

S E C T I O N I I

PRODUCT INSTALLATION

Chapter 3	Solid Parquet Floor	Page 1
Chapter 4	Engineered Floor	Page 9
Chapter 5	Solid Plank Floor	Page 18
Chapter 6	Solid Strip Floor	Page 26

SECTION II

PRODUCT SPECIFIC INFORMATION

CHAPTER 3

SOLID PARQUET FLOORING

3/4" & Thinner Unfinished/Factory Finished/Impregnated

I. Minimum Acceptable Jobsite Conditions and Checklist

See Section I

II. Acclimation Guidelines

NOTE: Always follow the manufacturers recommendations for acclimation.

Upon delivery check wood flooring moisture content (Section V, Appendix AB, AD and AE) to establish a baseline for required acclimation (Section 1, Chapter 1).

Acclimation depends on geographic location, interior climate control and time of year. See Definition of Acclimation under Section VI. Refer to Section V, Appendix AD and AE.

III. Flooring Grade Levels (Section V Appendix AF)

Above Grade: Solid parquet wood floors can be installed successfully above grade level.

On Grade: Solid parquet wood floors can be installed successfully on grade level.

Below Grade: SOLID WOOD FLOORS ARE NOT RECOMMENDED FOR BELOW GRADE INSTALLATIONS.

NOTE: The entire flooring level is considered to be BELOW grade where soil is present along any perimeter wall and is more than 3" above the installed wood flooring level.

IV. Subfloor Guidelines – Wood Joist Systems – panel products or solid boards

NOTE: Always follow the manufacturers recommendation for proper subfloor

NOTE: Subfloor/Underlayment panels should conform to the US Voluntary Product Standard PS 2-92 or PS 1-95 and/or Canadian performance standard CAN/CSA 0325.0-92 Construction Sheathing. Check underside of boards for codes.

Chapter 3, Solid Parquet Floor

NOTE: Solid board subflooring should be: 3/4" x 5 1/2", Group 1 dense softwoods, (SYP, Doug Fir, Larch, etc), No. 2 Common, Kiln dried less than 15% MC.

Check subfloor for performance stamp and/or specification agency.

Subfloor must be flat, clean, dry, structurally sound, free of squeaks and free of protruding fasteners.

Test subflooring for moisture according to Moisture Testing Procedures in Section V, Appendix AB. Moisture content should be within 4% of average area environmental conditions. Section V, Appendix AD and AE.

For installations using mechanical fasteners of 1-1/2" and above, the subfloor should be flat to within 1/4" in 10' or 3/16" in 6'.

For gluedown installations and installations using mechanical fasteners of less than 1-1/2", the subfloor should be flat to within 3/16" in 10' or 1/8" in 6'.

For paneled subflooring/underlayment – nailing schedule must be adequate, typical-every 6" along panel ends and every 12" along intermediate supports; all panel edges should exhibit spacing; edge swell should be flattened as necessary.

For board subflooring – Boards should be no wider than 6"; installed at 45 degree angle with all board ends full bearing on joists and nailed with 2, 8d nails; 1/4"-1/2" space should be present between board edges.

PREFERRED SUBFLOORING: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment (Exposure 1), 4' X 8' sheets; OR 3/4" (23/32", 18.3mm) OSB subfloor/underlayment, with joist spacing 19.2" (475mm) on center or less.

MINIMUM: 5/8" (19/32", 15.1mm) CDX Plywood subfloor/underlayment (Exposure 1) 4' X 8' sheets, maximum 16" (400mm) on center joist construction

Follow panel manufacturer recommendations for spacing and fastening. Typical panel spacing and fastening for joist systems, 1/8" (3.2mm) around perimeter and fastened every 6" (150mm) on bearing edges and every 12" (300 mm) along intermediate supports.

For 3/4" (18.3mm) CDX Plywood and 23/32" (18.3mm) OSB, with joist systems spaced over maximum 19.2" (475mm) o/c requires an additional layer of plywood. Minimum requirement; 1/2" (15/32", 11.9mm) CDX plywood subfloor/underlayment, (Exposure 1) 4' X 8' sheets. The 1/2" plywood should be offset by 1/2 panel in each direction to the existing subflooring. The panels may also be laid on a diagonal or perpendicular, with 1/8" spacing between sheets. Nail on a 6" minimum grid pattern-using ring shanked nails. Or brace between joists with 2X6 or wider boards every 24".

Chapter 3, Solid Parquet Floor

NOTE: Parquet cannot be installed directly to solid board subfloors

Board subfloors must have additional underlayment. Preferred requirement; 1/2" (15/32", 11.9mm) CDX plywood subfloor/underlayment, (Exposure 1) 4'x8' sheets. Minimum thickness 3/8" underlayment panels. Panels nailed on 6" minimum grid pattern using ring-shanked nails or staples.

NOTE: With minimum specified materials, at maximum span and spacing (i.e. greater than 19.2") flooring will exhibit minimum performance. Minimum performance may result in the following conditions: movement, gaps, noises, and with site finished flooring finish delamination.

V. Subfloor Guidelines – Concrete Slab

NOTE: Always follow the manufacturers recommendation for proper subfloor.

Concrete must be flat, dry, structurally sound and clean.

Test concrete for moisture according to Moisture Testing Procedures in Section V, Appendix AA. Excess moisture should not be present.

Tolerance should be flat to within 3/16" in 10' or 1/8" in 6'.

Substrate should be flattened to tolerance

Lightweight concrete (less than 3000 psi) where adhesive used has a higher psi rating than concrete, use with a Subfloor-Floated.

RULE OF THUMB: Draw a nail across the top and if it leaves an indentation, it is probably lightweight concrete.

Before moisture testing begins, the slab must be cured for a MINIMUM of 30 days.

Direct Glue Application

NOTE: Always follow the manufacturers recommendation for proper application, proper adhesive and correct spread rate.

If necessary, add moisture retarder before applying adhesive. (Section V, Appendix AG)

Typical – 3/4" thick parquet requires a vapor retarder over the concrete slab, and spread rate for adhesives 30 – 50 sq. ft. per gallon.

Typical – 1/2" and thinner parquet does not require a vapor retarder, and spread rate for adhesive is 40 – 60 sq. ft. per gallon.

Chapter 3, Solid Parquet Floor

Subfloor – Floated

NOTE: Always follow the manufacturers recommendation for proper subfloor

If necessary, add moisture retarder before applying underlayment. (Section V, Appendix AG)

PREFERRED: Subfloor system: 2 layers 1/2" (15/32", 11.9mm) CDX plywood subfloor/underlayment, (Exposure 1) 4x8 sheets. **MINIMUM** Subfloor system: 2 layers 3/8" (10mm) CDX Plywood subfloor/underlayment (Exposure 1) 4' X 8' sheets.

Place first plywood layer with edges parallel to wall, without fastening.

Plywood should be placed with 1/8" gaps between sheets

Lay second layer perpendicular or at 45 degree angle to first

Plywood should be placed with 1/8" gaps between sheets

3/4" minimum expansion space at all vertical obstructions and wall lines

Staple, screw, or nail second layer to first layer on 12" grid pattern.

Glue Down Subfloor

NOTE: Always follow the manufacturers recommendation for proper subfloor

If necessary, add moisture barrier before applying underlayment. (Section V, Appendix AA)

PREFERRED: Subfloor: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment (Exposure 1), 4'x8' sheets. **MINIMUM** Subfloor: 5/8" (19/32), 15.1mm) CDX Plywood subfloor/underlayment, (Exposure 1), 4'x8' sheets.

For single layer system; Apply adhesive per manufacturers recommendations (typical spread rate – 30-35 sq.ft.per gallon with a 1/4"x 1/4" notched trowel), cut plywood to 2'X8' or 4'X4' sections; score on the back 1/2 the thickness on a 12"x12" grid; lay sections in a staggered joint pattern in the adhesive; 1/8" spacing between sheets; 3/4" minimum expansion space at all vertical obstructions.

Nail Down Subfloor

NOTE: Always follow the manufacturers recommendation for proper subfloor

If necessary, add moisture barrier before applying underlayment.

PREFERRED Subfloor system: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment, (Exposure 1), 4'X8' sheets. **MINIMUM** Subfloor: 5/8" (19/32, 15.1mm) CDX Plywood subfloor/underlayment (Exposure 1), 4'x8' sheets

Chapter 3, Solid Parquet Floor

1/8" spacing between sheets with staggered joints
Fasten every 12" and 6" from edge along the border for a minimum of 32 shots per 4'x8" sheet.
For load (shot) information, contact your local supplier
Areas with higher humidity may require additional nails (shots).
3/4" minimum expansion space at all vertical obstructions

NOTE: Fasteners may be powder driven pins, pneumatic driven nails, hand nails, screws, deformed pins, or other fasteners suitable for concrete application. Check with fastener distributor for specification such as length, drill size, and/or shot load where applicable.

