



**REAL
CEDAR**



HOW TO INSTALL WESTERN RED CEDAR SIDING

WESTERN RED CEDAR LUMBER ASSOCIATION

Congratulations on your choice of Western Red Cedar siding. Western Red Cedar is one of the world's premier quality woods noted for its appearance, durability, light weight, insulation value and dimensional stability. It will provide your home with character and a distinction that other sidings cannot match. Properly installed and finished, it will provide years of low maintenance performance.

Before beginning your siding project read this brochure thoroughly – it contains useful information to ensure the siding is installed correctly and will perform as intended. This brochure is organized into three sections.

Section I. Before You Start' deals with numerous considerations which you should be aware of before you start installing Western Red Cedar Siding.

Section II. Outlines proper installation techniques.

Section III. Provides a list of industry best practices for Western Red Cedar siding installation.

Note that these are general guidelines that are minimum standards to be followed with confidence in most areas. However, severe local climatic conditions such as extreme heat and dryness; high winds; seacoast exposure; and, areas with wide climatic swings may necessitate additional provisions for the installation of the siding. Your national and local building code requirements always supersede these instructions. A detailed siding installation DVD is available from the WRCLA. Call 1-866-778-9096 for a copy.

SECTION I BEFORE YOU START

1. INSPECT MATERIAL

Always purchase recognized grades such as those from WRCLA members and ensure you understand the grade of material you've purchased. Grades are designed for specific appearances and uses. Before installing, be sure the siding you've selected meets your requirements. Any product found to be damaged or visually unacceptable for any reason should not be installed; if you encounter any such product STOP and call your supplier immediately.

2. ACCLIMATIZE SIDING BEFORE INSTALLING

One of the most stable softwoods, Western Red Cedar is nevertheless a natural material and it responds to the environment. Cedar siding can swell or shrink as it gains or loses moisture to reach equilibrium with the moisture content of the surrounding air. Ensuring that the moisture content of cedar siding is at equilibrium before it is installed will minimize movement later on. Recommended moisture content for sidings are given in the table below.

	Average	Individual Pieces
Most Areas	12%	9-14%
Dry Areas	9%	7-12%
Damp, Warm Coastal	> 12%	9-20%

1) To calculate average, test 10% or more of pieces.

2) Source: Wood Handbook 1987.

The following procedures are suggested for different siding specifications:

Kiln Dried Clear Siding

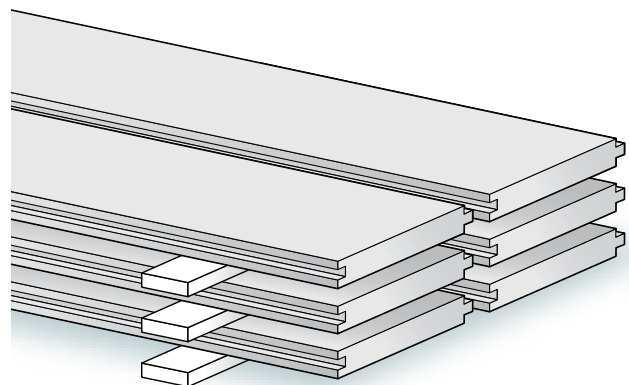
Kiln dried siding products are the preferred choice for consistency, stability, paintability and overall performance. These siding products have been dried at the mill to 12-15% moisture content. They are the most ready-to-use of all siding products. If the siding has not been wetted prior to arrival on the job site it may be applied upon arrival except in hot and dry conditions where 3 to 5 days of well ventilated storage is generally required. If the siding has been wetted it must be separated and allowed to dry to the local equilibrium moisture content.

Dry Knotty Sidings

Some knotty sidings are air or kiln dried to less than 19% moisture content. These products should be acclimatized to ambient moisture conditions by stacking the siding on evenly spaced, vertically aligned stickers (Figure 1) in a dry storage area for 7-10 days. More time may be required in damp or humid conditions.

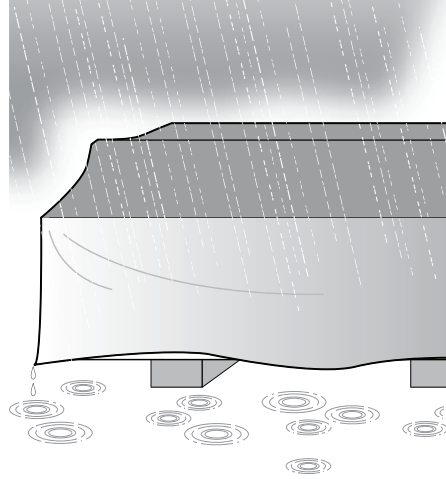
Green (Unseasoned) Sidings

Unseasoned or green sidings have not been dried prior to delivery and require a longer time to acclimatize than seasoned sidings. Separate the siding with vertically aligned stickers, keeping two pieces stacked face to face between stickers and store in a well ventilated dry location for a minimum of 30 days, or longer in damp or humid conditions. If specifying unseasoned siding, patterns such as channel, bevel and board-and-batten are recommended since these allow for shrinkage. Narrower widths are also recommended since they move less overall than wider widths. Note the WRCLA discourages the use of green sidings.



