Redwood

Certified Kiln Dried and Air Seasoned Siding Patterns and Applications

Redwood is synonymous with quality architecture. No other siding material adds value to a home or commercial building like redwood. The value of redwood's beauty is immediately apparent and the value of its long-lasting performance is appreciated for decades.

Architects and builders specify redwood with confidence, knowing that exceptional performance is grown into every board and that redwood will add value and sales appeal to their projects.

Redwood's Total Performance
Redwood's performance characteristics are unique among American softwoods. Its superior stability is especially suited to the demands of siding applications. Its finish retention, weatherability, flame resistance and insulation properties make it ideal for virtually any project and

Dimensional Stability Test reports from the USDA Forest Products Laboratory show that redwood has less volumetric and tangential shrinkage than any other domestic softwood. This means that redwood siding will lay flat and straight throughout the life of the structure with minimal warping, cupping, checking and nail popping. With tighter joints, redwood provides better siding performance than other woods.

Finish Retention
Redwood has an open cellular structure and contains relatively little pitch or resins. This enables redwood to absorb and retain all types of finishes better than most other woods. As a result, projects look better over a longer period of time. Protective finishes last longer and work better. Refinishing is required less often.

Resistance to Decay and Insects
Redwood heartwood has grown-in resistance to decay and insects that is present throughout the lumber, not just on the surface. Wood exposed through sawing, boring or nailing is as decay-resistant as the surface.

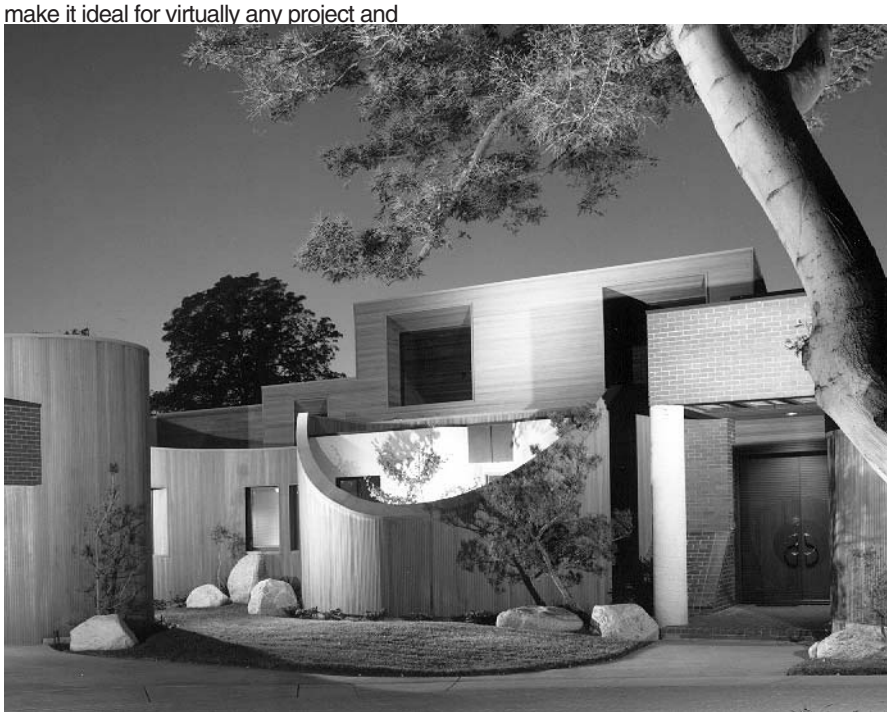
Quality redwood siding is available in the architectural grades: Clear All Heart, Clear, Heart B and B Grade.

Clear All Heart is a superior grade for fine sidings and architectural uses. It is all heartwood and the graded face of each piece is free of knots.

Clear is similar in quality to Clear All Heart, except that it includes sapwood in varying amounts. Some boards may have one or two small, tight knots on the graded face.

Heart B is an economical all-heartwood grade containing a limited number of tight knots and characteristics not permitted in Clear or Clear All Heart. It is graded on one face and one edge.

