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*BY DESIGN*

## *Small Cities Confront Need for Centralized Wastewater Systems*



Drainage systems in small communities have developed almost universally as a hodge-podge of solutions to a common problem: Where does the water go when it's flushed down the toilet, drained from the sink, or captured after a downpour?

Systems grew as needed, as time and money permitted, and as technology advanced. After 1900, septic systems became the most common way to handle waste from individual homes.

If a well-defined drainage system was added, it usually consisted of tile lines that emptied into county ditches or natural waterways. In some cases, direct connections from houses to the tiles were made, without benefit of the treatment provided by septic tanks.

### *Limitations of old systems*

Septic and supplementary drainage systems constructed during the past century have, in many cases, seen their better days. Septic systems require maintenance, so if a

system has not been pumped regularly, it becomes an ineffective treatment system and can cause plumbing failures and back-ups. Tile, concrete, and even wood drainage systems built years ago are most often plugged, collapsing, or deteriorating. If they're still functioning at all, they're often overloaded.

Use of septic systems as a home drainage system has been limited by development as well. To operate properly, a septic system requires a sizeable drainage field. As cities grow, lots are generally too small to act as drainage fields. The effect, particularly in periods of heavy rain, is sewer back-up, flooding, and discharge that threatens the environment.

### *The challenges*

In addressing the need for change, small cities face significant challenges. If there's never been an organized sewer system in the community, or if the existing collection sys-

Septic

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## Papetti's of Iowa Earns Governor's Award for Water Quality



Papetti's of Iowa was recently awarded the 2000 Governor's Iowa Excellence Award with special recognition for water quality for its Lenox, Iowa egg processing facility. Papetti's of Iowa is a division of Michael Foods, Inc. The facility was only one of two industrial facilities recognized by the State of Iowa in 2000.

In a letter to Papetti's general manager Paul Knoebel, Governor Vilsack said, "Your efforts serve as a model for the entire state and we are proud to recognize the leadership you have provided to help Iowa's environment." Papetti's of Iowa was presented with the award at a

December 14, 2000 luncheon in Des Moines.

Papetti's of Iowa and the City of Lenox constructed a new \$4.5 million wastewater treatment facility designed by Bolton & Menk in 1999. The project was funded in part with a Department of Commerce EDA grant. Papetti's employee Brent Wise is the superintendent and Neil VanZweden is the assistant at the wastewater treatment facility, which has been in compliance with the discharge limits since it was placed in operation.

Congratulations to Paul, Brent, Neil and the Papetti's of Iowa/Michael Foods staff for a job well done.

## In Frost, Minnesota, New System Minimizes Threat of Flooding

### Septic

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tem has failed, it is necessary to construct a new collection system and a modern treatment facility. Storm drainage needs should be addressed at the same time, particularly if the old, failed system served as a combined stormwater and sewage collection system. And, of course, once construction begins a city can expect months of torn-up streets and yards and general disruption of daily life.

### Financing new systems

When making improvements in a small city, costs are a harsh reality. A cost of \$200 to \$300 per household, per month is in most cases overwhelming and impossible.

Aiming for a more manageable \$30 to \$100 per-household cost, city representatives, state agencies, and engineers work together to find funding sources and design a system that's relatively affordable. As a part of this effort, the group must prioritize needs and occasionally compromise on the extent of feasible improvements.

### Successful change in Frost, Minnesota

In Frost, Minnesota, poor soils and a failing drainage system contributed to plumbing problems throughout the city before construction of new storm and sanitary sewer systems were completed in mid-2000.

Prompted by oppressive flooding in 1993, community leaders prioritized construction of a new storm sewer outlet in 1996. By 1997, work began on a new sanitary sewer system as well.

Grants and loans obtained from the following agencies reduced the monthly cost of the project to an acceptable \$40 per household. Funders included: the Minnesota Department of Trade and Economic

### "Dedicated Professionalism"

*Mike McNerney is a Senior Design and Construction Technician who's been with Bolton & Menk since 1971. Professionally, he's admired for his strong sense of detail, comprehensive record-keeping and project documentation, and his construction savvy. He's also a pro at helping municipalities get through the daily details of a major project, and at communicating with the public about those projects. In December, Mike was selected as the USDA Rural Development Project Representative of the Year for his involvement in the City of Frost's Wastewater Improvements project. Congratulations Mike!*



Development, the Minnesota Public Finance Agency, and USDA Rural Development. Region 9 Development Corporation assisted with grant administration in this case. Other private and public agencies are available to help with this task as well.

Bruce Firkins, Vice President of Bolton & Menk's Civil Division, says the project was a major enhancement for the community. "It was just a matter of time before most of the housing in Frost was going to have external plumbing problems. We abandoned old septic systems, installed new lines throughout the city (up to homes), and in the process, reduced the threat of flood- and sewage-related problems in the community and in downstream waters such as the Blue Earth



*Civil engineers build the world's infrastructure. In doing so, they quietly shape the history of nations around the world. Most people can not imagine life without the many contributions of civil engineers to the public's health, safety, and standard of living. Civil engineering's contributions to daily life, including transportation, clean water, and power generation, are magnificent in scope and functionality.*

*Simply stated, civil engineers are creative, people-serving, and problem-solving leaders who make our lives easier to live from one day to the next.*

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