Workshop 1
8th September 2011

To learn about energy standards and how to design advanced energy efficient building envelopes. Passive house principles and fundamentals on thermal, moisture issues, and air tightness will be covered.

Asst.-Prof. DI Dr. techn. Anton Kraler

Activities as a craftsman
- apprenticeship as a joiner
- lumberjack
- journeyman joiner
- master carpenter

Academic education
- technical school for furniture design
- study of architecture
- doctor of technical sciences

1. Introduction 1:00 – 1:05 Anton Kraler
2. Sustainable Wood Construction Practices in Austria 1:05 – 1:30 Anton Kraler
4. Passive House Principles 2:00 – 3:00 Anton Kraler
Break 3:00 – 3:30
5. Detailing for Durability 3:30 – 4:30 Paul Fisette
6. Discussion Forum 4:30 – 5:00 Moderator Alexander C. Schreyer

2011 Wood Structures Symposium

8th September 2011

Sustainable Wood Construction Practices in Austria
Asst.-Prof. DI Dr. techn. Anton Kraler

Massachusetts – Austria

Europe - Austria

Innsbruck - View from north
Sustainable Wood Construction Practices - Anton Kraler

Traditional log buildings
- Examples of modern wood architecture

Timber construction systems
- Detail: wall in timber frame construction
- Timber frame construction

Timber frame construction
Timber construction systems

Timber frame construction

Single-family house

Detail: wall with solid wood or cross-laminated timber (CLT)

Timber construction systems

Detail: ceiling board with solid wood or cross-laminated timber

Solid wood construction

Timber construction systems
Sustainable Wood Construction Practices - Anton Kraler

**Timber construction systems**

Room cells – modular construction with CLT

Interior of room cells

Modular construction

Connectors for the shear force

Exterior view

Social - center

Cross laminated timber (CLT) without glue

Thoma
Requirements for timber construction systems

- Wood Protection
- Moisture Protection
- Fire Protection
- Sound Insulation
- Heat Protection
- Airtightness

Hybrid: solid wood and timber frame construction
Detail – Party Wall, Ceiling and Exterior Wall

Comparison of low energy house – passive house

Typical U-Values in W/(m²K) in Austria

- Dach 0.15-0.25
- Fenster 1.2
- Wand 0.20-0.31
- Bodenplatte 0.30-0.35
- Bodenplatte ≤ 0.15

Typical thermal insulation for timber construction

- Wooden softboard
  - 10 in - 15 in for U-Value 15kW/m²K

- Cellulose
  - 10 in - 14 in for U-Value 15kW/m²K

- Mineral wool
  - 9 in - 11 in for U-Value 15kW/m²K
Typical thermal insulation for timber construction

**Sheep’s wool**

10 in - 14 in for U-Value 15kW/m²K

Special thermal insulation for timber construction

**Vacuum-insulation panel (VIP)**

2 in for U-Value 15kW/m²K

Important factors for timber construction systems

- Sound insulation
- Air tightness
- Quality assurance

Quality assurance

Blower Door and Thermography measurements

Quality assurance

- Moisture measuring device
- Ultrasonic testing equipment
- Fractometer tests
- Bending test
- Hardwood core drill

Thank you for your attention