TRANSCRIPT: Sustainability Training Module

01: Overview

The objective of our presentation is to provide you with a solid understanding of Western Red Cedar, its properties, its uses and how it will enhance the appeal of your next project.

While we can't cover everything in the short time provided, at the end of today's talk you will definitely have a greater awareness of all the properties that make Cedar such a unique species.

You will also go away with a better appreciation of the styles and grades of Cedar available and how they should be specified to achieve the desired appearance and performance.

Finally, you learn about the various finishes that can be used to further enhance Cedar's beauty as well as the maintenance steps that should be taken to keep your project looking as good as the day it was completed.

Today's presentation will cover the following:

An introduction to Western Red Cedar and the Western Red Lumber Association;

A brief look at the interesting heritage of Western Red Cedar which is considered the "tree of life" by the First Nations peoples in British Columbia;

We will detail the environmental benefits of Western Red Cedar, the progressive environmental management in British Columbia forests and the various certification schemes in place.

Further we will explore Western Red Cedar's unique basket of characteristics and take you through a visual tour of projects around the world incorporating Western Red Cedar, provide you with the information you need to know on grades and sizes to ensure you can accurately specify the type of materials that complement your vision.

We will discuss proper coatings and finishing techniques as well as offer some tips for regular care to ensure your project continues to look its best.

Finally we will provide information about useful reference materials and sources on Western Red Cedar that you can use in your practice.

02: About WRCLA

The Western Red Cedar Lumber Association is a non profit trade association of Western Red Cedar producers, distributors and retailers throughout North America.

Founded in 1954, the association is known worldwide as "the voice of the cedar industry."

Its members account for more than 65 percent of the world's production of Western Red Cedar and have an annual volume of nearly 1 billion board feet.

The WRCLA works closely with architects, designers and builders to ensure the right product is specified and utilized for each project.

The association offers extensive resources for architects, builders and installers including installation guides and DVDs available in English, Spanish and Russian, specification information and technical support.

03: About Cedar

The stately Western Red Cedar which is incidentally the official tree of British Columbia.

I won't dwell on the technical too much here, but it is important to make you aware of Western Red Cedar's scientific name, "Thuja Plicata". There are imitation or alternative wood products that claim to be "Red Cedar" or present themselves as a suitable substitute… avoid problems before they happen, specify "Western Red Cedar" and add "Thuja Plicata" for good measure.

Western Red Cedar trees reach heights of 200 feet with diameters of up to 16 feet meters. The trunk of older trees is buttressed, fluted and quite tapered. The largest standing Cedar tree in Canada is located in the world famous Pacific Rim National Park located on Vancouver Island.

As mentioned earlier, the First Nations people called the Cedar "Tree of Life". They recognized its natural durability which 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 natural durability, remarkable performance and unsurpassed beauty, bring warmth, character and longevity to homes, offices and their surroundings.

As you will soon see, its supreme versatility as a building material has made it the enduring choice of discerning architects and builders of projects of distinction around the world.

Despite the claims from others, there are no comparable species to Real Cedar… make sure you specify Western Red Cedar or better yet, Thuja Plicata.

I don't know who the architect was on this project but obviously he knew enough to use Western Red Cedar. Western Red Cedar's popularity as a building material dates back thousands of years among First Nations who first settled the region. Its versatility made the trees essential to people up and down the Pacific coast. A number of long houses such as this are still standing today.

Native craftsmen and artists found different uses for each part of the tree. Working with tools made of stone, bone and shell, they created totems such as this one, still standing strong nearly two centuries after it was crafted. A fine example of the performance and natural durability of Cedar.

The "Tree of Life" is still utilized by craftsmen today, as it has been for so many centuries. Building on the experience of the First Nations peoples, by the early 20th century, Cedar was being adopted as a favorite building material by many leading architects. Early adopters of this wonderful species were British Columbia architect Samuel McClure. The American architect Bernard Maybeck who lavishly used Cedar to add character and charm to the interiors and exteriors of the San Francisco Bay area homes he designed. For the First Nations peoples, Cedar continues to play an integral cultural role and offers a range of economic opportunities through art, forestry and tourism.

04: Sustainable Forests

While there are some volumes in the US, as far North as Alaska and South to Oregon, the majority of Western Red Cedar comes from British Columbia.

Within the province, approximately 80% comes from the Coastal region with the balance growing in the interior wet belt.

British Columbia is in a very unique position when it comes to forest land ownership. Approximately 95% of BC's forests are owned by the crown. This compares to only 30% public ownership in the US and 25-30% in Scandinavia. This is a key distinction. Public ownership ensures a more holistic and long term commitment to sustainability.