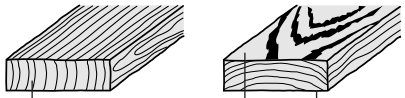
B Grade is an economical grade containing a limited number of tight knots with sapwood accenting the heartwood.



Specifying Storage & Handling

Grain
Redwood lumber has either flat or vertical grain. Siding Is considered vertical grain when the annual growth rings form an angle of 45 degrees or more with the surface of the siding. If the angle is less than 45 degrees, the siding is known as flat grain. Vertical grain siding possesses enhanced dimensional stability and will hold paints and finishes better than flat grain.

Vertical Grain **Flat Grain**



Seasoning
Clear All Heart, Clear, Heart B and B Grade sidings are available Certified Kiln Dried for applications requiring minimal shrinkage and top performance. Redwood kiln dried to accepted standards will include the words “Certified Kiln Dried” or the initials “CKD” in the grademark on each piece or package of siding or be so specified on the invoice.

Patterns
Standard redwood siding patterns include: bevel, rabbeted bevel, tongue and groove, shiplap, channel shiplap and V shiplap. Board and batten siding is laid up using standard size boards.

Pattern Numbers
Each siding pattern has a pattern number. To ensure delivery of the proper product, the pattern number should be included on specifications and invoices. Pattern details are given in CRA’s *Architectural Guide* and *Redwood Pattern Book*.

Textures
Surfaced sidings have a smooth, planed face, emphasizing the wood’s grain and color.

Saw-textured sidings have resawn faces providing a rough textured appearance that holds finishes extremely well.

Specifying Redwood Siding
To ensure delivery of the proper siding product, the specifications should include: use, grade, grain, seasoning, pattern description and number, and surface texture.

In addition, the Installation section of the specification should specify: non-corrosive fastener materials, type and size; bearing and fastener spacing requirements; water repellent application as appropriate, and field priming of cut edges.

Storage, Handling and Acclimating
Redwood siding and trim are quality finish products and should be handled with care. At the job site, redwood siding should be kept completely under cover and off the ground and away from fresh concrete or drywall work or any other source of moisture but in a location on site with proper air circulation. Without fail, allow the siding to acclimate before installation. As the siding acclimatizes and seeks an equilibrium with the atmosphere it will move and physically adjust to its new climate. Do not install siding before it has fully acclimated. Loosen the water-proof cover-ings or shipping packaging to allow air to circulate between the covering and the siding. Laying kiln dried stickers every 3 feet between courses of siding will allow more air to flow around the siding and let it adjust more completely. Sticking is highly recommended. Acclimate the siding for a minimum of three weeks. The longer the better. Allowing the siding to acclimate properly and keeping the siding clean and dry will help to eliminate the possibility of finish problems and improve stability.

Priming
It is recommended that a water repellent containing mildewcide be applied to all surfaces of redwood siding before construction begins. This will inhibit the movement of moisture as well as mildew growth, two conditions which can severely damage a finish coating. When a clear, bleached or semitransparent finish is to be applied later, a preliminary coat of water repellent will protect against weathering and construction staining prior to final finishing. For best performance, special care should be given to end grain; cut ends should be coated before installation. Redwood siding should always be back-primed. Factory priming or pre-finishing is highly recommended.

Application

General Application Information
Careful attention to construction detailing is necessary to prevent moisture penetration into the siding and the wall cavity. Flashing over window and door headers and at other horizontal siding breaks should be sufficiently sized, well placed, tightly anchored and sealed with caulking. Thorough caulking of all joints with a non-hardening compound is important, particularly at the butt joints of short length siding laid vertically. High performance caulks such as polyurethane, polysulfide or acrylic latex are recommended for best results.

The lowest edge of siding should be at least 6 inches off the ground to prevent moisture problems. It is particularly important that end grain at the bottom of vertical siding be coated with water repellent. The use of a drip cap at the lower edge of the siding is recommended.

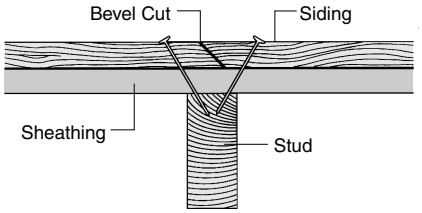
A water repellent building paper, with a permeability rating of at least 5 perms, should be applied over sheathing. This will help reduce water and wind penetration.

