Engineering Enterprises, Inc.

IN THIS EDITION

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Enterprises

Sand, Sand and More Sand!

The Village of Sugar Grove Well No. 9 was designed for a total depth of 1,465 feet and a 700 gpm target pumping rate from the deep sandstone Ironton-Galesville aquifer. During the well development

Well No. 9 and Well No. 9 Treatment Facility, Sugar Grove, Illinois

phase, it was determined the sandstone formation in this location was unstable. Consequently, the well was producing a fair amount of sand under pumping conditions.

With an unstable sandstone formation, the Village had two options: eliminate sand production or manage the sand at the surface. Due to the negative effects of continuously pumping sand for surface removal, the Village decided additional time and money should be invested to stabilize the well.

In an effort to identify the formation's zone of instability, the Village, EEI, and the well contractor considered a number of investigative techniques including downhole-logging tools; production zone isolation with packer(s) and test pumping; as well as a dynamic downhole video survey (DDVS).

The selected tool, DDVS, included sending an ultra thin camera along with a submersible pump and motor into the well. With the pump running, a video camera monitored sand movement and determined the sand entrance through a large cavity 1,344 feet from the surface.

Next, the project team investigated whether sealing the bottom portion of the well, thereby closing the zone of instability as a water source, would eliminate the sand.
This was accomplished by filling the area with a granular material and sealing the bottom portion with a temporary bentonite plug. After stabilization of the bentonite plug, additional test pumping was conducted. The monitored discharge revealed sand production dissipated to nearly negligible amounts.

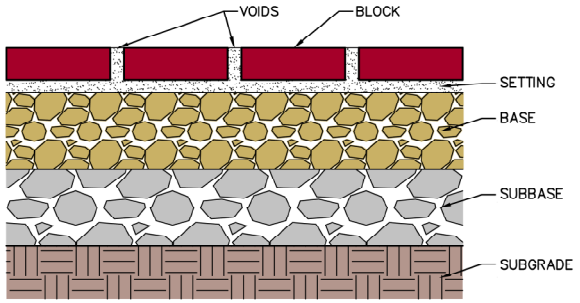

Aquastream System

To ensure against sand production and extend well life, EEI integrated an additional sand reduction technique, namely a suction flow control device, manufactured and supplied by Aquastream. This device is a specially designed slotted PVC pipe with a porous exterior coating that distributes water withdrawal over the entire length of the production zone of the well. The equalized flow and velocity profile within the well (that this device helped to create) reduced the chance for sand release.

Well No. 9 continues to supply sand-free water to the Village as a result of the team effort by the Village, EEI and the contractor. ■

Permeable Paver Pa

Permeable interlocking concrete pavers are often an excellent alternative to traditional asphalt or concrete pavement. Permeable pavers allow



Keeping Your Community Ahead of the Curve

Among the many challenges municipal officials face in rapidly growing communities is the responsibility of planning and implementing public infrastructure systems. Timing and financing of these critical municipal assets can be successfully addressed with a comprehensive understanding of needs and a fair assessment of costs to development entities. Among municipal infrastructure issues requiring this type of planning are transportation systems; water supply, treatment, storage, distribution and control systems; wastewater collection and treatment systems; and stormwater management systems.

Growth management tools such as transportation system planning studies, water works system needs assessments, wastewater system facility planning studies, and regional stormwater planning studies are available to assist municipal decision makers. These tools establish an accurate inventory and understanding of existing infrastructure and identify improvements required to meet projected growth demands.

Furthermore, these tools include construction cost estimates for required improvements and develop a fair share allocation to the various development participants. These allocations, otherwise known as impact fees or connection fees, become the basis for financing design and construction of infrastructure on a timely basis, as growth occurs, without placing an additional burden on local tax dollars and utility rates.

Expertise in annexation negotiation and plan review, coupled with the knowledge obtained from conducting these studies, enhances growth management efforts, annexation agreement content and plan review procedures, thus keeping the municipality "ahead of the curve". ■

aybacks

stormwater to infiltrate through spaces in the paver surface. This infiltration creates an opportunity for several conservation design benefits, including reduced stormwater runoff and a reduction in costly detention ponds.

Permeable pavers are a structural Best Management Practice that filters water to reduce contaminants and recharges the groundwater because water is allowed to pass through the void spaces between the pavers. The materials that fill the void spaces and the base materials beneath the pavers should be constructed of materials that allow for drainage.

A good maintenance plan is required to preserve the permeable pavers high infiltration rate. This includes utilizing street vacuum sweepers to clean the surface twice a year, followed by refilling any drainage voids between pavers.

When comparing the cost of constructing and maintaining permeable pavers versus traditional pavement, it is apparent that with a 50-year lifespan, permeable concrete pavers can be less expensive than traditional asphalt parking lots which need frequent repair and reconstruction. Additionally, pavers provide an opportunity for cost savings on the construction of stormwater management facilities, and contrary to popular myth, if properly built, hold up to heavy traffic and snowplows.

Contrary to popular myth, permeable pavers provide a versatile surface that holds up to heavy traffic and snowplows.

Pavers are aesthetically pleasing and many color options are available from a variety of manufacturers. Both beautiful and beneficial, permeable pavers provide "paybacks" to the community and the environment for years. ■

Enterprises Challenge

Trivia, brainteasers and more...

The Enterprises Challenge will take place in each issue. The person with the first correct answer will receive a $100 American Express gift card.

Send your answers to Bobbi Erdmann at berdmann@eeiweb.com or fax your answer to 630-466-9380, Attn. Bobbi.

Q What route, built by Winfield Scott in 1832, went from Chicago, passing through Aurora and Naperville, to Galena?

Did you know the answer to the Spring/Summer question?

A Reasonable and prudent

Did You Know?

Recent changes in federal and state radionuclide regulations have made radium removal in drinking water a topic of particular concern for the communities in northern Illinois and southern Wisconsin. In response to the new and pending regulations, EEI performed a radionuclide/heavy metals study on the water works and wastewater systems of the Village of Hampshire in northwestern Kane County, Illinois.

With a focus on the removal of radium and barium, the study evaluated impacts of drinking water treatment on the radionuclide and heavy metal content of wastewater sludge and effluent. With limited industrial influences to the municipal waste stream, Hampshire's system served as an ideal case study for generating data specifically for ground water supplies discharging to publicly owned wastewater treatment systems.

Sampling and testing conducted during the study provided a clear indication of how radium and barium traverse municipal water works and wastewater systems.

EEI will be presenting the findings of this study and treatment options Thursday, March 15 at the 2007 Illinois Section American Water Works Association Annual Conference and Exposition which will be held in Springfield, Illinois at the Crown Plaza Hotel.

If you would like information on this topic, contact Edward J. McCall, P.E., Project Manager at 630-466-9350 or emccall@eeiweb.com. ■

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