While forests cover more than 149 million acres, government limits harvesting to less than 1/3 of 1% annually and mandates that eight seedlings are planted for every tree harvested. Also, the BC government ministry of forests incorporates a broader group of stakeholders and issues than what would take place for private land ownership elsewhere in the world.

In BC, forest companies are economically and legally obligated to practice sustainable management. If they fail to do so they will lose the access to their supply.

As part of the stewardship of the forests it owns, BC has set aside extensive regions as parks and protective regions. These regions contain approximately 50 million cubic meters of Western Red Cedar that will never be available for harvesting.

The species balance between coastal regions and the interior are quite different.

On the Coast, Western Red Cedar along with Douglas Fir and Hemlock makes up the majority of inventory, with Western Red Cedar representing 20% of the total.

Conversely in the interior where the climate and geography are quite different, Western Red Cedar comprises only 2% of the total standing inventory.

With more than 750 million cubic meters of standing timber, the proportion of Cedar has remained constant over the past 25 years. This is because of strict harvesting limit set by British Columbia's chief forester.

05: Harvesting Practices

Annually, companies harvest approximately 6.4 million cubic meter of Western Red Cedar in log form. This converts to approximately 1 billion board feet of sawn timber. Note that this does not include volumes for shake and shingle production.

Thanks to a greater awareness of environmental issues by companies and government, the method of harvesting Western Red Cedar has changed dramatically over the past 10 years.

The use of clear cut harvesting has been significantly reduced in both frequency and size. Currently the law limits Coastal clear cuts to a maximum area of 30 hectares; however in practice most clear cuts on the coast do not exceed 20 hectares.

Various methods of variable retention harvesting and helicopter logging are now widely practiced. These methods ensure the protection of wild life, preservation of riparian zones and biodiversity. Where roads are constructed to provide access to logging areas, steps are taken to "decommission" (translation = return to a natural state) them.

Many of these changes are expensive so companies continue to maximize the utilization of the Cedar they harvest. Bark and sawmill residues are separated and extracted for use as garden mulch. Even Cedar's natural oils are extracted from mill wastes for use in cosmetics and to keep pesky moths away from clothes.

An expensive but effective method of harvesting. Helicopter logging eliminates the need to construct roads which has positive implications on both costs and the environment. Helicopter logging also causes less disruption of riparian zones and provides access to areas that are unsafe for conventional harvesting methods.

This is an example of a variable retention harvesting zone using helicopter logging. Note that no roads were required to access this area. This particular block also incorporates wild life corridors to facilitate migration and access to the newly created "meadows" where various new food sources such as berries and grasses will become available as the forest begins to regenerate.

A larger, more conventional cut block shows the various stands and clumps of trees that were retained for aesthetic and wildlife purposes. Complying with Ministry of Forest regulations, the roads will be decommissioned after replanting to reduce erosion.

Forests are restored through a combination of natural regeneration and tree planting. Soon after harvesting is complete, often less than a year, forest companies will return to the block to plant seedlings. Companies replant the "profile" of the forest they have harvested to avoid creating "unnatural" stands. To further protect biodiversity, seedlings are propagated from trees growing in similar harvest areas and elevations. Typically WRC is 50% natural regeneration and 50% planted.

Only a small percentage of the world's forests are independently certified as being legal and sustainable.

Canada and the province of British Columbia are world leaders in forest certification. In fact, British Columbia has more forest area certified than the US and Russia. Even more than Finland and Sweden combined.

PEFC is a global umbrella organization for the assessment of and mutual recognition of national forest certification schemes developed in a multi-stakeholder process.

PEFC has in its membership 35 independent national forest certification systems of which 25 to date have been through a rigorous assessment process involving public consultation and the use of independent assessors to provide the assessments on which mutual recognition decisions are taken by the membership.

These include the three most commonly used North American certification systems:

CSA - (the Canadian Standards Association): evaluates forest practices and performance using internationally recognized criteria that are adapted to local conditions through a transparent public participation process.

SFI - (the Sustainable Forestry Initiative): evaluates forest practices using a tough standard of environmental principles, objectives, performance measures and core indicators.

and ATFS (American Tree Farm System) which is only available in the U.S.

The availability of FSC is limited due to the lack of a regional standard for BC.

Please note that all three have been recognized by DEFRA in the UK and Keurhout in the Netherlands as being both legal and sustainable. As a further indication of their environmental commitment, most companies are certified to ISO 14001 EMS.

In total more than 140 million hectares are certified in Canada. Certified forests in British Columbia represent almost 37%(52 million hectares) of the national total.

