

## Special Paving Applications

The February 2006 Contractor Focus highlighted paver installation tips including the choice of laying patterns, projecting perpendiculars to establish the layout and pattern, cutting and compacting the pavers. This edition reviews some special applications affecting residential and commercial contractors. The guidelines presented in the previous issue are a prerequisite to those presented in this article.

### Paving around openings

Paving around openings such as manholes, fountains and even pools should not be as challenging as it seems. How does an installer ensure paving around an opening results in dropping the last paver in place without shifting a large field of pavers or, at worst, cutting pavers to fit? The key is maintaining bond lines by projecting parallel and perpendicular string lines from a reference line of reference from the initial laying face. While the basics of this process were discussed in the previous issue of Contractor Focus, some additional insights follow.

In some instances, obstruction to pave around is encountered as the field of pavers has already started and the laying face progresses forward. Figure 1 shows the process for paving around smaller openings such as tree wells, manholes and other utility structures using a herringbone pattern. The procedure is as follows:

- Snap perpendiculars and parallel chalk lines in the sand or pull string lines on all four sides of the opening. These should be perpen-

dicular to the base line.

- Lay pavers evenly on both sides, until the back side of the opening is reached.
- Fill with pavers on the back side and create a 45° pyramidal laying face as shown in Figure 1.
- Adjust bond lines as required.
- Fill any gaps around the opening with cut pavers

Paving around larger openings like swimming pools requires a bit more finesse. Figure 2 shows a pool area and with most pools the line of sight from one side to the other

