 2007. Her role on this board comprises of writing articles, and working actively within the construction industry to promote her field to the younger generation in the Industry. She was recently nominated for the Ambassador Award for displaying significant achievements in the Profession at the G4C New Generation Awards. Sophie continues her link with the Bartlett as a guest critic for Diploma students, visiting throughout the term for two teaching Diploma Units. She has given lectures on her work at the ICA, and has contributed to a number of collaborative work exhibitions.

### **3. 2009/10 Wood Design Awards**

**Marianne Berube**, Ontario Wood *WORKS!* Executive Director

This presentation will highlight award-winning projects from the North American Wood Design Awards program as well as the Wood *WORKS!* Wood Design competitions. The projects featured in this presentation showcase innovative uses of wood in institutional, commercial and residential designs. Unique one-of-a-kind buildings will be showcased, as will designs that can be easily and cost-effectively replicated.

**Marianne Berube**, Ontario Wood *WORKS!* Executive Director

Marianne Berube lives and works in North Bay, Ontario. She originally graduated from Nipissing and York Universities with degrees in Environmental Science and Business. She later obtained both a Professional Management and Certified Investment Management Degree. She has worked extensively with the Construction Industry, CMHC and now, the Canadian Wood Council.

Marianne has been the Ontario Wood *WORKS!* Executive Director for the past 10 years. She is a regularly-invited speaker on developments in sustainable building and how wood products can be incorporated into non-residential building designs.

She was the founder of the annual Wood Awards Program- that honours innovative wood buildings and the people that are creating them. Marianne recently won the 2007 Northern Ontario Business Influential Women's Award, acknowledging her perseverance and success with the Wood *WORKS!* Project.

## **Building Green**

### **4. Building Green with Wood Construction**

Jim DeStefano, P.E., AIA, president, DeStefano & Chamberlain Inc., Fairfield, Connecticut  
Sustainability – everybody talks about it but nobody does anything about it, at least not enough to make a real difference. There is more to sustainable design than scoring points towards a LEED certification. This presentation will discuss how to design and build structures using wood products in an environmentally responsible fashion. The following topics will be covered:

- Green characteristics of wood
- Sustainable forestry and certification programs
- Efficient use of wood fiber
- Non-toxic wood treatment
- Recycling and responsible waste management

#### **James B. DeStefano, P.E., AIA, President, DeStefano & Chamberlain Inc., Fairfield, Connecticut**

Jim received his Bachelor of Science degree in Civil Engineering from the *University of Pennsylvania* in 1976 and received the Estrada Award for being first in his engineering class. Jim went on to earn a Master of Science degree in Structural Engineering and Structural Mechanics from the *University of California - Berkeley* in 1977.

Jim served as the President of the *Connecticut Structural Engineers Coalition* from 1994 to 1997. He has also served as a director of the *National Council of Structural Engineers Associations (NCSEA)*.

Jim currently serves on the *Structural Engineering Institute (SEI)* Sustainability Committee.

Jim is a founder and past chairman of the *Timber Frame Engineering Council (TFEC)*. Jim is a member of the *American Wood Council (AWC)* Task Committee on Timber Framing.

Jim is a Director of the *Structural Insulated Panel Association (SIPA)*. He serves on the *American Plywood Association (APA)* SIP Performance Standard Committee.

Jim is the past-chairman of the *Structure* magazine Editorial Board.

Jim is a Registered Professional Engineer, a board certified Structural Engineer and a licensed Architect.

### **5. Green Building Rating Systems: How Does Wood Fit?**

Helen Goodland, Executive Director of Light House Sustainable Building Centre

In 2009, Light House was asked by Forestry Innovation Investment to examine the world's major green building rating and certification systems in order to evaluate their relationships with wood in order to gain a better understanding of what opportunities may be available for promoting wood as a green building product. In October 2009, the findings from this study were presented at the Economic Commission for Europe's Timber Committee at the United Nations in Geneva. The findings have informed recommendations that will be taken forward to the Climate Change Summit in Copenhagen in December 2009.