06: Environmental Value

Certification of harvesting practices should be just one of the elements used in assessing the environmental benefit/value of a product. Life Cycle Assessment (also known as life cycle analysis, ecobalance, and cradle-to-grave analysis) models the complex interaction between a product and the environment from cradle to grave. It is a methodology that assesses the environmental performance of materials, assemblies and even whole structures over the course of their entire lives, from extraction through manufacturing, transportation, installation, use, maintenance and disposal or recycling. Impacts are measured in terms of a wide range of potential effects

LCA is widely accepted within the environmental research community as one of the best ways to compare the environmental impacts of alternative materials, components and services.

When evaluating the overall environmental impacts of using different construction systems, wood systems are far superior than any other method.

A more detailed review shows how wood compares to steel and concrete in terms of its energy use; contribution of greenhouse gases; generation of pollutants and waste; and use of ecological resources. As you can see from this table, wood is significantly better in each of these areas, in some instances dramatically so. Note the impact on water pollution of steel compared with wood.

Western Red Cedar Lumber Association (WRCLA) members determined commissioning a third-party LCA of siding and decking products was the only credible way to provide consumers with reliable environmental performance information. To place the study results in sharper perspective, a parallel study of alternative products including brick and fiber cement siding as well as composite decking products was also commissioned.

Western Red Cedar decking substantially outperformed composite decking in each of the seven criteria tested and was by far the product with the least environmental impact when compared with both virgin and recycled wood-plastic composite (WPC) decking products.

Even after subjecting the cedar decking results to a "worst case" scenario in which Western Red Cedar required the replacement of 20 percent of boards in normal service and periodic application of coatings, the environmental impact results remained strongly in favor of Western Red Cedar over a "best case" scenario for composite decking.

Western Red Cedar siding had the best overall performance when compared to vinyl , fiber-cement and brick. The Western Red Cedar received top marks in five of seven impact criteria, including "global warming potential."

Total life energy of Western Red Cedar siding can be further improved by altering end-of-life disposal practices away from the assumed practice of 100% landfill, to a mix of reuse, energy recovery and landfilling. This practice, already reality in many communities, results in cedar siding becoming a net "carbon sink;" other products tested remained green house gas contributors.

Timber or wood is the only material that is produced primarily with solar energy.

07: Cedar Products and Grading

Western Red Cedar has a unique and unparalleled basket of characteristics that make it an exceptional building material. It's not just a pretty face.

Of particular note is its natural durability. This means no harmful chemicals are required to treat the wood to make it suitable for use outdoors. As a result it offers customers peace of mind… why would you choose treated wood that poses a potential risk when a naturally durable alternative is available?

As we'll see later, Western Red Cedar is an excellent base for a wide range of coatings. This offers you as architect greater flexibility.

In planning any project, concerns about fire must be taken into account. Western Red Cedar is a natural inhibitor to flame spread and has a rating of Class II. In the UK, to achieve Class O, Cedar can be treated with readily available fire retardants that do not otherwise alter its performance.

Western Red Cedar is one of the least dense softwoods commercially available in the market. This makes it an excellent thermal insulator. It does not transfer heat which is why Cedar is great for saunas and patio decks. Cedar decks remain cool in summer and warm in cooler months.

But let's face it, Cedar is a remarkably beautify wood. No artificial product can replicate its warmth and beauty. For those who insist on the finest wood the world has to offer, Western Red Cedar is the logical choice.

Western Red Cedar is used extensively for siding applications in British Columbia. Cedar siding is well suited to provide weather resistant, yet breathable protection for residential, multi-family and commercial structures. Its use is not just limited to wood frame construction, in fact, with the use of strapping, Western Red Cedar can readily be added to standard brick and block construction. Time does not allow us to go into detailed installation tips on siding but I will

have Cedar siding installation guides for you at the back of the room. I also encourage you to visit our websites which also provide useful construction tips.

Through life cycle assessment research Western Red Cedar stands out as having the lowest impact on the environment. The global warming potential measure indicates that WRC siding produces the least greenhouse gases of the four siding/cladding product systems studied. WRC siding is 3 times less intensive than fiber cement siding.

Western Red Cedar siding comes in a spectrum of patterns and grades, including the one that is just right for your design and vision. To give you a better understanding, I'll spend a few moments discussing these. Remember specifying the right grade and profile are key to ensuring your project turns out as you envisioned it. Don't leave it up to the builder to decide for you!

For Western Red Cedar there are three primary grading agencies: North American Lumber Grading Agency (NLGA); West Coast Lumber Inspection Bureau (WCLIB) and R-List. Of these the most commonly used are NLGA for finished products and R-List for raw material.

For siding applications, the best grade available is known as "Clear Vertical Grain Heart". All products that meet this grade are sawn for vertical grain and are kiln-dried. Pieces have a smooth face of decay resistant heartwood. Each piece is free from growth characteristics that affect appearance or performance. You will want to specify this grade when nothing but the best will do. Include the grade rule paragraph "NLGA 200a" for tongue and groove or lap siding and "NLGA 201a" for bevel siding in your specification.

