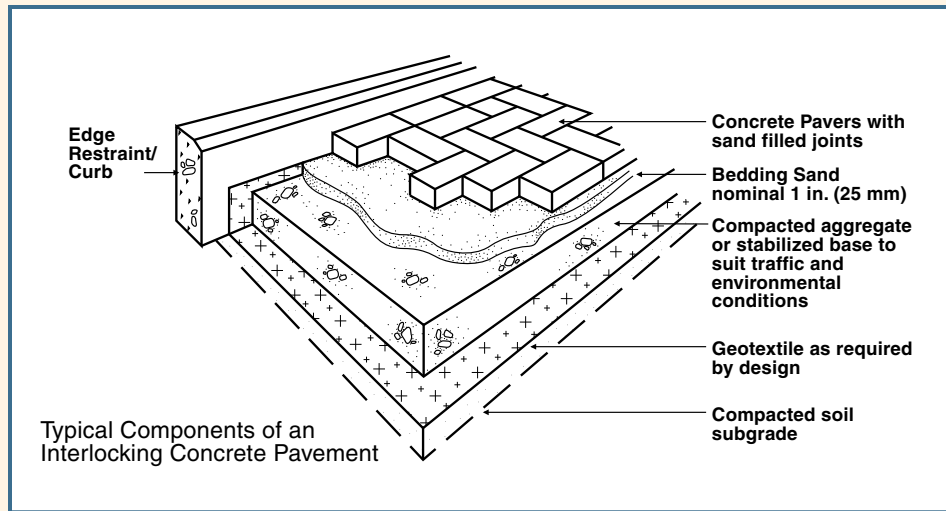


Construction Tolerances and Recommendations for Interlocking Concrete Pavements

Note: This guide does not apply to permeable interlocking concrete pavements or tumbled pavers



Paver and bedding layer

Attribute	Tolerance*
Paver joint width	1/16 in. (2 mm) to max. 3/16 in. (5 mm)
Paver surface flatness	±3/8 in. (10 mm) in 10 ft. (3 m) (non cum.)
Lippage at catch basins/drains	1/8 in. to 3/8 in. (3 to 10 mm) (non ADA)
<i>Lippage between individual pavers maximum 1/8 in. (3 mm) for pedestrian access routes</i>	
Attribute	ICPI recommendation
Paver aspect ratio (l:t) <i>(length divided by thickness)</i>	max. 4:1 for pedestrian & driveways max. 3:1 for street/parking
Joint fill depth	max. 1/2 in. (13 mm) measured from top of pavement
Bond lines ¹	±1/2 in. (13 mm) max. over 50 ft. (16 m)
Slope for drainage	min. 2%
Cut pavers ⁵	No less than 1/3 for vehicular application No less than 3/8 in. (10 mm) for all other applications
Paver laying pattern ²	Acceptable for application
Minimum paver thickness	3 1/8 in. (8 cm) for street/parking 2 3/8 in. (6 cm) for pedestrian & driveways
Bedding layer thickness	1 in. (25 mm) nominal
Joint sand gradation	ASTM C144 or C33 CSA A23.1 FA1 or CSA A179
Bedding sand gradation	ASTM C33 or CSA A23.1 FA1

Base and subbase layer

Attribute	Tolerance*
Top of base surface variation	± 3/8 in. (10 mm) over 10 ft. (3 m) (non cumulative)
Attribute	ICPI recommendation
Base thickness variation ³	+ 3/4 in. to -1/2 in. (+20 mm to -13 mm)
Compaction	min. 98% standard Proctor
Over-excavation (dense graded bases)	greater of 6 in. (150 mm) or equal to base thickness
Geotextile	as needed
Minimum base thickness ⁴	
Sidewalks, patios, pedestrian	4 in. (100 mm)
Residential driveways	6 in. (150 mm)
Parking lot/residential street	8 in. (200 mm)

Edge restraint/curb edge

Attribute	ICPI recommendation
No movement	firmly in place
Proper restraint	acceptable for application (see "Guide References" on reverse)

Notes:

¹Bond lines: Unless it is deemed that the pavement is not adequately restrained at the edges the bond line tolerance is considered cosmetic

²Paving layer pattern: ICPI recommends herringbone laying pattern for all vehicular applications

³Base thickness variation: An example of an acceptable variation is 7 1/2 in. to 8 3/4 in. (190 to 220 mm) for an 8 in. (200 mm) required total base thickness. The excavated cut should have the same slope and contouring as the final surface profile.

⁴Minimum base thickness: These are for well drained soils. Increase thickness in colder climates or weak soils.

⁵The contractor should have the discretion on cuts no less than 1/3 paver size. Sometimes it is not possible to adjust the cuts to less than 1/3 paver size without adjusting laying pattern, and sometimes it is not possible to adjust laying pattern with certain shapes.