### **Helen Goodland, Executive Director of Light House Sustainable Building Centre**

Helen is the co-founder and Executive Director of Light House Sustainable Building Centre, located in Vancouver, British Columbia. Founded in 2005 by Simon Fraser University and Ecotrust Canada, Light House serves as an economic development centre for green building providing market intelligence, business networking and facilitation services, technical assistance, policy research, public outreach and education. Light House's mission is to nurture Vancouver's emerging green building sector: helping local companies reap the benefits of shifting to a green economy while inspiring everyone to take action in reducing the environmental impacts of buildings. Helen is a LEED accredited UK-chartered architect and also holds a Masters in Business Administration from UBC.

### **Durability of Wood in Exterior Applications**

#### **6. Deterioration Challenges and Durability by Design**

Jieying Wang, PhD. Wood Treatment Scientist. Durability and Protection Group, FP Innovations

Wood buildings have a track record of good service performance and longevity. However, to avoid premature deterioration it is important to understand local durability challenges and then apply appropriate measures in design and construction. The principle of four "D"s should be used in order to prevent rain intrusion. "Deflection" can effectively protect building components from getting wet during rain events. "Drainage" is an effective way to remove bulk water once the water gets onto the building assemblies. "Drying" should be facilitated by properly applying vapour and air flow control measures for the building assemblies. The application of "durable" materials is covered by the following presentation. For areas with termite hazards, the application of a six "S"s principle can effectively prevent termite attack. Design for flexibility also helps prolong building service life.

#### **Jieying Wang, PhD. Wood Treatment Scientist. Durability and Protection Group, FP Innovations**

Jieying Wang is currently a research scientist in the Durability and Protection Group at the Forintek Division of FP Innovations, Canada's national forest products research institute. Previously she worked with Dr. Paul Cooper at the University of Toronto as post-doctoral research fellow for three years after she obtained her PHD in wood science from Beijing Forestry University, China. Since she joined Forintek in 2005, her research has focused on thermal modification and then building science-related durability issues. She has been extensively involved in developing durability-related building codes and standards in China. She was the project manager for a wood house durability survey in China and the development of the durability chapter of the Shanghai wood-frame construction code. She has been working with building science professionals in identifying durable wall assemblies for cross-laminated timber (CLT) construction for its use in North America. She has also been heavily involved in projects about differential movement in wood-frame construction.

## **7. Durability by Nature and Durability by Treatment - Including Coatings**

Paul Morris, PhD, Group Leader – Durability and Protection, FP Innovations

After design, the most important decision for durability and enduring aesthetics is the choice of wood material. Several of our local wood species are dimensionally stable and naturally durable, but they are susceptible to weathering caused by sun and staining fungi. The properties of other widely available woods can be enhanced through treatment to provide the desired service life. Naturally durable and treated wood can be left to weather naturally or they can be coated for colour stability. Dr. Morris' presentation will help you make informed decisions on selecting naturally durable or treated wood products and ensuring they stay looking good.

### **Paul Morris, PhD, Group Leader – Durability and Protection, FP Innovations**

Paul Morris is currently Group Leader – Durability and Protection at FP Innovations, Canada's national forest products research institute. His group of four scientists and six technologists is responsible for meeting client needs for research in short-term protection of wood during harvesting, transport and storage, and long-term durability in service. The latter includes durability by nature, durability by design and durability by treatment. Paul has twenty seven years experience in wood preservation research since obtaining his PhD from Imperial College of London University. He has authored or co-authored over 250 papers, technical reports, contract reports and other publications. As a member of the International Research Group on Wood Preservation he maintains awareness of new technologies under development throughout the world. He also participates in collaborative research and test method development. His areas of expertise include test methodology, international building codes and wood preservation standards, treatment of Canadian wood species, and factors affecting the durability of wood products. Paul is also an adjunct professor in the Department of Wood Science at the University of British Columbia.

## **Mid-rise Construction**

### **8. Providing Fire Safety in Six-storey Wood-frame Residential Buildings**

Jim Mehaffey, PhD, Representing FP Innovations

The British Columbia Building Code (BCBC) was revised, effective April 6, 2009, to permit construction of five- and six-storey wood-frame residential buildings. Since these BCBC provisions came into effect, there have been concerns expressed about the fire-safety of such structures. This presentation attempts to allay those concerns. A critical review of the pertinent fire-safety requirements is provided as is a discussion of sound engineering approaches to meet those requirements.