This grade is available in both solid and finger jointed siding. You should note that finger jointed material is both practical and can reduce your costs when a painted finish is desired.

"A" Clear is a fine-appearance grade siding that allows only slightly more natural characteristics than Clear Heart. The pieces are a combination of both vertical and flat grain and are graded from the surfaced face. Frequently manufacturers will sell "A "Clear bevel with a small percentage of "B "Clear. For example, a typical specification is "A " Clear with a maximum 10% "B" Clear. This grade is available in both solid and finger jointed siding. Include reference to NLGA paragraph 200b for tongue & groove and lap siding and 201b for bevel in your specification.

If clear appearance is the look that suits your vision, do not accept lesser specifications than A Clear.

Knotty siding is typically graded for "rough" or re-sawn face. Select Knotty is the highest grade available. In this grade, knots are sound and tight with other characteristics strictly limited. Some producers supply this grade with knots glued on the reverse face for added performance. Typical shipments of Select Knotty grade usually include a percentage of Quality Knotty grade pieces. This should not exceed 10% as Quality Knotty allows for cut outs and greater defects. Specify NLGA paragraph 204a for tongue & groove or lap siding and 205a for Select Knotty bevel.

For marketing purposes, many producers will produce proprietary versions of a high quality knotty siding product. Many of these are of good quality; however, to reduce price, some producers may include lesser grades. Use caution when specifying proprietary grades and ensure you have a clear understanding of what you are purchasing before making the final decision. You may wish to reference industry grade categories such as WRCLA's Architect Knotty which has a reputation for quality

When it comes to siding profiles, one of the most common is bevel siding. It's also known as clapboard in some regions. There are two basic kinds of bevel siding, square butt and rabbeted. The groove in rabbeted bevel ensure the siding lays flat against the wall. Note bevel siding should only be applied in horizontal applications.

Standard thicknesses for clear bevel siding are ½" (12mm); 11/16" (17mm); and ¾" (19mm). Standard thicknesses for knotty bevel siding are 5/8" (16mm); 11/16" (17mm); ¾" (19mm) and 7/8" (22mm).

The most popular widths for bevel siding are 6" (152mm) & 8" (203mm); however, most manufacturers also offer 4" (102mm), 10" (254mm) and 12" (305mm).

Tongue and Groove, often referred to as T&G profiles usually have machined edges. These machined edges create a v-shaped joint between adjoining pieces. Flush-jointed, reveal joints, and radius joints are also available. Detailed tongue and groove profiles are available from the manufacturer, Western Red Cedar Lumber Association or Western Wood Products Association.

T&G for siding applications is available 5/8" (16mm); 11/16" (17mm); ¾" (19mm) thicknesses. For applications such as interior paneling or soffits, thinner profiles are also available. Typical widths are 4" (102mm), 6" (152mm) & 8" (203mm). Many producers will produce specialty patterns based on customer needs. Check with individual companies to learn what's available.

Channel siding is a popular lap siding profile. Each board partially overlaps the board next to it. This partial overlapping creates a channel that gives a shadow line effect. Channel siding provides excellent weather protection and allows for dimensional movement. Other specialty profiles create a unique and attractive look that cannot be easily replicated. Mixing siding profiles creates a dramatic look. For example, log cabin siding can be used in combination with other cedar sidings or materials such as river rock to add a rustic accent to a home. Lap siding profiles allow architects, builders, and homeowners to demonstrate their creativity and flare.

A deck made with Western Red Cedar, one of the world's most beautiful woods, is apt to be one of the best looking decks in the neighborhood. But Western Red Cedar decks have much more going for them than good looks alone. Extending living space to the outdoors, integrating home and landscape, making use of damp or uneven terrain and giving a contemporary look to a traditionally-styled home are just a few of the ways that decks make life a little better.

Life Cycle Assessment research reveals WRC decking is essentially carbon neutral and its life cycle impact assessment measures dramatically lower than wood plastic composite decking. In fact, the environmental impact of WRC decking over a 25-year life cycle is less than 20% of the effect of wood plastic composite decking.

Grading for decking differs slightly from that for siding applications. The general principals are similar; however the grade descriptions and references are distinct.

The end use application for Cedar decking is self explanatory. Cedar decking is ideal for residential projects due to its low maintenance, ease of application, natural durability and environmental friendliness.

Whether as decking or boards, "A" Clear is the most common "clear" material and offers superior appearance and performance. The grade permits somewhat more imperfections than Clear Heart but is still restricted to pieces with excellent appearance. Common specifications are "A & Better" which contains both A Clear and some Clear Heart or "A & Better" with a percentage of B grade allowed.

