



Western Red Cedar – Distinctive, Sustainable Design

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



Course Description

This presentation is intended to increase awareness of Western Red Cedar uses, properties and performance characteristics. Western Red Cedar grades and product specifications will be reviewed, as will proper installation, finishing and maintenance for a variety of applications. Through brief case study presentations, attendees will gain an appreciation of design trends that leverage cedar's versatility and the enhanced appeal it brings to institutional, commercial and residential designs. Demonstrating Western Cedar's value as one of the 'greenest' building material available, discussion will include facts about sustainable forests and forest certification systems along with a brief review of Western Red Cedar Environmental Product Declarations (EPDs).



Learning Objectives

1. Examine the properties of Western Red Cedar that make it a durable and sustainable building material.
2. Review specification options for Western Red Cedar, including lumber and appearance grades, as well as compatible fastener selection.
3. Demonstrate Western Red Cedar's versatility as a building material through three case studies featuring institutional and commercial projects.
4. Illustrate recommended installation, finishing and maintenance techniques associated with Western Red Cedar.

Presentation overview

- Introduction – association
- Western red cedar's heritage
- Environmental management & certification
- Western red cedar characteristics
- Product grades & sizes
- Review case studies of various commercial, inst. Res.
- Installation, finishing & maintenance
- Reference materials and sources

Introduction

WESTERN RED CEDAR LUMBER ASSOCIATION

- Non profit trade association, established in 1954, known worldwide as “the voice of the cedar industry.”
- Producing members account for more than 70 percent of the world’s production of Western Red Cedar and have an annual volume of nearly 1 billion board feet.
- Purpose: Increase market awareness for WRC through education, technical expertise and promotion.
- Offers technical and promotional resource for architects, builders, consumers.

Introduction – Real Cedar

WESTERN RED CEDAR (Thuja Plicata)

Western Red Cedar trees reach heights of 200 feet with diameters of 16 feet.

The trunk of older trees is buttressed, fluted and quite tapered.

The “Tree of Life” is what the first residents of the Pacific Northwest called the stately Western Red Cedar. Its legendary durability made cedar nature’s gift for building ocean-going canoes, post-and-beam houses, ceremonial dance masks and ancestral totem poles, many of which have withstood centuries of weathering.

Today its exceptional beauty brings warmth, character and longevity to homes, and its supreme versatility as a building material has made it the enduring choice of craftsmen for centuries.



The Tree of Life



HAIDA “MONSTER HOUSE” (photo 1873)

The Tree of Life



CEDAR TOTEM POLE (nearly 200 years old)

The Tree of Life



Cedar continues to play **A KEY CULTURAL ROLE**

Growing Region

NORTH AMERICA

Primary growth regions for WRC

- **Coastal** – British Columbia (BC), Southern Alaska, Washington and Oregon (PNW)
- **Interior** – BC interior wet belt. Inland US including Idaho, Montana and Washington



Growing Region



- The volume of timber in BC's Forest totals roughly 11 billion m³ on 136 million acres and approximately half is located on land suitable for harvest.
- Total standing volume of WRC is estimated at 650 million m³

Citation: B.C. Ministry of Forests, Mines and Lands. 2010. The State of British Columbia's Forests, 3rd ed. Forest Practices and Investment Branch, Victoria, B.C.

Standing Volume



- Forests of BC cover 136 million acres.
- Less than 1/2 of 1% are harvested annually.
- More than 200 million seedlings are planted each year (up to eight for every tree harvested).

Citation: B.C. Ministry of Forests, Mines and Lands. 2010. The State of British Columbia's Forests, 3rd ed. Forest Practices and Investment Branch, Victoria, B.C.

Harvesting Practices



Harvesting Practices

Annual harvest volumes

- 3 million m³ (2.4 million m³ is from the Coast) in log form.

Drastic Changes in Methods

- Variable retention and helicopter logging are widely practiced and keeps the forest structure intact.