VI. INSTALLATION

NOTE: The styles and types of block and parquet flooring as well as the recommended procedures for application vary somewhat among the different manufacturers. Detailed installation instructions are usually provided with the flooring or are available from the manufacturer or distributor.

Test wood subflooring for moisture according to Moisture Testing Procedures in Section V, Appendix AB. Moisture content should be within 4% of average area environmental conditions. Section V, Appendix AD and AE.

Test concrete for moisture according to Moisture Testing Procedures in Section V, Appendix AA. Moisture indicators should be within the adhesive and flooring manufacturers specifications.

A minimum expansion space equal to the thickness of the installed product must be left around the perimeter and all vertical obstructions.

Some 3/4" slat parquet can be nailed down, as long as the pattern continues to have an exposed side tongue in which to nail

Lay both blocks and the individual pieces of parquet in adhesive.

Use the wood manufacturer's approved adhesive. Follow the spread rate, trowel size and installation procedure as recommended by the adhesive manufacturer.

If recommended by manufacturer, roll floor with proper roller.

The most common layout of parquet is with edges of parquet units and the lines they form square with the walls of the room. (see figure 1-1)

Chapter 3, Solid Parquet Floor

Start by snapping a chalk line through the center of the room (line Y (see figure 1-1)). The next line (X) must be exactly 90 degrees to line Y to form a perfect square corner. To ensure this angle, do the following:

1. From the center point (A) of line Y, measure 4 feet along line Y and mark that point (B).
2. From the same center point, measure 3 feet in the general direction of where line X will be and scribe an arc.
3. Return to the original 4-foot mark on line Y and measure 5 feet, scribing an arc that crosses (point C) the 3-foot arc you made in the previous step.
4. Verify all measurements before proceeding.
5. If correct, snap a chalk line through the conjunction of the two arcs and the center point of line Y. This will be line X, at an exact 90-degree angle to line Y.

An alternate layout is a diagonal pattern, with lines at a 45-degree angle to the walls. For diagonal layout you will start with a diagonal working line in the center of the room. (see figure 1-2)

To establish a 45-degree working line:

1. From the center point, measure 4 feet down in each direction on lines X and Y.
2. From each of these points, measure 4 feet and scribe an arc. The conjunction of these arcs creates points D and E.
3. Snap a chalk line between points D and E, and the center point. This line represents a 45-degree angle.

Most special patterns can be laid out with the above two working lines. Herringbone will require two lines, one at 90 degrees and the other at a 45-degree angle. These lines must be adjusted to properly center the points of the pattern. *Herringbone direction should be installed in accordance with consumer preference. If the pattern is to be installed in the direction of the length of the room, the herringbone working line should be laid out parallel to line Y. (see figure 1-3 and figure 1-4). Line B in this instance must run parallel to line Y and represent the center of the herringbone material. To determine the center of the herringbone material and establish line B:*

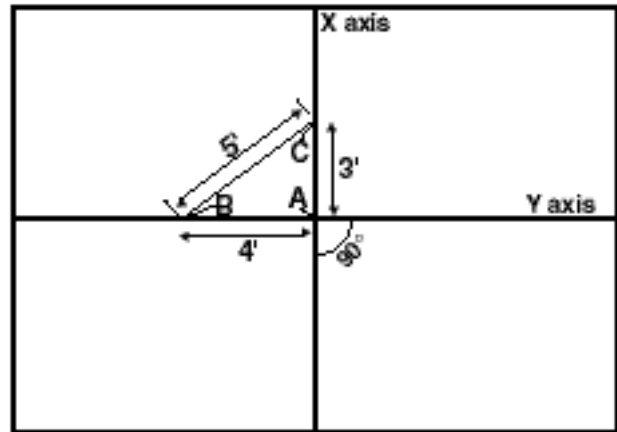


figure 1-1

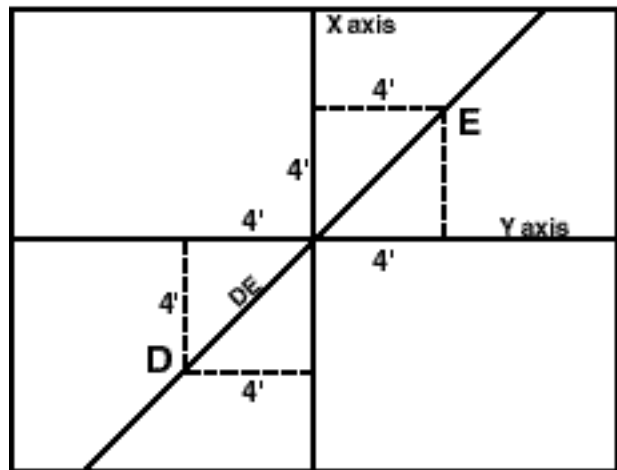


figure 1-2

Chapter 3, Solid Parquet Floor

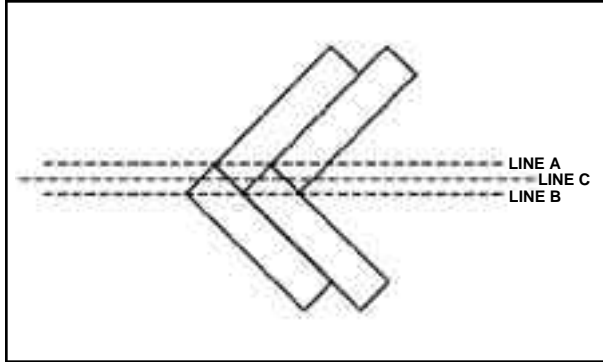


figure 1-3

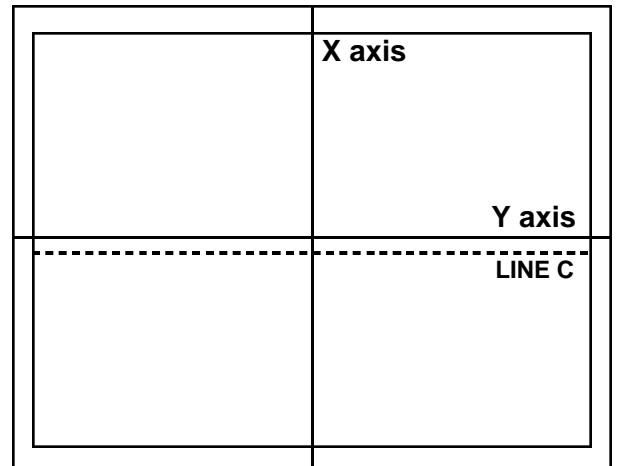


figure 1-4

1. Begin by laying out a few alternating slats. (see figure 1-4)
2. Snap line A and line B through the corners of the alternating slats.
3. Measure the distance from line A to line B. The working line should be one-half that distance and run parallel to line Y.

Herringbone installation: To begin installation on line B (see figure 1-5), cut a square piece of plywood the size of the herringbone pattern you are installing. For example, if the herringbone is 3 inches by 12 inches, cut a 12-by-12 inch piece of plywood. Nail this piece of plywood at your starting point on line B, with one corner of the square pointing in the direction of your layout.

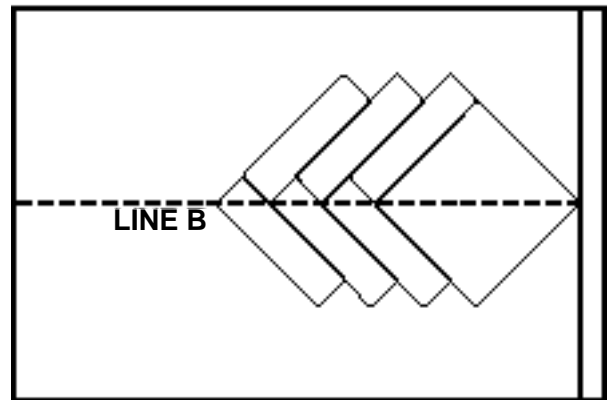


figure 1-5

VI. EXISTING FLOORING GUIDELINES

NOTE: Always follow the manufacturers recommendations for installation over existing flooring.

Glue down parquet applications that require the use of PVA adhesives is not recommend over existing sheet vinyl or vinyl and cork tile flooring unless an underlayment is put down first. Underlayment should be in accordance with preceding NWFA guidelines.

Other types of adhesives may require the use of a primer or vinyl blocker when installing over sheet vinyl or vinyl and cork tile flooring.

Chapter 3, Solid Parquet Floor

Nail down applications may be successful over existing sheet vinyl or vinyl tile if fastener penetration is not significantly diminished and the subfloor meets minimum requirements.

