LAYOUT

PART I
Working Lines

Working lines are guidelines drawn or marked on the subfloor. Some are critical measurements, such as the primary or secondary lines, while others can be placed as guides to stop nailing or spreading adhesive, or to aid in layout of the different parts of the floor.

A. Working lines should be measured from the longest, straightest, continuous line in the room.

   1. On wood subfloors, measure off of subfloor seams or the longest, straightest, continuous wall in the room to find working lines.
   2. On concrete subfloors, measure off of the longest, straightest, continuous wall in the room to find working lines.

B. A chalk line is a very simple tool that performs an essential task: it provides a perfectly straight line. A chalk line with a fine braided string can leave a much finer line for precision work with less ghosting of the chalk.

C. Working lines should be identified on the subfloor by using different colors of chalk or by labeling them to avoid confusion between lines.

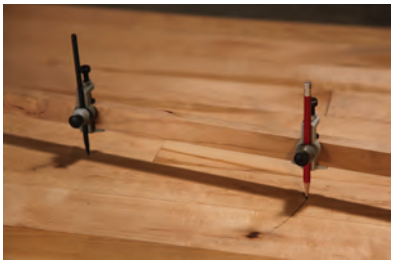
D. For working lines that connect to a wall, make a mark on the wall to indicate the line's location in the event that the working line on the subfloor is covered during installation.

E. To prevent working lines from being erased or worn away, apply a quick-dry aerosol spray poly or lacquer over the lines.

F. When using a sheet-goods vapor retarder, mark your working lines on the subfloor and then transfer those lines to the secured-in-place vapor retarder.

PART II
Trammel Points

A. Trammel points (bar and compass) consist of two compass points that are mounted or attached to a beam. They are used in situations where a traditional compass is too small for the area, which makes them ideal for wood flooring. The beam should be a minimum of 4' in length. A longer beam will be beneficial for larger floor spaces.

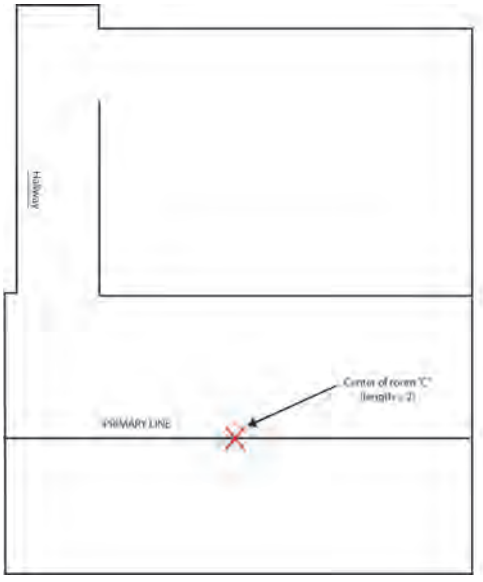


B. Trammel points are a simple and accurate method for laying out working lines. They can be used to draw circles or to scribe arcs as reference points for laying out working lines. Attach a pen or pencil to one of the points.

C. To find center and to square any room for a wood floor layout using trammel points, follow these steps:

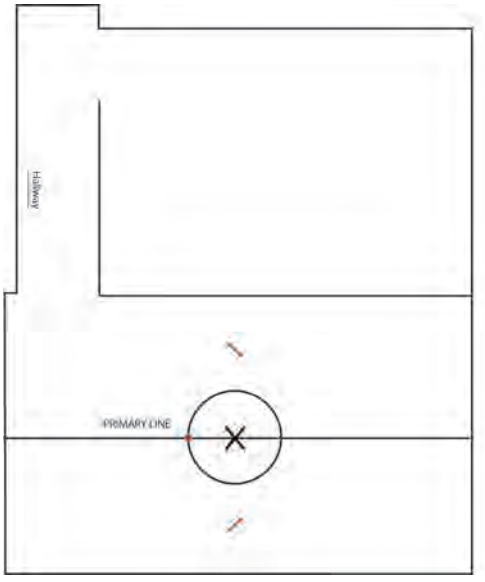
   1. Measure the width of the room. Measuring from the same wall at opposite ends of the room, measure the width of the room and divide the width by two to find the center-point. Mark these points on the subfloor.
   2. Adjust the centerline where necessary to promote a visually attractive layout. Oblique adjustments to compensate for unsquared walls or other permanent fixtures are sometimes necessary. Parallel adjustments to off-center focal points (window, door, or fireplace) are sometimes necessary as well. These conditions should be discussed with the end-user/builder before continuing the installation.
   3. Snap a line across the length of the room, connecting the center-point marks. This line is your primary line.