3. JOB SITE STORAGE

Until installed, Western Red Cedar siding needs protection from direct sunlight, water saturation, dirt, and other elements. Store the siding flat and off the ground on stickers and a vapor barrier so that moisture is not absorbed through the bottom boards of the stack. Protect with a waterproof covering elevated in the center so that water does not pool on the cover. Do not completely seal the bundle, as good air circulation is required. Ideally, the siding should be stored in an enclosed building such as a garage prior to use.



4. FINISH SIDING PRIOR TO INSTALLATION

Before installation (job site), applying a finish to all surfaces (including ends) is recommended. Factory applied finishes are best. They ensure the best performance of the finish. The type of coating will be determined by final finish and look selected. The finish protects the wood from moisture absorption and UV degradation, helps prevent staining caused by mildew and extractives and will increase the service life of top coats.

Recommended Priming Procedures for Western Red Cedar Siding

Type of Finish Coat	Recommended Priming Coat
Natural and semitransparent stains	Apply the oil based stain to all surfaces.
Solid color stains and paints	Apply an alkyd oil, stain-blocking primer (preferred) to all surfaces. High quality water based stain blocking primers may also be used.
Bleaching oils	Apply the bleaching oil to all surfaces.

More information about finishing is available on the WRCLA's website and in the "Guide to Finishing" publication.

5. FIELD CUTS

Regardless of the time of the year of the installation, all field cuts must be finished. The end grain of all wood products absorbs liquids up to 250 times more rapidly than other wood surfaces. 100% acrylic-latex primer is acceptable as long as it is able to properly cure according to the primer manufacturer's instructions. However, where temperatures drop below 50 degrees Fahrenheit either during application or within the curing period, use an alkyd oil wood primer to coat end grain exposed by jobsite cuts. Trim boards with end cuts coated with alkyd oil primer can be installed before drying without compromising the coating's effectiveness. Above 50 degrees, a high quality 100% acrylic-latex primer will suffice to coat exposed end grain if allowed to dry before installation. With either primer, follow manufacturer's recommendations.

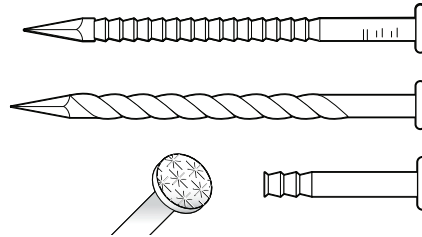
6. FASTENERS

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 ASTM A 153, aluminum and stainless steel fasteners are all corrosion-resistant and all can be used to fasten Western Red Cedar. Other types of fasteners (including electroplated and mechanically galvanized) are not recommended. They can rust and disintegrate and react adversely with the natural preservative present in cedar resulting in stains and streaks.

Type

For best result use “splitless” ring shank siding nails. These have thin shanks and blunt points to reduce splitting. Textured heads should be used to reduce the glossy appearance of the nail head.



Hand Nailing is Preferred.

Nails should be driven with care into the framing members. To ensure nailing accuracy run chalk lines to mark framing locations. Heavy nailing distorts the wood and may cause splitting. At mitred corners, near edges and near ends, nail holes may need to be pre-drilled to avoid splitting. Avoid the use of pneumatic nailers if possible. If a pneumatic nailer must be used, reduce the air pressure and tap nails flush.

Overdriven nails must be remedied immediately. Fill overdriven nail holes with exterior grade wood putty specifically designed for filling exterior nail holes.

Placement

Siding should be fastened to each stud or blocking 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 of each piece and may cause splitting.