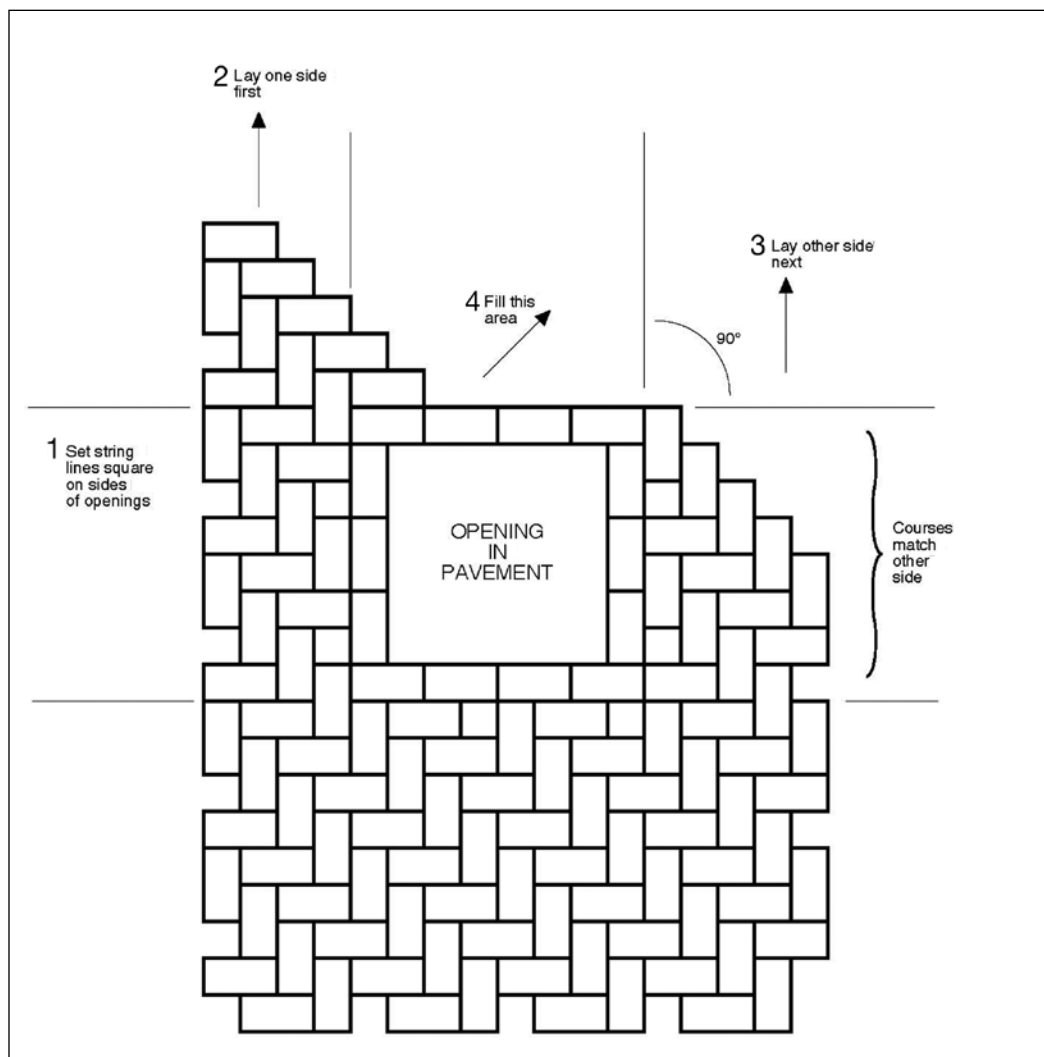


Figure 1. Paving around smaller openings

doesn't allow the crew to see the bond lines on the other side. There may not be an established laying face and the installer must create a starting point. A reference line, shown as RL1 is snapped into the bedding sand and a perpendicular is established at the approximate midpoint shown as the Point of Origin.

To begin this process the installer screeds the bedding sand around the perimeter of the pool, as outlined in Figure 3. Installation begins at the Point of Origin and paving works simultaneously in both directions on screeded bedding sand around the pool (east and west).

As paving progresses in both directions, the crew checks perpendicular and horizontal bond lines. Moving north, horizontal bond lines are checked at a minimum of every 6 to 10 feet (2 to 3 m) by setting string lines on top of the laid pavers, parallel to the RL1, the first horizontal reference line. Check perpendicular bond lines every 10 to 20 feet (3 to 6 m) by pulling a string line on top of the pavers parallel to the perpendicular center reference line established at the Point of Origin. When paving initially around the perimeter of the pool, the pavers are laid in a 3 to 4 foot (1 m) band around the pool. Bond lines that deviate from string lines can be righted with an alignment bar as shown in Figure 4.

As with smaller obstructions, when the back (north) side of the pool is reached, the pavers are filled in by creating a 45° pyramidal-shaped laying face as shown in Figure 1.

By following these procedures, the installer should be able to pave to the other pool side (or obstruction) and drop in the remaining pavers without cutting or excessive shifting. In the case of the pool deck example, the crew can then continue the installation by working from four laying faces; screeding bedding sand and laying pavers in four different outward directions to complete the pool deck.

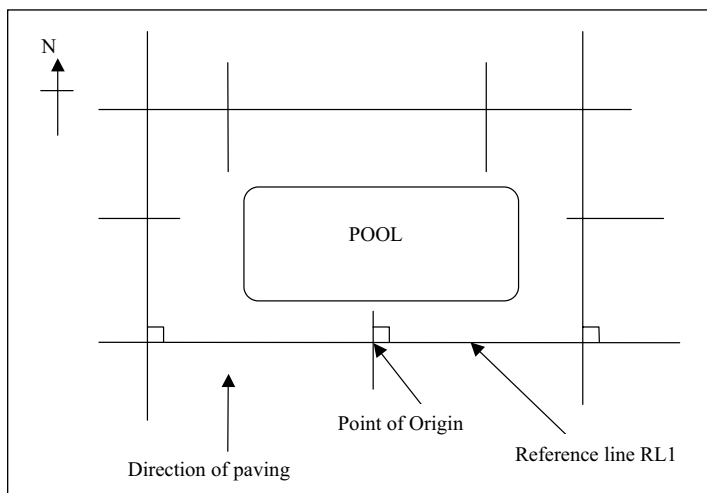


Figure 2. To begin paving around a pool, a reference line and point of origin must first be established.

## Alternatives—Bands and Paving Direction

Sometimes it will be easier and require less cutting to change the paver direction and include banding when paving to an obstruction. Figure 5 shows an example of changes in paver direction to minimize cutting when paving around an obstruction (in this case a statue). Banding enables the change by presenting a clean break between one paver direction and another.