4. Measure the length of the primary line and divide by two to find the center-point. Mark this point on the subfloor. This point is the now the center point of the room (point "C").

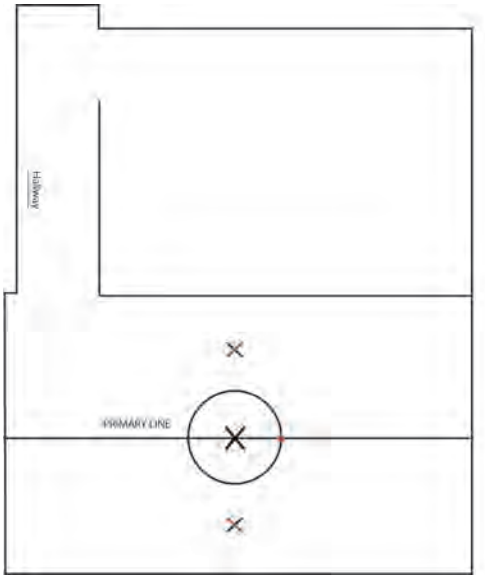


5. Place the trammels at a distance approximately half the length of the beam you are using.
6. Place one trammel point end (to remain fixed in position) on point "C". From point "C", use the marking end of the trammel to draw a circle on the subfloor.

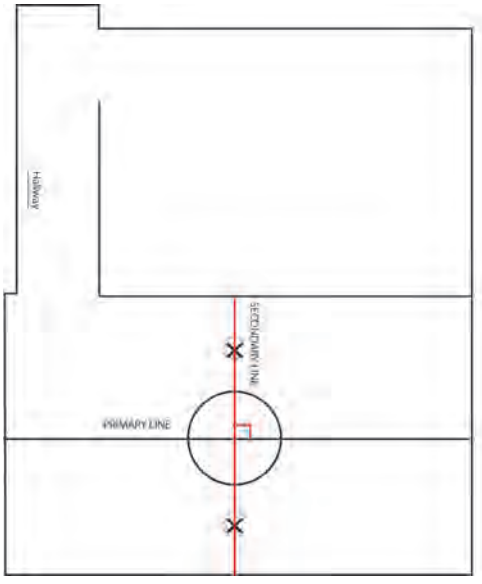
7. Extend the trammel point distance on the beam by approximately 40% (if possible).
8. Place the trammel point end at one of the locations where the circle intersects the primary line. Use the marking point of the trammel to draw an arc above and an arc below the primary line, as near to perpendicular to the center mark point "C" as possible.



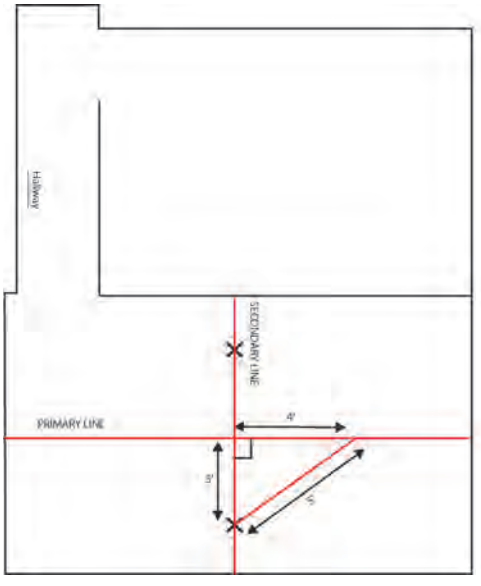
9. Move the trammel point end to the opposite location where the circle intersects the primary line. Use the marking point of the trammel to draw an arc above and an arc below the primary line, as near to perpendicular to the center mark point "C" as possible, crossing the marks made in the previous step.