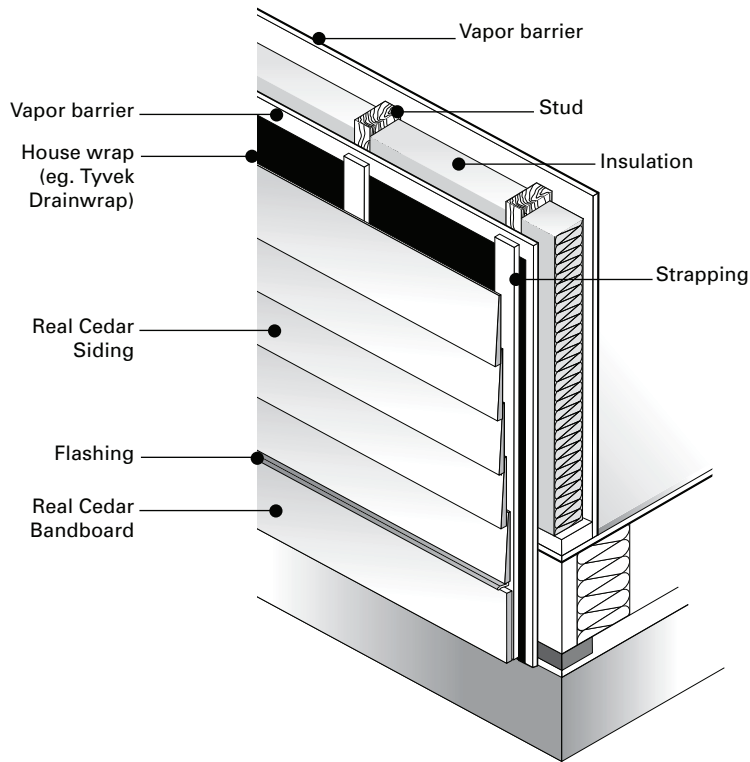
Size

The size of nails to use depends on the type and thickness of siding. Use nails long enough so that they penetrate solid wood (sheathing and blocking or studs) a minimum of 1 ¼ inches.

Siding Type*	Nominal Thickness (in.)	Spiral/Ring shank Nail Length (in.)
Bevel	1/2	2 (6d)
	5/8	2 (6d)
	3/4	2-1/4 (7d)
	7/8 to 15/16	3 (10d)
	5/4	3 (10d)
Boards, T&G and Lap	5/8	2 (6d)
	3/4	2 (6d)
	7/8	2-1/4 (7d)
Battens for Board and Batten	3/4	3 (10d)

* Important: For application over foam sheathing, add the thickness of the foam to the tabulated nail length.

7. CONTROLLING MOISTURE: VAPOR BARRIERS AND BUILDING PAPER



High humidity output from washers, dryers, showers, kitchens and other sources, combined with today's energy-efficient construction, can result in a build-up of interior moisture vapor. This vapor migrates through the fabric of a building from the warm interior to the cold exterior, and when it condenses to water can cause structural damage and damage to sidings and finishes. 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. Housewrap installed on the outside face of the sheathing helps prevent rain and snow from penetrating the walls but allows the escape of moisture vapor. The WRCLA recommends the use of rainscreen wall construction (see diagram and related section later in this publication) especially when installing over rigid foam.

Proper wall construction includes the use of housewrap (such as DuPont Tyvek's Drainwrap) or gas permeable building paper and interior vapor barriers. These are extremely effective in helping to prevent moisture problems.

8. WALL CONSTRUCTION

Stud Walls

Like all siding materials, Western Red Cedar performs best when installed properly on a suitable frame. Cedar siding should be securely nailed to framing members, furring members or to blocking between framing members. Standard stud walls generally require no special preparation for horizontal siding installation. Siding should be nailed into studs or blocking at maximum of 24 inches on center when applied over wood based sheathing and 16 inches on center when siding is installed without sheathing. In instances where an air space between siding and sheathing is desired (see rain screen wall construction) nail siding to furring strips. Maximum spacing for furring strips is 16 inches on center.

Vertical siding applications require horizontal nailers, blocking or other wood framing members spaced no more than 24 inches on center. Check your building code to verify requirements in your area.

Lumber Size and Spacing for Blocking and Furring¹

	Nominal Size (inches)	Actual Size (inches)	Preferred Spacing (inches)	Maximum Spacing (inches)
Blocking	2x2	1 ½x1 ½	16	24
Furring over plywood/ OSB sheathing ²	1x2	¾x1 ½	16	16
Furring over masonry walls	2x2	1 ½x1 ½	16	16

1. Furring must be securely fastened to studs.

2. Can be used in moist and severe climates to form an air space between siding and sheathing (ie. rainscreen).

Rainscreen Construction

The basic rainscreen wall configuration, incorporating two layers, or wythes, separated by an air space, has variations that provide different levels of rain protection effectiveness. A distinction should be made between the drained cavity wall, the simple or open rain screen, and the pressure-equalized rain screen wall. What is usually meant by a “rain screen wall” is generally the latter: an exterior cladding, a cavity behind the cladding, drained and vented to the outside; an inner wall plane incorporating an air barrier; and a set of compartment seals limiting the cavity size. The outer “screen” layer of cladding deflects the kinetic force of the rain, while the inner wythe remains protected. The vented cavity uses gravity and flashings to drain water that penetrates the outer wall, away from vulnerable surfaces and joints. The cavity is sufficiently wide that surface tension and capillary action are not able to move water across the cavity.

Step by step construction tips for basic rainscreen construction:

1. Drill holes in the exterior wall sheathing (if plywood or OSB sheathing is used) to permit residual moisture to escape.
2. Install housewrap (such as DuPont Tyvek’s Drainwrap) or gas permeable building paper.
3. Install vertical furring strips. Ensure they are lined up with the studs.
4. Install screen materials under the ends of the furring strips. Fold the screen material over the furring strips and staple to the front of the furring strips.
5. Install Western Red Cedar siding over the furring strips.

