

# Interlocking

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***Largest U.S. PICP Project***

***PICP in Redevelopment***

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# Permeable Pavement Enhances Redevelopment Project



*Center Street Village in Mentor, Ohio used over 140,000 sf (14,000 m<sup>2</sup>) of old-style permeable interlocking concrete pavement to simulate stone paving in a mixed use project.*

**M**ending and restoring the urban fabric through redevelopment often involves grafting in existing structures, adaptively reusing them and building some new ones. Center Street Village development in the heart of Mentor, Ohio did all of this. The project converted the Center Street School building into 17 residential condominiums, added townhomes while expanding and revitalizing a commercial area.

However, the project owner went a step further by using the pavement to help attract residential buyers and commercial tenants in a soft real estate market. This would have been impossible with conventional asphalt or concrete. The attraction came from 143,000 sf (14,300 m<sup>2</sup>) of cobblestone permeable interlocking concrete pavement (PICP). Project owner Rick Osborne, Jr. of Junior Properties used PICP to add the area's historic character while reducing stormwater runoff. Moreover, PICP eliminated stormwater detention ponds from the project thereby enabling more room for income-generating development.

Mentor, Ohio (pop. 52,000) fits comfortably against Lake Erie about 20 miles (35 km) northeast of Cleveland. The city's claim in history is that President James Garfield grew up there. Center Street Village represents a classic redevelopment project that makes architectural references to historic roots with new buildings and PICP.

According to project owner Rick Osborne, he "fell in love" with PICP the moment he saw it. PICP was about twice as expensive as cast-in-place (impervious) concrete, but PICP

manages the stormwater for the entire 10 acre (4 ha) three-phase project with far fewer storm pipes and no detention pond, even when completely built out in the coming years. Mr. Osborne noted that snow plowing is not much different than conventional pavement and deicing salts were used where needed. The PICP has not moved or heaved from freeze-thaw cycles.

Located on a glacial till geological formation, the sandy-gravelly soil under the development has a high infiltration rate, around 20 in./hour (500 mm/hr). This enabled the PICP design to capture and infiltrate the difference in runoff between the pre-development and post-development 100-year storm. The spaces between the aggregate in the base and subbase provide a storage reservoir for practically all rainfall events, even those beyond the 100-year storm. According to designer Rick Cantanzriti, Engineer with Land Design Consultants, Inc. in Mentor, "There has been minimal runoff contributed to the city storm sewer system even in the heaviest rainstorms."

The pavement structure supports cars and delivery trucks. The structure consists of a 8 to 10 in. (200 to 250 mm) thick subbase of ASTM No. 2 stone under a 4 in. (100 mm) base of No. 57 stone under 1 1/2 in. (40 mm) of No. 8 stone for the bedding. See Figures 1 and 2. The 100% permeable surface built with concrete pavers consists of 3 1/8 in. (80 mm) thick units and joints filled with No. 8 stone to quickly infiltrate runoff. A thicker subbase (10 in. or 250 mm) was used in areas with high traffic loads.

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# Permeable Pavement Enhances Redevelopment Project

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Center Street Village was the first PICP project for the City of Mentor. PICP was well-received by the City Engineer and Stormwater Engineer, as well as by Lake County officials. This enabled the project to move through municipal review without delays.

An ICPI member experienced with PICP installations screeded the No. 8 stone bedding layer and mechanically placed the pavers. Spacers molded into the sides of each unit created sufficient space to receive No. 8 stone bedding material. After filling the joints and then sweeping loose stones from the surface, the pavers were compacted to

begin load-spreading interlock. The installation crew averaged 4,000 sf (400 m<sup>2</sup>) per day including layout, screeding, mechanical laying, cutting edge pavers, joint-filling, compaction and clean-up.

The PICP is designed to accommodate runoff from the third and final phase of the project planned for 2009. In the meantime, the existing commercial buildings are almost completely leased so there are many reasons to visit the center even on rainy days, as customers no longer have to put up with puddles. ❖



Figure 1. The No. 57 stone base is in place and being compacted with a vibratory roller. The No. 57 stone was placed over a No. 2 stone subbase.



Figure 2. After compacting the No. 57 stone, No. 8 stone for the bedding layer is screeded smooth to receive the permeable pavers.



Figure 3. Mechanically placed pavers enabled an average installation rate of about 4,000 sf (400 m<sup>2</sup>) per day including layout, screeding, mechanical laying, cutting edge pavers, joint-filling, compaction and clean-up.



Figure 4. The offset rectangular laying pattern of the permeable paver clusters enables greater interlock.