#### **Jim Mehaffey, PhD, Representing FP Innovations**

Dr. Jim Mehaffey has been active in the fire protection community since 1980. From 1980 to 1987, he was a research scientist at the National Research Council where he modelled the growth and severity of building fires. He also conducted full-scale fire experiments to validate the models.

In 1988, he joined FP Innovations, Canada's Wood Products Laboratory, where he has been modelling the performance of wood-frame assemblies exposed to fire. From 1993 to 1997, he was seconded to the University of British Columbia where he was Director and Associate Professor in UBC's Fire Protection Engineering Program.

In 1997, he returned to FP Innovations in Ottawa where he conducted research and developed design tools to deliver performance-based fire-safety design for wood-frame buildings. He is an Adjunct Professor and Sessional Lecturer at Carleton University.

Over the years, he has been active in domestic and international codes & standards committees.

Although Dr. Mehaffey retired effective December 31, 2009, he is representing FP Innovations today.

### **9. A Case Study of a 6-Storey Hybrid Wood-Concrete Office Building in Québec, Canada**

Sylvain Gagnon, P.Eng.: Research Scientist, FP Innovations, Québec, Canada

Until recently, modern midrise construction has been limited to steel and concrete. However, the introduction of new performance and objective-based building codes and the development of innovative structural wood products and systems around the world have contributed to the construction of several tall timber-based buildings. The recent adoption in Canada of an objective-based building code is expected to eliminate the biases against wood that are inherent in prescriptive codes.

In this presentation, the design and the construction of a 6-storey timber-based office building built in Québec City during 2009-2010 will be discussed. The overall area of each floor is about 1000 m<sup>2</sup> and the building uses concrete shear walls as lateral load resisting system. The main structure is of a post and beam configuration using glulam with wood floor diaphragms.

#### **Sylvain Gagnon, P.Eng.; Research Scientist, FP Innovations, Québec, Canada**

Sylvain holds a Bachelor degree in Civil engineering from Université Laval where he graduated in 1994. He joined the Forintek team in July 2003 as a research scientist and structure engineer. As such, he provides support to members with regard to the development and performance of special building

systems projects. One of his main responsibilities is to assist the industry in increasing its market shares in the non-residential and multifamily construction sector in Canada.

Sylvain is mainly experienced in wood design as well as in the industrial manufacturing and standardization of structural wood products. He also holds a large experience with other materials such as concrete and steel. Sylvain worked for numerous years as project leader in consulting engineering for SNC-Lavalin, Pellemon and Tecscult. He also participated in the start-up of a Québec-based engineered wood plant and held, for four years, a position of engineering instructor at Université Laval. He was also a member of the Standing Committee on Structural Design of the National Building Code of Canada during the Code Cycle 2005-2010.

#### **10. NEESWood Capstone tests – seven-storey building in simulated earthquakes on world’s largest shake table in Miki, Japan**

**Steve Pryor, P.E., S.E., International Director of Building Systems, Simpson Strong-Tie, California**

“Between June 30 and July 14, 2009 a full-scale seven-story building was subjected to a series of earthquakes at the world’s largest shake table in Miki, Japan, in what were known as the NEESWood Capstone tests. Configured to represent a mixed-use retail and residential structure, the first floor was a new type of innovative steel framing system providing the openness needed for a retail area, while six stories of wood light-frame construction was used for the apartment areas above. The objectives of the test program were to (1) demonstrate that the performance-based design procedure developed as part of the NEESWood project worked for this mixed-use structure; (2) validate the new steel moment frame connection system specifically developed to work with wood floor diaphragms while providing high ductility; and (3) obtain better understanding of how to combine wood and steel to provide more building options in areas of high seismicity. The building had 220 square meters of retail space on the first floor with 1350 square meters of living space in the 23 apartment units above. The steel frame was also configured with removable elements to create a three-dimensional lifting truss which was used to lift the 360 metric ton structure onto the shake table. After subjecting the seven story building to two earthquakes (corresponding to the 72 year and the 675 year event for Los Angeles, USA), bracing was added to remove the participation of the steel frame from subsequent testing to the 72, 475 and 2500 year event levels, effectively just testing a six story wood structure. To prevent overturning in the wood shear walls and allow them to develop their full shear capacity, an anchor tie-down system consisting of steel rods, bearing plates and shrinkage compensating devices was used at each end of all shear walls. The building performed very well under the 2500 year earthquake. Only minor damage occurred, with global roof drift at approximately 2% and maximum interstory drifts of approximately 3%. Measured shear wall overturning demand reached levels as high as 750 kN (170 kips). The presentation will focus on both the performance-based-design analysis methodology that developed the demands as well as the specific design and detailing methods used to size connections to resist these demands.”