More information about rainscreen construction techniques is available from Canada Mortgage and Housing Corporation (www.cmhc-schl.gc.ca).

Masonry Walls

Masonry walls require furring strips for horizontal and vertical siding installation. Furring strips must be thick enough to allow for nail penetration of 1 ¼ inches into solid wood.

Structural Insulated Panels (S.I.P.)

Structural Insulated Panels require furring strips for horizontal and vertical siding installation. Furring strips must be thick enough to allow for nail penetration of 1¼ inches into solid wood. Typical Structural Insulated Panels

have nominal ½ inch sheathing. To ensure the appropriate nailing base, furring strips a minimum of ¾ inch thick should be installed on the outside of the sheathing at a maximum of 16 inches on center.

Insulated Concrete Forms (I.C.F.)

These systems have no wood component and the foam has no nail holding capacity. As a result, Insulated Concrete Forms require furring strips of a minimum of 1¼ inches thick spaced 16 inches on center on the outside of the foam. Note these will need to be securely fastened to the concrete.

Rigid Foam Sheathing

Rigid foam sheathing has an insulation value superior to that of traditional lumber and plywood sheathings. However, it has no nail holding power and using rigid foam sheathing as a nailing base for cedar siding is not recommended. Follow the nailing recommendations given in this publication as to nail type, positioning, penetration and spacing.

Foam sheathing panels vary in moisture permeability but are generally considered as good moisture barriers. They should be used with a continuous film vapor retarder on the inside wall under the interior finish. Rigid foam sheathing can cause moisture to accumulate on the back of siding and cause staining, buckling and damage to finish coats. As a result, it is recommended that furring strips are used to create an air space between the sheathing and siding (follow the rainscreen construction method).

Other recommendations that should be followed to minimize potential problems:

- Use thicker siding patterns in widths of 8 inches or less. Thick, narrow siding is more stable than thinner, wider patterns and better able to resist dimensional changes.
- Use kiln-dried siding over rigid foam sheathing. This is the most stable cedar siding.
- Proper prefinishing is essential.
- Use light color finish coats to maximize heat reflection and reduce dimensional movement.
- In all cases it is recommended that house wrap, such as DuPont Tyvek DrainWrap, be applied over the foam sheathing.

SECTION II INSTALLING WESTERN RED CEDAR SIDING

1. FLASHING

Before installing siding, make sure that flashings are installed to prevent moisture from entering wall and roof spaces. Flashing are an important line of defense in controlling moisture in wall assemblies. Flashing intercepts and directs the flow of water away from the building to designed drainage paths. Install horizontal flashing extending from the top of all wall penetrations (ie all windows and doors) and at any material or material directional change (ie. bandboards, water tables or the introduction of any alternative material). The flashing should tilt downward to allow water to drain away from the wall. Siding or trim should be ¼ inch above the flashing ledge. Do not caulk where the flashing and trim or other materials meet. Note that caulking in lieu of flashing is not acceptable.

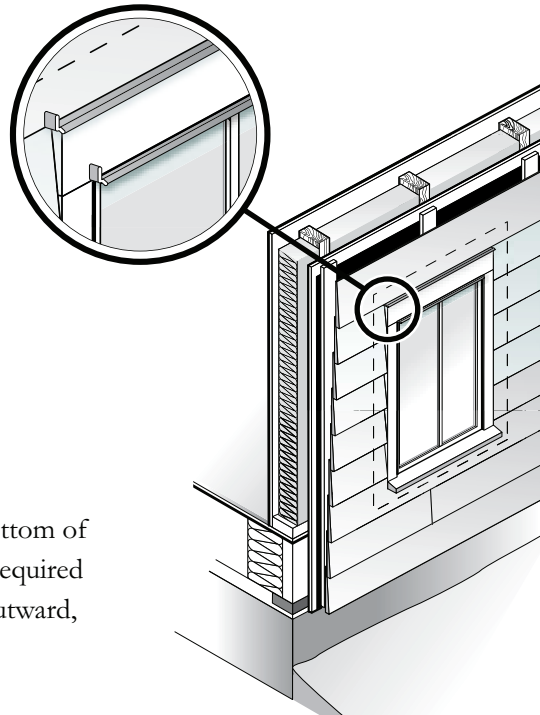
Door and Window Flashing

The purpose of flashing window and door headers is to intercept water behind the siding and direct it to the outside, and to redirect water flowing down the face of the wall to flow away from the wall opening.