For specific details on this grade you can reference N.L.G.A. paragraph 200b for boards or 202b for decking.

Select Knotty is the highest grade of knotty boards or decking available. The knots are sound and tight. Other characteristics are strictly limited so they don't detract from the overall appearance. Typical shipments of Select Knotty grade usually include a percentage of Quality Knotty grade pieces. Select Knotty illustrates rustic charm at its best. This grade is well manufactured and is ready to use. Knots are sound and tight and limited in size to meet the highest buyer expectations. The smooth, skip-free dressing over the entire face makes it an ideal deck surface. Select Knotty is the top choice for those looking for the beauty and lasting charm of a knotty cedar deck.

Specify NLGA 126A for Select Knotty decking or 204a for boards.

Sawn lumber is used in a variety of engineered structures from commercial, industrial and residential buildings to landscape structures such as bridges, arbors, pergolas and field houses. Applications fall into two broad groups: First, those structures in which both the strength and the appearance of exposed wood are of equal importance and; secondly, those where appearance is paramount. For both end user groups, Western Red Cedar offers the advantages of natural beauty, design flexibility, exceptional dimensional stability and long term durability. Cedar has a long history of withstanding the rigors of time and weather. While primarily an appearance product, cedar can also be used for certain structural applications when manufactured to set standards. Cedar's attributes allow for the design of distinctive timber structures of all types.

Clear grades of timbers are normally supplied green or unseasoned. When seasoning is required, it can be achieved by air drying.

When the finest quality rough lumber is desired, you should specify "R-List #2 Clear and better." This lumber is sound and well manufactured. It's generally free of defects and its natural characteristics don't detract from the wood's fine appearance. This grade can be used "as is" for timber, posts or beams. It can also be used as raw material for high-end finished products such as siding, paneling and window components. Do not accept offers of "Clear" Cedar. While this is a general description it is not a formal grade which means you cannot compare the product your receive against established standards.

#4 Clear offers good appearance in high-quality, well manufactured lumber. The grade does allow some larger and more numerous natural characteristics which are widely accepted in the construction of outdoor structures. Some pieces may require trimming to yield clear lengths for the intended use. This product is often used for remanufacturing. The grade is available surfaced or rough-textured. Specify R-List paragraph 65a.

Appearance Knotty is a category rather than a specific grade of product. It generally describes a non-structural product manufactured to meet the appearance requirements of a particular design. This material has highly restricted wane allowances to give well-defined corners. It contains no holes or other characteristics that detract from the appearance. Appearance Knotty represents good value for appearance end uses. You can request Appearance Knotty timbers with structural grading.

Today's producers of Western Red Cedar utilize as much of the tree as possible:

- The chips are used in the production of paper products
- The sawdust is often used as biofuel to power and heat manufacturing facilities
- Falldown (or trim) material is collected from the waste bins, re-graded and used to produce finger joint and edge glued panels (for fascia and trim), dimension lumber, and siding.

In addition to the uses of Western Red Cedar that we've just reviewed, it is also used for: ceiling fans; barbeque shelves; planter boxes; bird houses; garden houses, sheds, conservatories and even grilling planks (show example, mention limited quantities are available for interested parties). The bottom line is that with Cedar, you're limited only by your imagination.

08: Cedar Projects

We felt you would be interested in seeing how professionals here and from around the world have used this unique species in their commercial, institutional, residential and outdoor living projects.

The project is in the town of Ijsselstein, The Netherlands. The architect was Hans Goverde of Kraaijvanger – Urbis

In the US, sporting goods retailer, Columbia Sportswear has incorporated the rustic warmth of knotty Western Red Cedar on all their new store fronts. The finish used on this project was a Sikkens clear stain.

The new law courts for the city of Bordeaux designed by the Richard Rogers Partnership are intended to emphasize, through a feeling of transparency and openness, a positive perception of the accessibility of the French justice system. The exterior of the courts, clad in western red cedar strips, were positioned and fixed on site by artisan carpenters to produce the elegant and arresting finished structures.

In New Zealand, a local winery features Cedar in a variety of applications. The primary product you see featured is clear bevel siding coated once again with a semi-transparent stain. You'll also note the use of Cedar trim boards in both vertical and horizontal applications and for the louvres and door frame. And that raises a point, all around the world Western Red Cedar is used for a wide variety of applications including doors, windows, window blinds, shutters… don't limit yourself to what you've seen in your own back yard, investigate what others have done. I can recommend www.architectgallery.com as an interesting resource.

Don’t worry the barrels are still oak!

Project title: Melbourne Central

Architect: Ashton Raggatt McDougall

This project by Foster + Partners Architects features Western Red Cedar for the siding and the timber shading fins.

The 657 shading fins were produced and supplied by Levolux (www.levolux.com).

