A Return to Natural

DESIGNING WITH WESTERN RED CEDAR

Presented By:

Project: High Desert Residence
Architect: Hacker
Photographer: Jeremy Bittermann

LEARNING OBJECTIVES

1. Understand design trends that are incorporating more natural wood products, including biophilia and sustainability.
2. Examine both exterior and interior uses for Western Red Cedar, as well as new products that have entered the market.
3. Review options for designing with Western Red Cedar, including grades, profiles, and finishes.
4. Explore a case study where Western Red Cedar was used for its sustainable beauty in a Massachusetts residence.

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A RETURN TO NATURE

Wood is one of the oldest building materials known to man, but in modern times has often been replaced with competitor's materials. Thankfully, wood is seeing a renaissance due to current design trends and a global push for sustainability. One prominent trend in design is a return to natural products. In a recent Architectural Digest article, designer Gemma Riverti, head of interiors at WGSN Lifestyle & Interiors, points to our response to societal chaos as an even greater push toward a calm, pared-back, warm minimalism that was already taking hold. She says, "Humans are feeling a greater need to be connected to nature and you will see elements of the 'great outdoors' infusing interior design. The cozy Scandinavian influence will endure with organic shapes and natural tones as key design elements."

Organic materials such as natural wood, undyed yarn, recycled textiles, naturally occurring fabrics such as wool, cotton, linen, and leather, and warm earthenware will increasingly be used in design to create a sense of harmony within ourselves and the environment.[1] "It seems our collective yearning for getting back to nature will extend to home accents. Think botanical prints, lush greens, and *replications of wood grains* and stone veining for pillows, rugs, and upholstery, along with delicate wild flora and fauna motifs in homewares," experts say.

BIOPHILIA

Biophilia literally means "love of life" in Greek, or an affinity for living things and the natural world. The "biophilia effect" describes the positive impact humans feel when they have a sensory experience with nature through sight, sound, smell, or feel. In architecture, the biophilia effect can be cued when people respond to daylighting, views of nature, use of patterns, and use of natural materials, such as wood products where the grain is visible.[2]

Aneka Kerlin of Aneka Interiors says, "Biophilia is the belief that humankind has an innate need for nature and the greater sense of connection that nature brings to human existence. Biophilia in design is easily achieved through daylight, plant life, and natural materials such as stone and wood.

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In architecture, the biophilia effect can be cued when people respond to daylighting, views of nature, use of patterns, and use of natural materials, such as wood products.

Project: Bridge House
Architect: Dan Brunn Architecture
Photographer: Brandon Shigeta

Wood is increasingly being used in residential and commercial buildings, for both low-rise and mid-rise structures. Not only is wood beautiful, but innovations in engineered wood products and building systems are allowing for longer spans and taller walls, and the product is competing with steel and concrete as the primary construction material in some buildings.

By bringing the outdoors into a space, occupants feel a greater sense of belonging and serenity."[3] Bill Browning, environmental strategist and founding partner of Terrapin Bright Green notes in a recent interview, "There is a growing body of research that shows the spaces we inhabit have distinct physiological and psychological impacts on us. Spaces with elements of biophilic design are more attractive and have been found to increase use of the space. Biophilic experiences can reduce stress, improve cognitive function, and enhance mood and creativity."[4]

SUSTAINABILITY AND THE MOVE TOWARD HEALTH AND WELLNESS

Sustainability should be top of mind as well, as it's no longer just a trend or an added feature in a project. Rather, it's a demand from consumers in all markets who expect sustainability to be integral in all aspects of design. An offshoot of the sustainability movement is the growth of health and wellness, which is also becoming integrated into products, society, and corporate initiatives. In her article, *From Health and Wellness to Sustainability in Brands*, Iryna Lozynska notes, "The relationship between health and wellness and sustainability is shaping up to be not a correlation, but rather complex causation evolving into a symbiosis. Understanding the relationship between sustainability and health and wellness is essential when navigating the world of storytelling and brand-building, made ever more complex by the savvy consumer, increasingly commanding an elevated, premium experience." Indeed, we can see that a return to natural products, increased desire for a connection to nature, and demand for sustainable goods can form a symbiotic relationship in design.

WOOD'S RISE

Designers would be wise to incorporate materials into their designs that check all the boxes:

- Connection to nature
- Biophilia
- Sustainability
- Health and Wellness

In fact, using wood products does just this. A 2006 Canadian study, *Appearance Wood Products and Psychological Well-Being* (Rice et al, 2006), mapped out people's perceptions of wood used in interior applications. The research found that, "People's response to wood is, for the most part, extremely positive, with subjects generally showing a strong preference for rooms containing many wood details. There also appears to be a strong belief that the use of wood can help to create healthful environments, and commonly-evoked descriptors for wood rooms include 'warm,' 'comfortable,' 'relaxing,' 'natural,' and 'inviting.'"[5]

Wood is increasingly being used in residential and commercial buildings, for both low-rise and mid-rise structures. Not only is wood beautiful, but innovations in engineered wood products and building systems are allowing for longer spans and taller walls, and the product is competing with steel and concrete as the primary construction material in some buildings. Some examples of engineered wood products being used in tall wood buildings are cross-laminated timber, nail-laminated timber, dowel-laminated timber, and glue-laminated timber wood panels.