Note: There have been reports of problems arising from the combination of wood siding and rigid plastic foam sheathings. Request Redwood Technical Data Sheet *Using Redwood Siding Over Rigid Foam Sheathing*.



Measuring and Cutting
All butt joints must occur over a stud or solid blocking. Be sure that siding fits snugly against corner strips and trim. Mitered corners, sometimes used with thicker patterns, should be cut in a miter box. Plain bevel siding requires a compound miter. Predrill nail holes for all ends, especially mitered ends.

Using bevel cuts at a 45° angle (see illustration) can minimize the appearance of gaps if end shrinkage does occur.



Do not reduce lap recommenda-tions as this can result in damage from wind-driven water. Carefully observe expansion clearance requirements for the siding pattern selected.

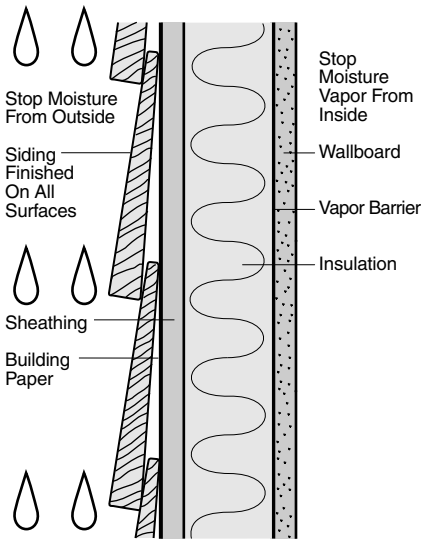
Nailing
Nailing recommendations refer to nailing siding to every stud or (for vertical coursing) each 2x4 blocking line, at not more than 24 inches on center.

Selection of proper nails is important. Siding nails with annular-ringed shanks provide the best holding power. All nails must be either stainless steel, aluminum or top-quality, domestic, hot-dipped galvanized. Electroplated galvanized nails are not recommended. Poor quality nails will react with redwood's natural decay-resisting extractives, and will cause unsightly stains.

Nails can be countersunk (not more than 1/16 inch) or driven flush with wood surfaces. Unfilled nail holes may not be particularly noticeable where natural finishes are used as long as proper quality nails have been used. At mitered corners, or near the edge or end of a piece, pre-drill the nail hole to avoid splitting the wood. Nails must be long enough to penetrate into studs (or stud and wood sheathing combined) at least 1-1/2 inches. Do not fasten siding to only composition or pressed fiber sheathing as those materials provide no nail-holding power.

Do not use staples for redwood siding. Staples do not provide adequate holding power and most are not corrosion-resistant.

Preventing Moisture Problems



Proper interior and exterior wall construction prevents moisture problems. Building paper should have a permeability rating of 5 perms, the vapor barrier, a maximum of 1 perm.

Moisture is the largest cause of siding and finish problems. Most problems can be avoided if precautions are taken during construction. Understanding the dynamics of wood's reaction with moisture will be the builder's best protection against callbacks.

New energy-efficient construction techniques increase the amount of humidity within homes and commercial buildings. Efficient insulation, storm windows, weatherstripping, as well as heating equipment and appliances that retain warmth add to the build-up of interior moisture vapor.

This invisible moisture is one of the least understood and most troublesome causes of structural and finish failures. It moves as invisible moisture vapor from the warm interior of the house toward the cold exterior. Vapor travels through plaster, insulation and wood and may condense into water as it approaches the colder exterior surfaces of the sidewall. This can sometimes result in structural damage as well as siding cupping and nail popping. Water entering the siding can also cause finishes to blister, peel and discolor.

Vapor barriers are necessary to prevent migration of moisture vapor. They must be applied to the warm side of the stud wall, directly under the finish material. There are several types; the most frequently used are either plastic or aluminum sheet material with a rating of one perm or less. Those sheets should overlap at least 2 inches at their edges. Ordinary building felt is not a vapor barrier.

