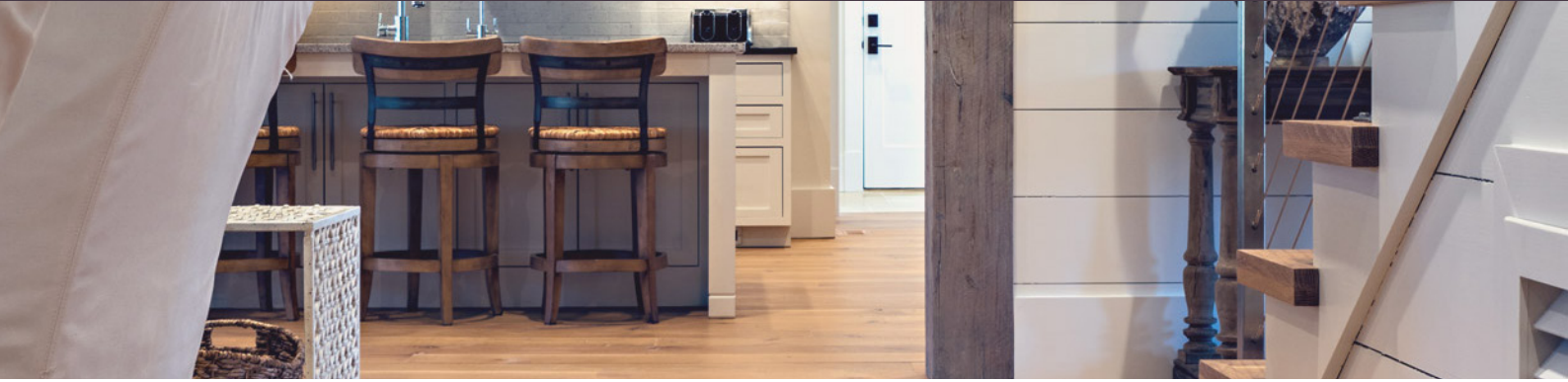

SOLID WOOD FLOORING INSTALLATION INSTRUCTIONS



OWNER/INSTALLER RESPONSIBILITIES

Wood flooring is a product of nature characterized by distinctive variations in grain, pattern, and color. These natural variations are neither flaws nor defects, but rather normal characteristics of wood. Before beginning the installation, first determine if the jobsite and subfloor conditions are acceptable. The project environment conditions such as weather fluctuations and product storage can adversely affect all moisture sensitive materials. The customer/installer is responsible for final inspection of flooring quality, grade and moisture testing of wood flooring and subfloor.. During installation, use reasonable board selectivity and good judgment. Any particular plank deemed unacceptable in appearance or quality should not be used. Defects should be cut off placing the remainder of the plank at walls or in closets. If milling or quality is suspected, stop the installation and call the distribution or manufacturer. Installation constitutes acceptance of material quality

and all jobsite conditions and once the flooring is installed it is deemed free of all visual defects. The manufacturer shall not be responsible for costs associated with repairing or replacing flooring installed with visible defects prior to installation. Remember Oak and Broad flooring is manufactured in accordance with accepted industry standards that may allow possible defects caused by (manufacturing or nature) not to exceed 5%. Depending on layout, plank selection and species, approximately 5%-8% of additional material should be included in an actual square footage to be used for cutting waste. Custom installations, diagonal layouts and certain species may require an additional square footage added to the order.

