

Pervious Concrete

Advantages

Applications

Design

Construction

Testing



Concrete Thinking
for a sustainable world



Portland Cement Association



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Presentation Outline

What is Pervious Concrete?

Why is it needed?

Architectural Uses

Advantages

LEED Certification

Placement & Testing

Cost Assessment

Engineering Properties

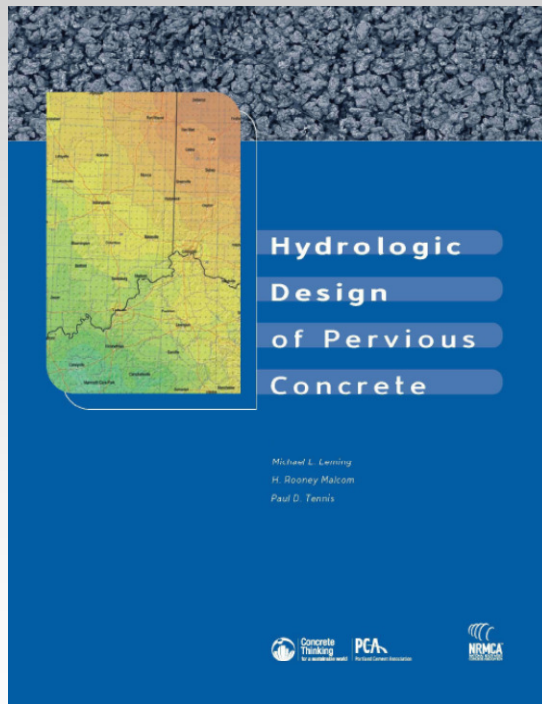
Design Considerations

Local Examples

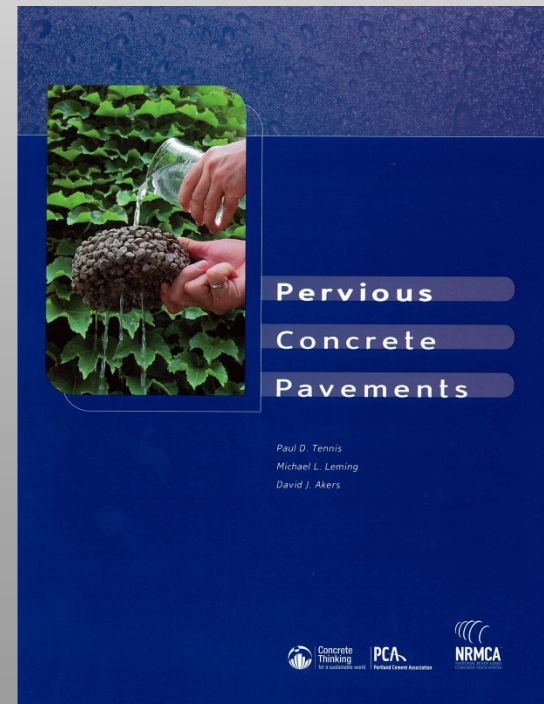


Reference Documents

Leming, Malcom, Tennis,
*Hydrologic Design of Pervious
Concrete*, PCA & NRMCA, 2007



Tennis, Malcom, Akers,
Pervious Concrete Pavements,
PCA & NRMCA, 2004



What is Pervious Concrete?

- Essentially a “boney” concrete. Fine and medium aggregates have been removed.
- Thick cement paste is developed to surround and support the coarse aggregate.
- The resulting inter-connected void space makes the concrete highly permeable.
- It is **not** Porous Asphaltic Concrete!



What is Pervious Concrete?

- Widely used in the south since 1960s.
- Can be used in northern climates with simple design modifications.



Concrete solution

Pervious concrete, widely used in the South, is becoming increasingly popular in northern climates. Tests have shown that the porous concrete, if installed and maintained properly, can hold up under the freeze-thaw cycles experienced in Ohio.

▼ Conventional concrete

1. Strong, good for heavy truck traffic.
2. Smooth surface.
3. Deflects water.
4. Used on roads, parking lots, sidewalks and airport runways.



Gravel or crushed stone mixed with cement, water and sand.



◀ Pervious concrete

1. Not as strong as conventional concrete.
2. Rougher surface.
3. Water seeps through, reducing stormwater runoff.
4. Muffles noise and reduces hydroplaning.
5. Used primarily on parking lots, sidewalks and some roads.

Uses stone that is smaller than conventional concrete and cement with little or no sand in the mixture. This creates porous spaces that allow water to pass through.

SOURCE: Researchers at Cleveland State University and Iowa State University

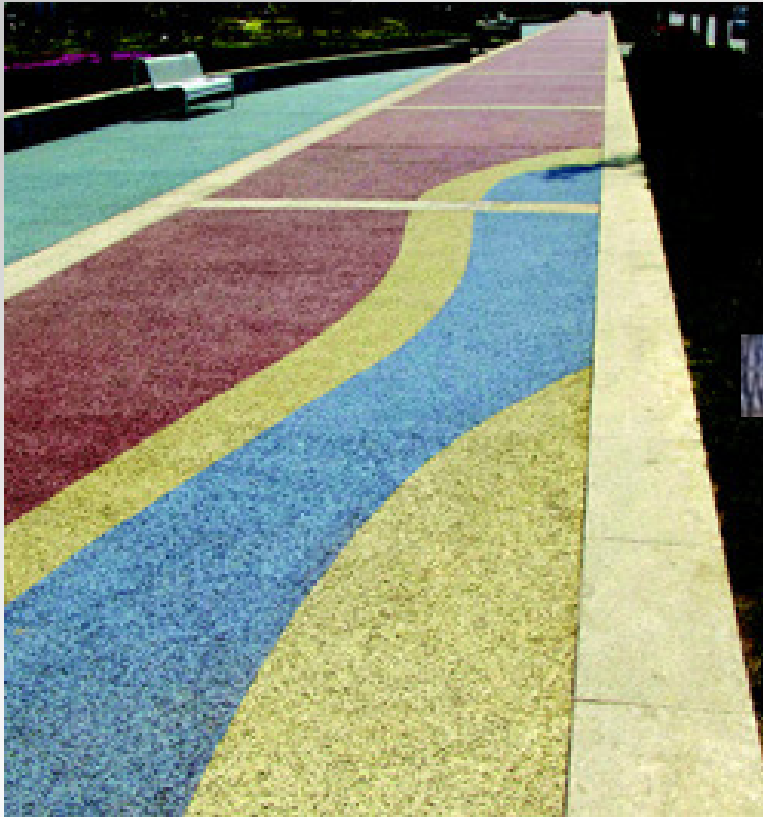
THE PLAIN DEALER

Applications

- Low-volume pavements and parking lots
- Residential roads, alleys, and driveways
- Sound barriers
- Slope stabilization structures
- Sidewalks and pathways
- Patios, tennis courts, swimming pool decks
- Pavement edge drains and gutters
- Seawalls, reefs and other hydraulic structures



Architectural Applications



- Fine-aggregate overlay on coarse pervious
- Stained pervious concrete



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