

Construction Tolerances for ICP

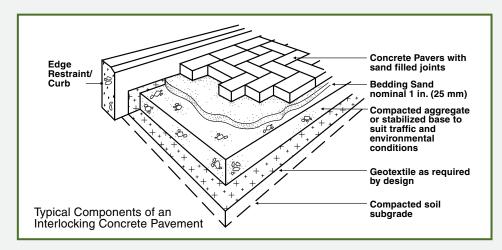


Construction Tolerances and Recommendations for Interlocking Concrete Pavements

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



These are the basic guidelines. **Review related Tech Specs for** specific details. These tolerance and recommendations are applicable to most products, but allowances may be required for tumbled, embossed or other unique products. Consult manufactures recommendations.



Paver and bedding layer

Attribute

1/16 in. (2 mm) to max. 3/16 in. (5 mm) Paver joint width Paver surface flatness Lippage at catch basins/drains 1/8 in. to 3/8 in. (3 to 10 mm) (non ADA)

Attribute

Paver aspect ratio (I:t) (length divided by thickness)

Joint fill depth

Bond lines1 Slope for drainage

Cut pavers⁵

Paver laying pattern²

Minimum paver thickness

Bedding layer thickness Joint sand gradation

Bedding sand gradation

Tolerance*

 \pm 3/8 in.(10 mm) in 10 ft. (3 m) (non cum.)

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

ICPI recommendation

max. 4:1 for pedestrian & driveways

max. 3:1 for street/parking

max. depth of 1/4 in. measured from the bottom of the chamfer or the top surface of the paver if there is no chamfer at the time

of final inspection

 $\pm \frac{1}{2}$ in. (13 mm) max. over 50 ft. (16 m)

min. 2%

No less than 1/3 for

vehicular application

No less than 3/8 in. (10 mm) for all

other applications

Acceptable for application 31/8 in. (8 cm) for street/parking

23/8 in. (6 cm) for pedestrian & driveways

1 in. (25 mm) nominal ASTM C144 or C33 CSA A23.1 FA1 or CSA A179

ASTM C33 or CSA A23.1 FA1

Base and subbase layer

Attribute

Top of base surface variation

Tolerance*

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

Attribute

Base thickness variation³

Compaction **Base Extensions** **ICPI** recommendation

 $+ \frac{3}{4}$ in. to $-\frac{1}{2}$ in. (+20 mm to -13 mm) min. 98% standard Proctor

Base Thickness in. (mm)	Base Extension in. (mm)
Up to 6 (150)	6 (150)
6 to 10 (150 to 250)	equals base thickness
10 to 20 (200 to 500)	10 (250)
20 (500) or greater	1/2 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

Base thickness variation: An example of an acceptable variation is 71/2 in. to 83/4 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 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 58-16 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

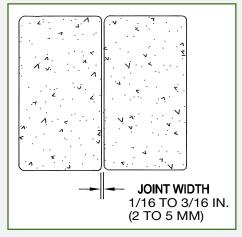
ICPI Tech Spec 5—Cleaning, Sealing and Joint Sand Stabilization of Interlocking Concrete Pavement

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

Tolerance Measurement Guidance



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

Base, subbase and subgrade layer references

ASTM D 2940 Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports

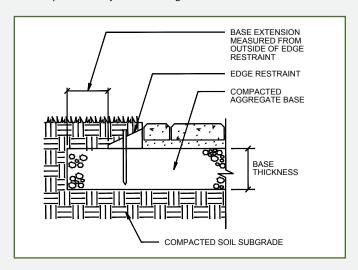
ICPI Tech Spec 2—Construction of Interlocking Concrete Pavements
ASTM D698 Standard Test Methods for Laboratory Compaction
Characteristics of Soil Using Standard Effort

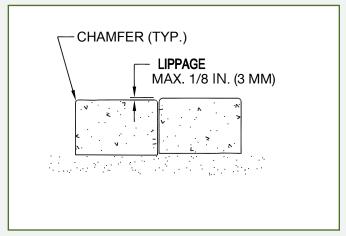
Edge restraint references

ICPI Tech Spec 3—Edge Restraints for Interlocking Concrete Pavements

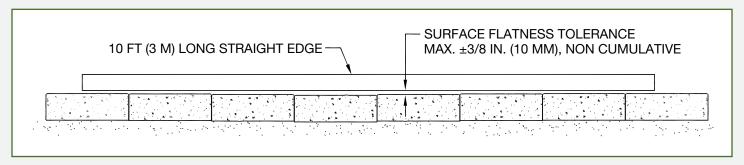
Geosynthetics reference

Tech Spec 22 —Geosynthetics for Segmental Concrete Pavements





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