When residing an existing house without a vapor barrier, an effective solution can be to paint the inner side of the exterior walls with a vapor barrier paint.

Attic areas should be adequately vented to prevent vapor from condensing on cold surfaces or penetrating through the ceiling. Critical sources of humidity, such as kitchens, baths and laundries, are best ventilated by fans that exhaust outdoors. Crawl spaces should be well ventilated all around the house; the vent area should equal about 1/50th of total floor space. Keep vents free of obstructions. Movement of vapor into stud spaces from crawl spaces may take place as water evaporates from the ground under the house, and can be retarded by laying polyethylene film over the ground. Basements may be a source of considerable dampness and require effective ventilation.



Bevel & Rabbeted Bevel Patterns

Redwood bevel siding, also known as lap or clapboard siding, has the timeless appeal of a strong traditional style and provides the deepest horizontal shadow line of all siding patterns.

Bevel siding is produced in both plain and rabbeted patterns. Each is available in two different butt thicknesses for variation in depth of shadow line and insulation value.

Plain bevel patterns produce a bolder shadow line than rabbeted bevel patterns of the same thickness. Rabbeted bevel, with its 1/2-inch rabbet milled to fit over the thin edge of the preceding course, allows the siding to lay flat against the studs or sheathing. Rabbeted patterns provide a weather-tight lap and lay up with greater coverage than plain patterns.

Availability
Bevel and rabbeted bevel sidings are available in all architectural grades.

Plain bevel siding has a smooth surface on one face and a saw-textured surface on the other face. Either face may be exposed. Rabbeted bevel siding is available with either a smooth or saw-textured face. Saw-textured faces are more even in color and appearance and they hold finishes better.

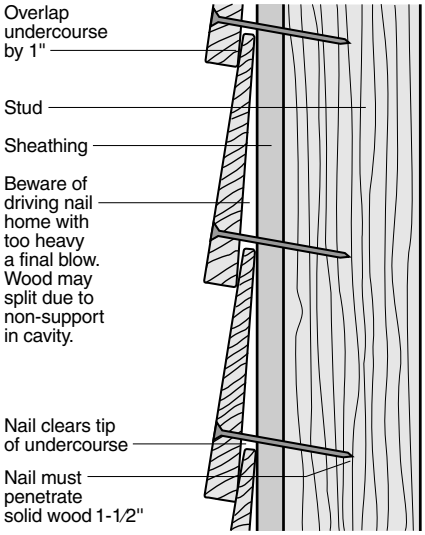
Installation
With plain bevel patterns, use a furring strip to support the lower edge of the starting course. With rabbeted patterns, the bottom course should be supported by a nailing strip sawn from the thin edge of the pattern. Nail bevel siding at every stud, which should not exceed 24 inches on center.

For plain bevel siding, a lap of one inch is required to ensure weather-tightness.

Note: With CKD rabbeted bevel patterns, an expansion clearance of 1/8 inch is required in the rabbet.

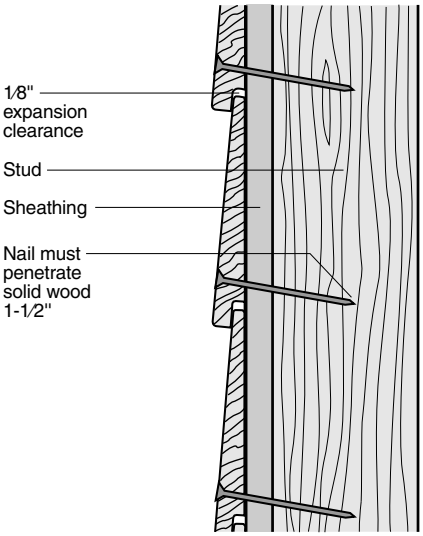
Sample Specification
Exterior siding shall be CRA-RIS grade-marked redwood Clear grade, mixed grain, Certified Kiln Dried, 3/4x8 Rabbeted Bevel, pattern 372, with a saw-textured face.

