

PERMEABILITY TESTING

Permeable pavement systems are in greater demand due to increasing requirements for storm water control. A paver system (including all sub-base materials) is considered permeable if it allows water to pass through the system at the rate of at least 3 inches per hour.¹

CalStar permeable pavers were installed at the School for Advanced Segmental Paving, in Franksville, WI in accordance with ICPI guidelines for permeable pavements:² the sub-base was 12” of Number 2 aggregate; the base was 4” of Number 57 crushed rock; the bedding layer was 2” of Number 8 sand.³ CalStar permeable pavers were mechanically laid and compacted. Paver joints were filled with Number 8 sand.

The infiltration rate was then tested in accordance with ASTM C1701-09 *Standard Test Method for Infiltration Rate of In Place Pervious Concrete*. In this test, a 12-inch diameter cylindrical ring, open at both ends, is affixed to the paver installation with plumbers putty pressed around the ring and into the paver surface to create a watertight seal. The system is pre-wetted, and then a known quantity of water is poured through the system. The time required for the water to infiltrate the system is recorded and the infiltration rate is calculated according to the formula below:

$$I = \frac{KM}{D^2 \times t}$$

where:

I = infiltration rate

M = mass of infiltrated water

D = inside diameter of infiltration ring

t = time required for measured amount of water to infiltrate system

K = an empirical coefficient (4,583,666,000 in SI units; or 126,870 in inch-pound units)

CalStar’s Testing Showed:

Mass of infiltrated water	39.6 lb
Diameter of infiltration ring	12.83 in
Time required for measured amount of water to infiltrate paver system	37.4 s
K (in SI units)	126,870 (in ³ s)/(lbh)
Infiltration rate	816 inches/hour

The minimum required infiltration rate for a permeable paver system is 3 inches/hour. The infiltration rate of the tested CalStar permeable paver system is 816 inches/hour.

¹ Smith, D.R. *Permeable Interlocking Concrete Pavements*, 3rd edition, Interlocking Concrete Pavement Institute, 2006.

² Guidelines found in reference above.

³ Different pavement applications require different sub-base depths. A local engineer should be consulted to determine the appropriate depths for specific applications.