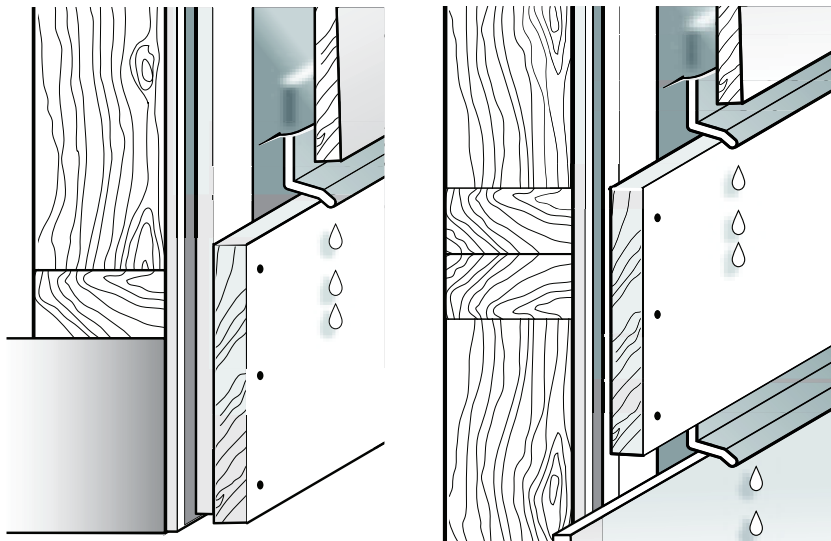
Moisture can accumulate behind the siding as a result of:

- rain penetration through the siding;
- water vapor diffusion;
- leakage of moist air from the interior or condensation.

Some moisture will drain through the weepholes at the bottom of each pieces of siding. An additional head trim flashing is required at the head of the window/door to direct water further outward, beyond the thickness of the window



Skirt and Bandboards



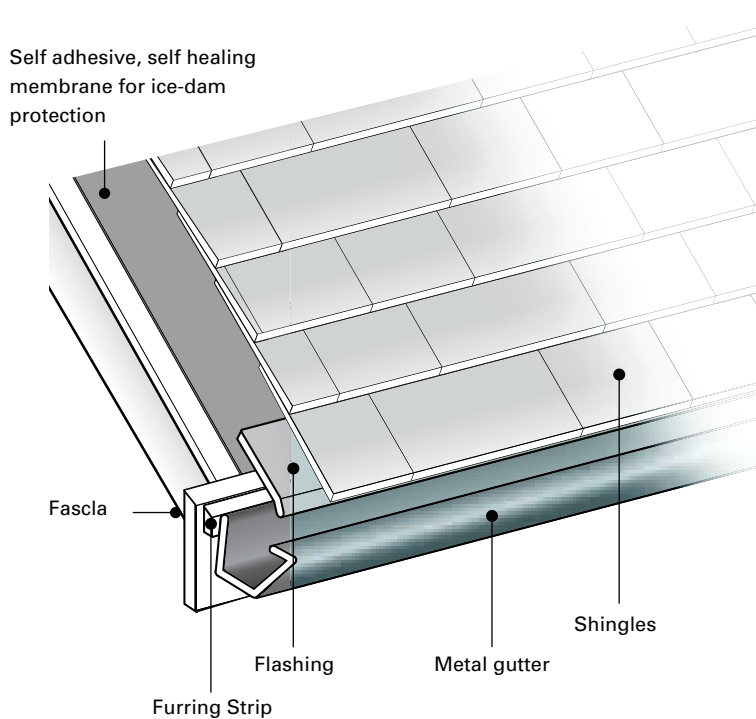
Ground Level Skirtboard

Second Story Bandboard

Fascia Flashing

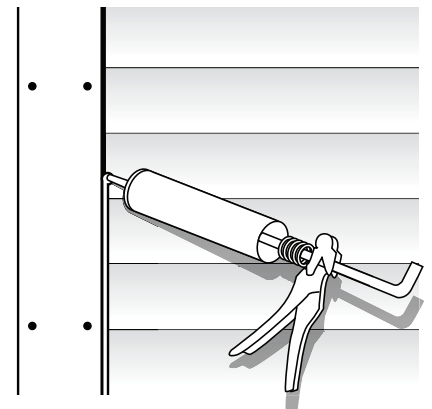
The purpose of fascia flashing is to support the shingle edge and to provide a drip edge to prevent water from running back underneath the roofing shingles and down along the fascia and soffit.

Preformed eaves flashing/drip edge should be installed under the starter course of the shingle roofing. The extension of flashing supports the edge of shingles. If eaves troughs (rain gutters) are used, the flashing edge also helps to direct the water into troughs. Fascia flashing protects both the soffit and the fascia board, and provides a drip edge at the bottom edge to direct water away from the building.



2. CAULKING

Use high-performance acrylic-latex, acrylic, acrylic-silicone, polyurethane, polysulfide or terpolymer rubber caulks or sealants to seal gaps around windows, doors, corners, and other exterior joints that are exposed to potential water intrusion. Pure silicone and clear caulks do not work well on Western Red Cedar and are not recommended. Caulking is not a permanent solution and as such requires regular maintenance. If not inspected and maintained, caulking may fail and trap water, creating severe moisture problems. Do not rely on it as the only barrier to moisture penetration. Do not caulk areas that will prevent moisture from escaping the wall cavity (e.g., under windows and around flashing).