*** Please refer to the NWFA Technical Manual or your Oak & Broad Distributor for installation support.**

JOB SITE CONDITIONS

Wood flooring is one of the last jobs of any construction project. Prior to delivery of the wood flooring a site evaluation must be done. **Check for the following:**

- The building should be completely enclosed.
- All outside doors and windows must be in place and have latching mechanisms.
- Soil drainage should direct water away from the building.
- All concrete, masonry, plastering, drywall, and other wet trades should be completed and thoroughly dry. All ceiling/wall texturing and painting primer coats should be completed and dry prior to flooring installation.
- In warm months, the building must be well ventilated each day to prevent moisture from building up within the building.
- Be sure the flooring will not be exposed to extremes of humidity or moisture fluctuations.
- Interior environmental conditions must be near or at occupied living conditions 30% and 50%.
- NWFA does not recommend solid wood flooring below grade such as basements
- Crawl spaces must be dry and well ventilated.
- Heating, Ventilation and or Air Conditioning (**HVAC**) systems should be fully operating and running with temperature between **60F and 80F**, with humidity between **30% and 50%**, at least 5 days before delivery.





ACCLIMATION

Allowing wood moisture content to become at equilibrium with the environment in which it will perform is crucial to quality installation. Oak & Broad solid flooring does need to be acclimated to the jobsite.

Wood flooring is a hygroscopic material subject to dimensional change as a result of variations in moisture, temperature and humidity within the surrounding environment. Wood flooring simply needs to reach moisture content level in equilibrium with the surrounding environment (EMC) in which it will be installed, at or near normal living conditions. The amount of change varies with wood species, cut, and type of flooring. Oak & Broad Solid Plank is a natural hardwood and we recommend that the flooring be stored in a controlled environment prior to installation.

For best performance, condition and maintain the flooring to consistent indoor temperatures of **60° - 80° F** and indoor humidity levels of **30% - 50%**, before, during and after installation. Depending on your local conditions the use of a **dehumidifier** or a **humidifier** may be necessary to maintain the desired results. Not following these recommendations can result in negative plank performance and can result in excessive movement, squeaks, board gapping, board-edge cupping, finish splits and other related issues. This is especially true regarding flooring placed in vacation/weekend residences without proper ventilation and climate conditions and will void plank warranty.

SUBFLOOR PREPARATION

WOOD SUBFLOORS

Installer is responsible to perform a pre-installation jobsite evaluation, check and record subfloor (wood moisture content/conditions prior to installation.

Subfloor moisture content must not exceed 12% and the differential between subfloor and flooring moisture content must be 4% or less for strip floor (up to 3") and 2% for plank (over 3") floors. If subfloor moisture readings are too high, postpone installation until subfloor levels are within standard.

- Wood panel subfloor must be a minimum 5/8" (16mm) plywood or 23/32" (18mm) OSB subfloor.
- Minimum thickness subfloor panel material recommendations are satisfactory for 16" O.C. joist spacing. Thicker subfloor is recommended for up to 19.2" joist spacing. When joist spacing is greater than 19.2" O.C., flooring will exhibit minimum performance and may result in movement, gaps and/or flooring noise.
- **Truss/joist systems spaced over more than 19.2" O.C. and up to a maximum of 24" require minimum 7/8" T&G CD Exposure 1 Plywood subfloor panels, or nominal 1" OSB Exposure 1 subfloor panels – or two layers of subflooring. Or brace between truss/joists in accordance with the truss/joist manufacturer's recommendations and with local building codes.**

High spots/joist must be sanded down. Low spots should be cut out and repaired or may be filled with old pieces of firm vinyl or build up with 30 lb. black roofing paper. Do not fill-in low areas under nail down flooring with hard patching materials as these may crack/break down over time or with penetration of flooring fasteners.

New construction; It is the builder's or general contractor's responsibility to provide the wood-flooring contractor with a subfloor that is within the tolerances listed above. Postpone the installation until corrections have been completed

WOOD SUBFLOOR OVER CONCRETE

A Floating Subfloor System over concrete (not attached to the subfloor)

- Concrete should be flat to within 1/8" in 10'
- Install 6 mil polyethylene sheeting completely covering the concrete overlap seams a minimum of 4" and secure with approved tape.
- Minimum two layers of 1/2" minimum CD Exposure 1 Plywood subfloor panels (CDX) 4' x 8' sheets.
- Square-edged plywood panels should be placed with 1/8" gaps between sheets and a 3/4" minimum expansion space at all vertical obstructions and wall lines.
- Place the first plywood layer with edges parallel to wall, without fastening. Leave 3/4" space between wall and plywood subfloor.
- Lay the second layer at 45° degree angle to the first.
- Glue and screw (with urethane or construction adhesive) the second layer to first layer on 12" interior grid pattern (6" on the perimeter). Use extreme caution to select the appropriate fastener not to penetrate the vapor retarder.

