Survey of International Tall Wood Buildings

Presented on 06 November 2014 by Rebecca Holt, M.Urb, LEED AP BD+C

Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.
MARKET CONTEXT
The Opportunity
SURVEY OF INTERNATIONAL TALL WOOD BUILDINGS
Compile experiences from key stakeholders in tall wood construction:

**Areas of Inquiry**
- Lessons learned
- Project insurance
- Project financing
- Building ops/maint.

**Stakeholder Groups**
- Owners/ Developers
- Design Teams
- Authorities
- Construction Teams
Approach and Methodology
BULLETIN OF LESSONS LEARNED

FORTÉ, MELBOURNE, AUSTRALIA

The bulletin presents the lessons learned in an innovative demonstration project, which is a world-class example of a high-rise residential building constructed using cross-laminated timber (CLT) as the primary structural material. The project is a collaborative effort between the University of Melbourne, BSCL, and several other partners.

DESIGNER

BSCL

TECHNICAL TEAM

BSCL

STRUCTURAL ENGINEER

Land Solar

AUTHORITY HAVING JURISDICTION

Melbourne City Council

CONSTRUCTION TEAM

BUILDER

Land Solar

PROJECT VITALS

LOCATION: 766 Elizabeth Street, Melbourne, VIC, 3000, Australia

TOTAL COST: $126.5 million AUD

CONSTRUCTION COST: $77.2 million AUD

TOTAL FLAIR AREA: 3,091 m²

NUMBER OF LEVELS: 31

ARTICULATE USAGE: 69.27%

TECHNICAL RESOURCES: BSCL

The bulletin includes a comprehensive list of resources and links to other relevant materials.

Deliverables
Participant Project
First example of timber structure above 5 storeys

2008

Architecture by Kaden Klingbeil
Photo credit: Bernd Borachrt
Limnologen
VÄXJÖ, SWEDEN

Residential
Panelized
8 Storeys
Completed
2009

Architecture by Arkitektbolaget Kronoberg
Photo credit: Midroc
Bridport House
LONDON, ENGLAND

Residential Panelized
8 Storeys
Completed 2010

Architecture by Karakusevic Carson
Photo credit: Willmott Dixon Group
3XGR ÜN

Berlin, Germany

Residential
Panels/Post/Beam
5 Storeys
Completed 2011

Architecture by Rozynski Sturm
Photo credit: Stefan Mueller
Holz
8
BAD AIBLENG, GERMANY
Commercial/Residential
Panelized
8 Storeys
Completed 2011

Architecture by Schankula Architekten Photo credit: Huber&Sohn
Forté
MELBOURNE, AUSTRALIA

Commercial/Residential
Panelized
10 Storeys
Completed
2012

Architecture by Lend Lease Photo credit
Earth Sciences Building
VANCOUVER, CANADA

Institutional
Post/Beam
5 Storeys
Completed 2012

Architecture by Perkins+Will Photo credit: Martin Tessler
LCT ONE
DORNbirn, Austria

Commercial Panels/Post/Beam
8 Storeys
Completed 2012

Architecture by Hermann Kaufmann Photo credit: www.creebuildings.com
Tamedia

ZURICH, SWITZERLAND

Commercial Post/Beam
6 Storeys
Completed 2013

Architecture by Shigeru Ban Photo credit: Didier de la Tour
Cenni di Cambiamento
MILAN, ITALY

Commercial/Residential
Panelized
9 Storeys
Completed 2013
LESSONS LEARNED
Why Tall Wood?
Rationale and Motivation

- Market Leadership and Innovation
- Environmental Benefit of Wood
- Construction Schedule Savings
Supportive Governing Policy

- Carbon taxes and reporting
- Renewable resources policies
- Energy efficiency policy
- Timber industry incentives and support
A Successful Approach

- Commit
- Conduct Market research
- Create research partnerships
A Successful Approach

• Collaborate/Integrate design and fabrication
• Innovate Holistically
A Successful Approach

• Pre-plan and plan again
• Share
Design and Construction Solutions
Range of Design Solutions

- Panels favoured for residential
- Concrete core, CLT load bearing walls
- Char layer, sprinklers, gypsum
- Separated or decoupled floors/ceilings
- Raised floors, dropped ceilings
- Structural timber not exposed, moisture sensors
A Range of Construction Solutions

Precast concrete accelerates schedule

Material interfaces require special attention

Limit mix of materials and penetrations

Details make all the difference

All or nothing
Working Through Approvals

• Collaborate Early
• Establish a methodology of compliance
• Test
• Account for innovation and engagement

Design Team:
Online Questionnaire Participant Responses
Frequency of Special / Additional Documentation Required by AHJ due to Use of Structural Wood Technology

28.6% 71.4%
Yes
No
Overcoming Code Challenges

• Educate the Authority along with project team.
• Onsite AHJ Inspections
INSURANCE AND FINANCING
Insurance

- Insurance coverage and costs were similar or identical to conventional in almost all cases.
Financing

• Self-financed or traditional lending
• Projects were completed within set budgets
• Significant incentive funding accessed in NA only
BUILDING PERFORMANCE
Complementary Performance Objectives

• Wood supports an efficient envelope
• Aligns well with Passive House standard
• Occupant education is important
Occupant well-being and quality of space

- Exposed wood creates warm spaces
- Wood is a healthy material
Monitoring

- Moisture
- Energy performance
- Occupant comfort
- Open source results
FINAL MESSAGE
The Strongest Message

• Tall wood construction is a valid construction method with the potential to transform the construction industry.
What’s Still Needed

• Testing and monitoring data
• Market acceptance research
• Policy frameworks – regulatory mechanisms and government support
  - Refinement in design and construction techniques
• Product suppliers
Keys to Success

• Supportive governing policy is key
• Collaborate, research, engage
• Innovate holistically, not just with wood
• Early effort is essential
Lessons for North America

- Wood offers multiple benefits:
  - Energy
  - Quality
  - Low carbon
  - Regional imperative
- Integrate timber construction expertise in design
- Take better advantage of prefabrication
Contact

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