Helicopter Logging



Helicopter Logging



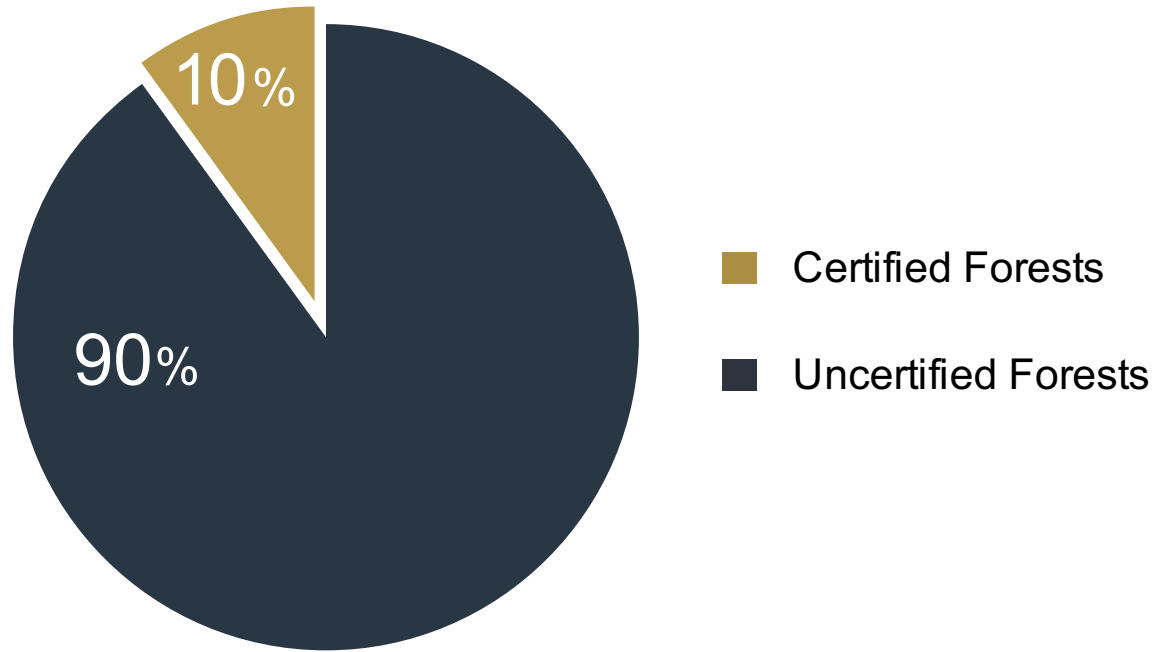
Variable Retention



Reforestation



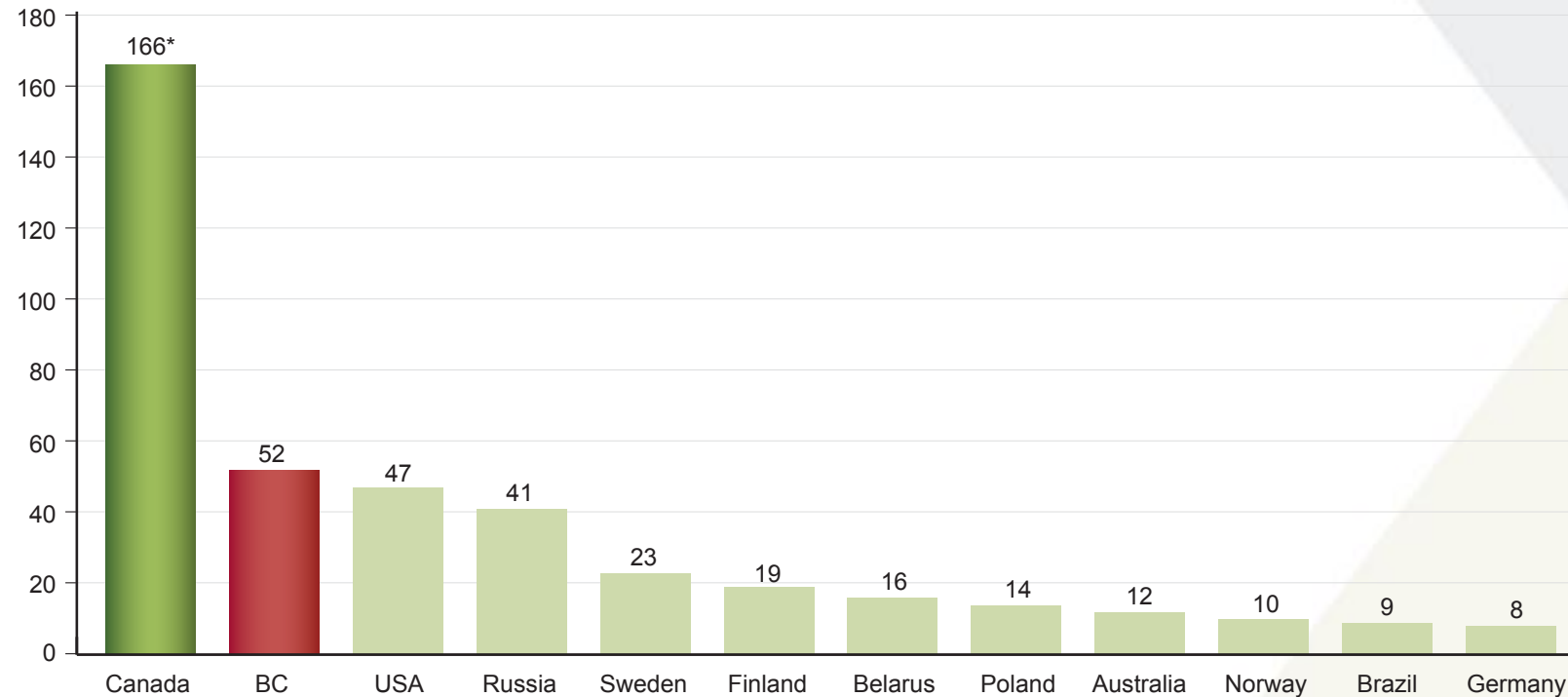
Global Forest Certification



Certification in Canada & BC

British Columbia Forest Certification in the Global Context

2015 Year-end



*Double counting of areas certified to more than one standard has been removed from this figure.
Source: certificationcanada.org as of Dec 31/15

Certification in BC

FSC (Forest Stewardship Council)

- Three regional standards in Canada endorsed by FSC International and one draft
- British Columbia, Boreal, Maritimes, and Great Lakes-S. Lawrence (field-tested draft)

SFI (Sustainable Forestry Initiative)

- North America-wide standard
- Endorsed internationally by PEFC

CSA (Canadian Standards Association)

- National Standard of Canada approved by the Standards Council of Canada
- CAN/CSA Z809 and CAN/CSA Z804-08 (woodlots)
- Endorsed internationally by PEFC

Certification in BC

BC FORESTS by certification scheme

	BC	BC% of total certified in CA
CSA	25.4	62%
SFI	25.6	29%
FSC	1.4	2.60%

- As of December 31, 2015
- Figures in million hectares, eliminates double counted areas certified to more than one standard.