Nail-Down Subfloor System over Concrete (attached to the subfloor)

- Use minimum 3/4" (23/32, 18.3mm) CD Exposure 1 Plywood subfloor panels (CDX), 4' x 8' sheets.
- The concrete compressive strength must equal to 3000 psi or greater.
- Concrete should be flat to within 1/8" in 10'.
- Install 6 mil polyethylene sheeting completely covering the concrete overlap seams a minimum of 4" and secure with approved tape.

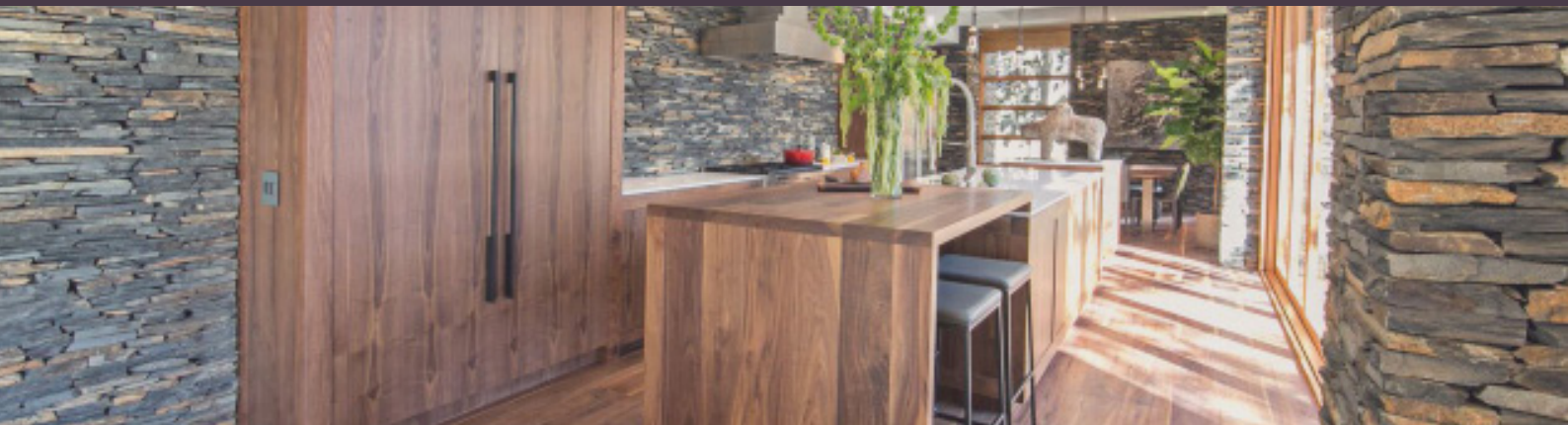
SUBFLOOR PREPARATION

- Note: Fasteners may be powder-driven pins, pneumatic driven nails, or other fasteners suitable for concrete application. Check with fastener manufacturer for specification such as length, drill size, and/or shot load where applicable.
- Stagger subfloor panel joints allowing 1/8" (or more) expansion space around all panels joints to prevent edge peaking.
- Allow 3/4" minimum expansion space at all vertical obstructions.
- Subfloor panels should be mechanically fastened to the concrete with powder load or pneumatic pressure information, contact the fastener manufacture.
- Fastener requirements should be a minimum 32 shots per 4' x 8' panel.