The UCD Virus Reference Laboratory, Dublin (McCullough Mulvin Architects) is particularly good as it is very well designed to weather naturally and evenly in colour, something that often overlooked.

This project by well respected firm, the Hillier Group out of Princeton, New Jersey, features a custom designed siding profile manufactured out of clear Western Red Cedar specifically for this job. The architect also incorporated clear tongue and groove for the ceiling detail. You can see more of this project by visiting the website I just mentioned.

This is the Experimental Media and Performing Arts Center for Rensselaer Polytechnic Institute by Grimshaw Architects.

This $200m building is a laboratory for both performing arts and science and provides state-of-the-art immersive environments for the senses of seeing and hearing including a concert hall, a theater, three performance studios and recording and editing facilities.

The concert hall is the centerpiece of the building and is contained inside an enormous three-dimensionallycurved wooden “hull”, clad entirely in Western Red Cedar tongue-and-groove planks sourced from sustainably managed forests in British Columbia. 86,000 linear feet of cedar plank was used in the project, equating to 5,800 pieces 6” wide by 15 feet long.

Grimshaw, the Design Architect, selected Western Red Cedar for its superior technical performance characteristics in addition to its beautiful esthetic qualities. The wood hull for EMPAC was subjected to a stringent series of flame spread tests and the Western Red Cedar was judged to inherently conform to the Class B rating required, including the applied finish which met with the architect’s demanding and diverse requirements.

With Cedar, your designs are not limited with standard profiles. Your are limited only by your own creativity as evidenced here at the department of plant sciences building at Cambridge University.

This award winning and dramatic interior of the National Assembly of Wales by Richard Rogers Partnership is perhaps one of the most unique and extensive interior applications of Cedar we seen recently. It is yet another example of the flexibility of design offered by this unique timber.

The new addition to “The Mint” at the Historic Houses Trust in Australia features custom designed Cedar shutters.

This LEED platinum, award winning, multifamily project by Busby Perkins & Will in Calgary, Alberta, Canada features knotty Western Red Cedar siding with a semi-transparent stain.

As we’ve discussed, Cedar is equally suitable for traditional and modern designs. This home on Sydney harbour highlights this point. Cedar enhances the distinctive styling and adds a hint of warmth to the otherwise concrete structure. A similar approach was taken for the interior.

This residence was designed by Sir Edwin Lutyens, and built by W.H. Colt Son & Co. Ltd (www.colthouses.co.uk) back in the mid 1930’s. It is made almost entirely of western red cedar, with Douglas fir frame and floors, and some western hemlock in places. It is now being restored to its former glory. Note that almost all of the Western Red Cedar is original and does not require replacement.

Another project in the US Pacific Northwest. Again on the ocean, this home by Finn Architects of Seattle used Cedar extensively. For the exterior, Mr. Finn used knotty timbers, clear bevel siding and individual sidewall shingles. The

custom designed doors, windows and railing system are also Western Red Cedar. As a result of using a combination of natural materials, the project blends seamlessly into its environment.

An interior look at the same home shows the use of Cedar knotty posts and beams as well as clear tongue and groove paneling. High clerestory Cedar windows provide extensive natural light. The warmth of Cedar is offset with the crisp white walls and ceiling.

Extensive use of Western Red Cedar Knotty siding on this award winning project in

Its dimensional stability and durability make Western Red Cedar the ideal species for doors and windows. Its paintability and low density are further benefits. As mentioned before, there are a number inferior species that try to leverage Western Red Cedar's reputation, if in doubt, insist on Thuja Plicata.

In Australia, Cedar is renowned for use in shutters and blinds because of its natural stability and thermal properties. They are wonderful accents and additions to any home.

Whether you are designing for a large or small outdoor space, Cedar adds a dramatic effect and blends seamlessly into its environment. A rainy west coast evening poses no problems for Western Red Cedar.

Even small spaces deserve Western Red Cedar

As consumers become more aware of the risks of chemically treated wood, Cedar has become an increasingly popular and logical alternative. Friendly to the environment and safe for your family, Western Red Cedar decking is the ideal material for use in the garden.

For estate properties or parks, Cedar lends itself well to large gazebos used for outdoor entertainment. Gazebos offer a fully functional outdoor retreat. Add a stone fireplace or incorporate a barbeque to truly create an outdoor living space. As a matter of interest, note the beautiful Cedar tree beside the gazebo.

09: Cedar Siding Installation

When we discuss installation, there are five essential elements to a proper installation:

- Prior to installation, the cedar should be conditioned on site by stacking in conditions appropriate to the end use to allow equalisation of moisture content.
- Use proper wall construction
- Design the building to prevent rain penetration.
- Prior to installation, stain or prime the Cedar on all four sides and two ends. If available, we recommend you use factory finisher.
- Ensure the proper fasteners are specified and used. Follow the nailing patterns recommended by the WRCLA.