NOTE: Particleboard is not generally an acceptable underlayment. Some manufacturers approve particleboard as an acceptable underlayment. In such cases follow manufacturers recommendation.

Sand off old finish and high spots on existing wood floor and prep to clean, dry, sound, flat subfloor. Repair, re-nail or replace loose flooring products.

Wood Flooring can be installed over existing ceramic tile, terrazzo, or marble with proper underlayment or adhesives only on manufacturers recommendation.

SECTION II

PRODUCT SPECIFIC INFORMATION

CHAPTER 4

ENGINEERED WOOD FLOORS

Multi-ply wood flooring – Strip, Plank, and Parquet – Unfinished/Factory Finished/Impregnated

I. Minimum Acceptable Jobsite Conditions and Checklist See Section I

II. Acclimation Guidelines

NOTE: Always follow the manufacturer's recommendation for acclimation.

Upon delivery check wood flooring moisture content (Section V, Appendix AB, AD, and AE) to establish a baseline for required acclimation (Section I, Chapter 1).

Acclimation depends on geographic location, interior climate control and time of year. See Definition of Acclimation under Section VI. Refer to Section V, Appendix AD and AE.

III. Flooring Grade Levels (Section V, Appendix AF)

Above Grade: Engineered wood floors can be installed successfully above grade level.

Engineered wood floors can be installed direct to concrete or wood subfloor.

On Grade: Engineered wood floors can be installed successfully on grade level.

Engineered wood floors can be installed direct to concrete or wood subfloor.

Below Grade: Engineered wood floors can be installed successfully below grade level.

Engineered wood floors can be installed direct to concrete or wood subfloor.

NOTE: The entire flooring level is considered to be BELOW grade where soil is present along any perimeter wall and is more than 3" above the installed wood flooring level. Ground should be sloped away from the house for proper drainage. Check local building codes. Local building codes prevail. Follow local building codes.

IV. Subfloor Guidelines – Wood Joist Systems – panel products or solid boards

NOTE: Always follow the manufacturers recommendation for proper subfloor

Chapter 4, Engineered Floor

NOTE: Subfloor/Underlayment panels should conform to the US Voluntary Product Standard PS 2-92 or PS 1-95 and/or Canadian performance standard CAN/CSA 0325.0-92 Construction Sheathing. Check underside of boards for codes.

NOTE: Solid board subflooring should be: 3/4" X 5 1/2", Group 1 dense softwoods (SYP, Doug Fir, Larch, etc.), No. 2 Common, Kiln dried less than 15% MC.

Check subfloor for performance stamp and/or specification agency.

Subfloor must be flat, clean, dry, structurally sound and free of squeaks and free of protruding fasteners.

Test subflooring for moisture according to Moisture Testing Procedures in Section V, Appendix AB. Moisture content should be within 4% of average area environmental conditions. Section V, Appendix AD and AE.

For installations using mechanical fasteners of 1-1/2" and above, the subfloor should be flat to within 1/4" in 10' or 3/16" in 6'.

For gluedown installations and installations using mechanical fasteners of less than 1-1/2", the subfloor should be flat to within 3/16" in 10' or 1/8" in 6'.

For paneled subflooring/underlayment – nailing schedule must be adequate, typical – every 6" along panel ends and every 12" along intermediate supports; all panel edges should exhibit spacing; edge swell should be flattened as necessary.

For board subflooring – Boards should be no wider than 6"; installed at 45 degree angle with all board ends full bearing on joists and nailed with 2, 8d nails; 1/4" – 1/2" space should be present between board edges.

PREFERRED SUBFLOORING: 3/4" (23/32, 18.3mm) CDX grade Plywood subfloor/underlayment (Exposure 1), 4' X 8' sheets, OR 3/4" (23/32" 18.3mm) OSB subfloor/underlayment grade, with joist spacing 19.2" (475 mm) on center or less.

MINIMUM SUBFLOORING: 5/8" (19/32", 15.1mm) CDX Plywood subfloor/underlayment (Exposure 1), 4' X 8' sheets, maximum 16" (400mm) on center joist construction.

Follow panel manufacturer recommendations for spacing and fastening. Typical panel spacing and fastening for joist systems, 1/8" (3.2mm) around perimeter and fastened every 6" (150mm) on bearing edges and every 12" (300mm) along intermediate supports.

Chapter 4, Engineered Floor

For 3/4" (19mm) CDX Plywood and 23/32" (19mm) OSB, with joists spaced over 19.2" (475mm) on center or 5/8" CDX Plywood with joists systems spaced over 16" (400mm) on center an additional layer of plywood is required. Minimum requirement: 1/2" (15/32", 11.9mm) CDX plywood subfloor/underlayment, Exposure 1), 4'x8' sheets. The panels may also be laid on a diagonal or perpendicular, with 1/8" spacing between sheets. Nail on a 6" (150mm) minimum grid pattern using ring shanked nails. Or brace between joists with 2X6 or wider boards every 24".

NOTE: Some Engineered flooring cannot be installed directly to solid board subfloors. (see manufacturers recommendation)

Board subfloors must have additional underlayment. Preferred requirement: 1/2" (15/32", 11.9mm) CDX plywood subfloor/underlayment, Exposure 1, 4'X8' sheets. Minimum thickness 3/8" underlayment panels. Panels nailed 6" minimum grid pattern using ring shanked nails or staples.

NOTE: With minimum specified materials, at maximum span and spacing (i.e. greater than 19.2") plank flooring will exhibit minimum performance. Minimum performance may result in the following conditions: movement, gaps, noises, and with site finished flooring, finish delamination.

V. Subfloor Guidelines – Concrete Slab

Concrete must be flat, dry, structurally sound and clean.

Test concrete for moisture according to Moisture Testing Procedures in Section V, Appendix AA. Excess moisture should not be present.

Tolerance should be flat to within 3/16" in 10' or 1/8" in 6'.

Substrate should be flattened to tolerance.

Lightweight concrete (less than 3000 psi) – Where adhesive used has a higher psi rating than concrete, use with a Subfloor-Floated.

RULE OF THUMB: Draw a nail across the top and if it leaves an indentation, it is probably lightweight concrete. If psi of concrete unknown use Subfloor-Floated.

Before moisture testing begins, the slab must be cured for a MINIMUM of 30 days.

Direct Glue Application

NOTE: Always follow the manufacturers recommendation for proper application, proper adhesive, and correct spread rate.

Chapter 4, Engineered Floor

Typical – spread rate for adhesive 40 – 60 sq. ft. per gallon.

Subfloor-Floated

If necessary, add moisture barrier before applying underlayment. (Section V, Appendix AG)

PREFERRED Subfloor system: 2 layers 1/2" (15/32", 11.9mm) CDX Plywood subfloor/underlayment (Exposure 1), 4'X 8' sheets. **MINIMUM** Subfloor system: 2 layers 3/8" (10mm) CDX plywood subfloor/underlayment, (Exposure 1), 4'x8' sheets.

Place first plywood layer with edges parallel to wall, without fastening.
Plywood should be placed with 1/8" gaps between sheets
Lay second layer perpendicular or at 45 degree angle to first
Plywood should be placed with 1/8" gaps between sheets
3/4" minimum expansion space at all vertical obstructions and wall lines
Staple, screw, or nail second layer to first layer on 12" grid pattern.

Glue Down Subfloor

NOTE: Always follow the manufacturers recommendation for proper subfloor

If necessary, add moisture barrier before applying underlayment. (Section V, Appendix AG)

PREFERRED Subfloor: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment (Exposure 1), 4'x8' sheets. **MINIMUM** Subfloor: 5/8" (19/32), 15.1mm) CDX Plywood subfloor/underlayment, (Exposure 1), 4'x8' sheets.

For single layer system; Apply adhesive per manufacturers recommendations (typical spread rate – 30-35 sq.ft. per gallon with a 1/4"x 1/4" notched trowel), cut plywood to 2'X8' or 4'X4' sections; score on the back 1/2 the thickness on a 12"x12" grid; lay sections in a staggered joint pattern in the adhesive; 1/8" spacing between sheets; 3/4" minimum expansion space at all vertical obstructions.

Nail Down Subfloor

NOTE: Always follow the manufacturers recommendation for proper subfloor

If necessary, add moisture barrier before applying underlayment.

PREFERRED Subfloor system: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment, (Exposure 1), 4'X8' sheets. **MINIMUM** Subfloor: 5/8" (19/32, 15.1mm) CDX Plywood subfloor/underlayment (Exposure 1), 4'x8' sheets

Chapter 4, Engineered Floor

1/8" spacing between sheets with staggered joints

Fasten every 12" and 6" from edge along the border for a minimum of 32 shots per 4'x8" sheet.

For load (shot) information, contact your local supplier

Areas with higher humidity may require additional nails (shots).