Cross-laminated timber (CLT) is a wood panel system formed by stacking and gluing together successive perpendicular layers of wood, which are then pressed in large hydraulic or vacuum presses to form an interlocked panel. The panel is sized and shaped with

a CNC machine into a fully construction-ready component, which may have door and window openings, and routings for electrical and mechanical systems. The material's high strength, dimensional stability, and rigidity allow it to be used in mid- and high-rise construction.

Nail-laminated timber (NLT or nail-lam) is a traditional construction method that is now found in new projects of all sizes. NLT is created from dimensional lumber stacked on edge—2x4, 2x6, 2x8, 2x10, or 2x12 at 1-1/2" on center—and fastened together with nails. Plywood sheathing is often added to one top side to provide a structural diaphragm, which also allows it to be used as a wall panel. The panels can be used for floor, wall, and roof systems as a viable substitute for concrete slabs and steel decking in residential, commercial, and institutional buildings.[6]

Dowel-laminated timber (DLT) is the first all wood mass timber panel in North America, with no nails, glue, or metal fasteners. DLT is similar to nail-laminated timber but instead of nails or screws, DLT uses wood dowels to join laminations.[7]

Another engineered wood product that was recently introduced to the market is laminated veneer lumber, or LVL, which is often used for headers, beams, and rafters. Laminated veneer lumber is a type of structural composite lumber that is produced by bonding thin layers of veneer with moisture-resistant adhesives. The grain of all veneers is parallel to the long direction of the lumber. LVL has high allowable stress and is less likely to warp, twist, bow, or shrink than conventional lumber. Up to four LVLs may be connected together to create a larger beam or header.[8]

Glue-laminated timber (glulam) is a structural engineered wood element commonly used for beams and columns in residential and commercial applications. Glulam is a highly visible form of mass timber in contemporary projects, with long spans framing signature designs that have been left exposed to take advantage of wood's natural aesthetic.[9]

High-profile projects in the United States and Canada that have utilized these wood systems include:


Courtesy of Shakertown

- Carbon 12 in Portland
- T3 in Minneapolis
- Brock Commons Tallwood House in Vancouver
- The Origine Building in Quebec

Later in the course we'll discuss engineered wood products made with Western Red Cedar and how to incorporate them into building design.

ENVIRONMENTAL BENEFITS OF USING WOOD

There are also environmental benefits of using wood vs. steel and concrete, the materials typically used to construct taller buildings. Wood is an excellent thermal insulator, which helps keep buildings cool in the summer, and interiors warm in cold weather, ultimately improving comfort and reducing heating and cooling costs. Wood has 400 times better insulation (R-value) than steel, 2,000 times that of aluminum, and 8 times that of concrete.[10]

Wood is durable, allowing it to last a very long time, which reduces material consumption. Man-made materials—including brick, cement, and composite products—don't break down like wood does once it's discarded and are more difficult to recycle. Wood is also the only major building material that's renewable, which is why Canada's forest base is still abundant after 150 years of harvesting. For every tree that's harvested, at least 3 (and up to 8) are planted.[11]

Wood also reduces energy consumption. According to an independent study that compared how much energy is needed to obtain, manufacture, transport, and install building materials for identical wood frame, steel frame, and concrete houses, wood products require much less energy to produce

GLOSSARY

Bevel Siding—the most widely-used cedar siding type that is produced by re-sawing lumber at an angle to produce two pieces thicker on one edge than the other; one face is saw textured while the other face is smooth or saw textured depending on the grade and customer preference

Bleaching—weathering products designed to provide the weathered look of cedar sooner and more evenly than natural exposure to sunlight; they are lightly tinted with either gray or brown pigments, which mute the natural coloration and accelerate the weathering process

Board and Batten—a vertical design created using wide clear or knotty cedar boards spaced apart with narrower boards (battens) covering the joins

Clear Grades—Western Red Cedar products that are visually clean and free from defects and usually graded for smooth face exposure; there are only a few, if any, characteristics, which could include an occasional knot or minor imperfections

Knotty Grades—Western Red Cedar products graded to allow more inclusions, meaning there will be knots and other characteristics; they have a more casual, rustic appearance than clear cedar grades

Rough Boards—the rough sawn texture from either circular or band saws is present on all four sides

Shiplap—a versatile siding that can be installed vertically, horizontally, or diagonally; the profile of each board partially overlaps that of the board next to it or below it, creating a recessed channel that gives shadow line effects, provides excellent weather protection, and allows for dimensional movement