Use recommended fasteners length when fastening 3/4" flooring to concrete subfloor, check with fastener manufacturer.

Glue-Down Subfloor System over Concrete (attached to the subfloor)

- Use minimum 3/4" (23/32, 18.3mm) CD Exposure 1 Plywood subfloor panels (CDX), 4' x 8' sheets.
- Follow the adhesive manufacturers' recommendations for type of adhesive, floor prep, moisture barrier and trowel size
- Concrete compressive strength must equal 3000 psi or better.
- The concrete compressive strength must equal to 3000 psi or greater.
- Concrete should be flat to within 1/8" in 10'.
- Cut 4' x 8' sheets into (4) 12"x8' planks Install 6 mil polyethylene sheeting completely covering the concrete overlap seams a minimum of 4" and secure with approved tape.
- Note: Fasteners may be powder-driven pins, pneumatic driven nails, or other fasteners suitable for concrete application. Check with fastener manufacturer for specification such as length, drill size, and/or shot load where applicable.
- Stagger subfloor panel joints allowing 1/8" (or more) expansion space around all panels joints to prevent edge peaking.
- Allow 3/4" minimum expansion space at all vertical obstructions.
- Subfloor panels should be mechanically fastened to the concrete with powder load or pneumatic pressure information, contact the fastener manufacture.
- Fastener requirements should be a minimum 32 shots per 4' x 8' panel.
- Use recommended fasteners length when fastening 3/4" flooring to concrete subfloor, check with fastener manufacturer.
- Concrete should be flat to within 1/8" over 6' or 3/16" over 10'.
- Use minimum 3/4" (23/32, 18.3mm) CD Exposure 1 Plywood subfloor panels (CDX), 4' x 8' sheets.
- Place 12"x8' planks into wet adhesive, stagger joints min 12" allow planks to fully bond/cure before wood installation.