10. Snap a line across the length of the room, perpendicular to the primary line, connecting the marks. This line is your secondary line, and should be perpendicular to the primary line.



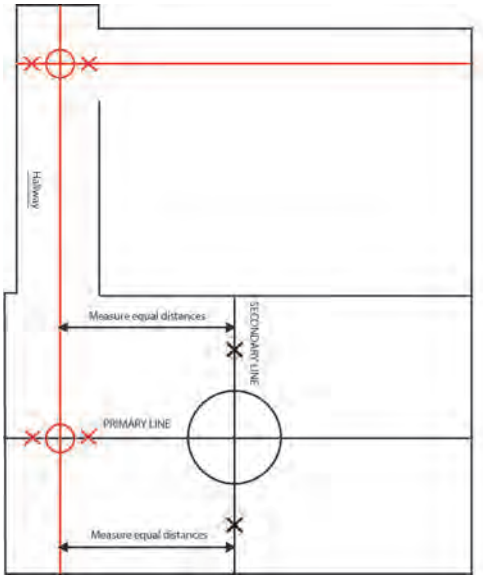
D. You can also square a room or check that your lines are perpendicular by using the 3-4-5 rule.



1. **3-4-5 rule**: This rule says that if one side of a triangle measures 3 and the adjacent side measures 4, then the diagonal between those two points must measure 5 in order for it to be a right triangle.
2. It doesn't matter which unit of measurement you use, as long as you keep it the same for all three sides. It can be 3-4-5 feet, 6-8-10 meters, or any multiple of 3-4-5.

PART III
Transferring Lines

A. Transfer the lines by using the trammel points at locations along the primary or secondary lines that can allow you to extend the working lines through doorways and into other rooms. Or measure off of the primary or secondary line to determine new working lines that may be extended.



B. Use the same method to square adjoining room with perpendicular lines. Complete this process for each room receiving wood flooring.

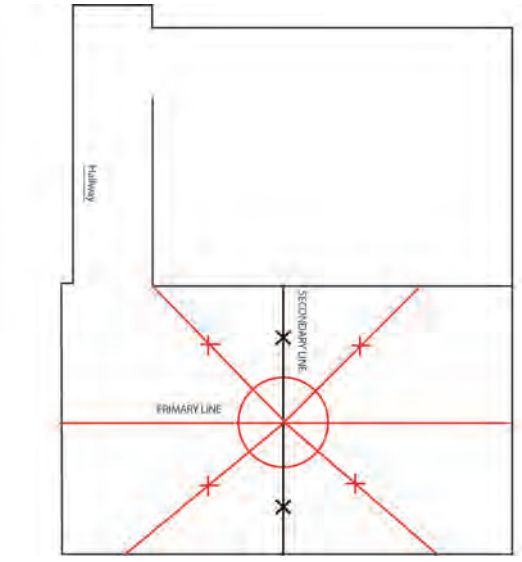
C. It is important to not wait until the end to verify lines. If you are off on the first secondary line and then move that to adjoining rooms without verifying, then the lines will be wrong in all rooms. Laying out working lines will help guide the installation.

PART IV
45° Angles

To create perfect 45° angle lines for diagonal installations, asymmetrical layouts, or for patterned floors, using trammel points:

A. Extend the trammel points on the beam to dissect each quadrant using the same method as detailed in the Trammel Points section.

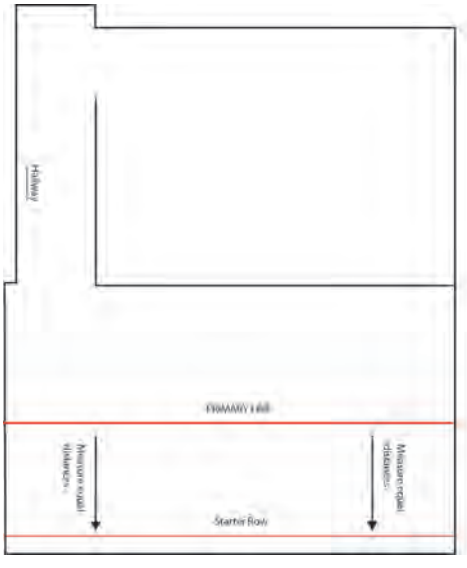
B. Snap a line that bisects (divides in half) each quadrant. This bisecting method can be repeated again and again between any 2 adjacent radial lines (emanating from a common point) to divide the angle the two lines make, in half.