Life Cycle Assessment



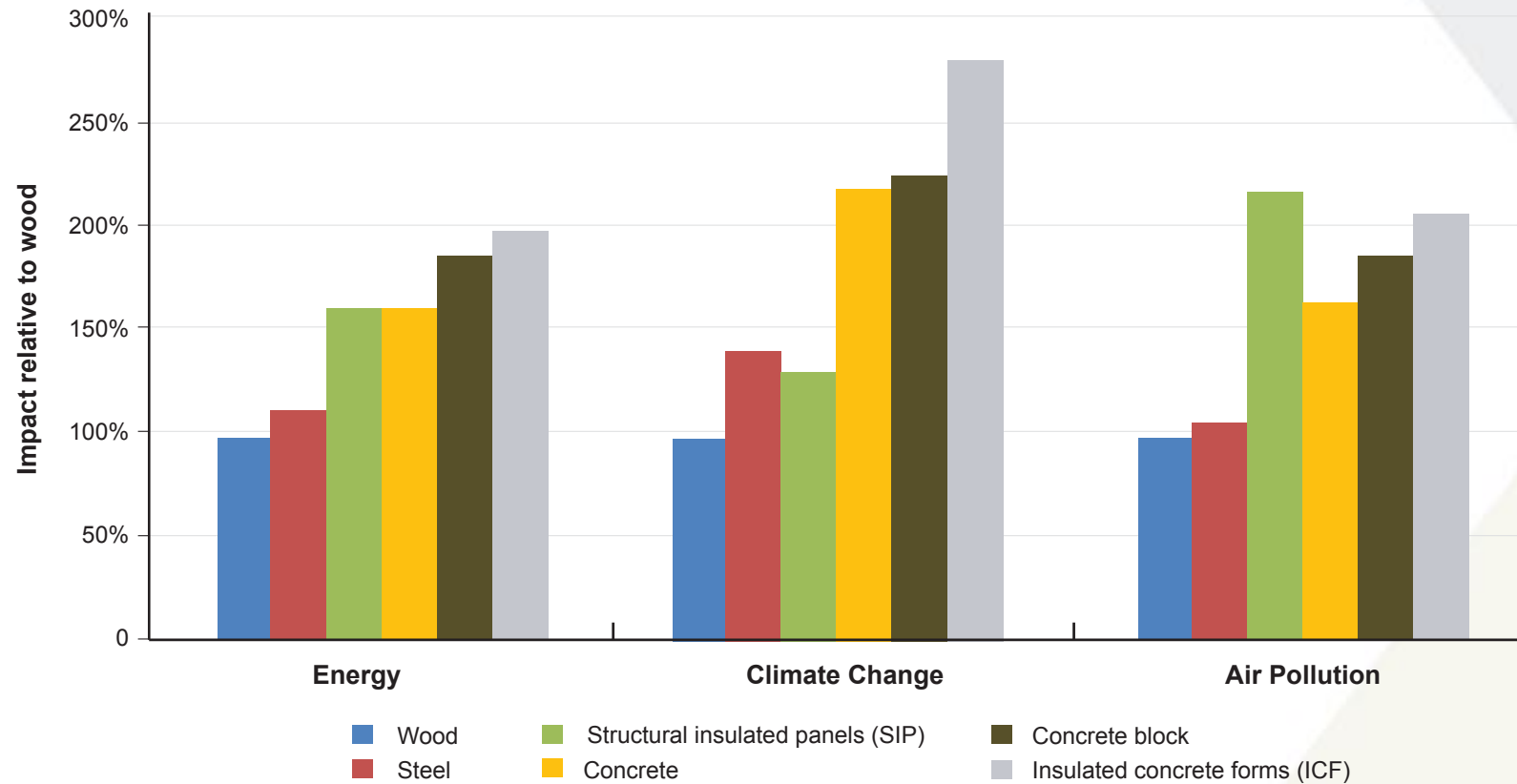
Note on Life Cycle Assessment

“...wood is the only material available today for which detailed information gathered by third parties is available regarding operation under management plans that ensure appropriate protection of flora, fauna, water quality, soil productivity, old trees, and more; ...”

Jim Bowyer Past President, Forest Products Society Director, Dovetail Partners Responsible Materials Program
Forrest Products Journal Vol 65 No. 7/8 pgs. 305-306.