GENERAL INSTALLATION

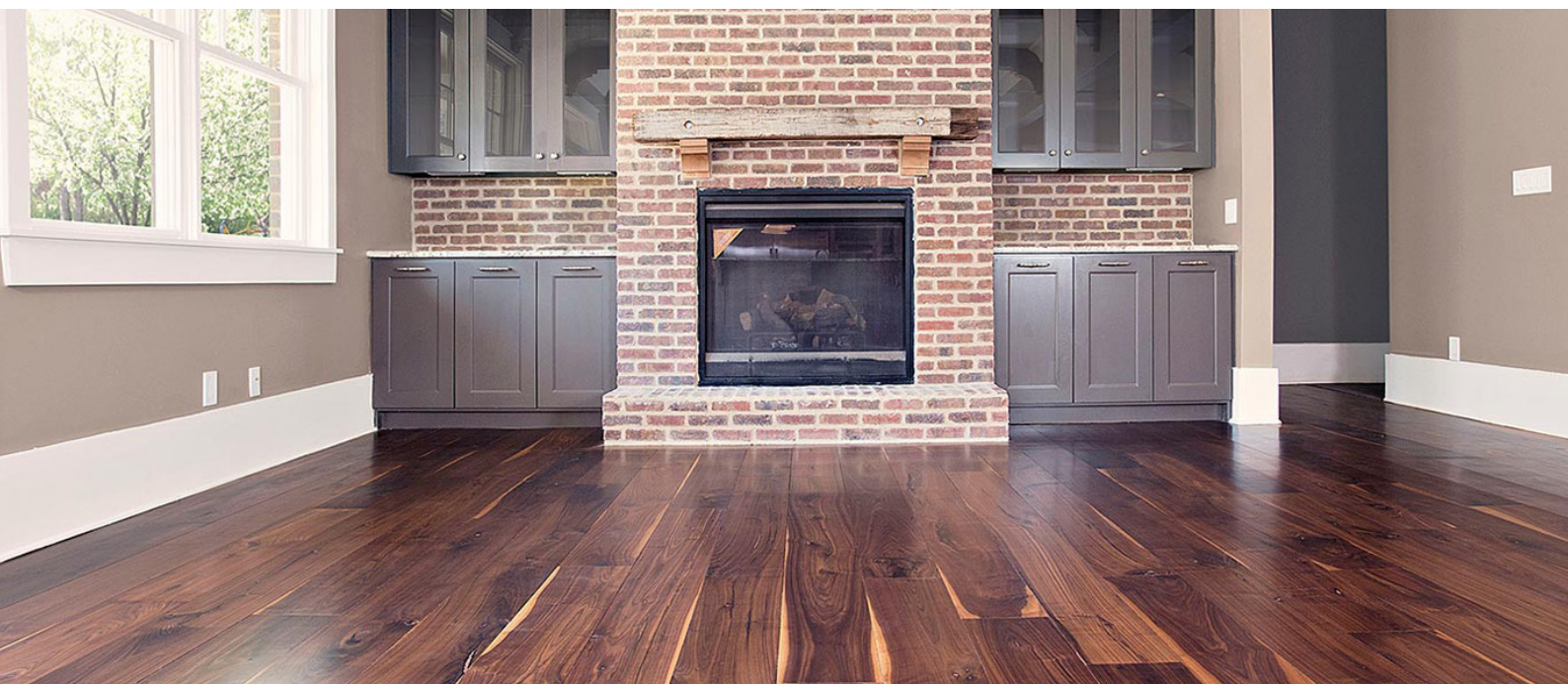
MAKE CERTAIN BUILDING INTERIOR AND SUBFLOOR ARE DRY

The building interior should have been dried and seasoned to a comfortable living environment and installation should be done in a similar, comfortable working environment. As part of your subfloor preparation remove any existing base, shoe mold or doorway thresholds. These items can be replaced after installation, but should be replaced in such a way as to allow room for expansion around the perimeter of the room. Interior should be dry and a room temperature as required by adhesive manufacturer with a relative humidity of 30%-50% should be provided before, during and after any installation.

Installer should have adequate lighting to inspect flooring during installation process. Use a jamb saw (manual or powered) to undercut all door jambs/casing to allow enough clearance for the wood flooring to easily slide underneath. Flooring should be installed from several boxes at the same time to achieve a uniform look. To ensure a random pattern, make sure all butt joints are at least 6" from the butt joint of the prior row. Proceed until you have come to the final row to complete the room. Discard twisted or warped boards or use for starter planks.

An Expansion gap or space must be left around the perimeter and at all vertical obstructions. This space is normally the same as the thickness of the new flooring, for example; 3/4" flooring requires 3/4" expansion gap.

When you have reached the final row, you will need to measure the width of the final planks. You may need to rip the planks to match the width of the space remaining. The tongue of the final row will need to be removed for a clean fit. Use a pry bar/puller to snug the last row of planks with the completed second row.



GENERAL INSTALLATION

SITE PREPARATION

Evaluate the job site. Always check the job site for satisfactory conditions. The sub floor must be clean, dry, firm and flat. Refer to the NWFA Technical Manual for required conditions. When you are ready to begin, open the cartons and inspect each plank for quality. Do not install planks that are not of the quality or grade purchased.

FASTENER SPACING

Hardwood flooring must be installed over a proper subfloor using a fastener specifically designed for the installation of wood flooring. Tongue and groove flooring must be blind nailed using the appropriate fastener that is specifically made for the type of product being installed. Smooth fasteners (finish nails, etc.) may only be used for the purpose of attaching the start and finish rows either by face or blind nailing.

For wide-width plank flooring (5" or wider), to assist the nailing schedule of 6"-8" and increase holding power, apply approved flooring adhesive, either full spread or serpentine pattern.