Plain Bevel
Horizontal Siding (Side View)



Face nail with one nail only per bearing. Drive nail so shank just clears the tip of the preceding undercourse. The space between the nail shank and the tip of the preceding course should not exceed 1/8 inch.

Rabbeted Bevel
Horizontal Siding (Side View)



Face nail with one nail only per bearing. Position material to allow expansion clearance of 1/8 inch. Drive nail about one inch above lower edge of course.

Surface Feet of Bevel Siding to Cover 1 Square (100 sq. ft.)

Nominal Width	Plain	Rabbeted
4 inch	160	128
5 inch	143	
6 inch	134	117
8 inch	124	117
10 inch	122	113

Size Availability
Bevel & Rabbeted Bevel

Bevel

	4"	5"	6"	8"	10"
1/2 inch	•	•	•	•	
3/4 inch			•	•	•

Rabbeted Bevel S1S-2E smooth

	4"	5"	6"	8"	10"
1/2 inch	•		•	•	
3/4 inch			•	•	•

Rabbeted Bevel S1S-2E saw-textured

	4"	5"	6"	8"	10"
3/4 inch			•	•	•



Tongue & Groove

Redwood tongue and groove siding is versatile and weathertight. Its variety of refined patterns has established a permanent place in residential and commercial architecture. Tongue and groove siding can be laid up vertically, horizontally or diagonally and is ideal for matched interior-exterior combinations. Tongue and groove patterns are produced in square edge, eased (slightly rounded) edge and various widths of V groove edges. The latter create a shadow line emphasizing the direction of the courses. Various design effects are achievable by alternating patterns and board widths.

Availability
Tongue and groove sidings are available in all architectural grades.

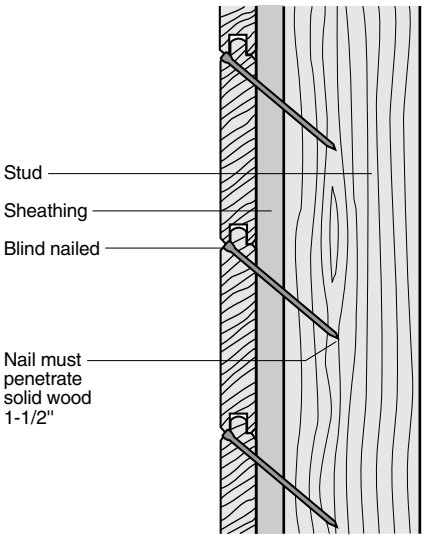
Standard tongue and groove patterns come from the mill with a smooth surface on both faces. Reversible patterns are saw-textured on one face and surfaced smooth on the other. All tongue and groove siding patterns can be special ordered saw-textured. Saw-textured faces are more even in color and appearance and they hold finishes better. Tongue and groove redwood is also available in thinner patterns commonly used for interior paneling.

Installation
Tongue and groove siding is properly applied with the groove edge down; this assures a weathertight wall.

Horizontally-applied tongue and groove siding should be nailed at every stud, not exceeding 24 inches on center. Siding applied vertically should be nailed to 2x4 horizontal blocking that is installed between the studs at not more than 24 inches on center. As an alternative, vertical siding may be nailed to 1x3 furring strips and solid wood sheathing at 24 inches on center.

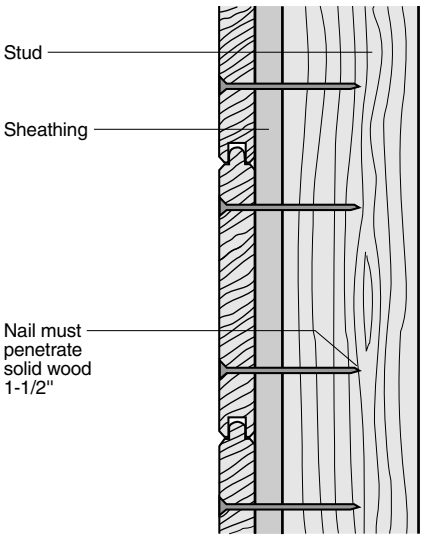
Sample Specification
Exterior siding shall be CRA-RIS grade-marked redwood Clear grade, vertical grain, Certified Kiln Dried, 1x8 Tongue and Groove, pattern 712R, saw-textured face to be exposed.