3/4" minimum expansion space at all vertical obstructions

NOTE: Fasteners may be powder driven pins, pneumatic driven nails, hand nails, screws, deformed pins, or other fasteners suitable for concrete application. Check with fastener distributor for specification such as length, drill size, and/or shot load where applicable.

Screed System

Engineered wood flooring cannot be installed directly to screeds. Screed System must be overlaid with proper subflooring, see IV. Subfloor Guidelines – Wood Joist Systems – panel products or solid boards this chapter.

Screeds should be 2"X4" or 2"X3", Group 1 species, pressure treated, kiln-dried after treatment to 12% m.c. or less; flat, with minimum twist or crook, cut as necessary to maintain flatness, typical, 18"-48" in length; lay in runs maximum 16" on center at right angles to flooring direction; set screeds widest dimension in adhesive with 100% contact; use cold bond adhesive or adhesive approved by the manufacturer; lap along sides at end joints 3"-4" with 1/8" spacing between; stagger all screen end joints; leave 3"-4" space at all vertical obstructions; apply necessary vapor retarder. See Section V, Appendix AG.

Existing flooring guidelines

NOTE: Always follow the manufacturer's recommendation for installation over existing flooring.

Glue down applications of Engineered wood flooring may be successful over existing sheet vinyl or vinyl tile. Some types of adhesives may require the use of a primer or vinyl blocker when installing over this type of surface.

Nail or staple down applications may be successful over existing sheet vinyl or vinyl tile if fastener penetration is not significantly diminished and the subfloor meets minimum requirements. (Particle board is not an acceptable underlayment)

Where present old finish should be removed from an existing floor. Subflooring should be flattened to tolerance should be flat to within 3/16" in 10' or 1/8" in 6'.

Chapter 4, Engineered Floor

Substrate should be clean, dry, and sound. Repair, re-nail or replace loose flooring products.

NOTE: Only on manufacturer's recommendation can engineered wood flooring be installed over existing ceramic tile, terrazzo or marble. Contact manufacturer in all cases for proper adhesive and/or underlayment recommendation.

VI. INSTALLATION:

The styles and types of engineered wood flooring as well as the recommended procedures for application vary somewhat among the different manufacturers. Detailed installation instructions are usually provided with the flooring or are available from the manufacturer or distributor.

NOTE: Always follow the manufacturer recommended installation procedure.

Glue Down Engineered Strip and Plank

There are several different ways to start the installation of glue-down engineered wood flooring. The following has proven successful where instructions differ from manufacturer recommendations, manufacturer recommendations prevail.

Test substrate for moisture according to appropriate Moisture Testing Procedures in Section V. Excessive/elevated moisture should not be present. Subfloor should be within acceptable moisture content as per manufacturer recommendation before installing.

Expansion space should be left around the perimeter or in accordance with manufacturer recommendation. Typical expansion is equal to the thickness of the product installed.

Snap a working line parallel to the starting wall, out approximately 3 feet, in multiples of the pattern width.

Use an adhesive approved by the flooring manufacturer. Follow the installation procedure recommended by the adhesive manufacturer, which includes; spread rate, trowel size, open time, working time, and flash time as necessary. Spread the adhesive as instructed up to and along the working line.

Install a sacrificial row along the edge of the working line and begin installation. (Before finishing the installation remove sacrificial row and complete installation or alternatively, lay one row of plank in the adhesive along the entire length of the working line. Follow manufacturer instruction for tongue and groove direction and placement procedure. Add each additional row of flooring. Maintain proper pattern repeat, distribute lengths avoiding "H" patterns and end joints less than

Chapter 4, Engineered Floor

6 inches in adjacent runs; if recommended use tape or tensioners to maintain a tight floor.

If recommended by manufacturer, roll floor with proper roller.

Mechanically Fastened Engineered Strip and Plank

If necessary, add moisture retarder before applying underlayment. (Section V, Appendix AG)

Stretch or snap a working line parallel to the starting wall allowing expansion space as the manufacturer recommends. Typical expansion is equal to the thickness of product installed.

Lay one row of plank along the entire length of the working line. Use appropriate size fastener for top nailing first row, last row and any area where nailer will not fit. Space fasteners at 6-8 inch intervals.

Add each additional row of flooring. Maintain proper pattern repeat, distribute lengths avoiding "H" patterns and end joints less than 6 inches in adjacent runs.

During installation of flooring pieces, gently tap boards flush to the previous row. Always tap against the tongue, tapping the groove may damage the surface or edge.

Fasten flooring through the tongue on a 45 degree angle ("blind nailing") using recommended fasteners. Typical, narrow crowned (1/4") 1" staples or 1" – 1 1/4" hardwood flooring cleats spaced as recommended by the manufacturer or every 4-8 inches.

Glue Down Engineered Parquet

Test substrate for moisture according to appropriate Moisture Testing Procedures in Section V. Excessive/elevated moisture should not be present. Subfloor should be within acceptable moisture content as per manufacturers recommendation before installing.

The most common layout of parquet is with edges of parquet units (and the lines they form) square with the walls of the room. Center, working lines on prominent physical features of room, e.g. doorway(s), bay window(s), fireplace, etc., or mid points of walls. Working lines should be perpendicular to each other.

An alternate layout is a diagonal pattern, with lines at a 45-degree angle to the walls. Snap chalk lines as described above and then snap diagonal chalk lines at a 45-degree angle to the square lines.

Chapter 4, Engineered Floor

Most special patterns can be laid out with the above two working lines. Herringbone will require two lines, one at 90 degrees and the other at a 45-degree angle. These lines must be adjusted to properly center the points of the pattern.

Expansion space should be left around the perimeter or in accordance with manufacturers recommendation. Typical expansion is equal to the thickness of product installed.

Use an adhesive approved by the flooring manufacturer. Follow the installation procedure recommended by the adhesive manufacturer, which includes; spread rate, trowel size, open time, working time, and flash time as necessary. Spread the adhesive as instructed up to and along the working lines.

If recommended by manufacturer, roll floor with proper roller.

Floating Engineered Flooring

Test substrate for moisture according to appropriate Moisture Testing Procedures in Section V. Excessive/elevated moisture should not be present. Subfloor should be within acceptable moisture content as per manufacturers recommendation before installing.

If necessary, add moisture retarder before applying underlayment (Section V, Appendix AG)

Expansion space should be left around the perimeter or in accordance with manufacturers recommendation. Typical expansion is equal to the thickness of product installed.

Typically, subfloors are covered with a resilient material; foam or cork. Follow manufacturers instructions for correct materials and thickness.

Typically, floating engineered flooring is edge glued. Use an adhesive approved by the manufacturer. Apply adhesive at the spread rate to the side grooves and/or ends as recommended by the manufacturer. **Tapping block should be used against tongue only.**

Stagger end joints per manufacturers recommendation. Typical, 18-20".

XI. EXISTING FLOORING GUIDELINES

NOTE: Always follow the manufacturer's recommendations for installation over existing flooring.

Chapter 4, Engineered Floor

Glue down applications of Engineered wood flooring may be successful over existing sheet vinyl or vinyl tile. Some types of adhesives may require the use of a primer or vinyl blocker when installing over this type of surface.

Nail or staple down applications may be successful over existing sheet vinyl or vinyl tile if fastener penetration is not significantly diminished and the subfloor meets minimum requirements. (Particle board is not an acceptable underlayment.)

Sand off old finish and high spots on existing wood floor and prep to clean, dry, sound, flat subfloor. Repair, renail or replace loose flooring products.

Wood Flooring can be installed over existing ceramic tile, terrazzo, or marble with proper underlayment or adhesives only on manufacturer's recommendation.

SECTION II

PRODUCT SPECIFIC INFORMATION

CHAPTER 5

SOLID PLANK FLOOR

TONGUE AND GROOVE:

3/4" X 3", 4", 5", 6", 7" and up Unfinished/Factory Finished

I. Minimum Acceptable Jobsite Conditions and Checklist See Section 1

NOTE: With wider plank flooring, environmental conditions associated with a factory finished flooring product should be present.

II. Acclimation Guidelines

NOTE: Always follow the manufacturer's recommendation for acclimation.

Upon delivery check wood flooring moisture content (Section V, Appendix AB, AD and AE) to establish a baseline for required acclimation (Section 1, Chapter 1).

Acclimation depends on geographic location, interior climate control and time of year. See Definition of Acclimation under Section VI. Refer to Section V, Appendix AD and AE.

III. Subfloor Grade Levels (Section V, Appendix AF)

Above Grade: Solid plank wood floors can be installed successfully above grade level.

On Grade: Solid plank wood floors can be installed successfully on grade level.

Below Grade: SOLID WOOD FLOORS ARE NOT RECOMMENDED FOR BELOW GRADE INSTALLATIONS.