**Steve Pryor, P.E., S.E., International Director of Building Systems, Simpson Strong-Tie**

Steve Pryor, S.E., has been with Simpson Strong-Tie for 12 years and currently serves as their International Director of Building Systems. Prior to joining Simpson Steve was a practicing structural

engineer in California. A nationally recognized expert on the seismic design of light-frame structures, Steve serves on several state and national committees that develop the seismic design codes used in the U.S. Culminating a four year project in July of 2009, Steve was the primary industry technical consultant to what was known as the NEESWood Capstone testing, the largest building ever tested on a shake table, in Miki City, Japan. This 7 story mixed-use structure consisted of a new type of steel special moment frame on the first story with six stories of light-framed wood construction above. Designed using a simplified performance-based seismic design philosophy, the building suffered only minor damage during an MCE level (2500 year return period) seismic event. Steve's presentation will be on the Capstone project, how it was done, and what has been learned thus far

### **11. California Mid-rise Construction- Lessons Learned (structural wood details that work... and some that don't)**

**Bill Nelson, NCE, Inc. Consulting Structural Engineers, Irvine, California**

Presentation TBA

#### **Bill Nelson, S.E. President and Managing Partner , Nelson Consulting Structural Engineers**

Mr. Nelson has been involved in the construction of all types of structures including all levels of Residential Construction including high density podium construction, Country Club Houses, Resort Destination Facilities in heavy snow load areas, Retail Outlets and Shopping Centers, Commercial and Industrial Complexes, Multi-Story Office Buildings, Parking Structures, Schools, Hospitals and Modular Structures. His experience also includes seismic retrofit of several historical, municipal and private sector buildings. Mr. Nelson is well versed in the integration of all construction materials and techniques. He is actively involved in the Structural Engineers Association of Southern California promoting the implementation of state of the art design and technology. As a result of his involvement in SEAOSC, his designs reflect the latest developments in structural systems, codes, and material properties.

### **Design and Construction**

#### **12. Timber Engineering – The European Approach**

**Konrd Merz, Merz Kley Partners Ltd, Austria**

The range of engineered wood products has been continuously growing since the 1990s. Large-sized panels of exceptional strength led to the emergence of new perspectives in construction. Individual panels or panels in conjunction with a framework of timber allow for the construction of two-dimensional structural elements which, unlike beams, can assume several functions. Integrated or multifunctional elements that provide support, bracing, partitioning and sheathing at the same time are being produced. The lecture gives an overview of the materials currently used and discusses technical aspects on the basis of state of the art applications in Europe.

### **Konrd Merz**

Konrad Merz is a structural engineer. From 1987 to 1990 he was Julius Natterer's research assistant for his professorship in timber construction with the Swiss Institute of Technology in Lausanne. From 1990 to 1992 he worked for MacMillan Bloedel Research in Vancouver. He is now principal in Merz Kley Partners Ltd, which he founded in 1994. The practice has offices in both Austria and Switzerland and is responsible for the structural design of many award winning structures all over Europe.

### **13. A Preview of Upcoming Design Tools for Timber Connection Design**

Peggy Lepper, M.Sc.F. Director of Technical Services, Canadian Wood Council

The 2009 edition of CSA O86 has introduced numerous changes to fastening design; particularly for bolt, screw and nail connections. These changes use a mechanics based design approach to address the various types of failures that may occur in a bolted connection. These changes provide more flexibility for designers that can result in more efficient and cost effective connections. However, the implementation of these designs will be more complex. Peggy will provide a preview of the design tools that the Canadian Wood Council is developing to assist designers with wood connection design.

