

# Congratulations!!

EEl would like to recognize the following employees for their milestone anniversaries with the company:

**10 Years: Deborah R. Anderson**  
Administrative Assistant

**15 Years: Kristopher K. Pung**  
CAD Manager

**20 Years: Angela R. Smith**  
Executive Asst./Mktg. Coordinator

EEl congratulates **Julie A. Morrison, P.E. and Michele L. Piotrowski, P.E., LEED AP** on their promotion to Senior Project Managers.



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## Did You Know?

One of the ways that EEl continues to support our local community is by donating space in our building to the Between Friends Food Pantry. For the past seven years our staff has assisted in transporting the holiday meals from Jewel back to the food pantry for distribution to their clients.



## Enterprises Trivia Challenge

**Q:** How many miles of roads are paved with asphalt in the United States?

Send your answer to [eei@eeiweb.com](mailto:eei@eeiweb.com) or fax to **(630) 466-6701** December 31st to be entered in a drawing for a \$50 American Express gift card!



Engineering Enterprises, Inc. (EEI), founded in 1974, provides consulting engineering services throughout northern Illinois. Our expertise includes water, wastewater, transportation, stormwater, construction management, land surveying and GIS.

[www.eeiweb.com](http://www.eeiweb.com)

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## Porous Asphalt Pavement - Can It Stretch Your Infrastructure Dollars?

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In recent years, many communities have struggled with the need to not only resurface their roads but also address any localized drainage issues. Rural road sections and alleys often have represented an area where there is little to no stormwater management, which can greatly affect the adjacent roadway condition. Infrastructure costs have continued to rise, traditional methods for stormwater management such as curb and gutter and storm sewer have become less cost effective. This has forced communities to look at more efficient ways to stretch their infrastructure dollars to meet both roadway rehabilitation and stormwater management needs.

Porous Asphalt or Porous HMA has been around since the 1970's as a cost effective and sustainable way to manage stormwater runoff compared to traditional curb and gutter and storm sewer construction. Porous HMA is typically applied to parking lot, driveways, alleys and other areas where there is not heavy loading or heavy turning movements.



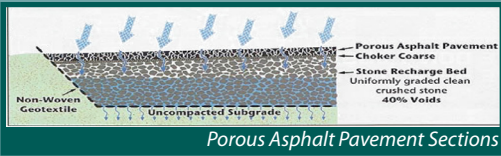
Fall / Winter  
2016

# Enterprises



# Porous Asphalt Pavement - Can It Stretch Your Infrastructure Dollars?

## Porous HMA generally consist of five different layers



- Uncompacted Subgrade: The bottom subgrade layer must remain as uncompacted as possible to ensure that there is maximum infiltration.
- Non-Woven Geotextile Fabric: Fabric lies on top of the subgrade allowing water to flow through and prevent soil migrating into the recharge bed.



- Stone Recharge Bed: The recharge bed goes on top of the fabric and consists of large single sized crushed stone (1-inch to 3-inches) with approximately 40% voids. The voids in the recharge bed allow water to flow through the layer and infiltrate the subgrade as well as provide storage for water as it infiltrates the subgrade. Typically a perforated underdrain is installed below the recharge bed to help drain the alleys during times of high subgrade saturation.
- Choker Course: The stone recharge bed must be capped with smaller stone to facilitate paving. The choker course usually consists of single sized crushed aggregate 1/2-inch to 3/8-inch size.

- Porous Asphalt Pavement: The top asphalt mixture is designed to have 18-20% voids to allows water to drain through.



## Alleys - A long time concern for the Village of Montgomery

The alleys located in downtown Montgomery have long been a subject of complaints due to flooding, ponding, potholes and the overall condition of the alleys. The alleys were originally gravel until the early 90's when they were paved with 2-inches of asphalt. The profile of the alleys followed the existing ground and many of the alleys drained into resident's yards, garages or even basements. A challenging aspect of the design was providing a new vertical alignment for the alley to redirect drainage into the alley and away from the resident's property when possible. The alley width was also increased to a uniform 10 feet when possible to increase vehicle access and safety. Given these parameters the Village decided to reconstruct the alleys with Porous Asphalt.