NOTE: The entire flooring level is considered to be BELOW grade where soil is present along any perimeter wall and is more than 3" above the installed wood flooring level. Ground should be sloped away from the house for proper drainage. Check local building codes. Local building codes prevail. Follow local building codes.

IV. Subfloor Guidelines – Wood Joist Systems – panel products or solid boards

NOTE: Always follow the manufacturers recommendation for proper subfloor

Chapter 5, Solid Plank Floor

NOTE: Subfloor/Underlayment panels should conform to the US Voluntary Product Standard PS 2-92 or PS 1-95 and/or Canadian performance standard CAN/CSA 0325.0-92 Construction Sheathing. Check underside of boards for codes.

NOTE: Solid board subflooring should be: 3/4" x 5 1/2", Group 1 dense softwoods, (SYP, Doug Fir, Larch, etc), No. 2 Common, Kiln dried less than 15% MC.

Check subfloor for performance stamp and/or specification agency.

Subfloor must be flat, clean, dry, structurally sound and free of squeaks and free of protruding nails/staples.

Test subflooring for moisture according to Moisture Testing Procedures in Section V, Appendix AB. Moisture content should be within 4% of average area environmental conditions. Section V, Appendix AD and AE.

For installations using mechanical fasteners of 1-1/2" and above, the subfloor should be flat to within 1/4" in 10' or 3/16" in 6'.

For paneled subflooring/underlayment – nailing schedule must be adequate, typical-every 6" along panel ends and every 12" along intermediate supports; all panel edges should exhibit spacing; edge swell should be flattened as necessary.

For board subflooring – Boards should be no wider than 6"; installed at 45 degree angle with all board ends full bearing on joists and nailed with 2, 8d nails; 1/4"-1/2" space should be present between board edges.

PREFERRED SUBFLOORING: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment (Exposure 1), 4' X 8' sheets; OR 3/4" (23/32", 18.3mm) OSB subfloor/underlayment, with joist spacing 19.2" (475mm) on center or less.

MINIMUM: 5/8" (19/32", 15.1mm) CDX Plywood subfloor/underlayment (Exposure 1) 4' X 8' sheets, maximum 16" (400mm) on center joist construction.

Follow panel manufacturer recommendations for spacing and fastening. Typical panel spacing and fastening for joist systems, 1/8" (3.2mm) around perimeter and fastened every 6" (150mm) on bearing edges and every 12" (300 mm) along intermediate supports.

NOTE: With minimum specified materials, at maximum span and spacing (i.e. greater than 19.2") plank flooring will exhibit minimum performance.

Minimum performance may result in the following conditions: movement, gaps, noises, and with site finished flooring finish delamination.

Chapter 5, Solid Plank Floor

For 3/4" (18.3mm) CDX Plywood and 23/32" (18.3mm) OSB, with joist systems spaced over maximum 19.2" (475mm) o/c requires an additional layer of plywood is required. Minimum requirement; 1/2" (15/32", 11.9mm) CDX plywood subfloor/underlayment,(Exposure 1) 4'X8'sheets. The 1/2"plywood should be offset by 1/2 panel in each direction to the existing subflooring. The panels may also be laid on a diagonal or perpendicular, with 1/8" spacing between sheets. Nail on a 6" minimum grid pattern-using ring shanked nails. Or brace between joists with 2X6 or wider boards every 24".

V. Subfloor Guidelines – Concrete Slab

NOTE: Always follow the manufacturers recommendation for proper subfloor.

Concrete must be flat, dry, structurally sound and clean.

NOTE: A moisture retarder with permeance equivalent to 4-mil polyethylene film is always required over the concrete slab and below the subflooring material.

Test concrete for moisture according to Moisture Testing Procedures in Section V, Appendix AA. Excess moisture should not be present.

Tolerance should be flat to within 3/16" in 10' or 1/8" in 6'.

For installations using mechanical fasteners of 1-1/2" and above, the subfloor should be flat to within 1/4" in 10' or 3/16" in 6'.

Substrate should be flattened to tolerance

Lightweight concrete (less than 3000 psi) where adhesive used has a higher psi rating than concrete, use with a Subfloor-Floated.

RULE OF THUMB: Draw a nail across the top and if it leaves an indentation, it is probably lightweight concrete, use Subfloor-Floated.

Before moisture testing begins, the slab must be cured for a MINIMUM of 30 days.

NAIL DOWN PLANK FLOORING MUST HAVE AN APPROVED SUBFLOOR OVER THE CONCRETE. PLANK CAN NOT BE SHOT TO THE CONCRETE. 3/4" PLANK CANNOT BE DIRECT GLUED TO CONCRETE. PLANK CANNOT BE GLUED AND NAILED DIRECT TO CONCRETE.

NOTE: Some manufacturers suggest direct glue installation of 3/4" plank in lengths less than 11 1/4". In such cases follow manufacturers recommendation.

NOTE: A MOISTURE RETARDER IS RECOMMENDED ANYTIME SOLID WOOD FLOORING IS INSTALLED OVER CONCRETE.

Chapter 5, Solid Plank Floor

Subfloor – Floated

NOTE: Always follow the manufacturers recommendation for proper subfloor

Add moisture barrier before applying underlayment. (Section V, Appendix AG)

PREFERRED Subfloor system: 2 layers 1/2" (15/32", 11.9mm) CDX Plywood subfloor/underlayment (Exposure 1), 4'X 8' sheets. MINIMUM Subfloor system: 2 layers 3/8" (10mm) CDX plywood subfloor/underlayment, (Exposure 1), 4'x8' sheets.

Place first plywood layer with edges parallel to wall, without fastening.

Plywood should be placed with 1/8" gaps between sheets

Lay second layer perpendicular or at 45 degree angle to first

Plywood should be placed with 1/8" gaps between sheets

3/4" minimum expansion space at all vertical obstructions and wall lines

Staple, screw, or nail second layer to first layer on 12" grid pattern.

ALTERNATE Subfloor: 3/4" (23/32", 18.3mm) CDX Plywood sheathing, (Exposure 1), 4'x8' sheets; cut to 16"X8' planks, scored on back 3/8" deep every 12" across width, 16" planks oriented perpendicular to direction of flooring, panels staggered every 2", and spaced 1/8" between ends and 1/4" to 3/4" between edges. 3/4" minimum expansion space at all vertical obstructions.

Glue Down Subfloor

NOTE: Always follow the manufacturers recommendation for proper subfloor

Add moisture barrier before applying underlayment. (Section V, Appendix AG)

PREFERRED Subfloor: 3/4" (23/32), 18.3mm) CDX Plywood sheathing, (Exposure 1), 4'x8' sheets.

For single layer system; Apply adhesive per manufacturers recommendations (typical spread rate – 30-35 sq.ft.per gallon with a 1/4"x 1/4" notched trowel), cut plywood to 16"X8' planks, or 2'x8' sections or 4'x4' sections, scored on back 3/8" deep (scoring for 16" planks every 12" across width, for 2' and 4' sections on a 12"X12" grid). 16" planks and 2' sections oriented perpendicular to direction of flooring, panels, staggered every 2', and spaced 1/8" between ends and 1/4" to 3/4" between edges. Space 4'x4' sections 1/8" to 1/4"

3/4" minimum expansion space at all vertical obstructions.

Nail Down Subfloor

NOTE: Always follow the manufacturers recommendation for proper subfloor

Chapter 5, Solid Plank Floor

Add moisture barrier before applying underlayment.

PREFERRED Subfloor system: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment, (Exposure 1), 4'X8' sheets.

Use full 4'x8' sheets or cut to 16"X8' planks, or 2'x8' sections. Full sheets oriented at 45 degrees (preferred) or perpendicular to direction of flooring. 16" planks and 2' sections oriented perpendicular to direction of flooring staggered every 2'. Space 1/8" between ends and 1/4" to 3/4" between panel edges. Panels are staggered, full sheets by 1/2" sheet for planks and sections every 2'.

Fasten every 12" and 6" from edge along the border for a minimum of 32 shots per 4'x8" sheet.

For 2' sections and 16" planks fasten every 12" along the length with 1 or 2 fasteners equally spaced from edges.

3/4" minimum expansion space at all vertical obstructions

NOTE: Fasteners may be powder driven pins, pneumatic driven nails, hand nails, screws, deformed pins, or other fasteners suitable for concrete application. Check with fastener distributor for specification such as length, drill size, and/or shot load where applicable.

Screed System

NOTE: Plank flooring 4" and wider cannot be installed directly to screeds.

Screed System must be overlaid with 3/4" (23/32" 18.3mm) Exposure 1, or 5/8" (19/32" 15.1mm), Exposure 1, CDX plywood subfloor/underlayment or 3/4" (23/32", 18.3mm) OSB underlayment properly spaced and oriented perpendicular to screed direction.