Surfaced One Side, Two Edges (S1S2E)—a surfacing process that results in a rough sawn face and a smooth back that provides uniform width and thickness tolerances; typically graded from the rough face, it may in some instances be reversible to the smooth back

Surfaced Four Sides (S4S OR PAR, D4S)—a smooth surface on all four sides that presents a uniformly sized product with a quality appearance; this surface finish is most commonly found on clear grades

Tongue & Groove—Western Red Cedar siding furnished kiln-dried, manufactured in clear grades, and available with one rough or smooth face; in standard patterns, these are usually reversible

than concrete or steel. Wood products make up 47 percent of all raw material manufactured in the United States, but their share of manufacturing energy consumption is only 4 percent. Steel requires 21 times the energy to produce and releases more than 15 times sulfur dioxide when compared to wood.[12]

ENTER WESTERN RED CEDAR

One wood product that has been around for millennia, and is increasingly being used in both commercial and residential buildings, is Western Red Cedar. It is nature's most beautiful and versatile building material. Its dimensional stability, longevity, ability to accept a wide range of finishes, resistance to decay, and natural good looks make it the only sensible choice for siding, paneling, corner boards, fascia, skirting, soffit, and window and door trim.

Many materials such as vinyl and composites try to replicate the look of real cedar, but it is difficult to achieve the wood grain, color, and feel of Real Cedar. Wood trim on the exterior of residential, commercial, or industrial buildings perfectly complements any architectural style and is compatible with all contemporary cladding materials.

This article continues on http://go.hw.net/AR112020-2. Go online to read the rest of the CEU course, complete the corresponding quiz for credit, and receive your certificate of completion.

SPONSOR INFORMATION

The Western Red Cedar Lumber Association represents quality "Real Cedar" producers, distributors and retailers throughout North America. Founded in 1954 and known as "the voice of the cedar industry," WRCLA offers extensive resources to assist with selection, specification and quality standards. For more information, visit RealCedar.com

QUIZ

1. Which of the following describes the positive impact humans feel when they have a sensory experience with nature through sight, sound, smell, or feel?
   a. Green sense
   b. Natural response
   c. Biophilia
   d. Organic sensory overload

2. In architecture, the biophilia effect can be cued when people respond to which of the following?
   a. Daylighting
   b. Views of nature
   c. Use of patterns
   d. Use of natural materials
   e. All of the above

3. Which of the following is an environmental benefit of wood?
   a. Excellent thermal insulator
   b. Only major building material that is a renewable resource
   c. Durability reduces material consumption
   d. Reduces energy consumption in manufacturing
   e. All of the above

4. Which product has been approved for soffit applications in Wildland Urban Interface (WUI) areas in California, Oregon, and other places that require fire-resistive construction?
   a. Cedar tongue and groove with clear veneer overlay
   b. Engineered knotty cedar
   c. Western Red Cedar trim
   d. Dowel-laminated timber

5. Which product is assembled out of smaller pieces of wood into long length material that can be nailed, sanded, and sawn just like solid stock?
   a. Cross-laminated timber
   b. Glue-laminated timber
   c. Engineered knotty Western Red Cedar
   d. Clear solid Western Red Cedar

6. _____ is the highest grade of Western Red Cedar.
   a. A Clear
   b. Clear Heart
   c. Select Knotty
   d. Architect Knotty

7. Which Western Red Cedar product contains no open characteristics or through defects and allows the use of adhesives on the reverse side to secure knots?
   a. Clear V.G. Heart
   b. B Clear
   c. Select Knotty
   d. Architect Knotty

8. Which Western Red Cedar surface finish presents a smooth surface on all four sides and is most commonly found on clear grades?
   a. Rough Boards
   b. Surfaced One Side, Two Edges (S1S2E)
   c. Surfaced Four Sides (S4S OR PAR, D4S)
   d. Matte

9. Which Western Red Cedar siding is the most widely-used cedar siding type and is produced by re-sawing lumber at an angle to produce two pieces thicker on one edge than the other?
   a. Bevel siding
   b. Tongue and groove
   c. Board and batten
   d. Shiplap
   e. Shingle panels

10. Which finish produces the natural weathered look of Western Red Cedar faster than waiting for nature to take its course?
    a. Noir stains
    b. Natural gray
    c. Bleaching
    d. Transparent stain


Courtesy of Shakertown

While the most popular uses of cedar are siding, trim, decking, and outdoor structures, Western Red Cedar can add beauty and elegance to interiors as well; cedar paneling, molding, windows, doors, posts, beams, ceiling treatments, and interior projects like feature walls and room dividers can provide natural warmth to spaces.

Western Red Cedar is a proven performer with centuries of use, going back to the mid-1800's in modern construction. But the use of cedar actually goes back to ancient times when it was used by First Nations of the Pacific Coast 3,000 to 5,000 years ago. The versatility of the trees prompted the Native people to revere it as "The Tree of Life," as they used Western Red Cedar for canoes, storage boxes, mats, baskets, water repellent clothing, ropes, and more.[13]

WESTERN RED CEDAR USES

Western Red Cedar is widely used for both exterior and interior elements of buildings. Imbued with decidedly crisp yet superbly rich tonal properties, cedar can create sublime outdoor sanctuaries, embolden traditional home decor, provoke cutting-edge architecture, and inspire innovative interiors.