3. ROOF AND GROUND CLEARANCE

Trim that extends down to a roof (dormers, second floors, etc.) and decks requires a minimum of a 2 inch gap to avoid wicking. Trim, such as water table or skirt boards must be a minimum of 6 inches above the grade.

4. INSTALLING BEVEL SIDING (ALSO KNOWN AS CLAPBOARDS)

Spacing for the siding should be laid out beforehand. The number of board spaces between the soffit and bottom of the lowest piece of siding at the foundation should be such that the overlap is as per the table.

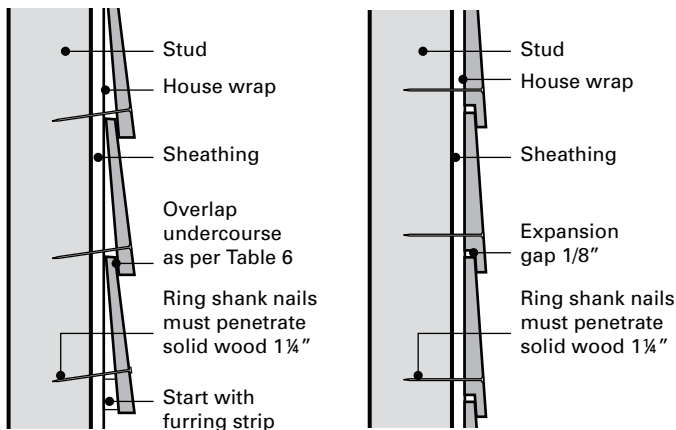
Start with the bottom course using a furring strip to support the lower edge. Each succeeding course overlaps the upper edge of the previous one by a minimum of 1 inch. Rabbeted patterns are self-spacing, but leave 1/8 inch expansion clearance. Where possible, the bottom of the board that is placed across the top of the windows should coincide with the window cap.

Bevel siding should be face nailed to studs with 1 1/4 inch penetration into solid wood using one nail per piece spaced at a maximum of 24 inches on center (16 inches on center if installing directly to studs or over furring strips). Place nail just above the overlap. Take care not to nail through the overlap of two pieces.

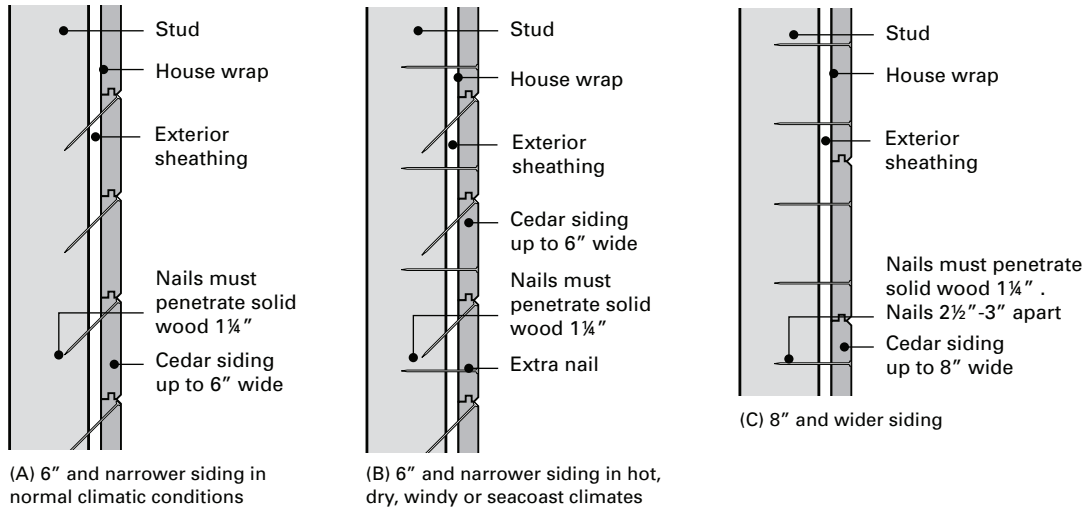
Do not reduce the siding overlap recommendations given in the installation sections of this publication. Doing so could result in damage from wind-driven water. Use the larger overlaps for unseasoned sidings to allow for shrinkage and expansion. Take care not to overdrive fasteners when using larger overlaps. Butt joints between boards should be staggered and meet on studs. Fit siding snugly to other pieces and to trim.