Tongue and Groove Horizontal Siding (Side View)



For 4-and 6-inch widths of tongue and groove siding over solid wood sheathing, blind nailing is possible using one 8-penny finishing nail per bearing.

Tongue and Groove Horizontal Siding (Side View)



Tongue and groove siding 8 inches or wider should be face-nailed, using two 8-penny nails per bearing.

Surface Feet of Tongue & Groove Siding to Cover 1 Square (100 sq. ft.)

Nominal Width	Coverage Factor
4 inch	128
6 inch	118
8 inch	117
10 inch	113

Size Availability
Tongue & Groove
Eased Edge S2S-CM

	4"	6"	8"	10"
1 inch	•	•	•	

V1S S2S

	4"	6"	8"	10"
1 inch	•	•	•	•

V2S-S1S Saw Textured 1S

	4"	6"	8"	10"
1 inch	•	•	•	•



Shiplap & Channel Shiplap

Redwood shiplap patterns are widely used for siding and paneling because of the varied visual effects that can be achieved. The boards are self-aligning, which makes installation easy. Shiplap patterns form strong, deliberate shadow lines.

Shiplap siding in V channel, Cove and Boston shiplap patterns can be applied either horizontally or vertically. Square-edged channel shiplap patterns should only be applied vertically.

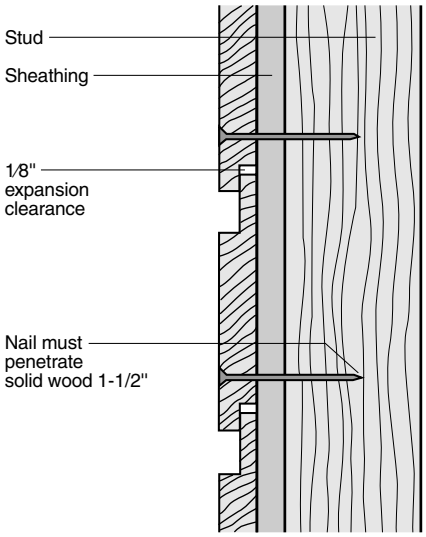
Availability
Shiplap sidings are available in all architectural grades.

Standard shiplap siding has a smooth finish on both sides, except those patterns designated with the suffix R, which are reversible. Those have a saw-textured channel pattern on one side and a smooth finish V pattern on the other. Shiplap siding patterns can be special ordered with a saw-textured face. Saw-textured faces are more even in color and appearance and they hold finishes better.

Installation
Shiplap sidings applied horizontally start with the bottom course and are nailed at each stud, which should not exceed 24 inches on center. Channel shiplap pattern sidings require a 1/8-inch expansion clearance in each joint.

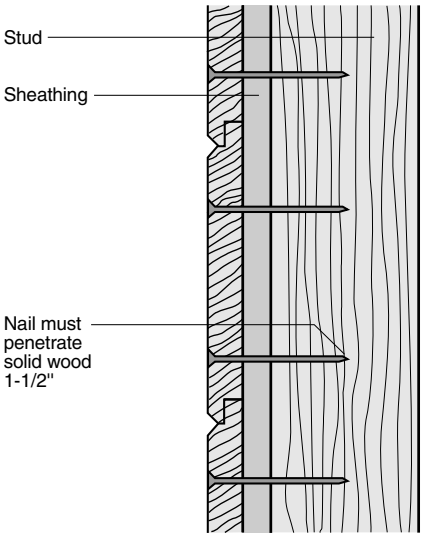
Shiplap siding applied in vertical courses should be nailed to 2x4 horizontal blocking that is installed between the studs at not more than 24 inches on center. As an alternative, vertical siding may be nailed to horizontal 1x3 furring strips and solid wood sheathing at 24 inches on center.