Like all siding materials, Western Red Cedar performs best when installed properly on a suitable frame. In horizontal applications, Cedar siding should be securely nailed to framing members (studs) or battens. Blocking between framing members is recommended for vertical applications.

Proper wall construction includes the use of vapor barriers. These are extremely effective in helping to prevent moisture problems. Vapor barriers installed on the warm side of the wall largely prevent the migration of moisture vapor but they are not perfect. Residual vapor must be allowed to escape to the outside.

This diagram summarizes the key elements of a properly constructed timber frame wall. Please note construction detailing may vary with local conditions, accepted best practice and building regulation requirements.

Whether you are using horizontal or vertical siding, treated strapping must first be attached to the concrete wall. All strapping must be a minimum 2" thick x 2" wide (nominal). Strapping should be fastened every 24 inches using good

quality, rust resistant concrete anchors that do not protrude past the face of the strapping. Anchors must not have a diameter larger than 3/8”; it will weaken the integrity of the strapping.

In order to align the holes in the strapping with the anchor bolts, the strapping is held in place then, a hole is drill through the strapping and into the concrete using a hammer drill. The anchor is then inserted into the hole through the face of the strapping and tightened sufficiently. Anchor bolts should be installed a minimum of 6 inches away from the ends of the strapping to reduce splitting or cracking.

Please note construction detailing may vary with local conditions, accepted best practice and building regulation requirements.

If vertical siding (such as board and batten) is used, the horizontal strapping members must incorporate drainage holes to allow water trapped behind the siding to drain easily out the bottom.

Please note construction detailing may vary with local conditions, accepted best practice and building regulation requirements.

Here are the recommended lumber sizes and spacing for blocking and battens.

Specifying the correct fasteners is essential to the overall performance and appearance of the siding.

Stainless steel nails are the best choice, especially if the siding is to be finished with transparent or semitransparent stain. Use No. 304 stainless for general siding applications and No. 316 for seacoast exposures.

Hot-dipped galvanized (as per ASTM153) and aluminum fasteners are corrosion-resistant and can also be used to fasten Western Red Cedar.

Other types of fasteners are not recommended. They can rust and disintegrate and react adversely with the natural preservative present in cedar resulting in stains and streaks. Copper nails also react with cedar and should not be used.

For best result use “splitless” siding nails.

These have thin shanks and blunt points to reduce splitting.

For greater holding power, nails with ring threaded or spiral threaded shanks are suggested.

Nails with textured heads can be used to reduce glossy spots at the nails when finishing. Nails should be driven with care. Heavy nailing distorts the wood and may cause splitting. At mitered corners, near edges and near ends, nail holes may need to be pre-drilled to avoid splitting.

The size of nails to use depends on the type and thickness of siding. Good building practice is to use nails long enough to go through underlying materials, such as sheathing and insulation, and penetrate at least 1-1/4 inches (32mm) into solid wood if using ring or spiral shank nails.

Face nailing is recommended for all profiles except narrow profiles of tongue and groove where blind nailing is acceptable.

Siding should be fastened to each stud or battens strip with nails spaced at a maximum of 24 inches on center.

Nail placement depends on the siding pattern and width. The key is to fasten the siding securely without preventing it from moving in response to the moisture content in the air. In general, each piece of siding must be nailed independently. Nailing overlapping pieces together restricts the natural movements.

As mentioned previously, it is essential that nails penetrated 1 ¼ inches (32mm) into solid wood.

Before the Cedar siding is installed, a coating on all surfaces (including ends) is recommended. The coating protects the wood from water penetration, helps prevent staining caused by mildew and extractives and can increase the service life of top coats.

A few tips to prevent moisture penetration into the building:

- Install breathable building paper (such as Tyvek Drainwrap)
- Use mitre joints rather than butt joints and seal them with a coating.
- Use flashing on horizontal trim as well as door and window openings.
- Apply caulking where siding abuts vertical trim.
- Where possible incorporate the rainscreen principle in wall designs.

Flashing for transitions. Please note construction detailing may vary with local conditions, accepted best practice and building regulation requirements.

Flashing for windows and doors. Note the turned up end of the flashing to prevent the moisture from running down along the edge of the trim.

Please note construction detailing may vary with local conditions, accepted best practice and building regulation requirements.

Fascia flashing. Please note construction detailing may vary with local conditions, accepted best practice and building regulation requirements.

Please note construction detailing may vary with local conditions, accepted best practice and building regulation requirements.

10: Finishing & Maintenance

Western Red Cedar has unique properties that allow it to outperform most other wood species. Its natural durability ensures long term resistance to decay and insects.