Recommended Overlap

Nominal Width	Overlap (inches)
4	1
6	1
8	1 to 1 1/8
10	1 to 1 1/2
12	1 to 2



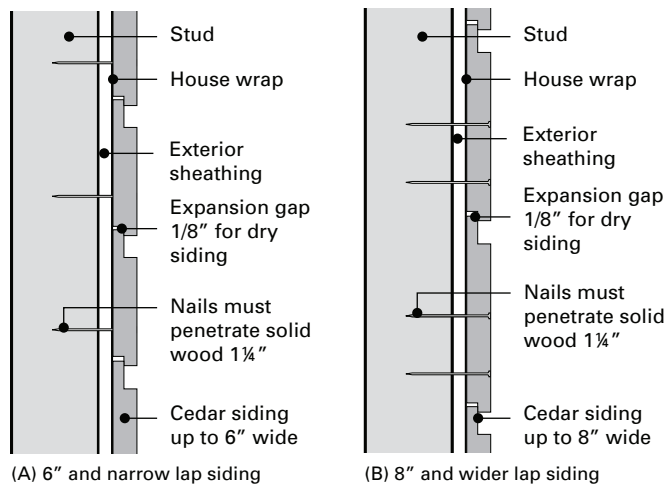
5. INSTALLING TONGUE AND GROOVE



Tongue and groove siding can be installed horizontally or vertically. In horizontal application, start at the bottom and work up with the groove edges facing downwards. Siding up to 6 inches wide can be blind nailed with one siding nail per bearing toe-nailed through the base of each tongue. Wider siding should be face nailed using two nails per piece. Nails must penetrate 1 1/4 inches into solid wood.

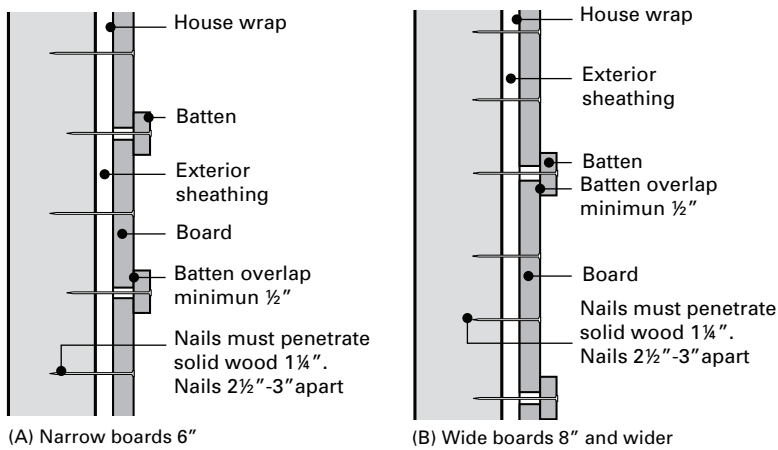
In vertical application, start at one corner with grooved edge toward the adjacent wall. Use a level or plumb line to ensure that the first board is installed plumb. The grooved edge of the first board may have to be trimmed to ensure a flush fit. Siding is nailed to horizontal blocking lines installed between studs or to furring strips. As with horizontal installation, pieces up to 6 inches can be blind nailed and wider pieces should be face nailed.

6. INSTALLING LAP SIDINGS



Lap sidings can be installed horizontally or vertically. For horizontal applications, start with the bottom course and work up with the channels pointing upwards. Allow a 1/8 inch expansion gap between pieces if the siding is air or kiln-dried. Do not nail through overlaps. For siding up to 6 inches wide, use one nail one inch up from the lap. Face nail with two nails per piece for 8 inches patterns and wider, keeping nails 2-1/2 to 3 inches apart to allow for dimensional movement without splitting. For vertical applications, siding should be nailed to horizontal blocking or furring strips.

7. INSTALLING BOARD-AND-BATTEN SIDING



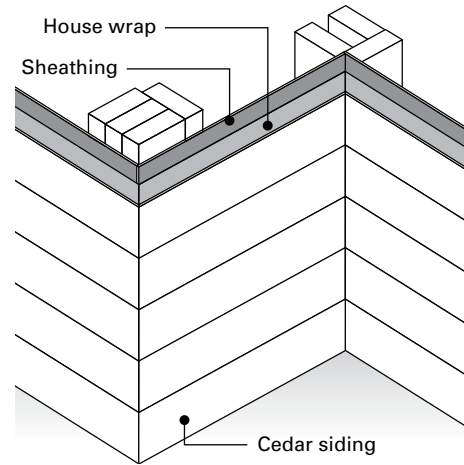
Board-and-Batten is a vertical pattern created using cedar boards and battens of various widths for a wide range of appearances. For nominal 6 inch boards spaced $\frac{1}{2}$ inch apart, battens should overlap by a least $\frac{1}{2}$ inch. With wider boards, increase batten overlap proportionately. While there are no set widths for board and batten siding, an attractive combination is 1x3 battens with 1x10 boards.

Siding should be nailed to horizontal blocking lines or to furring strips. Boards up to 6 inches wide should be fixed with one nail per bearing driven through the center of the board. The overlying batten covering the gap between boards should be attached with one nail per bearing, the shank passing between the edges of the under boards. Use two nails per bearing on boards 8 inches and wider placing the nails 2-1/2 to 3 inches apart.