Channel Shiplap
Vertical Siding (Overhead View)

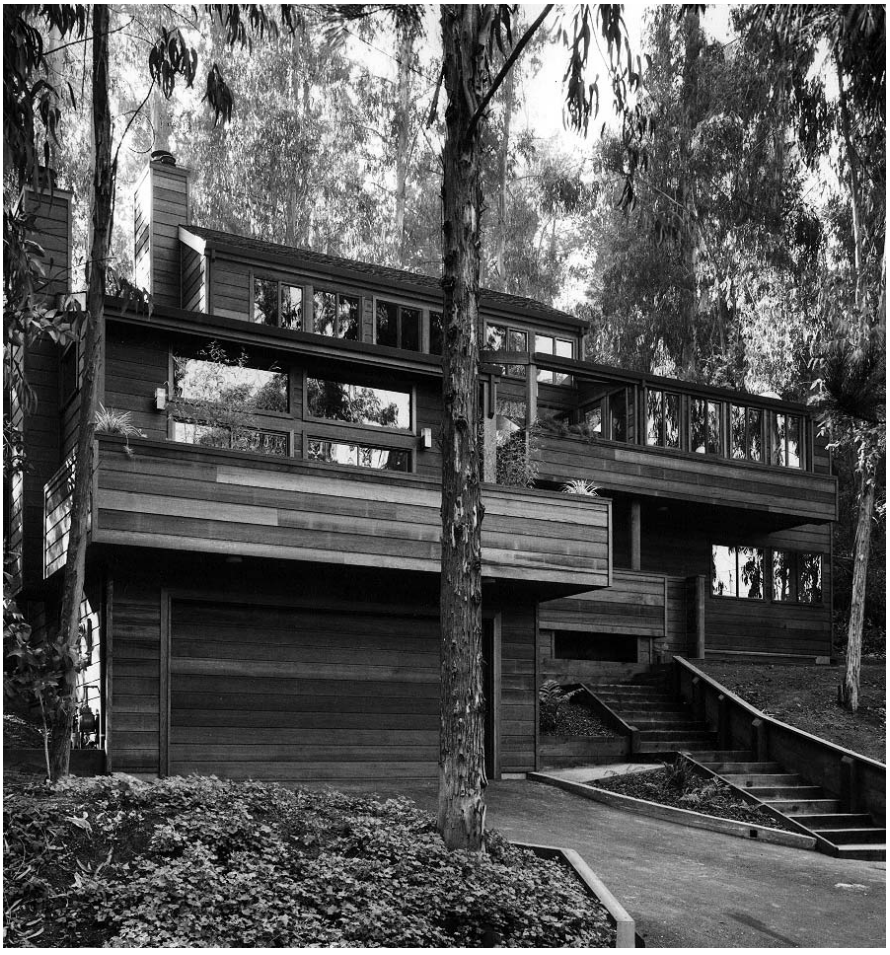


Use one nail an inch from the lap for 6-inch Channel Shiplap. Face nail with two nails per bearing for 8-inch and wider patterns. Space nails 1-1/2 inches from edge of overlap and two inches from edge of underlap for 8-inch boards. Nail wider patterns proportionately.

V Shiplap
Horizontal Siding (Side View)



For 6-inch V Shiplap patterns, use one nail per bearing with the nailing point one inch from the overlapping edge. For patterns 8 inches and wider, face nail with two siding nails per bearing. Position nails one quarter the width of the material in from each edge.



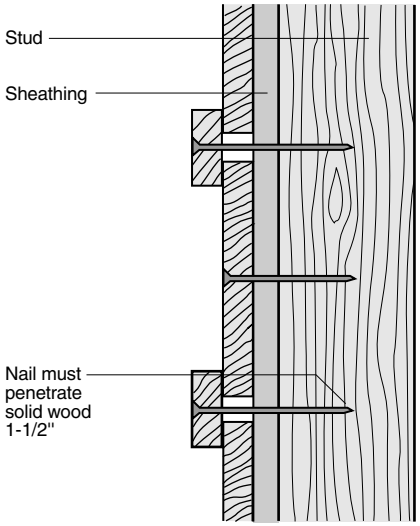
Board & Batten

The popular board and batten siding styles are not, strictly speaking, siding patterns but are created using standard size lumber. Any number of interesting treatments can be created, including various width battens over wide board, even spaced board and batten, and reverse board and batten.

