Wood WORKS! BC

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What is Wood WORKS! BC?



What is Technical Intervention?



Who does it? How? When? What does it cost?



What are the issues? Durability and Wood.





QUICK FACTS - SUSTAINABLE BUILDING SERIES

- 1. WOOD, The Building Material of Choice!
- 2. WOOD and the Greening of Commercial Buildings
- 3. WOOD and the Greening of Residential Buildings
- 4. Life Cycle of WOOD Products
- 5. Embodied Energy of WOOD Products
- 6. WOOD Products and Carbon Sequestration
- 7. WOOD and Building Occupants
- 8. Durability and WOOD
- 9. Value-Added WOOD Products
- 10. Certified WOOD Products
- 11. WOOD Survey on Green Building in Canada

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WOOD, The Building Material of Choice!

- used as a building material for centuries.
- strong, lightweight, easy to use
- easy to manufacture into new products.
- possesses significant, positive environmental attributes
- single major renewable building material
- requires less energy to manufacture



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WOOD and the Greening of Commercial Buildings

- initial focus has been on commercial and multi-residential buildings.
- encouraging energy efficient, responsible choices in the design and build process.
- incomplete in many areas,
- no single program is able to offer a comprehensive rating system.
- consider all viable approaches.



WOOD and the Greening of Commercial Buildings

- building rating systems have been developed as proactive voluntary measures
- the intent is to transform the market
 - by increasing demand for "green" buildings
 - reduced the impact on the environment.
- lack deeper environmental assessments



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WOOD and the Greening of Residential Buildings

- The R-2000 program launched in 1984
- Canadian Home Builders' Association and Natural Resources Canada (NRCan).
- to stimulate improved environmental performance of buildings
- typically use 30% less energy
- no quantifiable assessment of the impact that these choices have on the environment



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Life Cycle of WOOD Products

- When considering environmental impact consider using a Life Cycle Assessment
- It measures:
 - » Embodied energy in production
 - » Emission of greenhouse gases
 - » Release of pollutants into the air
 - » Generation of water pollutants
 - » Production of solid wastes



Life Cycle of WOOD Products

- Life Cycle Assessment (LCA)
- "performance-based" approach
- qualifies the overall effects of a product, process, or activity on the environment over its lifetime.
- Includes material extraction, manufacturing, transportation, installation, use, maintenance, and disposal or re-use.



QUICK FACTS - SUSTAINABLE BUILDING SERIES

Life Cycle of WOOD Products



Athena Model - A life cycle focus



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Embodied Energy of WOOD Products

Every material used in construction has embodied energy. This is the sum of the energy required to

extract harvest process manufacture transport construct maintain

materials/products used in building applications.



QUICK FACTS - SUSTAINABLE BUILDING SERIES

Embodied Energy of WOOD Products

When the total embodied impact of each design was calculated, the analysis revealed some telling statistics.

The steel and concrete designs

- embody 26% and 57% more energy relative to the wood design
- emit 34% and 81% more greenhouse gases
- release 24% and 47% more pollutants into the air
- discharge 400% and 350% more water pollution
- produce 8% and 23% more solid waste, and
- use 11% and 81% more resources (from a weighted resource use)



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WOOD Products and Carbon Sequestration

- greenhouse gas emissions are a significant cause of climate change
- trees draw carbon dioxide
- release oxygen back to the atmosphere
- use carbon to produce wood and leaves.
- they lock away or "sequester" large quantities of carbon dioxide



QUICK FACTS - SUSTAINABLE BUILDING SERIES

WOOD Products and Carbon Sequestration

- When a tree is harvested
 - the carbon it sequestered is retained
 - placed in a dormant state, removed from the atmosphere
- The carbon is only released back into the atmosphere
 - when the wood is burned
 - when it biodegrades.



WOOD Products and Carbon Sequestration

- young forests grow vigorously and store greater quantities of carbon.
- for mature trees this rate slows down.
- it is better to harvest a forest before it is over mature.
- A typical wood-frame house holds
- 28.5 tonnes of carbon dioxide = to the emissions of a small car over 7 years.



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WOOD and Building Occupants

- Buildings can significantly influence the well being of people.
- Natural elements can have a positive impact on worker productivity and patient recovery.
- wood generates positive feelings.
- contributes to a sense of well being
- resulting in better performance outcomes.