Screeds. 2"X 4" or 2"X 3" Group 1 species, pressure treated, kiln dried after treatment to 12% m.c. or less should be flat with minimum twist or crook, cut as necessary to maintain flatness, 18" - 48" long.

Use adhesive approved by the manufacturer

Set screeds with widest dimension in rivers of adhesive for 100% contact, space 1/8" at end joints, screed joints should be staggered and not fall directly under subfloor panel edges.

Lay screed runs maximum 16" on center at right angles to direction of finished floor, leaving 3/4" expansion at all vertical obstructions.

Lay 6-8 mil poly film over screeds

Chapter 5, Solid Plank Floor

VI. INSTALLATION

NOTE: Always follow the manufacturers recommended installation procedure.

Unfinished/Factory finished solid plank should be installed perpendicular to the joists or on a diagonal for any single layer subfloor. (exception, diagonal, solid subfloor boards, install perpendicular to joist or subfloor direction).

CAUTION: When laying 3/4" solid plank flooring parallel with the floor joists either add an additional layer of minimum 1/2" (15/32") CDX plywood underlayment to the existing subfloor (as previously recommended) or brace between joists with 2" X 6" or wider boards every 24" minimum. Subfloor must be within 4% moisture content of the hardwood floor before installing. Refer to Section V, Appendix AB.

Before installing wood flooring place 15 lb. asphalt saturated felt paper that meets ASTM Standard D4869 or use a building paper with an equivalent permeance over wood subfloor. REFER TO MANUFACTURERS RECOMMENDATION BEFORE PROCEEDING.

Snap a working line parallel to the starting wall allowing 3/4" expansion space between the starting wall and the edge of the first plank run.

A 3/4" expansion space must be left around the perimeter and at all vertical obstructions.

Plank is laid out in the same manner as strip flooring, alternating courses by widths. Start with the widest board, then the next width, etc., and repeat the pattern.

Lay one row of plank along the entire length of the working line.

Top and blind nail the first row (hand nail if necessary), using appropriate fasteners. Each succeeding row should be blind nailed with the nailing machine wherever possible. At the finishing wall and other obstructions, it may be necessary to blind nail by hand until top nailing is required.

Racking rule of thumb: Stagger end joint a minimum of 6" between pieces on adjacent rows, see figure 1-1. Avoid H joints

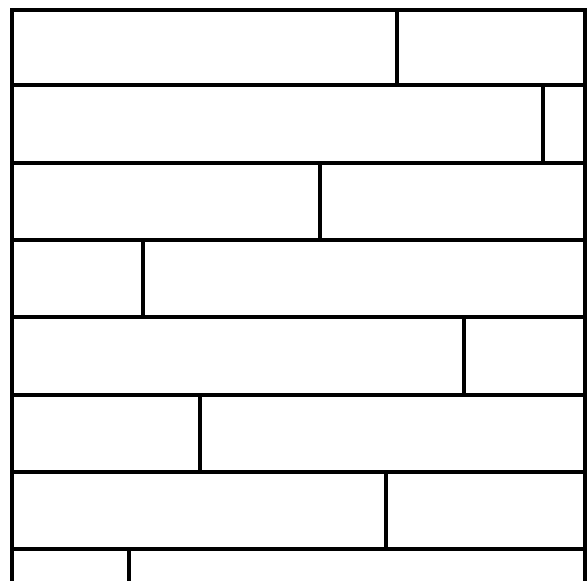


Figure 1-1 ACCEPTABLE

Chapter 5, Solid Plank Floor

Add each additional row of flooring, watching the pattern repeat and offsetting or staggering the end joints at least 6 inches.

On floors wider than 20' to minimize expansion: More or less spacing may be needed depending on geographical area, interior climate control and time of the year.. In some areas, additional spacing may not be necessary.

Where spacing is required: Use a washer or removable spacer to leave additional space every few rows and/or start in center of room and work out to both sides.

Nailing: Blind nail through the tongue using 2" barbed flooring cleat, 7d or 8d flooring nail, or 2" (15 gauge) staples with 1/2" crown. Use 1 1/2" length, fasteners with 3/4" plywood subfloor direct to concrete slab. Face nail boards where needed using 7d or 8d flooring nail – casing nail – galvanized nail – finishing nail, or flooring cleat. Fasteners should be spaced every 8".

For additional fastening, any of the following options may be used in addition to the nailing schedule.

FOLLOW Manufacturer's instructions for installing Plank Flooring.

It is general practice to countersink one or more No. 9 or No. 12 screws at each end of each plank. The wider the plank the more the general practice is used. Fill with wood putty or use plugs of the same or contrasting species as desired. Appropriate mastic may be applied to the ends of each board and/or on back or to the subfloor in addition to nailing schedule. This will make repair/replacement of boards very difficult.

Blind nail and face nail, as necessary, to complete the final rows.

VI. EXISTING FLOORING GUIDELINES

NOTE: Always follow the manufacturer's recommendations for installation over existing flooring.

Check existing flooring for soundness and repair and refasten as necessary.

Wood flooring can be nailed directly into existing sheet vinyl or vinyl tile if the subfloor is within NWFA guidelines (5/8" or thicker CDX grade plywood underlayment or 3/4"(23/32") or thicker OSB Underlayment Grade. (Particleboard is not an acceptable underlayment.)

Wood flooring can be nailed to existing flat, dry and structurally sound solid strip or plank wood floors by sanding high spots and laying the floor at a 45 to 90

Chapter 5, Solid Plank Floor

degree angle to the existing wood floor. Adding an additional 1/2" underlayment (minimum 3/8") allows for the floor to be installed in any direction.

Wood flooring can be installed over existing ceramic tile, terrazzo, or marble with proper underlayment only on manufacturers recommendation.

SECTION II

PRODUCT SPECIFIC INFORMATION

CHAPTER 6

SOLID STRIP FLOOR

TONGUE AND GROOVE
1 1/2", 2", 2 1/4", 3", 3 1/4", Widths
1/2", 3/4", 33/32", thick classification
3/8", 5/16", thin classification

SQUARE EDGE, Unfinished
5/16"X1 1/3", 1 1/2", 2", thin classification

I. Minimum Acceptable Jobsite Conditions and Checklist See Section 1

II. Acclimation Guidelines

NOTE: Always follow the manufacturer's recommendation for acclimation.

Upon delivery check wood flooring moisture content (Section V, Appendix AB, AD and AE) to establish a baseline for required acclimation (Section 1, Chapter 1).

Acclimation depends on geographic location, interior climate control and time of year. See Definition of Acclimation under Section VI. Refer to Section V, Appendix AD and AE.

III. Subfloor Grade Levels (Section V, Appendix AF)

Above Grade: Solid strip wood floors can be installed successfully above grade level.

On Grade: Solid strip wood floors can be installed successfully on grade level.

Below Grade: SOLID WOOD FLOORS ARE NOT RECOMMENDED FOR BELOW GRADE INSTALLATIONS.

NOTE: The entire flooring level is considered to be BELOW grade where soil is present along any perimeter wall and is more than 3" above the installed wood flooring level. Ground should be sloped away from the house for proper drainage. Check local building codes. Local building codes prevail. Follow local building codes.

Chapter 6, Solid Strip Floor

IV. Subfloor Guidelines – Wood Joist Systems – panel products or solid boards

NOTE: Always follow the manufacturers recommendation for proper subfloor

NOTE: Subfloor/Underlayment panels should conform to the US Voluntary Product Standard PS 2-92 or PS 1-95 and/or Canadian performance standard CAN/CSA 0325.0-92 Construction Sheathing. Check underside of boards for codes.

NOTE: Solid board subflooring should be: 3/4" x 5 1/2", Group 1 dense softwoods, (SYP, Doug Fir, Larch, etc), No. 2 Common, Kiln dried less than 15% MC.

Check subfloor for performance stamp and/or specification agency.

Subfloor must be flat, clean, dry, structurally sound and free of squeaks and free of protruding fasteners.

Test subflooring for moisture according to Moisture Testing Procedures in Section V, Appendix AB. Moisture content should be within 4% of average area environmental conditions. Section V, Appendix AD and AE.

For installations using mechanical fasteners of 1-1/2" and above, the subfloor should be flat to within 1/4" in 10' or 3/16" in 6'.

For gluedown installations and installations using mechanical fasteners of less than 1-1/2", the subfloor should be flat to within 3/16" in 10' or 1/8" in 6'.

For paneled subflooring/underlayment – nailing schedule must be adequate, typical-every 6" along panel ends and every 12" along intermediate supports; all panel edges should exhibit spacing; edge swell should be flattened as necessary.