Cedar complements any architectural design, from turn-of-the-century to contemporary. It has a richly textured grain with colors ranging from mellow ambers to reddish cinnamons and rich sienna browns. Its warm coloring is complemented by a uniform, fine-grained texture with a satin luster. Because cedar is pitch and resin free, the wood easily accepts a range of finishes, from fine oils and stains to solid coatings and paint. And, the natural compounds that give this wood its fine scent also make it resistant to rot, decay and insect attacks, so it's low maintenance.[14]

EXTERIOR USES

Exterior uses for Western Red Cedar include siding, trim, and decking or other outdoor structures.

Siding[15]

When deciding on siding, there are many factors to consider such as aesthetics, value, durability, versatility, and environmental sustainability. Siding is Western Red Cedar's primary application because it is naturally beautiful, incredibly durable, and very versatile. Designers are not limited to just 3 patterns that are only 12 feet long. There are a wide variety of patterns and widths available and they can be supplied up to 20 feet long or longer. Soffit paneling is considered a siding application. We will discuss the different siding profiles in a bit.

Trim[16]

Trim boards are generally used in applications such as corner boards, fascia, skirting, and molding around windows and doors. Like siding, trim boards are available in a variety of grades and textures to complement the style you have envisioned. Clear boards have a limited number of natural characteristics and are specified when a "clean," fine appearance of the highest quality is desired. Specify the surface finish by choosing surfaced four sides (S4S), surfaced one side and two edges (S1S2E), or rough sawn all round (rough).

Decking[17]

Western Red Cedar is a highly revered, durable wood that is naturally resistant to rot, decay, and insect attacks, which means decks built with it may last longer and require less maintenance. It is also used for outdoor structures such as pergolas and gazebos. Deck maintenance generally only requires a once-a-year cleaning in the spring to remove dirt, mildew, and other forms of discoloration. Yearly cleaning will ensure that the deck looks nice and will prolong the life of the protective coating.

INTERIOR USES

While the most popular uses of cedar are siding, trim, decking, and outdoor structures, Western Red Cedar can add beauty and elegance to interiors as well. Cedar paneling, molding, windows, doors, posts, beams, ceiling treatments, and interior projects like feature walls and room dividers can provide natural warmth to spaces. You can even specify cedar for acoustic insulation, as cedar walls and ceilings provide sound insulation necessary for quiet or media rooms.

Sunshine will play off the natural undertones of cedar, and in the winter the intrinsically rich reds of the wood will be warm and inviting. In the kitchen, just one wall of knotty Western Red Cedar paneling can offer a warm juxtaposition to stainless steel appliances and modern countertops. A cedar feature wall will provide all the warmth of natural wood without becoming chalet cliché. As a room divider, a widely spaced cedar slat

partition is a contemporary way to separate areas. It adds a visual point of interest without shutting out limited natural light.

NEW WESTERN RED CEDAR PRODUCTS

There are several new Western Red Cedar products that have recently entered the market. They provide even more opportunities for designers to beautify their structures.

Engineered Clear Solid Western Red Cedar

Finger joined and edge glued products such as engineered clear solid Western Red Cedar are primarily made into boards that are used for trim, fascia, and siding. They are manufactured differently than solid stock. They have no knots and may be run to patterns for siding applications. Engineered clear solid products are manufactured into long lengths (typically 16 or 20 foot) while still providing exceptional dimensional stability and long-term durability.[18] Because of wide color variations in these products, they are sold pre-primed.

Courtesy of Shakertown

Perfect for exterior cladding or soffits, as well as interior wall or ceiling details, engineered Western Red Cedar tongue and groove paneling will provide many years of beautiful service.

Engineered Western Red Cedar Products with a Clear Veneer Overlay

To manufacture engineered Western Red Cedar products with a clear veneer overlay thin pieces of clear, vertical grain Western Red Cedar veneer are applied to backer boards using the same techniques and glue used to make other engineered building materials rated for exterior use. Perfect for exterior cladding or soffits, as well as interior wall or ceiling details, engineered Western Red Cedar tongue and groove paneling will provide many years of beautiful service. These products are available in 1x4 T&G and 1x6 T&G with a variety of edge details. They are environmentally friendly because less clear fiber is required to make them. T&G products with clear veneer overlay have been approved for soffit applications in Wildland Urban Interface (WUI) areas in California, Oregon, and other places that require fire-resistive construction.