PART V
Wall-Layout

A. Choose a starting wall according to the most aesthetically or architecturally important elements in the room, taking into consideration doorways, fireplaces, cabinets, and transitions, as well as the overall squareness of the room. The starting wall will often be the longest unbroken wall in the room.

B. Transfer the working line back to and parallel with the starting wall, allowing necessary expansion space between the starting wall and the edge of the first strip or plank run.



C. Prior to installing the flooring, secure a straight edge (starter board) inside the chalk line to act as a guide and to prevent the row of planks from shifting during installation. The straight edge could be a straight piece of lumber or piece of flooring. This is temporary and will be replaced as the floor is completed.

D. Lay one row of flooring along the entire length of the working line, proceed with the installation.

PART VI
Center-Layout

A. Beginning the installation from a center-point in the room allows for the installation to progress in two opposite directions.

B. Find the center of the room, square the floor and snap a line down the center of that room.

C. Install a starter/backer board along the line. Fasten the starter/backer board to the subfloor using an appropriate fastening mechanism (wood subfloors may be screwed; concrete subfloors may be set with temporary adhesive or pressure-sensitive tape).

D. Install the first row of wood flooring against the starter board, being careful not to move the starter board when nailing. Generally, the groove of the flooring should be against the starter board.

E. Use the appropriate installation method to install several rows of wood flooring. Use the installation methods detailed in the appropriate section, and per manufacturer instructions.

F. After installing in one direction, remove the starter/backer board.

G. Install a spline or a slip tongue in the groove of the board that was against the straightedge. Put wood flooring adhesive down the entire length of the groove before installing the spline.

H. To keep the spline in alignment for the next flooring board, use a scrap piece of wood flooring to run along the length of the spline.

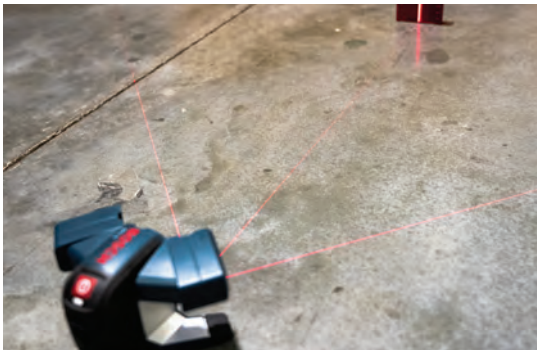
I. Install the remaining rows in the opposite direction. Use the installation practices as necessary for the flooring being installed.

J. Runs of flooring should generally be installed straight. Unless otherwise required, the installed wood flooring should not deviate from a straight line more than 3/16" in 10'.

PART VII
Lasers

A. Caution when using any lasers. Never stare directly at, or direct a laser beam toward any persons or animals, as doing so can lead to serious eye injury or blindness. Read and understand all safety precautions and proper usage of any laser-producing tools.

B. Laser-layout tools can assist in accuracy and speed in floor layout. Most laser layout tools have a primary beam line and a perpendicular beam, and often incorporate a 45-degree beam, as well. More-advanced lasers also have lights to align floor layout to tray ceilings, chandeliers, and other features above the floor.



C. General guidelines for using a laser as a layout tool:
   1. Designate a location flat on the floor within the room.
   2. Place laser targets and align the laser to target both marks.
   3. The width of the laser line changes with increased distance. Accuracy can be affected by any increase in distance measurements.
   4. Mark lines onto the floor accordingly and snap chalk lines.

D. Not all lasers can establish diagonal lines. To establish a diagonal working line, trammel points or the method described in the following section, "Diagonal Layout," can be used.