## Paving over existing concrete or asphalt

Sometimes the opportunity arises where pavers can be installed over an existing asphalt or concrete parking lot or driveway. Figure 6 shows an example of a typical overlay. Note the geotextile over the concrete or asphalt. Typically concrete or asphalt may require this fabric due to potential surface cracking, migration of bedding sand into them and settlement. A geotextile ensures separation so that there is no loss of bedding sand.

Another concern is surface tolerance. Just like an aggregate base, the asphalt and concrete need to have a surface tolerance of  $\pm 3/8$  in. (10 mm) over 10 ft (3 m) so that there is consistent bedding sand thickness. In some cases, the surface of the existing pavement can be ground out and bedding sand and pavers placed in the milled area. Some ground out areas may need to be patched prior to placing the geotextile, bedding sand and pavers. Cracks  $3/8$  in. (10 mm) or larger in width should always be patched.

In all overlay applications, special attention should be given to drainage of the bedding sand layer. Drainage can be achieved by drilling 2 in. (50 mm) vertical holes at the lowest elevations of the pavement, as shown in Figure 7. The drain holes should be filled with pea gravel and covered with geotextile to prevent loss of bedding sand.

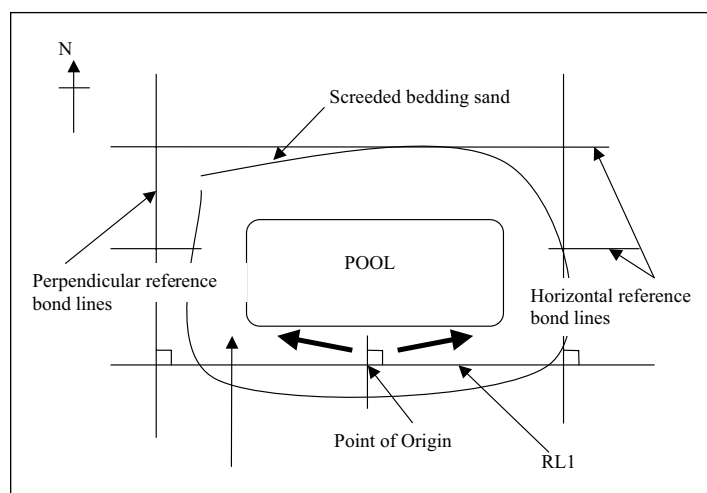


Figure 3. Checking perpendicular and horizontal reference bond lines around a pool.

## In Conclusion

There are often many applications where special treatment of paving, bedding layer or base is needed. *ICPI Tech Spec 10—Application Guide for Interlocking Concrete Pavements*, addresses some of these treatments. Additional applications are discussed such as roof plazas and parking decks, gas stations and snow melting systems. Visit [www.icpi.org](http://www.icpi.org) and follow the link to "Design Professionals." There are resources such as ICPI Tech Specs and many design details. For design ideas, installation tips, and marketing/ business tools, visit the contractor section of this web site by following the link to "Contractors."

## Continuing Education Opportunities

ICPI is pleased to announce the Board of Directors recently approved recommendations from the ICPI Construction Committee for developing higher levels of certification. These will soon be outlined to all of our Certified Concrete Paver Installers. The requirements for the next higher level of certification will include hourly requirements for continuing education credits. This column will continue to offer one credit hour for successfully answering the questions. These credits can be applied to hourly requirements for higher certification levels when the new programs are announced.

Please also note the following submission requirements.



Figure 4. An alignment bar, shown above adjusts joint widths to maintain bond lines.



Figure 5. Incorporating banding and a change of direction can reduce cutting when paving around an obstruction.

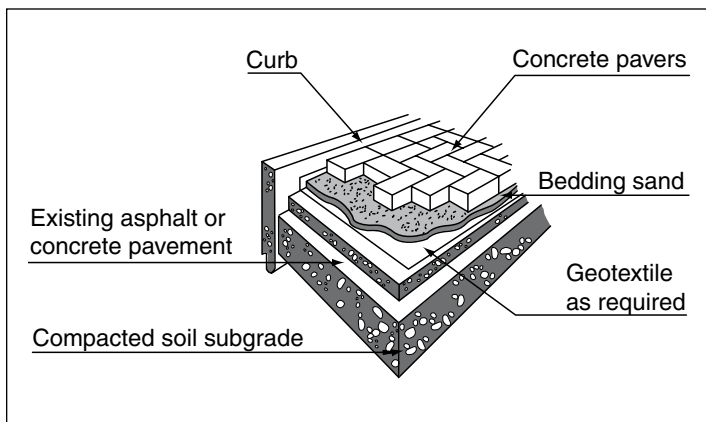


Figure 6. When pavers are installed over existing concrete or asphalt, geotextile plays an important role by containing the bedding sand.