*See reverse for tolerance measurement guidance

Guide References

Specification and design references

ASCE/ANSI *Structural Design of Interlocking Concrete Pavements* – pre-standard
ICPI Tech Spec 4–*Structural Design of Interlocking Concrete Pavement for Roads and Parking Lots*
ICPI Tech Spec 9–*Guide Specification for the Construction of Interlocking Concrete Pavement*
ICPI Lockpave software www.icpi.org

Pavement system references

ASTM C936 *Standard Specification for Solid Interlocking Concrete Paving Units*
CSA A231.2 *Precast Concrete Pavers*
ICPI Tech Spec 1–*Glossary of Terms for Segmental Concrete Pavement*
ICPI Tech Spec 2–*Construction of Interlocking Concrete Pavements*
ICPI Tech Spec 4–*Structural Design of Interlocking Concrete Pavement for Roads and Parking Lots*
ICPI Tech Spec 5–*Cleaning, Sealing and Joint Sand Stabilization of Interlocking Concrete Pavement*

Bedding and joint sand references

ASTM C33 *Standard Specification for Concrete Aggregates*
CSA A23.1 *Concrete Materials and Methods of Construction*
ASTM C144 *Standard Specification for Aggregate for Masonry Mortar*
CSA A179 *Mortar and Grout for Unit Masonry*
ICPI Tech Spec 17–*Bedding Sand Selection for Interlocking Concrete Pavements in Vehicular Applications*

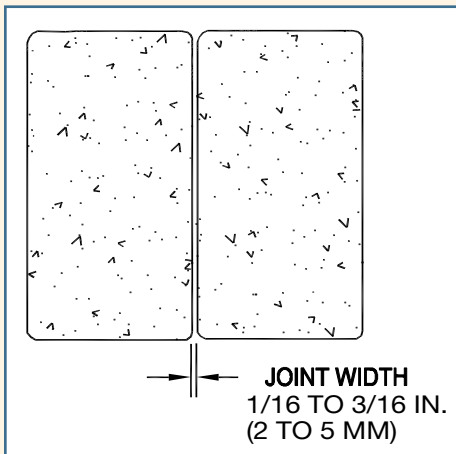
Base, subbase and subgrade layer references

ASTM D 2940 *Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports*
ICPI Tech Spec 2–*Construction of Interlocking Concrete Pavements*
ASTM D698 *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort*

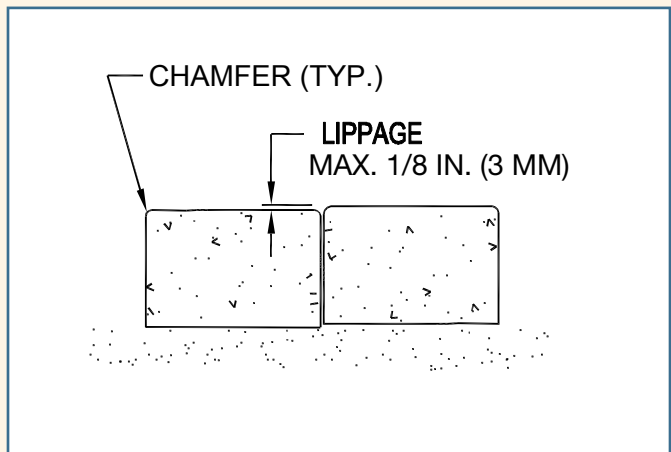
Edge restraint references

ICPI Tech Spec 3–*Edge Restraints for Interlocking Concrete Pavements*

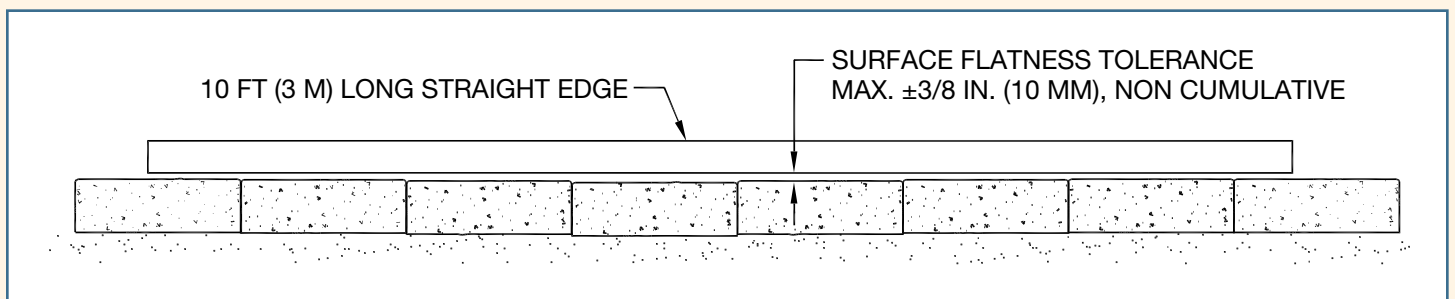
Tolerance Measurement Guidance



Joint widths are measured with a ruler from inside edge of paver to inside edge paver between adjacent pavers



Lippage is measured from the top of a paver to the top of the adjacent paver



Paver surface flatness and top of base surface variation are measured with a straight edge for simple slopes and with a transit for complex contours