Wood Flooring Type	Fastener to be Used	Fastener Spacing
Solid strip T&G ¾" x less than 3"	1½" to 2" fastener, or 6d-8d	Blind fastener spacing along the or finish nails. On slab with ¾" lengths of the strips, minimum two underlayment, use 1½" fastener fasteners per piece near the ends (1"-3"). In addition, every 8"-10" apart for blind nailing, 10"-12" for face nailing.
Solid strip T&G ½" x 1½", ½" x 2"	1½" fastener	Blind fastener spacing along the lengths of the strips, minimum two fasteners per piece near the ends (1"-3"). In addition, every 10" apart. ½" flooring must be installed over a minimum 23/32" thick subfloor.
Solid strip T&G 3/8" x 1½", 3/8" x 2"	1¼" fastener	Blind fastener spacing along the lengths of the strips, minimum two fasteners per piece near the ends (1"-3"). In addition, every 8" apart.
Solid strip T&G 5/16"	Narrow crowned (under 3/8") 1"-1½" staples or 1" - ½" hardwood flooring cleats	Space fasteners at 3" 4" intervals for staples, 4" - 6" for cleats, and within 1" - 2" of end joints, or as recommended by the flooring manufacturer.
Solid plank ¾" x 3" or wider	1½"-2" fastener, or 6d-8d casing	Blind fastener spacing along the or finish nails. On slab with ¾" lengths of the strips, minimum underlayment, use 1½" fastener two fasteners per piece near the ends (1"-3"). In addition, every 6"-8" apart for blind nailing, 10"-12" for face nailing. To assist the nailing schedule, option is to apply adhesive.

NAIL/STAPLE INSTALLATION

Choose a wall to start on. Place expansion shims against the entire perimeter of the room. Lay the first with the groove against wall. Nail or staple tongue in the nail pocket of the first row. Nailing pattern should be every 6" or closer. You may want to face nail the first row close to the wall so the base molding will cover when finished.

When top nailing pre-finished flooring (the first and last rows, stair treads, and risers) it is recommended to pre-drill and hand nail using a 3/32" drill bit and 6d finish nails. Although pneumatic finish nailers are faster, improper use can easily damage the board and/or finishes.

After the first row is secure, engage the planks, one at a time to start the second row. Nail/staple each plank in the tongue nail pocket as you go to secure into position. Proceed by sliding each individual board into place making sure both the tongue and groove are tight, along with the butt joints. Proceed with this procedure until you have come to the final row to complete the room.

When you have reached the final row, you will need to measure the width of the final planks. You may need to rip the planks to match the width of the space remaining. Make sure the expansion shims are in place and take the shim width into consideration when ripping the final row. The tongue for the final row will need to be removed for a clean fit. Make sure you nail close enough to the wall so that the base molding/shoe will cover nails.

Please refer to the NWFA Technical Manual or your Oak & Broad Distributor for installation support.

SEASONAL CHANGES What to expect (all installation methods)

Seasonal gapping should be expected in all wood flooring and does not constitute a product flooring failure.

It is normal that wood floors will be affected by fluctuating levels of humidity within the building. Care should be taken to control humidity levels to within the **30%-50%** range and temperatures of **60°-80° F**. To protect your investment and to assure that your floors provide lasting satisfaction, note recommendations below:

- **(Dry)** Heating Season - A humidifier may be needed to minimize excessive shrinkage in wood floors due to low humidity levels. Wood stoves, radiant floor heat and electric heat will create dryer conditions.
- **(Humid, Wet)** Non-Heating Season - Proper humidity levels can be maintained by use of an air conditioner or dehumidifier. Avoid excessive exposure to water during periods of inclement weather. Do not obstruct expansion joints around the perimeter of your floor.

FINISHING UP

- Fill in nail holes and minor gaps with close matching wood filler.
- Install any base board molding and shoe molding
- Install transition moldings

FLOOR CARE AND MAINTENANCE

- Make sure after completion of the installation to leave all floor care and warranty information with the end user.