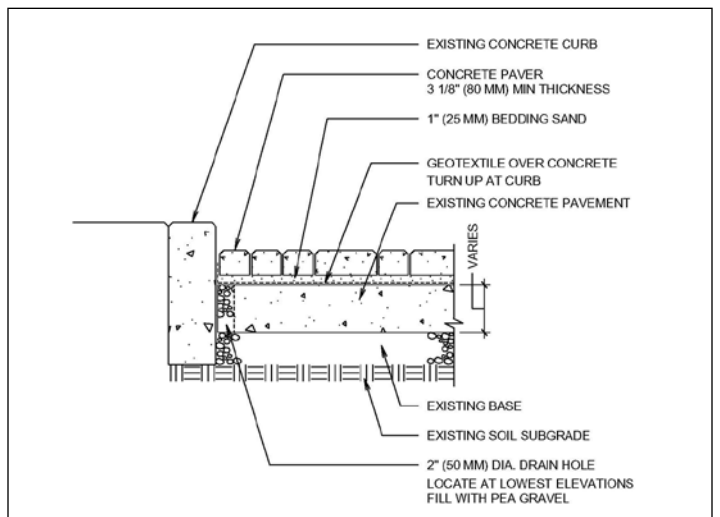


Figure 7: When paving over existing concrete or asphalt, 2 inch (50 mm) drain holes are required at lowest elevations to ensure that the bedding layer does not become saturated.

Log onto [www.icpi.org](http://www.icpi.org) and follow these links: Contractors, Certification, and Online Training. Continuing education credits earned from answering questions about magazine articles will continue free of charge. This one is labeled Exam 7. By entering answers online you will receive your certificate immediately upon successful completion and ICPI will maintain an automatic record of your continuing education credit. Faxed answers will not be accepted. If you are looking for more hourly credits, you will see others offered for the ICPI member price of only \$20.00. Good luck on the exam!

## Contractor Focus CE Questions

1. *When paving around obstacles, the key to maintaining bond lines is:*
  - a. Dependent on the laying pattern
  - b. Dependent on joint widths
  - c. Dependent on the type of paver used
  - d. By projecting perpendicular and parallel string lines from a reference line
2. *One way to make paving around obstacles easier is:*
  - a. Remove the obstacle
  - b. Incorporate banding and changes in pattern direction
  - c. Always pour a concrete header around the obstacle
  - d. None of the above
3. *A useful tool to assist with bond line adjustments is:*
  - a. A screw driver
  - b. A tire iron
  - c. A paver alignment bar
  - d. A jumping jack compactor
4. *When paving initially around the perimeter of the pool, the pavers are laid in a 8 to 10 ft (3 m) band around the pool.*
  - a. True
  - b. False
5. *It is not recommended to install geotextile over old concrete or asphalt when doing a paver overlay.*
  - a. True
  - b. False
6. *When overlaying pavers and bedding sand over new or existing concrete or asphalt a contractor must always make provisions to drain the bedding sand layer.*
  - a. True
  - b. False
7. *When paving over new or existing concrete or asphalt, 1 in. (25 mm) diameter drain holes are required at lowest elevations to ensure that the bedding layer does not become saturated.*
  - a. True
  - b. False
8. *When overlaying pavers on concrete or asphalt, the surface tolerance does not need to be as close as with a typical dense-graded base.*
  - a. True
  - b. False
9. *When paving around obstacles, fill in remaining areas to be paved with laying faces parallel or perpendicular to the original reference line.*
  - a. True
  - b. False
10. *When paving around obstacles, perpendicular and parallel reference lines are best when struck in the bedding sand.*
  - a. True
  - b. False