QUICK FACTS - SUSTAINABLE BUILDING SERIES

WOOD and Building Occupants

"Evidence Based Design"

- effects of building design on client outcomes
- effectiveness and efficiency of staff
- warm, calming environment for patients
- accelerated patient recovery
- shorter wait times



QUICK FACTS - SUSTAINABLE BUILDING SERIES

WOOD and Building Occupants

- wood moderates indoor humidity
- peak moisture periods it absorbs moisture
- in dry periods it relieves excess humidity
- wood has a large capacity as a moisture "sink."
- reduce peak moisture loads in a typical interior wood paneling can reduce peak moisture loads in a typical Canadian house by 10-25%



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- Durability and longevity are important parameters of sustainable design
- Sustainable design endeavors to reduce the impact that buildings have on the environment by extend the life cycle of building products and systems.
- using durable materials in the right locations
- employing sound maintenance practices.



- 20% of Canada's heritage buildings that were demolished over the last three decades not because they wore out but because
- type, style, occupancy or size of the building was no longer suitable for the owner's needs.
- they were not adaptable.



- A 2004 Minnesota Demolition Survey prepared for Forintek Canada Corp. by the ATHENA Institute further substantiates this claim.
- In this major survey of buildings demolished in St. Paul, Minnesota for the period 2000 to mid-2003,
- 85% of the demolished wood buildings were in the 51 and over age categories,
- 49% in the 76 to 100 years category
- 18% were more than 100 years old.



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Value-Added WOOD Products

- family of wood products and systems
- solid sawn lumber
- manufactured wood products (plywood, OSB)
- engineered wood components (trusses, wood I-joists, glued-laminated timbers, laminated veneer lumber, and laminated strand lumber)



Value-Added WOOD Products

- Building products that earn high marks in green building programs are those that:
 - Reduce impacts of extraction of materials from the environment
 - Install and use materials efficiently in construction
 - Contain renewable and/or recycled content
 - Reduce impacts on disposal at the end of the life cycle


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Certified WOOD Products

Sustainable forest management (SFM) certification programs



CSA - Canada's National Sustainable Forest Management Standard (CAN/CSA-Z809) (47.4 million hectares)



- SFI the Sustainable Forestry Board's Sustainable Forestry Initiative® Program (35.5 million hectares)
- FSC the Forest Stewardship Council's Principles & Criteria and/or Standards. (4.4 million hectares)



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WOOD Survey on Green Building in Canada

- In 2004, the Canadian Wood Council undertook a survey to gauge Canadian stakeholder perceptions about green buildings and sustainable development.
- 285 targeted
- 160 responded (56%)
- architects, engineers, builders, all levels of government, and associations.



WOOD Survey on Green Building in Canada

- 48.7% of respondents indicated that wood products are environmentally the most suitable choice
- 89.7% said wood is renewable & recyclable
- 19.2% said wood is low in embodied energy
- 6.4 % said wood reduces carbon gases



WOOD Survey on Green Building in Canada

- (53.7%) indicated that engineered wood products are more suitable than sawn lumber (use less of the raw resource)
- LEED was mentioned by 39.4%
- Green Globes was mentioned by 8.1%
- LEED currently only recognizes the Forest Stewardship Council (FSC)
- Green Globes recognizes all three



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What is the basic rule of durability?

KEEP WOOD DRY



Technical Interventions

1 - Royal City Star Casino

2 - VCCEP

3 - Penticton Creek Bridges



Royal City Star Casino







WOOD WORKS! engineered for strength and style neturally







The Issue? – Durability by design & Surface applied coatings.

Vancouver Convention Centre Expansion Project















Penticton Creek Bridges





Boyle & Company Bridge



#1





Boyle & Company Bridge





WOOD WORKS!

or strength and style.











Wade Avenue Bridge











Penticton Avenue Bridge









#3

Penticton Avenue Bridge

- Span = 16 m (52' 6'')
- Width = 3.1 m (~ 10')
- Girders are
 - 330 X 1500 (12 ¼" X 60") c/w 300mm (1') camber
- Species is Douglas Fir
- Treatment called for is ACQ











Penticton Avenue Bridge

The Issue? Is there a better way? First two bridges used surface coatings only. New design calls for ACQ (Nevada) FP Innovation exploring treating the lamstock before it is glued. Fabricator recommends Pacific Yellow Cedar (no sapwood)



Wood WORKS! BC

Exposing wood to the elements is not new, trees have been doing it since the beginning of time they just do it better.

What does your bark look like?

Wood WORKS! BC

What is your message to the design community?

Through WW BC we can deliver that message but we need your help.

We need your speakers with the knowledge and topics we will do the rest.

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THANK YOU

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