Engineered Knotty Western Red Cedar

Engineered knotty cedar products are now available as well. They are assembled out of smaller pieces of wood into long length material that can be nailed, sanded, and sawn just like solid stock. Engineered knotty Western Red Cedar is run to pattern for siding applications. Other primary applications are fascia and trim board. When used as fascia and trim boards, long lengths are desired and there is not enough production in solid stock to meet demand. 16- and 20-foot lengths are being manufactured in engineered form to meet the demand for fascia and trim applications. Another advantage is that in some markets, kiln dried engineered knotty products are replacing materials usually furnished unseasoned.

GRADES

Different grading agencies, including the National Lumber Grades Authority (NLGA), West Coast Lumber Inspection Bureau (WCLIB), Western Wood Products Association (WWPA) and Pacific Lumber Inspection Bureau (PLIB) publish varying grading rules for Western Red Cedar. These organizations create the grading rules and standards used for their inspections. The two main grading agencies for Western Red Cedar are NLGA (British Columbia, Canada) and WCLIB (Portland, OR), both of which are approved by the American Lumber Standard committee so you can be assured that whether the Cedar is sourced from Canada or the United States it's being produced to industry grading standards.

Western Red Cedar siding is available in clear and knotty grades. The higher the grade, the better the quality. Clear Heart is the highest grade of Western Red Cedar. The next highest grade is "A" and better. Deliveries of this product may include a small percentage

Courtesy of Shakertown

Clear grades provide a premium quality appearance and are ideal for prestigious, upmarket applications; they are visually clean and free from defects.

"B" grade material. Select Knotty is the highest grade for knotty cedar.

Clear Grades

Clear grades provide a premium quality appearance and are ideal for prestigious, upmarket applications. They are usually graded for smooth face exposure but are manufactured in both S4S and S1S2E form. The clear grades are visually clean and free from defects. You will see only a few, if any, characteristics, which could include an occasional knot or minor imperfections.

Clear V.G. Heart

Clear V.G. Heart is the highest Bevel siding grade available; it is sawn vertical grain (edge grain) and is kiln dried. Pieces have a smooth face of decay-resistant heartwood and are free from growth characteristics that affect appearance or performance. Pieces have excellent dimensional stability and hold finishes exceptionally well. It is available as solid wood or finger-joined.

Clear Heart

Clear Heart is the highest grade for non-bevel patterned siding such as T&G, shiplap, and boards. This grade includes only pieces with heartwood on the exposed face. Many pieces are completely clear, while others have minor imperfections that do not detract from their fine appearance.

A Clear

A Clear is a fine appearance grade that allows only slightly more characteristics than Clear Heart. Pieces are of mixed grain pieces

(vertical and flat) and are graded from the surfaced face. A Clear is typically sold with a percentage of B grade.

B Clear
B Clear allows for cutouts and is always included as a small percentage with "A."

C and Better and D Clear
C and Better and D Clear are the lowest clear grades available. It is a high-quality material for use where appearance is important, but cutout defects are allowed.

Proprietary Grades
Proprietary grades are graded to the manufacturer's specifications to meet or exceed industry standards. Boards often represent good value in the no-hole product range.

Knotty Grades

Knotty siding has warmth and casual charm and is ideal for homes, cottages, clubhouses, and applications where a rustic appearance is desired. Knotty grades allow more inclusions, meaning there will be knots and other characteristics. Appearance-wise, knotty grades of cedar are an excellent and durable choice—they just have a more casual, rustic appearance than clear cedar grades. All knotty products are well-suited for factory priming or finishing.

Select Knotty
Select Knotty has knots and other natural features that define the visual character of knotty sidings. In this grade, knots are sound and tight. The product is available rough or smooth and kiln-dried or unseasoned. Some companies may supply this grade with knots glued on the back. Common specifications are Select Knotty with a percentage of Quality Knotty allowed.

Architect Knotty
Architect Knotty is intended to be fully usable with the re-sawn face exposed. The product contains no open characteristics or through defects and allows the use of adhesives on the reverse side to secure knots. Architect Knotty is supplied kiln-dried.

TEXTURE OPTIONS

Western Red Cedar boards may be specified in one of three surface finishes: rough; surfaced one side, two edges (S1S2E); or surfaced four sides (S4S). These texture options further enhance your design flexibility.

Rough Boards
The rough sawn texture from either circular or band saws is present on all four sides.

Surfaced One Side, Two Edges (S1S2E)
This versatile product is the most popular choice for trim boards. The surfacing process results in a rough sawn face and a smooth back that provides uniform width and thickness tolerances. Typically graded from the rough face, it may in some instances be reversible to the smooth back.

Surfaced Four Sides (S4S OR PAR, D4S)
The smooth surface on all four sides presents a uniformly sized product with a quality appearance. This surface finish is most commonly found on clear grades.

PROFILES

Western Red Cedar exterior siding or cladding comes in a wide variety of patterns that can match any style.

Bevel

Western Red Cedar Bevel Siding is the most widely-used cedar siding type. It is produced by re-sawing lumber at an angle to produce two pieces thicker on one edge than the other. The manufacturing process results in pieces with one face saw textured; the other face is smooth or saw textured depending on the grade and customer preference. Bevel siding is installed horizontally and gives an attractive shadow line, which varies with the thickness of siding selected. Bevel siding is available in both clear and knotty grades.