For board subflooring – Boards should be no wider than 6"; installed at 45 degree angle with all board ends full bearing on joists and nailed with 2, 8d nails; 1/4"-1/2" space should be present between board edges.

NOTE: Thick classification flooring can be installed directly over board subflooring. Thin classification flooring must have a minimum 1/4" plywood underlayment installed over the board subflooring.

Thick classification-

PREFERRED SUBFLOORING: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment (Exposure 1), 4' X 8' sheets; OR 3/4" (23/32", 18.3mm) OSB subfloor/underlayment, with joist spacing 19.2" (475mm) on center or less.

MINIMUM: 5/8" (19/32", 15.1mm) CDX Plywood subfloor/underlayment (Exposure 1) 4' X 8' sheets, maximum 16" (400mm) on center joist construction.

Chapter 6, Solid Strip Floor

Thin classification-

MINIMUM SUBFLOORING: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment (Exposure 1), 4' X 8' sheets; OR 3/4" (23/32", 18.3mm) OSB subfloor/underlayment, with joist spacing 19.2" (475mm) on center or less.

Follow panel manufacturer recommendations for spacing and fastening. Typical panel spacing and fastening for joist systems, 1/8" (3.2mm) around perimeter and fastened every 6" (150mm) on bearing edges and every 12" (300 mm) along intermediate supports.

NOTE: With minimum specified materials, at maximum span and spacing (i.e. greater than 19.2") plank flooring will exhibit minimum performance. Minimum performance may result in the following conditions: movement, gaps, noises, and with site finished flooring finish delamination.

For 3/4" (18.3mm) CDX Plywood and 23/32" (18.3mm) OSB, with joist systems spaced over maximum 19.2" (475mm) o/c requires an additional layer of plywood is required. Minimum requirement; 1/2" (15/32", 11.9mm) CDX plywood subfloor/underlayment, (Exposure 1) 4'X8' sheets. The 1/2" plywood should be offset by 1/2 panel in each direction to the existing subflooring. The panels may also be laid on a diagonal or perpendicular, with 1/8" spacing between sheets. Nail on a 6" minimum grid pattern-using ring shanked nails. Or brace between joists with 2X6 or wider boards every 24".

V. Subfloor Guidelines – Concrete Slab

NOTE: Always follow the manufacturers recommendation for proper subfloor

Concrete must be flat, dry, structurally sound and clean.

NOTE: A moisture retarder with permeance equivalent to 4-mil polyethylene film is always required over the concrete slab and below the subflooring material.

Test concrete for moisture according to Moisture Testing Procedures in Section V, Appendix AA. Excess moisture should not be present.

Tolerance should be flat to within 3/16" in 10' or 1/8" in 6'.

For installations using mechanical fasteners of 1-1/2" and above, the subfloor should be flat to within 1/4" in 10' or 3/16" in 6'.

Substrate should be flattened to tolerance.

Lightweight concrete (less than 3000 psi) where adhesive used has a higher psi rating than concrete, use with a Subfloor-Floated.

Chapter 6, Solid Strip Floor

RULE OF THUMB: Draw a nail across the top and if it leaves an indentation, it is probably lightweight concrete, use Subfloor-Floated.

Before moisture testing begins, the slab must be cured for a MINIMUM of 30 days.

NAIL DOWN STRIP FLOORING MUST HAVE AN APPROVED SUBFLOOR OVER THE CONCRETE. STRIP CANNOT BE SHOT TO THE CONCRETE. 3/4" STRIP CANNOT BE DIRECT GLUED TO CONCRETE.

SOME MANUFACTURERS SUGGEST DIRECT GLUE TO CONCRETE INSTALLATION OF 3/4" SOLID STRIP IN LENGTHS OF LESS THAN 11 1/4" and 1/2" THICK AND THINNER SOLID STRIP FLOORING REGARDLESS OF LENGTH. IN SUCH CASES, FOLLOW MANUFACTURERS RECOMMENDATIONS.

Subfloor – Floated

NOTE: Always follow the manufacturers recommendation for proper subfloor

Add moisture barrier before applying underlayment. (Section V, Appendix AG)

PREFERRED Subfloor system: 2 layers 1/2" (15/32", 11.9mm) CDX Plywood subfloor/underlayment (Exposure 1), 4'X 8' sheets. MINIMUM Subfloor system: 2 layers 3/8" (10mm) CDX plywood subfloor/underlayment, (Exposure 1), 4'x8' sheets.

Place first plywood layer with edges parallel to wall, without fastening.

Plywood should be placed with 1/8" gaps between sheets

Lay second layer perpendicular or at 45 degree angle to first

Plywood should be placed with 1/8" gaps between sheets 3/4" minimum expansion space at all vertical obstructions and wall lines Staple, screw, or nail second layer to first layer on 12" grid pattern.

ALTERNATE Subfloor: 3/4" (23/32", 18.3mm) CDX Plywood sheathing, (Exposure 1), 4'x8' sheets; cut to 16"X8' planks, scored on back 3/8" deep every 12" across width, 16" planks oriented perpendicular to direction of flooring, panels staggered every 2", and spaced 1/8" between ends and 1/4" to 3/4" between edges.

3/4" minimum expansion space at all vertical obstructions.

Glue Down Subfloor

NOTE: Always follow the manufacturers recommendation for proper subfloor

Add moisture barrier before applying underlayment. (Section V, Appendix AG)

Chapter 6, Solid Strip Floor

Thick classification-

Subfloor: 3/4" (23/32), 18.3mm) CDX Plywood sheathing, (Exposure 1), 4'x8' sheets.

For single layer system; Apply adhesive per manufacturers recommendations (typical spread rate – 30-35 sq.ft.per gallon with a 1/4"x 1/4" notched trowel), cut plywood to 16"X8' planks, or 2'x8' sections or 4'x4' sections, scored on back 3/8" deep (scoring for 16" planks every 12" across width, for 2' and 4' sections on a 12"X12" grid). 16" planks and 2' sections oriented perpendicular to direction of flooring, panels staggered every 2', and spaced 1/8" between ends and 1/4" to 3/4" between edges. Space 4'x4' sections 1/8" to 1/4"

Thin classification, tongue and groove – including 1/2" thick flooring.

MINIMUM SUBFLOORING: 5/8" (19/32", 15.1mm) CDX Plywood sheathing, Exposure 1, 4'X8' sheets.

For single layer system: Apply adhesive per manufacturers recommendations (typical spread rate- 30-35 sq. ft. per gallon with a 1/4"X 1/4" notched trowel), cut plywood to 16"X8' planks, or 2'x8' sections or 4'x4' sections, scored on back 5/16" deep (scoring—for 16" planks every 12" across width, for 2' and 4' section on a 12" X 12" grid). 16" planks and 2' sections oriented perpendicular to direction of flooring, panel staggered every 2' and spaced 1/8" between ends and 1/4" to 3/4" between edges. Space 4'X4' sections 1/8" to 1/4".

1/2" minimum expansion space at all vertical obstructions.

Nail Down Subfloor

NOTE: Always follow the manufacturers recommendation for proper subfloor

Add moisture barrier before applying underlayment.

Thick classification-

PREFERRED Subfloor system: 3/4" (23/32", 18.3mm) CDX Plywood subfloor/underlayment, (Exposure 1), 4'X8' sheets.

Use full 4'x8' sheets or cut to 16"X8' planks, or 2'x8' sections. Full sheets oriented at 45 degrees (preferred) or perpendicular to direction of flooring. 16" planks and 2' sections oriented perpendicular to direction of flooring staggered every 2'. Space 1/8" between ends and 1/4" to 3/4" between panel edges. Staggered joints, full sheets by 1/2 sheet, for planks and sections by 2'.

Fasten every 12" and 6" from edge along the border for a minimum of 32 shots per 4'x8" sheet.

Chapter 6, Solid Strip Floor

For 2' sections and 16" planks fasten every 12" along the length with 1 or 2 fasteners equally spaced from edges.

3/4" minimum expansion space at all vertical obstructions

Thin classification, tongue and groove-including 1/2" thick flooring.

MINIMUM SUBFLOORING: 5/8" (19/32", 15.1mm) CDX Plywood sheathing, (Exposure 1), 4'x8' sheets.

Use full 4'x8' sheets or cut to 16"X8' planks, or 2'x8' sections. Full sheets oriented at 45 degrees (preferred) or perpendicular to direction of flooring. 16" planks and 2' sections oriented perpendicular to direction of flooring staggered every 2'. Space 1/8" between ends and 1/4" to 3/4" between panel edges. Staggered joints, full sheets by 1/2 sheet, for planks and sections by 2'.

Fasten every 12" and 6" from edge along the border for a minimum of 32 shots per 4'x8" sheet.

