

## Pervious Concrete and Joint Layout

The joint layout for pervious concrete more or less follows the basic rules for standard concrete, the most important being: sections should be square or close to square with a maximum width to length ratio of 1:1.5 to minimize cracking. After that, however, the similarities end.

With a regular concrete pour of a large area, for example 45' x 100', the perimeter would be formed, and the entire area poured in one placement. After the concrete sets, you then snap chalk lines in the desired pattern and cut the joints. While some patterns will of course perform better than others to prevent random cracks, you have quite a bit of freedom regarding joint placement. Any direction, angle, or spacing can be done. This is not the case with pervious concrete. When installing pervious concrete we have a number of placement constraints that do not exist with regular concrete, which directly impact joint layout.

Due to the unique properties and requirements of pervious concrete during placement and equipment used, we cannot pour large areas in one shot and then come back to cut joints as you can with regular concrete as described above. Because pervious concrete contains much less water than regular concrete and has an open matrix, it is very sensitive to moisture loss which will weaken the concrete. This is why pervious concrete is cured after placement with a 6 mil. plastic sheeting to lock in the moisture for maximum hydration. It is very important that the pavement be covered quickly to minimize moisture loss, and this is best accomplished by keeping the pour area to a manageable size. In addition, the equipment we use limits our width to about 18', although we prefer to keep it to 16' or under for better quality control. For these reasons, we form and pour in lanes, as shown in the photo below in figure A.

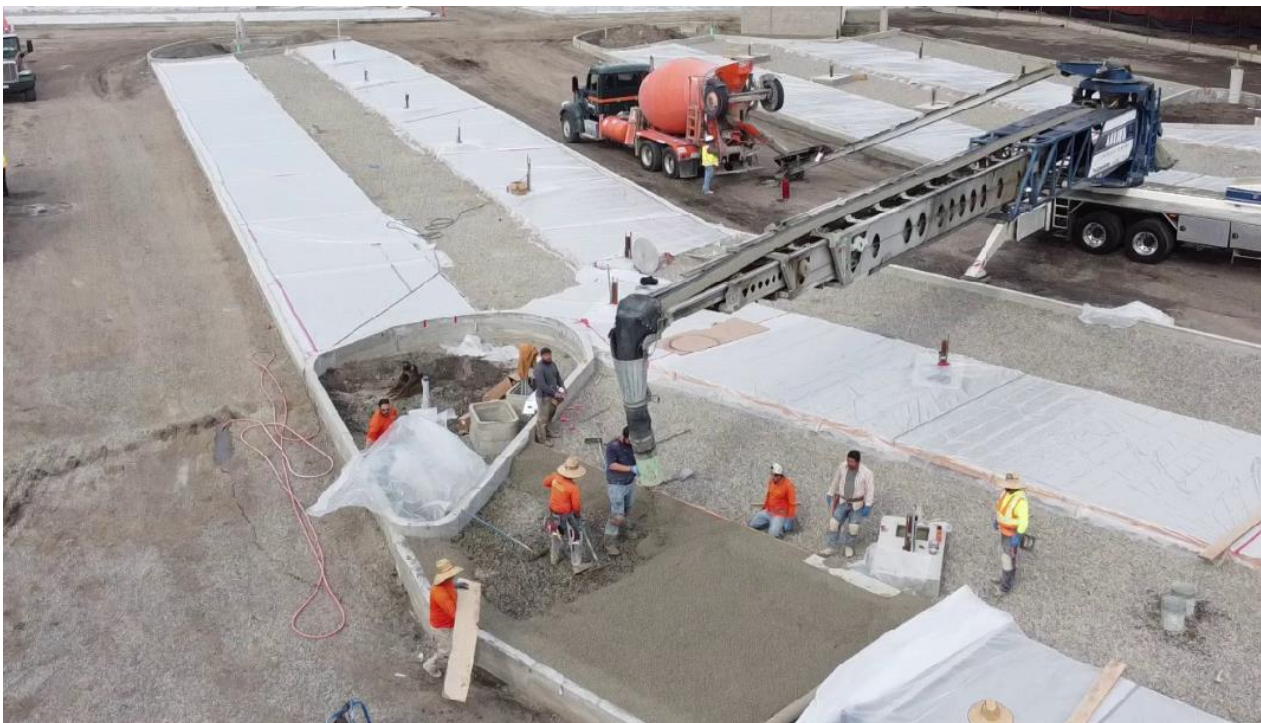


Fig. A

In the example of the 45' x 100' area, we would form and pour three 15' wide lanes x 100' long. We would pour the outside lanes first and after those sections have set, come back and pour the middle lane. Unlike regular concrete, we cannot do early cutting. We must wait until after the curing period (typically 10 days) has ended and the plastic sheeting is removed before we can cut joints. Referring back to our most important jointing rule; square or close to square sections, a 15' x 100' pavement will likely develop multiple cracks before we can cut the joints. To avoid this, we tool-in perpendicular joints as we pour a lane. These perpendicular joints, along with the joints between lanes, create a grid pattern as seen below in Figure B. If needed, we can also come back and saw cut additional joints after the curing period.



Fig. B

Our final constraint is placement, which is made more challenging because pervious concrete cannot be pumped. Depending on how we are delivering the material to the placement area; concrete buggy, skid steer, conveyor telebelt, or backing in the concrete truck, we must lay out the lanes in such a way that we have the necessary access for delivery.

When taking into consideration all the above factors, you can see why joint layout and pattern is a function of the pour sequence and layout for pervious concrete.



One additional piece of the puzzle is maximum joint spacing as opposed to layout and pattern. Max joint spacing is a function of pavement thickness; the thicker the pavement the more you can space out the joints. A general rule of thumb is the thickness of the pavement in inches  $\times 32 =$  the maximum joint spacing. As an example, for a 6" thick slab you would multiply 6"  $\times 32$  which is 192 inches, or 16 feet. With a four inch thick slab the maximum spacing would be 10 feet 8 inches. As mentioned, this represents a general rule of thumb, meaning staying under the maximum does not guarantee you will not get a crack, but they will be minimal, and going over the maximum does not guarantee you will get cracks, but it becomes more likely. Note that using the right type and dosage of fibers can also minimize cracks and allow for larger joint spacing.

We strongly recommend that you not only reach out to us with any questions, but also send us your site plan so we can develop a workable joint plan for you.