## Coordination with the residents and businesses were key

The residents and businesses in the Village of Montgomery were given construction flyers to inform them of the anticipated work, schedule and to request resident and business comments for any special needs. Coordination with residents and businesses included vehicle access, parking restrictions, garbage pick-up, and handicap and medical needs. During construction a continuous line of communication was maintained with property owners as access and schedules changed.

Paving in the alleys presented numerous challenges due to limited equipment and trucking access as well as low overhead utilities. The contractor utilized 6-wheeler trucks and a smaller track paver while paving. The smaller equipment and trucking were used due to the narrow alleys, overhead utilities and to minimize compaction on the base and subgrade material. Unlike traditional asphalt which is compacted with a vibratory roller, the porous asphalt must be compacted with a static roller. During production a growth curve was performed to decide the proper rolling pattern to achieve the desired air voids.



## Other considerations to keep in mind

Other factors that may need to be accounted for are the long term maintenance of the asphalt and snow plowing limitations. The Village needs to institute a yearly sweeping and vacuuming program to prevent debris from clogging the pores and affecting the overall performance of the pavement. Sanding must also be limited during winter maintenance.

## Successful project completion

The alley reconstruction project was completed within budget this summer as part of the Village's annual roadway program. Both the Village and the residents were extremely pleased with the final completed project. Before the project the Village had numerous residential complaints. After completion there have been no complaints even with some larger rain events.

On October 11th, EEI held a Lunch 'n Learn presentation and demonstration of the Porous HMA product on-site at the Village of Montgomery.



If you would like additional information or see if Porous HMA is a solution for your road, please contact **Chris Ott at [cott@eeiweb.com](mailto:cott@eeiweb.com) or (630) 466-6700.**

# President's Message



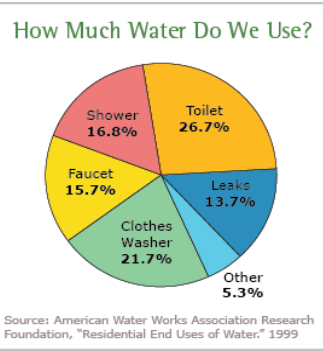
*Peter G. Wallers, P.E., CFM*

## Do We Take Water for Granted?

We live in an area of the country that seems to have an endless supply of water. However, we are learning that all of our water supply sources have some sort of challenge. The deep aquifer is being over pumped, the Lake Michigan withdrawal is limited by agreement, inland surface waters can have water quality and quantity challenges and the shallow aquifers face challenges due to pollution such as increasing chloride levels and over use. Even with all of these long term challenges, especially when coupled with the on-going cost of maintaining Water Works System infrastructure, water rates are a bargain.

The fact of the matter is that it is often easy to take water for granted. Municipalities and water utilities deliver high-quality water to our houses for a low price. In the municipality that I live, I can get 300 gallons delivered to my tap every day for about \$1.50 per day. In comparison, a Starbucks "grande" sized coffee (depending on location) costs around \$2. When considering the drastic difference in quantity for about the same price, I think it is pretty easy to conclude publicly supplied water is an incredible value.

Many people are shocked when they find out how much water they, and their family, use per day. According to the USGS and USEPA, the average person in the US uses 80 to 100 gallons per day, and the average family in the US uses 300 gallons per day. Of course, this varies widely across the country, with the more arid states generally using more water. If you are asking yourself how that is possible, here is a link to a Home Water Use Calculator that may help answer that question: <http://www.home-water-works.org/calculator>.



Obviously, you can also check your water bill to see the total amount you are using per billing period. In any case, you may be surprised at how much water you do use.

Municipalities and water suppliers do a great job at providing an abundant, clean and economical supply of water. They are skilled and efficient and are working 7 days a week, 24 hours a day, 365 days a year to make sure that when we turn on the tap clean water comes out. That is their job. Our job is to make sure they have the resources they need to do their job, which sometimes requires an increase in water rates. I can tell you from experience that every municipality and water utility takes rate increases very seriously. They perform a careful analysis before they make any recommendation to increase rates.

They evaluate the impact the increased rates will have on typical water bills. With all of that in mind, we need to remember that water is essential to our lives and our economy. We need to remember not reinvesting in our water utilities is not an option. We need to put the value of water into perspective. I am sure everyone could survive without a grande cup of coffee, but no one can survive without a sustainable supply of water. We cannot take water for granted. We must protect our water resources, and we must continue to invest in our water infrastructure.