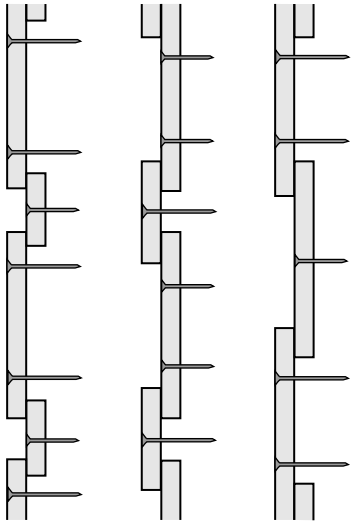
Availability
Any clear or tight-knot grade of redwood lumber may be used, either with smooth or saw-textured face. Clear All Heart, Clear, Heart B and B Grade lumber is available Certified Kiln Dried.

Installation
Board and batten patterns should only be applied vertically. Boards should be nailed to horizontal blocking placed not more than 24 inches on center. As an alternative, 1x3 or greater horizontal furring strips may be applied over solid wood sheathing.

Board and Batten
Vertical Siding (Overhead View)



Space underboards at least 1/2 inch apart and nail with one nail per bearing through the center of the material. For boards wider than 8", use two face nails evenly spaced. Wider spacing may be used with wider battens. Nail batten strips through the center so the nail shank passes through the space. Make certain the batten laps the underboard at least 1/2 inch on both sides.



Board and batten siding can have a variety of appearances depending on the width of boards and battens. A reverse board and batten pattern is achieved by placing wide boards over the narrow battens.



Finishes

Redwood Finishes
Apply finishes to clean, dry surfaces only. The optimum temperature range is between 50 and 70 degrees Fahrenheit. Saw-textured redwood holds finishes up to twice as long as smooth-surfaced wood.

Siding Finishes for Redwood

Description	Application	Maintenance
Clear Water Repellents with Mildewcide Stabilize color at a buckskin tan and let the grain and texture show through. Minimize the effect of weathering and redwood's natural darkening.	Apply with brush or roller. Two coats recommended for new wood. Coat sawn ends, backs and edges before nailing siding in place.	Reapplication required after old finish has lost its effectiveness. Reapplication may be required every 18-24 months.
Bleaching or Weathering Stains Provide a gray, natural weathered appearance. Bleaches accelerate the natural color changes of wood.	Apply with brush or roller. Use one or two coats according to directions. Bleaching action may be aided by periodically spraying surfaces with water.	Bleaching stains provide low maintenance. Periodic reapplication of clear water repellent with mildewcide is recommended.
Semitransparent Stains Variety of colors are available in these finishes that let the wood grain show through. Oil-based stains are recommended for best performance.	Apply with brush for best results, roller next best applicator. Two coats usually required for new wood; follow manufacturer's directions.	Color may wear away after weathering. Refinishing may be necessary every 2-4 years. Remove loose dirt and old finish with bristle brush before refinishing.
Solid Body Stains Available in a variety of opaque colors. These finishes obscure the grain and have an appearance similar to paint. Latex stains should be applied over a compatible stain-blocking primer.	For best results apply with brush. Avoid drips and lapmarks. Two coats usually required for new wood; follow manufacturer's directions.	Color may wear away with age. Refinishing may be necessary every 3-5 years. Remove loose dirt and old finish with bristle brush before refinishing.
Paints Durable attractive finishes for traditional exteriors. Paints obscure the grain and the texture of the wood.	Apply with brush for best results. Roller is next best applicator. One prime coat and two finish coats are recommended. Back-priming required. Use oil- or alkyd-resin base primer and acrylic latex top coat.	Repaint one coat after most of old coat has weathered. Avoid creating an excessively thick paint film. Sand or scrub with bristle brush to remove old finish and dirt. Countersink nails if sanding.

Caution: Varnishes, lacquers and clear film-forming finishes deteriorate rapidly in moisture and sunlight, so they should not be used.

Redwood—our renewable resource

Additional Literature
Architectural Guide
Redwood Pattern Book
Grades and Uses
Exterior Finishes

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