Life Cycle Assessment

Embodied Environmental Impacts of Various Exterior Wall Systems

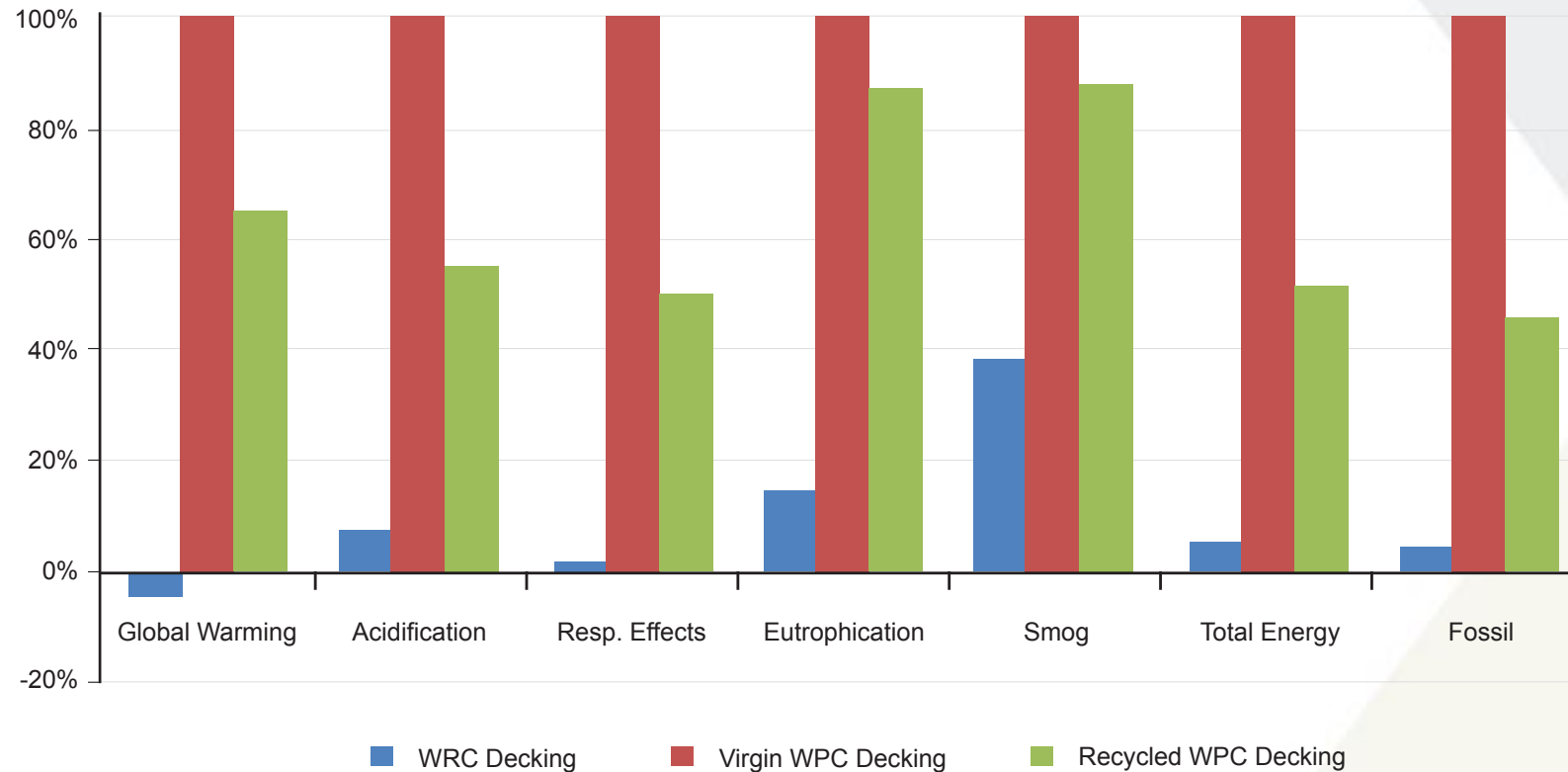


Data compiled by FP Innovations, Forintek Division using the ATHENA EcoCalculator with a data set for Vancouver, British Columbia.

