

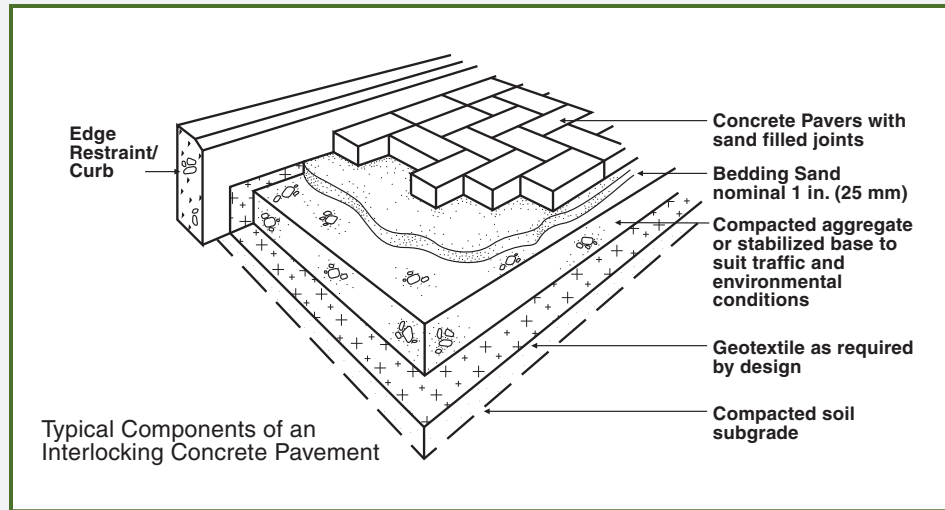
Construction Tolerances and Recommendations for Interlocking Concrete Pavements



icpi

Interlocking Concrete Pavement Institute®

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



Paver and bedding layer

Attribute

Paver joint width

Tolerance*

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)

Lippage between individual pavers maximum 1/8 in. (3 mm) for pedestrian access routes

Attribute

Paver aspect ratio (l:t)

ICPI recommendation

max. 4:1 for pedestrian & driveways

(length divided by thickness)

max. 3:1 for street/parking

Joint fill depth

max. 1/2 in. (13 mm) measured from top of pavement

Bond lines¹

±1/2 in. (13 mm) max. over 50 ft. (16 m)

Slope for drainage

min. 2%

Cut pavers⁵

No less than 1/3 for vehicular application
No less than 3/8 in. (10 mm) for all other applications

Paver laying pattern²

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

Top of base surface variation

Tolerance*

± 3/8 in. (10 mm) over 10 ft. (3 m) (non cumulative)

Attribute

Base thickness variation³

ICPI recommendation

+ 3/4 in. to -1/2 in. (+20 mm to -13 mm)

Compaction

min. 98% standard Proctor

Over-excavation

greater of 6 in. (150 mm) or equal

(dense graded bases)

to base thickness

Geotextile

as needed

Minimum base thickness⁴

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

No movement

Proper restraint

ICPI recommendation

firmly in place

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 58-10 *Structural Design of Interlocking Concrete Pavements for Municipal Streets and Roadways*

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*

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*

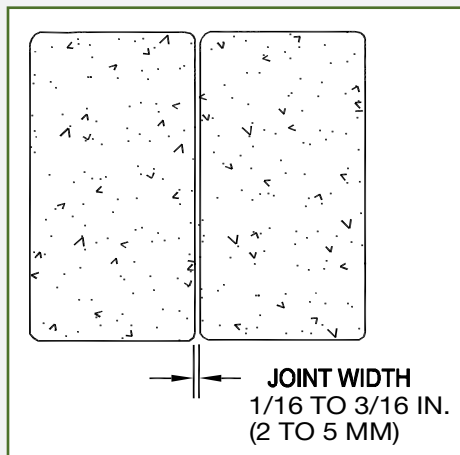
ICPI Tech Spec 2—*Construction of Interlocking Concrete Pavements*

ASTM D698 *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort*

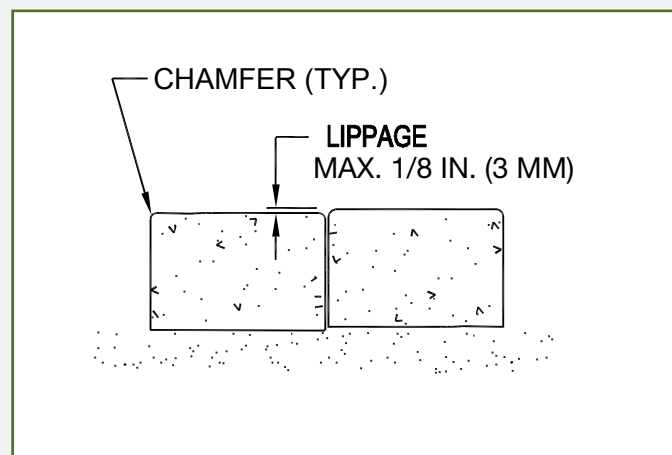
Edge restraint references

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

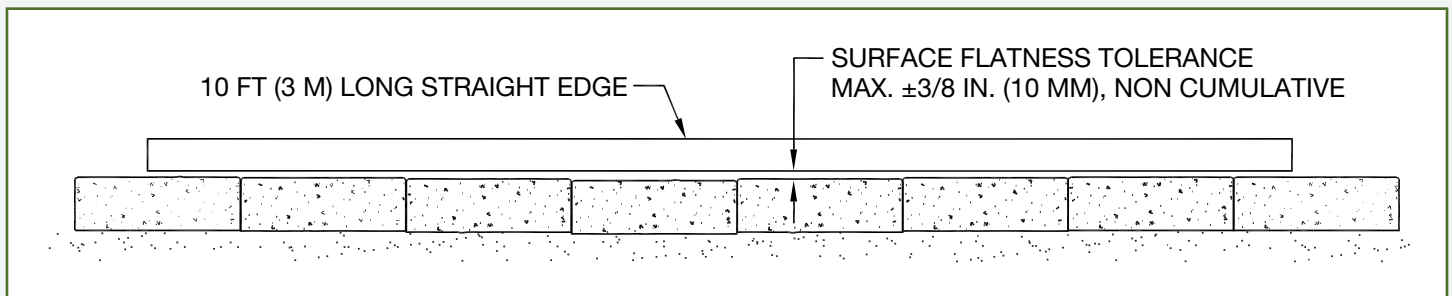
Tolerance Measurement Guidance



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