Finger-Joined Bevel Siding
Finger-joined bevel siding is also produced, which has precision-fitted joints that are virtually invisible and stronger than the surrounding fiber. It is available in clear, knotty, and engineered knotty grades. Finger-joined bevel siding is available in lengths up to 16 feet and provides the handsome appearance and all-weather performance of premium cedar siding. Builders appreciate both the convenient long length and the speed and ease of installation with fewer field joints.[19]

Knotty grades allow more inclusions, meaning there will be knots and other characteristics; appearance-wise, knotty grades of cedar are an excellent and durable choice—they just have a more casual, rustic appearance than clear cedar grades.

Tongue and Groove

Western Red Cedar Tongue & Groove is widely used for its good looks and versatility. It can be installed horizontally or vertically, each method giving a distinctly different look. Tongue & Groove siding is usually available with one rough or smooth face; in standard patterns, these are usually reversible.

T&G patterns are furnished kiln-dried and the siding is manufactured in clear grades suitable for a more formal, elegant appearance, particularly when pieces are smooth faced. Knotty grades are also in demand for their smart, casual look.

The joints between adjoining pieces are usually V-shaped but flush joint, fine line, and radius edge details are also available. The different joints and surface textures in tongue and groove siding combine to provide a range of shadow line effects that enhance the product's versatility. The nominal thickness is 1" with nominal widths available in 4, 6, 8 and 10 inches. Thicker material is also available.

Shiplap

Channel rustic is the most popular type of shiplap siding. A versatile siding, it can be installed vertically, horizontally, or diagonally. In channel siding the profile of each board partially overlaps that of the board next to it or below it, creating a recessed channel that gives shadow line effects, provides excellent weather protection, and allows for dimensional movement.

Shiplap sidings are normally supplied in a variety of patterns and supplied either green (unseasoned) or dry. They are available in clear or knotty grades; clear grades are typically manufactured to order. The face side is usually saw textured but may be supplied smooth or surfaced, especially in clear grades. Shiplap patterns are graded to the intended exposed face and are not reversible. Shiplap siding's commonly available sizes are 1"x6", 1"x8", and 1"x10".

Board and Batten

Western Red Cedar Board & Batten is a vertical design created using wide clear or knotty cedar boards spaced apart with narrower boards (battens) covering the joins. There are no set board or batten widths because various combinations are used to create different looks suitable for large- or small-scale applications. A frequent combination is 1"x3" battens and 1"x10" boards. This can also be reversed with boards installed over battens to create a deep channel effect, called reverse board and batten. Rough sawn, or S1S2E, unseasoned or kiln dried boards are commonly used for board and batten siding. Sizes are available from 1"x 2" to 1"x12" but thicker material is available in nominal 5/4" and 2" thicknesses.

Trim Boards

Western Red Cedar Trim Boards are available in a variety of grades and textures to complement the envisioned style. Clear boards have a limited number of natural characteristics and are specified when a "clean," fine appearance of the highest quality is desired. They are available kiln dried or unseasoned.

Knotty boards present a more rustic appearance and may be specified seasoned or unseasoned. Texture options of rough; surfaced one side, two edges; and surfaced on four sides further enhance design flexibility.

Shingle Panels

Thanks to 8-foot, single-course panels on the market, it's easier than ever to install real cedar shingle siding. Several styles are available including staggered butt and fancy cuts such as like diamond-point and fishscale.

EXAMPLE OF HOW TO SPECIFY BEVEL SIDING

Species: Western Red Cedar
- Ex. WRCLA Western Red Cedar

Product Pattern and Intended Use: Siding is used as an exterior cladding to provide both weather protection and architectural style. The designer may choose from plain bevel, rabbetted bevel, or wavy edge bevel.
- Ex. Plain Bevel Siding

Size: Specify the nominal size of the product.
- Ex. 1/2 x 6 in.

Grade: The grade of the product governs its overall quality. Refer to WRCLA specification literature or grading agency rule books for available grades.
- Ex. Clear V.G. Heart

Grading Agency Paragraph: To ensure that the product meets a written standard, an agency grade paragraph should be referenced.
- Ex. NLGA para. 201a

Moisture Content: Specify whether the product is to be green (unseasoned) or kiln-dried.
- Ex. Kiln-dried

Surface to be exposed: Specify the application orientation to assist the supplier in shipping the right product for the job.
- Ex. Surface Face

Quantity: Express in surface measure the quantity required. See table for factor to convert square feet to surface measure.
- Ex. 5500 surface measure

CHOOSING THE RIGHT FINISH

Western Red Cedar accepts and holds a wide range of finishes beautifully. Below are the five finish options available for Western Red Cedar Siding:

- Opaque coatings such as paints and solid-color stains
- Semi-transparent stains
- Natural finishes such as transparent stains
- Bleaching or weathering products

Trends in Finishing

There are several finishes currently trending for Western Red Cedar. Noir stains that replicate the Japanese Shou Sugi Ban technique of charring cedar are growing in popularity. In fact, the Architectural Digest trend article we discussed earlier in the course notes, "Given the trend toward soothing minimalism, it's no surprise that the Japanese aesthetic will be a strong presence in 2020." Designer Michelle Lamb, editorial director at The Trend Curve, says, "These looks are always present in some way, but periodically, they are energized as a trend. Natural materials, used in simple forms, reinforce a feeling of purity that is at the core of this style." She notes, "The wood-charring technique Shou Sugi Ban is a compelling texture for furniture and decor that speaks to eco sensibilities." Letting the cedar weather to a natural gray is also popular, and lower maintenance to boot. There are also bleaching products that produce the natural weathered look faster than waiting for nature to take its course.


Courtesy of Paneltek Products

Western Red Cedar accepts and holds a wide range of finishes beautifully.

Important Note: All these types of finishes can be factory applied for optimal results; but if you choose to finish your siding on site, follow best practices and apply products to all six sides of each board.

PRIMING, PAINTING, AND STAINING CEDAR SIDING

While many homeowners prefer to showcase Western Red Cedar's beautiful texture and color with a natural finish, some prefer to use a solid finish. Western Red Cedar has naturally occurring extractives but without a proper base coat, those same extractives may discolor opaque finishes such as latex paints and solid-color stains. A stain blocking primer, alkyd-oil or water-based formulations must be used; alkyd-oil based primers usually offer the best shield against discoloration by water-soluble extractives.

Paints

Compared to other finishes, paint offers the greatest protection for Western Red Cedar siding against the elements. While cedar siding accepts, holds, and showcases all types of paints beautifully, your best choice is a 100% acrylic latex formula. They outperform other types of paints in all types of weather.

Solid-Color Stains

As with paints, solid-color stains shield the wood from damage caused by ultraviolet light and water. These stains come in a wide array of tints that defuse cedar's naturally occurring brilliance, but unlike paints you still get all the warm texture of wood shining through. It's important to keep in mind, though, that unlike non-penetrating stains, these finishes form a film. These stains come in latex and oil-based formulas. When it comes to recommended usage, DO apply a stain-blocking primer before applying solid color stain but DON'T use an oil-based solid color stain over a latex primer.

Transparent Stains

If wood's natural characteristics are desired but you want to provide some protection against the elements, transparent stains are the way to go. These non-tinted products highlight cedar's natural beauty while providing water repellency but have a short service lives. Look for products that contain mildicides and fungicides. This will help prevent future growth of mildew and fungi and prolong the wood's service life. Among the different types of transparent stains, there are waterborne and solvent-born formulas. Both of are completely unpigmented, which means they require regular reapplication because they don't offer any protection against damage caused by the sun's ultraviolet. But like all transparent stains, they can be refinished with relative ease.

Semi-Transparent Stains

Solvent-borne, oil-based, semi-transparent stains penetrate the wood surface; they do not form a surface film like paints or solid stains. For Western Red Cedar products, they are the best choice in terms of offering protection, yet they still showcase the wood's natural beauty. With latex semi-transparent products, you can achieve the same look as


Project: High Desert Residence
Architect: Hacker
Photographer: Jeremy Bittermann

Bleaching and weathering products are lightly tinted with either gray or brown pigments, which mute the natural coloration in Western Red Cedar and accelerate the weathering process.

solvent-borne ones but these stains tend to form a film and do not penetrate the wood. They do contain pigments that add color—including cedar tones. They will increase the service life of siding and protect it from damage caused by ultraviolet rays. If applied according to best practices and depending on design and exposure to weather, these stains can last three to four years before having to be reapplied. Two-coat applications may provide additional service life, but are only recommended for textured face exposure.

Bleaching and Weathering Products

Bleaching and weathering products are designed to provide the weathered look and do so sooner and more evenly than natural exposure to sunlight. They are lightly tinted with either gray or brown pigments, which mute the natural coloration in Western Red Cedar and accelerate the weathering process. They are available in oil-based and latex formulas and like all finishing products, should be applied to all six sides of each piece. This will provide color consistency as well as equal water repellency to all six sides.

**Note:* Be sure to prime or stain all raw ends and end cuts.

CONCLUSION

As you've learned, wood is seeing a renaissance due to current design trends and a global push for sustainability. Today's designers are incorporating more organic materials, including natural wood products, into their designs to create a calm, pared-back, warm minimalism. Western Red Cedar products contribute to this return to nature, the biophilia effect, sustainability, and health and wellness. There are many exterior and interior uses for the product and the new engineered Western Red Cedar products that have recently entered the market will transform how the material is used in both residential and commercial buildings. ■

ABOUT THE WRITER

Paige Lozier is an experienced writer of digital and print publications, primarily within the design and construction industries. She received a Bachelor's degree in Interior Design and a Master's degree in Historic Preservation from the University of Georgia.