Life Cycle Assessment

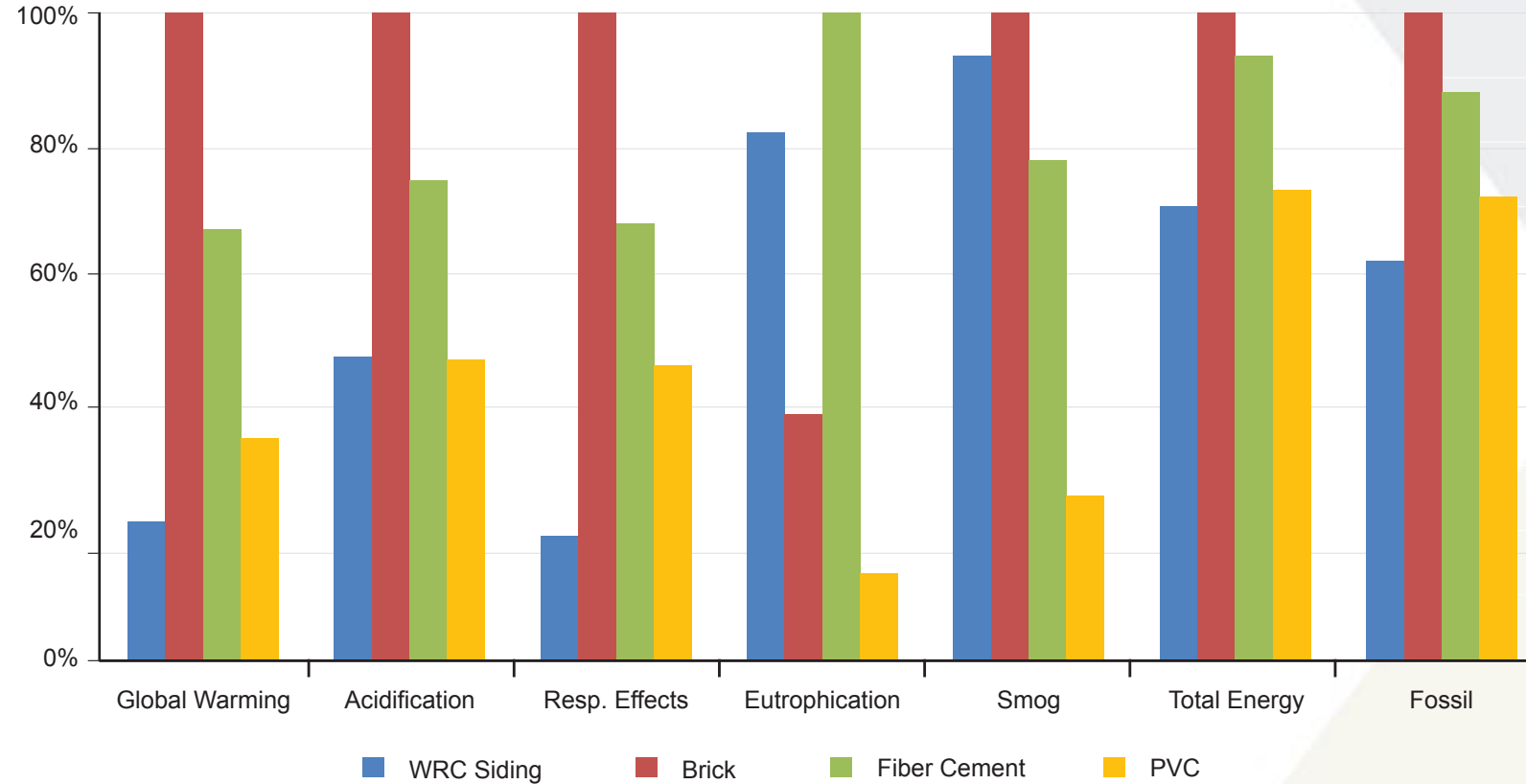
 The ATHENA TM Sustainable Materials Institute	Wood	Steel	Concrete
Total Energy Use	Lowest	140 % more	70 % more
Greenhouse Gases	Lowest	45 % more	81 % more
Air Pollution	Lowest	42 % more	67 % more
Water Pollution	Lowest	1900 % more	90 % more
Solid Waste	Lowest	36 % more	96 % more
Ecological Resource Use	Lowest	16 % more	97 % more

Life Cycle Assessment



Mahalle, L. & O'Connor, J.; 2009. Life Cycle Assessment of Western Red Cedar Siding, Decking, and Alternative Products, FP Innovations, Forintek Division, Vancouver, BC

Life Cycle Assessment



Environmental Product Declaration

Environmental Product Declaration

Typical Western Red Cedar Decking

Type II environmental declaration developed according to ISO 14021 and 14023 for average cedar decking products manufactured by the members of the Western Red Cedar Lumber Association.

Issued April 2011
Valid until April 2016



REAL CEDAR  **FPInnovations** 

Environmental Product Declaration

Typical Western Red Cedar Bevel Siding
"1/2 x 6" Clear Grade, Painted

Type II environmental declaration developed according to ISO 14021 and 14023 for average cedar siding products manufactured by the members of the Western Red Cedar Lumber Association.

Issued April 2011
Valid until April 2016



REAL CEDAR  **FPInnovations** 

Made with Solar Energy



WRC Unique Characteristics

CHARACTERISTIC	WHAT IT MEANS
Dimensional Stability	Lays flat & stays straight
Natural Durability	Resists rot/decay with natural preservatives
Presence of Thujic Acid	Prevents insect attack
Free of pitch & resin	Readily accepts a wide range of finishes
Straight grain & uniform texture	Easy to cut, saw, nail & glue
Light weight	Easy to transport & handle
Class II/B Flame Spread	Resists the spread of fire
Thermal Insulator	Energy efficient; does not transfer heat
Acoustic properties	Noise insulation and absorption
Natural Aesthetics	Unmatched warmth and beauty

Western Red Cedar – Siding



Siding Grades

CLEAR SIDING GRADES



Clear VG Heart

NLGA 200a/201a

WCLIB 102b/106aa

WWPA

21.11

Siding Grades

CLEAR SIDING GRADES



A Clear

NLGA 200b/201b

WCLIB 106a

WWPA 21.12

Other Clear Grades Include:

B Clear

C Clear and

Clear Rustic or Tex Face

Siding Grades

KNOTTY GRADES



Select Knotty

NLGA 204a/205a

WCLIB 111e

Quality Knotty

NLGA 204b/205b

WCLIB 111f

3 Common

WWPA – Inland Knotty

Siding Options

COMMON BEVEL PROFILES

Bevel siding, thickness measured at the butt



Rabbeted bevel siding



Specialty profiles such as wavy edge bevel are also available from select manufacturers.