#### **Peggy Lepper, M.Sc.F. Director of Technical Services, Canadian Wood Council**

Peggy Lepper joined the Canadian Wood Council in 2000 and currently holds the position of Director of Technical Services. She participates on Canadian and US wood design standards and Canadian Building Code Committees including the National Building Code of Canada Part 9 Committee on Housing and Small Buildings and the CSA O86 Committee on Engineering Design in Wood. She also oversees the development of CWC design tools including the Wood Design Manual, the Engineering Guide for Wood Frame Construction and WoodWorks<sup>®</sup> Software. She has been a member of the CSA O86 Technical Committee on Engineering Design in wood since 2001 and is currently the Chair of the Fastening Subcommittee.

### **14. Use of Wood in Retrofit of Coquitlam Recreation Centre( Seismic Upgrade ) - Jozef Jakubowski P. Eng., Bogdonov Pao Associates Ltd**

This presentation will give participants insight into the recent structural upgrade of a 32,000 sq. ft wood frame arena building built in the early 1960's. The focus will be on the development of the solution for upgrading the existing glulam arch frames, selection of components and construction details.

#### **Jozef Jakubowski P. Eng., Bogdonov Pao Associates Ltd**

Mr. Jozef Jakubowski is a partner and serves as a managing engineer with Bogdonov Pao Associates Ltd., a Vancouver based structural engineering firm. He is a creative structural designer with over 25 years of industry experience and a strong emphasis on structural detailing of architecturally intricate designs. Jozef has a diverse background, having been involved in the design, renovation and seismic upgrade of various types of building projects, forensic investigations and building construction services. The knowledge he acquired from his varied experiences has become invaluable to his approach to structural design and has enhanced his thinking in his design practices.

**15. BC's Wood First Act: What It Means To You** –Peter Fuglem, Executive Director, Wood First Initiative, Ministry of Forest & Range, Province of British Columbia

The Wood First Act received royal assent in October of 2009 requiring that all provincially-funded structures incorporate wood as allowed within the B.C. Building Code. How did this Act come about? What does it mean to designers and their clients? This session will provide attendees with information about what the Act is and is not, how projects can consider the use of wood, and what conditions apply regarding funding. As well, participants will get a better sense of where to go to answer questions, identify solutions and receive technical support and information about material sourcing.

**Peter Fuglem, Executive Director, Wood First Initiative, Ministry of Forest & Range, Province of British Columbia**

Peter Fuglem was appointed Executive Director, Wood First Initiative for the Province of British Columbia in April of 2009. Peter completed a B.Sc.F. in Forest Management and Economics in 1976 and a M.Sc.F. in Fire Management in 1979, both from the University of Alberta. Following experience in Inventory, Silviculture, Harvest Planning and Operations (skidder operator), Peter joined the Forest Service in 1980. He progressed through the organization to become the Executive Director of Operations Division in 2007. Prior to that, Peter spent five years as Director of the Protection, two years as Manager of the Timber Supply Analysis Section in the Timber Supply Branch and 20 years in various roles with the Protection Branch. During his time with Protection, Peter was also seconded to the ASEAN Institute for Forest Management as a Fire Management Specialist to the Canadian International Development Agency and has done work for the California Department of Forestry, Alberta Forest Service, and Sabah Forestry Department/Industries on the island of Borneo.

**16. Western Red Cedar - Distinctive, Sustainable Designs**

Paul Mackie, Western District Manager, Western Red Cedar Lumber Association

Increase your awareness of Western Red Cedar, its properties and performance characteristics. Expand your understanding of Western Red Cedar grades and product specifications for your projects. Gain a greater appreciation of Cedar's versatility and the enhanced appeal it brings to both commercial and residential designs. Get the facts about proper installation, finishing and maintenance of all Western Red Cedar applications. Learn about design trends around the world using Western Red Cedar. Find out why Western Red Cedar is the 'greenest' building material available and get the facts about forest certification systems.

**Paul Mackie, Western District Manager, Western Red Cedar Lumber Association**

Paul is the Western District Manager for the Western Red Cedar Lumber Association. Known as "Mr. Cedar," Paul is a fourth-generation lumberman serving as the primary technical and media expert for the Western Red Cedar Lumber Association (WRCLA). One of North America's foremost authorities on Western Red Cedar as a building material, Paul Mackie continually shares his expertise with home-improvement audiences across the continent and has appeared both on-camera and in print interviews.