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CASE STUDY

Western Red Cedar Contributes Sustainable Beauty to this Western Massachusetts Home

Sheffield Residence, Sheffield, MA

Construction was recently completed on a 3,600 sq.ft. contemporary home in Sheffield, Massachusetts, designed by Vincent Appel/Of Possible Architecture and built by Kent Hicks Construction. The home is a marriage of spatial poetry and building science. The timeless craft of traditional New England construction is met with the most advanced building science principles and technologies, resulting in a contemporary expression of rural American architecture that will last for generations.

The clients were torn between wanting a glass house and something more traditional. The result is a home where every window and door is a floor to ceiling picture frame of spaces throughout the property. Moving through the home over the course of the day, one is drawn from the inside spaces to the outside landscape. Similarly, when one approaches the home from the outside, the large terraces create frames drawing visitors into the interior. The architectural finishes are a sober palette chosen to enhance the effect of these frames against the ever-changing seasonal New England landscape.

A Modern Vernacular Home Meets Passive House Institute Standards

The project is an example of uncompromising contemporary design, conceptual architecture, and the application of sustainable building science. Working with Kent Hicks Construction, a contractor and Certified Passive House Consultant, the design team developed straightforward construction details to achieve Passive House level building assemblies. Though not certified, the home is built to meet Passive House Institute standards. Materials were sourced regionally, selected for low global warming potential, and detailed for ease of construction to last generations. The home was detailed to Passive House insulation, air sealing, and thermal bridging performance levels. This includes blown in mineral wool and cellulose that were chosen for their low global warming potential, consistent insulation values over the lifespan of the building, and vapor permeability. In addition, mechanical systems and energy loads were sized so that the home could achieve net zero energy performance with the addition of a small ground mounted solar panel array.

Traditional light frame construction framing methods were thoughtfully modified to create the most efficient wall assembly. The typical wall assembly is a 2x8" load bearing stud wall with 10-1/2" Larsen trusses suspended on the exterior. This assembly has the advantage of creating a primary water and air tight barrier that is protected in the middle. A 3"" rain screen was detailed to allow the Western Red Cedar siding to dry quickly and evenly on all sides. The result is a wall assembly that will last for generations.

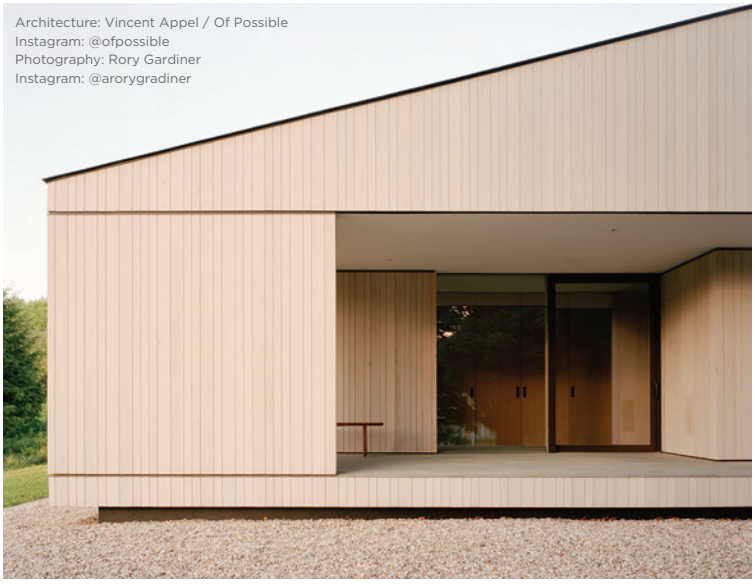
Use of Western Red Cedar at the Sheffield Residence

West Facade

Two 7/8" reveals form horizontal strike lines around the entire exterior of the home. These subtle lines nod to the history of modern architecture's flat roofed pavilion like homes such as the Farnsworth and Glass House. These strike lines are positioned so the facade can consist entirely of continuous vertical cedar planks with no intermittent seams. The horizontal strike lines, continuous vertical cedar boards, and long-span low pitched gable roof form a composition that moves between horizontal to vertical and volumetric to planar depending on your position in and around the building.

View from the south courtyard

Western Red Cedar finished with a 50/50 mix of bleaching and pre-weathering stain was carefully selected through the Western Red Cedar Association to achieve a soft neutral tone to frame the seasonal New England landscape. The finish will "live" through the life of the building and eventually weather to a silver grey. The 50/50 mix was selected to prevent drastically uneven weathering of the cedar across its different exposures.



Traditional light frame construction framing methods were thoughtfully modified to create the most efficient wall assembly; a 3" rain screen was detailed to allow the Western Red Cedar siding to dry quickly and evenly on all sides, resulting in a wall assembly that will last for generations.

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