Siding Options

COMMON PANELING/T&G PROFILES

V-grooved on two sides (EV2S) WRCLA2



V-grooved on one side (EV1S) WRCLA1



Centre matched tongue and groove



Other tongue and groove siding patterns

WP-6



102



106



*Pattern numbers from the Western Wood Products Association
publication Standard Patterns*

Siding Options

COMMON LAP SIDING PROFILES

Channel Siding



WP-11



101



105



Log Cabin



*Pattern numbers from the Western Wood Products Association
publication Standard Patterns*

Western Red Cedar Panelling

Grade	Description	Grading Rule Paragraph ¹
SELECT KNOTTY		
	Available kiln-dried or unseasoned. Knots are sound and tight. Typically sold with a percentage of Quality Knotty included (NLGA 204b/WCLIB 111-f).	NLGA 204a WCLIB 111-e WWPA N/A
PROPRIETARY GRADES*		
	Designed to meet appearance requirements for cedar sidings and trim. Ask your Real Cedar Certified Cedar Distributor for details.	NLGA N/A WCLIB N/A WWPA N/A

¹Manufacturers may market their own proprietary grades.

Western Red Cedar – Decking



Decking Grades



Architect Clear

WRCLA Member proprietary grade. Only WRCLA members may use this designation.

Proprietary

Clear decking may have specialty marketing names that conform to Architect Clear

WRCLA Members produce high quality, Clear decking suitable for all appearance end uses

Decking Grades

KNOTTY DECKING GRADES



Architect Knotty

WRCLA member proprietary grade. Only WRCLA members may use this designation.

Proprietary

High quality knotty decking may appear in market under manufacturer branding names. WRCLA member knotty decking will conform to AK (Architect Knotty) grade.

WRCLA Members produce high quality, knotty decking suitable for appearance end uses

Western Red Cedar – Timbers



Timber Grades

CLEAR TIMBER GRADES



#2 Clear & Better *Export R List 401*

Used as finished material or raw material for finely manufactured products.

