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### Permeable Interlocking Concrete Pavement (PICP) for Stormwater Management

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# Permeable Interlocking Concrete Pavement (PICP) for Stormwater Management



<p><b>Benefits and Uses</b></p>	<ul style="list-style-type: none"> <li>• Quantity, Pollutant Reduction, and Flood Control</li> <li>• Recharges Groundwater</li> <li>• Reduction in Stormwater Infrastructure (Piping, Catch-Basins, Ponds, Curbing, etc.)</li> <li>• Suitable for Cold-Climate Applications, Maintains Recharge Capacity When Frozen</li> <li>• No Standing Water or Black Ice Development During Winter Weather Conditions</li> <li>• Maintains Traction While Wet</li> <li>• Reduced Surface Temperatures; Minimizes the Urban Heat Island Effect</li> <li>• Potential for Extended Pavement Life Due to Well Drained Base and Reduced Freeze-Thaw</li> <li>• No curing time – ready for traffic upon installation completion</li> </ul>
<p><b>Limitations</b></p>	<ul style="list-style-type: none"> <li>• Requires Routine Vacuum Sweeping (Vacuum-Assisted Dry Sweeper Only)</li> <li>• ICPI Recommends a PICP Installer Technician On-site During Installation</li> <li>• Proper Soil Stabilization and Erosion Control Required to Prevent Clogging</li> </ul>
<p><b>Cost &amp; Maintenance</b></p>	<p>Total Project Cost Can Be Comparable for PICP with Reduced Stormwater Infrastructure vs. Standard Pavement Applications where Stormwater Infrastructure is Required</p> <ul style="list-style-type: none"> <li>• Paver Surface and Bedding Cost is 25-35% More Than Traditional Concrete</li> <li>• Long-term Maintenance Required by Routine Vacuum Sweeping</li> <li>• Sweeping Cost May Be Off-set by Possible Reduction in Deicing Costs</li> <li>• Repairs Can be Made in Freezing Temperatures with Reinstated Concrete Paver Units and Aggregate Jointing/Bedding Materials</li> </ul>
<p><b>Design Criteria</b> * Source: ICPI</p>	<div style="display: flex;"> <div style="flex: 1;"> <p>Recommended Soil Permeability 0.01 - 3.0 in./hr</p> <ul style="list-style-type: none"> <li>• Recommended Drainage Time 24-72 Hrs</li> <li>• Use Underdrains to Remove Water That Cannot be Infiltrated within Drainage Time</li> <li>• For Parking Lots, Alleys, Low-Use Roadways and Sidewalks</li> <li>• Required Vertical Separation from Seasonal High Groundwater (1-3 ft. typical)</li> <li>• Minimum Surface Infiltration (New) – 100 In./Hr and Minimum In-service Infiltration Indicating Vacuum Cleaning – 10 In./Hr Using ASTM C1781</li> <li>• AASHTO Layer Coefficients: 0.3 for Concrete Pavers and Aggregate Bedding; 0.9 for Base Reservoir; 0.6 for Subbase Reservoir Thicknesses</li> <li>• Can use stabilized open-graded bases for heavy traffic</li> </ul> </div> <div style="flex: 1;"> <p><b>TYPICAL CROSS-SECTION</b></p> </div> </div>
<p><b>Additional Resources</b></p>	<ul style="list-style-type: none"> <li>• US FHWA PICP Fact Sheet <a href="http://www.fhwa.dot.gov/pavement/concrete/pubs/hif15006.pdf">www.fhwa.dot.gov/pavement/concrete/pubs/hif15006.pdf</a> (2015)</li> <li>• ACSE <i>Permeable Pavements</i> manual <a href="http://ascelibrary.org/doi/book/10.1061/9780784413784">http://ascelibrary.org/doi/book/10.1061/9780784413784</a> (2015)</li> <li>• Interlocking Concrete Pavement Institute, <i>Permeable Interlocking Concrete Pavement</i> (2011)</li> <li>• Interlocking Concrete Pavement Institute: <a href="http://www.icpi.org">www.icpi.org</a></li> </ul>