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INSTALLING STANDARD INTERLOCKING CONCRETE PAVERS ON OPEN-GRADED AGGREGATES

QUESTION:

Is it acceptable to construct standard interlocking concrete pavers (ICP) with sand-filled joints on an open-graded aggregate (OGA) base or bedding?

ANSWER:

This construction method combines a base/bedding from a permeable interlocking concrete pavement with a surface layer of standard sand-set interlocking concrete pavement. Standard sand-set pavers over dense graded aggregate base

with a concrete sand bedding are the recommended assembly for most ICP applications. Alternatively, standard sand-set pavers on an open graded aggregate base/bedding may be appropriate with specific limitations. This pavement system has the potential to reduce frost heave during winter and minimize delays caused by wet or cold weather during construction. However, to achieve these benefits, it is essential to follow the best practices for both pavement systems and carefully consider the recommendations outlined below.

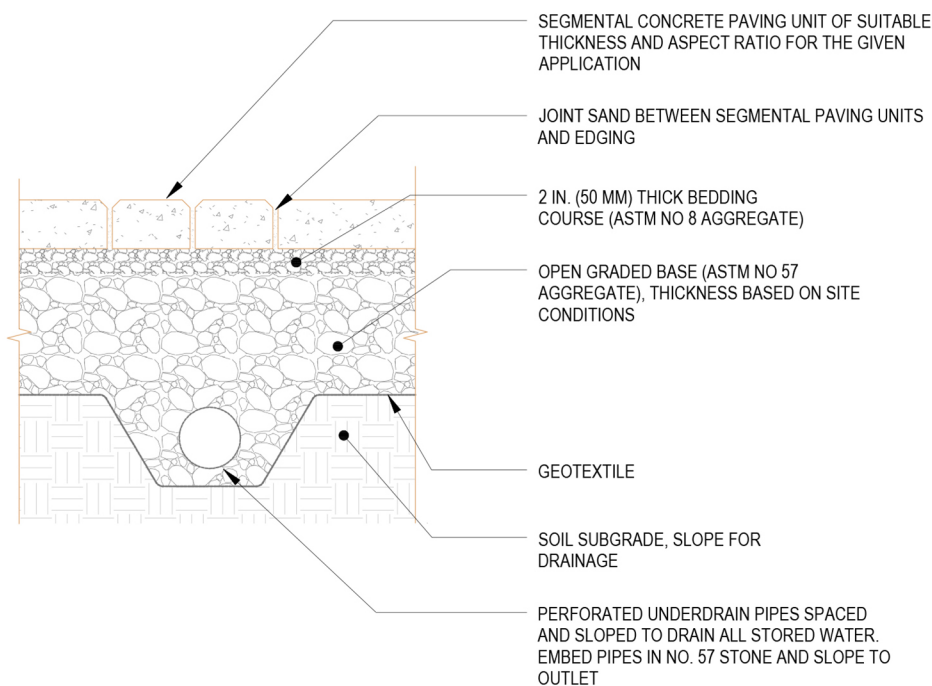


Figure 1— Typical cross section of a standard interlocking concrete pavement with sand filled joints on open graded aggregates.

To evaluate this approach, the ICPI Foundation funded a three-year study, “Open Graded Drainage Position Statement Research,” conducted by Englobe which concluded in 2025. The final report is available on the Concrete Masonry & Hardscapes Association (CMHA) website at masonryandhardscapes.org.

Standard ICP on an OGA base systems use materials and construction techniques from standard interlocking concrete pavements and permeable interlocking concrete pavements. Please refer to CMHA’s technical resources for the recommendations related to these systems in addition to the recommendations below.

DESIGN RECOMMENDATIONS

- This method of construction is only for Residential Pedestrian Projects: patios, pool decks, sidewalks, and walkways. It is not for any commercial or vehicular applications.
- Geotextile is installed along the bottom and sides of the excavation to stop surrounding soil from migrating into the open-graded aggregate base.
- Jointing Material: Use ASTM C144 mason sand or polymeric sand. ASTM C33 concrete sand may be used, however, it is more difficult to work into the joints compared to other recommended materials.
- Underdrains should be included where subgrade soils are not highly permeable to prevent water from collecting in the base and saturating the subgrade.
- Edge restraints must provide a stable edge that will resist lateral spreading of the concrete pavers. Edge restraints used for PICP applications are appropriate.

CONSTRUCTION RECOMMENDATIONS

- Open graded aggregates must be compacted, to prevent future settlement and proper load distribution. Compaction can be confirmed by using a lightweight deflectometer and achieving an average maximum deflection of 0.6 mm.

MAINTENANCE RECOMMENDATIONS

- Joint sand will migrate into the open graded aggregates below. It is important to monitor sand loss and replenish when the loss is greater than 1/2 in. (12 mm).
- Stabilized joint sand should be used with caution. While joints may appear full after installation, sand loss from below can leave only a thin surface crust. Over time, the binder will break down, leading to increased sand loss. Monitor joint sand loss and replenish as per manufacturers recommendations.
- Check for lateral shifting, heaving, rutting, or settlement of the pavement surface and repair as needed.

While open-graded aggregate base systems can provide benefits such as increased frost heave resistance and fewer weather-related construction delays when used beneath standard interlocking concrete pavers, they may not be appropriate for all projects.

Optimal performance of interlocking concrete pavement relies on thorough site evaluation, appropriate material selection, proper construction techniques, and regular maintenance. Contractors should carefully assess soil conditions, drainage needs, and anticipated loading before selecting this system. Inadequate evaluation or unsuitable design choices, particularly in high-load applications, can result in premature deterioration.

For best results, it is recommended to use the services of a qualified [CMHA Certified Concrete Paver Installer](#) and refer to the latest technical resources available at masonryandhardscapes.org. A careful, site-specific approach helps ensure the system functions as designed and provides long-term performance.

ABOUT CMHA

The Concrete Masonry & Hardscapes Association (CMHA) represents a unification of the Interlocking Concrete Pavement Institute (ICPI) and National Concrete Masonry Association (NCMA). CMHA is a trade association representing US and Canadian producers and suppliers in the concrete masonry and hardscape industry, as well as contractors of interlocking concrete pavement and segmental retaining walls. CMHA is the authority for segmental concrete products and systems, which are the best value and preferred choice for resilient pavement, structures, and living spaces. CMHA is dedicated to the advancement of these building systems through research, promotion, education, and the development of manufacturing guides, design codes and resources, testing standards, and construction practices.

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