For 2' sections and 16" planks fasten every 12" along the length with 1 or 2 fasteners equally spaced from edges.

1/2" minimum expansion space at all vertical obstructions

NOTE: Fasteners may be powder driven pins, pneumatic driven nails, hand nails, screws, deformed pins, or other fasteners suitable for concrete application. Check with fastener distributor for specification such as length, drill size, and/or shot load where applicable.

Screed System

NOTE: Only 3/4" and 33/32" tongue and groove strip flooring may be installed directly to screeds.

Screeds. 2"X 4" or 2"X 3" Group 1 species, pressure treated, kiln dried after treatment to 12% m.c. or less should be flat with minimum twist or crook, cut as necessary to maintain flatness, 18" - 48" long.

Thin classification, tongue and groove – including 1/2" thick flooring.

For screed runs spaced maximum 16" on center and 1/2" and thinner flooring a subfloor is required. Screed should be at right angles to direction of finished floor. MINIMUM SUBFLOORING: 5/8" (19/32", 15.1mm) CDX Plywood sheathing, (Exposure 1), 4'x8' sheets. Set screeds with widest dimension in rivers of adhesive for 100% contact, space 1/8" at end joints, screed joints should be staggered and not fall directly under subfloor panel edges.

Chapter 6, Solid Strip Floor

Use cold bond adhesive or adhesive approved by the manufacturer

Lay screed runs maximum 12" on center at right angles to direction of finished floor, leaving 3/4" expansion at all vertical obstructions. For flooring grades averaging less than 2 1/2' long screed run spacing maximum 9" on center, leaving 3/4" expansion at all vertical obstruction.

Lay 6-8 mil poly film over screeds

1/2" minimum expansion space at all vertical obstructions.

VI. INSTALLATION (Tongue and Groove Flooring)

NOTE: Always follow the manufacturers recommended installation procedure.

Unfinished/Factory finished solid plank should be installed perpendicular to the joists or on a diagonal for any single layer subfloor. (exception, diagonal, solid sub-floor boards, install perpendicular to joist or subfloor direction).

CAUTION: When laying 1/2", 3/4" and 33/32" solid plank flooring parallel with the floor joists either add an additional layer of minimum 1/2" (15/32") CDX plywood underlayment to the existing subfloor (as previously recommended) to the existing subfloor or brace between joists with 2" X 6" or wider boards every 24" minimum.

NOTE: Do not lay thin classification flooring parallel to joists.

Subfloor must be within 4% moisture content of the hardwood floor before installing. Refer to Section V, Appendix AB.

Before installing wood flooring place #15 lb. asphalt saturated felt paper that meets ASTM Standard D4869 or use a building paper with an equivalent permeance over wood subfloor. REFER TO MANUFACTURERS RECOMMENDATION BEFORE PROCEEDING.

Snap a working line parallel to the starting wall allowing 3/4" expansion space (Expansion space will typically equal the thickness of the flooring installed.) between the starting wall and the edge of the first plank run.

A 3/4" expansion space must be left around the perimeter and at all vertical obstructions.

Lay one row of strip along the entire length of the working line.

Chapter 6, Solid Strip Floor

Top and blind nail the first row (hand nail if necessary), using appropriate fasteners. Each succeeding row should be blind nailed with the nailing machine wherever possible. At the finishing wall and other obstructions, it may be necessary to blind nail by hand until top nailing is required.

Racking rule of thumb: Stagger end joint a minimum of 6" between pieces on adjacent rows, see figure 1-1. Avoid H joints

Add each additional row of flooring, watching the pattern repeat and offsetting or staggering the end joints at least 6 inches.

On floors wider than 20' to minimize expansion: More or less spacing may be needed depending on geographical area, interior climate control and time of the year.. In some areas, additional spacing may not be necessary.

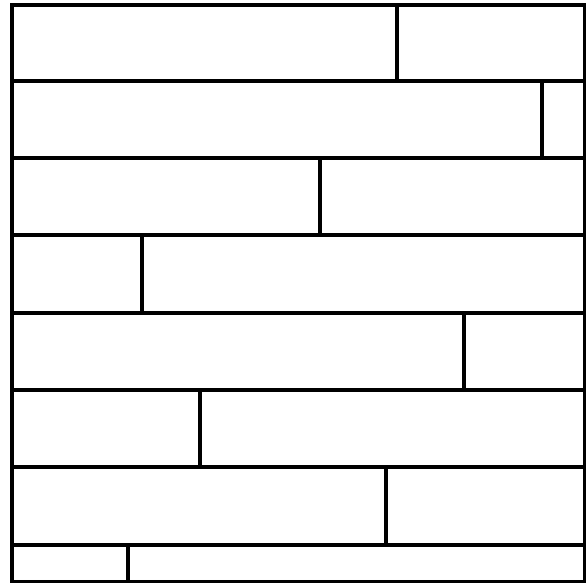


Figure 1-1 ACCEPTABLE

Where spacing is required: Use a washer or removable spacer to leave additional space every few rows and/or start in center of room and work out to both sides.

Nailing: Blind nail through the tongue using 2" barbed flooring cleat, 7d or 8d flooring nail, or 2" (15 gauge) staples with 1/2" crown. Use 1 1/2" length, fasteners with 3/4" plywood subfloor direct to concrete slab. Face nail boards where needed using 7d or 8d flooring nail – casing nail – galvanized nail – finishing nail, or flooring cleat. Fasteners should be spaced every 8".

Blind nail and face nail, as necessary, to complete the final rows.

VII. INSTALLATION (Square Edge Thin Flooring)

NOTE: Always follow the manufacturers recommended installation procedure.

Unfinished solid square edge strip flooring should be installed perpendicular to the joists or on a diagonal for any single layer subfloor.

Subfloor must be within 4% moisture content of the properly acclimated wood floor before installing. Refer to Section V, Appendix AB.

NOTE: Do not use asphalt products under square edge flooring.

Chapter 6, Solid Strip Floor

Snap a working line parallel to the starting wall allowing 5/16" expansion space between the starting wall and the edge of the first strip run.

A 5/16" expansion space must be left around the perimeter and all vertical obstructions.

Lay one row of strip along the entire length of the working line.

Top nail the first row (hand nail, if necessary), using the appropriate fasteners as recommended by the manufacturer. Nailing should be 2 nails every 7" along the length of the strip for 1 1/2", and 2" flooring. For 1 1/3" flooring, 1 nail every 5". Each succeeding row should be top nailed with the nailing machine. (Do not use an air operated finish nailer for nailing) Set all nails.

Racking rule of thumb: Stagger end joint a minimum of 6" between pieces on adjacent rows, see figure 1-1. Avoid H joints.

Add each additional row of flooring offsetting or staggering the end joints at least 6 inches.

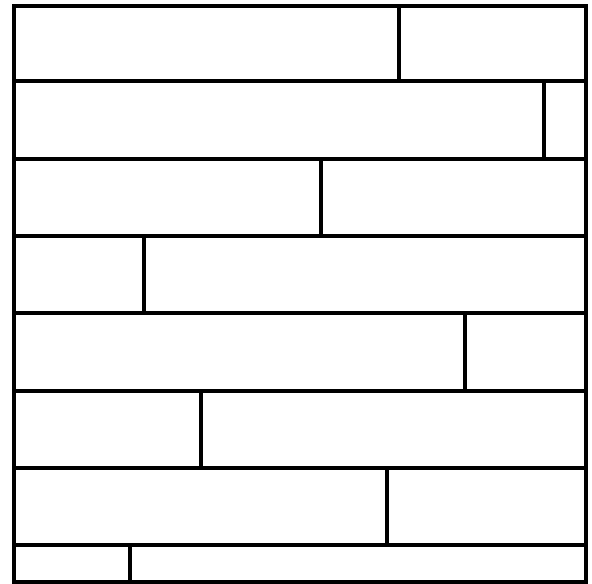


Figure 1-1 ACCEPTABLE

VII. EXISTING FLOORING GUIDELINES

NOTE: Always follow the manufacturer's recommendations for installation over existing flooring.

Check existing flooring for soundness and repair and refasten as necessary.

Wood flooring can be nailed directly into existing sheet vinyl or vinyl tile if the sub-floor is within NWFA guidelines (5/8" 19/32") or thicker CDX grade plywood underlayment or 3/4" (23/32") or thicker OSB underlayment. (Particleboard is not an acceptable underlayment.)

Wood flooring can be nailed to existing flat, dry and structurally sound solid strip or plank wood floors by sanding high spots and laying the floor at a 45 to 90 degree angle to the existing wood floor. Adding an additional 1/2" underlayment (minimum 3/8") allows for the floor to be installed in any direction.

Wood flooring can be installed over existing ceramic tile, terrazzo, or marble with proper underlayment only on manufacturers recommendation.