Timber Grades

CLEAR TIMBER GRADES



**#4 Clear
PLIB**

Export R List 401a

Timber Grades

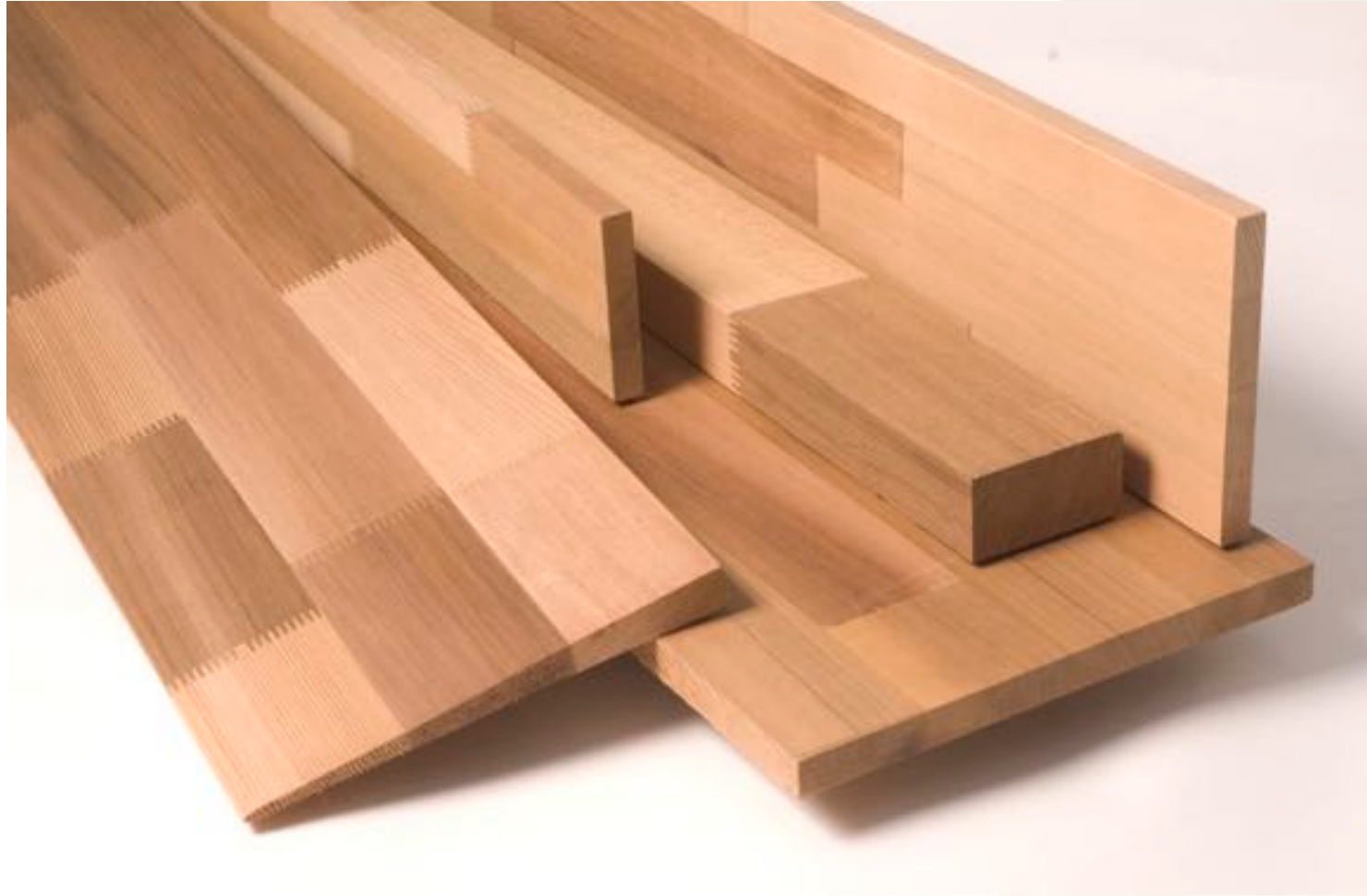
KNOTTY TIMBER GRADES



Appearance

High quality knotty timbers graded for appearance end uses, square edges and tight knots.

Engineered Western Red Cedar



Western Red Cedar – Products

OTHER PRODUCTS INCLUDE

- Screening – Privacy Lattice
- Outdoor Furniture
- Balusters & Handrails
- Sidewall Shingle panels
- Custom Profiles & Specialty Manufacturer Products
- Outdoor structure kits

YOU' RE LIMITED ONLY BY YOUR IMAGINATION.

Case Studies



Sandy High School

- Special Design Citation, National School Board Association Exhibition of School Architecture, 2013
- Design Excellence Award, American Institute of Architecture Committee on Architecture in Education, 2013
- Council of Educational Facility Planners International, National Project of Distinction, 2013

Dull Olson Weekes Architects (DOWA-IBI)
Portland, Oregon

Sandy High School

The Real Cedar Solution

Indigenous to the region, superior durability and was suitable for diverse applications “the natural characteristics of Western Red Cedar came to the top very quickly”.

The modern Cascadian interpretation pointed to a design concept of heavy-timber frames, pitched rooflines and uncoated WRC board siding.

Cedar was also used as roof decking (in three-to four-inch thicknesses) with exposed facing; as 8x8 quad posts, and for siding.

Reduce the school’s carbon footprint” and in the process achieve a LEED Gold certification. Where shading was needed, deep overhangs and a combination of vertical and horizontal cedar louvers were installed.

Selecting materials that would last the minimum 75-year life of the building, patina over time and not tire, and require few resources to maintain.



Institutional Projects



Crate & Barrel: A Global Success

Design Considerations

- Crate & Barrel's approach to interior design is based on the concept of turning over the crates and barrels that merchandise is packed in and stacking the wares on top.
- Exterior design is informed by the existing buildings Crate & Barrel acquires, or by the area in which the company undertakes new-build construction.
- Architectural elements differ wildly. For example: the Chicago store on Michigan Avenue is clad in white aluminum tiles with large expanses of glass, while the Madison Avenue storefront in New York City is fittingly traditional/corporate. Shopping mall locations rely mainly on clean-line entrances and the brand logo to lure customers.

Crate & Barrel: A Global Success

The Real Cedar Solution



- Western Red Cedar has traditionally been used by Crate & Barrel to give each store a casual, easy elegance.
- With respect to technical support for Western Red Cedar, SWP relied heavily on WRCLA.
- 10 to 40 crates of the wood being shipped to each construction site (or, between 3,000 and 15,000 square feet of cedar per project, with an average value of about \$90,000). Annually, Crate & Barrel uses between 100,000 and 150,000 square feet of cedar.
- used for exterior siding, interior paneling, as flooring, on the ceilings, and it's stained and painted
- Crate & Barrel uses clear cedar predominantly, a wire-brushed knotty cedar is increasingly used to mimic barn wood for interior accents (one outlet in Georgia and two in Florida).

AWARDS

Crate and Barrel Atlanta received the Silver Award in Retail Store Design from The International Council of Shopping Centers U.S. Design and Development Awards in 2014.

Commercial Projects



PROJECT — Retail Outlet (United States)

Residential Home



Design Considerations

- Resiliency to Washington's wet, windswept winters.
- Cedar be used as cladding, roofing and trim
- The second floor exterior have a dramatically different cladding pattern than that of the ground level. Additionally, a cedar deck on the second level be incorporated into the design.

The Mackies hired AIA architect Todd Soli to design the home, Soli having extensive experience with island county permitting and the subtle blend of styles associated with Pacific Northwest residences.

