An Illustrator user sent me a file with some patterns that he couldn't get to tile correctly. This file was my reply.

Your problem pattern swatches are not constructed to tile correctly. The easiest way to see this is to put two copies of the pattern tile side by side, with a clipping mask set to be the same as the tiling rectangle.

Below are two copies of your Loading Zone swatch:



If you select each of the groups above (or look at them in Outline view), you will see that the two background rectangles are exactly snapped together, but your diagonal lines don't meet at the edges.

The diagonal lines are also not evenly spaced (they range from 9 pts apart to 13 pts apart), and your background rectangle is 101.824 pts x 101.761 pts.

By far the easiest way to make seamless diagonal stripes is to define your pattern with straight horizontal or vertical lines, and then rotate the fill within the object. That way a single pattern can suffice for any angle of stripes or checks. I will get back to that method later. But first it may be instructive to learn how to build 45° diagonal stripe patterns directly.

You begin by laying down a single diagonal line (click with the pen tool, then hold down the shift key and click again to constrain to exactly 45°.)



Next double-click on the black arrow tool or use the Move command from the Transform menu to bring up the Move dialog. Enter a horizontal move distance for your desired spacing. I have chosen 11 pts here because it is about the average spacing of your yellow lines. Leave the vertical move distance at zero!

Click the Copy button, and then hit Cmd-D to make a bunch more copies.



When you have enough copies to completely cover a square (it is OK to make some extras and then delete them), Option/Alt-click the Rectangle tool in the center of your area, and enter a height and width that are a multiple of the spacing you used in the Move command, and small enough to fit within the area you've filled with stripes. For example, since I moved these yellow lines 11 pts, I could make my rectangle 33 pts by 33 pts or 44 pts by 44 pts, or 55 pts by 55 pts, etc. What these dimensions do is ensure that the diagonal lines cross at the same place on the left and right, and on the top and bottom, as shown by the blue guides. If the tile were a different size, they wouldn't match up.

(I've given the tile box a thin stroke above just so you can see it, but you won't want to leave it stroked.)



Change the stroke to a fill only, and send the rectangle to the back. Duplicate it in back (Cmd-C, Cmd-B) and remove the fill from the back copy.

At this point you could define your pattern even with the full diagonal lines sticking out (it would tile the same), but just to make the tile design look a little neater you can chop off the dangling edges. Just make sure to leave enough sticking out that the full stroke width on the stripes is inside the tiling box.

Here is how the Loading Zone pattern looks with the above tile definition:



Here is the same kind of demonstration with two sideby-side copies of your Construction Zone swatch:



As you can see, the diagonal lines do not match up. The rectangle is 143.74 by 146.948 pts, and the lines are spaced anywhere from 5.7 to 12 pts apart.

The same technique can be used to construct diagonal checks. The most important thing to remember is to make your tile box dimensions be a multiple of the horizontal distance (or vertical distance) that you copy-moved a single diagonal stripe. The mistake most people make is first constructing an arrangement of horizontal or vertical lines and then rotating that grid by 45°. But doing that would mean your tile box would have to be a multiple of the square root of 2 times whatever spacing you used between your lines before rotating them.

Below I have normalized the check spacing to 8 pts horizontal separation. First I made an X by copy-rotating 90 degrees, and then I copy-moved it 8 pts to the right 13 times.



After copy steps

Trimmed

The tiling box used is 56 pts by 56 pts (select it or go to Outline view to see it.) But any multiple of 8 pts that fit within the checkered area would work.

Here is how the revised pattern looks:





(It gets pretty bad anti-aliasing on screen, but looks good zoomed in or printed.)



OK, now for the promised tip about rotating pattern fills that are defined with straight lines. Above we have a pattern for green stripes. (I put a thin blue stroke on the tile box just so you could see it. Of course it is not there in the swatch definition.) Notice that there is only one swatch for these stripes in the palette. But I can apply that swatch to multiple objects, and rotate or scale the fill. All of the ovals below are filled with the same pattern.



To rotate (or scale) a pattern within an object, you can click to bring up the Scale or Rotate dialog, and check the "Patterns" box, and uncheck the "Objects" box. Or you can check "Transform Pattern Only" in the Transform palette's menu. Or you can hold down the tilde ~ key while dragging.



Another cool trick you can do with patterns is make the base pattern have a transparent background (like these green stripes and the Construction Zone checks), and then use the Add New Fill command in the Appearance palette to put a solid color background behind the pattern. You can also overlay two pattern fills. The red and green checks above have one red fill layer, and two layers of the Green Stripes pattern, one rotated 30 degrees, and the other rotated 120 degrees. If you have a fill row highlighted in the Appearance palette, the Pattern Only transforms that you do will apply to that fill layer only.

Multi-fill appearances such as the above can be stored in the Styles palette, so that you can apply them to objects just as easily as you do swatches. (Open the Styles palette of this document to see.)