Its dimensional stability makes Cedar suitable for fine joinery.

To further enhance its natural performance and beauty, a selection of finishes are available. These range from clear transparent stains to solid color finishes. Which one to choose is ultimately up to you.

Solid color stains and paints offer the best performance with a typical life span for quality opaque finishes of 5-10 years. Longer performance may be experienced in less exposed areas.

Do not allow the Cedar to weather before applying the coating. UV rays will degrade the wood surface which will negatively impact coating adhesion.

Start with an alkyd oil primer followed by two high quality 100% acrylic latex top coats.

While not always true in life, in the case of coatings you get what you pay for. Spend a little more to ensure you get the performance you need.

If at all possible apply coating to all six surfaces prior to installation. If available to you, factory finishing is highly recommended.

Semi transparent stains are for those who do not want to completely hide the grain and texture of the wood.

Either latex or oil-based, semi-transparent stains do not contain as much pigmentation as solid stains, life span of quality semi transparent stains is approximately 3-5 years.

Latex stains do not penetrate the surface

As with solid stains, the proper coverage of all six surfaces is essential.

This is the coating industry's greatest challenge: deliver a "clear" coating that protects the beauty of WRC from damaging UV rays. There are a number of coating manufactures working to perfect this type of product. It should be pointed out that there is currently an enormous amount of research in this area. Government research facilities, coating manufacturers and Cedar producers are jointly pursuing new technologies, including something called "nano-technology" which will revolutionize how clear coatings perform. While current "clear" products on the market offer a limited life span of approximately 1-2 years, it is anticipated that these new coatings would offer between 5-10 years of protection. Some of these new coatings are starting to become available on a commercial basis.

With clear coatings, extra care and attention will be required to ensure coatings perform and last. Follow those manufacturer's instructions to the letter and never wait too long to refinish.

All outdoor materials require some regular upkeep (no different than washing your fine automobile), there is no such thing as "no maintenance". Some tips to ensure you get the maximum performance and appearance from your Western Red Cedar products include regular preventative maintenance. Take some time to wash your siding, decking or yardscape product. Dirt and grime will wear down coatings.

Power washers are not recommended. It's too tempting to crank up the PSI and blast clean; unfortunately the powerful jet will dig into the wood and push water into the cells.

Instead, use a diluted bleach or oxygen bleach solution to clean surfaces and protect against mold and mildew growth.

Use wood brighteners to remove weathered fibers before applying finishes.

Always rinse thoroughly after cleaning.

While many of us men avoid doing this, read and follow the coating manufacturer's instructions!

11: Summary

I appreciate this has been a lot of information to absorb in such a short period of time. In conclusion I would like to highlight some of the key messages:

Western Red Cedar is the "natural choice" for building applications. It is certified legal, sustainable and renewable.

Western Red Cedar is a versatile product and ideal for a broad range of exterior as well as interior applications due to its unique combination of natural characteristics and extraordinary beauty.

When you are specifying grades, use established industry standards such as R-List or NLGA. When using proprietary grades ensure you fully understand the grade description associated with it.

Don't compromise your standards. In a business where there are well established price structures, if something sounds like a super deal, it probably isn't. With Western Red Cedar, you get what you pay for.

Western Red Cedar (Thuja Plicata) has a proven track record of performance that dates back centuries. Your clients will appreciate the prestige, distinction and performance of Western Red Cedar, and we encourage you to incorporate it into your next project.

12: WRCLA Resources

The internet is an excellent source of information for Western Red Cedar. Of particular note are www.WRCLA.org, the core website of the Western Red Cedar Lumber Association and a one stop shop for technical and promotional information; The Architect Gallery website offers an opportunity to see what other design professionals are doing as well as feature your own Cedar projects at no charge.

I draw your attention to a number of publications that will help you learn more about this beautiful species.

The publication titled "Growth, Properties & Uses of Western Red Cedar" is a comprehensive booklet that provides extensive technical information on Western Red Cedar the tree, the material and the products.

How To Specify Western Red Cedar, How To Install Western Red Cedar siding and Guide to Finishing Western Red Cedar are practical guides to selecting the correct material, finishing it and installing it on your project.

As part of the Architect Advisory Services program, the following core services will be offered: AIA Lunch & Learns; Guest Speaker services; Personalized Architect Support

The WRCLA offers online training specifically for architects at www.cedar-training.org. This a professional training website which has been approved by the American Institute of Architects for 7 hours professional development credits. The site offer extensive online learning about Western Red Cedar. You will need broadband internet connection to successfully access this site. If you are using dial up, you can request a CD version from the WRCLA.

13: Contact Us

The Western Red Cedar Lumber Association is here to offer you assistance in making your experience with Western Red Cedar a success.

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