Residential Home – Northwest Contemporary
Paul Mackie – “Mr. Cedar”
Whidbey Island, Washington

Residential Home



The Real Cedar Solution

- Given space limitations, “a significant challenge during construction was job site storage, so we erected a tent-like structure in the backyard and loosely stacked the cedar inside,” says Mackie. Best practices with regards to construction were followed, right down to the fasteners used: marine grade stainless steel siding nails.
- Factory staining (including staining of raw end cuts); installing all of the siding over DrainWrap; and installing horizontal blocking between the studs to provide a recommended nailing framework into which the vertical siding could be fastened.
- The general contractor relied on several WRCLA publications, notably four that address how to specify, finish, store on site, and install Western Red Cedar, respectively. “Anyone intent on using Western Red Cedar for a building project can, by following these guidelines, ensure that the completed structure is not only beautiful but able to withstand the elements – and the test of time”. So says Mr. Cedar, Paul Mackie.

Residential Home – Northwest Contemporary
Paul Mackie – “Mr. Cedar”
Whidbey Island, Washington

Residential Projects



PROJECT — Private Residence (United States)

Outdoor Living Projects



PROJECT — Private Residence (Canada)

Outdoor Living Projects



PROJECT Private Residence (Canada)

PRODUCT Knotty Timbers and trim, clear decking and shingles

Installing Western Red Cedar

GENERAL RULES

- Acclimatize prior to installation
- Use proper wall construction
- Proper flashing prevents moisture penetration at terminations, valleys, freeze boards, band joists and over doors/windows
- Prime or stain all surfaces prior to installation
- Use the appropriate fasteners and follow recommended nailing patterns

Installing Western Red Cedar

WALL CONSTRUCTION – THE BASICS

Provide for Nailing Base

- Horizontal applications
- Vertical applications

Vapor Barrier

- Non-permeable
- Installed on warm side of stud

Installing Western Red Cedar

Sizes for blocking and furring

	Max. Lumber sizes		Spacing	
	Nominal	Actual	Preferred	Max
Blocking	2x2	1 ½ x 1 ½	16	24
Battens over sheathing	1x2	¾ x 1 ½	16	16
Battens over masonry walls	2x2	1 ½ x 1 ½	16	16
Battens over foam	2x2	1 1/2x	16	16

Installing Western Red Cedar

PREVENT MOISTURE PENETRATION

- Install Breathable Building Paper (e.g. Tyvek Drainwrap)
- Miter Cut Joints and prime or stain field cuts.
- Use Flashing on Fascia, Horizontal Trim Pieces and the Top of Windows and Doors
- Caulk Where siding Abuts Vertical Trim

Finishing Western Red Cedar

ENHANCE THE VERSATILITY OF WESTERN RED CEDAR



Five Basic Finishes

- Transparent
- Semi-transparent
- Solid Color Stain
- Paint
- Bleaching Oils

Finishing Western Red Cedar

APPLY COATING BEFORE INSTALLATION

Reason for Priming and Staining All Surfaces

- Keeps Wood From Absorbing moisture Unequally
- Can Increase the Service Life of Finish Coat
- Helps Prevent Extractive Staining

Finishing Western Red Cedar



SOLID COLOR STAINS AND PAINTS

- Perform best on textured surfaces. They are non-penetrating and form a film
- Use a stain-blocking primer followed by a 100% acrylic latex top coat
- Apply primer to all six surfaces prior to installation.

Finishing Western Red Cedar



SEMI TRANSPARENT STAINS

- Latex or oil-based.
- Allows some of the natural beauty of the wood to show.
- Reduced protection from ultraviolet light.
- Latex stains do not penetrate the surface.
- Apply stain to all six surfaces.

Finishing Western Red Cedar



Transparent Water repellants are suitable for above ground uses.

- Reduces water absorption in the short term.
- Accentuates Cedar's natural beauty but has limited UV protection.
- The addition of a fungicide that inhibits the growth of mildew and fungi.

Finishing Western Red Cedar

PROTECT YOUR INVESTMENT

- Periodic, preventative maintenance helps coating performance.
- Power washers should NEVER be used.
- Dilute bleach and cleaners to the minimum strength necessary to accomplish their task.
- Oxygen bleach is preferred for treating mold & mildew growth.
- Use wood brighteners to remove weathered fibers before applying finishes.
- Always rinse thoroughly after cleaning, and follow the coating manufacturers instructions.

Western Red Cedar – Summary

- Western Red Cedar is legal, sustainable and renewable.
- Western Red Cedar siding and decking have a low impact on the environment compared with other non-wood building materials.
- WRC is ideal for a broad range of applications owing to its unique properties and aesthetics.
- WRC has centuries of proven performance.
- When specifying grades, use industry standards to ensure the right product is used on your project.
- Remember the old adage “You get what you pay for”.
- Your clients will appreciate the natural beauty and unsurpassed performance of Western Red Cedar.

WRCLA – Resources

Key WRC Literature Available (free of charge)

- *Designer Handbook*
- *How To Specify Western Red Cedar*
- *How To Install Western Red Cedar siding*
- *How to Finishing Western Red Cedar*
- *WRCLA Standard Patterns*

ARCHITECT ADVISORY SERVICES

Western Red Cedar experts available to assist with selection, specification, sourcing and application.

ON WEB – www.realcedar.com

ONLINE TRAINING TOOL (Eligible for AIA LU Credits)

www.cedar-training.org

Questions

This concludes The American Institute of Architects Continuing Education Systems Course
WRCLA4

WESTERN RED CEDAR LUMBER ASSOCIATION

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