8. OUTSIDE AND INSIDE CORNERS

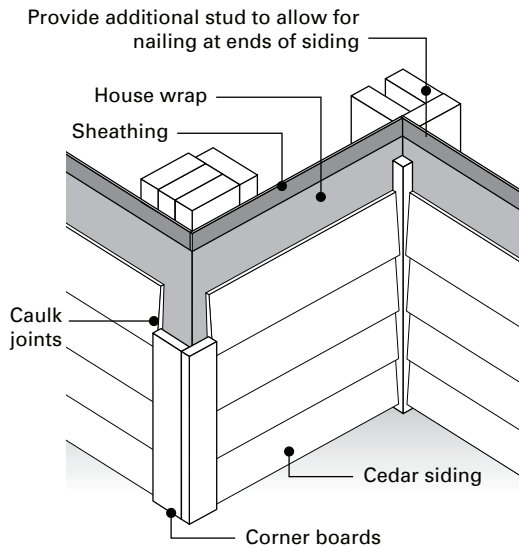
There are two main methods used for outside corners. The choice depends primarily on the desired appearance but also the experience and skill of the installer.

Mitered corners offer a professional looking finish. They are most commonly used with horizontally applied siding applications such as bevel. Mitered corners require good carpentry skills. They must fit tightly for the full depth of the miter. The ends are often set in caulking compound when siding is applied.

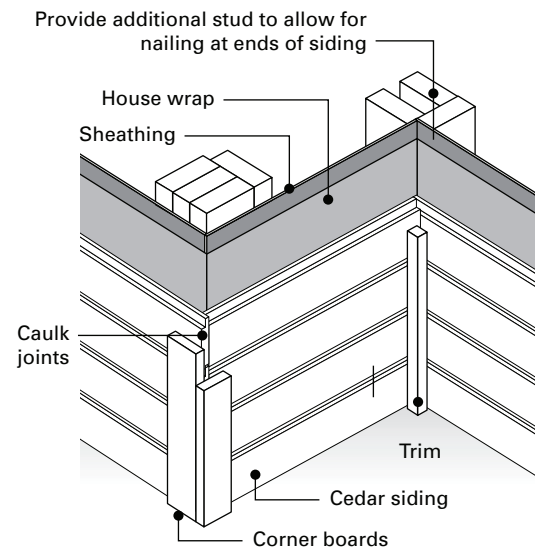


(A) Mitered Corners

Corner boards are a popular and easier alternative to mitered corners. Thickness of the corner board will depend on the thickness of the siding. The most common are 3/4 inch or 1-1/4 inches thick. Width is a matter of taste and proper proportion. Corner boards are applied to the sheathing with siding fitting tightly against the narrow edge of the boards. Joints should be filled with caulking compound when siding is applied. The corner boards and the ends of the siding are nailed to the corner studs which anchors the wood for a maintenance-free joint. Designing roofs with an eaves overhang to protect corners from weathering also helps ensure trouble-free joints. Always apply primer or stain end cuts. With corner boards, there is the choice of applying them next to the siding or over top of the siding as shown here.



(B) Corners boards



(C) Trim boards

As in the above illustration, at inside corners, siding is frequently butted against a 2 x 2 trim strip. It can also be butted against adjoining walls with a trim strip used to cover the joint.

9. FIELD JOINTS

When butt jointing siding, cut ends at 45 degree angles to form an overlapping joint. This is particularly important for vertical installation. Ensure joints meet on studs, blocking or furring strips with the nail penetrating solid wood at least 1 1/4 inches.

SECTION III SIDING INSTALLATION QUICK TIPS

All installers should learn and follow “best practices” in order to deliver a better job for their customer and reduce call backs.

DO:

- Follow local and national building codes
- Follow WRCLA installation instructions
- Purchase from WRCLA members, distributors and retailers.
- Use construction techniques to create easy drainage planes to shed water accumulations.
- Finish Western Red Cedar ASAP! Factory finish or apply coatings prior to installation if possible. Always touch up cut ends.
- ‘Acclimatize’ Western Red Cedar siding before you install it.
- Use the correct fasteners: 304 or 316 grade stainless steel, aluminum, or hot dipped galvanized (as per ASTM 153A).
- Nail all Western Red Cedar sidings into 1¼ inches of solid wood & sheathing!
- Ensure butt joints are made over solid wood to provide secure nailing. Join two pieces of siding with a mitered butt joint.
- Visit: www.wrcla.org or call 866 778 9096 for more information.

DO NOT:

- Allow Western Red Cedar to ‘Weather’ longer than 2 Weeks before applying a finish coating to the Cedar.
- Use Electroplated or mechanical galvanized that does not conform to ASTM - A 153.
- Install Western Red Cedar siding without acclimatizing.
- Fasten Western Red Cedar siding only to the sheathing material.
- Nail through two layers of siding.
- Fail to finish the end cuts during installation.
- Attempt to ‘Blind Nail’ bevel siding/clapboards.
- Install or paint over wet siding.
- Use caulking sealant as a substitute for flashing.
- Place siding direct contact with concrete, masonry, patios, porches, and/or roofs.